The Practical Home Farmer, A Popular Guide for the Farm and Fireside, 

—SHOWING—

The Dependence of the World upon the Farmer and his Family, and Giving Plain Instructions for the Care and Treatment of the Sick; also Giving the History, Cause, and Means of Prevention of all the Common Diseases of Horses, Cattle, Sheep, Swine, Poultry, Etc.

With the Most Approved Practical Methods of Simple Home Treatment.

—ALSO—

Giving Numerous Tables, and a Large Amount of General Information of Especial Value to the House-Wife, Children and Students.

Edited and Compiled by F. L. Munroe.

With a Large Number of Illustrations.

Little Rock, Ark.: Union Printing Company
Printers and Publishers, 1887.
INTRODUCTION.

Upon the farmer and the mechanic rests the entire structure of civilization, and pre-eminently so upon the farmer.

When reliance on agriculture has ceased, nations have invariably receded from their high position and sunk into oblivion.

The wonderful prosperity of the United States is almost wholly due to the immense agricultural resources of the country.

Many books called cyclopedias, manuals, etc., have been written and compiled, having in view the alleged object of "Educating the farmer." These books are for the most part filled with "isms," "ologys," and learned and scientific expressions; long, tedious and intricate tables, charts, etc., all of which renders them of little use to the busy, active, thinking man, who has no time to pore over long scientific dissertations.

The author of the "Practical Home Farmer" does not expect to educate the farmer, because the farmer is rapidly educating himself.

This work is designed as a store-house of general information and a companion for every day use, of easy access, and readily understood at a moment's glance by the seeker after facts, whether it be the father, the mother, the son or the daughter.

"Excellence and merit" is the standard by which America measures her productions.

That this work be measured by that standard, is the kindly wish of

THE EDITOR.
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THE PRACTICAL HOME FARMER.

The Home.

'Mid pleasures and palaces,
Tho' I may roam,
Be it ever so humble,
There's no place like home.

—John Howard Payne.

THERE is no sweeter word than home! Around the fireside cluster all that makes life beautiful—Love, Trust, Charity, Truth and Beauty. There husband and wife prove the loveliness of unselfish union. There the youth gains aspiration and the training for a noble life. There the maiden learns the sweetness of unsullied purity and gentle deeds.
Much lies upon the man before he can be worthy of a happy home, much upon the woman. Some examples teach by warning, as others by furnishing models for imitation. Let us take a common case. A girl marries. She has been reared by an unwise, though fond mother, whose slavish devotion to her children has made her an unlovely household drudge. She has been brought up to be that wretched thing, a gaudy slattern; she is unkempt at breakfast and elsewhere at home, but gay beyond the household means for others; is ashamed of, and discontented with, her surroundings. City life to such an one is a cheerless, if not fatal, thing. After her marriage, the young couple live with her parents, and what the wretched home-education has taught grows into life-habit. Or, perhaps, they board in some house where idleness and gossip grow like noxious weeds, choking the possibilities of good. There is no wholesome work of head or hand; a wretched, life of complaint ensues; the girl becomes the mother of children she is all unfit to rear; a querulous, discontented wife, doing nothing — often unable to see anything to do — to aid in building a Home. In the end, when her husband has won a house of his own, this woman drifts into a likeness of her mother. She is shrill-voiced, careless of raiment, old before her time, with no sign of the fair, calm matronly beauty, that second blossoming after seed-time, which should come to replace the young charm — the Indian summer, almost as fair as wakening spring-time. Her very love for her children works their hurt because their is no guidance.

The man is as often to blame, seeming to live for business alone, or, vastly worse, only for boon companions. It is true that the wife, if she be one of those exceptional beings who can answer harsh words or the more bitter neglect with a smile, who will make home sweet even when her own life is as ashes within her lips, will, in the end, win any man to home and duty. Of such women there are a few — martyrs as worthy of our highest homage as any that ever
perished at the stake. But such a husband has no right to expect his wife to prove one of them. God's law is that "whatsoever a man sows, that shall he also reap." The enforcement of this law is nearly always as speedy and obvious as it is ultimately certain. The man sows indifference, neglect, unfaithfulness, and he reaps bitter recriminations, domestic broils and jealousies, a full and hideous crop.

In country life, the way is more smooth for both, though far from easy. The life of a farm is hard, especially so for the woman, but there is work for willing hands to do. There is the home to be made a haven of rest and sweet content. The wife should never forget her high ideal of home life, and that she must be the center of its beauty. Though they have but a log hut amid the wilderness, she may make that wilderness blossom as the rose. She may have small share of beauty, yet she may still be exceeding fair in her husband's eyes. Let them both remember it is not the harsh word that heals the breach.

When the children come, let there be order, but remember children are not machines. Train them as you would a vine by daily, hourly care and thought; by example, not by hard rules. A child needs play, air, sunlight, and, above all, love and sympathy. He needs a gentle mother-breast wherein to pour the little griefs which, though quickly flown, are at the moment all as poignant as the weightier woes of later years. Teach by love. Teach by example. Be chary of stern precepts for which the child can see no reason but your arbitrary will. If you would have your child respect you—to say nothing of his love—never punish him in a spirit of anger. Never make him a promise without performing it. Remember, there are nearly always other and better modes of punishment than beating him. Remove some present, or deny some expected pleasure, instead. Let him, if the fault be grave, feel your grave displeasure. Never scold. Govern firmly, but don't govern too much. Threaten seldom—never idly. The parent who tells a
child, "If you do so-and-so, I will do so-and-so with you," and then weakly forgets both the broken command and the assigned penalty for it, merits and receives the child's contempt. In all things, remember the tremendous force of parental example. Long before he learns his letters, your toddling one has read your daily life through and through. He molds his little life by the pattern you present him. For your child's sake, no less than your own, see to it, then, that your life is upright, true and pure. Oh, the tender grace and sweetness of the home where love and duty reign supreme; where the husband and father may cast off his load of daily care; where the wife and mother, grown lovelier by her self-restraint and thought for others, shines beside the hearth the dearest and the sacrest of all created things. In many a home, even in these degenerate days, may such a wife and mother be found:

A woman, not too pure and good
For human nature's daily food,
For wholesome pleasures, simple wiles,
Praise, blame, love, kisses, tears and smiles.

From the day, when a bride, she has entered the house wherein the Home lies as does the sculptor's dream of genius within the marble block, needing the patient, loving toil to bring forth its lines of beauty; through days or years of sorrow or of sunshine; with many a rebellious thought, fancy or longing to be trodden down in the path of duty; amid griefs and heart-aches not merely to be endured, but to be made stepping-stones to a yet higher and nobler life. Through child-birth pain and weary illness—still guided by the light of Love and Truth—the true woman moves on, blessing all who come within her influence. "Her children rise up and call her blessed."

Woe to the man who shall mar the happiness of the home life. And how many a farmer unthinkingly does this! He amuses himself; he goes to town to buy and sell; he
hires labor when there is much to do, but he habitually neglects his fellow-toiler and helpmeet in the house. At the busy season the work heaped upon the "women folks" almost crushes the life out of them. All this is to his own future infinite loss. The life of too many farmers' wives is what no man could bear, and no woman should be made to suffer. It would be a standing shame to the men of America—a disgrace to our nation—if anywhere the women should become slaves without even the slave's holidays, as brutally sacrificed to the chase for the almighty dollar as ever victim dragged before the throne of Moloch. As a child needs play, so men and women need some form of innocent pleasure. If "all work and no play makes Jack a dull boy," so from Jill it either crushes all her brightness and beauty, or else almost forces her to rebel against social and domestic law, in search of a less intolerable lot. Work the wife of a farmer must, but he should make the burden as light as possible.

Does any reader recognize this picture of the overworked wife, drawn by Ella Wheeler, one of the most sympathetic poets of the West? If so, let him have a care, lest he, too, become such a tyrant to such a slave:

"Up with the birds in the early morning—
The dew-drop glows like a precious gem;
Beautiful tints in the skies are dawning,
But she's never a moment to look at them.
The men are wanting their breakfast early,
She must not linger, she must not wait;
For words that are sharp and looks that are surly,
Are what the men give when the meals are late.

"Oh, glorious colors that clouds are turning,
If she would but look over hills and trees;
But here are the dishes, and here is the churning—
Those things must always yield to these.
The world is filled with the wine of beauty,
If she could but pause and drink it in;
But pleasure, she says, must wait for duty—
Neglected work is committed sin.

"The day grows hot, and her hands grow weary;
Oh, for an hour to cool her head,
Out with the birds and winds so cheery!
So she must rise in the morning and make her bread.
The busy men in the hay-field working,
If they saw her sitting with idle hands,
Would think her lazy, and call it shirking,
And she never could make them understand.

"They do not know that the heart within her
Hunger for beauty and things sublime;
They only know that they want their dinner,
Plenty of it, and just 'on time.'
And after the sweeping, and churning, and baking,
And dinner dishes are all put by,
She sits and sews, though her head is aching,
Till time for supper and 'chores' draws nigh.

"Her boys at school must look like others,
She says, as she patches their frocks and hose,
For the world is quick to censure mothers
For the least neglect of their children's clothes.
Her husband comes from the field of labor;
He gives no praise to his weary wife;
She's done no more than has her neighbor,
'Tis the lot of all in country life.

"But after the strife and weary tussle
With life is done, and she lies at rest,
The nation's brain, and heart, and muscle—
Her sons and daughters—shall call her blest;
And I think the sweetest joy of Heaven,
The rarest bliss of eternal life,
And the fairest crown of all will be given
Unto the wayworn farmer's wife."
Sons and Daughters on the Farm.

It is not necessary that the boy reared in the country should be a farmer. Farmers' sons often become leaders in trade, commerce, the arts, science, politics, or letters. In fact, it is from the country that the vigor of the city is constantly recruited. Hence the necessity of educating every boy to fit him, not for some single groove in life, but to occupy any plane his talents and industry may enable him to reach. But does he choose the farm? There is here as high an ideal—as great a field for action as anywhere in the wide world.

Nor are the daughters of the household, because they are the children of farmers, all, of necessity, to become farmers' wives. It may be happy for them if they do, for there is no condition in life where more true enjoyment may be had than in the tillage of the soil, in the rearing of stock, a well-kept garden, an orchard dropping luscious and healthful fruits, a comfortable dwelling, and well-kept grounds. These, every industrious family may have, however few the acres.

We can no more control the affections of the daughters than the talents of the sons. But much may be accomplished by so directing education that these talents and affections may be carried in natural channels. The boy who is the mere drudge of the farm, and the girl that of the kitchen, will always be looking afar for that happiness denied them at home. It is the instinct of all young animals to play. By both his physical and mental constitution, the child requires exercise, to promote growth, harden the bones, strengthen the muscles and sinews, and recreate the brain. This must be found outside the daily routine of labor, whether it be of the farm, the workshop or the school. In directing these matters, nature must be counseled and cooperated with. She cannot be rudely overridden and dis-
regarded, without exacting a heavy penalty in a stunted and misshapen life.

**Adorning the Home.**

Wherever the home may be, whether in city or country, it is little things that make up the household comforts. In cities little can be done, except to keep the surroundings, small though they may be, neat and tidy. The small yard, if any, may have a little green grass and a few plants; the windows, in any event, should have a few pots of choice flowers. In the ordinary city home, great display should not be thought of. A single plant well grown is better than a window crowded full of ill-looking and untidy starvelings. The village home presents greater capabilities. A few handsome trees for shade, a smooth, green lawn, with here and there a bed of flowers, running roses trained to the veranda, a clinging vine over the porch, and a path winding gracefully with gentle curves to the door, will speak eloquently of taste and contentment in the owner. It will be a suggestion of happy, smiling children, a careful father, a fond and earnest mother. Inside you are sure to find neatness, order, and reliance one on another. The walls will not be bare of pictures, nor the windows of flowers, nor will there be wanting those little elegancies of feminine work that tell of taste and refinement in every department of the household. There may not be wealth, but there will be something better—comfort. The husband may be at work all day in his shop, the wife perhaps working at home, but it will be cheerful labor.
Common Sense Farming.

Study Your Farm.

The best farmers are those who study the capabilities of their farms, with a view to the selection of the most remunerative crops. The first question to be decided in settling in new regions distant from markets, is, What crops will bear the farthest carriage without consuming their value? These are wheat, flax, and grass-seeds. And these crops, on new lands, are raised with the least outlay of labor. This sort of cultivation is, of course, ruinous to the land, and, if long persisted in, will certainly end in so reducing the fertility of the soil that even other crops cannot be profitably raised. The soil must not only possess all the elementary substances necessary to the production of a crop, but it must, to yield the greatest return, have all these elements in excess of the requirements. And if only one of these elements is lacking or deficient, the crop is subject to such changes as not only to cease to be profitable, but often to become impossible to be grown.

Rotation and Crops.

In Europe especially, and in the older portions of the United States in a more limited degree, an elaborate rotation, with liberal application of manures, is found necessary to bring back the soil to a state of full fertility and keep it so. In the West, and in some portions of the South, a more simple rotation, with or without manure, is practiced. In newly settled districts little attention is paid to rotation, and less to manuring, except by the more sagacious settlers. The farmers raise wheat and flax until the soil
begins to show signs of exhaustion, and then alternate with corn, or else seed down the land for mowing and pasture, making corn the principal grain-crop, and thus naturally gliding into stock husbandry, in the place of grain husbandry. The better-informed acquire stock as quickly as possible, and before their soil refuses to raise wheat and flax. Those who do this early, make the most money; for thus all but a small portion of that taken from the soil may be returned to it. The soil simply loses the phosphates of the bones and the nitrogen of the flesh of the animals sold.

A Simple Rotation.

The rotation in mixed farming is of the simplest kind. One-quarter of the farm in small grain, three-eighths in corn, and three-eighths in pasture and meadow, is a natural rotation. It is evident here that one-quarter of the pasture must be broken every year. It would be inconvenient, but let us see how this may be accomplished by dividing the farm into six fields. Take one hundred and sixty acres: A section of each field is shown below; the figures at the top show the fields:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Corn</td>
<td>Wheat</td>
<td>Corn</td>
<td>Wheat</td>
<td>Grass</td>
<td>Grass</td>
</tr>
<tr>
<td>Second Year</td>
<td>Wheat</td>
<td>Corn</td>
<td>Wheat</td>
<td>Corn</td>
<td>Grass</td>
<td>Grass</td>
</tr>
<tr>
<td>Third Year</td>
<td>Grass</td>
<td>Wheat</td>
<td>Corn</td>
<td>Wheat</td>
<td>Corn</td>
<td>Grass</td>
</tr>
<tr>
<td>Fourth Year</td>
<td>Grass</td>
<td>Corn</td>
<td>Wheat</td>
<td>Corn</td>
<td>Wheat</td>
<td>Grass</td>
</tr>
<tr>
<td>Fifth Year</td>
<td>Grass</td>
<td>Grass</td>
<td>Corn</td>
<td>Wheat</td>
<td>Corn</td>
<td>Wheat</td>
</tr>
</tbody>
</table>

This rotation will give a cleaning crop of corn the year before every seeding of wheat or grass, and every third year one field of grass is to be plowed. This may be called a
three-course crop, and it will be seen that it will require a long time to bring the fields into their original order again. In the third year, field six will be field one, and the entire rotation will not be complete so the fields occupy their original place until the twelfth year, a far better plan than the usual hap-hazard plan generally adopted.

**Effect of Bad Season.**

Whatever the rotation, whether simple or elaborate, an unfavorable season may frustrate the best-laid plans. Winter wheat is liable to be destroyed by freezing. Winter and spring wheat are both subject to the depredations of the fly and other insects, often ruining the crop. We have known the corn crop destroyed by rain and flood to such a degree in one of the great corn counties in Illinois (Livingston), that the feed of the farm teams was not made, and all through June, and into July, the land could not be entered on for replanting. We have seen whole meadows in Northern Illinois destroyed by the white grub (larvae of the May beetle), which eats the roots of meadow grass below the surface. We have seen, we repeat, such meadows, when the turf might be rolled up like a carpet. All these, and other contingencies, will interfere with the regular rotation, and often destroy the sequence. In such cases, the meadow must often be plowed up and lost entirely as a meadow, and cannot be recovered in less than two years. The loss of an annual crop, however, need not seriously interfere. The land may be fallowed, or some temporary crop put in for that year, or a fallow crop may be sown and plowed under. Hence the loss is light, and the regular crop of the next season may come in its turn. In no rotation can more than the general idea be followed.
Elaborate Rotation.

In the foregoing, we have given the most simple rotation possible, as an example. Few farmers raise so simple a list of crops. Oats, barley and flax are generally raised. These all come under the same category as wheat. The cereal grains farm one year's crop, as a whole, and may be divided up to suit; but flax should not follow the cereals, nor should one cereal follow another. Sorghum, potatoes, roots, and all that class of crops, must have a place in the rotation. They should be allotted to the corn land. They are cleaning crops. Hungarian grass, millet, and other special forage crops, may encroach either upon the small grain crops, or corn. Flax, hemp, and other fiber crops are exhausting, and must also follow the cleaning or fallow crop.

No Rigid Rule.—The idea in all this, is not to lay down a system of elaborate rotation to be rigidly followed. This notion has long since been exploded. Every farmer must figure it out for himself, and select his own system as best adapted to his particular needs. But to reach the best success, a system must be adopted and adhered to, so far as possible. It is the want of system that cost money, or, what is the same thing, time. It is the knowledge as to the crops best adapted to a soil and climate, or the lack of that knowledge, that marks the successful farmer from the unsuccessful one. It is not the intention of this work to speculate upon what crops pay best, but to point out that which shall be of value to every reader to know, in the management of the farm.

Grass-seed and Meadows.

In the simple rotation already described, there may seem too little meadow and pasture. It is one adapted to new countries where the corn raised is supplementary to
the grass crop. This brings the feeding resources of the farm, in proportion to that of grain raised to sell, as three-fourths of the first to one-fourth of the latter. As stock increases, the pasturage may be increased. A seed crop of grass and clover may be taken the first year, but when this is to be done, the grass—timothy, blue-grass, red-top, orchard-grass, fowl-meadow, etc., must be sown separate. Clover, whatever the variety, must be sown separate, until stock can be obtained. Then seed crops may be made profitable, since the seed will bear transportation long distances, and still yield a profit. The seed crop taken, the aftermath may be plowed under, and the straw converted into rough fodder and manure. It will always pay to seed the grass with any cereal crop, with a view to turning it under out of its rotation, and independently of the meadow and pasture in their regular rotation. The notion is, not only to prevent exhaustion and keep the soil rich, but to make it richer. This is the true secret in all cultivation.

An Eastern Man on Rotation.

A simple and excellent rotation is given in one of the United States Agricultural Reports, as adopted by a gentleman in Vermont. This was on a one-hundred-acre farm, of which twenty acres were woodland. The farm had eight lots, of ten acres each. Labor was high, and since hay paid well, as much grass was raised as possible. In going through these eight fields in eight years, one ten-acre field would be in corn or roots; the second year in wheat, barley, oats, or some other grain-crop seeded to grass; the next two years mowed for hay, and the next four years in pasture, and about equally divided for the keeping of stock summer and winter, the owner to feed all the crops on his farm. By this system of rotation and feeding all the produce on the farm, it was estimated he
could keep two-thirds more stock than the majority of farmers, and the land would be all under cultivation. He estimated ten acres in hoed crops, ten acres in grain, and the roots at three hundred bushels of potatoes, or one thousand bushels of rutabagas or beets per acre, besides four or five hundred bushels of grain annually.

**A Southern Planter's Testimony.**

A wide-awake Southern planter gave his plan of rotation, adapted to the cotton region, the farm containing five hundred acres of open land under fence, two hundred and fifty acres being devoted to arable purposes, and the rest to grazing. The writer held that the rotation might be as follows: 1, Cotton and corn in the same field in suitable proportions. 2, Oats sown in August on the cotton and corn land. 3, Rye, or rye and wheat, sown in September, the land having been twice plowed in order to kill the germinant oats. 4 and 5, Clover, if the land is in sufficient
heart to produce it; if not, the fourth year rest ungrazed, and the fifth year sheep and cattle penned upon it every night during the year, using a portable fence. An ordinary farm of five hundred acres, it was held, would support five hundred sheep, besides the crops in the above rotation. The oats and rye should feed them during the winter nearly or entirely, without injury to the grain. Five hands would be sufficient to work such a farm and take care of the live-stock. During the first year, the following results might be expected from an ordinary farm, without manure:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Acres</th>
<th>Bushels/Barrels</th>
<th>Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 acres in cotton</td>
<td>25</td>
<td>12 bales</td>
<td>$15</td>
<td>$900</td>
</tr>
<tr>
<td>25 acres in corn</td>
<td>50</td>
<td>250 bushels</td>
<td>$1</td>
<td>250</td>
</tr>
<tr>
<td>50 acres in oats</td>
<td>25</td>
<td>500 bushels</td>
<td>80 cents</td>
<td>400</td>
</tr>
<tr>
<td>25 acres in rye</td>
<td>25</td>
<td>200 bushels</td>
<td>$1</td>
<td>200</td>
</tr>
<tr>
<td>25 acres in wheat</td>
<td>25</td>
<td>150 bushels</td>
<td>$1.50</td>
<td>225</td>
</tr>
<tr>
<td>Increase and mutton sales of 500 sheep</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>500</td>
</tr>
<tr>
<td>Wool, 3 pounds per head</td>
<td>500</td>
<td>33 cents per pound</td>
<td>33 cents</td>
<td>495</td>
</tr>
<tr>
<td>Manure, at $1 per head</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>500</td>
</tr>
</tbody>
</table>

The Second Year. - This gives an average of six hundred dollars per hand for the first year, fully three times the average per hand in the Cotton States then. The next year the writer holds that the cotton and corn would be more than double by penning five hundred sheep at night on fifty acres, and says that ten sheep regularly penned will manure well one acre in a year. Five hundred would, therefore, manure well fifty acres. He acknowledges that the appearance of the ground would not indicate this high manuring; but says it should be remembered that the liquid manure, which is equal in value to the solid, is not visible. If, in addition, a stock of cattle were kept and penned on the same fifty acres, then fertility would be increased in proportion.

The experience of the last few years of those in the South who have applied themselves to diversified crops, where stock forms a prominent feature, shows that this is not over-
drawn, and that the enrichment of worn farms by natural means is no more difficult there than in other sections of the country.

**Ignorance vs. Intelligence.**

They who do not believe in books, and in improved agriculture,—and there are not a few such,—are toiling from twelve to fifteen hours a day to scratch a hard-earned pit- tance from an unwilling soil, while their better-informed neighbors are working less hours, reading more, using improved seed, implements, and processes, and gaining a competence. Not by studying books a quarter of a century old, or a hundred years old, not works of theory and dry detail, but paragraphs and condensed and illustrated reading, that give ideas to be elaborated and made to fit, by each individual, his own particular wants. In other words, the application of agricultural truths, new and old, to the every-day labors of the farm.
Cereals and Their Cultivation.

The Cereals Described.

The cereals are the edible seeds of the grasses, or those cultivated for food. In the American usage, the cereals include wheat, rye, Indian corn, rice, barley and oats. In its broader sense, the word also includes sorghum, doura corn, some varieties of millet which are used as food by oriental nations and tribes, besides the seeds of the bene-plant (sesamum), a grain from which oil is expressed. The seeds of the bene-plant are eaten by some tribes, and were once used to a limited extent for food by the negroes in the South. In this work we shall not have occasion to notice any of the cereals except wheat, Indian corn, rye, barley, oats, buckwheat, rice and millet. Of these, wheat, rice and Indian corn are the most important food-plants of the world. In the United States, Indian corn is the most important food-crop, if we take into consideration its use for stock; wheat coming second. Of the food-crops of the world, as a whole, wheat stands first, rice second, Indian corn third, rye fourth; buckwheat, oats and barley coming last among civilized nations. Oats are coming more into use year by year as a staple article of food, in the shape of grits and meal, and are among the most nutritious of the cereals. Barley is becoming more important every year, being the chief ingredient in the manufacture of beer. All the cereals produce alcohol, by fermentation and distillation, but Indian corn is the great staple, and rye the next, for this purpose. For the manufacture of grape-sugar, or glucose (a saccharine product about forty per cent of the strength of cane sugar), Indian corn has within the last few years assumed great importance, and now employs immense capital in its production.
Corn in the United States.

An idea of the great importance and value of the corn crop of the United States is given by the immense crop, averaging since 1878 about 1,500,000,000 bushels a year, and this notwithstanding the crop failure of 1882. The following table, prepared by the Department of Agriculture, gives in a compact form all the facts about the corn crop of the United States for a period of sixteen years, during which time the production increased more than threefold. Since 1878 the quantity raised and the percentage exported have steadily increased.

<table>
<thead>
<tr>
<th>YEARS</th>
<th>Acreage</th>
<th>Yield per Acre</th>
<th>Total Product</th>
<th>Price per Bushel</th>
<th>Total Value of Product</th>
<th>Total Value per Acre</th>
<th>Corn and Corn-meal exported in the fiscal year closing June 30, following,</th>
<th>Proportion of Crop exported</th>
</tr>
</thead>
<tbody>
<tr>
<td>1863</td>
<td>15,372,441</td>
<td>25-98</td>
<td>Bushels 397,839,122</td>
<td>$0.69</td>
<td>$278,829,609</td>
<td>$18 16</td>
<td>Bushels 5,146,102 Pr. ct. 1.29</td>
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<tr>
<td>1864</td>
<td>17,438,759</td>
<td>30.42</td>
<td>539,451,493</td>
<td>99.5</td>
<td>557,719,183</td>
<td>30 56</td>
<td>2,015,402 Pr. ct. 0.58</td>
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<tr>
<td>1865</td>
<td>15,950,160</td>
<td>37.09</td>
<td>704,477,823</td>
<td>46.0</td>
<td>324,768,578</td>
<td>17 27</td>
<td>4,462,751 Pr. ct. 2.05</td>
<td></td>
</tr>
<tr>
<td>1866</td>
<td>33,346,538</td>
<td>25.39</td>
<td>861,946,795</td>
<td>68.2</td>
<td>591,666,935</td>
<td>17 21</td>
<td>16,027,947 Pr. ct. 1.85</td>
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<tr>
<td>1867</td>
<td>37,589,249</td>
<td>23.03</td>
<td>866,329,000</td>
<td>79.3</td>
<td>669,046,399</td>
<td>16 49</td>
<td>2,493,572 Pr. ct. 1.62</td>
<td></td>
</tr>
<tr>
<td>1868</td>
<td>34,889,246</td>
<td>25.9</td>
<td>905,527,000</td>
<td>89.8</td>
<td>559,012,450</td>
<td>16 52</td>
<td>8,286,665 Pr. ct. 0.94</td>
<td></td>
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<tr>
<td>1869</td>
<td>37,193,425</td>
<td>23.5</td>
<td>874,329,000</td>
<td>75.3</td>
<td>648,332,200</td>
<td>17 74</td>
<td>2,149,487 Pr. ct. 0.74</td>
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<tr>
<td>1870</td>
<td>38,669,977</td>
<td>28.3</td>
<td>1,094,215,000</td>
<td>54.9</td>
<td>601,639,930</td>
<td>15 57</td>
<td>10,676,978 Pr. ct. 0.98</td>
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<tr>
<td>1871</td>
<td>34,991,137</td>
<td>29.4</td>
<td>993,858,000</td>
<td>48.3</td>
<td>478,270,000</td>
<td>14 02</td>
<td>3,727,010 Pr. ct. 3.60</td>
<td></td>
</tr>
<tr>
<td>1872</td>
<td>35,526,836</td>
<td>30.7</td>
<td>1,099,719,000</td>
<td>39.8</td>
<td>434,149,399</td>
<td>12 24</td>
<td>45,154,274 Pr. ct. 3.68</td>
<td></td>
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<tr>
<td>1873</td>
<td>39,172,148</td>
<td>33.8</td>
<td>939,274,000</td>
<td>48.0</td>
<td>447,138,030</td>
<td>11 41</td>
<td>35,998,574 Pr. ct. 3.86</td>
<td></td>
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<tr>
<td>1874</td>
<td>41,085,018</td>
<td>20.7</td>
<td>889,168,000</td>
<td>54.7</td>
<td>550,041,080</td>
<td>12 40</td>
<td>35,925,676 Pr. ct. 3.53</td>
<td></td>
</tr>
<tr>
<td>1875</td>
<td>44,841,371</td>
<td>29.4</td>
<td>1,321,609,000</td>
<td>42.0</td>
<td>555,445,039</td>
<td>12 38</td>
<td>59,040,532 Pr. ct. 3.84</td>
<td></td>
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<tr>
<td>1876</td>
<td>49,255,364</td>
<td>26.1</td>
<td>1,285,827,000</td>
<td>37.0</td>
<td>475,402,140</td>
<td>9 26</td>
<td>79,150,611 Pr. ct. 5.66</td>
<td></td>
</tr>
<tr>
<td>1877</td>
<td>50,354,114</td>
<td>26.6</td>
<td>1,347,111,000</td>
<td>35.8</td>
<td>480,644,000</td>
<td>9 54</td>
<td>87,172,110 Pr. ct. 6.59</td>
<td></td>
</tr>
<tr>
<td>1878</td>
<td>50,935,000</td>
<td>26.9</td>
<td>1,388,218,750</td>
<td>31.8</td>
<td>441,153,475</td>
<td>8 55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average of whole period</td>
<td>35,935,407</td>
<td>26.7</td>
<td>959,174,938</td>
<td>52.3</td>
<td>501,616,287</td>
<td>13 96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Average 1863-'90. 28,050,703 26.8 768,010,845 67.7 520,309,421 18 16

Average 1871-'98. 43,210,111 26.6 1,129,341,531 42.0 480,923,154 11 18

Specially noticeable is the rapid increase in the corn product west of the Mississippi River and in the Southern States. West of the great river, the settlement of new lands is rapid, and in the South the notion is constantly gaining ground, that it is cheaper to raise corn than to buy it.
Different Kinds of Wheat.

The many varieties of wheat cultivated may be divided into two principal classes: hard wheats and soft wheats. The hard wheats are natives of warm or semi-tropical climates, and the soft wheats of cold climates. These are true wheats—that is, the seeds are not attached to the chaff. An inferior variety, but very hardy, is spelt wheat, also a
hard wheat, but with the seed adhering to the chaff like barley. Another division is into bearded and smooth wheat, and still another into red and white wheat. Polish wheat resembles rye; it is a hard wheat. St. Peter's corn, or one-grained wheat, is a variety in which the seeds adhere to the chaff, a whitish-seeded, flinty wheat, which makes a sweetish bread, and is sparingly raised in some portions of Southern Europe. Another variety, Emmer or Amel corn, is raised in the Alpine valleys; it is a vigorous, hardy and productive variety, used for bread, for cattle, and for making starch. The seeds are broadly furrowed, pointed at both ends, the upper end woolly, and the color grayish red, and very glassy.

**Proper Wheat Soils.**

The best soils for winter wheat are those that are compact, and not liable to shrink and swell (heave) in freezing and thawing weather — soils rich in phosphates, lime and potash. The same soils suit spring wheat, except that spring wheat may be raised on soils that do heave somewhat. Very soft (fluffy) soils containing large amounts of humus are not at all adapted to wheat, since all such soils are liable to rust, mildew and smut, especially in moist seasons. If a soil is wet, it may be improved by underdraining. If it is a rich humus, as much of the prairie land east of the Mississippi is, it is worth more for other crops than for wheat. Well-drained sandy loams are the best wheat soils since these lands are compact, and generally rich. The best wheat soils of the West and South lie in the undulating regions, and on the plains of Minnesota, Dakota, Nebraska, Kansas, and in the valleys of the Rocky Mountains and the Pacific slope.
Drilling Gives the Best Results.

The quantity of seed must be determined by the nature of the soil and its conditions. As a rule, poor land requires the most seed, since the plant does not tiller so readily. Two bushels is heavy seeding broadcast; one and a-half bushels per acre is the usual quantity. If the seed is drilled, one-quarter less may be used. Almost every one who has carefully noticed results, will admit that drilling the seed in gives the best crops. There is no use in going into an argument to prove this. Careful scientific experiment, as well as the experience of practical farmers in every part of the country, shows that drilling effects a saving of from ten to thirty per cent. in seed, and gives an increase of five to twenty per cent. in the crop gathered.

Cultivating.—There can be very little cultivation of the growing wheat under our system of tillage. We must have a much denser population, great division of farms, and very much cheaper labor first. A light harrowing in the spring if the ground becomes crusted, or a rolling if the land heaves, is almost all that can be done. Hence, the advantage of clean land and a thorough preparation of the soil. No crop that is largely composed of weeds ever yet paid the cultivator.

Time to Seed and Harvest.

The average time to seed and harvest wheat in different parts of the United States is given in the following table. It is compiled by the Department of Agriculture from answers from the different States, and also gives the average quantity of seed and the best wheat soils for the localities named.
<table>
<thead>
<tr>
<th>States</th>
<th>Time of Sowing</th>
<th>Average Bushels of Seed per Acre</th>
<th>Time of Harvest</th>
<th>Best Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>May 15 to June</td>
<td>1½ bush</td>
<td>August 20 to 30</td>
<td>Swale, corn stubble; high ridges; dry pasture</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>April to May 20.</td>
<td>1½ to 2 bush</td>
<td>August 1 to 20.</td>
<td>Clay loam; new upland; diluvial; black loam</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>April 10 to 25</td>
<td>1¼ to 2 bush</td>
<td>June 25 to Aug. 10</td>
<td>Loam clay; clay loam</td>
</tr>
<tr>
<td>Vermont</td>
<td>May 1 to Sept.</td>
<td>2 to 2½ bush</td>
<td>Last Aug to Sep 1</td>
<td>Sandy loam; clay loam; loam mixed with gravel</td>
</tr>
<tr>
<td>New York</td>
<td>May 10 to Sept.</td>
<td>1¼ to 2 bush</td>
<td>July 2 to Aug. 10</td>
<td>Frailable loam; loam clay loam; sandy loam, rather stiff</td>
</tr>
<tr>
<td>New Jersey</td>
<td>Sep. 1 to Oct. 15</td>
<td>1½ to 2 bush</td>
<td>June 28 to July 7</td>
<td>Light sandy; clay soil; sandy loam; limestone; do; clay, mixed with gravel; clay; do; clay and gravel</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>Sept 1 to Oct. 15</td>
<td>1¾ to 2 bush</td>
<td>June 15 to July 15</td>
<td>Rich loam; clay.</td>
</tr>
<tr>
<td>Delaware</td>
<td>Oct. 12</td>
<td>1 to 1½ bush</td>
<td>June 15 to July 15</td>
<td>Clay do. do.; clay and lime</td>
</tr>
<tr>
<td>Maryland</td>
<td>Oct to Nov.</td>
<td>50 lbs</td>
<td>June 1</td>
<td>Clay.</td>
</tr>
<tr>
<td>Georgia</td>
<td>Sept. 15 to Nov.</td>
<td>3½ to 1 bush</td>
<td>June 1</td>
<td>Red mulatto</td>
</tr>
<tr>
<td>Alabama</td>
<td>Sept. to Dec.</td>
<td>½ to 2 bush</td>
<td>June to July.</td>
<td>Loam; oak and hickory</td>
</tr>
<tr>
<td>South Carolina</td>
<td>Oct. and Nov.</td>
<td>75 lbs</td>
<td>July</td>
<td>Dark loam; all kinds.</td>
</tr>
<tr>
<td>Kentucky</td>
<td>Sept. and Oct.</td>
<td>75 lbs</td>
<td>July</td>
<td>Clay.</td>
</tr>
<tr>
<td>Ohio</td>
<td>Sep. 1 to Oct. 25</td>
<td>1 to 1½ bush</td>
<td>June 28 to July 20</td>
<td>Oak and maple land; clay do.; very warm; limestone; clay loam; yellow clay; clay; sandy.</td>
</tr>
<tr>
<td>Indiana</td>
<td>Sept. to Oct.</td>
<td>1 to 2 bush</td>
<td>June 15 to July 20</td>
<td>Sand and loam; clay loam; clay; improved clay; clay do.; clay; sandy loam.</td>
</tr>
<tr>
<td>Illinois</td>
<td>Aug. to Sept. 30</td>
<td>1 to 1½ bush</td>
<td>May to July 1</td>
<td>Sandy loam; clay; oat or clover; stubble; clover rich loam.</td>
</tr>
<tr>
<td>Michigan</td>
<td>Sept. 3 to Oct. 15</td>
<td>1½ to 1½ bush</td>
<td>June to July 30</td>
<td>Marl clay; clay and sand; oak; clay loam.</td>
</tr>
<tr>
<td>Iowa</td>
<td>Aug 20 to Sep 15</td>
<td>90 lbs</td>
<td>July 5 to 20</td>
<td>Lime soil.</td>
</tr>
<tr>
<td>Texas</td>
<td>Oct. 1 to Dec.</td>
<td>1½ bush</td>
<td>May 1 to June 10</td>
<td></td>
</tr>
</tbody>
</table>
Oats and Their Cultivation.

The value of oats in the agriculture of the United States and Canada is enormous. However small the farm, oats are an important factor in the crop, and for feeding horses are considered a necessity in spring and summer. This crop really stands next in importance after wheat in the cereal crops of the country. For feeding young animals oats are coming more and more into favor every year, on account of their bone and muscle making properties. They are adapted to nearly all soils not really sandy or wet, and the straw is more useful on the farm than that of any other grain. Taking the year 1879, a fairly productive year throughout the country, we find the values of the principal crops of the United States to be as follows:

Corn, $580,486,217; wheat, $497,030,142; hay, $330,804,494; cotton, $242,140,987; oats, $120,533,294; potatoes, $79,153,673; barley, $23,714,444; tobacco, $22,727,524; rye, $15,507,431; and buckwheat, $7,856,191.

Buckwheat.

The cultivation of buckwheat receives little attention in the West, and in the East it is sown principally as a secondary crop, where others have failed. It is sometimes difficult to eradicate it the second season, since the seeds shelled out in harvesting germinate the next season, pro-
ducing a volunteer crop. Sandy soils, and indeed, rather poor sands, produce the best buckwheat for flouring. It is one of the best fallow crops for turning under green, or just at the time of blossoming.

For a seed crop, the sowing should be so timid, that it will be in full seed at the time of the first frosts, since it requires cool nights to fruit properly. Sow about the fifteenth to the twentieth of June in the latitude of Maine and Minnesota, and later, even to the first of July, in the latitude of Philadelphia and Central Illinois.

Seeding and Harvesting Buckwheat.

The plant is tropical and killed by the slightest frost. It was introduced originally from Persia, and its name buckwheat is a corruption of beech-wheat, from the resemblance of its three-concerned seeds to those of the beech. The blossoms are eagerly sought by bees, from the abundance of honey they contain.

The seed is sown on fresh-plowed land, at the rate of two or three pecks, or if very late, one bushel per acre. The seed should be covered lightly (one-half inch). At the time of the first frost the crop is cut, laid in gavels, and set together, without binding until dry. Then it is threshed with the flail, or tramped out by horses. The yield varies according to the seasons from ten to forty bushels per acre, and the seed approaches, in price, about that of wheat. There are few varieties. The Silver-hull is considered the best, but the common buckwheat is generally sown.

The Corn Crop in the United States.

The United States now raise as the average 1,600,000,000 bushels of corn yearly, an increase of 100,000,000 bushels per year, for the present decade, as compared with
the last few years of the last decade. The American crop is seventy-eight per cent of the Indian corn crop of the world, the total production outside the United States being only 360,-000,000 bushels yearly. And yet the general average yield per acre in this country is only twenty-three bushels per acre, and the best average yield in the great corn year of 1880, only twenty-seven and a half bushels per acre, while authenticated yields of one hundred bushels per acre could be cited on one-hundred-acre fields, and special yields of one hundred and forty bushels to the acre on smaller areas. Whole counties have averaged sixty bushels, and some States forty bushels per acre in particular years. Taking all these facts, and remembering that no good farmer is satisfied with less than forty to sixty bushels in ordinary seasons, and it seems certain that a majority of farmers must be wofully negligent in their cultivation and recklessly inattentive to their best interests.

Comparing Results.—Let us estimate the loss from ignorance, or bad cultivation of the corn crop, as shown by the best average of the State and the general average of the country, remembering that the light averages are not in hilly, rocky, worn New England, but in countries of so-called virgin soil. Take the average annual yield at
1,500,000,000 bushels for the country, the general average of twenty-six bushels per acre, and the best State average of forty bushels per acre. Suppose the general average brought up to forty bushels, and the corn crop of the country would be increased fifty per cent., making a total of 2,250,000,000 bushels. At the average price of fifty-two cents, this would increase the annual value of the crop by over $390,000,000. Would this pay for the better cultivation of the crop? Even those who do not believe in advanced farming, must admit that it would.

How to Increase the Average.

There are only three reasons why the average yield of corn is not forty bushels per acre, as the minimum crop. In no ordinary season should it go below that, over any large area. The causes which keep down the average are: 1, want of drainage; 2, want of manure; and 3, bad cultivation. There are also these three causes, which may reduce the crop locally: 1, destruction by insects; 2, an excessively wet season, preventing proper cultivation; and 3, excessive drought. Untimely frosts can hardly be taken into account, since they occur so seldom that drainage, by allowing earlier planting and steady growth, would entirely throw this out of the calculation, and it would also practi-
cally do away with danger of severe loss from wet and dry seasons. As it is, through all the great corn region of the West, our dry seasons are our best ones. “Drought scares the farmer, but water utterly destroys his hopes.”

Therefore, if the land needs drainage, attend to it at once. It is the best investment, because it is a permanent one. If the soil lacks fertility, improve it by manure, a proper rotation, and by plowing under suitable crops.

The Cultivation of Corn—Plowing.

It is great mistake to suppose that fall plowing is not advantageous in the cultivation of corn. We speak of clay loams and clay soils, of course, such as raise our best crops. On sandy soils, fall plowing is not necessary, since such soils do not require the action of frost to mellow them. It is true, the spring plowing should not be omitted, but this is always superficial, never more than four inches deep, and may be done at the rate of three acres per day to the single plow. Besides the better disintegration of the soil, by freezing and thawing, when fall-plowed, the soil comes into condition earlier in the spring, absorbs warmth quicker, and as a rule may be worked much earlier than land not fall-plowed.

Planting the Crop.

There are four principal things to be remembered in planting a field of corn: 1, The rows should be perfectly straight. 2, The seed must be strong in its germ. 3, The planter must drop the seed accurately, and rather closely together, rather than widely spread. 4, Whatever the number of grains planted, more than four stalks should never be allowed to the hill; three is better.

If your farm is too small to allow you to own a check-row planter, hire your planting done by all means. There
is no doubt but corn may be planted as well by hand as by a machine; but children and hired men will not do it, and, at best, it is tedious and costly. Do not plant too close. Three feet and a half is close enough between rows for the dwarf varieties, three feet eight or ten inches for the medium varieties, and four feet is not too much for the Mammoth Southern varieties. If you have been careful to lay out your first row straight, as in the directions for plowing, you may with care keep every other row straight, by means of a re-marker attached to the planter and the check-rower. Perfectly straight rows should add five bushels an acre to the crop, through the better cultivation possible thereby. There is no doubt that more corn may be raised per acre by accurately drilling so the stalks will stand twelve inches apart in the row, but, except in small fields, or where the intention is to make a premium crop, the extra cost will not allow drill-cultivation to become profitable, especially in the great corn regions of the United States.

Harrowing the Young Corn.

The harrowing is the best cultivation young corn ever receives. Of course, the ground must be measurably free from trash, and no sensible farmer plants on trashy ground. With the present perfection in plows, trash may all be so deeply turned under that the harrow will not find it, and as the corn gains size, the trash will be so decayed as not to interfere seriously with good work. The harrowing should be given with a sharp, light harrow, at the first indication of weeds, whether the corn is up or not. If the corn is just pushing through the ground, care must be taken. The germ is thus easily broken. Otherwise harrow the field without reference to anything, except to destroy the weeds. If no weeds appear, and the top soil is not crusted, the harrowing may be delayed until the rows
of corn can be seen. It will often pay to harrow both ways, once before the corn is up and once after. After the corn is up we have always found it pay to have careful hands uncover such as may have been covered with trash and lumps. Two rows may be attended to each time, going across the field, using a forked stick, or better, one crooked at the end. The back of a hoe or rake is also useful for this purpose.

After Cultivation of Corn.

The hand-hoe finds no place in the cultivation of corn, except in very small fields; in those so rocky or stumpy that horse implements cannot work to advantage, or in fields where the weeds have got the full start of the crop.

In all fields of this kind, the cultivation is attended with such disadvantages as often to bring the balance on the wrong side of the ledger. That is, it will be cheaper to buy corn than to raise it, unless the special purpose be to clean the land for other crops. A roller may be used with success in some cases, after the harrow, if the ground is very lumpy. We have rolled corn eight inches high, and had it rise again all right; but the land should not be lumpy, nor need it be if the directions in relation to fall plowing have been followed. We repeat, never stir the land in the spring or summer unless it will work friably.
A Busy Time.—From the time the corn is up four inches high the cultivator must be kept moving. In catching weather every hour must be improved when the soil is in condition. If rainy weather has interfered with cultivation, and weeds begin to show unduly, pay no attention to regular hours, work the men from daylight until it is too dark for them to see the rows at night, changing teams and paying for extra time. This kind of work often saves a crop, for if once the weeds get a full start, it is difficult to overcome them. Remember always: the time to kill weeds is while they are young.

Clean Crops.—No man ever raised a good crop who waited for the weeds to grow before cultivating his land. The primary object of cultivation is to keep the soil in such condition that it will admit air properly through its pores. Killing weeds is only a secondary consideration. A weedy crop never pays its cost. A rich soil always grows weeds. They are easy to kill when young; when their roots get strong, it is difficult. The Chinese, who have cultivated the same soil for over four thousand years, have a saying that, "a clean crop is always good." Their fields are kept as clean as a garden.

How Often to Cultivate.

The cultivator should be kept going until the crop is so large that the stalks cannot be pressed under the arch of the implement. Whenever the surface is crusted from rain, moving the soil will be beneficial. Two harrowings and two to three plowings are what the average crop should get. The operation should be guided by the farmer's own observation of the necessities of the case. Wet, rainy weather interferes with cultivation, and the farmer who calculates on the basis of fifty acres to the hand, will, in bad seasons, not be able to do full justice to the crop; while in dry seasons sixty-five acres to the hand may be
well plowed. Why? Because the team can work every day, and an average of eight acres a day will get over this area once in about eight working days. A field ought to be plowed over once every ten working days.

**Depth of Cultivation.**

There is a diversity of opinion as to the proper depth of cultivation. Our experience is that the cultivation should be to the depth of about three inches while the corn is young, but after it has made good root, the cultivation should be superficial. By the time the corn is knee-high, the soil becomes pretty well filled with roots. In moist weather, if the roots are torn, they will quickly recuperate; if they are torn in dry weather, a decided injury ensues. After the corn begins to shoot, that is, to joint, and prepare for blossoming, cutting the roots is a decided injury. After this time the cultivation, if any be necessary, should be simply surface stirring, not more than than an inch and a half deep. Roots do not penetrate the soil by forcing their way through solid earth; that is impossible. They find their way between the minute interstices
which are always present, however compact the soil. If the surface is kept mellow, the sub-surface never becomes so compact but the pores are amply sufficient for the roots. Corn is a fast-growing crop under heat and moisture. It is a crop that must have mellow soil to give the best results. Other crops, such as wheat, onions, etc., require compact—not hard—sub-surface. Deep cultivation is not required for what are known as hard or compact soil crops. It is decidedly injurious to the soft-soil crops after the ground becomes filled with roots. A safe rule for corn is to give deep and clean cultivation while the crop is young; deep cultivation in the middle of the rows, while the corn is eighteen inches to two feet high. After that the cultivation should be shallow—simply sufficient to keep the surface fine and mellow. When the corn fully shades the soil, the earth will no longer be beaten down by the rain. It will not be liable to crust, nor will it become impacted or lose much moisture by evaporation at the surface. The roots will arrest all this.

_Harvesting the Crop._

There are two ways of securing the crop of corn—by husking on the hill, and by cutting and shocking, and husking from the shock. There are only three conditions under which corn should be husked and shocked: 1, when the fodder will pay for the extra cost of cutting and shocking, and the extra cost of husking from the shock; 2, when the corn is to be fed to cattle directly from the shock; 3, when from danger of early frosts, it becomes necessary to shock the corn to assist it in ripening.

It costs about as much to cut and shock an acre of corn as to husk an acre on the hill, or when the corn stands in the field as it grew. It takes twice as long to husk an acre of corn from the shock, and tie up and re-shock the corn, as it does to husk it standing in the field,
In husking from the hill—a team should be allowed to every two men. The wagon should be provided with one wide extra side-board, with cleats on each side, so they will slip down easily over the ordinary side-board. This is to prevent the corn from flying over when thrown into the wagon. The wagon should always be to the right of the huskers if possible, and two or four rows may be husked at a time. A short board, ten inches wide, should slant into the rear of the wagon, for ease in shoveling out the corn. When the wagon is filled and goes to the crib, the remaining hand husks and throws the corn in piles on the ground, to be picked up on returning. By this means, if the corn is dry, about one acre may be husked a day by each good hand. We have known one man thus to husk seventy-five bushels in a day, and it is said that one hundred bushels have been husked in a day by one man. It is certain that a man will husk an acre of heavy, sound, dry, standing corn, easier than an acre of soft and inferior corn, even when the yield in the first case is double what it is in the latter.
**Seed Corn.**

Seed corn that will germinate surely is indispensable. Have you carefully selected at husking-time, or before, the soundest and must perfect ears, and attended to their careful curing? If not, lose no time early in the spring in selecting the best you have, again carefully sorting this over. From that you think is pretty sure to grow, shell a small quantity from a number of ears selected as they run, mix all well together, count out fifty grains, place them between folds of flannel cloth, kept constantly moist and at a temperature of fifty-five to sixty degrees, not more. Corn does not germinate at a temperature much below fifty degrees. Note the time it takes to sprout. If it does so in seven or eight days, it is good. Ascertained the number of grains that come up promptly, and you can decide how much to drop in a hill. If your corn proves bad, buy good seed, whatever may be the cost. You cannot afford to risk uncertain seed. There are contingencies enough, even with the best seed. Never neglect carefully to select and save seed corn in the autumn.

**Cost of a Corn Crop.**

There is no crop that varies more in its cost than corn. Manure, rough land, hand-hoeing and small fields are expensive. In the great corn region of the West the cost is reduced to a minimum. Some years ago, while engaged extensively in general farming and stock-feeding in Central Illinois, every crop was itemized and correctly kept. Actual figures on a crop of corn from 1,225 acres were as follows. It must, however, be remembered that the smaller the area the more it costs per acre. Nevertheless, the smaller the field the greater the average yield. The field yielded a little over thirty-nine bushels an acre, and the
tillage was at the rate of sixty-five acres to the man and team for cultivating. But the season was an exceptionally good one for working. Here are the figures:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall plowing</td>
<td>$600</td>
</tr>
<tr>
<td>275 bushels seed-corn @ $0.80</td>
<td>$220</td>
</tr>
<tr>
<td>50 bushels seed-corn @ $1.50</td>
<td>$75</td>
</tr>
<tr>
<td>Manual labor</td>
<td>1,958.13</td>
</tr>
<tr>
<td>Team labor</td>
<td>1,174.25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$4,027.38</strong></td>
</tr>
</tbody>
</table>

This brings the corn ready to husk. The husking cost:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,470 days manual labor</td>
<td>$1,837.50</td>
</tr>
<tr>
<td>735 days team work</td>
<td>918.75</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$6,773.63</strong></td>
</tr>
</tbody>
</table>

The crop was 48,225 bushels. That portion not fed on the farm brought 42 cents in the crib, making a total for 48,225 bushels of $20,495.63. Deduct from this the cost of producing the crop, and the balance is $13,691 for the crop, or $11.09 per acre for the use of the land.

The men were all paid at the rate of $1.25 per day, and the teams were estimated at the same price for each double team. Every individual item was correctly charged, as plowing, harrowing, rolling, planting, cultivating, uncovering corn, etc., and there was even a charge of $13.20 for cutting and pulling weeds. Looking at the matter in another light, it will be seen that the whole expense of making the crop ready to husk, for man and team, was, counting man and team at $2.50 per day, at the rate of one and one-fifth days work per acre, or, in other words, counting the value of seed-corn, the cost of raising an acre of corn was $3.29 per acre. The cost of husking was $2.25 per acre, or, per bushel, nearly six cents; the whole cost of raising and cribbing the corn was $5.54 per acre, and the corn cost, in the crib, fifteen cents per bushel to raise, not counting...
ground rent. There is no reason why it should ever cost more for labor, in any clean, rich soil, free from stumps, stones, or other obstructions.

A well-kept account book is always useful in enabling the farmer to tell exactly what any crop has cost, but it is a curious fact that hardly one farmer in a dozen keeps a record of the debit and credit on a farm. Book-keeping takes time, of course, but without it the farmer never knows on what crops he is making or losing money. A single book, of, say, two hundred pages, with lines ruled for dollars and cents on the right, and one line on the left for the date of each entry, will be sufficient for most practical purposes.

Cultivation of Rice.

Main canals, having sluices at their mouths, are dug from the river to the interior about twenty feet in width; and, as they very frequently extend across the whole breadth of the swamp, they are more than three miles in length. The rice plantations are sub-divided into fields of about twenty acres each. The fields have embankments raised around them, with sluices communicating with the main canal, that they may be laid dry or under water separately, according as it may be required. Open ditches are dug over the grounds for the purpose of allowing the water to be more easily put on or drawn off.

In all cases the water is admitted to the fields as soon as the seed is sown, and when the young shoot appears above ground, the water is drawn off. In the course of a week the crop usually receives another watering which lasts from ten to thirty days, according to the progress the vegetation makes. This watering is chiefly useful in killing the land weeds which make their appearance as soon as the ground becomes dry. But, on the other hand, when the field is under water, aquatic weeds, in their turn,
grow up rapidly, and to check their growth, the field is once more laid dry, and the crop is then twice hand-hoed.

By the first of July the rice is well advanced, and water is again admitted, and allowed to remain on the fields until the crop is ripe. This usually takes place from
the first to the tenth of September, and the water is drawn off the day before the crop is to be reaped, or long enough to dry the land for this operation.

Large capital is necessary in the cultivation of rice, as well as good judgment, especially on tidal lands. The banks must be kept in good order, the drains and canals must be kept clear, and the sluices and valves must always be in repair. The rice-swamps also are unhealthy, and it is difficult to get labor when other work can be had; hence, higher prices must be paid. Nevertheless, properly managed, the crop is remunerative, and rice plantations used to be the highest-priced lands in the South—the best lands lying between twenty-nine and thirty-five degrees north latitude. The best variety is known as Golden or Carolina rice.

**Management of Rice-fields.**

Rice plantations are located above the junction of salt and fresh water, from the fact that rice, being an aquatic plant, requires a vast amount of fresh water during its growth; salt water being fatal to it at all stages. These swamps are usually reclaimed by means of banks or levees, which are made high and strong enough to bar out the river. Smaller embankments, called check banks, subdivide that portion of the plantation lying between the main river embankment and the high land into squares or fields, generally from fifteen to twenty acres in area. These squares are all subdivided again into beds or lands, of twenty-five or thirty feet width, by a system of main ditches and quarter-drains. Canals from twelve to thirty feet wide and four or five feet deep, are sometimes cut from the river embankment through the center of the plantation, to the high land, for the purpose of introducing or draining off the water to or from those fields situated far back from the river.
Flood-gates or trunks, having doors at both ends, are buried in the embankments on the river, as well as in the canal embankments and the check banks, those at the outlet of canals being so constructed as to permit the flat-boats to pass into the river. By means of these flood-gates or trunks the whole system of irrigation is carried on under the complete control of the planter, and the lands are flooded or drained at will. The canals and ditches being all carefully cleaned out, down to the hard bottom, the banks neatly trimmed and free of leaks—the flood-gates and trunks all water-tight, either to hold out or hold in water—the planter commences his operations, as early in the winter as possible, by plowing.

These lands, being yearly enriched by alluvial deposits from the river, do not require deep plowing, four or five inches being generally sufficient to furnish a good seed-bed, and on account of the numerous ditches subdividing the fields, a single mule plow is always preferable. When lands are plowed early in the winter and nicely shingled, it is of very great advantage to put in a shallow flow of water, and suddenly draw it off, in severe weather, for the benefit of freezing the furrow slices. But it is not a good practice to flood deep, as the weight of water packs the land, which becomes run together by the action of the waves, and renders good harrowing afterward an impossibility.

Some Special Crops.

Flax, millet, Hungarian grass, and canary-grass are largely cultivated in some sections for the seed. The only difference in the preparation of the soil from that for the cereals is that the greatest care must be taken to bring the land into the highest possible tilth for sowing. Flax is sown at the rate of three pecks to one and a half bushels per acre, just before corn-planting time. Millet, Hunga-
rian and canary-seed must not be sown until corn is well up and the nights warm, since it is easily checked by cold. Millet and Hungarian seed are sown at the rate of one-half bushel to three pecks, and canary-seed at the rate of three pecks to one bushel per acre. When fully ripe, it may be cut and stacked, loose, for threshing, or harvested by binding and shocking.
The Value of Grass.

The grass crop of the United States has a greater real value than any other one crop raised. The corn crop represents a greater apparent money value, and so does the wheat crop, the corn crop for 1881 having a money value of $759,482,170, and the wheat crop $456,880,427, while the hay crop was estimated at only $415,131,366. But the hay harvest is comparatively a small portion of the grass crop. In the average, hay is fed to stock in this country scarcely four months in the year, even allowing for horses and mules in the city eating hay all the year round. On the other hand, we see immense grazing areas, and millions of live stock which subsist and grow fat throughout the whole year on grass, which they gather for themselves. Besides, hay does not form more than half the food of farm stock during the winter months. On the whole, therefore, it is safe to say that the pastures and meadows of the country undoubtedly represent four times the value of the hay crop. This would make $1,660,525,464 yearly, a sum greater than the combined values of the corn, wheat, rye, oats, barley and buckwheat crops by $189,568,261, the crops of the cereals named being computed for 1881 at $1,470,957,200. The cry used to be, "Cotton is king." Later it was, "Corn is king." Let us not forget that grass is king and always will be.

The Alphabet of Agriculture.

A big herd makes a bare meadow.
Bad grass, bad farming; bad farming, bad crops.
Cultivate grass, and win wealth.
Dank meadows give dreary dreams.
Excellent herbage is an excellent heritage.
Fat pastures make fat pockets.
Grass is the governor, clover the crown, of agriculture.
Heavy meadows make happy farmers.
In the lea lies a lever of wealth.
June-grass is a jolly good joke, say the kine.
Kindly cattle come of good grazing.
Lean kine are lean milkers.
Mean grass shows mean farming.
"Nodding grass" is wealth to the owner.
Old pastures, say the sheep, if you please.
Pastures prudently managed get better with age.
Quick grass, quick profits.
Rather than stint your meadow, stint your grain.
Sweet pastures make sound butter; soft hay makes stout wool.
Tall grass, thickly set, fills big barns.
Up to my ears in sweet grass, says the steer.
Vain are the hopes of the farmer if the grass does not win.
Wealth leaves when the fodder fails.
Xanthium, the clot bur, never helped the grass.
Yellow hay never comes to him who is zealous.
Zeal in the meadow means weal in the wear.

No grass, no cattle; no cattle, no manure; no manure, no crops, is an adage covering the whole ground. It is as true to-day as when first spoken, and will continue to be so as long as agriculture lasts.

The Seed Crop.

Sow as early in the spring as the soil will admit, on land prepared and leveled in the best manner, covering one-half inch deep. The first flowering is apt to blast, hence this is cut for fodder, and the later or summer growth is taken for seed. It is generally mown with a machine, allowed to dry in the swath, raked into windrows, and, when thoroughly dry, either threshed directly with a clover huller or else stacked and threshed later. The
yield is all the way from four to eight, or even ten bushels
an acre. Six bushels is a good yield, and from the high
price it bears it is a good-paying crop in places remote
from the great markets. The best seed is raised in the
West, for there it is not infested with the seeds of Canada
thistle, and other pestilent weeds.

Sowing for Hay and for Pasture.

Information under this head is most clearly presented
in tabular form. The first table on next page shows the
weight of seed and depth of germination. Those follow-
ing give the quantity of seed to be sown of each variety for
hay, and for hay and pasture as adapted to various soils,
with the total number of pounds to be sown per acre.

<table>
<thead>
<tr>
<th>NAME OF PLANT</th>
<th>Pounds per Bushel</th>
<th>Seeds per Ounce</th>
<th>Depth (inches) at which germination will occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timothy, clean</td>
<td>56</td>
<td>74,000</td>
<td>0-1/4</td>
</tr>
<tr>
<td>Orchard grass</td>
<td>12</td>
<td>40,000</td>
<td>0-1/4</td>
</tr>
<tr>
<td>Red-top</td>
<td>12</td>
<td>425,000</td>
<td>0-1/4</td>
</tr>
<tr>
<td>Meadow foxtail</td>
<td>5</td>
<td>76,300</td>
<td>0-1/4</td>
</tr>
<tr>
<td>Tall oat grass</td>
<td>7</td>
<td>211,000</td>
<td>1/2-3/4</td>
</tr>
<tr>
<td>Sweet-scented vernal</td>
<td>6</td>
<td>71,000</td>
<td>0-1/4</td>
</tr>
<tr>
<td>Crested dog's-tail</td>
<td>26</td>
<td>28,000</td>
<td>1/2-1/2</td>
</tr>
<tr>
<td>Hard fescue</td>
<td>10</td>
<td>39,000</td>
<td>0-1/4</td>
</tr>
<tr>
<td>Sheep's fescue</td>
<td>14</td>
<td>64,000</td>
<td>0-1/4</td>
</tr>
<tr>
<td>Tall fescue</td>
<td>14</td>
<td>20,500</td>
<td>0-1/4</td>
</tr>
<tr>
<td>Wood meadow grass</td>
<td>15</td>
<td>173,000</td>
<td>0-1/4</td>
</tr>
<tr>
<td>Kentucky blue-grass</td>
<td>14</td>
<td>243,000</td>
<td>0-1/4</td>
</tr>
<tr>
<td>English blue-grass</td>
<td>20-28</td>
<td>115,000</td>
<td>1/4-1/2</td>
</tr>
<tr>
<td>Italian rye-grass</td>
<td>15-18</td>
<td>27,000</td>
<td>1/4-1/2</td>
</tr>
<tr>
<td>Rough-stalked meadow</td>
<td>15</td>
<td>217,000</td>
<td>0-1/4</td>
</tr>
<tr>
<td>Red clover</td>
<td>60</td>
<td>16,000</td>
<td>1/4-1/2</td>
</tr>
<tr>
<td>White clover</td>
<td>60</td>
<td>32,000</td>
<td>0-1/4</td>
</tr>
<tr>
<td>Lucerne</td>
<td>60</td>
<td>12,000</td>
<td>1/4-1/2</td>
</tr>
<tr>
<td>Millet</td>
<td>48</td>
<td>5,000</td>
<td>1/2-3/4</td>
</tr>
<tr>
<td>Hungarian</td>
<td>50</td>
<td>6,000</td>
<td>1/2-3/4</td>
</tr>
</tbody>
</table>
### GOOD MEADOW SOILS.

<table>
<thead>
<tr>
<th></th>
<th>Seed for hay, pounds</th>
<th>Hay and pasture, pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1—Timothy</td>
<td>- - - - - - - -</td>
<td>12</td>
</tr>
<tr>
<td>2—Red clover (biennial)</td>
<td>- - - - - -</td>
<td>8</td>
</tr>
<tr>
<td>3—Red clover (perennial)</td>
<td>- - - - - -</td>
<td>0</td>
</tr>
<tr>
<td>4—Orchard grass</td>
<td>- - - - - -</td>
<td>6</td>
</tr>
<tr>
<td>5—Meadow fescue</td>
<td>- - - - - -</td>
<td>2</td>
</tr>
<tr>
<td>6—Meadow foxtail</td>
<td>- - - - - -</td>
<td>0</td>
</tr>
<tr>
<td>7—Blue grass</td>
<td>- - - - - -</td>
<td>0</td>
</tr>
<tr>
<td>8—Red-top</td>
<td>- - - - - -</td>
<td>3</td>
</tr>
<tr>
<td>9—Rye-grass</td>
<td>- - - - - -</td>
<td>4</td>
</tr>
<tr>
<td>10—Fowl meadow</td>
<td>- - - - - -</td>
<td>2</td>
</tr>
<tr>
<td>11—White clover</td>
<td>- - - - - -</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>- - - - - -</td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

This gives seven varieties for hay, and eleven for hay and pasture.

### FOR LANDS SUBJECT TO OCCASIONAL OVERFLOW.

<table>
<thead>
<tr>
<th></th>
<th>Seed for hay, pounds</th>
<th>Hay and pasture, pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1—Fowl meadow</td>
<td>- - - - - -</td>
<td>8</td>
</tr>
<tr>
<td>2—Alsike</td>
<td>- - - - - -</td>
<td>6</td>
</tr>
<tr>
<td>3—Tall fescue</td>
<td>- - - - - -</td>
<td>5</td>
</tr>
<tr>
<td>4—Rough-stalked meadow</td>
<td>- - - - - -</td>
<td>4</td>
</tr>
<tr>
<td>5—Blue-grass</td>
<td>- - - - - -</td>
<td>0</td>
</tr>
<tr>
<td>6—Red-top</td>
<td>- - - - - -</td>
<td>4</td>
</tr>
<tr>
<td>7—Timothy</td>
<td>- - - - - -</td>
<td>5</td>
</tr>
<tr>
<td>8—Fiorin</td>
<td>- - - - - -</td>
<td>0</td>
</tr>
<tr>
<td>9—Meadow soft grass</td>
<td>- - - - - -</td>
<td>4</td>
</tr>
<tr>
<td>10—Perennial clover</td>
<td>- - - - - -</td>
<td>0</td>
</tr>
<tr>
<td>11—White clover</td>
<td>- - - - - -</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>- - - - - -</td>
<td><strong>36</strong></td>
</tr>
</tbody>
</table>
### Interchange of Grasses Between Nations.

Before leaving this subject finally, we wish to say a word on the value of the interchange of seeds and plants between different countries. The fact that a plant is indigenous to a country does not prove that it is useful there. Some of the more valuable forage plants of the South, such as Alfalfa, Bermuda grass, Guinea grass, Japan clover, etc., are introduced species. The same is true of the North. It is more than probable that some of our western indigenous plains species may prove of value in Australia, since that climate, like our far western one, is dry and hot in summer. Australia has given to California the valuable Eucalypti. Our western grasses stand hot sun, and many of them extreme drought, as the Gama and other so-called Bunch grasses. The climate of Australia is mild in winter, which our western plains are not, but there, and in the hotter southwestern regions, may be found grasses that may yet prove of great value there, as many foreign varieties have been found valuable here.
Seeding Meadows.

The quantity of grass-seed sown per acre by the best farmers, and the number of varieties used in seeding meadows, and especially those that are to be pastured, seems to many men to be a great waste. The waste, however, comes from seeding on ill-prepared ground. No grass-seeds are large, and most of them are very minute. If left on the top of the soil, they often become so dry that they do not germinate. If sown too deep, the germs never reach the surface, or only do so to die. The aim of every man should be to get the best return for his outlay. It never was yet gotten either by stinting seed or by slovenly cultivation. Rich soil, a fine tilth, and plenty of seed will give heavy windrows of hay and deep pastures.

As a rule, from ten to twelve pounds of seed are enough if the crop is intended strictly as a seed crop. For mowing, ordinary thick sowing would be about twenty pounds, mixing according to varieties sown, say timothy twelve pounds, clover eight pounds, or orchard grass seven pounds, timothy seven pounds, and clover six pounds. For mowing alone, timothy, red-top, orchard grass, meadow foxtail, fowl meadow grass, and red clover will be the basis. For mow-
ing and pasture add blue-grass and white (Dutch) clover for grazing, except for cattle, leave out timothy, but for pasture the more varieties the better.

**Clover in Its Relation to Husbandry.**

Clover has a threefold relation to husbandry: as a seed crop, as a forage crop, and also for its wonderful power of renovating the soil. Its proper soil is a thoroughly drained loam or loamy clay. Soils that in drying out crack badly, or those subject to heaving, are not adapted to clover. Argillaceous, granitic, drained calcareous loams, red and other well-drained clays are all congenial to its growth, and, in fact, nearly all soils, except those quite sandy or wet. The first winter it is apt to suffer if seeded in the fall, and hence should be sown in the spring. When sown alone it usually blossoms the first season; if seeded with
wheat, generally not until the next season. If the seed is to be taken, it should be sown alone, and for plowing under the same rule will apply. As soon as it is well up it should have two bushels of land-plaster (gypsum) per acre, especially on granitic soils. When sown for hog-pasture, for cutting green, or for turning under, not less than sixteen pounds of seed should be given per acre. If intended for seed, twelve to sixteen pounds will be sufficient. For plowing under, the Mammoth Red Clover (T. Pratense var.) is the best. It grows four to six feet high, and produces enormously in root and top. Cattle do not like it much, but hogs do.
Soiling Compared with Pasturing.

Soiling is the system of cultivating, cutting and feeding forage green, as distinguished from pasturing in the field. It is only practiced in older-settled districts where land is comparatively scarce and dear, and manure plentiful, labor cheap, and the stock kept principally for use on the farm. It prevails in some portions of Europe, notably in Holland and Belgium, and in Great Britain. In the United States it can hardly be said to prevail, to the exclusion of pasturing in any of the farming districts. Its advantages are that no food is wasted, all the manure is saved, and all the land of the farm is thus enabled to produce its maximum of crops. Soiling, however, is coming to be regarded as of more and more importance year by year, in all those sections of the United States that are subject to summer drought, to carry the stock over those seasons when pasturage is scant. Another advantage is that it gives working cattle a daily portion of green food, so essential to their health, without the labor of gathering it for themselves. In this view there can be no doubt of its economy, since the daily cutting and hauling is comparatively light, and the animals will do more than enough additional labor to pay the cost.

Soiling Indispensable in Dairy Districts.

In all the great dairy districts soiling is coming to be regarded as indispensable, during July and August, in order to keep cows up to their full flow of milk, and also to enable the dairyman to protect them from torturing flies
and mosquitoes; thus they may be pastured in the early morning and in the evening, giving needed exercise, and kept under shelter during the heat of the day and at night. The question of profit and loss must be decided by every one for himself.

When pastures are flush it would be folly to cut and cart fodder, but instances are rare where the same quantity of stock can be kept full-fed during the heat of summer as in the spring and autumn. This can only be done where irrigation is practiced. So far as fattening stock is concerned, corn is the cheapest feed, undoubtedly, in the corn zone of the United States. Corn, or better, meal may form a portion of the daily feed of milch cows, but they must have succulent feed and an abundance of it, in order to keep them to their full flow of milk. Hence, some system of partial soiling should be adopted by every farmer who keeps milch cows, an important part of his regular farm economy.

Soiling as Against Fencing.

Where only enough cows are kept to furnish the family with milk, as in many districts where the "no-fence law" is in operation, and where stock is herded in summer, there is no doubt of the economy of soiling. The cost of fencing the farm into fields, in order that the pastures may enter into the regular rotation, is saved; in fact, the interest on this outlay would many times pay the cost of cutting and carrying the fodder for the few animals fed.

On a farm in Central Illinois, requiring the labor of sixty-five horses to work it, and where five cows were kept for milk and butter, all were fed green food in addition to their daily rations of grain during the summer. Two men and a team cleaned the stables, hauled away the manure, cut the grass and fed it, and took the entire care of the cows, besides doing various chores. The horses got about
SOILING, FODDER AND ROOT CROPS.

forty pounds of grass a day, what hay they would eat (very little), and the cows were fully fed on grass. The labor of not more than one man was required simply to cut and haul the fodder. This was sown: rye, clover, common meadow-grass, and later, sown corn-fodder. The cutting began when the crop was twelve to fourteen inches high, except the corn, which was allowed to grow two feet high, and all was cut with a mowing machine, and raked and loaded by hand.

How to Raise a Soiling Crop.

Any land for a soiling crop to be cut green should be as rich as possible. The more luxuriant the growth, the better the swath, thus making a great saving in the labor of cutting and gathering. It will not do to depend on one variety for stock, for they soon tire of a single diet. A patch of Red clover—in the South alfalfa—one of orchard-grass, one of rye-grass, and one of rye may be provided. These will make your first cuttings, and if the ground is heavily manured, and there is plenty of moisture, these may be cut over once in four or five weeks and give a good swath.

Millet, corn and sorghum should follow, to eke out these, and you will have a variety that stock will never tire of. It is better for swine to be fed in this way than to allow them to run in a pasture, since then you are not obliged to ring them, exposing them to the risk of becoming impregnated with contagious blood, and other infections. The grasses may be top-dressed to keep up the fertility. This should always be done with compost manure, not less than four loads of forty bushels each per acre per year, and if two bushels of plaster and one hundred pounds of superphosphate be added, it will pay. It will also pay to have the soiling crop field as near the barn as possible. If you doubt the soundness of this advice, take a meadow of mixed
grasses, top-dress it with twenty loads of compost manure, plaster, and super-phosphate, and watch the results. It will be a swath you cannot put a "scythe into clear up to the heel."

*No Wilted Fodder.*—Whatever the soiling crop, be it corn, sorghum, millet, clover, meadow grass, or cow peas, the soil must be rich, else you will fail. You will also fail unless you cut it when quite green, or in its most succulent state. If you think it does not pay to haul the crop when it is heavy with moisture, you may wilt it. But good milk is not made from wilted plants. They are distasteful to stock, and are eaten only under compulsion. Above all do not let the cuttings lie on the wagon until they heat and begin to turn yellow. Distribute it as soon as hauled. Green grass and other fodder is in just the right state for heating. It will begin to get warm in half an hour if left in a pile. And certainly no humane man will force his stock to eat disgusting or distasteful food when it can so easily be avoided. We should almost as soon think one would take pleasure in having his family eat stale food. The taste of animals is fully as delicate as that of man. At least we may infer as much from watching them graze when not pressed by hunger.

*Common and German Millet.*—Common millet and German or golden millet are both excellent fodder-plants, and both of them are rapid-growing crops; the first has a close head, the latter more open, but with plenty of leaves. These may be sown as late, in the North, as the first of July, and make a crop of hay. All the fodder crops are, however, often somewhat difficult to cure, late in the season, and both these and Hungarian grass are better sown from the first to the tenth of June. The usual seeding is three pecks to the acre, but for hay or fodder one bushel per acre is better. If you wish to make seed, drill one-half bushel of seed per acre, in drills two feet apart, covering the seed not more than half an inch deep.
The Advantages of Soiling.

The advantages of exclusive soiling, that is, cutting and feeding green crops in summer, will never be acknowledged in the United States, except near cities where land is valuable, and on restricted areas. The late Josiah Quincy is the father of soiling in America; his claims, true enough, were:

1. it saves land; 2. it saves fencing; 3. it economizes food; 4. it keeps cattle in better condition and greater comfort; 5. it produces more milk; 6. it increases the quantity and quality of manure; 7. there is better docility and discipline of animals where it is used; 8. there is less breaking of fences; 9. there is increased order in all business of the farm.

Mr. Quincy’s testimony in relation to soiling and the crops grown in Massachusetts, the State where his operations were carried on, is, that one acre soiled from will produce at least as much as three acres pastured in the usual way, and that “there is no proposition in Nature more true than that any good farmer may maintain upon thirty acres of good arable land twenty head of cattle the year round, in better condition and greater comfort to the animals, with more profit, less labor, less trouble, and less
cash advance for himself than he, by the present mode, expends upon a hundred acres." He further says: "My own experience has always been less than this, never having exceeded seventeen acres for twenty head.

"To produce a sufficient quantity and succession of succulent food—about one and a half or two square rods of ground to each cow to be soiled—sow as follows:

"As early in April as the state of the land will permit, which is usually between the fifth and tenth, on properly prepared land, oats at the rate of four bushels to the acre.

"About the twentieth of the same month sow, either oats or barley, at the same rate per acre, in like quantity and proportions.

"Early in May sow, in like manner, either of the above grains.

"Between the tenth and twentieth of May sow Indian corn (Southern dent being best), in drills, three bushels to the acre, in like quantity and proportions.

"About the twenty-fifth of May sow corn, in like manner and proportions.

"About the fifth of June repeat the sowing of corn, as above.

"After the last-mentioned sowing, barley should be sown in the above-mentioned quantity and proportions, in following successions, on the fifteenth and twenty-fifth of June, and in the first week in July, barley being the best qualified to resist the early frosts."

Root Crops for Forage.

Turnip culture revolutionized the agriculture of England. The cultivation of Indian corn in connection with western grass, making cheap beef, bids fair to revolutionize agriculture there again. The climate of the United States, with the exception of a small portion of the extreme north,
is unsuited to the cultivation of the white or round turnip on account of heat and summer drought. Even rutabagas are generally hot, tough and stringy.

Another great objection to root crops is their cost, since they require much hand labor, and the roots cannot be grazed in the fields, as they can in England. And yet the need of some succulent vegetable food in winter has been so widely felt, that among our best farmers more or less attention has been paid to carrots, parsnips and to the sugar and mangel beets. We have found that mangel wurtzel beets fully met the requirements for both cattle and sheep. We are as fully satisfied that ensilage, to be treated of in the next chapter, will fairly perform all that is claimed for roots, except in some special cases. Hence it will be necessary to treat only of the general requirements for the cultivation of root crops.

**Things to Remember in Root Culture.**

**Important** things to be remembered in the cultivation of roots are:

1. They cannot be successfully raised on land recently treated with green manure. Why? It inevitably causes the roots to grow forked, reducing their value, and largely increasing the cost of gathering and cleaning. Hence the land, unless compost manure is used, should have been manured heavily one or two previous seasons.

2. A root crop should never be raised except on land made as rich as possible with manure. Why, again? Because it costs as much to cultivate a poor acre as a rich
one. The cultivation of roots involves an outlay of thirty dollars or more per acre for labor alone.

3. The cultivation of roots should never be undertaken on lumpy, trashy land, or on land otherwise difficult to work. It adds too largely to the manual labor of making the crop. These points carefully remembered, it will not be difficult to attain the best results for the least outlay.

Preparing for the Root Crop.

The chief expense in the cultivation of root crops is hand-weeding the rows, and thinning—singling as it is called—the plants. Hence the necessity of perfectly clean land, and of having the seed sown in absolutely straight equidistant rows, on soil entirely free from lumps or trash, and thoroughly friable. The orifice of the drill that delivers the seed should also deposit it in knife rows, that is, one single narrow line. In this way the hand cultivator may be run within an eighth of an inch of the rows, and in large fields gang implements may be used, by which two or more rows may be cultivated at a time.

These latter, however, are never used except in the most extensive market gardens, where forty or more acres of roots are grown, or where beets are grown by the hundreds of acres for making sugar. The writer has raised them thus, putting beets in the pits at a cost of three dollars and forty cents per ton, on an average yield of eleven tons per acre. It must be remembered that beets for sugar-making are never to be much over one pound each in weight. On highly manured land, fifty tons of beets per acre, and of carrots and parsnips thirty or more tons per acre, may be raised.

To bring the soil into the best condition, it should be deeply fall-plowed. In the spring, when the soil will work thoroughly friable, it may be lightly re-plowed, harrowed,
Soiling, Fodder and Root Crops.

Soiling, fodder and root crops. The accompanying cuts show Fig. 1, field carrot; Fig. 2, long mangelwurzel beet. The shaded edges show the ground line.

Sowing and Cultivating.

Field beets may be sown in drills thirty inches apart, and, in field culture, carrots and parsnips in rows two feet apart. This will allow the horse cultivator to run between the rows, and after the plants have gained considerable size no handwork need be done. Six pounds of beet-seed will be required to the acre, to ensure a stand against all contingencies.

Each capsule of the seed-plant contains from two to four seeds, and hence whether the land be weedy or not the plants must be singled. In all root crops the first thinning may be done with a narrow hoe or other implement; the subsequent thinning by hand. A wheel hoe (hand cultivator) will pay for itself every year in the cultivation of a single acre; and with such an implement one hand will keep from five to six acres free of weeds, going twice in each row, at every cultivation. Carrots and parsnips will require about four pounds of seed per acre, to be sure of a stand, and allow for what the insects may destroy.

Singling.—When the plants are up about three inches they must be singled by hand, the beets to stand from nine to ten inches apart, and carrots and parsnips five to six inches apart. In thinning, steady boys may be employed. They must go down on hands and knees, astride of the rows, the spaces having been previously marked for them with the point of a hoe or a gang implement, cutting narrow lines. In extensive cultivation we have done this with a horse machine going across the rows.
Weeding.—The weeders, whether boys or girls, must be properly instructed. Being on the hands and knees, the weeds, if any, having been pulled, one hand secures the bunch of plants to be operated on, while the other removes superfluous plants. If the plants are strongly rooted, it may be necessary to guard the plant to be left by holding the finger before it, close to the ground. The weeding is difficult to describe, but not difficult to learn. The overseer should practice and experiment himself, so he may be able to properly instruct those under his charge. The subsequent cultivation is simply to keep down weeds.

Harvesting Root Crops.

One of the most expensive operations, next to weeding, is harvesting. Beets may be easily pulled by plowing a deep furrow away from them with a one-horse plow. They should be laid in regular rows, two rows with the tops pointing together. Thus they are easily and quickly topped, by a man with a spade, ground sharp, topping one row going one way and another the other. The tops are more easily gathered up. The beets are then to be placed in long piles and covered with the leaves, or else hauled directly to the pit or cellar. Roots of any kind should never be allowed to be wilted by the sun.

Parssnips and carrots are dug by hand or plowed out. In plowing, begin on one outside row, and turn a deep furrow away from the row, running about seven inches from the row. Pass around the field and plow another furrow as on the first side. Returning to the first furrow, plow another furrow as deep as possible, and as close to the row as you can work. If you are a first-rate plowman, you can hit it fairly; if not, you will here find it out. The roots are then to be pulled, or lifted with the spade, topped, and carried to the pits.
In Europe there are various machines for digging roots. One that we made, and that would loosen five acres of beets per day, was simply two very heavy, properly curved coulters, each of them running under a row of beets. The digger was attached to the beam of a gang-plow, and drawn by four horses.

**Pitting and Cellaring the Roots.**

_Parsnips_ may be left in the ground all winter without injury. In the Channel Islands they are a favorite crop for feeding milk-cows, and all stock are fond of them. Other roots must be housed or covered. Parsnips are best piled in long ricks, whether above ground or in trenches. Attention must be paid to ventilation, so that the roots shall not sweat and heat. If kept too warm, they will sprout.

All roots are ruined by freezing, except parsnips, salisfy, onions, and rutabagas. These when frozen must be thawed out naturally in the pits, kept dark, before being opened, in order to escape injury. The pits may be about three and one-half feet wide, and three feet deep below ground, running to a sharp apex above, with small bundles of straw reaching from the bottom to the top at proper intervals. The whole should then be covered with straw, six inches thick; with a covering of earth at least six inches in depth, or sufficient to carry off rain.

Let the straw ventilators extend above ground. At the approach of hard weather, give another covering of six inches of straw and ten inches of earth over this, and the pits will be safe from any ordinary winter weather; but when a good crust has frozen, if very hard weather is feared, cover all with green manure litter.

The cuts of carrots represents, the one at the right, the Danvers; the one at the left, the half-long or intermediate varieties. For field cultivation, the large red and the white
(Belgian) varieties are mostly used. They grow with a considerable portion of their length out of the ground, thus making their harvesting easier. The last cut shows the red Altringham carrot, one of the long-rooted varieties.

The Artichoke.

A chapter on soiling, fodder and root crops would not be complete without mention of the artichoke. It was introduced into Great Britain from Brazil before the potato, but never met with much favor as an esculent. Until its value as food for swine was discovered in the West, it was used principally for pickling.

It is very hardy, remaining in the ground all winter uninjured by our severest cold weather, and springing up the next season without farther cultivation than that given by hogs in rooting out the large tubers. They are, however, better, if the section of the tubers are dropped in furrows four feet apart, and plowed once or twice, the yield in such cases sometimes reaching four hundred bushels to the acre.

When partly grown, the tubers are round, but as they attain full size, they become irregularly elongated. The
color of the skin and flesh is white, the stalks produce few branches, attain the height of six, and even eight feet, and bear yellow flowers, similar to the garden sunflower, but much smaller. The cut represents a tuber of the Brazilian variety, reduced in size. A native variety found growing in rich sandy bottoms of the West—the natural soil of the artichoke—is brown, smooth and long like the sweet potato; they are eagerly sought by swine.

**Silos and Ensilage.**

What is Ensilage?

ENSILAGE is a French word signifying the art of compressing into silos—pits, trenches, etc.—green crops, or other succulent vegetation; the word literally meaning the forage so preserved. Silo is the French name of the pit, trench or chamber in which the ensilage is stored. A silo, then, is simply a vat, cistern, or underground trench, water-tight at the bottom and sides, in which any vegetable substance liable to ferment may be kept fresh by exclusion of the air. The structure may be either entirely above or below ground, or partly above and partly below the surface. It is not even necessary that the silo be made water-tight in dry soil; nor is it necessary that it be bricked or stoned up in firm soil.

Silos and Ensilage Long Known in Europe.

The art of preserving succulent food in tight cisterns has been known for many years. Brewers' grains have been so preserved. It is claimed that silos were known to the ancient Romans, but there is no good authority to show
that green fodder was kept by them in this way. It is also asserted that the Mexicans so preserved their grain, both green and matured, by this method. The Mexican Indians and the Indians of North America did often keep their corn in the husk in underground caves, but not under pressure enough to exclude the air. A dry situation was chosen, and the grain was kept in much the same way that is now in general use for preserving roots — nothing more.

The practical application of air-tight green forage fresh-ern idea. The hon-belongs to the within the last few ess has received of experimenters in

Crevat's Experiments.—M. Crevat, after several years of experiment, recommends pits of the following dimen-sions: Depth, 2.30 meters (7.55 feet); length, 8 meters (26.25 feet), at the surface of the ground, sloping down to 7.40 meters (24.28 feet) on the bottom; breadth, 2.60 meters (8.53 feet) at the top, and 2 meters (6.56 feet) at the bottom. Each pit has a capacity for about 40 cubic meters (about 1,412 2/3 cubic feet) of fodder. M. Crevat has found reason to deepen the trenches and to contract their width, in order to lessen the expense of covering them with earth.
The sides and ends are sloped, in order to allow an oblique, as well as a vertical, pressure from the superincumbent earth, and to make the upper surface of the fodder convex. In each of these pits about $10\frac{1}{2}$ tons of green fodder may be packed. Two or three days' drying in the hot sun will reduce it about a third in weight. Many farmers prefer to dry the material in order to render it more easy of transportation. The trench is filled and the fodder piled up above the ground to a height equal to its depth under the surface. The earth is then thrown upon the mass before fermentation commences. Two feet depth of soil will depress the pile at least a yard by simple pressure. After some days of fermentation it shrinks to less than half its original volume. The weight of the material, by condensation, increases from about 800 pounds per cubic yard to over 2,000 pounds.

General Observations.—In some cases, the silos are mere pits, with walls of bare earth. In other cases, they are lined with brick or cement, either on sides or bottom or on both. Where the soil is excessively damp, the walls are built entirely or partially above the surface, and embankments are made for their support. It is found necessary to exercise special care in covering the pits to entirely exclude the air. The dislocations in the fermenting fodder will often open fissures through the covering soil, and the air thus admitted will transform the process of fermentation into one of putrefaction. Sometimes decidedly alcoholic fumes
have been given off through the crevices in the covering. One case is noted in which the ensilage entirely failed, on account of using sand instead of earth as a covering. Different opinions prevail in regard to the propriety of cutting or chopping the maize into small fragments before packing in the trenches. In case the maize has become over-ripe, it is urged that cutting facilitates fermentation, which will render the harder portions as easy of mastication and digestion by farm animals as the softer portions.

The Father of Ensilage.

To Mr. Auguste Goffart, a member of the Central Society of Agriculture of France, belongs the credit of a system of experiments by which green fodder, cut small, was kept in water and air-tight excavations in almost as good condition as when cut. In fact, the slight fermentation and breaking down of fiber, and the desiccations which the forage undergoes when thus stored, undoubtly renders the coarser portions of the provender more digestible, the change being analogous, in a sense, to cooking.

In 1852, Mr. Goffart built six underground silos of cemented masonry. They were small, having a capacity only of two cubic meters each. [The French meter is three feet three and one-third inches.] Maize, Jerusalem artichoke, beets, sorghum, turnips, potatoes and straw were experimented with; but not until 1873 did he have
real success, and then only by a fortunate discovery. This was exclusion of air by strong pressure. Hence to this gentleman is undoubtedly due the perfection of this very valuable method of saving fodder for the winter months.

The Best Results.—His testimony, and no one is better qualified to speak authoritatively, is that a silo built upon the ground gives the best results during the season from December to March, but that underground silos are better for spring and summer feeding.

He recommends silos sunk two meters (about six feet six inches) below ground, and raised the same distance above. He feeds the upper portion during winter and the lower portion later. In the United States, however, ensilage will not be used to the exclusion of pasturage, and hence it will be economical for us to cut from top to bottom, section by section.

What Ensilage May Do.

It will give us succulent food in winter and also enable any farmer to tide over the droughts of summer by saving the material in underground silos, and this at a minimum cost. By this means many waste products of the farm, such as clean, bright straw, may be added to the green forage to assist in taking up the superabundant moisture, thus reducing the whole to one homogeneous mass.

Corn fodder is not a perfect food in itself; it may be made so by the addition of other matter, mill-stuffs, bran, etc. To the dairyman ensilage is of great value, since it will keep the cows up to a full flow of milk continuously. To the shepherd it will allow the use of succulent food, so needful to sheep in winter. It will assist the breeder of young stock in keeping them in full growth and vigor in winter. It will be equally valuable to the breeder and feeder of fine stock, who, notably, spend large sums in artificial feeding stuffs.
Feeding Value of Ensilage.

M. Pasquay has deduced some valuable facts in relation to the feeding value of ensilage. It was found that maize fodder (green) has a feeding value equal to 22 per cent. of that of hay; rye fodder, 38 per cent.; grass (green), 34 per cent.; bright wheat-straw, 48 per cent. In a good forage ration for a milk cow, the ratio of nitrogenous to non-nitrogenous matter should be as 1 to 5, or even as 1 to 4.5; for young animals, weighing between 250 and 300 pounds, as 1 to 3.3; for animals of 450 pounds, as 1 to 4; for oxen in absolute repose, as 1 to 8. Maize forage cut green does not meet this requirement, as it shows a proportion of 1 to 9.24. The maize preserved with a mixture of straw, as at Cercay, approximates the standard, showing a proportion of 1 to 4.81. Its increased per cent. of fatty matter represents also a great advantage, being six times greater than in the green maize.

Other Facts. — M. Goffart finds that his preserved fodder is sufficient without any other food to keep his animals in fine condition. M. Houette, of the department of Yonne, has found by experience that the maize should be cut for preservation in silos as near as possible to its maturity, when it is more nutritive, the ears more developed, the stalks more firm, and the watery element less predominant. Being finely chopped before pitting, its fermentation in the silo will soften it and render it as palatable to animals as the freshly-cut maize. He has been able to keep stock upon it to the last of May, and once as late as July, the fodder being in a condition but imperceptibly changed from that of its primary fermentation in the silo. Some question has been raised as to the propriety of feeding fodder spoiled in the pits, but while no indications of injury from feeding it have been developed, it is justly considered that it is more available as a plant-
food than animal food; hence it is thrown upon the manure-pile.

*Maximum Yields.*—The comparative maximum yields of various fodder plants in France, by M. Leconteaux, is summarized, as showing extreme results, but those obtained, of the root crops noted, have often been largely exceeded. The results are given in the table:

<table>
<thead>
<tr>
<th>NAMES OF PLANTS</th>
<th>GRASS YIELD PER ACRE</th>
<th>EQUIVALENT IN HAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caragua maize (a tall species of Indian corn)</td>
<td>66.05</td>
<td>16.73</td>
</tr>
<tr>
<td>Sugar beets</td>
<td>35.68</td>
<td>11.63</td>
</tr>
<tr>
<td>Rye-grass with liquid manure</td>
<td>35.68</td>
<td>8.97</td>
</tr>
<tr>
<td>Marcite meadows of Italy</td>
<td>28.85</td>
<td>7.21</td>
</tr>
<tr>
<td>Rutabagas</td>
<td>21.41</td>
<td>5.35</td>
</tr>
<tr>
<td>Potatoes</td>
<td>9.81</td>
<td>4.90</td>
</tr>
<tr>
<td>Cabbages</td>
<td>17.84</td>
<td>3.56</td>
</tr>
</tbody>
</table>

The History of Ensilage.

A communication to the Department of Agriculture at Washington, some ten years ago, shows that the preservation of fodder in silos has been practiced in Austro-Hungary for nearly eighty years, and in Germany previous to its employment in France, but since its introduction into the latter country it has been nowhere so elaborately developed as there. As we have already shown, the perfect results in France have only been reached through the most careful and laborious experiments, carried on through a long series of years.

Fermentation Should be Avoided.

In an address at Blois, France, Mr. Goffart held that: "It is important to avoid all kinds of fermentation during and after ensilage. Fermentation can be produced when-
ever desired, and a few hours suffice to give all its useful effects. Take each evening from your silo the maize required for the next day's feeding, and in fifteen or sixteen hours after, however cold and free from fermentation when taken out, it will be quite warm, in full fermentation, and the animals will eat it greedily. Eight hours later it will have passed the proper limit and it will spoil rapidly."

With the cheap French labor, the cost of the ensilage, exclusive of that of raising the crop is about twenty cents per ton prepared and placed in the silo.

**Ensilage in the United States.**

Mr. Francis Morris, of Oakland Manor, Maryland, had his attention called to the subject through a French newspaper early in 1876. On the first of August, that year, he sowed five acres of corn in drills, at the rate of one bushel of seed to the acre. Three silos were bricked up inside a stone barn, each being ten feet deep, four feet wide, and twenty-four feet long (a single silo 12x12x24 would have been better). Early in October, the corn being in tassel, it was cut with a mowing-machine, drawn to the silos, cut into inch pieces, and mixed with about one-fifth its bulk of cut straw. The whole was placed in the silos, and well packed by tramping as it was put in. It was covered with boards heavily weighted with stone, and when thoroughly pressed the weights were taken off, the whole surface covered with straw, and this with clay, well rammed down, to exclude air. On Christmas day a silo was opened, and the ensilage given to the milch cows of the farm. Two of them refused to eat it the first day; the others took kindly to it, and the second day all ate. After that, he says, horses, mules, oxen, cows, sheep and pigs all ate it from choice.

Had Mr. Morris known at that time the superior
methods now used to exclude air, his success would have been still better. It was, however, the first fairly carried out practical experiment in curing ensilage in the United States. Within the last few years dairymen in the West have eagerly seized upon the idea, and each year sees more and better silos built in all the great dairy districts. The system may profitably be extended among those interested in other branches of agriculture.

**How to Build a Silo.**

Build it so it may be entered directly from the feeding stables, and one-half below ground. Eight feet below and four feet above, the upper portion banked up, with the excavated earth, would be better. There must be a double door at least five feet high and three feet wide, for ease in emptying the silos, after the first section is removed to a level with the bottom of the door. The ensilage nearest to the door should be supported by planks fitting into an inset in the wall, next to the door, to be removed one by one as the ensilage is taken out.

**The Foundation.**—The drainage under the foundation should be made perfect by means of a layer of coarse gravel and tile leading to a point below the bottom of the silo. The bottom and sides should be built of stone, laid in the best hydraulic cement. If stone cannot be had, hard-burned brick is the next cheapest good material. The bricks should be laid in cement and the whole inside and bottom thoroughly plastered with cement.

**The Superstructure.**—This may be of lumber, and the roof of shingles; and if it is carried up one story above the silo, it will afford a useful workshop or room for storage of any kind. It will pay to finish the building in this way, as the extra expense will prove to be true economy in the end. The excavation may be mostly done with the plow
and scraper, and the incline afterwards filled in by the scraper as the wall is built up. The cuts given will serve as a guide, so that any bricklayer and carpenter can do the work. Directions for raising the crops to fill the silo will be found in the chapter on Soiling and Fodder Crops.

Size of Silos for Certain Numbers of Stock.

While ensilage may be kept more or less perfect in simple pits, eventually the cost is reduced by the best constructed silos. The silos need not be expensive, but they must be built thoroughly, because thorough building is cheap building in the end. The cut shows sections of a double underground silo.

Rations for a Cow.—A cow will consume as a full ration from fifty to sixty pounds of ensilage a day. A cubic foot of ensilage weighs forty to fifty pounds, according to the material and pressure employed. One and a third cubic feet daily will keep a cow; one cubic foot will feed a sheep a week, and fully one and a half cubic feet will be required daily for an ox. To feed a cow six months will require about two hundred and fifty cubic feet of ensilage. If you have two cows, a silo 10x10 feet, and ten feet deep, will hold about twenty-five tons, and be ample for six months' feeding. A silo 10x10x30 feet would keep six cows, on nearly full rations, or double that number when other food is used to supplement the ensilage—a practice we should advocate in the West, when other food is cheap. Hence the dairymen feeding half rations, that is, half ensilage and half other food, could feed thirty cows for six months from a double silo, each compartment being 12x12 feet and thirty feet long. An extra silo would tide double this number of cows over the usual six weeks of summer droughts.
Practical Experience and Results.

In 1882 the Commissioner of Agriculture, Hon. George B. Loring, sent out twenty-six questions in relation to silos and ensilage, to which nearly one hundred answers were returned, from fifteen States, east, south and as far west as Nebraska; also from Canada. The information given in these answers was summarized under twenty-six heads, making one of the most complete and practical papers ever issued by the Department. Here it is:

1. Location of Silo.—A few have been built at a distance from the stables, but generally the silos are located with reference to convenience in feeding, in, under, or adjacent to the feeding-rooms. Local considerations will determine whether the silo should be below the surface, or above, or partly below and partly above. This is not essential. Where the stables are in the basement of a bank barn, the bottom of the silo may be on the same level, or a few feet below, and the top even with the upper floor. This arrangement combines the greatest facilities for filling, weighting and feeding.

2. Form of Silo.—With rare exceptions the silos described show a rectangular horizontal section; a few have the "corners cut off," and one is octagonal. (The cylindrical form, of which there is no instance in the accompanying statements, seems to have obvious advantages. If under ground, a cylindrical wall is self-supporting against outside pressure, and may be much lighter than would be safe in any other form. If of wood and above ground, the walls may be stayed with iron bands. In any case, for a given capacity, the cylindrical form requires the least possible amount of wall.)

A given weight of ensilage in a deep silo requires less extraneous pressure, and exposes less surface to the air, than it would in a shallow silo. For these reasons depth
is important. If too deep, there is danger of expressing juice from the ensilage at the bottom.

Where the ensilage is cut down in a vertical section for feeding, a narrow silo has the advantage of exposing little surface to the air.

3. Capacity of Silo.—The silos reported vary in capacity from 364 to 19,200 cubic feet. If entirely full of compressed ensilage, the smallest would hold 9.1 and the largest 480 tons, estimating 50 pounds to the cubic foot. Practically, the capacity of a silo is less to the extent that the ensilage settles under pressure. This should not exceed one-fourth, though in shallow silos, or those filled rapidly and with little treading, it is likely to be much more. A temporary curb is sometimes added to the silo proper, so that the latter may be full when the settling ceases.

4. Walls of Silo.—For walls underground, stone, brick and concrete are used. The choice in any case may safely depend on the cost. In firm soils that do not become saturated with water, walls are not essential to the preservation of ensilage. Above ground, two thicknesses of inch boards, with sheathing paper between (the latter said, by some, to be unnecessary), seem to be sufficient, if supported against lateral pressure from the ensilage.

5. Covering.—A layer of straw or hay will serve in some measure to exclude air, but is not necessary. Generally boards or planks are placed directly on the ensilage. The cover is sometimes made in sections two feet or more wide; oftener each plank is separate. The cover is generally put on transversely, having in view the uncovering of a part of the silo while the weight remains on the rest. Rough boards, with no attempt at matching, have been used successfully. A little space should be allowed between the walls and cover, that there may be no interference as the settling progresses.

6. Weight.—Any heavy material may be used. The amount required depends on various conditions. It will be
noticed that practices and opinions differ widely. The object is always to make the ensilage compact, and thereby leave little room for air, on which depends fermentation and decay. In a deep silo the greater part is sufficiently compressed by a few feet of ensilage at the top, so that there is small percentage of waste, even when no weight is applied above the ensilage. Screws are used by some instead of weights. The objection to them is that they are not self-acting, like gravity.

7. Cost.—The cost of silos, per ton of capacity, varies from four or five dollars, for walls of heavy masonry and superstructures of elaborate finish, and fifty cents or less for the simplest wooden silos. Earth silos, without wall, can be excavated with plow and scraper, when other work is not pressing, at a trifling cost.

8. Crops for Ensilage.—Corn takes the lead of ensilage crops. Rye is grown by many in connection with corn—the same ground producing a crop of each in a season. Oats, sorghum, Hungarian grass, field peas, clover—in fact, almost every crop valuable for soilage has been stored in silos and taken out in good condition. There are indications that some materials have their value enhanced by the fermentation of the silo, while in others there is loss. The relative values for ensilage, of the different soilage crops, can only be determined through careful tests, often repeated, by practical men.

All thoughtful farmers would be glad to get more value from the bulky "fodder" of their corn crops than is found in any of the common methods. There are accounts of plucking the ears when the kernels were well glazed, and putting the fodder into the silo. The value of such ensilage, and the loss, if any, to the grain are not sufficiently ascertained to warrant positive statements.

9. Planting and Cultivation.—Thorough preparation before planting is essential. Corn, sorghum and similar
crops should be planted in rows. The quantity of seed-corn varies from eight quarts to a bushel and a half for an acre. A smoothing-harrow does the work of cultivating perfectly, and with little expense, while the corn is small.

10. When Crops are at their Best for Ensilage.—The common practice is to put crops into the silo when their full growth has been reached, and before ripening begins. Manifestly one rule will not answer all purposes. The stock to be fed and the object in feeding must be considered in determining when the crop should be cut. On this point must depend much of the value of ensilage.

11. Yield or Ensilage Crop.—Corn produces more fodder per acre than any other crop mentioned. The average for corn is not far from twenty tons—which speaks well for land and culture. The largest yield from a single acre was fifty-eight tons; the average of a large area on the same farm was only twelve and a half tons.

12. Kind of Corn Best for Ensilage.—The largest is generally preferred; hence seed grown in a warmer climate is in demand.

13. Sweet Corn for Ensilage.—It is conceded by many that the fodder of sweet corn is worth more, pound for pound, than that of larger kinds, for soiling. Some hold that the same superiority is retained in the ensilage, while others think that the advantage after fermentation is on the other side. The sweet varieties generally do not yield large crops.

14. Preparing Fodder for the Silo.—The mowing-machine is sometimes used for cutting corn in the field—oftener the work is done by hand. Various cutters, having carriers attached for elevated silos, are in use, and are generally driven by horse, steam or water power. Fine cutting—a half-inch, or less—is in favor. It packs closer, and for this reason is likely to keep better than coarse
ensilage. Fodder of any kind may be put in whole, and, if as closely compressed as cut fodder, will keep as well, if not better; but it requires much greater pressure.

15. Filling the Silo.—During the process of filling, the ensilage should be kept level, and well trodden. A horse may be used very effectively for the latter. Some attach much importance to rapid filling, while others make it more a matter of convenience. With the packing equally thorough, rapid filling is probably best.

16. Cost of Filling the Silo.—The cost, from field to silo, is variously reported from thirty-five cents—and in a single instance ten or twelve cents—for labor alone, to two dollars and upwards per ton; though the higher amounts include the entire cost of the crop, not the harvesting alone. There is a general expectation that experience will bring a considerable reduction in the cost of filling.

It is probable that, with a more general adoption of ensilage, the best machinery will be provided by men who will make a business of filling silos. This could hardly fail to lessen the cost and bring the benefits of the system within the reach of many who otherwise would not begin.

17. Time from Filling to Opening Silo.—The ensilage should remain under pressure at least until cool, and be uncovered after that when wanted.

18. Condition of Ensilage when Opened.—In nearly all cases the loss by decay was very slight, and confined to the top and sides where there was more or less exposure to air.

19. Deterioration after Opening.—Generally the ensilage has kept perfectly for several months, showing no deterioration while any remained in the silo, excepting where exposed for a considerable time. It is better to uncover a whole silo, or compartment of a silo, at once, and thus expose a new surface each day, than to cut down sections.
20. Value of Ensilage for Milch Cows.—Ensilage has been fed to milch cows more generally than to any other class of stock, and no unfavorable results are reported. There can be little doubt that its greatest value will always be found in this connection. Several feeders consider it equal in value to one-third of its weight of the best hay, and some rate it higher.

21. Effects on Dairy Products.—There is a marked increase in quantity and improvement in quality of milk and butter after changing from dry feed to ensilage, corresponding with the effects of a similar change to fresh pasture. A few seeming exceptions are noted, which will probably find explanation in defects easily remedied, rather than such as are inherent.

22. Value for Other Stock.—Ensilage has been fed to all classes of farm stock, including swine and poultry, with results almost uniformly favorable. Exceptions are noted in the statements of Messrs. Coe Bros. and Hon. C. B. Henderson, where it appears that horses were injuriously affected. It should be borne in mind in this connection that ensilage is simply forage preserved in a silo, and may vary as much in quality as hay. The ensilage that is best for a milch cow may be injurious to a horse, and that on which a horse would thrive might render a poor return in the milk-pail.

23. Daily Ration of Ensilage.—Cows giving milk are commonly fed fifty to sixty pounds, with some dry fodder and grain.

24. Method of Feeding.—Experiments have been made in feeding ensilage exclusively, and results have varied with the quality of ensilage and the stock fed. It is certain that ensilage of corn cut while in blossom, or earlier, is not alone sufficient for milch cows. It is best to feed hay once a day, and some grain or other rich food, unless the latter is supplied in the ensilage, as it is when corn has
reached or passed the roasting-ear stage before cutting. Ensilage, as it is commonly understood, is a substitute for hay and coarse fodder generally, and does not take the place of grain.

25. The Condition of Stock, fed on ensilage, both as to health and gain in weight, has been uniformly favorable.

26. Profitableness of Ensilage.—There is hardly a doubt expressed on this point—certainly not a dissenting opinion.

Perfect Food and Rations.

Mr. Samuel Adams, of Massachusetts, in relation to the method of feeding, says: "For milch cows I should feed fifty pounds ensilage, ten pounds hay; if shorts were not too high, would feed two quarts per day, and if the dairy product was in demand, would give a little meal of some kind."

In the West more grain and less ensilage would naturally be fed. When corn is used as ensilage, we should recommend bran, mill-feed and oil-cake in preference to the corn in the grain. A mixture of one-quarter prickly comprey (strong in nitrogen), one-half corn fodder, and one-quarter rowen hay, with fifty pounds of bran to the ton of green fodder, will make a perfect food for milch cows. Then, fifty pounds of ensilage and five pounds of corn-meal would make a rich ration for each cow.

Some Statements of the Quantity Fed.

Mr. Jason Allen, Massachusetts, says: From the 10th of November to the 10th of January, I fed forty-five pounds of ensilage and five pounds of hay; from the 10th of January to the 10th of March, sixty pounds of ensilage and four pounds of middlings to dry stock, and two pounds
more to milch cows; from the 10th of March until May 1, sixty pounds of ensilage, one foddering of oat straw, and six pounds of grain to cows in milk. He regards sixty pounds of ensilage, with six pounds of grain, for an average-sized cow, per day, as a full ration.

Col. LeGrand B. Cannon, Vermont, fed an average of eighty-five pounds per head for three-year old steers, daily, for five and a half months, with three pounds of grain daily. Cattle fed as stated made a greater gain, and were in better health and condition than others fed on twenty pounds of chopped hay and three pounds of grain.

Mr. Wm. B. Eager, of Nebraska, fed forty pounds per day per head. The mid-day feed was of cut-dry corn-fodder, or cut millet hay, with ground feed. Occasionally for trial we fed meal upon the ensilage, but abandoned it and fed ensilage alone, and meal upon dry food, or cattle will not eat it. The herd of over three hundred milch cows came out in better flesh than when taken from pasture.

Prof. S. C. Armstrong, principal of the Hampton Normal School, in Virginia, only experimented with thirty tons, which were fed in one month's trial. The quantity fed was sixty pounds per day, with other food, and about three quarts of wheat bran. There was no perceptible change in the condition of the stock. He says ensilage works well with other food; does well as a substitute for roots.

Prof. J. McBryde, of Knoxville, Tennessee, says: "All our milch-cows receiving ensilage showed a notable improvement in milk. Butter made from milk of cows fed on ensilage of excellent flavor. Three yearling steers fed exclusively on long forage; one, weighing four hundred and twenty-eight pounds, received a daily ration of twenty pounds of hay; gained twenty-two pounds in twenty-eight days. Another, weighing four hundred and fifty-seven pounds, received ten pounds hay and twenty pounds ensilage; gained twenty-eight pounds. A third, weighing four
hundred and forty-two pounds, received forty pounds ensilage, and gained thirty-eight pounds. Two pounds ensilage gave better results than one pound hay. It is plain that animals should be fed on mixed rations of ensilage and matter rich in albuminoids."

Mr. L. W. Weeks, of Wisconsin, says: "I feed milch-cows from forty to fifty pounds at two feedings, morning and night, mixed with two pounds of corn-meal each feed, and same weight of some nitrogenous food, as oat-meal, barley-meal, or mill feed. At noon I feed hay, oats in straw chaffed, or barley straw chaffed; and stock always gaining in condition, coming out in spring in high flesh and healthy. Since feeding ensilage, I have had no trouble with garget or other unhealthy condition of udder. In my experience, ensilage has proved a gain in profit of certainly forty per cent. over any method of dry feeding that I know, besides enabling one to carry three times the amount of stock possible on the same amount of land with dry feeding."

Mr. John D. Whitman, of Iowa, testifies that ensilage is fully equal to half its weight in hay; the effects very similar to that of green grass, and extra good for calves.

If on full feed, seventy pounds per day is fed; a less amount with grain and hay is better.

Mr. George A. Pierce, of Canada, says that ensilage is very valuable for dairy stock, entirely taking the place of roots, and largely that of hay.

Immediately on feeding the ensilage the butter gained in quality and quantity. No fault was found by the purchaser.

Fed a few steers on ensilage and they did well; calves and young stock did remarkably well. He fed sixty to seventy pounds per day, mixed with meal. The stock began to gain as soon as they were fed ensilage; formerly had hay, roots, and some grain. He found ensilage a great advantage over the system of feeding hay and roots in winter.
Dr. John Q. Sutherland, of St. Louis County, Missouri, was one of the first practical farmers in the West to adopt the ensilage system, after Mr. Morris' experiments had demonstrated its value. He kept thirty-two head of milch cattle, which he fed on ensilage both in the winter and in the season of scant pasturage at midsummer, making the ration fifty-five pounds per day of corn ensilage to each cow. This he supplemented with a sufficient quantity of dry food—chopped hay and bran—in winter, to keep the animals in good condition, but in midsummer little besides the ensilage was needed. His cows were always up to a full flow of milk, and the butter excellently flavored.

Thus the testimony of practical farmers from widely separated locations is conclusive as to the value of ensilage.

The Cost of Ensilage in Massachusetts.

The following statement of Mr. Jason Allen gives a fair exhibit of the cost of ensilage, and may be taken as a fair approximation where much hand labor is employed. In the West and Southwest the cost ought to be considerably less:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plowing three acres</td>
<td>$9.00</td>
</tr>
<tr>
<td>Harrowing</td>
<td>$3.00</td>
</tr>
<tr>
<td>Commercial fertilizers</td>
<td>$20.00</td>
</tr>
<tr>
<td>Fifteen loads of manure, one-half charged to the corn</td>
<td>$15.00</td>
</tr>
<tr>
<td>Planting</td>
<td>$4.50</td>
</tr>
<tr>
<td>Seed-corn</td>
<td>$5.00</td>
</tr>
<tr>
<td>Replanting</td>
<td>$3.00</td>
</tr>
<tr>
<td>Harrowing twice</td>
<td>$3.00</td>
</tr>
<tr>
<td>Hoeing by hand</td>
<td>$6.00</td>
</tr>
<tr>
<td>Cultivating by hand</td>
<td>$3.00</td>
</tr>
<tr>
<td>Use of land</td>
<td>$8.00</td>
</tr>
<tr>
<td>Raising crop</td>
<td>$79.50</td>
</tr>
<tr>
<td>Cutting and storing in silo</td>
<td>47.75</td>
</tr>
<tr>
<td>Whole cost</td>
<td>$127.25</td>
</tr>
<tr>
<td>Cost per ton</td>
<td>$2.70</td>
</tr>
</tbody>
</table>
In the West corn fodder can be raised ready for cutting at a cost of one and a quarter days for man and team per acre.

**Building a Model Silo.**

Mr. Bisbee, of New York State, thus describes his plan of building: The top of the silo is even with a plateau, the bank descending fifty feet to the stable, and very steep. The ensilage is taken out by a hoisting apparatus over the top of the stone wall, and carried in a car on a gently descending grade into a small house, built on the roof of the stable, where the bottom falls out, and the ensilage drops to the floor over the stable. The silos were built double; seven and eight feet wide, respectively, by 24x15 feet deep. The material was stone. Outside walls dry, thirty inches thick at the bottom, and twenty at the top. Division wall twenty inches, laid in cement, and all walls plastered with cement. The walls were built by masons, in accordance with their notions of fitness, with the result of an extravagant cost. Above the silo walls is a curb of matched boards, six feet high, for settling-room—of course a roof covers the whole. The silos were covered with hemlock planks, and weighted with stone fourteen inches thick, and earth banked at ends of plank. The cost was between $700 and $800.

Mr. N. Gridley, New York, has a silo 32x12x10 feet deep, built of concrete, 14 to 16 inches thick. Posts set in the ground and lined with two-inch plank, put in as wall is built. Any kind of stone used. One part cement to five parts sand, mixed while dry, then wet so that it will pour from the pails in which it is carried. After the posts and planks are taken down the walls are plastered with cement, made with less sand. Bottom covered about two inches with gravel. The cost was $200, including light frame building over it.
Practical Conclusions from Careful Experiments.

COL. LEGRAND B. CANNON, of Vermont, previously quoted, gives some well-digested observations and experiments, which we append. He considers ensilage profitable, and believes it is entirely healthy, taking the place of roots. It is easily digested, as is shown by the uniform temperature of the animals and the condition of the skin and hair.

The claims made by many writers in regard to ensilage are extravagant; that it has certain advantages cannot be denied.

First. Not more than fifteen to twenty-five tons can be depended upon per acre.

Second. It is more certain as a crop than hay.

Third. Twice as many animals can be kept on the same acreage.

Fourth. It is largely a substitute for roots.

Fifth. The labor of feeding ensilage is much less than hay.

Sixth. The space required to store ensilage is not one-quarter that required for hay.

Experiment.—I fed ninety 3-year-old steers, divided in three lots; cattle and feed weighed monthly.

First lot. Fed twenty pounds hay with three pounds grain daily; run in yard with shelter.

Second lot. Kept in warm stable and stanchions; fed seventeen and a half pounds of hay, one peck mangolds, and three pounds grain.

Third lot. Fed eighty-five pounds ensilage with three pounds grain; this lot gained one-quarter pound a day more than No. 2, and one-half pound more than lot No. 1. The cost five per cent. in favor of ensilage.
Textile Crops and Fibers.

Cotton—Its History and Cultivation.

This wonderful plant, which has revolutionized the clothing manufacture of the world, is a native of the tropical and sub-tropical regions of Asia, Africa and America. Until the invention of the cotton gin, it could not be economically utilized. By hand labor, only a few pounds of the lint could be separated from the seed in a day. By the use of the cotton gin, three thousands pounds a day may be prepared for baling and market.

Though manufactured into cloth more than three thousand years ago, described by Herodotus, who lived four hundred and forty years before Christ, and mentioned by Strabo in the first century after Christ, as being manufactured into printed cloths, flowered, and of brilliant hues, it was not until nearly the middle of the present century that the production and manufacture of cotton had become so cheapened that it could be generally used. Pliny called it Gossypium, the scientific name by which it is now known.

The Soils for Cotton.

Long Staple.—The delicate, long-stapled, sea-island cotton, is grown in a very narrow belt, lying along the coast of South Carolina, Georgia and part of Florida. The soil is dark gray, sandy, with a powdering of peat, shell, wood, twigs and leaves.

Uplands.—The upland or green seed cotton is raised from a variety of soils, but the rich alluvial soils of the bottom lands of the Mississippi Valley are the best. The region of Georgia, Alabama and Mississippi, underlaid by rocks of the cretaceous (chalk) system—soot argillaceous limestone and the sandy soils underlaid by metamorphic
rocks, sandstones and chert limestones, also make first-rate cotton soils. But whatever the surface soil, it must have good and deep drainage, and not a large amount of vegetable matter to produce the best staple.

Soils that are light (fluffy), that dry out easily on the surface, that are composed mainly of decayed vegetation, and deficient in drainage, should never be selected for cotton. Rich, deep humus soils, however great a crop of stalks they may raise, will never give good results in fiber. So again, soil that are cold or wet in the sub-soil, or those subject to flooding, will not grow cotton. Scab, rot, insects and other contingencies will destroy the crop.

Soils that are silicious and aluminous, rich in potash and other mineral matter, are always sought for cotton. A dark-colored, warm, finely comminuted upland, or second bottom, is always to be preferred, if not too rich in vegetable matter.

COTTON CULTIVATION IN THE UNITED STATES.

The aborigines of Mexico and the South American Pacific slope cultivated cotton and wove it into cloth. The savage tribes of the United States knew nothing of its use. The plant is supposed to have been introduced, about 1664, from Barbadoes. A South Carolina planter clothed his negroes in 1778 with cotton prepared entirely by hand, though the spinning-jenny of Arkwright was invented in 1769, and that of Hargreaves in the next year. Little cotton was raised in the United States up to the year 1793, when the invention of the cotton gin by Whitney started a revolution in cotton industries. By this originally crude instrument, instead of one pound of lint per hand, 350 pounds could be cleaned in a day.

The first cotton shipped from North America was one bag of the staple sent abroad in 1740, and no more was shipped for fifty years. During the Revolutionary war cotton was cultivated in small patches and woven at home. In 1793 cotton was first planted as a marketable crop.
TEXTILE CROPS AND FIBERS.

In 1792 the export of cotton was 138,328 pounds; in 1840, 744,000,000 pounds; in 1860, 1,765,115,735 pounds, or 4,412,789 bales of 400 pounds each, but the quantity produced in 1860 was 2,079,230,800 pounds, or 5,198,077 bales. This production had fallen off somewhat in 1870, when the quantity produced was reported as 3,011,996 bales, or 1,204,798,400 pounds. During the war the production dropped to almost nothing. For the first eleven years after the war the average crop was about 3,300,000 bales, which is almost exactly the average for the eleven years immediately preceding the war. The largest crop made in America previous to 1860 was 4,669,770 bales in 1859, which fell far short of the crop of 1880-81. Of late years the increasing demand for cotton and the better prices obtained have caused a rapid increase in the quantity raised, a large proportion of the crop being raised on small farms and by white labor.

The crop of 1880-81 was 6,589,329 bales, the largest ever produced up to that time, though it may soon be looked upon as no more than a fair average crop. Of this, 4,596,279 bales were exported, and the home consumption was 1,891,804 bales. The crop of 1882-3 was 5,425,845
bales. The comparison of seventeen-year periods, one ending with 1860-61, and the other with 1881-82, shows:

<table>
<thead>
<tr>
<th></th>
<th>CROP IN BALES.</th>
<th>EXPORTATION—BALES.</th>
<th>HOME CONSUMPTION—BALES.</th>
</tr>
</thead>
<tbody>
<tr>
<td>First period of seventeen years</td>
<td>51,330,790</td>
<td>39,913,005</td>
<td>11,422,799</td>
</tr>
<tr>
<td>Second period of seventeen years</td>
<td>63,377,375</td>
<td>46,892,528</td>
<td>21,494,210</td>
</tr>
</tbody>
</table>

**COTTON BY STATES.**

<table>
<thead>
<tr>
<th>States</th>
<th>Acres</th>
<th>Yield per Acre</th>
<th>Pounds of Lint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virginia</td>
<td>61,985</td>
<td>178</td>
<td>11,033,330</td>
</tr>
<tr>
<td>North Carolina</td>
<td>1,050,543</td>
<td>180</td>
<td>180,097,740</td>
</tr>
<tr>
<td>South Carolina</td>
<td>1,587,244</td>
<td>183</td>
<td>290,465,652</td>
</tr>
<tr>
<td>Georgia</td>
<td>2,844,305</td>
<td>152</td>
<td>432,334,360</td>
</tr>
<tr>
<td>Florida</td>
<td>260,402</td>
<td>117</td>
<td>30,467,034</td>
</tr>
<tr>
<td>Alabama</td>
<td>2,534,388</td>
<td>150</td>
<td>380,158,200</td>
</tr>
<tr>
<td>Mississippi</td>
<td>2,233,844</td>
<td>190</td>
<td>424,430,360</td>
</tr>
<tr>
<td>Louisiana</td>
<td>887,524</td>
<td>235</td>
<td>208,568,140</td>
</tr>
<tr>
<td>Texas</td>
<td>2,810,113</td>
<td>240</td>
<td>674,427,120</td>
</tr>
<tr>
<td>Arkansas</td>
<td>1,110,790</td>
<td>233</td>
<td>258,814,070</td>
</tr>
<tr>
<td>Tennessee</td>
<td>815,760</td>
<td>170</td>
<td>138,679,200</td>
</tr>
<tr>
<td>Missouri, Indian Territory, etc.</td>
<td>79,793</td>
<td>180</td>
<td>14,362,742</td>
</tr>
<tr>
<td></td>
<td><strong>16,276,691</strong></td>
<td><strong>187</strong></td>
<td><strong>3,052,837,946</strong></td>
</tr>
</tbody>
</table>

The production of the twelve cotton States, with the acreage of each State, average yield of lint per acre, and the pounds of lint produced, with totals for the year 1882, are shown by the preceding table. Suppose careful cultivation should raise the average to that of Texas, it would increase the yearly total to nearly one billion of pounds.

**THE CLIMATE FOR COTTON.**

Cotton has been called a child of the sun. It requires a strong heat and plenty of sunshine, but the heat must be
There must be abundant moisture, with continuous sunny weather. Between latitude 30° and 33° in the United States these conditions exist, where the soil contains plenty of sand, or is so well drained as quickly to percolate superabundant moisture.

North Carolina is the northern boundary of its profitable cultivation on the Atlantic coast, while the bottom lands of Tennessee are practically its northern limit on the east banks of the Mississippi. High prices, at times, have tempted its cultivation in Kentucky and Missouri, somewhat largely in Kansas, on the eastern shore of Maryland, in southern Delaware, southern Indiana and Illinois, and even in southern Iowa. It may be ripened up to 40 degrees north latitude, but north of Tennessee it will not pay. Arkansas contains much fine cotton land; so does the Indian Territory, and in Texas, as is well known, the soil and climate, in wide districts, is admirable. The great Cotton States, in the relative order of production are: Georgia, Texas, Alabama and Mississippi. The three other States, in each of which, in 1882, over 1,000,000 acres were cultivated, were South Carolina, Arkansas and North Carolina. Louisiana and Tennessee produced less than 1,000,000 bales.

The Best Cotton States.

So far as the climate is concerned, the best regions for cotton cultivation in the United States are in the lower parts of Georgia, Alabama, Mississippi, Louisiana and Texas. In these regions there is comparatively little frost, and the winter is always mild, with considerable heat in the summer; but this is tempered, to a great extent, by the pleasant and salutary effects of the sea breeze, which sets in from the Gulf or the Atlantic for a great part of the day. There are heavy dews at night, and frequent showers occur, in the spring as well as in the summer. In the interior and more northern portions of these States (which
are, in some parts, elevated from five hundred to one thousand feet above the level of the sea), frost is expected in October, and often continues until April; sometimes it occurs even in May, so as to injure, but does not then usually destroy, the plant. The heat of summer, though frequently high, still is tempered by the influence of the ocean or the Gulf of Mexico, and of the numerous great rivers, as well as by the dews and occasional showers.

The cultivation of cotton is generally commenced about the beginning of April, when the land is still saturated with the winter rains, and difficulty is sometimes experienced in getting the land sufficiently dry; otherwise, a good shower is essential when cotton is first sown, and it is desirable also to have occasional showers during the planting, plowing and hoeing season. The bolls begin to open about the middle of July, and continue to do so until the appearance of frost, from the middle to the end of October.

The whole region west of the Alleghany Mountains is adapted to cotton much further north than is the region east of the Alleghanies. The direction of the valleys favors the drawing-in of the warm air of the Gulf of Mexico, and the summer climate is thus modified even up to Wisconsin and Minnesota, so that Indian corn, tobacco, melons and other fast-growing, semi-tropical products are freely produced.

THE CULTIVATION OF COTTON.

Of late years the cultivation of cotton has been much simplified by improved implements for ridging, sowing the seed and cleaning the crop. The principal points to be remembered have been stated by an experienced cultivator in the middle cotton region as follows:

Lands should be deeply and thoroughly plowed long enough before planting to allow the spring rains to settle the soil. If not plowed previously, particular pains should be taken to secure uniform and deep pulverization. If rough and full of clods, the harrow should follow the plow.
The usual practice among successful cultivators is to form beds with the turning plow, as foundations for the ridges, turning furrows both ways toward the centers.

Ridge planting is almost universally practiced; yet the custom of planting in hills, as with corn, has obtained, and may be preferable in otherwise suitable lands that are inclined to be too moist and cold, giving a better exposure of the fibrous side roots to the action of the sun. An increased elevation given to the ridge has essentially the same effect.

If land has been fallow, or in sod, it should first be thoroughly broken up with a heavy plow, and then bedded with a smaller one, harrowing after the first plowing. This not only pulverizes thoroughly, but leaves grass and weeds far beneath the surface. It will not do to slight the work at this stage; the success of the crop depends upon its character. If done well, half the battle of the season is over.

When the ridge is ready to open for seeding, great care should be taken to get a perfectly straight furrow, to facilitate "scraping out" superfluous cotton and grass. A very light and narrow plow should be used, making a furrow not exceeding an inch in depth. Unless the soil is very light and dry, the seed should not be covered half an inch. A wooden instrument for making the seed bed is frequently used to advantage instead of a plow.

The distance between ridges and between the plants must depend upon the probable size of the plants, which vary from eighteen inches to half as many feet in height. The largest yield is secured by so graduating the distance that the plants will cover the grounds and slightly interlock their branches. In good soils the ridges should be four feet apart, and the plants fifteen inches; in lighter, three and a half, and twelve inches; in very rich lands the ridges might be four and a half feet, and the plants fifteen to eighteen inches. This direction is good for cotton soils.
If a stinted growth only is expected, plants may be set nearer; some of our amateur planters think six inches will do, but counsels so extreme should not be heeded. This was the general plan followed up to within twenty years ago, and in small fields where much of the work must be done by hand it would be a good practice now; at all events, the land must be cleared of trash. The large planter will of course avail himself of all improved implements possible to facilitate and cheapen labor. This is written principally for that class who cultivate comparatively small areas. It would be better for all these to hire the improved implements, if they cannot buy.

One thing must be remembered; cotton will not make a crop unless the land is in good heart; strong land will grow heavy grass and weeds; unless these are kept under, the crop is a failure, for the roots of cotton must have the soil and the tops the sun. The distance of the rows from each other, and the intervals of the plants in the row, should vary with the fertility of the soil. The rule for uplands is four feet between the rows, and twenty inches between the plants. In lands that are strong enough to yield a bale to the acre, the spaces should be five feet one way by three the other; while in the valleys of the Southwest, such as the Red river and Brazos bottoms, the luxuriance of the growth is such as to require an interval of eight feet between the rows, and of five or six between the plants, and even then the branches interlock so that it is difficult to walk between the rows.

PREPARATION OF THE SOIL.

If the soil be poor and worn, manures must be applied; but large quantities of barn-yard manure are not advisable, especially in soils that already have much humus. Phosphatic manures, lime and potash, would here be indicated. The question of manure must be settled, each man for himself, according to the cost. The preparation of the soil, recommended by a writer having wide experience in
Louisiana, is as follows: "Where the field is foul with weeds or the stalks of last year's crop, it is best to bury them under the middle of the cotton ridge, and it is recommended to run a double furrow at intervals of four feet in hill lands, and at intervals of five or six feet in bottom lands. This can be done early in January, whenever the ground is not too wet. Behind each plow are two hoe hands, to break up and pull down into these ditches all the dead growth of the surface, one from the right side and the other from the left. Let it be well pulled down into the trench, and covered with some earth to keep it in place. Then, about the middle of February, according to situation, latitude and drainage of the land, let the double plows set in to break up the entire surface. If the rows for burying the trash are uniformly laid off, they can be used as the foundation of the bed or ridge. Throw a deep furrow from each side into the trench, filling it, and covering all the trash, and continue to plow out the intervening spaces or middles, as they are called, until the whole surface is turned under. This plowing should be deep and thorough.

Plowing and Fertilizing.—If compost or barn-yard manure is applied to the field, it should be done just before
plowing, and scattered broadcast. If concentrated fertilizers, such as ashes, guano, gypsum or superphosphates are to be used, they are best applied in the drill. In respect to fertilizers for the cotton field, it may be here remarked that cotton is a moderate consumer of the salts that nourish plants, especially if the seed is returned to the soil, as it should be, in the form of manure. Potash and phosphate of lime should abound in any manure applied to cotton. The effect of an abundance of potash in the soil will be to secure thrifty plants. The effect of phosphoric acid is to produce plenty of seed and a strong fine staple, and this is what brings the money.

*When to Plant.*—One rule, and a good one, is to plant cotton as soon as the oak leaves are the size of a squirrel's ear. Another good rule is to plant when the hickory buds have opened to show the leaves. This indicates that the days and nights are so warm that there is little danger of frost.

The amount of seed will depend upon the danger of destruction by cut-worms, etc. It is always best to plant seed liberally, but not, as some do, to manure the soil with them. The plants inevitably spindle before being thinned, and once spindled, you have lost your profit.

**Tending the Growing Crop.**

*The First Cultivation.*—The first cultivation of the crop should begin about fifteen days after the planting, or as soon as the weeds begin to start. If the instructions given above, with regard to evenness of rows and of the intervals between the plants are followed, the first cultivation may be easy and rapid. A light plow should be run close to the line of plants, cutting away the weeds and grass and stirring the earth to a moderate depth. The hoes follow, smoothing the inequalities produced by the plow, and clearing the intervals between the clumps of young plants. In the ordinary mode of planting, when the
seed is scattered thickly through the drills, this first cultivation is called "chopping out."

The Second Cultivation.—Two weeks after, the hands should go over the crop again, thinning out the young plants to a stand. This is sometimes done at the first cultivation, especially in strong soils. The second cultivation should be the most thorough of any, the thriftiest plants only being spared, and the rest being pulled up with care so as not to displace the roots of those allowed to remain. A little fresh earth is thrown around the roots of the young plants, and the entire ridge, as well as the intervals between, should be made perfectly clean. On a good soil, with favorable seasons, the growth will now be rapid, and the subsequent cultivation can be effected mainly by horse implements; but very deep cultivation, except in bedding up the land in the spring, is never beneficial. It breaks the lateral roots of the plants, and this retards the development of the pod and curtails the picking season; hence, the best implement for cultivating cotton is one which, instead of turning the soil, scrapes and pulverizes the surface of the earth.

The Scooter Plow.—The implement in common use is very well adapted to this purpose, and consists of a common scooter plow or bull tongue with wings attached three or four inches above the tip, and set in such a way as to pass just beneath the surface and throw a little ridge of fresh earth close to the stems of the plants. They often, when skillfully used, clean the surface so thoroughly that the hoes can pass over the crop very rapidly. Sometimes early in the month of July, on a good soil, the plants will be so far advanced that the branches will touch and perhaps lock across the middles. Many planters think that little is gained by running the plows after the crop attains this growth, but the more the ground is stirred, if lightly, the more readily will the heat of the sun penetrate the soil and fall upon the roots of the young plant, and this is what
is required to hasten their development; but the cultivation must vary with the season and condition of the soil. As a rule the cultivation further north should be discontinued sooner than south, since, if the plants get a check, they will blossom earlier and the crop thus be saved from frost.

Destroying Insects.—Insect depredators are a great drawback to the successful cultivation of cotton. They must be carefully watched for and destroyed. For those which feed on the foliage, spraying by hose, with a mixture of Paris green, arsenic or London purple. The last is probably best, as it more easily mixes with water. On small fields the poison may be applied by hand, mixed with damaged flour, by dusting from a suitable can. One pound of Paris green, or rather more of London purple, to a barrel (forty gallons) of water is sufficient; or, one pound of London purple to thirty pounds of flour. The poison must be pure and of known strength.

Flax and its Cultivation.

A consideration of the cultivation of flax naturally follows that of cotton, not because it is next in importance as a textile crop, for in the United States hemp holds that place; but because in seed and fiber it is germane thereto. The fiber has been used only since the introduction of machinery for making coarse tow and twine, the seed being the principal object. So much hand labor is required that the fine lint will be little used until the population of the country becomes more dense.

The Seed.—In the West, however, it is a favorite crop on new lands remote from market, since the price of the seed renders transportation over great distances practicable. In 1850 the production of flaxseed was 562,000 bushels; in 1860, 611,000; in 1870, 2,500,000, and the
Straw was estimated as equal to the production of 75,000,-
000 pounds of fiber.

The Fiber.—This in coarse bagging would cover, as baling, the whole cotton crop of the country. The textile strength of flax is rated as double that of East India jute, and yet not one-fifth of the flax crop is utilized, although there are many mills in the West for working the straw, the reason being that other lines of manufacture are more profitable. It is, however, an important product for the seed alone, the crop of 1881 being computed at 8,000,000 bushels, from 1,127,300 acres, an average yield of a fraction over seven bushels of seed per acre. Over 800,000 acres of this being in the States of Iowa, Indiana, Kansas and Illinois.

Proper Soil for Flax Seeding.

It has been said that good barley land is good flax land. This means that flax likes a deep, open, warm, moist loam. In the West, new prairie and old turf lands are much used. Recent timber clearings are desirable if suitably drained, or any good corn land, or rich silicious soil in good tith. Flax will grow well in any moist, deep, strong loam, upon upland. A light, sandy soil should be avoided, as well as very low lands or river bottoms, upon which flax is very liable to mildew. Flax should be put in after some hoed crop, to be free from weeds. A weedy soil, in any location, should not be thought of in connection with flax, even when raised for seed alone. If fiber is also an object, the time and labor will be wasted on such land.

Preparing the Soil.—On old land it is better that a pretty deep plowing be given in the autumn, and the area lightly re-plowed just before sowing. For the fiber, deep plowing is essential. To strengthen the fiber, three or four bushels each of superphosphate of lime, plaster, ashes and salt should be applied per acre. The soil must be brought into the best possible tith, the seed sown evenly,
and covered not more than half an inch deep. The usual quantity to be sown per acre, when seed alone is the object, is from one-half bushel to three pecks. One bushel per acre has given us the best results, since the ground is quickly covered and the crops ripen more evenly.

Selecting the Seed.—The quality of the seed must be looked to. It should be clean, bright and heavy. The best time to sow flax is just prior to that of corn-planting, or when the trees are beginning to green. A change of seed is necessary, since, in the West, the oily qualities rapidly deteriorate. East India seed is said to be the richest in oil, and next, that from Riga (Russian), and Rotterdam (Holland), is recommended.

Quantity of Seed to Sow.—If lint and seed both are the object, one and one-half to two bushels should be used. In Europe, where fine lint is raised, three and even four bushels are sometimes sown. In this country, however, where the principal object is seed, one and one-half bushels to the acre is the maximum. The yield will always vary with the season and the quality of the land. The maximum may be stated at twenty-five bushels, but half this quantity per acre is an average even on rich soil.

Harvesting Flax.

The time to harvest is when the lower portions of the stalk turn yellow, or when the seed-bolls show signs of shedding. Cut with a reaper that will rake off in gavels, since it is not necessary to bind it, the idea being to cure it as quickly as possible. Set the gavels up, one leaning against another, in regular rows sufficiently far apart for a wagon to pass between.

Thresh with a machine having beaters instead of teeth, since the straw is apt to tangle in the latter.

If the seed is not sold immediately, it should be spread and turned occasionally until fully dry, or it will heat.

If the straw is to be sold for tow, it should be spread,
in October, the product of about two to three acres upon one of grass land (unless very heavy), and then left until ready for the mill, say a month or longer. The water-rotting of flax for fine fiber requires much labor, pools of soft (river or pond) water, and much manipulation. There is, however, so little likelihood that the preparation of water-rotted flax will soon become an industry of importance in the United States, that the directions are not worth the space necessary for description.

Hemp and its Cultivation.

Like that of flax, the hemp industry may be said to be declining. When great navies of sailing vessels traversed the ocean, vast quantities of linen were used for sails, and of hemp for cordage. Steam has decreased the number of sails, and most of them now in use are more cheaply made from cotton, and the fibers of other plants, and iron cordage has largely taken the place of hemp. In some portions of the country, however, it is still an industry of some importance, but water-rotting of hemp is not practiced in the United States, on account of the labor required in the process. When intended for lint it is simply dew-rotted.

The Soil for Hemp.—The soil for hemp must be rich, deep, warm, loamy, and well drained — such land as will produce, with good cultivation, fifty or more bushels of corn per acre. The seed will ripen perfectly up to forty degrees of latitude, and usually up to forty-three degrees in the Mississippi valley. The cultivation of the crop for seed is practiced in some sections, and with profit.

Raising a Crop of Hemp Seed.

Land intended for seed must be in good tilth and well prepared by careful plowing. It should be laid off in straight rows, four feet apart each way, and planted in hills seven or
eight seeds to the hill; the same rules observed for cultivating corn will apply in the after-culture of hemp seed; when the plants reach the height of six or eight inches, they should be thinned to from three to four plants.

Male and Female Plants.—Hemp plants are divided into male and female, the former producing the pollen or impregnating powder, the latter bearing the seed. A very little observation will enable the grower to distinguish between them. As soon as the distinction can be made, the male should be drawn up by the root, when cheap labor can be had, leaving, however, here and there, one that the female plant may be properly impregnated; the female is to be retained until its seeds are perfected, when it is to be harvested by cutting at the ground and removal to cover; when cured, the seed may be threshed with a flail, cleaned, winnowed, and put up in barrels or sacks, perfectly dry, and out of the way of rats and mice until sold.

RAISING HEMP FOR LINT.

If lint is the object, it is necessary that the seed be raised as directed in the preceding section, for the lint crop is cut before the seed is formed. The soil must be prepared by deep and careful plowing, as directed for flax, and as carefully brought into a state of perfect tilth.

The ground must be free from weeds, or once carefully weeded by hand after the crop is up. Sow from fifty to seventy pounds of seed per acre, preferably from a broadcast seeder, or from a centrifugal seeder, to insure even distribution.

The seed should not be covered more than half an inch, and it is better, after sowing, to roll the land with a light roller. The sowing should take place at or immediately before corn-planting time. The plant, after it is up, is not affected by light frosts, but the seed itself is liable to rot in cold ground. In good weather the plants will show in a few days.
THE TIME TO HARVEST HEMP.

When lint is the object, as is always the case in thick sowings, the time for cutting is indicated in two ways: 1, the crop changes from a deep green to a paler hue; and, 2, the leaves die and drop, beginning at the bottom. Hemp is of two sexes, as before stated. The male plants bear the pollen and the female plants the seed, as in the case of spinach. That is dioecious, having staminate and pistillate flowers on distinct plants. The male plants ripen two weeks before the female.

In the United States, the pulling of the male plants before the female ripens, costs more than will pay the benefit. A good indication of the time for cutting is given by the pollen of male plants rising in clouds from the field.

Cutting.—The cutting is usually done by a heavy hook made for the purpose, but large, level fields may be cut by a reaping machine, made especially for this use. J. L. Bradford, of Kentucky, a noted hemp raiser, thus describes the process of harvesting, rotting and breaking: If the crop is to be cut with the hook, the operator is required to cut at once through a width corresponding to the length of the hemp, and as close to the ground as possible, spreading his hemp in his rear in an even and smooth swath, where it remains exposed to the sun's rays until the stalk is properly cured, and the leaves sufficiently dry to detach easily.

The hemp can be shocked with more compactness without the leaves than with them, and any operation having an influence upon the future security of the staple from dampness or atmospheric influence, is certainly important; the perfect detachment of all the leaves should, then, in nowise be omitted. No time should be lost, after the stalk is cured, in getting the crop up and into neat shocks; every additional day's exposure to sun, wind, rain or dew, is deteriorating its quality and subtracting from its quantity. The brighter the stock can be secured, the better.
ROTTING AND BREAKING FOR MARKET.

The same rule will apply to hemp that obtains in securing good hay. The operator, in taking up the hemp, uses a crook, often a rude stick cut from the branches of the nearest tree, about the length and weight of a heavy hickory walking-cane, having at the end of the stick a small branch making a hook. With this primitive but very effective tool he can rapidly draw the stalks into bunches of the proper size for sheaves. In operating, he throws his rude hook forward to its full length and suddenly draws it toward him, each motion making a bunch. This he raises quickly from the ground, and with his hook, by a few well-directed strokes, divests the plant of its leaves. He then binds his sheaf with its own stalks, and passes on to repeat the operation.

Shocking.—Other laborers follow and place the hemp into neat, close shocks of convenient size, securing the top by a neat band made of the hemp stalks themselves, after the manner of shocking corn. Here it is suffered to remain until the whole crop is thus secured as soon as possible, selecting clear, dry weather for the operation. The whole crop is to be secured by ricking or stacking. The same rules are to be observed in stacking as with grain, the object being to keep the crop secure and dry until the proper time for rotting arrives. In the latitude of Kentucky about the middle of October is the proper time. The crop must be retained in the rick or stack until the summer heats and rain have passed, and frost appears instead of dew.

Rotting.—The whole crop is then removed from the rick, and hauled back to the same ground on which it grew, there to be spread in thin swaths for rotting, where it remains without turning until properly rotted. This is indicated by the fiber freely parting from the stalk, and the dissolution by the action of the elements of the peculiar
substance that causes it to adhere thereto. This stage is only to be learned to perfection by practical experience; yet the novice must have some information to enable him to begin, and it is easily acquired by a little observation.

**Bunching.—** When the operator finds his hemp sufficiently rotted, the wooden hook is again brought into requisition for once more drawing the swaths into convenient bunches. The hemp will have lost much of its weight, and can be bunched and shocked with less labor than at first; besides, at this last shocking, the binding is to be omitted entirely, the hemp is to be carefully and neatly handled, all tangling to be avoided, and placed again in shocks, and firmly bound at the top.

**Breaking and Dressing.—** Then comes the last and crowning operation—breaking and dressing the fiber or lint for the market. The peculiar break to be used, like the knife or hook for cutting, needs no description, being manufactured in hemp regions, at a cost of about five dollars each, and from long experience has been found perfectly adapted to the uses required. The beginner would save time and money by ordering a sample break, from which any carpenter can manufacture as desired.

The crop is broken in Kentucky and Missouri, directly from the shock in the open field by the removal of the break from shock to shock as fast as broken. In the North, owing to the severity of the climate, it would probably be necessary to remove the rotted hemp to the barn, where the labor of breaking could be more certainly performed. The coldest and clearest weather is the best for this operation; in fact, excess of dampness in the atmosphere suspends this labor altogether. The breaking process is laborious, yet more depends on the skill than on the strength of the laborer.

**CONCLUSIONS ON FLAX AND HEMP.**

The rich lands of the corn zone of the West are far better adapted to the cultivation of hemp for the fibre than
more southern latitudes. If water-rotting were practiced, the fiber would undoubtedly be the best in the world. Ponds and streams are plentiful, and the high price of ordinary unskilled labor is the only thing against this process. Other crops, however, are as yet more profitable in this region, and will continue so to be until the population becomes dense enough to cheapen labor. Therefore we do not advise the raising of either flax or hemp for fine fiber. Both flax and hemp-raising for the seed are profitable, to a limited extent, up to, and even above, the fortieth degree of latitude.

**Jute and Its Cultivation.**

**Jute** is a plant known in the South for years, under experimental cultivation. It belongs to the mallow family. The fiber is in many respects superior to that of hemp. When American skill and ingenuity shall have found means to prepare the fiber cheaply for the loom, the cultivation of this plant will be a source of great wealth in the South. The time may soon come when the fibers can be cheaply separated.

Jute (*Coochrrus*) is an annual, the two species cultivated in the United States being *C. capsularis* and *C. olotrious*, the first named being the better. The plants grow from five to seven feet high, and the quantity of seed sown, broadcast, is, on rich land, prepared as for flax or hemp, from fifteen to twenty-two pounds per acre. The plants are cut about three inches above ground, one month before the seed ripens.

The best fiber is raised on deeply-drained, moist, rich land. The seed should be sown as directed for hemp: that is, evenly distributed. The produce is all the way from 2,000 to 4,000 pounds per acre. The Gulf States contain the region best adapted to the cultivation of jute,
which is thus described by a planter of Louisiana, one of the pioneers in its cultivation:

**GROWTH AND HARVESTING OF JUTE.**

The ground being well tilled and the seed properly sown, on wet days if possible, the jute is left alone like wheat. No other care than that of drainage is necessary until maturity. The cost of that first operation cannot exceed four dollars per acre, if the material is adequate and the management judicious. That expense, of course, does not include the value of the seed, because, after the first outlay, planters will provide themselves with it from the low lands, or from the weak spots of the plantation. In the bottom, when we plant in drills for seed, a subsequent plowing or two will be necessary in the intervals to neutralize the encroachments of grass. In Louisiana that labor is a necessity principally for the purpose of combating the tall weed called wild indigo, which occupies the low grounds. That weed, also fibrous, is the only plant that keeps pace in growth with jute; all other plants are distanced and smothered by the shade of the jute. In the field, planted broadcast, no parasite can resist the vigorous and absorbing influence of jute. Even the hardy and noxious plant commonly called coco in Louisiana is destroyed after two seasons of broadcast cultivation.

**Harvesting:**—The best period for cutting crops of jute is during the stage that precedes the blossoming, or, at least, the seeding. The fiber is then fine, white and strong. The monthly sowing graduates the maturing of the successive crops, which facilitates labor. April planting can be harvested in July, May planting in August, and June planting in September. Any late growth can be harvested in October, and even after, if no frost interferes. The plant stands green until frost dries it up; but even then it can furnish a good material for paper. The cutting operation is done with a mower or reaper. The
albumen of the plant makes it easier to cut than dry wheat. The reaper gathering the stems, bundles are made and carried as fast as possible to the mill, where the textile is rapidly separated.

PREPARING JUTE FIBER.

As fast as the fiber is turned out by the decorticating machine it is plunged into large vats filled with pure water, and left exposed to the heat of the atmosphere. Kept under at least one foot of water, the filament is disintegrated by the dissolution of the gums or resins which united it in a sort of ribbon. That process of fermentation or rotting takes about a week in summer. With care and attention to the proper degree of rotting, the fiber comes out almost white, lustrous, and fine like flax. The disintegration is known to be complete when the fiber assumes a pasty character.

Then the rotted hanks are withdrawn, carefully washed in clear water, and hung up to dry in the shade. Care must be taken that the filament be well covered with water during the fermenting period, because atmospheric agencies tend to communicate to it a brownish color. After a few days of good weather it is ready to be shaken and twisted for baling like other textiles. That new process of rotting the separated filament, instead of whole stalks, combines different profitable results—the advantage of economy in labor, in value, and also in integrity of product.

Experiments in South Carolina, Florida and the Gulf States have shown that, wherever in the Southern States there is a hot, damp climate, and a moist soil of sandy clay or alluvial mold, jute can be profitably raised. April plantings were cut in July, and the June plantings in September. Some of the stalks reached the height of fifteen feet, and the yield was in several cases at the rate of 3,500 pounds to the acre, yet this probably is an exception.
THE hop prevents fermentation, and adds an agreeable bitter to beer, ale and porter. To these qualities it owes its commercial value, England, Germany, Austria and the United States being the principal sources of supply. In 1840, the quantity produced in the United States was 1,238,502 pounds. In 1850, this had increased to 3,496,850 pounds, of which the State of New York alone gave 2,536,299 pounds. In 1860, 11,010,012 pounds were grown; and two years later, the crop exceeded 16,000,000 pounds.

About this time, Western farmers awoke to the profits of hop culture, and, in 1867, the crop had, in some parts of this region, reached enormous proportions. Wisconsin, which has much valley land favorable to the cultivation, produced, during the year named, 7,000,000 pounds, of which Sauk County alone gave 4,000,000, worth $2,500,000.

In 1869, the hop crop of the United States was no less than 25,456,669 pounds; and from that time the acreage steadily increased. In 1876, it was over 60,000 acres, almost equaling that of England, then the greatest hop-producing country of the globe. In 1877, the year of largest production, the yield was 110,000 bales, of which 95,000 bales were exported. The acreage of the great hop-growing countries is as follows: United States, about 70,000 acres; England, from 68,000 to 70,000 acres; Continental Europe, 76,000 acres. The year 1878 was a disastrous one to hop-raisers, insects and meteorological conditions combining to ruin much of the crop.

COST OF RAISING.

In the West, the product has often been enormous, 1,000 pounds per acre not being unusual, and the cost to
the farmer as low as six cents a pound. In the Eastern States, the cost varies from twelve to fifteen cents, while in Kent the famous hop district of England, the average cost of producing one hundred pounds is estimated at $24.30, or twenty-four and one-third cents per pound. The following figures, given by a prominent hop-grower in Sauk County, Wisconsin, in the flush time of 1876, will explain the epidemic in the West. The hop-yard contained four acres, the capital invested, including land, fixtures, poles, kilns, presses, etc., was $2,000. For 1877, his second year, his statement is as follows: Interest on capital, ten per cent., $200; cultivation, setting poles, etc., $100; harvesting, curing, etc., $943; total expenses, $1,243. Receipts for 11,520 pounds of hops, at sixty cents per pound, $6,912; net receipts for hop roots, $3,040; total receipts, $9,952; net receipts, $8,709, or 435 per cent. on original investment.

ESTABLISHING A HOP YARD.

The principal reasons for failures of the hop crop, in the West, especially, are inexperience in the preparation of the land, careless cultivation, and the neglect of prompt measures to prevent the depredations of insects. A crop of hops pays a large sum of money per acre, and much labor must be spent to get it. The hop plant is always propagated by sets, or sections of the roots, and never from the seeds unless the operator wishes some new variety.

THE PROPER SITUATION AND SOIL.

Never put the hop yard in a situation where there is not a free circulation of air, and at the same time exemption from violent winds. Avoid all cold, tenacious, poor or wet soils. Any of these will cause failure. In England the best hops are produced in the Farnham district, upon the outcrop of the upper green-sand, and on a deep diluvial loam lying in the valleys beneath; in East Kent, upon a rich, deep loam, resting upon the upper chalk and
plastic clay; in Mid Kent, upon the ragstone rock of the lower green-sand; in West Kent, chiefly upon an outcrop of the upper green-sand and gault, and in the Hill Grounds upon the upper chalk; in the Weald of Kent and Sussex, upon Hastings sand of the Wealden formation; and in the Worcester district upon the marls of the new red sandstone.

In the United States a deep, rich, sandy loam, tolerably firm, thoroughly well drained, rich in lime, the phosphates, potash and humus, is the best—soil that will produce large crops of wheat, and one that will not heave from freezing and thawing. If you have these conditions, or can make those you do not naturally have, including protection, “go ahead.” If not, “go slow.”

PREPARING FOR THE CROP.

The best English authorities have established the following rules in preparing the soil for hops, setting and cultivating, which we have adapted to American practice: Having chosen the site for a new plantation, the ground is trenched, or subsoil-plowed, and the holes dug, early in October. The plants are raised by cutting off the layers, or shoots, of the preceding year. These should have been bedded out in the preceding March or April, in ground previously trenched and well manured, which, by autumn, will have become what are termed “nursery plants,” or bedded sets; or the cuttings themselves are planted out the same year; but this plan is not recommended, although less expensive, since, in a dry spring, there is great risk of their dying.

If the nursery plants be used, it is desirable to set them early. When cuttings are used, they are planted in squares, or triangles, at equal distances, generally from six to seven feet apart. The triangular planting possesses an advantage over the square, as, when three poles to a hill are employed, it allows the hop cultivator more com-
pletely to move all the ground on the outside of the poles, which is a matter of some importance. With regard to distances, as a general rule, six feet is preferred for square planting, and six and one-half feet for triangular. For very fertile grounds the distances are further increased, sometimes to nine feet in square planting, having poles from twenty to thirty feet in length. In all these matters, however, the exercise of judgment is required.

SETTING THE PLANTS.

If nursery or bedded sets are employed, one, two or three plants may be used to form a hill, according to the strength of the plants. One is sufficient, if it be a large, strong, healthy plant, and if great pains and attention be bestowed upon the subsequent management. When cuttings are used, it is safest to plant five to each hill, which should be dibbled in around one as a center. Each cutting should have an inch of earth between it and its fellow. In the planting of new grounds attention should be paid to the introduction of a sufficient number of the male plants. One hill in two hundred, or about six on an acre, are considered ample. They ought to be planted at regular and known intervals, in order that, in subsequent years, the cuttings saved from these grounds may not become indiscriminately mixed. The introduction of these male plants is a matter of extreme importance, and ought on no account to be neglected; for it is an established and indisputable fact that the grounds which possess them are more prolific, and bring the hops of maturity earlier than those plantations which are deficient in them, and, in addition to these advantages, the hops are of a better quality.

The subsequent cultivation of a new plantation requires constant attention. The ground must always be kept quite clear of weeds, and should have a good depth of pulverized soil. In the latter part of the spring a light pole about six or seven feet high above ground should be placed to each hill, if planted with "nurseries," and about four feet high if
planted with cuttings; to these, the young vines, as they shoot out during the summer, must be tied up. At the end of May, or the beginning of June, unless the ground is new and rich, a dressing of guano and superphosphate of lime should be applied, at the rate of 300 pounds of the former and 100 pounds of the latter per acre. This should be placed in equal quantities around each hill and hoed in, taking care not to allow any of the mixture to come in contact with the plant. Another and similar manuring should be applied in July, and after this the hills should be earthed about six inches. The above quantities of fertilizers may appear extravagant, but it must be borne in mind that young hops cannot be too strong; for, unless they be very strong, they will not come into full bearing the next year. This recommendation is the result of a long and extensive experience. The cost, too, is often repaid in the same year, by the growth of 200 or 300 pounds of hops per acre. When the hops from these nursery grounds are picked, the vines must not be cut, but the hops must be gathered from the sticks, as they stand, into small baskets. The vines and poles of this young plantation should not be removed until late in autumn, or when the plants have entirely ceased growing. Whatever the age, nothing should be done except when the soil will work in a perfectly friable condition. It is especially dangerous to the crop to work the soil when wet.

In the West, where land is not so valuable as in England or the Eastern States, we advise wide planting. It gives greater ventilation and ease of horse cultivation. In England, where the climate is moist, planting is done in raised hills. In the West, if the land is well drained, level cultivation is best. Dwarf varieties should be selected, since they are richer in the constituents which make hops valuable.

In setting the plants, manure should not be put in the hill, especially new, unfermented barn-yard manure, but a
richer soil may be added on thoroughly worked old com-
post if the ground is not rich. The roots of the sets should
be spread out carefully, fine mold put around them, the
soil pressed firmly and the earth heaped over them. Each
hill should have two poles. In England the number is
determined by the kind of hop. The Farnham, Canterbury
White, and the Goldings are strong growers: and
require large poles, from fourteen to twenty feet long. The
Grape varieties are smaller and need poles not exceeding
ten to fourteen feet in length.

Care of the Hop Yard.

Lay out the ground in regular rows seven or eight feet
apart by plowing or checking perfectly straight furrows
each way. Manure should not be used in the hill when
setting the hops, but, if necessary, very rich earth may be
added. It is usual to place five cuttings in a hill. Three
plants may be allowed for the distances here given, though
two plants to stand are enough. The first year the yard
may be planted with corn, potatoes, or any similar crop,
between the vines, the hops being tied temporarily to short
poles as previously directed, and the cultivation may be
hill or flat according to the drainage or other features of
the field. In well-drained soils not too retentive, flat cul-
ture is the best. In the autumn two good shovelsful of
well-rotted compost manure over the crowns will serve to
protect the plants during winter, besides enriching the
soil and giving the plants a vigorous start in the spring.

Cultivation in Crop Years.

After the first season, the hops should occupy the
whole soil. Two poles are allowed to each hill; these
should be sharpened true and set deep enough with the bar
to prevent danger from being blown down when weighted
with hops. They are better if inclined apart at the tops.
When the hops appear above ground, two of the best should be selected for each pole, and, when they reach a height of two feet, be tied thereto with stocking-yarn, bast, prepared rushes, or other suitable material. All other vines should be cut just beneath the surface of the ground. The cultivation is simply to keep the surface of the soil clean and mellow, to destroy all weeds and supernumerary vines that may appear, to tie the vines to the pole until they twine and support themselves, and to watch for and destroy all insects that may appear.

**Picking the Hops.**

The English rule is that the hops are ripe when the seed has changed from a bright straw color to a pale brown, and emits its peculiar fragrance. Another rule is to pick when the hop becomes hard and crisp to the touch; when the extreme petal projects prominently at the tip of the hop, when the color is changed from a light silvery green to a deep primrose or yellow; and when, on opening the flower, the cuticle of the seeds is of a purple color, and the kernel, or seed itself, hard, like a nut. Even after the hop has
attained a lightish-brown color no real injury to its quality will have accrued, and, for many purposes, such hops are most esteemed in the market; but after the hops generally attain a dark-brown hue there will be a great loss, both in quality and weight. When in a proper stage of ripeness, four pounds of undried hops will make one of dry, and five pounds, scarcely ripe, are required to make one when dried. Before picking time the hop-grower should secure all necessary aid; and that aid, when promised, under no circumstances should fail, as it so often does in the harvesting of other crops. The hops are commonly picked in large boxes, containing from twenty-four to forty bushels. These boxes are divided lengthwise by a thin partition, and then subdivided into quarters. They are raised a little from the ground, and have handles at the ends.

One man and four girls are allowed to each box. Each hand deposits the hops in his or her own division of the box, and a good hand can pick twenty bushels in a day without difficulty. They are generally paid by the quantity, at so much for the box-full. It is the business of the man to supply the boxes with poles, which he raises from the ground as needed, cutting the vines about a foot high; to see that the picking is properly done, to remove the empty poles, clear them of the vines, and stack them in a systematic manner. In picking, the hops should be kept free from stems and leaves, and all blasted or immature ones should be rejected. The boxes should be emptied at least once a day; at all events, no hops should be left in the boxes over night.

The picking finished, the poles are stacked wigwam fashion and bound at the tops, or else stacked so that nothing but the lower ends will appear; they must be kept from the ground.

**Drying the Hops.**

In California and other dry, sunny climates, hops are sometimes dried in the sun, but in the end it is everywhere
cheaper to build a kiln or dry-house. This may be a simple affair, the lower room containing a stove, with as much radiating pipe as possible, and a room above with a slotted floor, upon which the hops are dried on cloths. A regular kiln, such as is used for curing malt, is better, when charcoal, coke or anthracite coal can be used for fuel. Hops being from three-fourths to four-fifths water, soon spoil if kept in bulk in a green state. Hence the kiln is worked day and night, and the hops pressed into bales, of two hundred pounds each, as soon as dry.

The Drying Kiln.—The best form of kiln for drying hops is undoubtedly one square and tight to prevent the escape of the heated air except at the ventilator in the roof. Paper orifices, regulated by sliding doors, are left near the ground to admit cool air to be warmed. The heat for ordinary farm use may be stoves, with plenty of pipe running around the heating-room. The illustration shows a dry-house twenty-two by thirty-two feet, with a kiln sixteen by sixteen feet. The stove-room is twelve by twenty-two, and two and one-half feet lower than the level of the kiln. The drying-floor should be ten feet from the ground, so that there may be no danger of scorching the hops in drying. This floor is formed of slats about one and a half inch each in width, and the same distance from each other. They are covered with a strong, coarse cloth, of open texture, so as to admit of a free transmission of the heated air from the kiln below. The drying-room should be of comfortable height for a person to work in it, and the sides should be lathed and plastered so that there may be no irregularity of the heat in the different portions of the room in high winds.

The cloth for the drying-floor should be well stretched over the slats and firmly nailed. On this floor the hops are spread to the depth of six or eight inches. The proper thickness will depend somewhat on the condition of the hops; if they are very full of moisture, they should be laid
on quite thin; but if gathered when fully ripe, and in fine weather, a depth of ten inches will be allowed.

Management in the Kiln.

The hops being spread as evenly as possible, the fires are immediately kindled in the kiln, and the temperature regulated to one uniform degree of heat. This, however, may be quite high at first, as there will be but little danger of scorching the hops if the floor is sufficiently high. If the hops are rusty, or discolored from any other cause, it is usual to burn a little sulphur under them, which will bring them to a uniform appearance. This is done as soon as the hops are well warmed through, and feel somewhat moist. Great prejudice formerly existed against the use of sulphur in drying hops, but no objection is now made by the brewers, and it is generally thought that the use of it improves the appearance of all hops, and that it also facilitates the drying. During the drying process the fires should be kept up, and there should be a free supply of fresh air below, sufficient to keep up a regular succession of heated air from the kiln, passing through the hops and out at the ventilator, carrying with it the vapor expelled from the drying hops.

Dried by Hot Air.—Mr. Morton, the well-known English authority, states the principal points in drying hops. The great object with the hop-drier, he says, is to get rid of the condensed vapor from the green hops as quickly as possible, and the dry-houses should be so constructed as to effect this object perfectly. It must be borne in mind that hops should be dried by currents of heated air passing rapidly through them, and not by radiation of heat. This is a distinction of the utmost importance, since success is entirely dependent upon a strict adherence to the former principle. In order to accomplish this effect, the space
above the hops must be kept hot, and all the lower parts of the kiln cold, whereby the greater density of the cold air will force the rarified air above, carrying with it the vapor from the hops, through the aperture or cowls upon the summit of the building. To aid this ascent of the heated air passing through the hops, a stream of heated air is sometimes thrown above the hops through a tube, thus adding greatly to the heat of the current passing through the hops, and giving it a greater ascending power.

After Drying. — When sufficiently dried the hops should be allowed to cool off a little, if time can be afforded, otherwise there will be great danger that they will break in moving, or a portion of them shell off and waste. Ten or twelve hours are required to dry a kiln of hops. Two kilns may be dried in twenty-four hours by keeping the heat up through the night. A twenty-foot kiln will thus dry four hundred bushels in a day, as they come from the vines, making about seven hundred and fifty pounds of hops when dry. Do not let the heat slacken, but rather increase it, until the hops are nearly dried, lest the moisture and sweat which the fire has raised fall back and discolor the hops. For these reasons chiefly it is that no cool air should be suffered to come into the kiln while the hops are drying. After the hops have lain about seven, eight or nine hours, having left off sweating, and leap up when beaten with a stick, then turn them with a malt shovel or scoop made for that purpose; let them remain in this situation for two or three hours more, until every hop is equally dried. They must not be turned while they sweat, for that will scorch and cause them to lose their color; the fire may be diminished a little before they are turned, and renewed again afterwards; the heat should be kept as equal as possible. It may be of service to use a thermometer, by marking upon it the degree of heat proper for drying hops, as soon as that degree is ascertained by experiment.
The Cooling-Room.—Mistakes are often exceedingly detrimental to the hops, and great attention is required by the drier, night and day, until finished. When they are thoroughly dry, which is known by the brittleness of the inner stalk (if rubbed and it breaks short), the fire should be put out and the hops taken from the kiln into the cooling-room. Here they should be spread out, not exceeding twelve inches in depth, and in a day or two will be ready to bale. Care should be taken to exclude a drying air from the cooling-room. The hops being dried, the next process is to bale them. This should not be done immediately after they are taken from the kiln, but they should be allowed to lie a few days in the store-room, till they become a little softened, otherwise their extreme brittleness will cause them to be much broken in baling, and the sample be thereby greatly injured.

We have been particular in describing all the minutæ of cultivating, curing and baling hops, for they are important. No one should undertake this industry unless he is prepared to carry out the directions to the minutest detail.

The Cultivation of Tobacco.

The tobacco crop of the United States is every year increasing in importance, and it is the belief of the writer, that in the valleys of some of the hill regions of the South will yet be found soils that will produce leaf equal to Havana tobacco. The product is sought the world over. It is one of the great money crops of the United States, and its area of production is constantly spreading wherever suitable soils are found, from Massachusetts to California, and from Wisconsin to the Gulf States. To show the value of the tobacco crop it may be mentioned that in 1869 the crop of the United States amounted to about 324,000,000 pounds against, in round numbers, 412,000,000 pounds
in 1870; 410,000,000 in 1871; 505,000,000 in 1872; 502,000,000 in 1873; 358,000,000 in 1874; 520,000,000 in 1875; 482,000,000 in 1876; and 581,500,000 in 1877. Afterwards this enormous production fell off, and in 1880 it was 446,296,889 pounds, worth $36,414,615.

It is not safe for farmers to rush into the business unless they have a soil and climate suited to the crop, and have also informed themselves thoroughly upon the best modes of cultivation and management. Proper houses for curing and packing the tobacco must also be provided. The plant will ripen wherever the Concord grape will, but it does not therefore follow that any soil that will produce the Concord grape will produce good tobacco. There is no plant that is more susceptible to influences of soil and situation than tobacco.

SOILS AND SITUATIONS FOR TOBACCO.

Tobacco requires a deep, rich, thoroughly drained, friable soil, strong in potash and nitre. A rich humus loam is usually rich in these constituents, if it be produced from a granite soil. Sandy loams are preferable, but whatever the soil, the situation must be protected from sudden changes of temperature, and especially from blowing winds, which would bruise the delicate leaves by whipping them about. Hence, protected valleys are always sought.

If the soil is not naturally rich in potash, nitrogen and the phosphates, it must be made so. Valley lands, protected from high winds, are excellent, and if manure can be had cheap, rather light sandy lands, if not too dry, will make good crops. However good the land, manure will help it, since it costs little if any more to take care of an acre of good land, producing up to 2,000 pounds per acre, than one producing 800 to 1,000 pounds, and the large,
choice leaves of uniform quality will sell for much more per pound, than the light, thin leaves. In fact, the measure of success in tobacco culture lies in the difference between six or seven cents per pound, and twenty-five or thirty cents per pound. The first will lose money; the latter will make money fast. No acre should produce less than 1,500 pounds, if the crop is going to pay. Not even then will the farmer make money if he raises five and six cent tobacco.

**THE TRUE TOBACCO BELT.**

The belt of country in which the best tobacco is grown in the United States lies between thirty-six and forty degrees, though much of the best cigar tobacco is grown in the West, well north, in Wisconsin, about the latitude of forty-three degrees. The best manufacturing tobacco, club and chewing, is raised in Kentucky and Missouri. Virginia and North Carolina raise fine tobacco for smoking in pipes, and some of the Florida soils are celebrated for a cigar tobacco second only to that of Cuba.

The principal producing States are Virginia, Kentucky, Tennessee, Missouri and Ohio. Kentucky produces by far the largest quantity. In the Centennial Exposition twenty-one States were represented, which, besides the hung-leaf, exhibited ninety specimens of pressed leaf, the best sample being from Virginia. In cigar tobaccos, Connecticut produces the best, and Wisconsin the next best tobacco, if we except Florida, which produces comparatively a small quantity, but of a high grade for cigar wrappers and fillers.

What the country west of Arkansas and Missouri may do in the cultivation of tobacco (excepting California, which
produces an excellent article), is yet to be learned. It is thought that Arizona contains lands that will produce leaf of the best quality.

RAISING THE CROP SOUTH.

The principles of tobacco raising are, of course, the same everywhere. Proper attention to the condition of the soil, judicious selection of plants, careful setting, thorough cultivation, effective precautions against the cut-worm in the spring, careful worming during the season of the tobacco worm, topping in season, removing suckers and pruning (removing the leaves next to the ground) are all necessary. How this is done is well told by a Southern tobacco planter of large experience. He says:

Plenty of Plants.—Select good land for the crop; plow and subsoil, if in autumn, to get all the benefits of winter's freezes. This cannot be too strongly urged. Have early and vigorous plants, and plenty of them. It were better to have one hundred thousand too many than ten thousand too few. To make sure of them, give personal attention to the selection and preparation of the plant-bed, and to the care of the young plants in the means necessary to hasten their growth, and to protect them from the dreaded fly.

Manure Liberally.—Collect manure in season and out of season, and from every available source—from the fence
corners, the ditch-bank, the urinal, the ash-pile. Distribute it liberally. Plow it under (both the home-made and the commercial) in February, about four inches deep, that it may become thoroughly incorporated in the soil, and be ready to answer to the first and every call of the growing plant. Often (we believe, generally,) the greatest part of manure applied to tobacco—and this is true of the bought fertilizer as well as that made on the farm—is lost to that crop from being applied too late. Don't wait to apply your dearly-purchased guano in the hill or the drill from fear that, if applied sooner, it will vanish into thin air before the plant needs it. This is an exploded fallacy. Experience, our best teacher, has demonstrated that stable and commercial manures are most effective when used in conjunction. In no other way can they be so intimately intermixed as by plowing them under—the one broadcasted on the other—at an early period of the preparation of the tobacco lot.

*Spring Cultivation.*—Early in May (in the main tobacco belt, between the thirty-fifth and fortieth parallels of north latitude), re-plow the soil to about the depth of the February plowing, and drag and cross-drag, and, if need be, drag it again, until the land is brought to the finest possible tilth. Thus you augment many fold the probabilities of a stand on the first planting, and lessen materially the subsequent labor of cultivation. Plant on lists (narrow beds made by throwing four furrows together with the moldboard plow) rather than in hills, if for no other reason than that having now, if never before, to pay wages in some shape to labor, whenever and wherever possible horse-power should be substituted for man-power—the plow for the hoe. Plant as early as possible after a continuance of pleasant spring weather is assured. Seek to have a forward crop, as the benefits claimed for a late one from the fall dews do not compensate for the many advantages resulting from early maturity. Make it an inflexible rule to plant no tobacco after the tenth of July, in the tobacco
belt we have named. Where one good crop is made from later planting, ninety-nine prove utter failures.

TRANSPLANTING, CULTIVATING AND WORMING.

Take pains in transplanting, that little or no re-planting shall be necessary. The cut-worm being a prime cause of most of the trouble in securing a stand, hunt it assiduously, and particularly in the early morning, when it can most readily be found. Keep the grass and weeds down, and the soil loose and mellow by frequent stirring, avoiding as much as possible cutting and tearing the roots of the plant in all stages of its growth, and more especially after topping.

There are few cultivated plants more beautiful when in blossom than the tobacco plant. When at all practicable—

and, with the great improvements in cultivators, sweeps and other farm implements, it is oftener practicable than generally supposed—substitute for hand-work in cultivation that of the horse. The difference in cost will tell in the balance-sheet at the close of the operation.

Worming.—Attend closely to worming, for on it hinges in no little degree the quality and quantity of tobacco you have for sale. A worm-eaten crop brings little money. So important is this operation that it may properly claim more than a passing notice. Not only is it the most tedious, the most unremitting, and the most expensive operation connected with the production of tobacco, but the necessity for it determines more than all other causes the limit of the crop, which in general it has been found possible for a
single hand to manage. Therefore, bring to your aid every possible adjunct in diminishing the number of worms.

**Killing the Moth.**—Use poison for killing the moth in the manner so frequently described in treatises on tobacco, to wit: by injecting a solution of cobalt or other deadly drug into the flower of the Jamestown or jimson weed (*Datura stramonium*), if necessary planting seeds of the weed for the purpose. Employ at night the flames of lamps, of torches, or of huge bonfires, in which the moth may find a quick and certain death. In worming, spare those worms found covered with a white film or net-like substance, this being the cocoon producing the ichneumon fly, an enemy to the worm likely to prove a valuable ally to the planter in his war of extermination. Turn your flock of turkeys into the tobacco field, that they, too, may prey upon the pest, and themselves grow fat in so doing. If these remedies should fail, sprinkle diluted spirits of turpentine over the plant through the nose of a watering-pot, a herculean task truly in a large crop, but mere child's play to the hand-picking process, for the one sprinkling suffices to keep off the worms for all time, whereas hand-picking is a continual round of expensive labor from the appearance of the first worm until the last plant has been harvested.

**Turkeys.**—The writer's experience in raising tobacco in the North is that hand-picking is the only sure means of killing the worms. It costs money and time, but the difference in the leaf and the crop, in price, is what ensures profit. Turkeys are indefatigable hunters of the tobacco worm, and they will kill them after their hunger is satisfied.

**Topping.**—The topping of the plants must be attended to in season, just at the time the buds appear. From eight to twelve leaves should be left to each plant, according to
the richness of the soil. This will give strong growth, but the grower must exercise his judgment here. It is better to have a few strong leaves than more weak ones.

**THE SEED-BED.**

Growing the plants is one of the most important things in tobacco culture. Without good, healthy plants, failure is pretty certain. In the South a warm, sheltered situation of well-drained land is selected. This should be carefully dug over in the autumn or winter when dry, and so covered with brush that the soil may be burned deep enough to kill the weeds lying near the surface. The beds may be burned over in February, March or April, according to the locality, and immediately sown, since the seed will not sprout until the earth has the proper temperature.

**Sowing.**—After burning, hoe and rake the surface thoroughly, to a depth of two or three inches, and leave the surface fine and smooth. Mix the seed with dry ashes, at the rate of a large tablespoonful for each eighty square yards, and sow evenly, rake lightly, or better, tamp the whole carefully over with the rake, the handle being held upright. Cover carefully with brush, but not so as to exclude the sun. As soon as the plants require weeding, remove the brush carefully, at the same time thinning the plants where they stand too thick. In this way you will get fine, well-rooted plants for setting.

**RAISING PLANTS NORTH.**

In the North, raising plants is more difficult. The season is so short that the crop is often late in ripening. If the plants are placed in too warm a border they are apt to become chilled or killed by frost, and are seldom large enough for setting by the first to the tenth of June. We have always had the best success by raising the plants in a cold frame—a compartment of boards sixteen inches high at the back, sloping to ten inches in front, covered with sashes, and containing four or five inches of fine compost soil.
Caring for the Plants.—The seed may be sown in this bed about the first of April, and are easily cared for, readily protected against the fly, by dusting with soot or fumigating with smoke. They are also thoroughly protected against frost at night, or too much wet, and are easily watered when necessary. If given plenty of ventilation to keep them growing slowly and healthily, and if exposed to the full influence of the air during the day, for two or three weeks before setting, they make stronger and better rooted plants than any grown out of door.

Transplanting.—Transplanting in the North should not be undertaken until cucumbers and melons will germinate and grow promptly, or until both days and nights are warm. In untoward seasons plants are set until about the first of July. From the first to the fifteenth of June is the proper time in Wisconsin, and a little earlier in Northern Illinois; about the first of June is the best time in the New England States. Of seed-leaf tobacco from five thousand to six thousand plants are set per acre, and of Havana six thousand to seven thousand, according to the size of plants your seed will produce.

PREPARING THE LAND.

In the North, the ground for tobacco should always be deeply fall-plowed, turning under a liberal quantity of barn-yard manure. If the land has not been previously manured, twenty loads of fine manure should also be carted and spread in winter to ensure richness near the surface. About ten days before planting-time this should be turned under about four inches deep and the surface brought to an uniformly fine tilth.

Marking the Land.—Mark the land in straight lines three feet apart, and with a single horse-hoe or double mold-board plow run through these marks, thus bedding up the land. Run a harrow over the ridges lengthwise and then a plank to bring all fine and smooth. You will
then have a succession of flat, slightly raised beds upon which to plant.

If you mark these beds crosswise, three feet apart, you will get 4,840 plants per acre. This is space enough for the largest Connecticut or Maryland tobacco. If you mark your squares two feet you will have 7,200 plants per acre, and this is close enough for the smallest Havana plants. Thus you may graduate your distances to accommodate plants of any size that one season’s cultivation will show, according to the richness of the soil or variety of tobacco cultivated. It should always be remembered that the closer

you grow your plants, according to soil, the better the crop as a rule.

Smaller Squares.—Or if you choose to make your beds three and a half feet apart, then by marking across the beds thirty inches apart you will get 4,076 plants per acre. Marked two feet apart there will be 6,223 plants; if twenty inches apart in the row, 7,467 plants per acre.

PLANTING AT THE NORTH.

Directions for planting, general cultivation, care, harvesting, drying, stripping and packing tobacco will apply to all parts of the country, allowances being made for differ-
ences in latitude and other conditions. Many tobacco growers pull the plants when the leaves are the size of one's thumb-nail, and simply press them into the ground when it is wet. This is never done, North or South, by the best cultivators. We give the best plan, and in the end it is the cheapest, because it is the best. Never wait for rain in transplanting anything, provided the ground is in a fairly moist condition; that is, friably moist, or not really dry. Water the plants thoroughly in the bed, and as soon thereafter as the soil can be worked, take out enough plants for the day's planting, beginning at about three o'clock in the afternoon, or if the weather is cloudy, work all day. Plant as late at night as you can see. Havana seed plants have long roots like cabbage, and are not so easy to set as Connecticut seed-leaf, which has fibrous roots. Hence it is better to prick them out.

**PROPER WAY TO TRANSPLANT TOBACCO.**

When the plants have leaves about the size of a silver dollar, let a careful hand take them up and bring them to the field as wanted, arranging them in baskets on wet moss, so they can be easily handled and covered with a fold of damp cloth. The ground being properly marked, the planter takes a plant, makes a hole for it with one or two fingers, inserts the roots, pressing the earth firmly around it, but leaving a depression to hold a little water. This assistant supplies from a watering can with a spout. If the earth is in good condition, a gill is enough for each plant; if the soil is pretty dry more water must be given, and always in the depression which is left about the roots.

Thus the hands, as many as are necessary, go on working with a deftness that is learned only by practice, and covering a large area of ground in a day. When the water has dried down, other hands, girls preferably, smooth the soil nicely to the plants, covering the watered surface with fine dry mold.

The plants should be set as shown in the annexed cut;
they will seldom suffer for want of moisture, and in ordinary weather will grow right along. It is the cheapest way in the end, and by no means slow, for an active hand will set 5,000 plants in a day. And when the work is thus done, in the best possible manner, there will be no baking or drying of the soil about the roots. This is true of plants of every kind and should be remembered. In setting on these raised beds, the tobacco plants should be rather below the level of the surface, for as soon as the crop is fairly growing, a little earth should be dressed up to them.

**THE CULTIVATION.**

All other cultivation should be the same as that for corn or other hoed crops, thorough and frequent. No weeds dare be allowed at any time. In an average season the plant will mature sufficiently by the early part of August to dispense with further cultivation, but until the ground is fairly shaded, the cultivation must be thorough. When the plants have from fourteen to sixteen leaves, or when they begin to throw up the blossom shoots, pinch off the tops, and from time to time, as the suckers appear, pinch them out before they attain a length of three inches. If the suckers are allowed to remain, they will reduce the growth of the true leaves.

The necessity of watching for, and killing cut worms, after the plants are set, and destroying the horn (tobacco) worms as fast as they appear, has already been pointed out. These must be attended to or the crops will be seriously damaged and may be ruined. No man should undertake to cultivate tobacco, or any other special crop, unless he is prepared to spend the time and money necessary to do everything in the best manner, since, upon this depends the ultimate profits. In the North, the worm, larva of the tobacco sphinx, and also that of the tomato worm, an allied species, appear about July 1st, and feed on the leaf until the crop is secured. In fact, they frequently, if not picked
off clean, cling to the leaves after the stalk is hung up. Usually, from three to four weeks from the time of topping the plant will mature and be ready to cut.

Uniform size of leaves, and a stiffness of the leaf, making it liable to break by bending and handling, are the surest signs of maturity. The lower leaves change color, and in some varieties the leaves present a spotted or mottled appearance. This must be carefully studied, and

![Tobacco Plant in Blossom](image)

the beginner would do well to employ a man competent to judge, and who is also familiar with handling, hanging; drying, stripping, bulking and packing the crop. Otherwise, the beginner should experiment in a small way until he learns. Nowadays, however, the crop is usually sold in bulk, in the North, the buyer attending to the casing and shipping himself.

**Cutting and Curing Tobacco.**

The time to cut must be determined by the condition of the crop. Sometimes it ripens unevenly. In this case, the
portion that is ripe must be selected first. If the crop ripens up handsomely, it is better to cut altogether, since the inferior plants left are apt to be whipped and injured by the wind. The stalk is severed with a heavy knife (similar to a corn stalk knife) just above the ground, and at a single blow. Each stalk is laid on the ground to wilt, but it must not be long exposed to the sun, especially if it is hot; nor must it be cut with the dew on.

Cut after the dew is off, but not during the middle of the day, when the sun is bright, as you must guard against burning while it is undergoing the wilting process, preparatory to spearing and handling in the removal to the shed. When wilted, so the plants may be handled without breaking the leaves, they are speared, spiked, or strung by the butts upon laths four feet long. Four or five plants are strung to each lath, and hung on proper frames, on a wagon or sled, for removal to the house. Some persons hang in temporary sheds in the field or near the house, for partial curing, but it is not a good plan. The house should be large enough for the whole crop. It should have ventilators at the top to pass out the foul air, and ventilators at the bottom to admit fresh air in windy weather.

THE TOBACCO HOUSE.

The tobacco house may be arranged for four or five tiers of stalks. It should rarely or never be higher. The illustration shows the general arrangement—beams for hanging the tobacco, lath doors or shutters for ventilation, etc. The ventilation is important. In damp weather the house must be closed. In windy weather the leaves must not be blown about. If the dry heat of charcoal, coke, etc., is used for drying, it should be conveyed in pipes running
at proper intervals through the house and not within eight feet of the leaves. Care must also be used in curing, according to whether the demand is for light or dark tobacco.

Stripping.—In December, and from that time on, when the weather is moist enough so the tobacco will be pliable, or "in case" for handling, stripping may commence. The tobacco should be assorted into three qualities, first, second and third, corresponding to best, second-best and inferior, and all leaves in a "hand" should be of uniform length. This assorting must be by competent hands. One man may take the best, passing the stalk to another, he selects the seconds, and another the inferior. These tied in bundles of twelve to sixteen leaves, and bound at the butts by a single leaf, constitute a "hand" of tobacco, as shown in the cut. Twelve leaves make a "hand" of the best wrappers; from fourteen to sixteen are often put into "hands" of seconds and thirds.

Bulking.—This is a nice job, and requires the utmost care and watchfulness to bring the tobacco into the proper condition. If too damp, it will get hot, if too dry it will not warm up sufficiently to bring out the fragrance and color of prime condition. It will pay to hire a competent man until the owner is familiar with the process. The object is to have the tobacco dry out slowly, and to remain in proper condition until ready for packing in cases in the North, or in hogsheads in the South. These boxes, or cases, contain four hundred pounds, while the hogsheads contain one thousand pounds each. The bulking is done between the sides of a frame as high as the bulk is to be carried, and wide enough to allow the leaf-tips to lap, one on the other with the butts at the sides. A bulk three and a half feet high, and twenty feet long, should hold four thousand pounds. Bulk each sort by itself. In bulking, take the "hands" one at a time, laying them straight, over-
lapping the tops one-third on the other, keeping the whole even, and pressing with the knees as you proceed, until the task is finished. Then remove the side-pieces, and cover all with blankets, weighting them down with boards if necessary.

The bulks may remain until sold to the packer, watching it carefully to see that it does not heat unduly. If the fermentation is too strong, the tobacco will blacken; if too little, the flavor will not develop. To get the right effect requires the greatest care and judgment.

**TWELVE RULES FOR TOBACCO GROWERS.**

1. The land must be rich and in good condition generally; potash and nitrogen are essential to the crop, as well as friability and permeability of the soil.

2. The seeding in the seed-bed must be thick and even; to be afterwards thinned, to enable the plants to grow stocky and strong for transplanting. It is well to allow an ounce of seed for every two acres of tobacco, to allow for destruction by the fly and other insect enemies.

3. Do not transplant until the weather is permanently warm—the nights as well as the days. If once the plants are chilled the crop is injured.

4. After planting out watch carefully for cut-worms, at daylight in the morning, and wherever a leaf is attacked find every worm before you quit.

5. Transplant promptly from a reserve bed of extra plants whenever you find a plant missing.

6. Cultivate thoroughly, always being careful not to break or injure the leaves. Careless workers will destroy more than the value of extra wages paid to careful men.

7. Watch for the appearance of the tobacco moth, which lays the eggs. It is well to have a plat of Jinson weed near, or of tobacco plants in flowers, to attract the moths. The flowers may be poisoned with a solution of cobalt, such as is used for killing flies.

8. When the worms—larvæ of the tobacco moth, hatched
from the eggs laid on the tobacco leaves — appear, go over
the field twice a day, carefully, to kill them. Also hunt for
the patches of eggs on the leaves and destroy them.

9. Top the field to twelve or fifteen leaves, as soon as
the buttons — flower-buds — have generally appeared, and
pinch out suckers before they grow three inches in length.
Take off all lower leaves that sweep the ground.

10. Cut the crop when ripe, preferably with a sharp saw,
and never allow plants to wilt when the sun is hot. Handle
very carefully, to prevent injury in carrying to the house
and in hanging.

11. Watch the ventilation in the house. The leaves
must not hang near enough for one stock of leaves to touch
another. The wind must not blow them about and the
vapors must be promptly carried away through ventilators
at the top of the house.

12. In stripping, keep each grade by itself. Bulk care-
fully, and watch daily to see that it does not overheat.

Cultivation of Peanuts.

The cultivation is simple, and yet peculiar. The
blossoms, when fertilized, hang down, grow into the ground
and pierce it until the firm soil is reached, where the pods
form and ripen. Hence, the necessity of shallow cultiva-
tion. The soil should be plowed in autumn, and in the
spring only surface-plowed, not more than three or four
inches, to kill weeds.

When all danger of frost is over, the soil is bedded up
and prepared, as for tobacco, leaving only a slight furrow-
mark between the rows. In the center of each of these
beds, in a straight line, plant two seeds, at distances of
eighteen inches; also have reserve plants, to fill the places
of those that may be destroyed by cut-worms, etc.

The cultivation is simply to keep down the weeds, pre-
serving the shape of the beds until near the time of blossoming.

A narrow cultivator is then run through the rows, followed by a horse team to earth up the plants. The earth is afterwards leveled to present a flat hill, in which the nuts are to form. If weeds or grass thereafter appear, they must be pulled up by hand. The illustration shows the vine, the root, and the nuts formed under the surface.

GATHERING THE NUTS.

The crop is not harvested until the vines are touched by frost, for the longer the vines grow the greater the number of sound pods, except in the extreme South, where the vines ripen fully. Hands follow the rows and loosen the nuts with pronged hoes or flat-tined forks. They are followed by others, who pull the vines, shake the earth from them and leave them turned to the sun to dry. In dry weather they will thus be sufficiently cured for shocking. The shocking is done somewhat after the manner employed for beans; or they may be finally cured, as beans sometimes are, on scaffolds under sheds.

Shocking.—The Tennessee plan is to provide stakes, seven feet long, made sharp at both ends; then lay two fence rails on the ground as a foundation, but with supports underneath to afford free access to the air. The stakes are stuck in the ground at convenient intervals between the rails, the stacks built up around them, and finished off by a cap of straw to shed the rain. The diameter of the stack is made to conform to
the spread of a single vine. After remaining about two weeks in the stack, the picking should begin, taking off none but the matured pods. These are to be carried to the barn, and prepared for market by finishing the drying process, and then fanning and cleaning. The most tedious part of the work is picking. An expert discriminates at a glance between the mature and immature pods, but cannot pick more than two and a half or three bushels per day.

After-management and care of seed.

Unless the management in the barn is carefully conducted, there is great danger, where there is much of a bulk, that the peas will become heated and moldy. The condition in which the early deliveries are often made on the market renders this caution necessary. In fact, there is as much slovenliness in the handling of this crop as there is in regard to any other, perhaps more; for the reason that so many inexperienced persons engage in the culture every year. Until the pods are thoroughly seasoned, the bulk should be frequently stirred and turned over. A certain classification, in respect to quality, obtains in peanuts as in every other article of agricultural produce. The descriptive terms in general use are inferior, ordinary, prime and fancy; but these are not so definite as to admit of no intermediate grades.

Seed Peanuts.—A matter of primary importance is to provide seeds of good quality for planting; and in order to be assured of their excellence the planter should either raise them himself or buy them of a person on whose fidelity he can rely. If, after the vines are dug and they are lying in the field, they should be exposed to frosty weather, the germinating principle would be destroyed or impaired. As a merchantable article, however, their value is not affected. Neither should the nuts become the least heated or moldy; nor should they be picked off the vines while wet, or before they are thoroughly cured. It is obvious,
therefore, that the most careful attention is requisite in this matter. Previous to planting, the pods should be carefully shelled, and every faulty bean thrown out; not even the membrane inclosing the seed should be ruptured. It takes about two bushels of peanuts in the pod to plant an acre.

**Sweet Potatoes.**

The sweet potato is another special crop that year by year becomes more important, especially since cheap railway facilities admit transportation for long distances, and improved methods enable the farmer to preserve them in good condition through the winter, and until late in the spring. There is now only about two months in the year when they may not be readily bought in the Northern markets.

Sandy soil, or a rather firm, sandy loam is the best for this crop. In soft land, especially if plowed deep, the tubers grow long and stringy. The potatoes are never planted directly in the hill, but are grown from “slips”—sprouts three to five inches long—obtained by bedding the potatoes in a hot-bed, covered with boards, to shed rain, and protect them from being chilled at night. As the sweet potato is killed by the slightest frost, the plants should never be set out in the field until the days and nights are warm. Planted from the first to the middle of June, good crops are raised up to, and even north of, forty-two degrees in favorable situations.

A central Ohio farmer gives, in a nut-shell, all that is necessary for field cultivation. For the garden it is cheaper to buy the plants than to raise them, two hundred plants being enough for a family of moderate size. Our authority, a thorough practical farmer, says:

**FIELD CULTURE OF SWEET POTATOES.**

"My plan is to place logs on a sloping piece of ground, say ten or twelve feet apart. I then drive small stakes, or
pegs, in rows three feet apart, and eight inches high. The object is to have not more than seven or eight inches depth of manure, which should be fresh horse-dung, a mixture of hay, straw, corn-fodder, etc., trampled down level with the tops of the pegs. I then put a coat of loam, three inches deep, upon the top of the manure, which answers for the dressing the subsequent year. I then place my tubers on, cover them from two to three inches deep, and then lay on boards, so as to keep them effectually covered from rain or cold until the plants are up.

**Drawing the Plants.**—During the day I let them have the sun, until I am sure they cannot be injured by frost. I sometimes water them, but not before the heat has somewhat subsided from the bed, which I ascertain by putting my forefinger through the covering. A very little warmth from beneath is sufficient; there is more to be apprehended from too much heat than too little. Some place a covering of sawdust on top of the bed; but this is entirely unnecessary. In this latitude, the beds should be made as early as the tenth or twentieth of April. The plants will be ready for drawing from the eighth to the twentieth of May.

**Preparing the Ground.**—I select ground, for growing the tubers, that will produce good corn. To manure just before planting will cause the plants to run to vines. Good loam, with or without sand, such as we call "second year's land," lying to the sun, yields best. It need not necessarily be sandy to produce the greatest yield; on the contrary, good loamy land produces tubers of the best flavor. I plow the ground well, when dry, and harrow thoroughly. It would even be better to cross-plow it. Then I throw two "moles" together, about four feet apart, and see that the ground is well pulverized, in order that the list may be clear from clods, sods and trash, and that the land is in the best order to receive the plants. The time for transplanting is when the ground is what we call "dry."
Planting.—The mode of planting is to make a hole with the hand, or otherwise, of the proper depth to receive the young plant; and, when it is placed in the hole, I pour in half a gill of water, so that the earth may settle around the fibrous roots; then I draw the dry earth around the plant, and compress it a little with a hoe. In less than twenty-fours the plant will be as vigorous as though it had never been removed. On good land, the distance of the plants apart should be from eighteen to twenty inches; for thin land, fifteen inches will be sufficient. The yield, in this section, is from 100 to 150 bushels to the acre. I should state that the plants require to be hoed about as much as corn. The vines should be thrown on the ridges, out of the way, while dressing. In digging, I use a large, long, flat, three-tined fork to throw the tubers out of the ground. When dug, I spread them to dry and wilt somewhat, preparatory to putting them up for winter, which requires much care.

KEEPING SWEET POTATOES IN WINTER.

Sweet potatoes are easily kept through the winter in a room where the temperature is about fifty degrees. A temperature materially lower than this will make them "frost-bitten," and if the room is much warmer than fifty degrees, it will sprout them. Sweet potato houses are built secure from frost, heated to the proper temperature, and the potatoes are kept in bins one over another, each containing about a barrel.

Any room of the temperature stated will keep them, if the potatoes have been handled without bruising. They may be packed either in barrels or boxes, and kiln-dried or thoroughly sun-dried sand poured over them to fill the interstices, or boxes of uniform size, separated one from the other by an inch space, may be piled one above the other. In this way the potatoes will keep sound until spring.
GARDEN CULTIVATION OF SWEET POTATOES.

Where a few plants are raised for family use in the autumn and early winter, the earth may be thrown up either into pretty high ridges or hills, and the plants set as directed, at any time after the season becomes permanently warm. Watch for cut-worms, keep the soil clean, prevent the vines rooting from the joints, by occasionally lifting with the handle of a rake, and in the autumn you will have fresh potatoes that will come in well for family use. Every farmer should plant from 200 to 500 vines.

Sugar and Its Manufacture.

Since sugar has come to be thought one of the necessities of life, various plants containing saccharine sap have been utilized for the manufacture of syrup, or sugar, or both. Sugar-cane and the sugar beet have been the most important of these, the maple-tree standing next, until within the last few years, during which time improved processes of separating tree sugar from the glucose of sorghum have come into use.

From the author's earlier experiments, forty years ago, in concentrating the juices of the corn-stalk, and of watermelons, we were convinced that these plants would never afford merchantable sweets. Not so after experimenting with sorghum, in 1856. The saccharine material was there; the question remained, how to separate it cheaply. This has now been so answered by the chemist as to make it seem probable that within a very few years the West will be able to produce sugar from sorghum as satisfactorily as Europe has done from the sugar beet. How important this is will be understood when we mention, that, notwithstanding the gradual increase of the sugar production in the very narrow Gulf belt of the United States, which itself is only partially adapted to the production of cane sugar, this country grows only one-seventh of the sugar it uses.

History of Beet Sugar in the United States.

There have been, in all, seven large beet-sugar factories started in the United States during the last twenty years. Two in Illinois, two in Wisconsin, one in Maine and two in California. True success has been reached by one, and all but one have suspended. The manufacture of beet
sugar requires an abundance of living water, intricate machinery, large capital, cheap labor in the production and working of the crop, and men of exact and scientific knowledge in the management of the factory. The same enterprise and money employed in the production of sorghum will produce double the results. The time may come when the production of beet sugar may be profitable in the United States; yet with the cheaper labor of Europe, the industry does not flourish there as in former years.

THE THREE SUGARS COMPARED.

A great want of clearness rests in the public mind as to grape and fruit sugars, arising from the carelessness with which scientific men use the terms, employing the words "grape sugar" or "un-crystallizable sugar" either to pure grape sugar, to pure fruit sugar, or to a mixture of the two. The mixture of grape and fruit sugars arising from the action of acids, ferment, or water upon cane sugar is called "inverted" sugar, "grape"
sugar and "uncrystallizable" sugar; being thus named differently by different persons. "Inverted sugar" is the proper name, which is derived from the change of action upon polarized light from right to left.

The practical results of our present chemical knowledge of the sugars may be briefly stated, as follows: Grape sugar is practically uncrystallizable in the manufacture of cane sugar, as it remains in the molasses; it is also much less sweet than cane sugar. Fruit sugar is as sweet as cane sugar, but does not crystalize. Cane sugar may be transformed into inverted sugar (which is a mixture of grape and fruit sugars) by means of acids, long boiling with water, and fermentation, etc.; but neither of these last sugars can be changed again into cane sugar by any process known in chemistry. For practical purposes the difference of composition of the three sugars, as shown by their organic analyses, need not be discussed here. It is, however, important to note that they form compounds with salts, and that these combinations with the salts naturally in the vegetable juices associated with the sugars do not crystalize. In the compound of cane sugar with lime the cane sugar is not destroyed or "inverted" by boiling, but grape or fruit sugar in combination with lime are rapidly destroyed by boiling.

Cultivation of Sugar Cane.

It is not likely that the cultivation of the true sugar-cane can ever become a great industry in the United States. The small yield, even in the best sections of Louisiana, which gives but from 1,200 to 1,800 pounds of sugar to the acre, as against 3,000 to 5,000 pounds in the Mauritius, and occasionally even up to 7,000 pounds per acre in Cuba, is against it. That would suffice, to say nothing of the malaria of the sugar plantations; the larger cost of culti-
vation; higher price of labor, compared with tropical climates where peon or slave labor is used.

Of late years, attempts have been made to introduce the plan of delivering the cane direct to central factories for working. What this may accomplish in time remains to be seen. The system has worked well in the French West Indies, and large profits have been made.

CULTIVATION OF SORGHUM.

The cultivation of sorghum, from the first preparation of the soil until the cane is ripe, is identical with that of Indian corn, with these exceptions: The soil should be reduced to a finer tilth than is generally made for corn; the cane being delicate in growth, more care must be used in cultivation when it first comes up; and the crop will be undoubtedly better for one thorough hoeing of the plants.

If planted in check-rows, three and a half feet by three would be about right, four or five plants to remain in the hill. If drilled, which is much the best plan, the plants may stand eight or ten inches apart. When the seed is to be planted by hand, the seed should always be soaked until the germ is ready to appear. A pocket-full of kiln-dried corn-meal, in which the hand may be dipped occasionally, will help to prevent the seed from clinging.

If the land is inclined to be wet after rains, the soil should be listed up for planting on; if well-drained, use level planting. The seed should not be covered more than an inch, and in the case of sprouted seed, half an inch is better. Never plant on trashy land. It should be as clean
as a garden. When this is the case, you may drill the seed, and plenty of it, always pressing the soil pretty firmly to the seed. When the land is thoroughly dried, you may put a sharp-toothed harrow on the land, crossing the drills at right angles to thin the plants. Lumpy soil should never be planted with sorghum. Lumps, as a rule, result from plowing the land when too wet.

The cultivator must decide for himself distance to plant, whether in hills or drills. For sorghum, good barn-yard manure, some phosphate (never nitrogenous manure), and gypsum should be used.

WHEN TO CUT SORGHUM CANE.

It is fully established now that the cane must not be cut until the seed is about ripe, or fully developed and hard. According to a late report to the Commission of Agriculture, taken from the results of 2,739 analyses of sorghum, the percentage of juice extracted from the stripped stalks gradually increases up to a certain point of ripeness, and then gradually decreases to the close of the season.

THE REAL TEST OF VALUE.

After all, the real test of value for any cane is the amount of crystallized sugar that can be actually separated
from the juice obtained from the stalks grown on an acre. This amount will depend very greatly on the quantity and quality of the canes, and upon the promptness and care with which they are worked up after cutting. The figures here given in explanation of the various points which have
been discussed have been derived from very carefully conducted work, and they are offered as fair statements of what can and should be attained by careful workers.

Among the essential points worthy of repetition are the following:

1. Select a cane that matures quickly, and has as long a working period as possible.

2. Do not work the cane too early; the seed should be well matured and quite hard, and the juice should have a specific gravity of 1.066, or higher.

3. After cutting the canes, work them up without great delay. It is best to draw directly from the field to the mill as may be needed.

Making Sugar on the Farm.

There are a number of patent methods now-a-days, all more or less valuable in large works. Fair brown sugar, and especially syrup, may be made on the farm, on any of the better class of evaporators. After the cane is gathered, stripped and crushed as heretofore directed, proceed as below, which is the course recommended by Dr. Jackson, of Boston, Mass:

Filtering and Liming.—In the first place, it is necessary to filter the juice, as it comes from the mill, in order to remove the cellulose and fibrous matters and the starch, all of which are present in it when expressed. A bag filter, or one made of a blanket, will answer this purpose. Next, we have to add a sufficiency of milk of lime (that is, lime slacked and mixed with water) to the juice, to render it slightly alkaline, as shown by its changing tumeric paper to a brown color, or reddened litmus paper to a blue. A small excess of lime is not injurious.

Boiling.—After this, the juice should be boiled, say for fifteen minutes. A thick, greenish scum rapidly collects on the surface, which is to be removed by a skimmer, and then the liquid should again be filtered. It will be of a pale,
straw color, and ready for evaporation. It may now be boiled down quite rapidly to about half its original bulk, after which the fire must be kept low, the evaporation to be carried on with great caution, and the syrup constantly stirred to prevent it from burning at the bottom of the kettle or evaporating pan. Portions of the syrup are to be taken from time to time, and allowed to cool, out, to see if it is dense enough to crystallize. It should be about as dense as sugar-house molasses, or tar.

**Crystallizing and Draining.**—When it has reached this condition, it may be withdrawn from the evaporating vessel, and be placed in tubs or casks to granulate. Crystals of sugar will begin to form generally in three or four days, and sometimes nearly the whole mass will granulate, leaving but little molasses to be drained. After it has solidified, it may be scooped out into conical bags, made of coarse, open cloth, or of canvas, which are to be hung over the receivers of molasses; and the drainage being much aided by warmth, it will be useful to keep the temperature of the room at 80° or 90° Fahr. After some days the sugar may be removed from the bags, and will be found to be a good brown sugar.

**Refining.**—It may now be refined by dissolving it in hot water, adding to the solution some whites of eggs (say one
egg for 100 pounds of sugar), mixed with cold water, after which the temperature is to be raised to boiling, and the syrup should be allowed to remain at that heat for an hour. Then skim and filter, to remove the coagulated albumen, and the impurities it has extracted from the sugar.

Decoloring.—By means of bone-black, such as is prepared for sugar refiners, the sugar may be decolored by adding an ounce to each gallon of the saccharine solution, and boiling the whole together. Then filter, and you will obtain a nearly colorless syrup.

Evaporate this, as before directed, briskly, to half its bulk, and then slowly until dense enough to crystallize, leaving the syrup, as before, in tubs or pans to granulate.

Whitening.—This sugar will be of a very light-brown color, and may now be clayed, or whitened, by the usual method—that is by putting it into cones and pouring a saturated solution of white sugar on it, so as to displace the molasses, which will drop from the apex of the inverted cone. The sugar is now refined as loaf sugar.
The methods here described are the common and cheap ones, such as any farmer can employ. It may be advantageous, when operations of considerable extent are contemplated, to arrange a regular system of shallow evaporating pans for the concentration of the syrup, similar to those now used in Vermont for making maple sugar.

Vacuum Pans.—It is evident that no ordinary methods can compete with those of a regular sugar refinery, where vacuum pans are employed, and evaporation is consequently carried on at a very low temperature. If the planter should raise sufficiently large crops to warrant the expense of such an apparatus on his farm, he would not fail to manufacture larger quantities of sugar, and to operate with perfect success in sugar-making; but this can be done only in the Southern, Middle, or Western States, where extensive farming is common. Those who wish to have their brown sugar clarified can send it to some of the large refineries, where the operations may be completed and the sugar put up in the usual form of white loaves.

Syrup.—A very large proportion of our agricultural people will doubtless be satisfied with the production of a good syrup from this plant. They may obtain it by following the methods described in the first part of this paper, or they may omit the lime and make an agreeable but slightly acidulous syrup, that will be of a lighter color than that which has been limed.

This syrup is not liable to crystallize, owing to the presence of acid matter. The unripe canes can be employed for making molasses and alcohol, but, as before stated, will not yield true cane sugar.

General Conclusions.

Let no person suppose that syrup, much less sugar, can be made without serious study of the art. Nothing must be left to chance. The eye of the master must be untiring. But, with a little care, both sugar and syrup of
fair quality may be made at comparatively little expense. Where it is practicable to raise the cane and cart it to sugar works, which are not more than five miles distant, to be worked on shares, that will, undoubtedly, be the better way.

When works are erected and the cane can be sold for cash, after being divested of the seed, which is as valuable for feeding, pound for pound, as corn, this will be profitable.

We have not written to induce any person to undertake the manufacture of sugar in a small way, for we do not believe it can be made profitable.

Still, we repeat that when capital and skilled labor undertake the manufacture of sorghum in a business way, the rich sandy, and sandy-loam region north and south, east, and especially west of the Mississippi, will supply sufficient sugar, with the cane sugar south, to enable the United States, instead of being obliged to import nearly all the sugar consumed within her territory, to become an exporter of sugar to other countries.

Maple Sugar.

In making maple sugar, the syrup is concentrated by any of the modern condensing pans in use for sorghum. The sap is obtained by tapping maple-trees, the sugar-maple producing sugar, and the red (soft) maple and ash-leaved maple yielding syrup liberally.

Boiling the Sap.—The quantity of sap that can be boiled in a given time depends on many circumstances. Sap will boil much faster on a clear day than on a cloudy or stormy one, and weak sap will boil away faster than that which is stronger.

Sap Buckets.—The buckets used to catch the sap are made both of wood and tin, the wooden ones being generally used. These are made of pine lumber, hooped with
iron, and painted with oil paint on both sides; at the top of the bucket, on the outside, is an ear made of sheet iron, through which is a hole large enough for the spike to pass on which it is hung. The spouts used for carrying the sap from the tree to the bucket are principally made of wood, although metallic ones are better.

The spikes for hanging the bucket on the tree are made of wrought iron, and are about two inches in length, with the head on one side of the nail to prevent the bucket from slipping off. All these may be bought ready-made, or rough substitutes, including troughs for holding the sap, may be made on the farm, and the sap boiled in a common potash kettle.

TAPPING THE TREES.

A common half-inch bit is used for tapping the tree, though many use one seven-sixteenths of an inch for that purpose, and a one-half inch bit for boring the second time. In all sugar lots where the surface of the land will admit of a team being used, the sap is drawn from the different parts of the lot to the sugar-house on sleds.

_Gathering Tubs._—For this purpose, a gathering tub, holding three or four barrels, is used. This tub is made with a head in both ends, the diameter of the bottom being much larger than the top, to prevent it from tipping when filled. In the top of the tub a hole is cut large enough to turn in the sap; a lid is made to fit this hole, so that when the tub is filled it can be closed tight, to prevent the sap from being wasted in going to the house. The tub is fastened on the sled with stakes or chains.

_Storing Tubs._—The tubs in the house, for storing, are usually about the size of the gathering tubs; they have but one head, and the tops of these are the largest. Both the gathering and storing tubs are made of spruce or pine planks, hooped with iron, and usually painted on the outside. The storing tubs should be painted on the inside,
like the buckets, to prevent them from becoming sour and discolored with mildew. Whenever storing tubs or buckets become sour, they should be immediately washed clean, before putting more sap in them.

BOILING AND SUGARING.

The reduction of the sap is carried on precisely as recommended for sorghum. No clarifying is needed, except filtering, since, the weather being near the freezing point when maple-sugar is made, it does not change readily. If it should do so, a little milk of lime may be used to neutralize the acid; but this portion should be kept by itself.

The sooner the sap is converted into sugar after it leaves the tree, the better; and especially is this the case when the weather grows warm; for the sap is liable to sour in the buckets, and also in the store tubs. When the weather is quite warm—as it sometimes is, for a day or two—sap will sour in twenty-four hours. At such times, the boiling should be forced to the utmost extent, night and day, if necessary. At no time should much sap be allowed to accumulate on hand, if it can possibly be avoided. After the sap has been gathered, if there is dirt in it without ice, it may be strained as it runs into the pans. After the boiling has commenced, it should be kept up without cessation until it is reduced to syrup, or as thick as it can be strained through a flannel or cloth when taken from the fire.

SUGARING OFF.

Sugaring is best done in a deep kettle when the syrup has settled after the first boiling. Pour off that part which is clear into the pan or kettle to be used in boiling it, leaving the sediment in the tub. By turning some hot sap into this, it can be settled again, and either boiled down by itself or with the next lot of syrup. After the syrup is placed on the fire, it should be kept boiling with a steady fire until it is done.

Running Over.—Sometimes, while boiling, it is inclined
to run over. To prevent this, put a piece of butter the size of a marble into it, and sometimes it will be necessary to put in a second or third piece before it will settle. A very good way is to take a stick long enough to reach across the vessel; lay the stick across the top of it, and from the stick suspend a piece of fat pork; when the syrup rises against the pork, it has the same effect as the butter. If neither of these methods will prevent the syrup from running over, the heat of the fire must be reduced until it boils steadily.

How Long to Boil.—The degree of hardness to which the sugar needs to be boiled depends on the subsequent treatment. If it is to be put into tubs and drained, it should be boiled only enough to have it granulate readily; if it is to be put into cakes, it should be boiled so much that it will not drain at all; it is necessary to boil it as long as it can and not burn.

TO TELL WHEN SUGAR IS DONE.

There are various ways of telling when the sugar is boiled enough. A convenient and good way is, when snow can be obtained, to have a dish of snow, and when some of the hot sugar is put on the snow, if it does not run into the snow, but cools in the form of wax on the surface of the snow, it is done enough to put into tubs to drain. But when it is to be caked or stirred, it should be boiled until when it is cooled on the snow it will break like ice or glass.

When snow cannot be obtained, stir some of the sugar in a dish, and as soon as it will granulate, it is done enough to drain; when it will form bubbles, feathers or ribbons, on being blown, it is done enough to cake or stir. To try it in this way, take a small wire or stick and form one end into a loop; dip this loop into the sugar and blow through it to produce the forms described. When the sugar is done, it should be taken from the fire immediately, and
cooled. It is then ready to be put up in any way that may be wanted.

In case the sap is taken from any of the trees named, except the sugar-maple, it is boiled at once into syrup, that when cold will be of good consistency.
ARRANGEMENT OF FARMS.
Comfort and Profit in the Homestead.

Pioneer Farming.

Before the great prairie region of the West was available to settlement, opening a farm was a far more serious business than since that time. Forty or fifty years ago, when the pioneers began to settle in the prairie region, the obstacles to be encountered were also far greater than in this day of cheap transportation, when railway lines pierce a wilderness of grass in advance, almost of civilization, and are ready to carry off the products of the settlers.

The pioneers of to-day know little of the discomforts and privations of those who opened the timbered farms of the country North and South, or of the difficulties encountered in the settlement of the prairie regions of Indiana, Illinois, Wisconsin, Iowa, Eastern Kansas, and the earlier settled portions of Texas. In that day implements were clumsy and means of transportation primitive. Only think of the dreary teaming, sometimes for over a hundred miles, to obtain a few necessaries, clothing and medicines; camping at night on the road, and returning worn out with a journey of two or three weeks!
Nowadays the pioneer farmer generally markets his crops and receives his supplies by rail, and he can do five times the work with the improved implements that he could forty years ago. In place of the clumsy plow, drawn by a long string of oxen, and doing poor work, the prairie is turned by a plow, drawn by two horses, the sharp share and rolling coulter slicing even furrows of the tough sod as thin as may be desired, so that in the autumn the whole is easily re-plowed for that universal crop of the pioneer —wheat.

Look to the Details.

It is attention to details that makes the whole system of labor perfect. Water furrows should be drawn at the proper time in the fields; lands laid out correctly for plowing; the furrows straight and equal in depth and width, according to the soil and the requirements of the crop. On a well-conducted farm there is no slighting of work at the corners, or in the final plowing of headlands, and the hands are required to use constant care that every hill of a row is properly cultivated.

If a field of grass or grain is to be cut, the first swath will be straight and the second will be perfect.

There will be no shirking or weaving by the team; they will have strength for their work, from proper care and feeding, and will have been taught by kind, but decisive training, just what is expected of them. They will be driven straight out at the end to the proper place to stop. They will be brought about so the machine will enter correctly and cut its full width at the first movement of the knives.

The track-clearer will be adjusted exactly right on the grass, will not interfere with the working of the machine at the next round, and yet will be evenly spread to the sun. The sheaves of grain will be bound in equal bundles and
of proper size, according to the ripeness and stoutness of the grain. The grass will be raked into straight windrows; the hay-cocks even and of uniform size; the shocks of grain in straight lines through the field, firm, and carefully capped. There is profit here; there has been no preventable loss, and all things have been done in the cheapest manner—cheapest, because most economically consistent with good work. So with every labor of the farm.

Improving the Farm.

The second year finds him with a mellowing soil, upon which any of the cereal grains may be sown, and upon which corn may be raised at the rate of sixty acres to the hand and team; so he goes on breaking more land year by year. Other settlers gather around him; cave or sod houses are exchanged for more comfortable dwellings, small though they may be.

Orchards grow green, young groves are planted, ornamental trees, shrubs and vines, find a place in the doorway, or cluster about the porches and windows of the dwelling.

Meadows are laid down, improved stock crop the sweet grass, under-drains laid along the valleys form cool rills upon the once arid prairie, or the wind-mill pumps the water from the greater depths.

A settlement becomes a hamlet, then a village—a city—and the busy hum of machinery tells how, in a short ten years, perhaps, this wonderful transformation has been accomplished. How? By the indomitable will and industry of a people, the division of labor, and the intelligent application of machinery to the various industries of life.

True Success in Farming.

Success in farming nowadays depends more upon correct methods than upon grinding hard work. Good farm-
ers do not go out in the morning and begin the day's work in a haphazard way. If plowing is to be done, no time is to be lost in scouring the plows, while teams and hands are waiting. The plows have been thoroughly cleaned, rubbed dry and the metal parts slightly, but evenly, oiled. If the plow has been out of use for some time, the metal has been thinly painted with lamp-black and kerosene oil, and put away where this coating would not be rubbed off. Thus, the first furrow turned is as good as the last.

Every tool should thus be kept in condition for service and duplicates of bolts ready to meet any small loss. The farmer should also be able himself to do riveting and minor repairs, and bad weather utilized for grinding or filing the cutting surfaces. Work should be systematized; done at the hours for work, and there should be other hours for rest and amusement. There should be a place for everything and everything in its place. A time for labor and a time for play.

Thrift and Unthrift Illustrated.

Shall we give the other side of this picture? It may be seen in every neighborhood. There are men whose work is never done in season, nor well done at any time. Their implements are always "lying about loose," but too often the owner may be found "tight" enough at the village grocery. They are of that class who insist that "farming don't pay." Their farms are mortgaged, gradually run down, and are absorbed by their more enterprising neighbors. They "don't believe in book larnin'," yet they have faith enough in their calling to think they may succeed in a new country.

The out-door indications are generally an index to the inner life. The surroundings of the man who "never has time" will not be unlike the opposite picture. His imple-
ments will lie around; his animals will rest where they can. He saves manure carefully—just where it is thrown out from the barn-stable. At last, the accumulations, which have been trodden under foot, increase, until a mountain rises, accessible only by strong-winged fowls. Something must be done. The indolent farmer says: "Yes, Johnny. I calc’late we must strat in out that manure. We can’t git the barn-door open any more."

Sensible son: "Why don’t ye move the barn, dad? It’ll be a heap easier."

Will the barn be moved? No. Will the manure pile be carted to the fields? No, there is no time. It will be "strat ined out," and the mortgage, constantly accumulating, will, at length, straighten out the indolent farmer.
The Careful Farmer's Barn.

Let us look at another picture. There is neither waste nor extravagance here. Careful management and business tact have kept Farmer Skillful steadily on the road to success.

First, a small barn was built. At the end of a few years it was shored up, a stone foundation put under it, and it was filled with stock. All manure made was hauled to the field, and the yard kept perfectly clean. The central figure in the illustration shows the first barn. Additions were gradually made, until, about the time Farmer Indolent was "calc'lin'" to "stratin' out that manure," Farmer Skillful's barn and yard presented the appearance shown in the companion illustration.

There is nothing extravagant about this; nothing for show, but everything is solid and substantial. It fronts east; the main building is 35x45; the south wing, the first addition made, is 24x45; the north wing 30x50, and both lap on the main building ten feet. The basement walls are eight feet high by two feet thick. There is a central shed under each wing for manure, which is regularly carted out. This gives complete shelter for the store stock.
How to Select a Claim of Land.

When settling in a new country there are many things that require careful thought. The intending settler should know something about soils, texture and composition; drainage, water supply, above and below ground; summer and winter climate, and the general adaptability of the land to present and future crops to be raised. Much of this may be learned from books, but, so much is written that the beginner is befogged. A few salient points, however, may well be borne in mind:

*Vegetation as an Index to the Soil.*—Observe the character of the vegetation on the surface. The prairie dock, or compass plant, shows a rich, moist soil, adapted to Indian corn or other soft-land crops. Hazel brush, the woody-rooted red root, amaranth, indigo weed, and short grasses indicate a good wheat soil—firm, fertile and dry. Horseweed, wild artichoke, and others of the sunflower tribe, show a rich, deep, warm soil, such as is usually found on arable river bottoms. All the sedges indicate cold, wet land. Thistles are found on rich, dry bottoms. Wild red-top, and the taller and more slender of the wild grasses, indicate good meadow land. Hence, by carefully observing the natural vegetation of a country—for each soil grows its characteristic plants—a pretty good idea may be formed of the value of the land.

*How to Test the Soil.*—Provide yourself with a small ground augur. With this you may judge of the nature and value both of the surface and sub-soil. If it is black and sandy, or loamy and friable, a chocolate, or even light brown, it is usually first-rate.

The color of the soil is, however, not always an indication of its value. A black soil indicates a humus soil if very light in gravity, or if heavy in weight it may contain charcoal and humus combined. Many light-colored soils
are excellent and lasting, especially for the cereals and grass. If the sub-soil is a stiff, tenaceous, pasty clay, reflect before selecting it, unless it lies at a considerable depth below the surface. If hard-pan, reject it.

Diversity of Crops.

The advantage of a diversity of crops is, if one fails you can have another to depend on. You also prevent your harvest coming on all together, which is an important point. A small area—the best you have—should be reserved for the garden, for potatoes, and for a field of corn sufficient, with the oats, to feed the team and make meal. Upon this land haul all the manure you have made, and plow it well in.

From this time on, break all the new land possible, and chop in corn. It will make excellent feed for milch cows, calves, steers, working oxen and hogs. Backset this at the proper time for the next year's work.

Wind-Breaks and Groves.

In prairie countries, the question of timber is an important one. However cheap other fuel may be, trees are needed for poles, fence-posts, wagon-racks, levers, foundations for stacks, and, more important than all, shelter for cattle and for the fields; this last not the least in importance.

The Timber Plantation.—The timber plantation should be placed where it will be easy of access, and where, at the same time, it will afford shelter for the farm buildings and stock. Planted timber has these advantages: you have the desired varieties just where you want them. Ash will give you timber where strength is required; catalpa is
valuable for posts, stakes, etc.; pine, larch and spruce for beams and light poles; chestnut, hickory, butternut and walnut for their nuts, and all of the latter for their timber. In forming these, their uses must be borne in mind. Ten or twelve years bring the nut trees into bearing. The same length of time forms the most impervious wind-breaks of evergreens, and will give split posts from the catalpa. Willows and cottonwood are valuable at five or six years old, and all yearly increase in value.

_How to Start a Grove._—Plant your grove as you would a corn field—in rows four feet apart, but thickly in the rows. These may be gradually thinned to form wind-breaks, until the trees stand four feet by four. As they begin to crowd, take out each alternate row, one way, and then, again, the other. They will now stand eight feet apart. Still another thinning, at two operations, will leave them sixteen feet apart. When finally thinned to thirty-two feet each way you have a noble grove, that has paid its cost many times, and is still worth more than any equal area on the farm. Your wind-breaks have grown into noble timber, beneath which stock may find shade in summer and shelter in winter. The increased crops from your fields have many times repaid their cost, and the farm itself has become of far greater value than the bare acres would be.

**Starting the Orchard.**

The wise man, beginning a farm far from nurseries, will provide himself, not later than the second spring, with material for an orchard, and will have prepared sufficient land for his permanent garden of small fruits, or at least for the plants. What are called maiden trees—trees one year old from the graft—may be ordered, or budded trees of the previous year.
The Trees to Plant.—Root grafts of apples, pears and cherries; budded peaches; cuttings of grape, currant and gooseberry; young roots of raspberry and blackberry; eyes of rhubarb, for the kitchen garden; and cuttings of cottonwood, white willow and mulberry; seeds of catalpa, and the nut trees mentioned, may be obtained. Later come seeds of ash-leaved, white-leaved and sugar maples, and of ash. The apples, pears, peaches, cherries, and the cuttings of the cottonwoods and willows may be planted in well-pulverized soil, in rows four feet apart by twelve inches in the rows; the cuttings, except those mentioned above, in two-feet rows, by three inches in the row.

Put rows eighteen inches apart by six inches in the row, and plant the other tree seeds thicker.

Transplanting.—A year, or two years later, remove to the position where they are permanently to stand. The first trees may remain in the rows three years. The other plants and the rhubarb should be taken to the garden the succeeding year.

The Result.—In the end you will see the economy of all this, when you find yourself three or four years in advance of your more tardy neighbors. Do not, however, hide your knowledge. Perhaps some will join you, and thus save expense in buying and transportation.

How to Clear a Timbered Farm.

The clearing of a timbered farm is a very different affair from opening up a prairie, and yet, aside from the hard labor of chopping and logging, not an unpleasant task. A man
may not accomplish results so fast, but some comforts can soon be attained. When the timber is valuable, money can be earned at once by chopping and delivering the logs at the mill, either by hauling direct, or to the nearest stream to be rafted.

Saving Valuable Timber.—If not valuable for timber, the trees may be cut, logged together in the usual way, and burned, the ashes sold for making potash, or leached and boiled on the farm. If there be no present sale for them, the valuable logs, especially walnut and pine, should be rolled into triangular heaps, well raised from the ground, with skids between each layer, covered with a crotch and pole roof, and this again with bark, to shed the rain. They will thus remain for many years, with a little looking after, until increasing population demands the erection of mills for sawing. Of the oak, hickory, maple and other valuable hard woods, the first may be converted into posts, the second into firewood and the others into rails.

Deadening Timber.

The first crop is often raised under deadening timber, where the larger trees have been girdled by cutting out a narrow circle around the trunk down through the sapwood, before the buds have started. The smaller timber is chopped and burned with the dry leaves and trash; all saplings, say those under four inches through, and all bushes are grubbed with a mattock, to add to the fire. Then the crop is sowed or planted without plowing, and harrowed or hoed in, so far as small grain is concerned, and the corn and potatoes dropped where a place offers, and cultivated entirely by hand.

This is tedious and slow, but all the heavily timbered farms of the country were originally opened in this way. The only revenue while the crop was growing was in the
potash made from the ashes of the burned timber. There are, however, now but very few localities in the United States where the timber will not pay handsomely for the labor. Oak and hemlock bark is sought far and wide by tanners. The logs are sawn into timber and lumber by portable saw-mills, and the cord-wood finds a ready sale.

The Work of Improvement.

The work of clearing and preparing the timber goes steadily on from year to year. Field is added to field, each being seeded to grass as soon as possible, until the smaller stumps can be drawn out. Up to the time when grass can be produced the stock subsist on what they can find in the summer, on mast in the autumn, and on the tender twigs and buds of the trees chopped in the winter. Hogs, except in a very inclement climate, will manage to live the year round, since the ground seldom freezes deeply in the dense forest, and nuts and roots furnish them with food.

As field after field of grass is added, the calves grow up into cows, and butter and cheese are made. The idea in clearing timber farms being that all the stock possible must be carried; the only care necessary being not to keep too many animals until grass and hay can be made. It takes a great deal of browsing to support a cow, and it is a make-shift at best.

Feeding grain raised in the laborious manner named must not be thought of. Only the necessities of the family should be looked after. When grass is produced, add to your live stock by every possible means. It is indeed hard labor to "hew a farm from the forest," yet it has many comforts not to be enjoyed by those who open and improve a prairie. Nevertheless we advise no one to take the timber farm, from choice, if the prairie may be had.
Still, if the prairie farm is not available, do not refuse the timber because you are not a chopper. Two months’ practice will enable you to swing the “woodman’s axe” deftly, and in three months you can carry the broadaxe “true to the line.”

**Soils Indicating Variety of Crops.**

The crop best suited to the soil may generally be told by the natural or wild vegetation found upon it. Hazel brush and red root (the hard, woody-rooted species) are indications of a good wheat soil. Why? They tell of a rich, and at the same time, firm soil. All the cereal crops will do well on such land. As a rule, our upland prairie soils are rich in in the phosphates and potash. Heavy-timbered lands usually have what may be called hard or firm soils, well adapted to wheat, rye, sorghum, sweet potatoes, onions, and, when there is moisture enough, to flat turnips and the pasture grasses.

The lower lands, covered with timber, often resemble what are known as soft soils; that is, they contain much humus, and are adapted to Indian corn, the common potato, garden crops, and the meadow grasses.

**Adaptation of Crops to Localities.**

When far from a market it would be unwise to cultivate much corn or oats, unless the farmer has stock to feed it to. If his stock is cattle and hogs, he would still be wrong in raising large fields of oats to fatten them. His crops, as before stated, must be of wheat, barley, linseed, grass, and
clover seed. Live stock being his main object, hogs, being the most easily multiplied, come first, then horned cattle, and lastly, as the country becomes more settled and free from predatory animals, sheep. All these may be driven long distances on foot to reach a market.

As stock increases, Indian corn is more and more largely raised, and pastures are steadily increased. Later a regular rotation is established; then railroads come to lessen the cost of transportation, and crops become more and more diversified from the increasing demand as towns and villages spring up.

**Starting a Dairy.**

The wise man is he who foresees what this increasing population naturally requires, and meets the demand. He, for example, obtains a herd of really good milking cows in advance of his neighbors. If there is not a good demand for milk, he has the best procurable machinery and implements put in for converting the milk into butter or cheese, and establishes his market. Others see that there is profit in this, and may solicit him to manufacture their milk also,
and this often grows to a large and profitable business, the farmer almost unwittingly lapsing into the tradesman and manufacturer. A careful study of the various crops will, however, indicate many other lines of possible profit that may be built up by a careful study of soil, climate, locality, and the crops adapted to the increasing wants of a growing community.

The Dairy-House.—A dairy-house, even though only an adjunct to the farm, is almost a necessity upon a large, well-managed country-place, and we herewith give a plan for the building required.

The Building Described.—The building occupies 24x30 feet of ground, and eight feet between floors. This will be sufficient for the product of forty cows, or with improved fixtures, of more than that number. The lower floor should be divided into two rooms; one for butter, the other for cheese. The attic is the curing-room for cheese, and has, besides the ventilator in the roof, open spaces in the sides which may be closed by wickets, and which serve to admit the air.

An abundance of fresh, cold water, or of ice, must be at
hand, as well as the necessary fixtures, including presses for cheese-making, tanks for setting cream, etc., all of which should be of the best patterns. If the soil will allow, a cellar should be dug, and, in all cases, the drain-pipes and drainage must be of the most thorough character.

**When to Hold the Crops.**

In a country so large as the United States there is little chance that there will be a failure of a given crop all over the country in any one year. The transportation facilities and the increasing railway extension year by year, preclude famine prices in any locality. The man who holds a crop of grain, wool, or other perishable commodity, hoping to get famine prices, always gets beaten.

The time to hold a crop is from seasons of general plenty and low prices to a season of scarcity and high prices. In this, storage, interest on the capital employed, insurance against fire, insects and shrinkage in weight, must always be taken into account. If the present price be so low that it will pay to hold in spite of all these items of expense, do so, but as a rule the best price in any one year is the best price for all time.

**When to Sell the Crop.**

The knowledge of when and how to sell the crops of a farm, is among the most important of the many elements that go to make success in farming. The man who blindly accepts the prices bid by the grain-buyer in his local market is apt to come out loser. The farmer can tell the value of his crop on the farm as well as anybody else, if he keeps himself informed as to freights, prices in central markets, insurance and storage.

If he does this he can always get full value for his pro-
ducts, even if there is no competition among buyers, or if there is only one buyer in the market.

The farmer can always ship direct to some reputable house in a central market, or he can combine with neighbors and do so. This will soon bring the local buyer to terms, since he can make some profit, as between the transportation rates that he gets and those which the farmer gets, who ships in smaller quantities.

The farmer can often contract his whole crop for less money per bushel than he will sell one bushel for, and still make money. If he has kept himself informed on prices, and the probable crop of a given commodity, he may often contract to deliver at a stipulated time, and get far more money per bushel than his neighbor, who sells his crop in a kind of "hit or miss" way, a few bushels at a time, just as he feels in the humor for "going to town."

Study the Probabilities.

The ideal time to sell is when the market is at the highest, or as near this point as possible. You cannot find this out by asking the village buyer. You could no more expect him to tell you that which might take money out of his pocket, than your neighbor could expect you to tell him of a trade that would take money out of your pocket.

The man who waits day by day for the market to go higher, and then refuses to sell when it has fallen somewhat from the highest point, is very apt to sell at the lowest price. In like manner, the farmer who ships on his own account and holds until the highest market price is past, usually finds his produce reaching tide-water about the time the lowest market is reached.

The fluctuations of the market are caused by so many varying influences that the wisest often are deceived. But the farmer who carefully figures profit and loss, who care-
fully studies the probable markets, who makes up his mind what should be a fair price, and sells when that price is reached, seldom makes failures. He may not, indeed, make "a hit" every time, but the "good hits" will be so largely beyond the bad ones that he will have no serious cause for complaint.

**Situation of the Farm.**

The situation of a farm is not considered by the average farmer as of great importance, yet a good building site is often worth half the price of the farm. It should be sufficiently elevated to be above danger of miasma, and yet easy of access, and even on the largest farms not more than a quarter of a mile from a main road. The rise to the buildings should be easy, and, if possible, the whole farm should lie in view of the house or the barn.

If a stream meanders through the farm or is capable of being turned to supply a pond, so much the better. Or if pipes may be laid to reach the house and barn, it will be a valuable improvement.

Oak, maple, hickory, black walnut, wild cherry and ash are the most valuable timbers. If the fences are in good order, and if the house—however small and rough—is well cared for as to its surroundings, you may be pretty sure the land has not suffered seriously.

But, when you find a farm thoroughly in order, with buildings and fixtures, the full value will have to be paid. The owner will pretty well understand what it has cost, and the man who has once put his farm into perfect home condition is seldom in a hurry to leave it. Yet good, natural features unimproved are not rare to those who have the eyes to see them. Excellent places are plentiful in timbered districts where homes can be made, but the farms in timbered districts will average smaller than in prairie regions,
and where there is an original growth of hickory, burr oak, black walnut, sugar maple, white wood (tulip tree), the soil and subsoil will generally be excellent.

Some Things to be Remembered.

Do not select a farm in a malarious district, unless the situation is high. Even then it is better that you satisfy yourself as to the probable health of your family before buying. A very low-priced farm in such a district is to be very carefully investigated before buying. Never buy a farm with costly improvements in buildings and planting, if they are not suitable to your wants, unless the price is so low that you can afford to alter and reconstruct. A rundown farm, if the soil is there, is the place to improve to your liking; but be sure that the farm is adapted to the crops you intend to cultivate. A high and dry farm is not adapted to grass, neither is moist, cold land, subject to every sweep of the wind, adapted to fruit. But, if protected by wind-breaks, the wet, cold land, after drainage, will be excellent for grass; and, if not too tough, will make good grain land. If your system of farming requires large amounts of manure, a location near some city will greatly cheapen the cost of getting manure. The other remedy, and a good one always, is to keep plenty of stock.

Do not buy a rocky, hilly or stumpy farm, unless pasturage is your object, and then the price should be low. For stock, except sheep, the moderately level land is always the best. If the soil is stiff and wet, under-draining will cure it, and such soils, when under-drained, are generally the most productive; but it will cost from fifty to eighty dollars for every acre you thoroughly under-drain. All this must be figured in.

Do not buy too much land. The necessary repairs must be made, implements bought, the farm must be stocked, and a proper sum reserved for working capital.
Fifty acres to each hand to be employed is fully as much as a good manager should undertake to work, even in the West, where the obstacles to thorough cultivation are less than in most other countries, unless stock-feeding is to be the principal object.

Before you decide finally, remember that farming requires fully as much thought as any other business; but all the requirements may soon be mastered by application. Farming is no longer the drudgery it was fifty years ago. The comforts and the elegancies are by no means to be overlooked. The man with five thousand dollars, or more, of capital, especially if he have a growing family, needing schools, may do far better to invest the money in an improved or partly improved farm, with schools, churches and society, rather than isolate them by going to the far West, and buying himself "land poor."

Leasing a Farm.

We do not advise any man who has money enough to stock a farm, however moderately, to lease. If, however, it is desirable to lease a farm, on account of the advantages offered by society, settlements and markets, nothing should be left to chance. Everything must be in black and white, and so plainly stated in the lease that there can be no room for dispute. Every permanent improvement made by the tenant should be paid for by the landlord, and every improvement made by the landlord, at the request of the tenant, will become an additional consideration.

Some leases are so carefully drawn, that the number of loads of manure to be made yearly is a condition, and to what particular crops these are to be applied; even the rotation of crops is often stipulated. The object, both of the tenant and landlord, is to get as good terms as possible for himself. In making a contract, of whatever kind, avoid all unnecessary words, and be sure that the meaning is clear.
Relative Cost of Fences and Buildings.

Those States of the American Union having cast-iron laws regulating the kind of fence and the space between boards or rails, would do well to repeal them. It is a generally accepted fact that the fences of the country cost more than the buildings. They must be renewed, on an average, about once in twelve years. The Secretary of the Wisconsin State Agricultural Society, a few years ago, estimated the cost of the perishable fences of the State to be $40,000,000, reckoning one rod of fence at eighty-five cents. More recently, a careful and unprejudiced observer, Mr. David Williams, of Walworth County, Wis., says:

"I have, with the assistance of a number of well-informed farmers of this county, made a careful computation of the first cost, annual deterioration, per cent., and cost of annual repair. There are sixteen townships, or seven hundred and fifty-six square miles in the county. Estimating one-sixteenth as lake, ponds, or abandoned lands, gives five
hundred and forty square miles, or 345,600 acres of improved or inclosed land. This, if fenced into forty-acre lots, will require five rods of fence to the acre (a careful estimate gives twenty-five acres as the average size of fields), or 1,728,000 rods of fence, exclusive of ornamental and village fences. Estimating one-eighth of this as division fence, and therefore duplicated in the foregoing estimate, and to include also temporary and comparatively worthless fence, will give in even numbers 1,500,000 rods of farm fence for the county, 100,000 rods for each township (one-sixteenth of the total area having been thrown out of the estimate as lakes, ponds, or abandoned lands) of improved or inclosed lands. From carefully prepared data, I find about two-fifths to be highway fence, making 600,000 rods of highway fence for the county, and 40,000 rods for each township.

"Estimating the cost of this fence at $1 per rod, gives $1,500,000 for the county, and $100,000 for each township.
Two-fifths of this for highway fences gives $600,000 for the county, and $40,000 for each township, or a total cost of all farm fence of $4.34, nearly, per acre, and a cost of $1.73 per acre of highway fence. Estimating ten per cent. on first cost for annual deterioration and repairs, and seven per cent. interest on first cost, gives $275,000 as the aggregate annual cost of farm fence for the county, and $18,333.33 for each township. Fully two-fifths of this are for highway fence. If to this sum be added the cost of village fences—mainly made necessary by the pernicious habit of using the highway as a public pasture, the total cost of fence for the county will be swelled to the considerable sum of $1,750,000, and the annual cost to $297,500.

Cost of Farm Fences in the United States.

The cost of the farm fences in the United States has been estimated at $1,350,000,000, and their annual maintenance at $250,000,000. Thirty years ago, the annual cost of repairing fences in Pennsylvania was about $10,000,000. The annual cost of fencing in New York State was placed at $13,500,000. In Illinois and some other Western States, fencing is not compulsory. The people of a county or township can decide by vote, whether they will have fences at all, or what shall constitute a lawful fence. This should be the rule everywhere.

No-Fence Laws.—When tried in Livingston County, Illinois, some years ago, the no-fence law worked excellently. We have seen cattle herded within a few rods of
standing corn, and they would take the road, morning and evening, quietly enough under the care of the herdmens. It is cheaper to fence cattle in than to fence them out, especially in all neighborhoods where pasturage is not the principal industry.

**Stringing a Wire Fence.**

Set the posts as for a board fence. Mark the places where the wires are to be strung on the posts. Never use a single wire. The contraction and expansion will bother you more than it is worth, whether it be barbed or not. Use two wires twisted together, or flat strips twisted. The objection to barbed wire is more theoretical than practical. Few animals are ever hurt with the barbs, and seldom is any but a breachy animal hurt at all, unless it may be horses or colts at play, or Texas or other semi-wild cattle, which do not see the wire. For such, a pole on top will serve as a warning.

To put up the fence take the reel of wire, placed on a wagon so it will revolve. Fasten one end to the end post, which must have been well braced to stand the strain, the posts being placed nine, ten or twelve feet apart, according to the strength of the fence required. Drive the wagon forward until the end of the fence is reached, strain to the required tension upon a roller turned by hand-spikes or other suitable device. Drive the staples properly into the posts, and so proceed until the fence is of the required height.
The manufacturers of each special wire usually furnish all necessary fixtures and full directions for putting up. In all prairie regions a good strip or double wire fence, whether barbed or not, is the cheapest and best stock fence made, if put on solid posts, not too far apart.

**Portable Fences.**

Portable fences are seldom used in the United States, though they are sometimes useful for dividing off flush pastures where fattening stock are fed, thus making them eat off the best of the grass regularly, to be followed by store cattle to finish up. They are also useful for penning off or for pasturing sheep.

The best unpatented fences we have ever used are strings of wire fence eight or ten rods long, with a small, round, carefully sharpened hard-wood post at each end, and strengthened at intervals of half a rod with upright slats of hard wood, an inch and a half square, to which the wire is stapled. The sections may be dragged to any desired spot while lying flat; they are easily set up, the post driven, and if two guys of wire, fastened to slanting stakes, are used occasionally on the side from which the pressure may come, they are perfectly secure. It is not a bad plan to have enough of this fence to reach across a field. When not used for feeding off meadows, they are excellent for small pastures for calves, lambs or hogs, and also for confining hogs upon parts of a meadow or other land infested with the white grub. These swine will thoroughly destroy, by rooting out and eating, every grub in the infested land.
Bars and Gates.

One of the tests of careful farming is the farm-gates. Bars are simply a make-shift for something better. They are never safe unless pinned or otherwise fastened, so they cannot be rubbed down by stock. They are dangerous to stock in passing through unless entirely removed; annoying if a team is to be driven through them, and cost more in time, in a single year, than would pay for a good gate. They also cost about as much to make and put up as a single gate, that any farmer can make with a square, a saw, an augur, an axe, and a handful of nails.

We shall elaborate somewhat on the subject of gates, and illustrate with a number of the more simple and practical. The subject of gates is an important one to farmers, and hence a careful study of the various plans will be desirable.

The Slide and Swing Gate.

Farmers have been swindled out of large amounts of money, first and last, by the holders of a patent that never should have been issued. The principle of the slide and swing gate is older than the oldest inhabitant, and not patentable. The primitive gate is made as follows: Set two stakes diagonally together and wide enough apart to admit the gate with plenty of play, but so that when the gate is closed the end will press against each stake. At the other end the gate rests on strong pins, so hooked that when movable pins are inserted the whole will be held firm. The gate is made by nailing inch boards
upon two inch posts at each end. The braces extend from the bottom board to the board next the top. In the middle a strong batten extends from top to bottom, and is securely nailed with clinch nails. The gate is slid back on a pin in the rear post under the top board. When slid back until the central batten is reached, swing it around so that the team can pass. Twelve feet is wide enough for a load of hay and a person easily passes through by swinging it slightly.

The forms of gates and the various attachments are so numerous that a full explanation of the principal ones would fill a volume.

**Hedges.**

**Advantages and Disadvantages of Hedges.**

There is a practical use for the hedge in the protection it gives, especially in the timberless districts, to the fields and stock, and to this we may add the pleasure a well-kept hedge affords the eye. The disadvantages are, they are costly to keep in order; they harbor weeds; they take up much valuable land; they prevent evaporation from roads, keeping them wet and muddy, and, if not carefully trimmed, they are unsightly.

The question of fencing is one of the most important the farmer in any district has to meet, and this becomes more and more serious as we advance beyond the Mississippi, upon the vast plains, that were once considered a desert, but are now found to be among the most productive lands of the West. But ingenuity has solved the problem of enclosing regions far distant from timber, through improvements in wire fencing.
The Osage orange has played an important, in many districts an indispensable, part in the settlement of many prairie regions of the West. It may do so still in some remote regions, but neither this plant nor the three-thorned locust (Gleditschia), the only two-hedge plants really adapted to the West, will be able to hold favor with those who regard space and cleanliness in fencing. But, as in any other operation, every farmer must judge for himself as to the economy of hedging. We believe that, simply as protection to fields, and as shelter to stock from sweeping winds—lines, or, better, clumps of trees along boundaries and principal fields, will prove more useful than hedges.

**How to Prepare the Hedge-Row.**

Whether hedging ever again regains its hold upon public taste or no, it will be used on many farms and, eventually, in an ornamental way on every farm. The Osage orange will only thrive on dry soil; wet land is certain death to it. Hence, in preparing for a hedge of this plant, it is necessary to raise a slight ridge, even upon high ground; over low places this must be of some height, and have a waterway beneath, where the accumulation of water is to be carried away. In fact, all hedge plants do better on a slight ridge in prairie land, that in spring is always partially or fully saturated with water.

This ridge may be entirely made with the plow, harrow and leveler. Eight feet in width is none too much. Plow
first as deeply as possible by throwing out the soil, leaving the dead furrow where the hedge is to stand. This should be done in the autumn. In the spring, as soon as the soil is in good condition, plow the furrows back, and again, deep. Three plowings should form the ridge, except in low places, where earth may be added with the scraper. Harrow and level until the tilth is perfectly fine and smooth, and leave the ridge to settle until wanted for planting.

**Trimming the Hedge.**

It has been found not a good plan to attempt to keep Osage orange in shape by trimming and shearing, as practiced for ornamental hedges. The most that can be done is to keep the upward growth within bounds by cutting back in the spring, and perhaps again in midsummer, to a height of five feet. This may be done with the common corn or cane knife. When the stems of the plants have reached a diameter of about two inches it may be laid down. This is done by trimming up the sides so a man can work. The stems are then sawed two-thirds through with a rather fine saw, or cut and bent over in line by means of a very heavy pole, worked by a man on each side of the hedge, so the stems will lie at an angle of about twenty-five degrees. If they tend to rise they may be weighted down when necessary. This will reduce the height of the hedge to three feet or less, but the new growth will soon present an impenetrable barrier, and the following year the hedge will have attained its full height. All that will be required thereafter will be to prevent the branches rising about five feet by cutting the hedge to this height in the spring before the leaves start, and again at midsummer. This trimming may be done with a sharp corn knife, or with a similar tool made for the purpose, as
heretofore shown. The strong limbs may be hooked off with a bill-hook, or with a hedge-clipper. For keeping out stock a well-kept Osage-orange hedge is impenetrable, and for this purpose it is useful, if not ornamental.

**Setting the Hedge.**

The hedge plants have been bought and sorted into best, second-best and culls, the hedge-row is economically prepared as follows: Draw a straight line along the center of the ridge. With a steady horse throw out the earth with a bull-tongue plow or other implement that will move the earth to either side. Pass back and forth in this line, correcting it until it is perfectly straight and true. Upon a strong garden line, not less than two hundred feet long, sew strips of red flannel, at such distances as you wish your plants, say ten to twelve inches. One man, with a bright, sharp spade, walking backwards along the line, thrusts in the spade, obliquely at every mark, presses the handle from him, and an assistant inserts the root. The spade is withdrawn, the earth is stepped on to compress it firmly about the bottom of the roots, leaving the plant fixed, and slanting somewhat, in the direction the workmen are going, the spade-man working backwards. Care must be taken that, when the earth is finally filled in around the plants, they are covered about an inch above the yellow portion of the root. To enable this to be done accurately, the line should be supported at proper intervals, at the desired height. The object in opening the trench is to save labor in planting, and by this means it may be accurately and speedily accomplished.
Finishing the Planting—Cultivation.

When thirty or forty rods of hedge has been set the bull-tongue may be used to carefully cover back the earth to the plants, after which they may be brought into line and the earth firmly packed around them, the sides of the ridge being left rough, the better to kill the first weeds that start. So proceed until you have all your plants set, first the best, then the second best, throwing away all inferior plants. If you have raised the plants set all culls in nursery rooms for future use, and if you buy them stipu-

late for No. 1 plants and accept nothing else. These may be divided into firsts and seconds. The first season's cultivation may be wholly with the straddle-row cultivator, and the plants must be kept earthed so that the yellow root does not show. The second year's cultivation may be done with any implement that will throw shallow furrows to or from the plants. No trimming is necessary the first two years. The object is to get a strong root, especially in the North, where the plant is liable to damage in winter, until it is three or four years old. After this time it is nearly as hardy as the oak, on dry soils.
The Importance of Draining.

The railways of the West early saw the advantage of tile drainage, and the Chicago, Alton & St. Louis, and the Illinois Central set the example of transporting tiles, for the farmers, at nominal rates, well knowing that the increase in the productivity of the soil would soon amply repay them in increased freights. The farmers of Indiana, Illinois and Iowa are now eagerly working at subsoil drainage, and thousands of acres are there yearly added to those already so improved.

Under-draining.—Under-draining is that system having subsoil water-ways formed of tiles, stones, gravel, brush, poles, slabs, or even, in stiff clays, an earth channel, protected artificially, by which the surplus water of the soil is quickly percolated and carried away.

Thorough draining is that system of under-drainage whereby a tract of land otherwise unsuited to cultivation may be rendered uniformly arable and fertile. Drainage is as old as civilization. Our system is built upon an improved form of the old Roman system. Modern—thorough—drainage has only been generally possible since books, and
especially journals devoted to agriculture, have been common, through the general education and consequent general intelligence of the masses.

**Practical Men on Tile Drainage.**

Tile drainage is an ancient art, lost during the dark ages, and slowly revived in modern days. Even in England, where the great value of farming land, the abundance of capital and the low rate of interest all favored its extension, the spread of its use has been slow. Let us give a short review of its history and the testimony of practical men in different parts of our country as to the benefits derived from it.

*Mr. John Johnston's Testimony.*—No person in the United States has probably exerted a wider influence in the early introduction of draining and persistent effort in doing the work thoroughly than Mr. John Johnston, who settled near Geneva, N. Y., and who, at a time when tile works were almost unknown in the United States, was obliged to import tile of the old-fashioned horseshoe pattern from England. He not only paid for his farm through the enhanced products per acre (and this in the face of the sneers of those about him, that he was "burying his money by putting crockery in the ground"), but he kept on buying and making tile pottery until he had 210,000 tile in the soil, paying for his original purchase of land and adding to his farm until he had over 300 acres in such a state of cultivation and productiveness that his would-be sympathizers might well hang their heads in shame that they could not have seen, when the first laid tile began to draw, that he was "sowing money to reap one hundred-fold;" in other words, getting one hundred per cent. yearly profit, and this when tile cost him $24 per thousand to make, for this was forty years ago.
Mr. Johnston says, among other things, that tiling paid for itself in ten years. One field of twenty acres that hardly produced ten bushels of corn per acre before draining, produced after draining an average of eighty bushels per acre; and it was also found that half the manure sufficed on drained land to that required on undrained land—that is, on land that previously was at times, during the growing season, sodden with water.

A Dry Surface May Need Drainage.

Nor is land apparently dry on the surface exempt from the necessity of drainage. Mr. Johnston had a field of thirteen acres on the shore of a lake, with a bluff bank from thirty to forty feet high descending nearly perpendicularly to the lake. The soil seemed dry, yet was not satisfactory in its crops. He engaged men to open a ditch, with the understanding that if water entered within eight hours he would have the whole field drained. The top soil was hard and dry, so much so that a pick had to be used. At the depth of a foot it was so wet and soft that it was easily spaded. As the ditches were opened, water flowed in and ran away from the outlet. It was thoroughly drained, and then commenced regularly to produce sixty to seventy bushels of corn per acre, and proportional crops of other grain. He testifies that he never saw a farm of one hundred acres but some portion of it would pay for drainage. Every man in the West who has ever done any draining knows this will apply to all soils where the top and subsoil is not sand or gravel.

What an Ohio Farmer Says.

In the Ohio reports for 1878, Mr. S. J. Wooley testifies that drainage with him has increased the richness of his meadows and pasture, and it has not only improved the
wealth of the people but alleviated the condition of animals. This has too often been stated to be disproved. He says that a forty-acre field which, before draining, produced not more than eight bushels per acre, produced, after being drained, from sixty to eighty bushels per acre, and with much less labor of man and team. A thirty-acre field on the same farm was sown to wheat; it winter-killed badly and was injured by rust. Since being drained it has produced large crops of superior wheat, and the crops have not been affected by the rust.

So, also, on drained land, potatoes were large and of fine quality, when before they were inferior and suffered from rot. The subsoil of this farm was a tough, sticky, blue clay, difficult to plow and work. Since it was drained, the clay has become friable, loose, easy to work and has changed color, so that now it is a fine, black loam, and works easily the whole season. But the writer adds, that if swampy timbered lands are suddenly drained, most of the timber will die—the oaks and hickories first, the change being first noticed in the tops. The young timber, however, accommodating itself quickly to the change, suffers but little, afterwards growing more thriftily than ever. In this connection we add: Land intended for planting timber should not be tile-drained. The roots will inevitably, sooner or later, choke the drains. Here dependence must be had on surface or open drains, or else the drains may be filled with brush.

Samuel Israel, Esq., near Mount Vernon, Ohio, in relation to a farm of beech land, the subsoil a tenacious clay, abounding in low places holding surface water during the spring, fall and winter, testifies to the value of draining, and specifies that over $40 per acre had been realized
from sixteen and one-half acres drained and planted in potatoes, and this without manure.

How many farmers are there who might give similar testimony of lands which in dry seasons produce large crops, but which, one year with another, are wet and sodden in the spring, and often, as last season, remain too wet to work until well into the summer? Had it not been for the wonderfully genial and pleasant autumn weather extending into November, of 1882-83, the corn crop of the State of Illinois would have been almost totally ruined in these years.

**Draining in Indiana.**

The wonderful results from drainage have been most thoroughly shown in Indiana. Commencing about ten years ago, the demand for tile has continued greater than the supply from year to year. At length the tile-makers of the State organized an association, in which is discussed the best form of tile, the quality of clay for working, and the gathering of statistics relative to drainage, and drainage processes have been undertaken, which have been of great value generally, and have done much to spread correct information, in connection with the efforts of the State Board of Agriculture in the same direction. Of the thousands upon thousands of acres there drained, the testimony is constant as to the money value of drained over undrained soils. Each recurring wet season goes more and more to intensify the belief that drainage is the one thing most needed to produce the best results in tillage upon our prairie soils, when they are flat and where they are underlaid with clay. Illinois, later, fell into line, and has now an active tile-makers' association.

If such soils were tile-drained to a depth of three feet, the tiles laid in lines corresponding to the natural slope of
the soil, the whole of the land would be drained. If the underlying water were pretty uniform through the under surface, the drains would, even if laid three feet deep, require to be, perhaps, thirty feet apart, in the case of strong, tenacious clay, and from this to forty or fifty feet in soils less tenacious.

Again, in draining many soils, especially where stock-raising is the principal object, the most that will be necessary will be to run a main drain down the gently sloping valleys to carry off the superabundant water, to prevent long saturation and consequent slow evaporation at the surface, keeping the soil cold and sodden below the water line. This single drain will, as a rule, relieve all such lands, unless the valley is wide and flat. When such is the case, lateral drains must be laid to connect with the main drain, striking it not at right angles, but somewhat obliquely.

Draining in Michigan.

As long ago as 1867, a committee of the Michigan Agricultural Society, reporting on the subject of drainage, gave an account of the profits therefrom, the land in question comprising twenty-five acres of swale land, producing the coarsest vegetation—bog grass, flags, rushes and other worthless plants. About 2,400 feet of tile was laid, at an aggregate expense of $480. The grass product of the field the next season, after draining, gave $1,570; expense of crop, $541.25; drainage, $480; $1,021.25, or a net profit of $548.75. The second year the land produced crops of the value of $1,425; expense of crop, $550, or a net profit of $875, equal to a rent of $35 an acre, on land originally worthless.

The increase in value on arable lands, requiring only partial drainage to bring the whole into a homogeneous
state, will be fully as great, or greater, according to the outlay, since a comparatively small portion only will need drainage, often not more than one acre in ten of the whole farm.

**Illinois Experience.**

In 1875 Messrs. Spalding & Co., Riverton, Illinois, made a report to the Department of Agriculture at Springfield, Illinois, of the thorough draining of eighty acres of strong loam, the subsoil being strong clay and redish clay. The land drained naturally to the south, and was intersected by three low ridges. Most of the land was considered to be well adapted to ordinary farm crops, but the low lands were too wet for cultivation, and it was decided to drain the whole, wet and dry alike. Mains of five-inch tile were laid between the ridges, at a depth of three and one-half and four feet; laterals of two, three and four inch tile were laid to connect. The next season the whole was planted in nursery trees and plants of the varieties usually grown, including ornamental stock. As we have seen this nursery several times since, there was no seeking to find a good spot for this or that stock; the whole surface was alike dry and friable, and remains so, perfectly, to-day. The proprietors estimate that the value of the land has increased from one hundred to two hundred per cent. and Mr. Spalding assures us that wet seasons have fully proven the importance of drainage, since their success in producing stock of a higher character is fully apparent. There is no weak, indifferent stock from being grown on water-soaked land.

Mr. Patrick, of DuPage County, Illinois, is known as one of the best farmers in his section. He believes in drainage. Upon his farm there are many circular sloughs, or wet places, which retain water for a long time. He has adopted a plan of his own which has worked well with
him, and which will work well in all similar cases. The cut will illustrate his system of draining. It will also serve as a lesson to show the necessity of careful thought by the owner of a farm in deciding upon the plan which will prove most economical when only partial drainage is needed. He has to protect against seipage, and also to provide for draining the low places and carry away the water. Hence, he lays a line of three-inch tile (two-inch tile, as shown in the cut, will do, except in rare cases) entirely around the slough, with laterals between. In this case, the only question is, whether less tile will suffice to take the seipage according to his plan than to run the laterals far enough into the bank to take it in the usual way. He says the first crop after the tile was laid fully reimbursed the expense of draining, besides leaving him in possession of these drained acres, as being the most productive on his farm.

A Right and a Wrong Way for Open Drains.

In digging drains, there is always a right and a wrong way. An open ditch must have slope sufficient to its sides so they will not founder down from the washing of water or the action of frost. When they are intended simply for
carrying away superabundant water from beyond, they may be made entirely by the plow and scraper, and this also allows vehicles to be easily driven over them, and this surface need not be lost. With a little care, they may be made entirely by the plow and scraper, and this also allows vehicles to be easily driven over them, and this surface need not be lost. With a little care, they may be made entirely by the plow and scraper, and this also allows vehicles to be easily driven over them, and this surface need not be lost.

Then plow again and again, and scrape until the required depth is gained at the center. When considerable depth is attained, the chain to the doubletree must be lengthened. If the slopes to this carrier are harrowed to a good tilth, and a little fine manure spread on the surface, it may be seeded with red-top or other suitable grass.

When the landing along which this carrier is to be made is sinuous, or not in a straight line, the windings must be followed measurably, but every advantage must be taken to cut off the turns as much as possible, to bring it straighter. Here a little work with a spirit or other level may be advantageous, to discover how much may be cut off at the turns. These higher points may be deepened afterwards with the plow and scraper, to bring the fall as equal as possible. If a main under-drain is ever to be laid, this preliminary work will not be lost. You will be enabled to place the main deeply—an important matter—and the original carrier will serve to carry off the water of spring, or of heavy flooding rains, quickly and easily.

When, however, the declivity at certain points is considerable, and these carriers are deemed necessary, such places should contain stones, pebbles or brush, to prevent washing. In this way, carriers may sometimes be available as a surface out-fall for lateral under-drains; but, as a rule, the covered mains of tile are better and cheaper in the end.
When It Pays to Drain a Farm.

In draining a farm, the first thing to be done is to carefully go over the land and estimate the amount of drainage necessary to bring all the fields to one uniform state, so the low or wet lands may be rendered as dry and pervious to water as are the naturally drained portions. A rule, and a good one, is that any soil in which water will stand in a hole two feet deep twenty-four hours after a heavy rain, needs draining. While this is true, if the land is intended for wheat and all that class of plants requiring quick percolation of water, it will not apply in every case. Another integer comes in. The value of the land and the value of the crops to be raised must be taken into consideration. In one situation, where tillage land is worth forty, fifty or sixty dollars an acre, for the reason that a class of crops may be raised that will pay interest on these sums, lands too wet for the finer crops will pay for drainage; but in other situations, more remote from market, where the best lands are not worth more than five, ten or twenty dollars per acre, drainage would not pay. Hence, every man must be his own judge as to the advisability of draining, after all. Yet this does not falsify the statement, in the abstract, that all soils require draining where the water does not readily settle away from holes dug to the depth as stated. Hence the careful survey of the farm in order to estimate rightly the amount of drainage necessary.

Stock Water from Drains.

One advantage of under-draining is that the mains will often furnish permanent stock-water, where otherwise the supply would not be available, except from wells. When the mains are laid for considerable distances in long, sloughy valleys, or in valleys to connect one system of wet-
land drains with another, all that is necessary, when a drinking-place is wanted, is to excavate about the required place, the sides sloping equally to the required depth, and put in a water-box.

Another plan answering the same purpose is to excavate a passage down to a level with the top of the tile, and, say sixteen to twenty or more feet wide. A trough is bedded down in place of the tile, and covered so that only a space along the top is left sufficiently wide for stock to drink through. The water enters at one end of the trough out of the tile, filling it, and passes out at the other end by means of a waste pipe connecting with the line of tile below. These drinking places may thus be multiplied indefinitely, according to the necessities of the stock, and the longer the line of tile the larger will be the water supply.

Another plan entirely feasible is to allow the tile to empty into a pond, excavated at some suitable place, and of greater or lesser extent, according to what is required. If in a valley, select a spot where there are good banks on each side. But the point where the tile empties into the pond at the upper part must never be covered by the water of the pond. Hence, the dam at the lower end must be far enough away so that whatever the height of water at the dam at the lower end, the level will never reach up to within two inches of the incoming tile, else there may be stoppage from the collection of silt.

The Formation of Under-drains.

Tile should always be used if they can be had at not too great a cost. Where the cost is excessive various other drainage material may be employed, but, in all under-draining, the shape of the ditches is important. They should be as narrow as will allow a man to work in them, since it is a saving of labor in casting out and throwing
back the earth. In digging, except in such soils as will not hold themselves up, the sides may be carried down nearly straight until towards the bottom, which in no case should be much, if any, wider than the tile—not more than three inches for a tile of two-inch caliber—and still less proportionately for larger tile.

When a subsoil plow is to be used for loosening the earth in the drain, it should have but one handle, and be small enough so a light mule can work it. By passing back and forth several times, the soil may be loosened to a depth easily worked with a shovel. A small mule will work in a space of sixteen inches wide, with a little practice, and when this plan is adopted a passage must be left at suitable intervals, so the animal can reach the surface to turn around. This may be governed by the length that can be worked in a day, the mule plowing one portion while the hands are shoveling out another.

When the work is to be done entirely by hand, or, at least, except the first eighteen inches, the cut here given will show the least width proportionately that may be used; but this only by the most expert drainers, with narrow tools for bottoming. However wide the top may be started, and carried down, the last spit, at the bottom, must conform to the width of the drain-tile or other drainage material to be used.

**Various Means of Drainage.**

Nothing but tile should be used, where they may be had, unless in the case where stone lies on the surface of the soil, and which must be gotten rid of. But it may happen that drainage may be necessary where tile must be carried long distances, and thus cost too much. Again, in the draining of orchards and woodlands the tile are apt to become filled with the roots of the trees. Thus, stone,
poles, slabs, and in very tough soils shouldered earth-drains may be used. Hence we give representations of several forms, to meet every case.

For orchard drainage and woodland drainage where stone is plenty, the ditch may be filled with stone to within twenty inches of the surface, if necessary. In woodland, nearly to the surface. Where brush is plenty, it may be tied in small bundles and laid regularly in the drains, the larger ends pointing down, to form a waterway. That is, the inclination of each succeeding series of bundles should be laid one on another, that the larger ends will point downward to the mouth of the drain, each successive layer being covered by the succeeding one. Here again the draining may be filled to within twenty inches of the top, with brush, well tramped down, which the intelligence of the operator should soon enable him to accomplish deftly.

**Lands Requiring Drainage.**

The expense of thoroughly draining land three feet deep will be from sixty to one hundred dollars per acre, varying according to cost of labor, tile and the obstacles to be encountered in prosecuting the work. Since, then, this represents a permanent work, it is capital employed. Thus, any person may figure what lands will or will not pay for drainage, according to the interest required on the investment. If the increased crops will pay the interest on the outlay, draining will pay. With corn at forty cents per bushel, fifteen additional bushels per acre in yield will pay the interest on one hundred dollars. If wheat is worth one dollar per bushel, an additional yield of six bushels per annum will pay the interest. There is no wet farm where it will not pay more than this. If but a small portion of the whole land requires drainage, the economy of draining will become more and more apparent; for, while a farmer
might not be able to drain an entire farm, any farmer can, from year to year, drain field after field, until soon the drainage will render the wet portions of the soil as good, or better, than the naturally dry portions.

Lands requiring draining:
1. On general principles, as heretofore stated, any land should be drained where the water stands in holes two feet deep twenty-four hours after a soaking rain.
2. Any soil that in winter or spring becomes water-soaked, so that plowing may not be carried forward twenty-four hours after a heavy rain, or where the soil remains wet during forty-eight hours of dry weather, after the frost has completely left the ground.
3. Any meadow or pasture that becomes packed from the treading of stock forty-eight hours after a heavy rain, or that remains soft after the frost is out of the land; for it must be remembered that none of the superior grasses flourish on wet soil. Moist soils they like, and a drained soil is always moist. Again, grasses do not root below the standing water line; they do, however, root deeply where the land is either naturally or artificially drained. Hence, draining will allow this deep rooting. The low-land vegetation will disappear, and the superior grasses will take their place.
4. Drainage prevents surface washing. Water falling on a soil, if it be sufficiently porous, sinks directly down until it finds the point of continual saturation, or of absorption by the soil. However steep the hillside, this is constant, so long as the rainfall is not greater than the power of absorption. For the reason that drainage renders the soil friable and porous, it absorbs the water, and hence, one reason why in time of drought it retains moisture. Every drop of rain or dew assists the deep reservoir of friable earth beneath, and the hydroscopic water of the atmosphere is constantly being separated in the minute cavities of the soil.
5. Drainage assists all low places or swamps; in fact, all soils where the plants named in the next article flourish.

**How to Know Lands Requiring Drainage.**

M. Barrel, author of a great French work on drainage, has put this so tersely and graphically that we give a translation. The author says: "Whenever, after a rain, water remains in the furrows; wherever stiff and plastic earth adheres to the shoes; wherever the foot of man or horse makes cavities that retain water like so many little cisterns; wherever cattle are unable to penetrate without sinking into a kind of mud; wherever the rays of the sun form on the earth a hard crust, slightly cracked, and compressing the roots of plants as in a vice; wherever, three or four days after a rain, slight depressions in the ground show more moisture than other parts; wherever a stick, forced into the ground eighteen inches deep, forms a well-like hole having standing water at the bottom; wherever tradition consecrates, as advantageous, the cultivation of lands by means of convex, high, large ridges." In all these the author affirms that drainage will be advantageous. How many farms are there where, on large portions, cultivation cannot be had at all, and yet the owner, perhaps, might scout at the idea of drainage; in fact, would insist that it would ruin his land? It would be, in fact, the only salvation of the farm gradually being ruined by having to be plowed when out of condition.

**TWELVE PROPOSITIONS.**

The late John H. Klippert, one who united practical knowledge to an active, observing mind, in a chapter on soils and their properties, discusses the advantages of under-draining, so far as theory (not hypothesis) in its proper sense is susceptible of demonstration, and asserts the following twelve propositions:
1. That drainage removes stagnant waters from the surface.
2. It removes surplus water from under the surface.
3. It lengthens the seasons.
4. It deepens the soil.
5. It warms the soil.
6. It equalizes the temperature of the soil during the season of growth.
7. It carries down soluble substances to the roots of plants.
8. It prevents "heaving out" or "freezing out."
9. It prevents injury from drought.
10. It improves the quality and quantity of the crop.
11. It increases the effects of manures.
12. It prevents rust in wheat and rot in potatoes.

A GOOD TEST.

While this is all correct as a rule, as applying to soil, it is none the less true that it applies only to soils requiring drainage, and a good and safe rule as to whether a soil really does require drainage, is, that it does not come into condition for working soon after heavy rains. If a soil does not free itself perfectly from the plow-share, and fall friably therefrom in plowing within forty-eight hours after a saturating rain, it requires draining to reach the most economical results in tillage. The only question then to be decided is, whether the crops to be cultivated will pay the interest on the sum invested. There is really but little land in the West, comparatively speaking, but would be better for draining.

Importance of Drainage to Stockmen.

Those interested in breeding and rearing stock might, from a superficial view of the subject, suppose that to them the drainage of the soil was of little importance. Not so. It is of fully as much importance to this class as
to any other class of farmers. The mere lengthening of 
the season for a week or ten days in the spring, and the 
same length of time in the fall, is a most important matter, 
since it shortens the winter, and, consequently, the fodder-
ing of stock for the same length of time. The more 
important question, however, lies here; that while wet soils, 
and even the worst marshes, will bear plants, and even 
grass, yet it is not such as will be eaten by stock, unless 
they are starving. Again, upon wet land, when the supe-
rior plants, as bluegrass, orchard grass, red clover, etc., will exist only on the higher portions, and then perhaps 
not in the highest perfection, or where they may be found 
growing generally over the field but sparsely, the loss to 
the value of the pasture is immense.
RURAL ARCHITECTURE.
Building According to Means.

However small and rude the beginning of a country home may be, the house and barn should be so planned that additions may be advantageously made, or else they must be so placed as not to interfere with the erection of better structures when increasing wealth shall allow. Our aim is to give directions for the erection of simple buildings, of a cost not exceeding $1,000, that any intelligent person can understand, and any carpenter build, without the aid of an architect. For a house costing over the sum named the fees of an architect will be money well spent, and in the end an economy, since he should be able to save the builder more than he will ask for the working plan.

We will, however, present a few designs for more elaborate dwellings, and would give the following as general
directions: Farm-houses should always be of solid and substantial appearance, avoiding florid and useless ornament. Land being cheaper than in towns, it is well to use it freely; do not build tall and narrow structures, which are always unsightly, and give unnecessary stairs to climb. The farm-house should be roomy, with high ceilings, solid and cheerful. When the means of the owner will allow, let it be imposing.

When to Build.

We repeat, never undertake a building until you have more than enough money to finish and to furnish it. It is far better to occupy the old house a year or two longer, or to add a cheap shed or two, for the time being, than to build a new house or elaborate barn on borrowed money. It may be necessary to borrow for the building of the first house; never for the second, unless storm or fire has destroyed your home.

When to build, then, is when you have the money to
do so, or can get it by the sale of surplus crops or stock. If you have more land than you can work to advantage, it may be wise policy to sell a part, to make your home comfortable.

The Provident Farmer's Marriage Settlements.

The man who adds farm to farm, and lives in a hovel, is neither a good citizen, a good father nor a good farmer. Let us speak unto you a parable: A certain man had a farm, which he thought he worked well. So thought his neighbors. To him were born three children. When the first of these married, one-quarter of the farm went as a marriage portion. By industry, the father raised as much on the three-quarters as he previously had on the whole, and was well satisfied.

Another child married and received a like portion to the first. Improved implements of cultivation, he found, to his surprise, still enabled him to live as well as ever.
The last child, a daughter, was to be married. "Ah, wife," said the father, "the child must have the same portion as the others. How shall we, in our declining age, live on the produce of the quarter of the farm?"

"We are but two," replied the wife, "and shall want but little. The new implements, the enriching of the soil, and the draining, gave us as much from the half as we once had from the whole. Increase the dressing, drain more thoroughly, plow and subsoil still deeper, cultivate yet more faithfully, exchange the poorest of the stock for pure breeds, and see what that will give."

This was done, and the third year thereafter surprised the farmer with more money as the result of his labor than he had ever received from the whole of the original acres of the farm. The application will serve him who intends to build a new house, and has not money enough, but does possess salable surplus land. A half-tilled farm and fine buildings do not go well together.

How to Build.

Whatever the structure, careful calculation will show its cost in the amount of excavation, stone, brick, cement, sand, lime, timber, scantling, joists, lumber, shingles, nails, sash, glass and labor. The farmer, perhaps, cannot calculate all these; the architect can, and any master carpenter should be able to do it, if the size of the structure, and the money to be expended are stated. Whatever you build, build will; that is, substantially and of good material.
Sound knotty lumber is as good as clear, where it is covered up. Unsound, shaky lumber should be used nowhere.

Special care must be taken that the bricks are firm and well burned. If the clay is of poor quality, or not well burned, the bricks soon crumble and shell. They are not only unsightly, but are costly in the end, and often dangerous. The cost of walls too thin for their purpose is always money wasted. As in draining, the value of the whole

work is estimated by the quality of the tile, and the poorest tile laid; so in brick or stone work, the value of the wall is in the quality of the material, the integrity of the mortar, and the honesty of the work.

There is a right and a wrong way to lay stone walls. Hence, it is not economy to employ a contractor simply because he is cheap. His work may be as bad as his price is low. Any man, by intelligent observation and study of the plans and specifications furnished, may be able to judge how the work is going on.

How to build, then, may be summoned up thus: Build according to your means. Whatever the structure, use
good material; it is cheapest in the end. Have the work carefully planned, and then see the whole carried out properly.

What to Build

Whatever you build make it comfortable. Remember that the house is woman's kingdom. Therefore, consult her. You sleep and eat there; she lives her life almost wholly within doors. None understand the arrangement of the rooms, pantries, closets, dressers and drawers so well as she.

Every farm-house should have a dairy-room, distinct and by itself; a bath-room, for cleanliness is health as well as comfort. When water cannot be brought direct from the wind-mill tank, it is easily supplied by a small force-pump and pipe leading to the cistern. Remember the woman who is obliged to cleanse the hard water of the well; and save her useless labor by providing the necessary cistern for soft water. If nothing better can be had, two or three oil hogsheads, first thoroughly cleansed, may suffice, but never forget the permanent cistern when building the new house.

Taste and Judgment in the Details.

It is folly to build a house larger than you require, or to have the rooms unduly large, unless your means will permit the hiring of necessary servants to keep all in order. Many a woman on whom the unaided work has fallen has been made prematurely old through such slavery, and often is herself to blame. Do not hesitate to spend money in making both the outside and the inside of your house pleasant to the eye.

Do the doors touch on top or bottom after the new house has been built and furnished? Do the walls crack?
In either case you have been neglectful or have been deceived; the foundations are unsound. Does the wood-work shrink? You have used green lumber instead of dry. Do the windows rattle or let in drafts of air? It is from the same cause. Does the water enter to discolor walls and ceiling? The siding or the roofing is to blame.

If you have a carefully written contract, and the builder is responsible, you can, perhaps, recover after a tedious lawsuit. It is better not only to have a carefully written contract, but also to watch how the details are carried out. If you have deliberately cheated yourself in refusing to pay for honest material, you are not to be pitied. The pity should all be given to the wife and children of the family, who really are the chief sufferers.

Where to Build.

So build as most economically to serve the various uses of the farm, and at the same time obtain, if possible, a view of the surrounding country. The farmer has the whole farm from which to select a building site. If he dumps his house and other buildings down next the road, only because it is a road, he shows bad judgment. If he builds upon a pinnacle simply because it is high, or in a hollow alone, because the wind cannot reach him there, he makes a great mistake. One should take into account, in carefully estimating the value of a building site, central situation on the farm, freedom from exposure to the full effects of the wind, air and elevation in relation to healthfulness, and the advantages to be obtained from perfect drainage; the adaptability of the site to the proposed farm buildings, and the economy of the water supply. All these must be duly weighed, and they are often difficult of solution. If the doubt is of drainage or of roads, the surveyor should be able to advise; if in relation to the house, the architect
should be consulted. Take counsel, also, of a landscape gardener—we mean a real landscape gardener, one who can look far beyond the simple details of planting and decoration, by taking the natural beauties into account, and the proper means for heightening them.

The Water Supply.

If a stream runs near the site of your house, have the necessary levels taken to find if water can be, by gravity, conducted in pipes to the homestead. If so, the advantage will be great. Besides the comfort, there will be water for the stock, and beauty be obtained in the future, by a pond and fountain. If this natural supply cannot be obtained, you must depend upon a wind-mill and wells for stock water, which same mill may be so arranged as to force soft water to the house from an ample cistern at the barn. This cistern should be in two parts, with a filter between. It is only a question of the first cost, and the necessary pipes and faucets. The reservoir-cistern may be in the barn or
other building that will furnish the necessary head. Water will rise, in a pipe, to the same height as the "head," as the elevation of the source of supply is called, but many persons suppose that it may be thrown, in an unconfined stream, to the same height. This is a great mistake, for the jet of a fountain never springs as high into the air as the reservoir which supplies it with water.

House Drainage.

Drainage is most important. It must be perfect. The pipes and mains conducting the house drainage should not

only be of ample size to prevent choking, but have the best possible traps to prevent foul gases from rising back into the building. These pipes must be so arranged that they can be "flushed out" with water when necessary. The cellar drains, when these are necessary, and the out-going main may be of tile, providing they do not connect with the other house drainage; if they do, a strong trap must be used where the drain-water of the cellar empties into the
house main. All other drains should be water-tight at the joints, and as a further precaution, a soil-pipe, perfectly tight, should lead from the bottom to at least four feet above the highest portion of the roof. This pipe connects at or near the bottom with the pipe service of the house. It is indispensable to carry off the effluvia which always collects in confined places.

**Ventilation.**

No less important is ventilation. It is true, in the country, where the air is pure, ventilation is not so serious a matter as in the city. Windows may be raised and doors left open in summer; but this is, at no time, the best way for the general ventilation of buildings, and in winter is not to be thought of. In the winter proper, ventilation is difficult. An architect who does not fully understand this question and the best means to be employed, has not wholly learned his business. Do not hamper him here with objections as to cost. However elaborate and expensive the structure, money stinted in ventilation and drainage always proves a costly error. A leak, however slight, in the soil-pipe will, perhaps, let out death to the family. If the earth within, or near, the foundations of the house becomes saturated with the drainage, the germs of low malarial fevers, and all that class of diseases, are scattered through the house. Do not believe, because your nostrils are not offended, that there is no danger. The most deadly miasma often gives no indication to the sense of smell. So with ventilation. There should be some system by which the air vitiated by breathing, and other emanations of the body, may be freely carried off. Do not employ an ignorant man, who professes to be an architect, because he works cheaper than a master of his profession.
Building Material and the Builder's Art.

Building Material.

A MAN who is going to build must consult, not only cost of materials and labor, but be governed by many circumstances. Good burned brick are the most lasting of all things used, and where abundant, are often the cheapest in the end. In some regions of the far West, "adobes," or unburned brick, are used, and if the roof projects sufficiently to prevent rain reaching the walls, and if between the ground and the adobe walls, stones, hard-burned bricks, or even planks saturated with bitumen, tar or rosin are laid, these sun-dried bricks last well. As in many places they are the only building material easily obtainable, we give directions for making them. Adobes, if protected as we have indicated, answer for any required structures, in regions where fuel for burning brick is difficult to obtain, and they are especially useful for temporary buildings, to be used until better material can be had. The adobe may be made from clay containing limestone or other small gravel, which would render it unfit for burning, but the more tenacious the clay, the better will be the wall. In making any brick, it is better that the clay, when dug from the bed, be well "weathered," to break down and disintegrate it before using, but less so for the adobe brick than that clay which is to be burned.

How to Make Unburned Brick.

The clay is put into a pit and brought to the proper consistency for treading. Two bundles of straw cut into six-inch lengths, are added for each one hundred brick.
The mass is then thoroughly trodden by cattle, after which it is formed in molds of plank, whose bottoms are not air-tight. These molds are twelve inches long, six wide and four deep, inside measure. They must be well sanded as emptied before being again filled, which filling is prepared by hand, and the surplus clay struck off by an iron "straight-edge." When taken from the molds the adobes are set upon edge on the drying ground, and the second day turned over. In three days they should be dry enough to pile under cover, and are then left for two weeks or more to "cure."

Building the Wall.—The walls of the building are laid in alternate courses of "headers" and "stretchers." "Headers" being brick laid endwise to the weather. "Stretchers" are brick laid with the side to the weather, that is, to the outside of the wall. The brick, being one foot long, determine the thickness of the wall, and the first course should run through. In carrying up the wall, joints must be broken, not only as regards layers of "stretchers," but with the "headers" also.
A Pretty Rural Home.

This house is adapted to a family of moderate means, doing business in a city and living in the country, or for a well-to-do business man or retired farmer, with small family, in a suburban town.

Specifications of Farm and Other Buildings.

It will not be necessary to enter into any detailed statement as to the construction of buildings, farther than what has been made heretofore. The illustrations and definitions, except so far as may be necessary to show how changes might be made for the better, will be all that will be necessary. In the illustrations we begin with the simpler and proceed to the more elaborate, for the reason that the majority want simple structures, and here will be the proper place to give the general specifications: First, for an ordinary modern building; and, second, for those for a first-class building of brick with stone foundation. Many items specified are not needed on the farm, but are necessary in suburban and other houses. In these we have followed, in a general way, the comprehensive and elaborate directions as given in a valuable, complete and costly practical architectural work, known as "Palliser's American Country Homes."

Outline of Specifications for House of Wood, with Stone or Brick Foundations.

Dimensions.—Drawings and details must be accurately followed according to the scale given, and preference must always be given to the scale rather than to the dimensions. The building must be in exact proportion and in size as shown on the architect's plans, and as figured in the drawings—as, for instance, height of cellar, first floor, kitchen,
second floor over main part of house, height of second floor over kitchen, third floor, etc., always in the clear, and built in exact accordance with the plans and specifications.

Note.—In the specifications, in some instances, we shall give size, quality and dimensions as being appropriate for buildings of two stories. Where blanks are left they are to be filled with figures and names as required. The whole being intended for what is known as a balloon-frame, to be still further treated of hereafter.

Suburban or Farm Cottage.

This is a tasteful, economical and cozy cottage, adapted, in point of architecture, to a rolling or hill country. The hall is to be used as a sitting-room or parlor, and the front bedroom may be converted into a library. The kitchen and living room is $18\times12$, and the rear building combines a wood-house, laundry and water-closet. The rooms are nine feet high in the clear, and whether built of wood,
brick or stone, the house is handsome. The upper story has two feet of perpendicular wall, which, with the sharp roof, gives plenty of air, and may contain two large sleeping-rooms of unequal size, each lighted by a handsome side window, and one of them by a dormer.

**Masonry and Mason’s Work.**

Excavating.—Do all necessary excavating required for cellar, area and foundations until firm and solid ground is reached, and always be entirely certain to go deep enough to be beyond the reach of frost.

Stone Work.—Build the foundation walls sixteen inches thick, of good, flat stone, of firm bed, well bonded through the wall, laid up in clean, sharp sand, lime and cement. Mortar made in the proportion of one part of cement to two of lime. Lay by, and full to, a line on the inner face, the joints of which must be flushed and pointed at completion. Put like foundation under all piers, chimneys and exterior steps.

Drains.—First quality cement drain-pipe, as per plan, are to be connected, if in a town, with the sewer; or in the country, a drain built for the purpose, and these pipes must be properly graded and trapped and the joints cemented tight.

Underpinning.—From the top of the stone wall, at grade level, extend up two feet in height with eight-inch wall of best hard-burned brick, and clean, sharp sand and lime mortar; face walls with selected brick of even color, laid in red mortar, close joints, jointed, properly cleaned down at completion, and finished with black joints, window-sills of (state the kind of stone).

Piers.—Build piers in cellar, as shown in the plan, of best hard-burned brick, laid in clean, sharp sand and lime mortar, and cap with flat stone the size of piers.
Chimneys.—Build chimneys as shown, plastered on inside and out, furnished with proper stove collars, and with ventilating covers where required; turn arch to fireplace, and turn trimmer arch under hearth; hearth to be (state the material of hearth) bedded in cement. Top out the chimneys above the roof, as shown, with selected brick in like manner to underpinning.

Lathing.—All stud partitions, ceilings and work that is furred off, on first and second floors, to be lathed with (state kind of lathing), and joints to be broken (state how the joints are to be broken, as, for instance, every tenth lath).

Plastering.—All walls, partitions and ceilings, throughout first and second floors, to be plastered, one coat of
brown, well-haired mortar, and finish. State whether white, hard, or other finish is required. All walls to be finished straight and plumb. All angles to be maintained sharp and regular in form, and the plastering in all cases to extend to the floor, ceiled surface, or base board, as the case may be.

**A Convenient Cottage.**

This house combines convenience with utility and economy of space. It may be cheaply built, for the reason that there is no costly ornamentation. This, however, may be added outside and in, for it is the finish of the average house that costs money. It will be seen that while the halls are large enough to be convenient, all that can be spared from them has been added to make the rooms more spacious. The opening, usually filled with folding doors, is eight feet square, making the parlor and dining-room a large salon, thus greatly adding to the hospitable look of the house, and giving large space. The stairs, enclosed between two walls, are more cheaply built. Each room has a closet, and with one exception, has straight edges. The house is ten feet between joists on the first story and nine feet above; the plan also provides for a cellar and stone cistern.

**Carpentry and Carpenter Work.**

Timber.—All timber must be put together in the most substantial and workmanlike manner known to the trade. State of what kind of wood all timber is to be, when not otherwise specified. This is important, since in every locality there is much inferior material.

Framing.—State the kind of framing. If a hollow frame, as follows: The frame to be what is known as a
hollow frame, well nailed together; second floor girts to be notched into and well spiked to studs. Do all necessary framing around stair-ways and chimneys, properly mortised and tenoned together.

Frame Timber.—The size must be carefully stated, and also the kind of material. The following may represent that for an ordinary sized two-story house: Girders, 4x6 inches; sills, 3x7 inches; posts, 4x5 inches; girts, \(1\frac{1}{4}\times 4\) inches; plates, 2x4 inches, doubled and well spiked into ends of studding; first-floor timbers, 2x8 inches; second-floor timbers, 2x6 inches, all to be six inches apart, from center to center of timbers; header and trimmer beams, 3 inches thick; roof-rafters, 2x5 inches, by 24 inches to centers, apart; door and window studs, 3x4 inches; intermediate studding, 2x4 inches, and 16 inches each to centers; studdings in partitions, 2x3 inches, and 16 inches each from center to centers; veranda sills and cross sills,
3x6 inches; floor timbers, 2x6, and 20 inches from centers; plates, 4x5 inches.

Bridging.—Bridge floor timbers with 1x2 inch cross-bridging, properly cut in between timbers, and nailed at each end with two ten-penny nails.

Furring.—Fur overhead on rafters for rooms on second floor, and also any other furring required.

Sheathing.—Cover all sides of the frame with tongued and grooved boards, not to exceed six inches in width, and nail through each edge to every stud with ten-penny nails.

Lumber.—All lumber must be of white pine (unless otherwise specified), free from knots, shakes and other imperfections impairing its strength and durability. Water-table seven-eighths of an inch thick, furred off one inch and capped with a leveled and rabbeted cap for clapboards to lap. The corner boards, casings and bands to be one and one-quarter by six inches, bands to be rabbeted top and bottom for clapboards and beveled on top.

Clapboarding.—All sides to be covered with clear pine clapboards four and one-half inches wide, nailed with eight-penny box nails, and to have not less than one and one-quarter inch lap, and underlaid with water-proof sheathing felt, which also place under casings, water-table, etc., so as to lap and make a tight job.

Cornices.—These are to be formed on three by five-inch rafter feet, spiked on to a rafter at plate; gutter formed on same and lined with tin, so as to shed water to points as are indicated in plan. Plancier to be formed by laying narrow pine matched boards, face down on rafter feet, large boards two inches thick and as shown, and all as in the detail drawing.

Window-Frames.—These are to be made as shown in the drawings. Cellar-frames of two-inch plank rabbeted for sash; sash hinged (or not, as the case may be), and to have suitable fastenings to hold open or shut; all other
sashes to be double-hung with best sash-cords and cast-iron weights, and to be glazed with best sheet glass (or other, as the case may be); also, specifying the number of sash and size of lights. Also, state thickness of sash. All sash to be made of best clear, thoroughly-seasoned pine. Window sills to be two inches thick. (For ordinary windows one and three-eighths inch is the usual thickness.)

Blinds.—State whether blinds are to be outside or inside, and of how many folds. Outside blinds should never be used where they can be avoided. All wood work should be primed with best white lead and linseed oil, as soon as exposed to the weather.

Door-Frames.—Outside door-frames of plank, rabbed, and furnished with 2-inch oak, or other hard-wood sills.

Porches.—These vary much in character. They should be constructed in accordance with the detail drawings, including columns, rails, newels, panels, etc.; steps should be 1 ½ inch thick, with ¾-inch risers, to have cove under nosings; floors laid with 1 ½ x 4 inch flooring, blind-nailed to beams; the joints served with white lead; ceiling to be ceiled with narrow-beaded battens of even width and molded in angles.

Roofs.—Cover all roofs with best sawed pine shingles,
laid preferably on roofing boards, solidly nailed to the rafters. If laid on strips, these may be 1x2 inches, nailed to the rafters with ten-penny nails. The shingles to be laid to break joints, nailed with white-metal nails, two to each shingle, the nails to be well covered by the succeeding lap, to make a perfectly weather-tight roof. It pays to paint shingles with mineral paint before laying.

Floors.—Kitchen floors are better laid with three or four-inch wide ash strips seven-eighths inch thick. Sound yellow and Georgia pine are next best. The principal floor of the house should be laid with best pine flooring, 1x6 inches. The second floors of seven-eighths inch pine, 6 inches wide. All floors to have joints broken, to be well driven home, and securely blind-nailed. Kitchen and other floors requiring mopping and scrubbing, are better if the flooring is paved with white lead, to make it water-tight.

Partitions.—All partitions should foot on girders, and have 3x3 inch plates to carry second floor; all angles formed solid, and all partitions bridged at least once in their height; The grounds to screed plaster to should be seven-eighths inch thick, and left on.

Wainscoting.—Wainscot walls for kitchen, when used, may be three feet high, if with beaded battens; if not, of 7/8-inch flooring, well driven home, and blind-nailed. They should be furnished with beveled and molded cap.

Casings.—These must be described in detail; the following will serve as an example: Casings in front hall and living-rooms—to be cut and stop-chamfered—1 3/4 x 6 inches; all doors and windows elsewhere to be cased before plastering with 7/8-inch casings, and finished with a 7/8 x 3/4 inch band mold. Put down 7-inch beveled base in front hall and bed-rooms after plastering; door jambs to be 7/8 inch thick, rabbeted for doors and headed on edges; windows to be finished with neat stool and apron finish.

Doors.—State whether the doors, and which of them,
are to be panel, sliding and sash doors. Sash doors are used for entresol, and sometimes for outside doors. Six-panel, ogee, solid molded doors are usual for inside single doors. Saddles of doors should be, preferably, of hard pine.

**Stairs.**—Cellar stairs should be of plank, without risers; second-floor stairs, 1 ¼-inch tread, ¾-inch risers, properly put together and supported.

**Sinks.**—Ceil up under sink with narrow beaded work to match wainscoting; hang doors for closets underneath; place appropriate hooks; ceil up splash-board, 16 inches high, and place drip-board.

**Pantries and Closets.**—Pantries should have a counter shelf and at least four shelves above, with appropriate pot hooks beneath counter shelf. China closets with counter shelf, drawers underneath, and appropriate shelves above. Wardrobe closets, to be fitted up with shelves, double wardrobe hooks, on molded strips.

**Door Furniture, etc.**—The door furniture must correspond to the specifications and drawings. Locks: mortise locks, brass fronts and keys, with stop-locks and shover-bolts for all outside doors. The stops should be of hard wood with rubber tips; hinges, of loose joint, but of size and strength appropriate to the doors.
Mantels.—These may be of marble, slate, pottery, or of hard wood, according to the nature of the building.

Cellar.—The partitions may be of brick or of wood (brick is best), divided into rooms, with suitable doors, and furnished with shelves, bins and other fixtures, according to the necessities of the case.

**Painter's Work.**

All wood-work, outside and inside, should receive two coats of the best white lead and raw linseed oil. Accept nothing adulterated. Paint that remains sticky, and is affected by atmospheric changes, is a nuisance. Clapboards should be painted in some light neutral colors, with darker trimmings. Grain the wood-work in kitchen in oak or maple, inside blinds, doors, etc., preferably in imitation of some light-colored handsome wood; bed-rooms are best painted in one color; chamfers and cut work should be picked out in appropriate colors. Paint the roof a dark-slate color; tin work, Indian red or other rather dark color. The whole to be in accordance with the design.

**Tinner's and Plumber's Work.**

Tinning.—All tinner's work should be of the best material, soldered in rosin; gutters lined with tin, tin leaders to convey water from gutters to grade level, to be firmly secured to the building, and to be graded in size to correspond to the amount of water to be carried.

Sinks.—These should be of cast-iron, to be supplied from five-eighths inch tin-lined lead pipe, with five-eighths inch brass cocks; waste-pipes two inch, of cast or wrought iron, gas-tight, properly caulked at joints if of cast-iron; if of wrought iron, the pipes must be screwed tight, the joints first payed with red lead, trapped and closely connected.
with the drain; the waste-pipe to extend through the building and above the roof for vent. All water-closet (if any) and other drain fixtures to be according to the best scientific skill.

In conclusion, we repeat, that all work of whatever kind must be in accordance with the specifications and design, in all the departments. Hence the importance of a specific contract and an honest architect.

School-house and Church Architecture.

On the principle that every building should be adapted to the use for which it is intended, there would seem to be
room for improvement in our public buildings in all our smaller cities and villages. The great mistake is in the failure to provide ventilation, correct acoustic facilities, perfect heating arrangements, comfortable seats, and ready egress in case of panic from fire or other accidental causes. In country districts the school-house is always the place of holding caucuses, society meetings, clubs, singing societies, public amusements, and often it is used on Sundays as a church. Hence it should be the best building in the neighborhood; not only built in the best manner, but pleasant in its surroundings. The lot should not be less than a full acre in extent, thoroughly and substantially fenced, carefully planted with trees and shrubbery, and, except the play-ground, laid out with walks and flower-beds and ornamented with flowers. The situation should be commanding, on high or well-drained land, near a public highway, and as near the center of the district as possible. Then, if the teacher have taste and practicality, and the trustees business discretion and firmness, the place will become one of the most attractive in the neighborhood, and all will work together in keeping it so.

Rustic Seats and Summer-Houses.

The garden and lawn are incomplete, if not supplied with some kind of seat, and when these have to be bought, there is such an infinity of designs to select from that all may be satisfied according to the contents of the purse. The charm, however, of all these ornamentations, whether of shade or comfort, is their rustic character. Here is one rustic enough, and at the same time, comfortably arranged for a tete-a-tete.

One of the prettiest effects we have ever seen was an elegant summer-house of woven wire, appropriately situated on a fine lawn, shaded here and there with large trees, and planted with shrubbery, a cut of which we give.
What do you suppose, dear reader, was contained within this summer-house? As surprising and as pleasant a thing as a school-yard, with trees, walks, flowers and a rustic summer-house. It was neither more or less than the veritable stump we have illustrated, with a rustic seat running all around it. The ladies voted it positively delightful—in fact, "too cute for anything." But every person has not the bank account of our friend of the elegant summer-house, who first had to buy the stump and pay railroad transportation on it. It is not necessary, as the preceding elegant designs will show. Anybody who can peel bark in June, lay it under pressure to dry flat, and cut and fit the pieces, can build either of these two elegant designs that we give
herewith out of many we have seen. Why not try? There is nothing of either of them but bark and poles, not even the furniture.

It is not necessary to describe how to do the work. In fact, the illustrations are the best description that can be given. It is simply a matter of taste, ingenuity and judgment. We think the circular house especially fine, particularly in its light and graceful appearance, added to by its roof of bark cut in scallops, and by its center-table and seat, covered with bark. It is surprising how many fine combinations of color may be gotten entirely out of bark.

**Grouping Farm Buildings.**

The barn will often contain the grainary, sometimes the horse-stable, and perhaps even the cow-stable. By this arrangement, there is saving in the original cost of the barn-yard buildings, with the further advantage, that the feed is always at hand. On larger farms, the same plan is,
in a measure, followed. There may be separate buildings for each kind of domestic animal, for horses, for cattle, for sheep and for swine, but each of these should contain a supply of the necessary food. Some of the most complete barns have the stables for cattle in the basement, the horse-stables on the main floor, mills for grinding feed, cutters for hay and straw, pulping machines for roots, and the silos connected with the barn by a covered passage. There should also be a steam engine, for driving the machinery and

![Western Corn-Crib](image)

for pumping water, when this cannot be brought in pipes from higher ground. This is true economy, however many structures may be needed for surplus produce.

### Granaries, Corn-Houses and Corn-Cribs.

The typical corn-crib of new countries is simply a pen of rails carried up ten feet. It may be either square or flared toward the top; it generally has only a rail floor and is often left entirely open to the rain on top. This certainly is a wretched way to keep corn, when the first intelligent thought would suggest a covering of rails and hay. A step in advance would be something like the illustration,
which, only carried up seven feet, may be extended nine or ten feet.

Such a crib six feet wide will keep corn as well as the best, and will be secure from rats and mice if an inverted pan, or flat stone is placed on top of the posts, next the crib, the posts being two feet high. If the corn is not dry when put in it may mould in a six feet crib in open, moist winters. This may be prevented even in cribs nine feet wide—a not unusual width for the great store cribs of the West—by placing a $\Lambda$-shaped ventilator four feet wide at the bottom and half the height of the crib, running to an apex at the top. This is made of five-inch fence boards, with spaces of five or six inches; and very little corn will drop through. It gives a free passage of air from end to end, and circulating through the corn above.

Glossary of Scientific Names Used in Architecture.

Abacus.—The upper member of the capital of a column, on which the architrave is laid.

Abutment.—Masonry, earth and timber, at the end of a bridge, or the solid part of a pier supporting an arch.

Arcade.—A covered walk along the side of or within a building, with columns on the outer edge, supporting arches.

Arch.—A curved, self-sustaining structure, supported by the key-stone and abutments; the beginning of the arch
is called the spring of the arch; the middle, the crown; the distance across, the span; and vertically, the height.

Architrave.—The lower of the three members of the entabliture, resting immediately on the columns.

Astragal.—A small molding, with semi-circular profile, as an ornament on the top or bottom of a column.

Attic.—The upper story or garret of a building. An attic base is the base of a column, with double moldings.

Balcony.—A projection from the exterior wall of a building, inclosed with a railing, usually placed before a window or glass door in the second story.

Balloon Frame.—A strong frame made with few mortises and tenons, spikes and nails holding all firmly together.

Baluster.—One of the upright portions of a railing, mis-called Banister.

Balustrade.—A range of balusters, connected by a rail on the top, and commonly called a railing.

Banister.—See Baluster.

Barge-board.—The projecting board placed at the gable so as to hide the horizontal timbers on the roof, more properly called verge-board.

Batten.—A narrow strip of board, for covering the exterior joints of vertically-boarded buildings. A batten-door is made of boards, with battens nailed on across them as stiffeners.

Battlement.—A wall on the top of a building.

Bay.—The space between posts or buttresses; in barns a low space for storing hay.

Bay Window.—A window, curved or angular, set in an exterior projection from the walls of a house, and having its base on the ground.

Bead.—A molding whose vertical section is semi-circular; a molding ornamented like beads.

Bearing.—The span of a beam or rafter, or that part which is without support.
BOND.—Mode of laying bricks or stones, to break the joints. When the stretchers and headers, as they are called, are in alternate and separate courses, it is termed English bond; when alternately in the same course, Flemish bond.

BOND-TIMBER.—Timber laid in a wall horizontally, for tying it together.

BOUDOIR.—Private ladies' room, for calls, dressing-room, etc.

BOX-SHUTTERS.—Shutters folding into cases.

BRACKET.—A support for shelves, stairs, balconies, projecting roofs, etc.

BREAST OF A CHIMNEY.—The contracting part of the back, opposite the throat.

BRICK-TRIMMER.—A brick arch, abutting on the wooden trimmer, under the slab of a fire-place, to prevent the communication of fire.

BRIDGE-BOARD.—The notched board on which the steps of wooden stairs are fastened.

BUTTRESS.—A prop or support of masonry against the sides of a building, to resist pressure and stiffen walls.

CAMBER.—Convexity or arch on the upper side of a beam.

CAMPANILE.—A tower on a building, serving as a belfry.

CAPITAL.—The upper projecting and ornamental part of a column.

CASEMENT.—Applied to windows divided into two parts by the mullion, and hung on hinges.

CAVETTO.—A concave molding, whose profile is the quarter of a circle.

CESSPOOL.—A well or cistern under the mouth of a drain, to receive the sediment.

CLAPBOARD.—See Siding.

CLUSTERED COLUMN.—One made of several united.

COBBLE-STONE.—A round stone, often used for walls of buildings by imbedding in regular courses in mortar or cement.
Colonnade.—A range of columns.
Column.—A pillar consisting of base, shaft or body, and capital.
Composite Order.—A compound of the Ionic and Corinthian orders.
Console.—A bracket.
Coping.—The capping stone or brick covering of a wall, wider than the wall itself, to throw off the water.
Corbel.—A projecting piece of wood or stone from a building.
Corinthian Order.—An order of Grecian architecture.
Cornice.—The upper projecting division of an entablature; any molded protection which crowns or finishes the part to which it is attached.
Corridor.—A gallery or passage.
Cottage Ornee.—An ornamental cotage, where expression or appearance is the chief object.
Course.—A continuous horizontal range of stones or brick in a wall.
Cove.—The concavity of an arch or ceiling.
Cross-bridged.—The cross-bracing placed between a series of timbers or joists.
Cupola.—A spheroidal roof or dome; a small structure on the top of a dome.
Curb-roof.—Gambrel roof, a roof with the lower half inclined at a steeper angle.
Cyma.—A wave-form member or part of a cornice; also termed ogee.
Deafening.—A floor covered with mortar placed beneath a floor, to exclude sound, and prevent the passage of flames.
Details.—Applied to the drawings of the separate parts of a building; working drawings.
Doric.—An order of Grecian architecture; intermediate between the Tuscan and Ionic, combining simplicity, strength and chasteness.
Dormer Window.—A window standing vertically on a sloping roof.

Dove-tail.—A joint made for connecting wood, the parts cut in the form of a dove's tail expanded, with a corresponding hollow.

Dowel.—A pin used in connecting two pieces of wood.

Dressings.—Parts to decorate plainer work, as the moldings of a window.

Drip-stone.—A projecting window-cap, usually hollowed beneath, that the rain may drop from it.

Dumb-waiter.—A cupboard or platform running on pulleys, to convey dishes, food, etc., from one story to another.

Elevation.—A drawing of the face or principal side of a building, every part seen exactly in front; differing from a perspective view, which is seen from one point.

Entablature.—The whole of the parts of an Order, above the column, including the architrave, frieze and cornice.

Facade.—The front of a building.

Fascia.—One of the parallel bands used to break the monotony of an architrave.

Fillet.—A narrow, flat band, used for the separation of one molding from another.

Final.—In Gothic architecture, the top or finishing of a pinnacle or gable.

Flashing.—Lead or other metal let into the joints of a wall, so as to lap over gutters and prevent the rain from injuring the interior works.

Float.—A long, straight-edged board used to render a plastered wall perfectly straight.

Foils.—A term applied to rounded or leaf-like forms seen in Gothic windows, niches, and the like.

Footing.—Spreading courses at the base of a wall.

Frieze.—The middle part of an entablature, between the architrave and cornice.

Funnel.—The stack or upper part of a chimney; the shaft.

Furring.—Slips of wood nailed to joists and rafters, to bring them to an even surface for lathing.
GABLE.—The triangular end of a house above the eaves.

GAIN.—The beveling shoulder of a joist or other lumber.

GALLERY.—A common passage to several rooms in an upper story; a long apartment for paintings, etc.

GAMBREL ROOF.—See curb roof.

GINGERBREAD-WORK.—A profusion of fanciful, ornamental carvings; this is always in very bad taste.

GIRDER.—The principal beam or timber in a floor.

GIRTH.—Horizontal connecting timber in an upright frame.

GOTHIC ARCHITECTURE.—The style of architecture denoted by the pointed arch. It admits of great variation in all its parts; the roof may be castellated or pointed, or with broad projecting eaves. A still greater variety exists in the windows, among which are the arched, triple lancet, rose, square-headed, oriel, triangular and other forms.

GRAINED.—Painted in imitation of the grain or texture of wood.

GROIN.—A line made by the intersection of two arches, crossing each other at any angle.

GROUND-SILL—GROUND-PLATE.—The lower and outer timber, supporting the posts.

HALL.—A large public room; the first large room within a building; the narrow entrance of a dwelling-house, designated as the entrance hall.

HAMMER-BEAM.—A horizontal timber, in place of a tie-beam, just above the foot of a rafter; used in pairs to strengthen Gothic frames.

HARMONY.—In large buildings, where variety prevails, it is that which brings all the varied parts into an agreeable relation to each other.

HEADERS.—Bricks laid crosswise in a wall, in contradistinction from stretchers, laid lengthwise. See Bond.

HIP.—The sloping angle of a hipped roof.

HIP-KNOB.—A finial, pinnacle or other ornament on the point of a gable, or on the hips of a roof.
Hipped-roof.—A roof with sloping ends.
Hood.—A projecting covering over a window or door, for shade and to throw off water.
Hood-Molding.—The molding over a Gothic window, called also label-molding.
Hydraulic Cement.—Mortar made of water lime, which hardens like stone under water; used for cistern, cellar bottoms, etc.
Intertie.—A horizontal piece of timber between two posts, to keep them together.
Inverted Arch.—Arch curving downwards, to give a firm foundation to piers.
Ionic Order.—A Grecian order of architecture.
Italian Architecture.—An irregular and beautiful style of modern architecture. Has projecting eaves, arcades, balconies, ornamental chimney-tops, campaniles, etc.
Jack Timbers.—Those shorter than the rest in the same row or line, by being intercepted by something else.
Juggles.—Pieces of hard stone introduced to stiffen the joints of masonry.
Joint.—The place where two pieces of timber come together.
Joist.—The smaller timber of a floor.
Key.—A piece of wood let into another across the grain, to prevent warping.
King-post.—The middle post of a framed roof, reaching from the center of the tie-beam to the ridge; called crown-post.
Label.—The outer molding over a window or doorway, descending a short distance on each side.
Lancet-window.—A window in Gothic architecture, acutely pointed at the top.
Landing.—The floor at the head of a flight of stairs, or portion of a flight.
Lintel.—The head-piece of a door or window frame.
Lodge.—A small house or tenement connected with a
larger. A gate lodge or porter's lodge is one placed near an entrance gate to an estate.

Louver-window.—A window open to the sound of bells within, but with blinds to exclude rain.

Mansard-Roof.—A French roof, inclining back slightly from the perpendicular, with a roof of low pitch above.

Miter.—The junction of two boards, at an angle, by a diagonal fitting.

Modillion.—A carved horizontal bracket.

Mortise.—A hole cut in a timber to receive a tenon, or corresponding piece of another timber.

Moldings.—The ornamental contour given to angles of cornices, window-jambs, etc., or to ornamental lines or borders generally.

Mow.—The loft of a barn.

Mullion.—The upright post or bar, dividing the two or more parts of a window.

Newel.—The column about which the steps of a spiral stair-case wind.

Notch-board.—The board which receives the ends of the steps of a flight of stairs.

Ogee.—See Cyma.

Oriel-window.—A projecting window, supported on a corbel or other projection; a bay-window; or has a foundation resting on the ground.

Ovolo.—A convex molding, whose profile forms about a quarter of a circle on its lower inclined side.

Panel.—A sunken space, most commonly applied to the portion of the door between the upright pieces (styles) and the horizontal pieces (rails).

Parlor.—The sitting-room or living-room of a family; more commonly restricted to a room for visitors.

Pavilion.—A word variously applied in rural architecture; a broad, highly finished veranda on the better class of dwellings.

Pedestal.—The lower part or base of a column, consisting
of the die or square trunk, the cornice or head, and the base or foot; also, the support of a vase, statue, etc.

Pediment.—The triangular or circular part of a portico, between the roof and top of the entablature.

Pendant.—An ornament hanging from the vault of a roof, in Gothic architecture; more commonly from the peak of a gable—the lower part of the ornament being the pendant, and the portion above the roof the hip-knob or finial.

Piazza.—A covered walk on one or more sides of a building, supported on one side by pillars. It is used nearly synonymously with veranda; the latter implies more shade and seclusion, often having lattice-work in front.

Pier.—Usually the pillar-like masses of masonry from which arches spring.

Pillar.—A general name for a permanent prop or support; a column is an ornamental pillar, usually round, and belonging to one of the orders of architecture.

Pinnacle.—The summit or apex; usually a square or polygonal pillar, at the angles of Gothic buildings, terminating at a point, and embellished with ornament.

Pise.—A wall constructed of stiff earth or clay, rammed in between molds as the work is carried up. In countries where frequent rains prevail, it cannot be very durable, unless covered, and is similar in character to walls made of unburnt brick.

Pitch of a Roof.—The proportion between the height and the span. If the rafters exceed in length the width of the building, the roof has a "knife-edge pitch;" if equal to the width, it is Gothic; if two-thirds, it is termed a Roman pitch; flatter it is a Grecian pitch. Generally the pitch is designated by number; if the height of the ridge is one-fourth of the span of the roof, it is termed "quarter pitch;" if one-third the "third pitch," etc.
Plan.—A drawing of the horizontal section of a building, showing the distribution, form and size of the parts.

Plate.—See Roof, as showing much in little space.

Plinth.—A projecting, vertical-faced member, forming the lowest part of the base of a column or wall.

Pointing.—Trimming with mortar the joints of a wall of masonry.

Porch.—An appendage to a building, forming a covered approach to a door or entrance.

Porte Cochere.—A carriage porch, or covered entrance to a large dwelling, under which a carriage may drive; literally a covered carriage-way.

Portico.—A covered space or projection, supported by columns, at the entrance of a building.

Purlins.—Horizontal pieces of timber to support rafters.

Putlog.—A horizontal timber to support a scaffold.

Quarters.—Upright posts in partitions, to which lath are nailed.

Rabbet (Rebate).—A cut made on the side or edge of a board, to receive the edge of another cut in the same manner.

Rail.—This is a horizontal piece of timber, as between the panels of a door, or over balusters, etc.

Reeding.—A small convex molding.

Ribbing.—The timber work sustaining a vaulted ceiling.

Ridge-pole, or Ridge-plate.—The horizontal timber or board sustaining the upper ends of the rafters.

Romanesque.—A style of architecture, adopted during the later period of the Roman Empire. It is prominently marked by arches and columns, and also by irregular forms.

Roof.—The upper covering of a building, consisting mainly of two parts, viz: the framing or trussing, and the covering of shingles, or other material. The different forms are a curved or French roof, a roof with an ogee curve, a gable, hip, and gambrel or curb roof.
Room.—Interior division of a dwelling, entered by a door. The first room (in houses containing all these different apartments) is the vestibule, or lobby, or ante-room, when used as a reception room. The second, the hall, or first large room within the building. There are the library, study, or office, or a room with these variously combined; the parlor or family room, sometimes used as an every-day living-room, in other instances as a breakfast-room, or a room for company only; the drawing-room, or room specially for the reception of company, or into which the company retire from the dining-room. In the smaller houses the parlor and drawing-room are one. The dining-room and kitchen are distinct; and appended to the kitchen may be the laundry or wash-room, the store-room or pantry, for provisions; the iron closet, for the coarser utensils; the scullery or sink-room, where utensils and dishes are cleaned and kept; the bath-room; the nursery; the boudoir, or ladies' private dressing-room, or for the private reception of company; and bed-rooms, the larger of which may have dressing-rooms attached, and closets. In the largest and most expensive dwellings all these rooms are found separately; but as dwellings become smaller, the purposes of two or more are combined in one.

Rough-cast.—Rough mortar or cement for the exterior walls of buildings, mixed with pebbles, small shells, etc.

Rubble.—Small rough stones, used for walls or filling between walls.

Rustic-work.—Building with the faces of stone left rough, and the adjoining sides wrought smooth; ornamental wood structures, with the bark on.

Safety-arch.—An arch built solid in the substance of a wall, to sustain any unusual weight on that part; a discharging arch.

Salon.—A lofty, spacious apartment; state-room; reception-room.
Scarf-Joint.—A joint made by cutting away corresponding portions of timbers.

Shaft.—The principal or central part of a column; the chimney above the roof.

Shoe.—The projecting part of a water-pipe at bottom, to throw the water from the building.

Siding.—The exterior side covering of boards to a building.

Sill.—The lower horizontal timber of a frame, door or window.

Specification.—An exact written description of the different parts of a building to be erected.

Springer.—The base of an arch; the rib of a groined roof.

Stack.—A number of chimney shafts combined in one.

Stile.—The vertical piece in framing or paneling.

Stretchers.—Bricks laid lengthwise in a wall.

Strut.—An oblique timber in a frame, serving as a brace. The term brace is usually applied to smaller and shorter pieces.

Stucco.—Fine plaster for covering walls, and for interior decorations. The best is made of two parts of sharp and perfectly pure sand, and one part purest of lime, the latter slacked with water to a fine powder, sifted and mixed with the sand. Outer walls, stuccoed, should have broad projecting eaves to throw off water.

Stud.—A piece of timber inserted in a sill to support a beam—a term usually applied to the upright scantling of a frame.

Surbase.—A cornice or series of moldings above the pedestal; also applied to the board which passes horizontally around the walls of a room, to protect them from injury.

Terra Cotta.—Architectural decorations, vases, chimney-tops, etc., made of a mixture of pure clay and broken flints, crushed pottery and other materials, and burned to the hardness of stone.
Tie.—Timber serving to bind walls or other parts together.
Tracery.—In Gothic architecture, the ornamental, feathery or foliated upper parts of an arched window, formed by the branching of the mullions: the intersecting rib-work on a vaulted ceiling, etc.
Trap.—A small water reservoir in a drain-pipe, to intercept bad odors, and retain sediment.
Triglyph.—An ornament repeated at equal intervals in a Doric frieze.
Truncated Gable.—A gable with a portion of its roof drooping in front.
Truss.—A horizontal timber supported by bracings above, so as to form a long span without posts below.
Turret.—A small tower, usually attached to and forming part of another tower.
Tuscan.—The simplest order of architecture, formed in Italy in the fifteenth century.
Valley.—The receding angle formed by the meeting of two inclined sides of a roof.
Venetian Blind.—A window blind made of slats of wood strung together, so as to be raised or lowered by a string.
Venetian Door.—A door having panes of glass on each side for lighting the entrance hall.
Venetian Window.—One formed of three apertures separated by slender piers, the center one being the largest.
Veranda.—A covered walk on the side of a building, of an awning-like character, with slender pillars, and frequently partly enclosed with lattice-work. It is usually understood to be more secluded than a piazza. Arbor veranda is a frame covered with foliage.
Verge-board.—The gable ornament of wood-work—often called barge-board.
Vestibule.—See room.
Villa.—A country house of superior character.
Volute.—A scroll or spiral ornament, which forms the
principal distinction of the Ionic capital, and is also found in the Corinthian and Composite. See Ionic Order.

**Wall-plate.**—See Roof.

**Water-closet.**—A privy, supplied with a stream of water, or water-pipe, to keep it clean.

**Water-lime.**—A species of lime that when made into mortar (see Stucco), will become hard under water.

**Weather-board.**—A board on the gable from the ridge to the eaves; the outer boards of a building nailed so as to overlap and throw off rain.

**Weather-molding.**—A molding or drip-stone, over a door or window, to throw off the rain.

**Well-hole.**—The space enclosed by the walls of a circular stair-case.

**Working-drawings.**—Drawings of different parts of a building, according to accurate measurement, including plans, elevations, profiles and sections, by which the builders are to be guided.

**Wainscot.**—The wooden lining on the interior surface of a wall.
Mechanics as Applied to the Farm.

The Farm Workshop.

Each farmer must decide for himself how much purely mechanical work it will repay him to perform or have done on the farm. Where population is dense, the division of labor must necessarily be more minute than where it is scattered. Hence, in thickly-settled districts, the farmer may find it cheaper to buy everything he does not grow on the farm rather than make it himself. On large estates there are generally carpenters, a blacksmith, and other artizans hired by the year; often a book-keeper, engineer and miller are required, until at last these employes, together with the farm laborers proper, and their families, form the nucleus of a village. We have seen all this happen in Illinois, and once on a farm of less than 3,000 acres. In the South, on some of the large estates, especially on sugar plantations, where the crop must be manufactured, and, in the North, wherever sorghum is produced in large quantities, it will repay the planter to do much of the repairing at home.

In thinly-settled districts the farmer should himself know how to do simple repairing. Making rails and posts and fitting them for use, is strictly a mechanical art, yet on timbered farms this is also a part of the necessary farm labor. On every farm some fencing is always to be done; there are gates to be made and hung, and rough sheds to be put up. The repair of the ordinary tools used is a natural application of mechanics to agriculture. The tightening, and even fitting, of horse-shoes, is often important. This only requires dexterity and observation to render its performance easy; and the same may be said of simple repairs to iron-work.
If skilled labor is near it will be cheaper, as a rule, to hire mechanics for all important repairs; yet every farmer should have some simple tools and a workshop. Many needed mendings and changes may be done at time unfitted for out-door labor. If the workshop be kept supplied with the necessary materials for such work, there is little time that may not be profitably employed by those necessary to work the farm.

**Sharpening Tools.**

There is no excuse for dull tools. A file will keep the plowshares and cultivators sharp. A grindstone and whetstone will keep the mower and reaper sickles in order.

Steel teeth wear much longer in a harrow than iron ones and are as easily repointed; the first cost is not much more, and a dull harrow means lost time. Carry out this principle in your purchase and use of tools and implements, and it will save you fully twenty-five per cent. in wear and tear of implements and teams, besides bettering the quality of the work done. This large percentage is clear profit.

How to sharpen tools is another question. It can be told only in general terms, the details must be learned by practice, but is not difficult. In grinding a surface, as that of an axe, the cutting part must be beveled off regularly and equally, and the edge then whetted on a stone until keen. A broad-axe or chisel is ground from one side only,
thus preserving the bevels; it is then simply "faced" on
the side containing the steel. In fine, every tool should be
ground according to its structure. Formerly scythes were
all ground upon one side. The best are now made to
grind on both sides alike, and when so, it is stated on the
tool.

Proper Way to File an Implement.

In filing, always do the cutting by thrusting the file
from you. In the reverse motion it should not press the
tool, because this cuts the edge of the file. In filing a saw

preserve the form of the teeth. A cross-cut (hand-saw for
cutting across the grain of the wood), is filed diagonally; a
rip-saw, more nearly square across. The form of the teeth,
it will also be observed, is quite different in the two. There
is no mystery in filing. It is simply a question of accuracy.
In saws every alternate tooth is to be filed in one direction,
and every other tooth in another; observation will easily
show this. A spade or shovel is edged from the front; a
plowshare is filed from the upper side, and, as a rule, the
shares of cultivators from the bottom. The wear will show
when this is not correct. A hoe is filed from the bottom,
and tools for edging and paring garden-walks filed or
ground on both sides alike. These general rules will enable
any farm-hand to acquire the necessary skill, and this will be worth many dollars yearly in wages. It is skilled labor, and skilled labor always commands an extra price. On the farm the manner of holding a tool of any kind for filing must be arranged according to the conveniences. In filing saws, they must be held from springing, else they cannot be filed correctly. They must also be set true.

**Repairing Common Implements.**

We have said that the farmer should have a supply of lumber, which must always be kept perfectly dry. Handles for tools, wagon tongues, and various fixtures can be bought, either ready-made or sawed in the rough. They should be kept on hand, then the work of fitting is often less than that of going to the shop. You have your work-bench fitted with vise and claw, for holding the wood to be worked. A taper bit, or a larger and a smaller bit will form the hole to receive the hasp of a rake, fork, etc. The drawing-knife, a bit of glass and sand-paper will fit the end for the ferule (see Singletree). It is the work of perhaps ten minutes. A wagon tongue is worked to proper shape, and the irons of the broken one fitted, and so with the addition of a little paint you have a wagon tongue as good as new.

Let us illustrate here in a single direction. An ox-chain is broken. You are in the woods, far from the shop. You
put in a wooden toggle to last home. You have open links, that you bought of your hardware merchant. The chain is mended quicker than it has taken to tell.

Shingling a Roof.

More persons fail in shingling a roof than in other rough building work, yet it is really very simple. If you begin at the top of the roof to shingle, you will not be the first man who has done so. But don't! Always begin at the bottom. Break the joints by laying the center of a shingle over the crack of two others, or a wide shingle to cover the cracks of narrow shingles. The rafters should be laid level; the shingles laid with not more then one-quarter of their length exposed to the weather, and nailed above the lap. Very wide shingles have three nails, the average two, and very narrow shingles one nail each.

Each line of shingles must be laid true to the line, one with the others, the lower course being laid about two inches over the edge of the lower sheathing board. The details of shingling are as follows: Stretch a line at the proper distance beyond the lower roof-board; lay the butts of the first course of shingles to this line, narrow and wide, just as they come, discarding such as are shaky, wormy or rotten. This course laid, stretch the re-chalked line along the row of shingles the proper number of inches above the lower edge, draw it tight, snap it, and you have the mark for the next course. Nail on this course, always having a shingle cover a crack by at least one inch. So proceed, course by course, moving your foot-rest up the roof when you can no longer nail from the scaffold on the side. When you have reached the peak, saw the last shingles square with the slope of the other roof. Shingle the other side, saw these off fair, cover the peak with two strips, nicely jointed together, and the roof will be as good as the rest.
Making a Hay-Rack.

Let a carpenter make one with iron bolts, if you can afford it. If not, one as strong as the best, if not so handsome, is easily made by laying two 2x8 inch joists, twelve feet six inches long, on the bed-pieces of the wagon; across these lay three 2x4-inch scantling; mark the bottom pieces so these three scantlings may be let into the joists the depth of one inch. The marks should be, one six inches from the front end, one in the middle, and one at six inches from the rear. The scantlings, which should be seven feet long, are to be then securely pinned or bolted to the bed-pieces; along the outside of the scantling securely nail a board six inches wide, one inch thick, and inside of where the hind wheels come, nail another four-inch wide board. Over the hind wheels form an arch and cover it with slats; nail a cross-piece front and rear, put a "ladder" in front six feet high, and with three rungs, playing on a roller through the bed-piece, so it may be turned down. This rack or ladder—as a hay or grain rack is sometimes called—will hold all that two horses can draw, and will be strong; how handsome it is will depend upon the skill of the builder.

Stone Fences.

Fencing with stone walls is not to be advised in any case, except when it is absolutely necessary to remove the stones from the land. In some hill regions of the United States, the quantity of loose stones in the soil is a most serious obstacle to cultivation. The stones must be gotten rid of; they are a nuisance piled in the field, and are too heavy to haul long distances. In such cases it may be economy to form them into stone walls. The stones of fields are generally those called bowlders. That is, stones
that have been more or less worn by abrasion in being moved about by the forces of nature. They are of all sizes, from a man's fist to those weighing tons. The larger ones must be reduced by blasting or other cleavage, or buried in pits dug so deep as to take the stone below the possible reach of the plow.

Moving Heavy Stones.

Anything from the size of a man's head or somewhat less to those two men can lift may be laid into a wall, and the larger ones that can be moved by oxen and a stone boat may form the foundation. The stones may be rolled onto the boat and also into their places in the foundation wall, by means of a rolling or sliding hitch of a chain. Anything that one or two pair of oxen can move, may be accomplished by passing a chain around the stone and over the hook, so the hook comes next the ground, or better, partly under the stone. The rolling hitch is made by passing the chain once or more around the stone and then over the hook—in this case the hook being next the ground on the side farthest from the team. Thus the chain will form a purchase, identical with the same hitch in rolling logs. The reason why oxen are better than horses is they move slowly and steadily, and will generally continue a pulling strain longer than horses or mules, unless the horses have been specially trained for the purpose. Oxen also come about more readily, and there is not the hamper of whipple-trees and harness.
HORTICULTURE
Orchard, Vineyard and Small-Fruit Garden.

The Farm Orchard and Garden.

IT is a well-known fact that farmers as a class, especially in the West, are more poorly supplied with fruit than the average townspeople. One reason is, an impression prevails that the cultivation of fruit requires great care and attention, and that the proper soil for fruit can be found only in certain districts. The same may be said of the garden for vegetables. But if the farmer would give his orchard and his garden the same attention that intelligent farmers give their stock and corn fields, an abundance of fruits and vegetables might be had the year round at less than half what the ordinary citizen has to pay for them. The mistake made by farmers in planting a home orchard, and especially in the arrangement of the vegetable garden, is that they follow the directions of writers of fifty and a
hundred years ago. They should employ the same methods that they do in their corn fields—long rows of horse cultivation—for all but the minor plants of the garden; and for these improved implements of hand-cultivation should be used. Clean cultivation is necessary in the home orchard, for the orchard for home use must be separate and distinct, and its management different from that of commercial orchardists.

Arrangement of the Home Orchard.

The small fruits and the vineyard may come in the same plot of ground and yet give ample room for all. A plat of land about thirteen rods by twenty-five is just five rods over two acres, and the shortest way across will enable most of the work to be done by horse-power. By beginning at the farther end the larger trees, as apple, pear, cherry, peach, plum, quince, etc., according as the climate and situation will allow, may come in successive rows, to be followed by grapes, blackberries, raspberries, gooseberries, currants and strawberries. To make the farther part of the orchard easily accessible, a pathway ten feet wide should remain unplanted through the middle, which will not interfere with the cultivation, for no grass should be allowed in the farm orchard. It must receive the same clean cultivation as the corn-field.

Next the house may come the vegetable garden, divided by the same broad path, so that the cart, the wagon or the wheelbarrow may freely pass along from one side to the other; or a space sufficient for a "turn-row" to be left on each side would be better; and, in that case, the turn-row may be permanently seeded down to grass or clover, to be cut for soiling. Hence, there is no waste space left whatever, and there are no weeds to seed, in any portion of the garden. In the space next the house, or in the kitchen-
garden proper, allot the most sheltered spot for a hot-bed, or a cold frame, and also as a border for the early cultivation of some special crops, as cress, radish, lettuce, plants of cabbage, cauliflower, etc., to be followed by egg-plant, lima beans, okra and other heat-loving plants. Then the first spaces, next the small fruits, may be devoted to pie-plant (rhubarb), asparagus, sage, tansy, mint and other perennial plants, and the balance, commencing with crops
requiring poling or staking, sugar corn, early potatoes, etc.; the smaller annual crops may succeed each other. Thus you may have what will not only make a pleasing feature of the homestead, but also a plat of ground that may be cultivated at a minimum cost, and which will turn out a maximum crop, if made rich enough with manure, and the soil is properly cultivated.

It may be objected by some, that a row clear across such a patch of some varieties of plants will not be needed. Suppose not, piece it out with some variety, requiring the same space of row, always remembering to cramp nothing. Thus, if you want half a row of raspberries, and the same of blackberries, let the width be that for blackberries. Currants and gooseberries may be pieced out in the same manner. So may the asparagus and rhubarb; carrots and parsnip; cabbage and cauliflower; radish and lettuce; dwarf beans and dwarf peas; muskmelon and cucumber; bush, or patty pan squash, and many other things that might be named, and which will naturally suggest themselves to the observing man in the first season's cultivation.

How to Prepare for an Orchard.

As a rule, in the West, the soil, if undrained, is at some seasons saturated with water for weeks. Many persons make the mistake of digging deep holes in such soils in which to set the trees. Nothing could be more fatal. With the plow and subsoiler make the orchard "one great hole." That is, deepen the soil, and cast it into high beds corresponding with the width of the rows of orchard trees.

There is no better time than immediately after harvest for preparing the soil. If not naturally drained it must be artificially drained, as a prerequisite to the best success. Upon prairie soils, plow the land in one of the directions in which the trees are to be set, as deep as the soil will
admit, following in the furrow with a subsoil plow, and loosening the earth below to as great a depth as possible, leaving the surface rough. If the soil is plowed both ways, to form squares so much the better.

Just before cold weather, but always when the land is dry and friable, proceed along the tops of the ridges where the trees are to be set, and cast two deep furrows apart so as to leave a "land side" in the middle. The ground should be left now until spring. Then, when the earth is in a good and friable state for working, set the trees so that the necks will be from one-half to one inch deeper than they stood in the nursery—in heavy soils the same depth they stood in the nursery—being sure they row both ways.
Laying Out the Orchard and Planting.

Begin at one side of the field, and extend the row as far as you wish, setting stakes exactly in line, and so the last stake will be some distance beyond the last row of trees desired. Then from the place of beginning, run a line at a right angle from the first. This may be done by adjusting two ten feet rods — by means of a square — at right angles to each other, and bracing them. Then set a stake at the corner, and another one at the end, and standing some distance behind the first stake, extend the line by means of other stakes as far as desired. So proceed from each corner until you intersect the first line run, correcting any errors that may occur. Then measure and stake accurately, the distance required for each tree, with a chain or tape line, entirely around the piece, and then the intervening spaces across the orchard plat. Thus, if you have done the work correctly, the stakes thus set will line both ways.

The Distance Apart.—The distance at which apple trees should be set is entirely a matter of taste with the planter. At thirty feet apart, with good cultivation, many varieties will meet and interlatch their branches at the end of eighteen or twenty years, if the cultivation has been good, and the trees remain healthy. Our own experience is, that twenty feet is a proper distance for apple trees, but we should set every alternate row with sorts that bear early, and by liberal cultivation and root pruning, force them into bearing, and wear them out at the end of twelve years, and then grub them out, leaving the alternate rows to occupy the entire land, plowing the earth from the centers, towards the remaining trees. Thus they will eventually be placed upon beds well elevated, and sloping gradually to the centers, until near the dead furrows. If the remaining trees interfere too much in the rows, every alternate one may be taken
out, and at last you will have your trees forty feet apart each way, the proper distance when then they get age.

Planting.—To set your trees, provide yourself with a fence board, say nine feet long, notched in the middle, and containing an inch and a half hole at accurate distances
from each end—say six inches. Place the notch against the stake where the tree is to set; thrust a short stake through the hole at each end, and remove the board, allowing the outside stakes to remain. Dig the hole and so proceed until you have the whole completed. Or, having two gauge-boards, exactly alike, one hand can be digging while another is setting. In planting the tree, all that is necessary is to slip the holes in the board over the pegs, and the notch in the middle will mark the exact place where the tree is to stand.

In digging the holes, be sure you have them large enough to accommodate the roots without crowding, leaving a good, broad mound in the center, upon which to set the tree. This is easily accomplished by drawing the earth to the center, after the hole is dug, tramping it solid, and then smoothing the mound to your satisfaction.

When to Buy Trees and When to Plant Them.

We prefer to order and receive the trees in the autumn for obvious reasons. They should be shipped as soon after the fall of the leaf as possible. Having received them, cut all ends of lacerated roots as clean as possible, and the trees being pruned into shape, heel them in, in some place where the winter sun will not fall on them in the middle of the day. To do this dig a trench on some well-drained spot, large enough to contain all the roots, and about a foot deep, throwing the earth to the south. Lay the roots into this trench, the trees as closely together as possible, and at an angle of about forty-five degrees. Cover the roots with mellow earth, dug from in front of where the roots lie, and cover the stems, also, well up to the branches. They are then safe for the winter.

Much has been said first and last about the proper time to plant orchard trees. If you are ready to plant and your soil has been properly prepared, there is no objection to
fall planting, if it is properly done. The great difficulty with fall-planted trees is, first, they are not protected from being swayed about by the wind. If fall planted, this must be attended to by carefully staking and tying. Then raise a sharp mound of earth about the tree. This will assist in holding it firm. The second and principal objection to fall-planted trees is the loss by winter evaporation, and especially by our cold, drying winds. Hence, we should guard against this by protecting all such trees from the wind and sun as much as possible the first winter. One of the means to meet this end is a more severe pruning (cutting back) than is usual with spring-planted trees. Other means will be readily suggested by the planter's own observation. On the whole, we prefer spring planting in the West.
What Varieties to Plant.

There is this to be remembered in planting a home orchard. While the cultivator must select measurably of those varieties that are hardiest and most prolific, he may, nevertheless, give himself larger latitude in selection than the purely market orchardist, whose selection runs to few varieties and those which will give the largest crops of fruit. The farmer raises fruit for himself, and may be content with a smaller crop and better fruit. The illustrations of fruits given in this chapter are not intended to convey the idea that they are the best for general cultivation. They are superior fruits, in repute in particular localities, and are given here to show forms and characteristics.

Apples, their Cultivation and Varieties.

Whatever the cultivation of the general orchard, the care of the home or garden orchard should be as good as that of the garden. The cultivation, however, must be superficial—only enough to keep the surface soil in tilth. About the tenth of July it is not a bad plan to sow buckwheat, and just before it comes into bloom plow it lightly under. It keeps down weeds, and when turned under helps to enrich the soil.

Pruning, Etc.—The pruning is important. Whenever you see a twig that is liable to give trouble by crossing another, take it out, whatever the season of the year. But do not prune too much—in the West, especially. The thicker the head the better, provided it does not get so dense as to exclude proper light and air from the leaves. The form of the tree must also be studied, and its natural habit be complied with. Insects must be watched, and the proper means taken to destroy them. The bark of trees seldom gets mossy and bark-bound where the soil is culti-
vated. If it does, it should be scraped, as to the rough bark, and washed with soft soap, or with a solution of potash and water. If leaf-blight attacks the trees, cut it away at the first indication and burn the twigs. If trees die from the effects of a hard winter, take them up and plant again. The first ten bearing years of any apple or any other long-lived tree is better than all that comes after. The profit is in young, thrifty trees, not in old ones. In the West, the average productive life of an apple orchard is less than twenty-five years. Trees five years old of early bearing sorts will produce fruit; the later bearing varieties will range longer, even up to ten years for such varieties as Northern Spy.

The Cherry.

There is no fruit more easily cultivated than the cherry, and none more liable to disaster than the sweet varieties. Its great enemies in the West are black-knot and the curculio. Do not attempt to raise any cherries but Early Richmond (Early May) or Late Morello, except in those districts where the sweet varieties are healthy. Michigan and some portions of Ohio are the only States in the West where sweet cherries are generally a success. Every farm should have a hundred trees of Early Richmond and Late Morello. The latter for the reason that they often give a crop when the first fails, and they are about two weeks later. The illustration shows the Late Morello at the bottom, and Early Richmond at the top.

As we go East, and especially South, the sweet varieties may be more freely cultivated. East of the Alleghenies their cultivation is general. The inference then is that the chief difficulties in the West are too hot and dry summers, and too cold and dry winters. This is borne out by the fact that Michigan is congenial to the sweet cherry; its climate is moist, comparatively cool in summer and mild in
winter. When the cherry is raised for family use, we should bud on Maheleb stocks, since there are no suckers and the fruit is larger. But on Morello the bearing is more profuse and the trees come into bearing earlier

**Pears—Their Variety and Cultivation.**

It has been said that pears cost the amateur ten times as much to cultivate as to buy them. It is certain that pears are only successfully cultivated for market in widely isolated localities. Still we have seen pears growing in farmers' gardens and bearing regularly, in many apparently unfavorable localities, judging from the lack of orchards near. The pear is long-lived, and resists severe winters. Its great drawback is blight, except on soils peculiar to the tree. In Michigan, for instance, some sections of Indiana and Illinois, and elsewhere in the West, are trees planted by the French missionaries of the last, and even preceding, century, "hale and hearty yet." Still, it is not to be denied that "pear culture" is "treacherous." It is best for the amateur to experiment with dwarf pears; we have had good success with them in garden culture.

**Peaches.**

They are as easily cultivated as corn, south of 40 degrees, and pretty much all over Michigan up to latitude 43 degrees. The only serious drawback is the disease called yellows, and this generally exists in the more sandy districts. "Curl" in the leaf is another disability, but not so fatal as the yellows, as deadly to the peach as is glanders to the horse. The only remedy is to grub the trees whenever found, and in pruning always clean your knife-blade with a solution of carbolic acid after pruning one tree and before commencing on another
When you plant a new orchard, always be sure you get your budded trees from a nursery not affected with the yellows. A peach orchard should never be allowed to grow up in grass if you wish good fruit. The curculio and damp, hot weather often cause rot, but no person, on account of any of these causes, should refuse to set peach trees wherever the climate is favorable to carry the trees through the win-

er. Don’t raise seedlings because they come up and grow themselves. Buy budded trees or bud them yourself.

The Small Fruits.

Blackberries.—These should be planted six feet apart between the rows, by three and a half feet in the row, and cut off when the canes are four feet high.

Raspberries.—These are planted the same distance
apart between the rows as blackberries, by three feet in the row. They are cut off at a height of three feet. Currants and gooseberries are planted four feet apart between rows, by about three feet in the row. The cultivation should be clean.

**Strawberries.**—The strawberry is universally cultivated. No farm-garden should be without them. Any land rich enough to bring forty or fifty bushels of corn per acre, under good cultivation, will do. The ground should be deeply and thoroughly well pulverized. Mark the land, if for field culture, the distance as for corn. If for garden cultivation, the rows may be three feet apart. For field culture, the land may be marked both ways, and one good plant placed at each intersection, spreading the roots naturally, placing the plants so the crowns will not be above the surface, giving a little water to the roots if the soil be not fairly moist, and after the water has settled away, drawing the dry earth over all. For garden culture, one plant to three feet of space will be sufficient, unless the plants are to be raised in stools, and the runners kept cut out, when a plant to each two feet will be about right, if you want extra large berries.

The cultivation is simple. The spaces between the rows, about two feet wide, may be kept clean with the cultivator. In the rows the weeds may be kept, early in the season, clean with the cultivator; later, when the runners have encroached on the rows, the weeds must be pulled out, if necessary, but on fairly clean soil the cultivation will not be difficult. Beds of the previous year, and which should be in full fruit this season, may be kept clean between the rows with the cultivator. The weeds will not trouble much until the crop is gathered.

**Picking and Packing Orchard Fruit.**

Before leaving the subject of orchard fruits, something should be said about picking. Never shake the harder
fruits from the tree, unless they are intended simply for their juice. Pick by hand, in smooth baskets, and handle without bruising until they are in the packages properly closed for market. Then they will remain intact. If barreled, press in the head so it will squeeze down hard upon the first layer of apples or pears. Although this may indent, it will not rot the fruit. It is shaking about in the package that destroys fruit. In picking, provide yourself with a proper ladder. The form shown in the illustration is the proper one, and it also makes a good step-ladder for a variety of purposes.

The Grapes for Farmers.

The grapes for the farmer's garden are not the new and untried varieties brought out every year for trial at five dollars a vine. It is true that from these successive varieties have come the well-established sorts in general repute. If experiments are interesting, make them by all means, but stick to well-established varieties until you have found a better. Our choice would be that Concord should have a place everywhere. It is a good grape, north, south, east and west. Then decide as to the other varieties to fill up the complement of the vineyard, earlier and later. Many of Rodgers’ hybrids are worthy of trial. If you are at a loss, ask the advice of some practical cultivator near you. In the North, especially north of forty degrees, we should plant principally of Concord, with Delaware and Clinton to fill up the vineyard. In the cultivation, avoid close summer
pruning. As to soil, land that will produce forty bushels of corn per acre will give good crops of grapes if the subsoil is not wet.

Culivation of the Vine.—In the cultivation of the grape avoid close pruning in summer, pinch the side growth of the current year to about two buds on each spur, and the vine being in fruit, prune none at all after the middle of July, except to clip off superabundant growth. This may be done with a corn-knife. Avoid, also, all fancy training. Close pruning and fancy training, advocated by so many theoretical writers, has done more to suppress the cultivation of the vine than the want of superior varieties. For ourselves we gave up, many years ago, the trellis for simple stakes, either bowing the vine or twisting and tying it around the stake. Our plan with young vines is to set one-year old plants 8x8 feet for the stronger growing varieties, and 6x6 feet for the weaker, as, for instance, Delaware.

The first season we simply tie the vine to a slender stake, cutting back in the fall to three eyes. The next spring we rub out two of these eyes, reserving the strongest shoot. This is tied to the permanent stake, which may be three or four inches in diameter and six feet high, although five feet is enough.

When the vine has reached a height of six feet it is pinched off at that height, the laterals as they put out are pinched off beyond the first bud. When this bud makes
growth to the extent of one bud, it is stopped again beyond that bud. It is sometimes (generally) pinched back once more. This leaves a succession of three buds, for fruiting the next year, on every spur.

Covering the Vines.—We believe in laying down the vines and covering them with a little earth each winter, in the North. It gives better fruit and saves occasional winter-killing. Vines six or seven feet long and studded with fruit, three bunches for each spur, and planted 8x8 will give tons of fruit per acre in good seasons. The aim of the cultivator is to keep the vine going by encouraging new fruit spurs each year that the bearing may be continued for years.

The time will come when the vine must be cut down at such a point as to induce the formation of a bud near the ground, and upon which to form a new bearing vine. This may be so arranged that about one-quarter, or up to a half, may be cut back each year; or two shoots may be reared from each vine, one for fruit, to be cut away in the fall, and the other to succeed it the next year. Our own plan, however, is to allow only one strong shoot, and renew the whole vine when necessary. Thus we have always got more and better fruit from the same area.
Grafting and Budding.

Grafts, Cuttings and Seedlings.

The object of budding and grafting may be briefly stated. If the seed of a fruit be planted, the tree or shrub growing from that seed will not bear fruit like that from which the seed was taken. If, then, you wish to grow a certain choice apple, peach, pear or other fruit, it is useless to keep the seed or "stone" of that particular fruit and plant it. If it be an apple seed that you plant, the tree growing from it would, certainly, produce apples; but they would, almost certainly, be of quite another variety, and, perhaps, of a very inferior quality. It is, in fact, by thus planting seeds and growing what are termed seedling-trees, or "seedlings," that new varieties are produced. Most are valueless—one in several thousand may, by some chance, produce a new and, perhaps, splendid variety of the fruit. It is very difficult to make fruit-tree cuttings (that is, branches cut off and put in the ground) grow. If you cut a branch from a willow and put the cut end into the earth, it will at once form roots and become a tree; a branch from a fruit-tree so treated dies.

If, then, you have a tree bearing a certain choice variety of fruit, you may cause the reproduction of the same choice variety thus: cut from the tree bearing the good fruit "grafts" or "buds;" then take certain branches, or the main stem, of a valueless tree of the same species, and, having destroyed its natural shoots, "bud" or "graft," as hereafter described, with your cuttings. By some law of nature the sap which comes up the stem of that tree will, on entering the new wood made by the portion grafted, produce fruit exactly like the tree from which the
cutting has been taken. Thus, with a stem of the same species, but of a different variety, you may produce a tree all the top and branches of which will yearly give you a fruit unlike what the original tree grew, but like to that grown upon the one from which your shoots came. Note—the tree grafted and the one from which the graft is taken must be of the same species. You cannot graft an oak with an apple, an apple tree with a peach, a plum tree with a pear; but any variety of the same species may be grafted with another.

The Grafter's Art.

Any boy or girl on a farm may easily learn to graft and bud. Except in the more unusual kinds of grafting, that art is exceedingly simple, and budding requires only nicety and care. Grafting is uniting a portion of a shoot (scion), containing one or more buds, upon a "stock" or a root, with a view to their union, and subsequent growth. If varieties came true from seed, grafting and budding would be less important than they now are. If fruits could be readily propagated from cuttings, there would be little use for grafting or budding, but they do not. Hence, grafting and budding will always be necessary.

Grafting on the Farm.—On the farm, it will yearly be desirable, there being but few orchards that will not require some change of varieties. If a tree, bush or vine proves barren or long in coming into bearing, it may be made to fruit, by grafting on it some earlier bearing variety. An unprofitable grape vine may be root-grafted with a better sort. Stone fruits may be budded to varieties better adapted to the climate and situation. Young seedlings are to be raised and grafted or budded as required; grafting being usually employed for the apple and cherry, and budding for the other orchard fruits. The peach, pear and plum should be budded, though all the fruits may be grown
by grafting, and the plum is, perhaps, as often thus propagated as by budding.

**How to Graft.**

The usual modes of procedure are by "cleft grafting" and by "saddle grafting"—the latter being little used except where the "stock" and "graft" are of nearly the same size. The whole art is to so fit the parts that the fiber or inner barks come naturally together, for this insures the passage from one to the other of the "cabium," that is to say the gummy fluid between the sap-wood and bark, from which both wood and bark are formed. To insure this the graft is generally slightly crossed with the stock by which the union of the two is at some point made certain. The whole is then covered with "grafting wax," to exclude moisture and air. If the grafting be done in the spring, between the rising of the sap and the putting out of the leaves, a proper union will soon take place.

**Root Grafting.**—This is performed in precisely the same manner as stock grafting; it being simply the proper union of the "scion" upon a piece of root, say six inches long, and preferably, that portion of the root of the year-old seedling next the crown of the plant. Root grafting is usually performed late in winter. It is not necessary to describe the performance here, since it does not pertain to the farm, but is a part of the nursery work now generally done with machines. Hence the root grafts may be bought of nurserymen cheaper than the work can be done on the farm by hand.

**Cutting and Saving Scions.**

Scions may be taken at any time in winter when the trees are not frozen. Select healthy twigs, of the current year's growth, with a terminal bud to each; let the sticks of your scions be of nearly equal lengths; tie with three
bands into small bundles, not more than three inches through. Correctly label each bundle according to the variety. This should be done with a tag, wired on, and also by sticking a sharpened slip of wood in the top of each bundle, with the name plainly marked. You may thus easily know the variety contained in each when the bundles are packed away. Set these bundles in moist sand, moist sawdust, or in moist (not wet) moss. Place in a cellar that will not freeze, and one that is secure from mice. The cuttings will then keep in good order until wanted. Scions of the peach or plum should be cut in autumn, since these trees are liable to be injured by severe weather.

**Grafting-Wax.**

Almost every professional grafter has his own formula for making grafting-wax. Many use, instead, a mixture of blue clay and fresh cow-dung, kneaded and beaten until it will work like putty. This really forms one of the best applications for grafting, in a small way, upon nursery stocks; a ball of the mixture being formed all around the mutilated stalk and graft. Grafting-wax is simply a compound of rosin, tallow and beeswax, in such proportions as to admit of being easily applied when softened by warmth, but not liable to melt and run in the sun's rays. A good grafting-wax is made of three parts of rosin, three of beeswax, and two of tallow. A cheaper composition, but liable to adhere to the hands, is made of four parts of rosin, two of tallow, and one of beeswax. One of the best and cheapest consists of one pint of linseed oil, six pounds of rosin, and one pound of beeswax. These ingredients, after being melted and mixed together, may be applied, when just warm enough to run, by means of a brush; or may be spread thickly with a brush over sheets of muslin, or thin, tough paper (manilla tissue paper), which are afterwards,
during a cold day, cut up into plasters of convenient size for applying, or the wax, after cold, may be worked up with wet hands, and drawn out into thin strips or ribbons of wax, and wrapped closely around the inserted graft. This is the better way on the farm, and in all cases the wax should be closely pressed, so as to fit closely to every part, and leave no interstices, since it is indispensable that every portion of the wound on the stock and graft be excluded from the air.

**Budding.**

In relation to budding, the late Dr. Warder, in "American Pomology," wrote: "It has been claimed in behalf of the process of budding, that trees which have been worked in this method are more hardy and better able to resist the severity of winter than others of the same varieties which have been grafted in the root or collar, and also that budded trees come sooner into bearing. Their general hardiness will probably not be at all affected by their manner of propagation; except, perhaps, where there may happen to be a marked difference in the habit of the stock, such, for instance, as maturity early in the season, which would have a tendency to check the late growth of the scion placed upon it—the supplies of sap being diminished, instead of continuing to flow into the graft, as it would do from the roots of the cutting or root-graft of a variety which was inclined to make a late autumnal growth. Practically, however, this does not have much weight, nor can we know, in a lot of seedling stocks, which will be the late feeders, and which will go into an early summer rest."

**When to Bud.**

The time for budding is before the tree has perfected its terminal bud, or during that season when the bark may be separated from the wood. The late F. R. Elliott, in an
GRAFTING AND BUDDING.

essay before the Ohio State Agricultural Society, sums up
the whole matter concisely. He says:

"The time for insertion of buds into the stock for the
purpose of changing the kind of fruit, varies with the habit
and character of both the tree to be propagated and the
stock on which it is to be worked. All buds, in order to
be successful, must be well ripened — that is, the tree on
which they have formed must have made its terminal bud,
or, in other words, the growth of the shoots must present
a continuation of perfect formed leaves to its point. The
ripening of buds occurs earlier in some varieties than in
others; usually early summer fruits ripen their buds earlier
than winter sorts. Next, the stock in which the bud is to
be inserted must be in a vigorous, healthy condition, but
apparently about to close its season's growth. Here
again comes the necessity before alluded to, of selecting in
the seed-bed the different habits of the young plants
relative to early or late maturity. Through our Northern
middle States, the usual time to commence budding the
apple and pear is about the 10th to 15th of August. Further
south they are in condition in June; and so on, all the
intermediate time, according to latitude and season; some
seasons being earlier than others by six to ten days.

"Such stocks as grow late in the season should be
budded late, because as new layers of wood are constantly
forming with every bud of extension in growth, it follows
if the bud is inserted too soon, it must be covered and
destroyed. On the other hand, if the bud be inserted too
late in the season, the cambium has acquired consistency,
the ripened flow of sap is checked, and the bud having no
powers in unison, dies. The quince; therefore, from its
habit of growing very late in the season, should be the last
to bud.

How to Prepare the Buds.

"If it is necessary, in order to have the buds ready to
meet the growth of the stock, that the scion or branch
from which buds are to be taken should be made to hasten its maturing of the buds, then pinch off the end of the shoot one or two buds. In from eight to twelve days the remaining buds will have ripened and fitted themselves for forming either new plants or branches. If this pinching is done early in the season, and the branch left to remain on the tree, the result is, the buds, after ripening, send out new branches, and make a sort of second growth. If scions have to be brought from a distance, or if it is desired to keep them several days, wrap them first in damp moss, or, failing that, a damp cloth; then inclose that in paper, and the whole in oiled silk. Other material will answer, provided moisture and a cool temperature be kept around and next them.

**Materials Necessary for Budding.**

 Bands of strings for tying the bud in its place after setting, are requisite; these may be of bass matting, such as is used in wrapping sheet iron or furniture, and which may be also procured by getting the bark of our common basswood in the spring or early summer, and laying it awhile to soak in water, when the outer rind readily peels off, and the inner bark peels into thin, strong, flat strips, that tie easily when wet; woolen-yarn, cotton-wicking and many other materials are used. Anything thin, soft and strong will answer. Bass bark is the best and should always be wet just before using. A knife with a thin blade, sometimes rounded at the point, and at the opposite end a wedge-shaped piece, of smooth ivory or bone, is used.

**Spring Budding.**

Although the summer is the time for most of budding operations, yet it sometimes happens that a new sort is obtained late in the spring, and, being valuable, it is desir-
able to make every bud become a tree. The scions are, therefore, kept until the trees have made leaves, when the buds are inserted in the usual manner, and as soon as they are united the top of the stock is bent over or cut off, and the sap being forced into the new set bud, it makes a good growth the same season.

**Grafting the Grape.**

Grafting the grape does not differ, essentially, from other grafting. The ordinary cleft-grafting upon the growing root is usually performed. Wax is not used since, the graft inserted, the earth is then drawn around the graft, which protects it from air. The vine, however, must be grafted either in the winter, the early spring before the sap has started, or so late that, the leaves being out, will prevent flooding of the graft and its drowning from the bleeding of the root. Any one who has pruned the vine in spring will easily understand this.

Vines may be laid down and grafted as late as midsummer. Our advice is: keep your grafts in a cool place until the vine is in full leaf; insert your scions in the root, but leave at least a portion of the original vine, or stock, growing; wait until your grafts have become securely united to the stock and have put forth leaves of their own; then cut away the old vine. The leaves having formed on the new part, the sap will be, at least partly, absorbed by them, and the "bleeding" be less.
Vegetable Gardening.

Economy of the Garden.

Strange to say, the family table of nearly every other man of equal means is better supplied with vegetables than that of the farmer. So few, indeed, have good gardens, that the class may almost be said to do without fresh vegetable food. Why is this so? The majority with whom we have talked have freely admitted their short-comings in this respect, but excused themselves by saying that they could not afford the time to "potter" in the garden. Here lies the principal difficulty. It is pottering work according to the old-fashioned way of cultivating everything in narrow rows and small beds. Apply the same common sense here that you do in the cultivation of field crops, and you may raise half the food of the family on a single acre, at an average outlay of about forty dollars. The same labor and money applied to the corn field will raise, say, six acres of corn. It will produce $200 worth of garden stuff, none too much for the average farmer's family.

Garden Cultivation.—Potatoes, early corn, okra, cabbage, early peas, summer squash, etc., may be grown in
three-feet rows; late peas and tomatoes in five-feet rows; muskmelons, cucumbers, etc., in six-feet rows; watermelons in eight-feet rows, and squashes and pumpkins in twelve-feet rows. Asparagus and pie-plant should have four feet between the rows; beets, cauliflowers, early cabbage, carrots, parsnips and onions, two feet; and the smaller plants, such as the radish, lettuce, spinach, and all the so-called bedded plants, eighteen inches between the rows. All these garden vegetables, except the bedded plants, may be cultivated almost entirely with the horse and cultivator, the thinning being about the only work that needs be done by hand. The whole cultivation of bedded plants, and the close cultivation, when young, of all others, except the gross growers, may be managed with the hand-cultivator.

How One Man Became a Gardener.

The following account of how one woman succeeded in having a good garden will show that any one may do the same if the husband consents.

"Why do you not ask your husband to lay out a garden and have it taken care of?"

"Oh, it is of no use. My husband says it is cheaper to buy our vegetables. He cannot spare time nor have the bother; the consequence is the vegetables are never fresh, for I have to order them from the city. I really would not mind working in the garden myself if I only knew how; but, indeed, it is about all I can do, with the help of Jane, to take care of the flowers and my house."

"Oh," replied her friend, "it is easy enough. Do it by proxy. Buy a good practical book on fruit and gardening, and get your husband interested. Get him to have the garden plowed, harrowed, and nicely raked, and hire the hard work done under your own supervision. Any intelli-
gent man can take care of a garden if he is properly directed."

'Yes, the men know enough—at least to keep out of the garden, but they dearly like good fruits and vegetables. I have often envied you your nice garden. Your husband really has a talent that way.'

"Has he? Yes, that is true, but it is an acquired one."

"Indeed! How did it come about?"

"Well, I was once in the same strait that you are. At length I took the initiative. After coaxing and coaxing I induced my husband to have me a piece of ground manured, plowed and harrowed. By hook and by crook I had it cultivated. I planted strawberries and some other small fruits. We had plenty of vegetables, and the second year, strawberries, some raspberries and blackberries and a few currants. My husband never went near the garden, but I could see the satisfaction with which he enjoyed its products, and I noticed, also, that we never had any trouble with the hired men. In fact I get many an hour's work from them, and they an occasional nice dish in pay. The third spring I took my husband into the garden and lamented that it had really grown beyond my powers, and how sorry I was that the good living we had enjoyed must now cease."

"That would be a pity," he said, "but, really, it is of no use to set a hired man to work here, and I really have not the time to do it. Nor is it right that you should have the care and supervision of it. I suppose we must go back to the old way of getting stale things from the city."

"An apparently bright thought struck me. I say apparently, for, of course, I had the plan all laid out. If, said I, a good man could be spared me three days a week, during April, May, and June, I think I could manage it."

"Oh," my husband replied, "hire a man constantly if you like," and, after going into a brown study for a few moments, he said, "Jenny, I think I'll learn gardening myself, and after this year, take the whole thing off your
hands. That garden is worth more than any ten acres on the farm. And it really seems not to cost much beyond a little clever care."

"But then, every man is not like your husband nor mine. It is really surprising how so many farmers are content to live year after year without the comfort of a good garden, with its health-giving fruits, and wealth of vegetables, which should constitute more than half the living of the family."

The Hot-Bed.

The heating material—fermenting horse-manure—should be laid in the bottom of the bed, about fourteen inches thick, and an inch of earth put over all to form a level surface for the troughs, which must be filled with the best compost of one-half friable loam—sandy loam preferable—and one-half thoroughly rotted manure intimately mixed. Old hot-bed manure and earth laid in a heap the previous season and turned two or three times is the best. Now, if the farmer has, in addition to this, a hot-bed frame of four sashes, three feet four inches wide by six feet long, he may not only raise lettuce for his family, but also have space enough for tomato, egg-plant, cabbage, cauliflowers, kohl-rabi, lettuce, celery, etc., for transplanting, either into the open frame we have mentioned, or directly into the open air, or both, for the frame will accommodate extra early samples, while the general crop of hardy plants may go safely into the open air as soon as danger of severe white frosts is over. But remember always, never transplant from the hot-bed into the open air without at least ten days hardening to the weather. Hence, for the farm garden, the necessity of the open frame, for, without it, the air required for cabbage, for instance, might be fatal to the tender plants.
Laying Up the Hot-Bed.

The best manure is that made by horses fully fed on grain, and bedded with hay or straw. Manure made with sawdust bedding is apt to heat violently and burn itself out quickly. If, however, it be tempered with tan bark, it makes an excellent heating material. The next best tempering material is the chaff of straw. If neither of these can be obtained, the manure must be tempered by turning often enough (every three days) to get the rank heat out of it, and cause it to heat slowly and equally. This may be assisted by pretty hard and evenly tramping the material when laying it up in the bed. Once the proper management of sawdust or shaving manure is learned, it makes an excellent material. In laying up the manure, choose a still day, as wind is pretty sure to destroy the heat. In preparing the manure for the bed, it is often necessary to add water, to bring it to a proper state of moisture, and one object in turning it several times in the heap is to promote a uniform state of moisture in the pile. If, however, water is added, it should be warm—unless the manure be very hot—and given from a fine rose water-pot.

The Pressure.—All that is required in laying up is that the hard lumps, if any, be thrown out, and that the whole be laid equally, so it will settle evenly. The less firm the manure is laid, the faster and stronger it will heat. If there be too much pressure, it will heat too slowly. Hence, the amount of tramping is important. Our plan is to tramp the whole lightly, especially next the sides, three or four times in laying up a bed two feet thick, in addition to that employed with the fork in discovering if it is laid true. The manure all in, the surface is made perfectly smooth and even, and the finer manure that may not have been taken up on the fork is then spread evenly over the surface, and six inches of the prepared earth is thrown over
all. If the earth is frozen, such portions should lie around the edges of the frame, that they may thaw gradually and perfectly, before the whole is finally raked smooth.

The Soil for Hot-Beds.

The best soil for the bed is a rich, light, sandy loam, to which has been added one-third of its bulk of fully decomposed horse manure. That formed of rotted sods is the best earth material. A clay soil should never be used. The soil must be one that will, under no circumstances, become pasty. Once you have formed your soil, preserve it carefully from year to year in a conical heap when removed from the beds in summer, adding, from time to time, such fresh soil and hot-bed manure as may be needed. Six inches of soil is sufficient for forcing general crops, and eight inches for asparagus. If rhubarb is forced, the entire roots are to be bedded upon three inches of earth, as closely together as possible, afterwards filling in so the crowns are just covered, packing the earth well about the roots. If the earth settles away from the crowns, in three or four days, add more. Neither of these, however, generally pay for forcing nowadays by the market gardener; on the farm they may. They may be transported long distances from the South. When forced, a half lighted cellar, or the space under the staging of a green-house is utilized. The cellar is kept at about fifty degrees, or somewhat less. More than this average heat should not be given in the hot-bed.

How to Have Early Rhubarb.

The market gardener has his soil as rich as manure will make it. He sets out one-third of the space to be occupied by rhubarb every spring—giving him a three years' rotation. All the large roots not required for eyes for the
new bed, and that are dug from the older portion of the oldest plantation are reserved for forcing. The farmer should do the same. In lieu of this a bed should certainly be set in the most sheltered position possible. Cover this in the autumn with fine manure, to be dug in the spring; set old barrels without heads or bottoms over the crowns of the plants, in the spring, and it will be found profitable. If you get one cent a pound for the surplus it will pay. Try it.

It is to be hoped every farmer has carefully read the directions for planting the home orchard and garden, so as to economize labor, and has already made preparations to begin in time. Do not allow other work to prevent so doing. Better hire a little extra help if necessary. Cheap help, properly directed, can handle manure and do all the rough work, and any of the better class of seedsmen's catalogues will direct as to sowing and general care; but make rows clear across the garden, and give space enough between the rows to save hand labor. This is important— one year will give you strawberries; two years will give you rhubarb; three years asparagus, currants, gooseberries, raspberries and blackberries; three to five years will give you cherries and peaches and some apples and pears, and from that time on an abundance.

"Take Time by the Forelock."

Do not be in too great a hurry to begin in the spring, but when the soil is in good condition to work—that is when it is quite friable—lose no time. Plant peas, beets, carrots, parsnips, onions, salsify, radish, lettuce, etc., as early as the soil may be worked; corn, bush-beans, and other half-hardy plants as soon as danger of white frosts is over, and at the same time transplant from the hot-bed or cold frame, lettuce, cabbage, cauliflower, kohl-rabi; also, parsley, sage, mint and other pot herbs. Squash, cucum-
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bers, melons, pole beans, okra, tomato and egg-plant should not go out until the nights as well as the days are warm, and all these should be transplanted from the troughs from cold frames we have named, rather than be planted by seed. Once the planting is done, it is simply to keep the soil clean and gather the produce. If you provide yourself with the same class of modern garden implements that you do with farm implements, this cultivation is neither onerous nor difficult.

A plank, a leveler and a smoothing harrow will fit the garden nicely. A modern seed sower will sow any seed correctly and evenly, and a wheel hoe will accomplish the cultivation next the rows better than it can be done with a hand hoe, and after the plants get up a little, any good, one-horse cultivator will work in rows not less than two feet wide.

Planting in the Moon.

We generally plant early potatoes just as soon as the frost is out of the ground and the soil is settled, and for the general crop, as soon thereafter as convenient — always before corn-planting time. Why? Because, if you do not get a good growth to your vines before hot and dry weather sets in, the crop is pinched. With earlier varieties it insures the crop ripe in August, and with late varieties, like peachblows, it gives them what they require, the whole season to grow and the cool autumn to ripen in.

There is just this much in the moon theory, and no more: plants do grow faster in light nights, probably, than in dark ones; and thus such plants as come up quickly, planted when the moon is new, may, with favorable weather, grow faster; and potatoes, which are slow in germinating,
planted after the full of the moon, and coming up when the nights are light, may, under favorable circumstances, seem to grow faster; but that there is any difference in the outcome, no careful experiments made have ever shown.

How to Raise Potatoes.

Potatoes on the farm are too often raised in some corner, where nothing else can be grown, and hence most farmers have neither enough in quantity nor the best in quality. There is no crop that pays better for extra care than the potato. If those farmers who think they can better afford to buy than to plant them will try the following plan, they will be convinced of their mistake: Select a piece of land the second year from the sod, or else a piece of stubble land enriched with not less than forty loads of half-rotten manure per acre, all which has in the fall been plowed under to the depth of, say, eight inches. In the winter draw on ten more loads of fine manure to the acre; plough this under about four inches deep, and, as early as the ground will work friably, harrow the land.

Furrow out three feet apart and drop a piece every fifteen inches, stepping on every piece. Cover by throwing two light furrows forming a ridge. When the weeds appear, harrow the ground lengthwise of the rows, with a two-horse harrow turned upside down. If weeds again appear before the potatoes are up, again throw up the two furrows to cover, and again harrow down just as the potatoes appear above ground. Do not be afraid of killing the potatoes. We have harrowed them when they were three inches high. The after cultivation consists simply in slightly earthing up the plants from time to time with a shovel plow, until the buds appear. If weeds appear after that, the large ones must be pulled out by hand.

To harvest them, if you have a large field, get a potato digger; if not, plow two furrows away from each row, and
dig the balks with a potato fork. That is about all there is to potato culture, except storing.

When they are dug, put in compact piles in the field, cover liberally with potato tops or slough hay, and six inches of earth well-smoothed down to turn rain. Just before cold weather, take them to the cellar, or place in pits for the winter.

In planting potatoes, do not delay too long. Plant about the time you sow oats, for unless the potatoes get their growth before drought and heat set in, you reduce the crop. Potatoes will not stand drought or heat. They are a moisture-loving and cool-weather plant. Good crops, however, are sometimes raised if planted about the twentieth of June. Then they have the advantage of the late rains and cool nights of autumn to mature. Above all, do not "plant in the moon," hoping to get a superior crop.

Garden Flowers and Shrubs.

The Flower Garden.

The vegetable garden is properly the province of the master of the farm; the flower garden pre-eminently the home of feminine art and taste. However small the village or city lot, flowers may smile up from it to the sun, and call down blessings from the admiring passer-by upon the fair and skillful hands that have tended them. In no place do they more improve and refine the surroundings, and show the beauty of feminine taste and culture, than upon the farm. An ample lawn studded with ornamental shrubs and trees, a bed cut out here and there, or a smiling parterre where these lovely gifts of nature have been taught by care and skill to bloom, fill the soul with an
harmonious joy. All long for the beautiful. All love flowers. But many, ignorantly, suppose that flowers cost so much in time and money that only the wealthy may enjoy them. They are within the easy reach of all. The common flowers are, as a rule, as beautiful as the rarer ones. Perennial flowering plants, or their seeds, once planted, remain year after year, increasing in beauty with each successive season until they arrive at their full perfection.

How to Cultivate Flowers.

The principal mistake made in the cultivation of flowers is permitting them to be smothered while young, by weeds. Many of the common varieties, which sow themselves by their seeds, remaining in the ground during the winter, manage to make a pretty successful struggle with their enemies, the weeds, but the plants are so crowded as to detract much from their beauty. This is why, in the country, so much attention is paid to perennials, that is to say, the plants or flowers that live from year to year. If the directions here given are followed, the cultivation of annuals will cost less labor, they will come much earlier to perfection, and be, in every respect, better than if sown in the open ground. All that is necessary is to prepare, about the time field plowing begins, a small hot-bed, as described in the chapter on Vegetable Gardening.

Having prepared the bed and put in six inches of clean, fine mold, sow the flower seeds in lines four inches apart between rows, putting down a peg marked with the name of each variety sown. When large enough to transplant, pick the plants out into another frame, place them two inches apart, and here let them stand until they are ready
to go out of doors. Take up with earth about the roots, lay on trays, and they are easily and safely carried to where they are to grow.

There are but few annuals that, treated in this way, will not transplant kindly. Sweet peas, candytuft, etc., should, however, be sown where they are to stand. The larkspurs, poppies, mignonette, heliotrope and cypress vine, which are somewhat difficult to transplant, may be pricked out in troughs, each trough having a pasteboard, or other division, thrust down along the middle, to separate it into two parts. Plants difficult of removal may be grown in these simple troughs, and be quickly and easily transplanted. This may be done at any time in the evening, unless the soil is too wet to work. If so, wait until it is dry enough. To transplant in dry weather, give the plants in the bed a good soaking the morning before transplanting which, as stated, had best be done at night.
Leave a little depression, water the roots, and, when the water has disappeared, draw the dry earth over all. They will hardly shrink. You will have forwarded the season of flowering fully three weeks, and produced your flowers, even of the more hardy sorts, far cheaper than if you had sown the seed outside. You will also be able to grow many things usually bought as plants from the florists, such as verbena, pinks, daisy, pansy, etc. You may, early in July, have in full bloom China and other garden pinks, and nearly all the class that, sown outside, do not usually bloom until the second year. You may have balsams, candytuft, alyssum, mignonette, nasturtium, phlox, zinnias, morning glory, in splendid condition, before your neighbors who have sown in the open air can see theirs among the weeds.
A second crop of mignonette, candytuft, annual phlox, alyssum, balsams, etc., should, later, be sown inside to produce autumn bloom. In your hot-bed start gladiolus, dahlia, tigridias and other bulbs and tubers, and also such roots of perennials, including Bengal and other tender roses, as you have kept through the winter in boxes placed in a light cellar.

**Select List of Flowers for General Cultivation.**

The running notes below will give all the information necessary to the grower in addition to that already stated.

Any respectable seed catalogue will give information as to special varieties.

**Ageratum.**—Cuttings may be started under glass. If seed is sown, cover lightly; set plants six inches apart; nice for winter flowering in the house.

**Amaranthus.**—Ornamental foliage plants; fine in masses, and in mixed shrubbery, borders and centers; sow in hot-bed and transplant.

**Asperula.**—Dwarf, desirable for shady situations and moist soil; fine for bouquets; plant six inches apart.

**Aster.**—Showy for borders; flowers in autumn; sow
in cold frame; transplant tall varieties sixteen inches apart, dwarf varieties seven inches apart, in good deep soil.

**Balsam.**—Showy and desirable; easily cultivated; prune by pinching out the terminal buds; sow in hot-bed, cold frame or window box; transplant into a deep rich soil, twelve inches apart; set dwarf sorts separate from tall varieties.

**Cacalia.** *(Tassel Flower).*—Tassel-shaped flowers in clusters on slender stalks; nice for bouquets; sow in cold frame; transplant to ten inches apart.

**Calandrinia.**—Sow seeds in slight hot-bed and transplant to light soil; it flowers freely, and is perennial if protected in winter.

**Calendula.** *(Pot Marigold).*—Very pretty; flowers toward sunset and does not open on cloudy days; hence one of its names, rainy marigold.

**Candytuft.**—Fine for edging of beds and bouquets; for early flowering sow seed in fall and protect during winter with mulch; thin plants to four inches apart in the spring; it is difficult to transplant.

**Celosia.** *(Cockscomb).*—Start early in hot-beds or window-boxes, and transplant into small pots, to remain until the flowers begin to appear, then set out in warm garden soil fifteen inches apart.

**Clarkia.**—Sow in March, under glass, and again later in the open air; they flourish in any soil free from wet; thin to a foot apart.

**Convolvulus.** *(Morning Glory).*—There are dwarf and also running species, all of them handsome; they may be sown in the open air at corn-planting time, or earlier in a cold frame and transplanted.

**Dianthus.** *(Pinks).*—Among the most elegant of plants are carnation, clove pink, China pink and sweet William; sow in hot-bed; transplant dwarf varieties six inches
apart; tall, twelve inches apart; if not kept too warm, they are good house plants.

Delphinum. (Larkspur).—These have finely cut leaves and beautiful flowers of scarlet, pink, purple, blue and white; double white is fine for bouquets; sow in the autumn or in the spring.

Eschscholtzia. — Showy flowers of yellow and cream white; will not bear transplanting; thin out to eight inches apart.

Gaillardia.— If sown early under glass, the bloom can be kept up the whole summer; the seed germinates slowly; do not transplant until all danger of frost is passed.

Gilia.—Low-growing, profuse in bloom; the best effect is produced by them in masses, or in borders on rockwork; the flowers are nice for bouquets; sow in fall, and cover lightly during winter; thin to six inches apart.

Lobelia.—Very pretty for baskets or vases; sow seed in hot-bed or frame; dwarf varieties are useful for borders or pots; transplant six inches apart.

Lupin.—Hardy and easy to grow; sow the seed in the open ground, where wanted to bloom; they cannot be transplanted.

Marigold.—The varieties are all showy, and produce fine effects in masses; hardy, and continue in bloom the
whole season; sow seed in frame or hot-bed; transplant two feet apart; dwarf varieties, twelve inches apart.

Mesembryanthemum.—Pretty plants of dwarf habit, fine foliage, suitable for basket or pot culture on the border; sow seed under grass; transplant eight inches apart.

Mignonette.—Delightful for its fragrance: sow under glass, and transplant in the open air eight inches apart; sow in the open ground in May for succession or late bloom.

Mirabilis. (Marvel of Peru).—Foliage and flowers are beautiful. For early flowering, sow in hot-bed or box, or may be sown where wanted to bloom; thin out two feet apart.

Nasturtium.—Dwarf and running varieties; the latter, used for hanging-baskets in winter. Dwarfs, pretty, low-
GARDEN FLOWERS AND SHRUBS.

Growing, profuse flowering plants. The green seeds, like martynia pods, are valuable for pickling. Sow in hot-bed, and transplant in open air eight inches apart.

**Nemophila. (Baby’s Eyes).**—Loveliest of blue-eyed flowers. They are low, hardy annuals, Sow in frames, transplant six inches apart; thrive best in cool, shady places. Seed sown in the fall will succeed well.

**Pansy. (Viola Tri-color).**—Nothing prettier; bloom, the first season, in June, if sown early in hot-bed and transplanted. Requires protection during the winter if in open-air beds.

**Petunia.**—Indispensable, and elegant in masses; fine in the window garden. The seed may be sown in hot-bed or cold frame; transplant eighteen inches apart; the plants do not always come true from seed; they are of every shade of color, and bloom from early spring until frost.

**Phlox, Drummond’s. (Annual).**—Among the most beautiful of garden flowers, and of infinite variety of colors. The seeds for early flowering should be sown in the hot-bed or the cold frame, and transplanted one foot apart, as too close planting produces mildew. Or plant out doors where wished to grow. The pretty moss pink is one of the perennial phloxes.

**Portulaca.**—One of the most brilliant of sun-loving flowers; low-growing, creeping plants, flowering abundantly. Sow in hot-bed and transplant, six inches apart in the open air.

**Ricinus. (Castor-Oil Bean).**—Plants of green and purple foliage, of tropical and striking effect. A centerpiece of ricinus, with plants of canna next, and a row of caladium plants outside, will form a bed truly tropical in effect.

**Scabiosa. (Mourning Bride).**—Bright-colored, annuals, adapted for beds and for bouquets. The German dwarf varieties are double; sow in frame or in open border.
Set the tall varieties fifteen inches apart, dwarf a foot apart.

Stock Flowers.—Stock or gilliflower will never go out of favor, being abundantly flowering, with colors running through all the shades of crimson, lilac, rose, white, etc. Rich soil is requisite to keep Stocks double; they are planted in May or sown early in the hot-bed, and set out, twelve inches apart. The annual Virginia Stock is fine for edgings, but it does not transplant easily.

Zinnia. (Youth and Old Age).—The varieties of this Mexican plant are magnificent in color. The flower is nearly as double as the dahlia, and lasts a long time. Sow the seed under glass in early spring, and transplant to the open ground, when danger of frost is over.

Everlasting Flowers and Ornamental Grasses.

The ornamental grasses and everlastings flowers (so-called), that is, flowers that retain their color and shape in drying, are considered indispensable in all good collections. Among these should not be omitted panicles of oats and heads of other grains carefully dried, while green, in the
shade, and then bleached, if desired, with the fumes of burning sulphur. There are many varieties of some of the species of everlasting mentioned. We give some of the better ones. These are: Acroclinium, white and red; ammobium, white; gomphrena (globe amaranth), white, flesh-colored, pink and white, and orange; helichrysum, rose, red, white, yellow and crimson; helipterum, white and yellow; rodanthe, white and yellow, purple and violet, rosy purple, etc.; statice, yellow, blue and rose; waitzia, yellow; and xeranthemum, purple, light-blue and white.

Besides these, that admirable and truly magnificent plant, Statice Latifolia, with its large trusses of lilac flowers, is most desirable where it is hardy.

Ornamental Grasses.—Among the giants in this class are pampas grass (gynerium), not hardy in the North, and erianthus ravennæ, hardy with slight covering, and fully as fine. The smaller ornamental grasses which we recommend are; agrostis nebulosa, elegant, fine and feathery; arundo donax, perennial, yellow striped leaves; avena sterilis ('animated oat'); Briza maxima, one of the best of the
ornamental grasses, also geniculata; brizopylum siculum, pretty; bromus brizæformis, perennial; chrysurus cynosuro-ides (lamarckia aurea), yellowish, feathery spikes; coix lachryma (Job’s tears); hordeum jubatum (squirrel tail grass), fine; lagurus ovatus (hare’s tail grass), dwarf, showy heads; pennisetum longistyllum, very graceful; stipa pennata (feather grass), magnificent; tricholæna rosea, beautiful, rose tinted.

Trellises.

Trellises are of various forms and easily made by any one who has a little mechanical skill. Those partly of wire and partly of wood are, many of them, of elegant forms, and are sold by all horticulturlists. When climbing plants and shrubs are grown at some distance from any building, some support must be given. Simple, strong stakes, the rugged stump, or even top of a tree may, with great effect, be covered by amelopsis, or any of that class of runners. Other climbers must have trellises to conform to their habit, and the height of these trellises must be governed by the plants employed.
Common Sense Timber Planting.

The Economy of Timber.

In the mountain country strict legislation should prevent the destruction of the forests. There the rainfall should be soaked among the roots, and the leaves and twigs retained at the foot of trees, whose shade prevents the sun's rays reaching the ground in full force. Then the water flows gradually away, giving to the country perennial rivulets. Remove the trees and this same water forms torrents which sweep before them the soil, leaving the hillsides bare, and, the rainfall over, the sun bakes the land into a desert. The rivers rise in a night from wretched streams, twining along through enormous beds of sand and silt to resistless currents bearing destruction to everything in their course. In a level country all the conditions are different, and in this, an agricultural work, the fair, arable land is all of which we consider the needs. So far as regards the great acreage of the lands of the United States the necessity for dense belts of timber is not as great as it has frequently been represented to be. The work of our horticultural and forestry societies has kept the people alive to the importance of the subject, although some of them have published assertions not borne out by later and more careful investigations. The writer once held somewhat extravagant notions which a more careful study of the subject did not confirm. One was upon the amount of forest per square mile of a country necessary to promote the best results in the cultivation of field crops. He finally settled upon the French standard of one-quarter of the area of a country. This we have modified from time to time until now we assert, without hesitation, that one-
tenth of the area of a country, equally distributed over farms as they may be in the prairie and plains region of the United States, will be amply sufficient, not only for the uses for which timber is designed, but also to insure the best results in the cultivation of crops.


Timber, generally distributed, modifies the climate in that the rains are more frequent and moderate, and the climate is, as a rule, more humid. The sun does not create so great a heat during the day, the radiation is less at night, and hence the temperature is more equable. The average rainfall of a country may be the same with or without timber. With timber it will be more equally distributed. A country may have the same average yearly pressure of wind with or without timber, but the probability is that a timbered country will be less subject to tornadoes, tearing every work of man from their pathway. It is not laborious, this planting of timber — not more so than the intelligent cultivation of corn.

Do we hesitate to wait so long as we must for the returns of our labor? We have to wait three and four years for our steers and colts to grow into usefulness, and from five to ten years on our orchards to pay for the labor bestowed on them. Five to ten years will give us poles, posts and firewood from our planted trees, and twenty years will give us timber.

What Timber to Plant.

To raise timber for profit we must plant, first, those varieties which enter most largely into the economy of civilized life — conifers, white pine, Norway spruce, Scotch pine, arbor vitae, and European larch; of deciduous trees,
white ash, black walnut, sugar, silver and soft maple, and the hardy Western catalpa (*C. speciosa*). Second: In planting a forest, in a prairie country, set apart a portion of the land for trees of rapid growth, to use before the slower growing species come forward. Among these rapid growers the cottonwoods, white and golden willow, and silver maple are the best.

We have already stated, in the appropriate chapters, that trees should be planted to ornament the landscape and to shelter stock and buildings. We have no very correct data in this country on the growth of forests. This we know—that they will reach a given size in two-thirds the time it requires in Europe, where forestry has been systematically carried on for many years,

*Time of Growth.*—The late Dr. Warder, one of the fathers of forest planting in America, stated that the coppice growths in European forestry are often utilized in periods of ten or fifteen years; in our own country, too, we have many trees of short rotation, and some of the most useful and most profitable trees are of this character.

The black locust may be harvested after it has grown from twenty to thirty years.

The catalpa speciosa in the same period will make good cross-ties and fence posts.

The ailanthus very soon attains a useful size, and for certain purposes has been very highly commended, both in this country and in Europe. Prof. C. S. Sargent is advising its extensive plantation, and some years ago it was spoken of as the most promising tree for the arid plains of the Southwest.

The forests of Scotch pine in Germany are allowed sixty years to reach their useful size for fuel and timber.

The birch there reaches its maturity in about half a century,

The willow, used for charcoal needed in the manufacture
of gunpowder, may be cut after growing twenty years, or even less.

Chestnut, in its second growth, is most profitably cut every twenty or twenty-five years.

The wood of the wild cherry soon reaches a profitable size for many purposes, though for saw-logs and lumber the trees should be larger.

Many individual trees, planted by the pioneers upon the broad plains of Nebraska, within the few years the white men have occupied the so-called "American Desert," have already attained to useful size and will yield each a cord of fire-wood.

Protection and Fuel.—The protection from cold winds afforded by groves of wood is also an economic consideration. A well-sheltered dwelling-house requires less fuel to warm it in cold weather than an exposed one. Animals, if well sheltered, need less grain and forage. Crops, too, are benefited by shelters.

From ten to twenty years, varying with the rapidity of growth of the trees planted, is, with proper care, a sufficient time to raise a grove of timber large enough to constitute an efficient protection, and to supply wood for most of the purposes for which it is needed on a farm. As has been often said, the trees will be growing while he who planted them is sleeping. No man, who had grown a shelter of that sort, would have it removed for ten times the cost of raising it.

For Other Uses.—The trees most suitable to plant for economic uses are to be noticed. Where it is desirable to have wood for shelter and use as speedily as possible, the white willow and silver maple are, perhaps, the best, as they are easily raised and grow rapidly. The white willow, thickly planted, produces long, straight poles, which are very serviceable in making fence, and will last a long time. It may also be made useful as a screen for planta-
tions of other trees which cannot so well endure the buffets of unchecked winds on the naked prairie.

The trees should be planted four feet apart each way, and thinned as occasion requires. The poles cut in thinning will be found useful. At eight feet apart, the larch will, in twelve or fifteen years, grow large enough for posts and railroad ties. Grown thus thickly, the tree shoots up perfectly straight, with small side branches, so that the entire trunk is available for use. Some have supposed that, as the American larch is commonly found in swamps, the European species has the same habitat. This is a mistake—it should be planted on dry ground; it will thrive in rocky, barren soils; poor, broken land suits it better than rich, flat prairies.

Trees.

Do we really estimate how pleasant a land we have—this prairie country—stretching away and away, like a vast, undulating ocean concreted by the hand of its Maker into firm land; verdant with emerald slopes; gorgeous with flowers, lacking only one thing to make it perfect—Trees.

Do those who swelter under our torrid summers, or lament our arctic winters, realize that with one acre in ten or twenty planted in timber, how perfect this land would become in all that makes a fertile country? The heat of summer tempered; our winters shorn of their terrors. How many know that, with each farm containing its little forest, each home its sheltering grove, the climate would be modified and softened; the gardens bloom with what to us now are exotics; orchards drop ripe and delicate fruits that now we cannot hope for; or fields bear a wealth of grain that would not be laid low with devastating storm, torn and tangled by tornadoes, or swept away by devouring floods. All these terrors we now sometimes experience.
Give us, then, trees about each homestead. Is it not pleasant, the pictures which our best-loved poet, Bryant, pen-paints of the forest, where

"The century-living crow,
Whose birth was in their tops, grew old and died
Among their branches, till at last they stood
As now they stand, massy, and tall, and dark, —
Fit shrine for humble worshiper to hold
Communion with his Maker."

These shall be green with gladness in the spring-time; glowing under the summer sun, they will shelter grateful heads and happy homes; fling their banners of purple, and crimson, and gold, in the autumn breeze.

If we plant forests, poets of generations who succeed us may sing, as the poet Hempstead has sung of those we are now transplanting from seeds of the Pacific slope. Of the great California redwoods, he says:

"They were green when in the rushes lay and moaned the Hebrew child;
They were growing when the granite of the pyramids was piled;
Green when Punic hosts at Cannæ bound the victor's gory sheaves,
And the grim and mangled Romans lay around like autumn leaves.
From their tops the crows were calling when the streets of Rome were grass,
And the brave Three Hundred with their bodies blocked the rocky pass;
In their boughs the owl was hooting when upon the hill of Mars
Paul rang out the coming judgment, pointing upward to the stars.
Here, with loving hand transplanted, in the noonday breeze they wave,
And by night, in silent seas of silver-arrowed moonbeams lave."

To enjoy the shade of trees in the West, we must plant them. If we would seek the shelter of the woods at noon-day, we must make it. Would we leave the noblest heritage to our children that the Western farmer can,—a growing grove of timber,—all that is necessary is, each spring, plant trees! PLANT TREES!
LAW GOVERNING FARMERS' ANIMALS.

The principles governing the law of the various States in relation to animals may be stated as follows: The farmer is responsible for the good behavior of his animals when beyond his care, and also for any injury or hurt done to persons by animals belonging to him, and known to be vicious, even although the person injured was a trespasser on the premises at the time. If you keep a vicious dog, and he tears a person hunting in your fields, you are liable in damages. If a vicious bull, ox or cow injures a person on your premises, you must pay the damage, even although the sufferer may have been a boy stealing apples from your orchard—but the person trespassing is also liable for his trespass. In fact, a person may be liable to more than money damage if he put a vicious animal in an enclosure to injure any special person who may have annoyed him by his trespasses across the field. A case is reported in which the farmer had to pay $500 for two broken ribs received by another in this way.

If an animal injures a person in the open highway, either by assault or by frightening a horse so he shall run away, to the damage of the driver or occupants of a carriage, the owner of such animal is liable. The owner of a horse was, in one case, convicted of manslaughter, because having turned his horse out on the road, and some children switching him, the animal kicked one of them, causing death.

Liability for Injury by Dogs.

We have already said that the owner of a vicious dog is responsible for any injury the animal may do a person, even on his owner's grounds. If a dog, even in play, runs
out into the street and frightens a horse or other animal so that he does injury, the owner of the dog is liable. However good-natured a dog may be, if he turns and bites children, who tease him, his owner is liable. The old English law held that a man could have no ownership in a dog. This became the rule in some of our States. The more enlightened rule now is that a dog is property, and to steal a dog a crime. Hence, in some States, although a person may not be the owner of a dog, merely harboring the animal renders the harborer liable for any damage the dog may do.

In States where dogs are licensed, a dog not licensed may be killed "whenever or wherever found." It is the law in some States, and should be everywhere, that a dog, licensed or not, if he attack a person, outside his owner's premises, may be killed, but your neighbor's dog has the right to pass peaceably over your premises, and you may not kill him simply for so doing. But if a dog is found beyond the enclosure of his owner, worrying or killing farm animals, he may be killed. Again, a dog may be killed if he haunt your premises, by day or night, to the disturbance of the family, either by his noise or otherwise. It is unnecessary to give the authorities from which these law-facts originally came. But by way of illustration, take the case of the dog, snapping and biting a boy who struck at him, in 124 Massachusetts, 57; and 38 Wisconsin, 300. The jury gave damages because they thought the boy acted naturally; but in 65 Illinois, 235, if it had been a mature man, instead of a boy, damages would not have been given.

Trespassing Upon Property.

Hunters.—One of the most common mistakes of gunners, trappers, etc., is that they have the right to hunt and fish where they please. All persons have the right to
fish in navigable streams and lakes, subject to the laws on fishing. In small streams and ponds, the right belongs solely to the owner of the adjacent land, for he owns the water also, until it has passed from his premises.

_Trespassing Animals._—The owner of the land has the right to kill trespassing animals, wild or tame, invading his premises to destroy his stock, and this, notwithstanding a law against killing wild animals, as mink, otter, etc., except at certain seasons. In fact, a man has a right to kill wild animals, especially destructive ones, upon his own land at any time, and all wild animals are destructive in some way—even rabbits.

_Berrying, Etc._—Persons may not trespass upon the land of another to pick berries or other wild fruit. Custom does not make law. Permission must first be had in order to avoid the payment of damage. It would, however, be considered mean to molest children berrying in the woods or enjoying a pic-nic. Still it is best always to ask permission.

_Posting Notice._—But because you are annoyed by trespassers you have no right to set traps, spring-guns, etc., to do injury, without first giving notice. It is also necessary, if you have a vicious animal on your premises, to post notice thereof. Some persons post the notice—"Man-traps and spring-guns," "Beware the dog," etc., on general principles, though the traps are imaginary and the dog innocent of harm.

_Neighbor’s Fowls._—You may not shoot, nor lay poison for your neighbor’s fowls, which trespass and scratch up your garden, even though you return the fowls back upon your neighbor’s land. If they have been poisoned by you, and the neighbor should eat them, it might go hard with you in court. So if you should injure a boy caught stealing fruit, you would be liable for malicious mischief.

_Injury to Stock._—You would be liable for damage to your neighbor’s stock if you threw dangerous substances,
as glass, bits of wire, or other trash into his field, or even deposited it in your own fence corners, and the fence being broken, the animal was injured. For instance, a cow swallowed bits of a wire fence that the owner had allowed to fall to pieces and get rusty. These pieces had fallen in a neighbor's field. A jury decided that the owner of the wire must pay for the cow. The same rule would follow from injury from trimmings of Osage orange, or other substances thrown in the road.

Division Fences.

The primary object of fences is not to protect against the evasion of other animals, but to keep in one's own. Yet, it is not lawful for you to put up a fence except it be entirely on your own land. Hence, when a division fence is to be built, if on the line, both persons join in building it, and it belongs jointly to them, and cannot be removed except by the consent of both. There must be an agreement as to which portion each person shall keep up.

Then, if the adjoining fence-owner does not do his duty, and your cattle walk over his imperfect fence, he has no redress; but if they stray beyond your neighbor's, upon the land of a third party, you are liable for the damage to that party, and even if this third party has not a proper fence. If you turn your cattle into the highway and they stray upon the property of another, even though he has no fence, you are liable. You are equally responsible if persons straying through your fields let down the bars or leave gates open by which your cattle do injury to the property of another. But if one is carefully driving cattle along the road, and without the driver's fault they break away and trespass, there is no liability if driven back as quickly as possible; for you have the right to drive your cattle along the road, though you may not lawfully turn them into it to shift for themselves.
Railway Fences and Trespass.

While it is the fact that by the common and general law, every man is bound to restrain his stock from doing injury to another, the manner of restraint by a fence is due to the statute. Hence, unless the statute clearly requires it, a man need not build a fence if he has no stock to confine. In relation to fencing railways by the corporations, the character of the fence is defined by law. The general law requires the company to maintain a suitable fence along the whole line. It does not mean that the fence shall be the same along the whole line. It may be necessary that some portions be better and stronger than others. It must be suitable.

If Stock is Killed.—Now, if the stock of a land-owner adjacent gain access to the track, by reason of the unsuitable character of the fence, and are injured or killed, the company is responsible; but if the animals stray from premises beyond, and find their way to the track over this contigious land, the railway company is not liable for damages. Nor would the company be liable under the common law for cattle straying along the public highway, without the care of their owner, if killed by a passing train on a crossing.

Railways Running Through Farms.

The conveyor of lands for a highway does not lose ownership in the lands, except as to its use for the purposes of a highway. Railway companies generally acquire simply the right of way, and not the absolute ownership of the land. The reason of this is that in the case of the abandonment of the highway, or the franchise of a railway company, the land may revert to the one who sold it, or the person owning the original tract at the time of the
abandonment, unless it is expressly stipulated to the contrary. But if a person gives an absolute deed, it, of course, would be binding. This should never be done, under any circumstances, because the abandonment and sale of a strip might cause great damage to a farm, if resold to other parties, and the conveyance for road purposes is sufficient for the railway or road commissioners.

The exclusive rights in the trees, and vegetation on the surface and the minerals below belong to the conveyor, and not to the company who only hold the right of way. And if a stranger take anything belonging to the soil proper therefrom, he is liable, not to the railway company, but to the owner of the soil; but the owner of the land does not therefore have the right, as against the company, to enter upon and remove the turf, soil, or anything growing thereon, or to disturb the same without the permission of the company, and the company have the right to cut down and remove whatever may be within their line, if it may at any time interfere with their use and operation of the road. No person has the right to take any property from the line of a railway, nor make use of the same without the permission of the company, and the person so doing, if it be personal property, is liable to the company and not to the seller of the land.

Public Roadways.

Roadways are made for the use of the public. Their right is simply the right of way or passage over the roads, by themselves, teams, vehicles, stock, etc. The road officers may use the soil, gravel, etc., of a road for repairs, or for transportation to some other part of the road, but not for their own private use. The owner of the land bordering on a road owns the soil, trees, grass, or any valuable thing on or under the surface. No man has any more
right to remove anything therefrom, except the owner of the soil, or the properly constituted officer, than from any other private property. Neither has any person a right to deposit and leave vehicles, wood, timber, or other property on the public road. If he does, the owner of the adjacent land may remove them, and, if injured or lost, the owner has no redress. Stock may not be stopped to feed on the public highway. No person may hitch a team in the highway, to the detriment of trees or other property. If he does, the animal or animals may be removed. No one has the right to stand in the road to abuse another, to throw missiles at your animals, without liability for trespass; and if obscene language is used, the person using it may be driven off, even by force. Fruit trees, standing in the road, belong to the owner of the adjacent land, and the fruit as well; and a well, standing partly in a field or yard and partly in the road, belongs exclusively to the owner of the land.

The Rights of the Public in the Road.

The road is for the convenience of the public at large. The owner of the adjacent land has no right to obstruct it. He cannot use the road to deposit trash; cannot place any structure, even a pig-pen, thereon, nor leave any vehicle standing thereon. If he does, even if not in the traveled path, and a person or animal runs into them at night, and is injured, the owner is not only liable for the damages, but for obstructing the highway. The owner of adjacent land must place his fence entirely outside the road, and not half over the line. Neither can he place terminal posts half on his own and half on his neighbor's land, unless he has liberty to do so. But if the road is discontinued, the land reverts to him, and he can enclose it again as a part of his premises.
Avoiding Obstructions in the Road.

It is generally supposed that no person has the right to leave the road for any purpose and pass over the adjacent land. There are, however, occasions when he may do so. If deep snows have fallen, or the road is drifted so full that it is impassable; if there is a washout that cannot be passed, or if from any cause the road is absolutely impassable, a traveler may have the right even to remove a fence and pass over fields, to a point beyond the obstruction, and he is not liable for trespass. But in doing this, he must be careful not to do unnecessary injury. For instance: A fence may not be broken down so as to injure it seriously; it must be carefully taken down. Hence it would not be safe to tear down a permanent wall or destroy a living hedge.

Right of Way Over Lands of Others.

If a person be shut out from the public highway by the intervening lands of another, he has the right to a private roadway, by the most practicable route, over such intervening land to the public road. This right must be acquired by one of three means:

1. The right by continued use. To acquire this right, the roadway must have been peaceably used for a period of fifteen or twenty years; that is, continuously or regularly, and under a claim to this right of use; but this right extends only to a definite road and for the definite purpose of passing directly to and from the public road. No person should attempt to acquire this right by use simply to avoid paying a just compensation. To gain this right it is not necessary that one person should have traveled, but successive owners, if there have been such within the prescribed period. It is not peaceably used if done under protest, however long the use be continued; and the right,
once acquired, if for a specific purpose, as hauling wood or other commodity from another lot, the right ceases when this specific use no longer continues.

2. If you sell all your land fronting the highway, retaining that lying away therefrom, you reserve the right to pass to and from your new home to the public road. So, if you sell to another that portion away from the road, the law gives him the right to cross your land to the road, if he be otherwise cut off. It makes no difference whether the right of way is stipulated in the deed or not. Yet, it is proper in every case to have the whole clearly stipulated.

3. The other way, and the proper one, is to buy your right of way, and no sensible man would object to granting it in this way. The difficulty in this case generally arises in dissensions as to the price. In such a case common sense and humanity would dictate that no advantage be taken on either side—both should make all reasonable concessions.

However the right to a private road may be acquired, you have no rights outside the line of the road. The seller, in the absence of any stipulation to the contrary, has the right to put in suitable gates, or bars, at the entrance and exit. And if the bars are left down by the person who acquires the road, or by his family, servants, or visitors, he is liable for all damage resulting therefrom, either by himself, family, servants, or visitors.

Liability of the Farmer for His Servants.

The liability of the farmer for the acts of his workmen is more onerous than is generally supposed. It might not be thought that if a horse be driven by one's hired man, and the horse cast a shoe, which flies and breaks a window, the owner of the team would be liable; but it is true that he is liable. So you would have to pay for the damage done by your team running away, if damage is done. It
was a large bill that a gentleman had to pay whose coachman allowed his team to run away and crush through a plate glass window, and into a jewelry store filled with costly articles.

If you lend a servant a team, and with it give him an order to execute, and he gets drunk, or from other preventable cause allows the team to do injury, you are liable. But if he borrows a team simply for his own pleasure, and commits injury, you are not liable. If your hired man injures himself through your negligence, you are responsible to him.

If you, or your hired man, by your orders, set fire to brush or trash on your own field, and the fire damages another, you are liable. So you are if you set him to chopping, and he accidentally chops down or into trees beyond your land line. In short, you are liable for any act of injury by your hired man in the performance of something you have set him to do. Therefore, never hire a man who gets drunk, and to set him a good example, never get drunk yourself. Under this head, however, the line is so closely drawn as to liability or not, that instead of depending upon general rules, in most cases it is better to consult a lawyer.

Rights Relating to Water and Drainage.

There are certain cases where one person may flow another person's land, as in the case of the mill owner, etc. It is a franchise that has been paid for. You may do what you please with your water, so long as it does not flow back upon the land of another. If it does, and the privilege has not been paid for, he may take down so much of the dam as will relieve his land from the overflow. This flooding is often done innocently, from ignorance of the extent to which the back-water will rise.
If a stream has become obstructed by drift-wood, etc., below, so that the water backs upon your land, you may remove this natural obstruction, leaving the material on the bank. This, however, does not apply to surface water accumulated by heavy rains. But water is no longer surface-water after it has been gathered into an natural or artificial channel. Surface-water originating on one's own land, the owner may detain it if he can.

Against an overflow by floods, a person has the right to embank, even to the detriment of his neighbor. His neighbor is at liberty to do the same, but it is not permissible to place impediments in the bed of the stream, to the detriment of another. Spring-water and underground water belongs to the soil. Your neighbor may have a well fed by springs on your land. You may cut the source of these springs and convey the water where you please. So long as it remains on your own land he has no redress.

You have no right to turn your drainage water onto your neighbor's land; but the same rule works here as in the acquirement of private roadways.

**Liability of Dealers.**

The adulteration of every article of use or sale, and frauds in contracts, etc., are growing evils. So far as contracts are concerned, unless the farmer is able to understand them, to be assured that they are correct, or cannot be separated into parts for his discomfiture, he should have nothing to do with them without first consulting his lawyer, to know that they are all right. Trust no stranger in any event. Beware of lightning-rod peddlers, jockeys, and confidence men generally, who want to make you rich in a trade. Sign no contracts for anything for future delivery, unless the men are known to your bankers as solvent, and especially sign no paper that may have a double meaning.

The liability of a dealer will compel him to make good
any deficiency. If you buy grain or other seeds, of a given name, they must be true to name. If expressly warranted pure and fresh, the dealer is not only liable for the purity of the seed; but if they fail to grow, or turn out something else, the dealer is not only liable for the value of the seeds, but for whatever loss the farmer or gardener may have suffered from these causes. Seedsmen intend to be honest as a rule. They sometimes make mistakes. If so, the innocent purchaser does not have to stand the loss, but the seedsman or dealer.

Hiring Help.—Specific Wages.

If a man or woman is hired without specific agreement as to wages, he or she is entitled to the current price of that particular labor. If a laborer hires for a specific time, and quits before the expiration of that time, even though he may have been hired at so much per month for that time, he cannot recover any of the money from the master. But if the farmer has paid him money on account from time to time, or has given him a note or notes in lieu of money, the farmer cannot recover this. But if the farmer voluntarily discharge the laborer, his wages must be paid.

If a laborer hire for a specific time at a fixed price and works, say until that season when wages may be much higher per day or month than the price agreed on per day or month for the whole time, and then quits, the master can recover this extra amount for the remainder of the time, and the laborer can not set off the value of the work already done. So if a man or firm be hired to do a specific work at a specific price, as digging a well, building a wall or a house, and leaves it unfinished, without good excuse, he is entitled to nothing.

If a laborer has good cause for refusing longer to work, he may do so, and the master must pay for the work actually done. Sickness of the laborer, a dangerous
epidemic in the family or neighborhood, improper treatment, bad food, etc., are valid causes for quitting. If the laborer is arrested and imprisoned for crime, it is no bar to his receiving pay for the work already done. As to what constitutes cause for quitting, outside of those mentioned, and in fact when litigation settles the matter, it must be determined by the jury.

If another person entice your workmen away before his legal time has expired, you have recourse upon the person enticing the man. The law would hold that he who interferes with another man's business must pay all the damage accruing from the inconvenience, and if done maliciously this might add special damage; but one person may offer inducements for a man to leave an employer where the person was only working from day to day, or when his time had expired.

What is a Farm?

A farm is any considerable piece of land, described, by metes and bounds, by monuments, blazed and distinctly marked trees, Government or other surveyor's stakes, properly recorded. The extent of a farm is determined by the length of the boundary lines, by visible objects of those that may be found, and those visible monuments, trees, rocks, sticks or stones, naturally or artificially placed. These control all other agents. When described by metes and bounds, the number of acres wrongly stated in the deed would give no cause for redress, even though they were far less than stated in the deed, or even though the seller fraudulently overstated the number of acres.

In buying a farm, if the seller overstate, even fraudulently, how much grass it will carry, how much stock it will pasture, or how much wood it will go to the acre, the buyer has no redress. But if, with a view to selling, he should fraudulently state that the farm had produced a specific
quantity of any article in a year, knowing it to be false, he would be liable to an action at law, so very close is the line drawn between mere talk and actionable talk.

A man may have a farm to-day and none to-morrow. If a stream carry away a part of or all of his farm, the loss lies with himself, although he may know where his farm is deposited. It thereafter belongs to the man fortunate enough to acquire the accretion, so long as it remains.

When a farm is bounded by a stream, the owner's right goes to the middle of the current, not always to the middle of the water. This should be remembered in determining what islands in a stream belong to one or to his opposite neighbor. If the land is bounded by a large lake, navigable river, bay or gulf, his rights extend only to low water mark. Farther, his rights are merely those common to all. But in tide waters, there may be flats, in this case it will depend upon his deed in its accuracy whether he owns to high or low water mark.

If a boundary line runs to a specific object, as a tree, rock, fence, etc., it runs to the middle of the object, unless specifically stated otherwise. If so, examine the record, to know that the next man actually owns up to your line; in fact, in buying any piece of property in which a deed, or other contract passes, it is well for your lawyer to pass on its merits. As a rule, the fee for such a service will be well invested.

**Getting a Free Farm.**

All public lands are virtually open to free settlement, the fees under the Homestead, Timber Culture and Desert Land acts being light. At public land sales the price ranges from one dollar and twenty-five cents to one dollar and fifty cents per acre, but the best of these lands are always gobbled up by railways and syndicates, and they often wrongfully dispossess the poor settler. But this need
not be if the man knows his rights and asserts them. Formerly pre-emption was the only means of acquiring title by actual settlement. Then the settler had to prove title and also pay one dollar and twenty-five cents per acre when the land was placed in the market. It is still a favorite means by which speculators secure water privileges, and valuable tracts of timber land, by means of fraudulent affidavits. They also pre-empt water fronts under the Desert act, and often by armed mob-force drive off actual settlers. Colonies of actual settlers may command respect from these pirates by organized force.

The Public Land System.

A complete and condensed compilation of the principal means by which public lands may be secured, brought down to the year 1883, is given below. To get a clear understanding of this it must be remembered that the public lands are surveyed into a series of lines of townships running north and south, each township consisting of thirty-six sections of 640 acres, or one square mile, each. The area of a township is, therefore, 23,040 acres. Each line of townships is called a range, the ranges being numbered from east to west, and the townships north and south. Each section is divided into quarters of 160 acres each, and these again divided into quarters of forty acres each. The public lands are divided into two great classes, the minimum price of one class being one dollar and twenty-five cents per acre, and of the other two dollars and fifty cents per acre. The latter class consists mainly of alternate sections reserved by the Government in land-grants to railroads. Public lands are not now placed in the market subject to purchase for cash, the general policy of the Government being to hold the lands for actual settlement only. The principal laws under which titles
can be perfected are the "Homestead," "Pre-emption," and "Timber-Culture" acts.

**Pre-emption, Homestead and Timber-Culture Acts.**

Under the Pre-emption law the settler must pay the Government price for the land. The maximum amount of each grant is 160 acres. To secure this the claimant must first become a resident of the land—by claim-shanty or otherwise—and within three months after settlement must file a declaratory statement of the facts at the nearest land office. For this filing he pays two dollars. He must reside on the land for at least six months, and within thirty-three months from the date of settlement he must submit final proof of actual residence and improvement, and pay for the land—two dollars and fifty cents or one dollar and twenty-five cents per acre, according to class. Any time before the thirty-three months expire the settler may convert his claim into a homestead by payment of the homestead fees.

**The Homestead Law.**

Under the Homestead law any citizen or intending citizen, of either sex, over the age of twenty-one, single or the head of a family, may obtain 160 acres of public land free by five years' actual settlement and residence thereon. The only payments the settler is required to make are the land office, patent, and commission fees, amounting altogether to about twenty-six dollars, of which sum eighteen dollars is paid at the time of entry and eight dollars at the end of five years when the title is perfected. Until last year the settler was allowed only eighty acres of the two-and-a-half dollars land, or land within the railroad limit, but the law has been so amended that 160 acres can now be secured. Soldiers and sailors who served during the war are allowed to deduct the time of such service—not
exceeding four years—from the five years' residence required before completion of title—a privilege which extends to widows or minor orphan children of all those who if alive could claim this allowance. After six months' actual residence and cultivation, the settler has power to prove up and purchase the land at the Government price, instead of residing thereon the remaining four and one-half years required to complete his title. This is what is known as commuting an entry. Under this act, therefore, any man, however poor, may become the owner of a farm of 160 acres for twenty-six dollars—a farm which at the end of five years should be worth at least $1,000. Special provision has been made for people who have been unfortunate in business, or burdened with debt, 'who wish to start anew, this act expressly providing that "no lands obtained under the provisions of this chapter shall in any event become liable to the satisfaction of any debts contracted prior to the issuing of the patent therefor."' According to recent rulings under this law a man and woman, each having a homestead entry, may pool their rights by marrying without invalidating either claim. Lands entered under this law are exempt from taxation until title has been completed. One person cannot relinquish a claim to another; relinquished lands revert to the Government. A single woman's rights are unaffected by marriage—so far as this act is concerned—provided the requirements of the law are complied with. A married woman making an entry, who has been deserted by her husband, will, upon final proof, receive the patent in her own name, notwithstanding the husband's return.

The Timber-Culture Act.

Under the Timber-Culture act actual residence is not required, and the same amount—160 acres—can be secured. The party making an entry is required to break
or plow at least five acres the first year and five more the second year. The first five acres are to be cultivated during the second year, and planted with timber seeds or cuttings during the third year. The second five acres are to be cultivated the third year, and similarly planted the fourth year. Not less than 2,700 trees, seeds or cuttings must be planted on each acre, and at the time of final proof there shall be growing not less than 675 living and thrifty trees to each of the ten acres. A tree crop, if destroyed one year, must be replanted the next. At the expiration of eight years from entry, final proof can be made and patent obtained. The fees are fourteen dollars at time of entry and four dollars at final proof. This land is exempt from taxation or execution for eight years.

Land Taken Under the Three Acts.

Under these three acts, any qualified applicant may obtain 480 acres of land at a nominal cost. A person cannot file under the homestead and pre-emption laws at the same time, actual residence being necessary in each case, but is at liberty to enter a pre-emption and tree-culture claim together, and after proving up on the pre-emption by six months residence or longer, may take a homestead, and thereby get possession of the 480 acres within a year of his first settlement. Every son and daughter over twenty-one can do the same. A pre-emption settler may mortgage his land to pay the Government price for it. A pre-emption claim cannot follow a homestead and tree-culture claim, as persons already holding 320 acres of land are barred from the privileges of the pre-emption act. Where the Government alone is concerned, the laws will be liberally construed; but where adverse rights are involved, a strict construction of the statutes is necessary.
The Desert Land Act.

There is, however, another land act, under which large areas have been sometimes taken, and actual settlers ousted through terrorism. It was intended to be beneficent, and might be so under proper restrictions. This act is applicable to all lands, exclusive of timber and mineral lands, which will not produce an agricultural crop without irrigation. This act is taken advantage of principally in the far West Territories, where there are large areas of arid land requiring irrigation to make them productive. Under this act, a person may obtain one section—640 acres—of desert land at $1.25 per acre by three years' irrigation—twenty-five cents per acre to be paid at time of entry, and the remainder of one dollar per acre on final proof at the end of three years. Actual residence is not required.

Under these laws, an immense number of fraudulent land entries have been, and are being made, the Land-Office Commissioner being comparatively powerless to enforce the law or investigate complaints. The work of the General Land-Office being limited by the size of the Congressional appropriations, it has been found impossible to inquire into a tithe of the alleged frauds, and the groundwork for a great structure of future litigation is now being laid out. Great quantities of valuable coal and iron lands, forests of timber, and the available agricultural lands in whole regions of grazing country have been monopolized by persons who have caused fraudulent pre-emption and commuted homestead entries to be made by their agents and employes, and the Commissioner, in his latest report, states his inability to stop this, owing to the limited facilities of the Land-Office. He strongly recommends the repeal of the pre-emption law, on the ground that it is being largely made a shield for fraudulent entries, and that the passage of the homestead law leaves it unnecessary.
Formerly, the pre-emption system afforded the only means by which settlers could acquire title to homes on the public domain, but, with the passage of the homestead act and the recent supplemental legislation, which placed homesteaders on an equal footing with pre-emptors, the special utility of the pre-emption law for bona-fide settlers has wholly ceased.

Lands Yet Open to Settlement.

The bulk of the land yet open to settlement is either mountain land, desert land, or the vast areas in the far Northwest, including Alaska, much of it inhospitable for cultivation. Alaska alone comprises about 370,000,000 acres. The tide of immigration is now settling into Dakota, Minnesota, and the farther valley lands of the Northwest. Dakota alone contains 150,000 square miles (a square mile contains 640 acres), two-thirds of which is unsurveyed, and with much desert land and mountain land at the West. The term desert lands with us means land requiring irrigation, but often naturally producing grass. The Northwest mountain valley lands are also of vast extent. Government surveys are progressing at the rate of about 50,000,000 acres per annum, or nearly 1,000,000 acres per week. The total area of public lands surveyed in the several States and Territories from the commencement of surveying operations by the Government until the end of the fiscal year 1882 was 831,725,863 acres. The estimated area unsurveyed is about 983,000,000 acres, figures too vast to be appreciable except by comparison.

Needed Reforms in Farm Law.

The laws relating to agriculture, taking agriculture in its broad sense, form no small part of the general statutes of a nation. The day is probably not far distant when the
people will demand a simplification of our laws generally, by which unnecessary verbiage may be expunged: 1. That they may be simplified to conform to fundamental principles, so that any man of average comprehension may understand the nature of any particular law. 2. To do away with the practice of brow-beating, intimidation, and badgering of witnesses, by which they are made to say what they do not mean; and to simplify pleadings, by which facts only shall be kept in view. It is true that such is the general purpose of law, and under the rulings of the judge, much that we have mentioned as desirable may be accomplished; but cannot always be done even if the judge desires. So many abuses have crept into our courts that the covering up of facts, and special pleas of counsel on either side, often so befog a jury that, notwithstanding the charge of the judge, they often find it impossible to eliminate from their minds that which has speciously been instilled by the pleaders. The more carefully trained mind could not follow and retain speech after speech, each one of a week's duration, presenting the most diverse arguments for and against, and sift the true from the false.
FISH AND GAME LAWS.

Maine.

The penalty is one dollar for taking larks, robins, partridges, woodpeckers, or sparrows, between March 1st and July 1st; and ten dollars to the owner of lands, with the liquidation of all damage suffered for any trespass committed, between March 1st and September 1st, in hunting or killing the birds named.

New Hampshire.

The law prescribes a fine of one dollar for killing, taking, or having in possession, at any season of the year, any robin, thrush, lark, bluebird, oriole, sparrow, martin, woodpecker, bob-o-link, yellowbird, linnet, flycatcher; or warbler, or rail, yellowleg, or sandpiper, between March 1st and August 1st. The fine is three dollars for each snipe, woodcock, or plover, between March 1st and August 1st; or for each partridge, or grouse, or quail, between March 1st and September 1st. One dollar additional is assessed for each bird, if taken in defiance of a published notice by the owner of the land—one-half for the use of the complainant, and the other half to the town or city. The action of the law may be suspended for one year, at any time, by a vote of a town or city, so far as relates to such town or city.

Vermont.

The law makes the fine one dollar in each case for taking, wounding, or killing, or for the destruction of the nest or eggs of the robin, bluebird, yellowbird, cherry or
cedar bird, catbird, kingbird, sparrow, lark, bob-o-link, thrush, chickadee, pewee, wren, warbler, woodpecker, martin, swallow, night-hawk, whippoorwill, groundbird, linnet, plover, phœbe, bunting, hummingbird, tattler, and creeper.

Massachusetts.

In this State, the penalty is two dollars each for killing, at any time, robins, thrushes, linnets, sparrows, bluebirds, bob-o-links, yellowbirds, woodpeckers, or warblers; the same for killing birds on salt marshes, the owner excepted; five dollars for killing partridges or quail between March 1st and September 1st; woodcock, between March 1st and July 4th; five dollars for trapping or snaring any birds at any time, save partridges; twenty dollars for killing grouse or heath-hen at any time, and ten dollars to the owner of the grounds, and a search-warrant authorized for any one suspected of the offense; and twenty dollars for hunting deer with hounds or dogs in Plymouth or Barnstable counties. There is a fine of one dollar for killing between sunset and one hour before sunrise, any plover, curlew, dough-bird or chicken-bird. Any city or town may vote to suspend, within its limits, any of the provisions of this law.

Rhode Island.

In this State there is a penalty of two dollars in each case for killing, destroying, selling, buying, or having in possession, any lark, robin, wood duck, gray duck, or black duck, between February 1st and September 1st; or quail, partridge, or woodcock, between January 1st and September 20th; snipe, between May 1st and September 20th; grass plover, between February 1st and August 1st; grouse, or heath-hen, between January 1st and November 1st; and swallow, or box-martin, between May 1st and October 1st;
twenty dollars in each case for killing woodcock between January 1st and July 1st. In addition, five dollars may be imposed, to be paid to the owner of the land, for the first offense, and ten dollars for the second offense, besides a liability to damage for trespass. Action must be brought within three months.

**Connecticut.**

The law in Connecticut provides a fine of three dollars for killing, selling, or possessing, or destroying a nest of eggs of woodcocks between the first day of February and the first day of July; pheasants, partridges or ruffed grouse, between the first day of February and the first day of September; quails of any species, between the first day of February and the first day of October; wood-duck, widgeon, black, gray, broad-bill, canvas-back or teal duck.

The fine is one dollar for killing, or trapping, a nightingale, bluebird, Baltimore oriole, finch, thrush, lark, sparrow, catbird, wren, martin, swallow, or woodpecker, at any time, or a robin or bob-o-link, between the 1st of February and the 1st of September.

The taking of brook or lake trout between September 1st and January 1st, is fined one dollar. It is also forbidden, under a penalty of ten dollars, to take pheasants, partridges, or quails, on the land of any other person.

**New York.**

The laws relating to game have been frequently modified, and now are probably among the best, in a general way. Insectivorous and other birds are protected between February 1st and October. The fine is placed at five dollars for each woodcock, between January 1st and July 4th; ruffed grouse, between January 1st and September 1st;
quail, between January 1st and October 20th; wood, black, gray, and teal duck, between February 1st and August 1st (excepting upon the shores of Long Island). It is forbidden to catch quail or ruffed grouse with a snare at any time; and it is unlawful to take prairie fowl within ten years, under penalty of ten dollars for each one killed or taken.

Five dollars each is the penalty for taking trout between September 1st and March 1st. A penalty is incurred of one hundred dollars and damages for putting lime or drugs in any lake, pond, or stream, by which fish may be injured. Owners of dams, if two feet or more in height, on the tributaries of Lake Ontario, Champlain, or the river St. Lawrence, are required to provide a sluice at an inclination of not more than thirty degrees, suitably constructed and protected, as a passage-way for fish.

Deer are prohibited game from February 15th to August 1st, in all counties except Clinton, Franklin, St. Lawrence, Jefferson, Lewis, Herkimer, Hamilton, Essex, Warren, Fulton and Saratoga (where the prohibition is taken off only in October), and in Kings, Queens, and Suffolk, where November is the only month for their pursuit.

For fishing, except with hook or line, in certain interior lakes, the fine is twenty-five dollars. A similar penalty attaches to trespass in fishing, after public notice has been given.

Pennsylvania

In this State it is forbidden, under penalty of two dollars, to trap, kill, or shoot any bluebird, swallow, martin, or other insectivorous bird, at any season of the year, and the same penalty attaches to the destruction of eggs or nests of any of the birds mentioned in law. A fine of five dollars is laid for killing rail or reed birds between June 1st and September 1st; pheasant, between February 1st and August 1st; woodcock, between February 1st and
July 4th; partridge or rabbit, between February 1st and October 1st, and a similar penalty is incurred by buying these birds out of season to sell out of the State.

**New Jersey.**

A fine of five dollars each is imposed for killing any partridge, water-fowl, grouse, quail, or rabbit, between January 1st and November 1st, or woodcock between January 1st and July 5th; to be recovered with cost of suit, and in default of payment imprisonment for sixty days may be adjudged.

A penalty of fifteen dollars is laid for placing decoys for geese, ducks or brant, at a distance of more than three rods from ice, marsh, meadow bank or sand-bar, or for hunting them with a light at night; and it is made unlawful to kill geese, ducks or brant, between April 15th and October 15th, in or about the waters of Barnegat bay or Manasquan river.

The fine is five dollars each for killing geese, ducks or brant, between April 1st and December first, at Cape May. A trespass, after having been once forbidden to enter lands, renders one liable to a fine of three dollars.

**Delaware.**

It is unlawful for non-residents to catch or kill any wild goose, duck, or other wild fowl, under a penalty of not less than fifty and not more than one hundred dollars. Citizens do not rest under this prohibition. The plan of procedure in prosecution is set forth so that any boat, gun, or decoy, used in violation of this law, may be seized and confiscated, and the penalty for resisting an officer is fixed at one hundred dollars.

The law does not prohibit persons from killing game
on their own premises, but it is unlawful for others to kill a partridge, pheasant, robin, or rabbit, between February 1st and October 15th (in New Castle County, between January 1st and October 15th); woodcock, between February 1st and July 1st. The penalty is one dollar for each bird killed. A person not a citizen of the State, gunning upon land not his own, without permission of the owner, is liable to a fine of five dollars for each bird or other game. The penalty of hunting or killing deer is two dollars.

**Ohio.**

In this State the penalty is from two to ten dollars, for killing insectivorous birds, or disturbing their nests. The same penalty is incurred for killing, between February 1st and 15th, any dove, wild rabbit, or hare, yellow-hammer, or flicker. From five to fifteen dollars may be imposed for killing wild turkey, quail, ruffed grouse, prairie chickens, or wild deer, between April 15th and September 1st; woodcock, between February 1st and July 4th, and wood duck, teal, or other wild duck, between May 1st and September 15th. Exposing for sale or having in possession, incurs the same penalties, and the costs of prosecution are in all cases to be paid by the offender.

**Michigan.**

The penalty for killing small birds in Michigan is fixed at five dollars each, and for wild turkey, partridge, or ruffed grouse, between February 1st and September 1st; for woodcock, between March 1st and July 1st; prairie chicken or wild duck, goose, or swan, between February 1st and August 15th; for quail, from January 1st to October 1st. It is made unlawful to destroy nest or eggs. The fines go to the school library fund. Indians and the inhabitants of
the upper peninsula are exempt from the effect of these provisions.

Illinois has no general bird law. In a portion of the counties it is made unlawful to hunt or kill deer, turkey, and grouse, prairie hen, or quail, between January 15th August 15th.

**Wisconsin.**

Five dollars is the penalty for killing grouse or prairie chicken between December 1st and August 12th; or partridge, ruffed grouse, or quail, between December 1st and the first Tuesday of September. It is unlawful to kill or take woodcock in Iowa between the 1st of January and 1st of July; prairie hen or chicken, between 1st of January and 1st of August; or quail, ruffed grouse, pheasant, wild turkey, or deer, between the 1st of January and 1st of September.

**Minnesota.**

In this State the penalty is five dollars each for killing at any time a whippoorwill, nighthawk, bluebird, finch, thrush, lark, linnet, sparrow, wren, martin, swallow, bob-o-link, robin, turtle dove, catbird, or other birds; five dollars for each woodcock, from January 1st to July 4th; partridge, or ruffed grouse, between January 1st and September 1st; ten dollars for trespass in sporting; twenty-five dollars for killing each deer, elk, or fawn, or having the skin of one in possession between January 1st and August 1st. A fine of five dollars is also imposed for each speckled trout taken, except in Lake Superior, Mississippi, Minnesota, St. Croix and Root rivers.
Game Laws in Old and New States.

It will be seen that in the newer States the laws do not cover so wide a scope as in the older ones. In other words, laws are not made until the necessity arises: first, for protecting insectivorous birds, then game birds, and, lastly, fish and four-footed game. On the other hand, in comparatively unsettled regions, bounties are given for the destruction of wild beasts. Sooner or later, however, it becomes necessary to enact and enforce laws for the preservation of birds beneficial to the farmer, and a careful comparison of the laws of several States will enable farmers to suggest to legislators what animals should be protected and what destroyed.

California's Experience

In California it is only within the last few years that anything has been done for the preservation of birds. The State began to be overrun with insects injurious to vegetation. Then the people began to move in relation to the protection of insectivorous birds; but some birds, at certain seasons of the year, when insects are scarce, will eat fruit.

Clamor Against Useful Birds.

The thrush family, including the mocking-bird, robin, etc., will eat fruit. Some ignorant fruit-growers clamor against them. Some ignorant farmers clamor against the crows and all that class of birds, because they pull corn; against owls and hawks, because, when they have exterminated mice and other vermin, they pick up a chicken
once in a while; against the skunk for the same reason; against the prairie-chicken and quail because they eat grain; against birds in general, forgetting that they pay ten-fold for all they eat, in the destruction of insects. Then there is a clamor for the Legislature to do something, for entomologists, and for means for destroying insects, after they themselves have caused the destruction of birds. Even the English sparrow, which is a general scavenger, and, like the bob-o-link, likes green grain, in common with the sparrow tribe in general. Yet the English sparrow, and others of his ilk, largely live in winter on the eggs of insects, when they can find them, thus nipping the insect evil "in the bud." The bob-o-link has been known to save a cotton-field from destruction by insects, but he likes young rice.

Laws Relating to Dogs.

Most men like a dog. It is natural, for however worthless a dog may be in general, his master is his god, and if there is anything the average man likes, it is to be worshipped. Then, again, dogs are clever to children, and therefore children like them. Yet ninety-nine dogs out of a hundred are practically worthless, at least for the purpose for which dogs are generally kept on a farm—to watch property: First, for want of proper training, and second, from mixing up all known breeds together. If dogs, like other animals, were kept for a specific purpose, all difficulty might be avoided, and the sheep-owner would not suffer from the depredations of worthless curs; the poultry-yard would not be decimated by bastard "fice," nor cattle worried or harried by the low-down yellow dog, with just enough bull-mastiff in him to intensify the savage
propensities in these brutes, added to the sneaking disposition to run away in time to save their hides from the shotgun; and this brings us to dog laws.

Massachusetts.

The law relating to dogs in Massachusetts is, in the main, one of the best in the country. There dogs are taxed from two to five dollars each; owners are made responsible, under heavy penalty, for their registry and taxation; assessors must make accurate lists, and evasions of the listing are heavily fined; refusal or neglect of officers to execute the law incurs a penalty of one hundred dollars; and untaxed dogs are killed without mercy, and district attorneys are required to prosecute officers who neglect to destroy them.

Many of the older States, of late years, have so amended their dog laws that a very little agitation would cause them to be made perfect.

Maine.

In this State the law is a good one, if carried out; but a saving clause, by which a township may nullify the law within the township, makes it worse than useless. Without the saving clause it would provide as follows: Dogs inflicting damage subject their owners to fines of double the amount of the damage done, to be recovered by an action of trespass. Any person may lawfully kill a dog that assaults himself or other person while walking or riding peaceably, or is found worrying, wounding, or killing any domestic animal. Any person finding a dog strolling out of the inclosure of his owner may, within forty-eight hours, make oath before a magistrate that he suspects such dog to be dangerous or mischievous, and notify the owner by
giving him a copy of the oath; and if the dog shall be found again at large, he may be lawfully killed; and if he shall thereafter wound a person or kill a domestic animal, the owner shall be liable to treble damages and costs.

New Hampshire.

In New Hampshire the amended law of 1863 provides that double the amount of damage by dogs shall be recoverable from the owner by an action of debt; or a complaint may be made to the selectmen of towns, who are required, upon proof made within thirty days, to draw an order upon the treasury, which is registered and made payable, in whole or in part, from the fund accruing from the dog tax, on the second Tuesday of March annually.

Vermont.

The law of Vermont is good enough for those who own dogs, since the owner is liable for damage done in any State under the organic law, it is good enough for sheep owners. The law is as follows:

The listers in several towns in this State shall in each year set all dogs in their respective towns in the grand lists to the owner or keeper of the same at the sum of one dollar each; and no person shall be entitled to have the amount so assessed deducted from their lists in consequence of any debts owing.

Every owner or keeper of a dog shall, when called upon by the listers for their lists, notify them of the dogs by him owned or kept; and every owner or keeper of a dog who shall neglect or refuse to notify the listers as aforesaid, shall forfeit and pay to the town in which he resides the sum of two dollars, to be recovered in an action on the case in the name of the treasurer of such town, before any court competent to try the same, with full costs.
It is hereby made the duty of the owner or keeper of a dog, whether set in the lists or not, to cause a collar, with the name of the owner or keeper plainly written thereon, to be worn on the neck of each dog by him owned or kept; and it shall be lawful for any person to kill any dog running at large off the premises of the owner or keeper not having on such collar; and the owner or keeper of such dog shall recover no damage for such killing.

Rhode Island.

By the law of 1860, a dog might be killed with impunity if found without a collar bearing his owner's initials, or worrying or wounds sheep or other stock out of the enclosure of his owner. Any person might make oath to any case of injury, or to the special ill-fame of any particular whelp, and if the allegation was sustained, the dog must be confined, or the life of the animal was forfeited. A late amendment requires dogs to be collared, registered, numbered, described and licensed, with the payment of one dollar and fifteen cents for each male, and five dollars and fifteen cents for each female dog, before the last day of April, and one dollar additional for each dog after that date, and previous to the first of June. Any person keeping a dog contrary to the provisions of the law is liable to a fine of ten dollars.

New York.

The laws, as amended by that of 1862, impose a tax of fifty cents for the first dog, two dollars for each additional; three dollars for the first female dog, and five dollars for each additional. The assessors are required to annex to the assessment roll the names of persons liable, and super-
visor must return them, when, if failure of paying the tax occurs, it becomes the duty of the collector, and the privilege of any other man, to kill the dog. The collector has a commission of ten per cent. on fines, and one dollar for each dog killed. The previous enactment provided that the owner of dogs killing sheep should be liable for injuries perpetrated; and in case the owner should not be found, the loss should be paid out of the fund arising from the dog tax.

**Pennsylvania.**

The laws of this State seem to have had for their object to hold the dogs to good behavior. Dogs may kill sheep, but not the second time: but the owner is liable, if he knows the dog has killed sheep. It is to be hoped that the State has either expunged the law altogether or sensibly amended it.

**Indiana.**

A license is required, at fifty cents for the first male dog, one dollar for each additional dog, and one dollar in every case for a female dog. All unlicensed dogs are declared nuisances, and may be lawfully killed. Accruing funds are set apart for the payment of damages suffered from injuries to sheep in the several townships. The sufferer has his option of the following remedies: Within ten days after having knowledge of such depredations, he may substantiate it to the satisfaction of the township trustee, and draw the amount at the end of the current year, or a pro rata proportion, if the fund is deficient; or he may recover, by suit, full damages from the owner of the dog. A fine of from five to fifty dollars, and liability to damages, recoverable by the owner, are the penalties for killing licensed dogs that maintain a fair canine character.
Ohio.

The solons of this State, unless the law has been amended, simply contented themselves with politely informing dogs that they should not run at large at night. The owners were held to no proper responsibility for their restraint. It is to be hoped that this great agricultural State will move in the proper direction. We, however, have not seen anything indicating that a general law has been enacted for proper protection against dogs. Yet, we suppose the farmers are still left their natural protection against marauding dogs— the shot-gun.

Delaware.

This State has had carefully-considered dog laws since 1811. The old laws are repealed, but the better features are contained in the new law. The owner of a dog which shall kill, wound, or worry a sheep or lamb, shall be liable to pay the owner of such sheep or lamb the full value thereof, and it shall be lawful for any person to kill such dog. It shall be lawful for any person to kill any dog running at large in Newcastle County, beyond the owner’s premises, without a collar upon his neck with the owner’s name upon it. The law of 1862 requires an assessment list, of persons owning dogs, to be returned to the levy court. The tax is placed at fifty cents for each male, and one dollar for each additional dog, and two dollars for each female dog, which shall procure the fund from which damages shall be paid, not to exceed three dollars for each lamb, and five dollars for each sheep injured or killed, the remainder, if any, to go into the school fund. A dog not on the assessment list, which may be wandering, or caught worrying sheep, may be killed. Persons paying taxes upon dogs are deemed to have property therein, and may recover damages for theft of or injury to such dogs.
Michigan.

In this State, since 1850, the law authorizes the destruction of dogs attacking any kind of domestic animals, except on the premises of the owner of the dog, and such owner is liable for double the amount of damage done by the dog. When notified of such damage, neglect of the owner to kill the dog is punishable by a fine of three dollars, and one dollar and fifty cents additional for every forty-eight hours thereafter, until such dog shall be killed. Supervisors, upon complaint of a citizen, verified by his oath, are required to prosecute and recover the fines imposed by this act. An act was passed March 20, 1863, requiring township assessors to ascertain the number of dogs liable to be taxed, and the names of their owners; and if such owners refuse for ten days after demand to pay the taxes assessed, it becomes lawful to kill the dogs so taxed.

Wisconsin.

By the law of 1860, dogs are required to be numbered, collared, registered and licensed on payment of one dollar for males and three dollars for females; and police officers, constables and marshals are required to kill and bury all unregistered dogs, and to receive twenty-five cents for such service. A person may be fined fifty dollars for removing a collar. Persons suffering loss from dogs are paid full damages at the first of April, if the tax fund is sufficient; if not, pro rata; and the owner of the dog is liable to the town for the full amount. The fine for keeping unregistered dogs is five dollars. Officers neglecting or refusing to obey the law, are fined twenty dollars for every twenty-four hours of such neglect. Towns may increase the license not more than one dollar, and the penalty not more than ten.
Minnesota.

This State early recognizing the fact that dogs should be held as amenable to the law as their masters, or rather that the masters should be so for them, enacted a law, in substance as follows: Every owner or keeper of a dog shall cause such dog to be registered, numbered, described, and licensed, paying one dollar for each male and two dollars for each female. The township or city clerk shall conspicuously post a list of all licensed dogs, and furnish one to constables and chief of police. Failure to license shall make one liable to a penalty of ten dollars. Stealing or poisoning a dog is punishable by a fine not exceeding fifty dollars, and killing subjects to a liability for damages double the value of the dog. Constables and police officers shall and any person may, kill any unlicensed dog; any one may also kill a dog assaulting him, or worrying sheep out of the enclosure of his owner. Within thirty days after suffering injury or loss of sheep by dogs, proof of damages may be presented to the county auditor, who may draw an order upon the treasurer, payable from the fund accruing from taxes of dogs, when the city or town may sue and recover full damages from the owner of the dog. It is made the duty of the mayor and aldermen of cities, and the supervisors of towns, to require the destruction of unlicensed dogs, and officers refusing or neglecting to perform these duties are liable to a fine of twenty-five dollars, for the benefit of schools. All of these penalties may be recovered, on complaint by any householder, before any justice of the peace of the county. Money remaining after the yearly payments from the tax fund is turned over to the school fund.
Stock and Estray Laws.

Almost every State has stock laws of some kind, differing principally in relation to stock running at large. In some States, the law leaves it optional with counties or districts, to decide whether fences shall or shall not be maintained. If not, stock of all kinds must be kept on the owner's premises.

Estrays.

In some cases, there is only fencing against cattle and horses; or, sheep and swine must be kept close. So far as laws in relation to estrays are concerned, they do not differ in essential respects. If an animal is found running at large, in violation of law, it may be taken up and impounded, where public pounds have been provided; or it may be held by the person taking up, on his own premises. If the owner is known, notice must be given him at once; if unknown, the animal must be advertised for a specified time; and no owner making claim, it must be sold to the highest bidder. The person taking up an estray is entitled to a reasonable compensation for maintaining the beast. In some States, after a certain time, the estray becomes the property of the person taking it up, the prescribed legal notice having been given. When an animal is found doing damage on the land of another, the fences being constructed according to law, it may be held as security for damages. In all cases where the owner is known, he must be notified of the facts, and a reasonable time allowed him to reclaim and to inspect damages.
Stock Laws of the New England States.

Maine and New Hampshire.

In Maine and New Hampshire, towns may make by-laws concerning the running of animals at large. The laws of Maine provide that persons injured by beasts may sue for damages, and distraint the animal. New Hampshire allows the owner of stock impounded for doing damage four days to respond to notice of the fact; and if he fails to answer, the animals may be sold and the amount of the damage be deducted from the proceeds.

Vermont.

In Vermont, twenty days are allowed for redemption. Ungelded animals are not allowed to run at large. Rams must be restrained from August first to December first, and be marked with the initials of the owner's name; and if found at large, a forfeit of five dollars is due for each one taken up, to the person so taking up. The owner of such animals is responsible for the damage done by them. The infected with foot-rot or scab, must be diligently restrained, and for all damage resulting from neglect of this provision, the owner is responsible, and is also subject to a fine of ten dollars. Any person finding such diseased animals at large may take them as forfeit, and no action at law or in equity will lie for their recovery. Any person who shall drive, or in any manner bring into the State, any neat cattle, knowing them, or any of them, to have the pleuro-pneumonia, or to have been exposed to that disease, is liable to a forfeit of a sum not over five
hundred dollars, or to imprisonment in a county jail for not more than twelve months, nor less than one month. Towns may establish regulations, appoint officers or agents, and raise and appropriate money for the purpose of preventing and arresting the spread of pleuro-pneumonia.

**Massachusetts.**

In this State it is provided that when a person is injured in his crops or other property by sheep, swine, horses, mules, or neat cattle, he may recover damages in an action of tort, against the owner of the beasts, or by distraining the beasts doing the damage; but if it be found that the beasts were lawfully on the adjoining lands, and escaped therefrom in consequence of the neglect of the person who suffered the damage to maintain his part of the division fence, the owner of the beasts shall not be liable for such damages.

The laws of this State in relation to pleuro-pneumonia are very strict, and are made more and more so from time to time. The selectmen of towns, and the mayor and aldermen of cities, in case of the existence of pleuro-pneumonia, or any other contagious disease among cattle, shall cause the infected animals, or those exposed to infection, to be secured in some suitable place or places, and kept isolated, the expense of keeping to be paid, one-fifth by the city or town, and four-fifths by the State. They may prohibit the departure of cattle from any enclosure, or exclude them therefrom; may make rules in writing to regulate or prohibit the passage of any neat cattle to or through their respective cities or towns, or from place to place, and arrest and detain them at the cost of the owners. They are authorized to brand infected animals, or those exposed to infection, with the letter P on the rump. For selling an animal so branded, there is liability to fine not
exceeding $500, or imprisonment not exceeding one year. Notice of any suspicion of the existence of contagious disease must be given, with a penalty for neglect or refusal. A board of commissioners is appointed for the State, with authority to use any measure to control the introduction of diseased cattle into the State, or the spread of the disease. The rules and regulations made by this board supersede those of the selectmen of towns, and mayor and aldermen of cities. The moving of cattle into other States without permission is prohibited.

The law of 1867 provides that no cattle diseased, or suspected of being diseased, shall be killed, except by order of the governor. The owners of cattle ordered to be killed are indemnified.

Rhode Island.

In Rhode Island, animals trespassing on lands are held a year and a day; and if a horse, must have a withe kept about his neck during that time. Each town is required to erect and maintain at its own charge one or more public pounds, and it is lawful for any freeholder or qualified elector or field driver, and it is made the duty of every surveyor of highways, to take up and impound any horse, neat cattle, sheep, or hogs, found at large on any highway or common. Provisions of the act extend also to goats and geese. In 1860, in view of the dangerous disease which had become prevalent in other States, the General Assembly enacted that neat cattle might only be brought into the State from places west of the Connecticut river, upon thoroughfares leading into the western and southern portions of the State, under regulations established by a board of commissioners, until they should prohibit importations from any of said places. For a violation of the provisions of the act, penalty was provided, not exceeding $300 for each offense, and liability to indictment, and, on conviction,
imprisonment not exceeding one year. In case of the introduction of a number of diseased cattle at the same time, the introduction of each animal is to be deemed a separate and distinct offense.

Town councils are empowered to take all necessary measures to prevent the breaking out or spreading of any infectious diseases among the neat cattle in their respective towns, and to prescribe penalties in money, not exceeding five hundred dollars. A board of commissioners is provided for, to be appointed by the Governor, consisting of one person from each county, to see that the law is faithfully executed. It is made the especial duty of the board to endeavor to obtain full information in relation to the disease known as pleuro-pneumonia, and to publish and circulate the same, at their discretion; and in case the disease should break out, or there should be reasonable suspicion of its existence in any town, they are required to examine the several cases and publish the result of their examination, in order that the public may have correct information. If satisfied of its existence in any town, they must give public notice of the fact in printed handbills, posted up; and, thereafter, any incorporated company or person, who may drive, carry, or transport any neat cattle out of the town into any other town in the State, is liable to the penalties above stated. Any person who sells, or offers to sell, any cattle known to be infected with pleuro-pneumonia, or with any disease dangerous to public health, is liable to indictment, and, on conviction, to punishment by fine not exceeding one thousand dollars, or imprisonment not exceeding two years. The act of March 26, 1864, provides that any person knowingly bringing into the State any neat cattle or other animal suffering from any infectious disease, or who knowingly exposes such cattle or other animal to other cattle and animals not infected with such disease, shall, upon conviction, pay a fine of not less than one hundred dollars, and not exceeding five hundred dollars.
Connecticut.

In this State, the law allows owners of sheep to keep flocks in common, and to make their own rules and regulations concerning their care and safety. No horses, asses, mules, neat cattle, sheep, swine, or geese, are allowed to go at large in any highway or common, or to roam at large for the purpose of being kept or pastured on the highway or commons, either with or without a keeper. Any person may seize and take into his custody and possession any animal which may be trespassing upon his premises, provided the animal enters from the highway, or through a fence belonging to the owner of the animal, or through a lawful fence belonging to any other person. He must give immediate notice to the owner, if known, and may demand for every horse, mule, ass, ox, cow, or calf, twenty-five cents; and for every sheep, goat, goose, or swine, ten cents; together with just damages for injuries occasioned by such animals, if applied for within twenty-four hours after such notice shall have been given. If the owner is not known, the animal shall be sold by the town clerk, after due public notice.

Stock Laws of the Middle States.

New York.

The laws of all the States east of the Alleghanies have, of late years, been very strict and carefully drawn in relation to animals liable to infection with contagious diseases, and are framed generally after those of Massachusetts, where the first case of pleura-pneumonia occurred. In relation to the general laws for stock, the laws of New
York allow any person to seize and take into his custody any animal which may be in any public highway, and opposite to land owned or occupied by him, or which may be trespassing upon his premises. Notice must be given to a justice of the peace, or a commissioner of highways of the town in which the seizure has been made, who shall post up notices in six public places, that the animal will be sold in not less than fifteen nor more than thirty days. The surplus money, after payment of all charges, is subject to the order of the owner for one year. The owner, before sale, may pay all charges and take the animal. If the animal has been trespassing by the willful act of another than the owner, to effect that object, the owner is entitled to the animal upon making demand, after paying the compensation fixed by the justice or commissioner, but no other costs; and the person committing such willful act will be held liable to a penalty of twenty dollars.

New Jersey.

Town committees, upon notice of the existence of any disease supposed to be contagious, are required personally to examine the cause, and if the symptoms which characterize contagious diseases are exhibited, shall cause such animals to be removed and kept separate and apart from other cattle and stock, five hundred feet distant from any highway, and the same distance from any and all neighbors. If any die of the disease, or are killed, they must be buried immediately, five hundred feet distant, etc., as above. No cattle that have been sick, and have recovered from any supposed contagious or infectious disease, shall mix with other cattle, or be removed, unless permission has been given by the town committee. Any person knowingly storing a hide, or any other portion of diseased animal, is subject to a fine. The town committee are
authorized to prohibit the importation or passage of cattle from other places into or through their respective towns. After notice of prohibition, owners are liable to a fine of one hundred dollars for every animal driven into a township. A fine of one hundred dollars is imposed for every animal sold and known to be diseased. The act of 1866 authorizes the Agricultural Society of the State to take measures for preventing the introduction or increase of rinderpest, and any other disease among cattle, at their discretion; animals affected with glanders are authorized to be killed. Cattle must not be marked by cropping both ears; nor must either ear be cropped more than one inch.

Pennsylvania.

The running of cattle at large is controlled in Pennsylvania by towns and counties, through special legislation. The sale of cattle or sheep affected with pleuro-pneumonia, or any other contagious or infectious disease, is punished by a fine not exceeding $500, or imprisonment not exceeding six months. Animals must not be sold alive from, or slaughtered on, premises where disease is known to exist, nor for a period of two months after disease shall have disappeared from the premises. Cattle and sheep are not allowed to run at large where any contagious disease prevails. Constables of townships are required to take up and confine any animals so found, until all costs are paid.

Delaware.

In Delaware cattle are forbidden to run at large in certain districts. Stallions over eighteen months old are not permitted to be at large.
Stock Laws of the Southern States.

Maryland.

In this State it is provided that any person aggrieved by trespass upon his premises of any cattle, hogs or sheep in the possession or care of a non-resident, may impound them, and have the damages sustained by the trespass, valued on oath by two disinterested citizens of his county, and the animals may be sold for the damages and costs.

Virginia.

In this State, if any horses, cattle, hogs, sheep or goats enter into any grounds inclosed by a lawful fence, the owner or manager may be liable to the owner of the ground for all damages; and, for every succeeding trespass by such animals the owner shall be liable for double damages; and, after having given at least five days' notice to the owner of the animals of the fact of two previous trespasses, the aggrieved party shall be entitled to the animals if again found trespassing on the same lands. Horses diseased and unaltered, are not allowed to be at large. Every person shall so restrain his distempered cattle, or such as are under his care, that they may not go at large off the land to which they belong; and no person shall drive any distempered cattle into or through the State, or from one part of it to another, unless it be to remove them from one piece of ground to another of the same owner; and when any such cattle die, the owner thereof, or person having them in charge, shall cause them to be buried (with their hides on) four feet deep. Any justice, upon proof before him that any cattle are going at
large, or are driven in or through his county or corporation, in violation of law, may direct the owner to impound them; and if he fail to do so, or suffer them to escape before obtaining a certificate that they may be removed with safety, they shall, by order of the justice, be killed and buried four feet deep (with their hides on), but so cut that no one may be tempted to dig them up. For the protection of sheep, special laws have been passed, taxing dogs in certain counties, and for their restraint in those counties.

**Georgia.**

If any trespass or damage is committed by stock in the State of Georgia on any lands not protected by lawful fences, the owner of the animal is not liable to answer for trespass; and if the owner of the premises should kill or injure the animal in any manner, he is liable in three times the damages. When fences are made pursuant to law, and any animal breaks in, the owner of the inclosure shall not kill or injure him for the first breaking, and not until after notice is given to the agent or owner, if possible, but the owner shall be liable for double the damage done by his stock.

**The Carolinas.**

In North Carolina, if cattle are driven from one part of the State to another, they must be certified to be healthy, sound, and free from any infectious distemper; the granting of such certificate by any justice, without affidavit, is a misdemeanor in office. Stallions and mules over two years old are not allowed to go at large, under a penalty of twenty dollars. Damages for injury done by trespassing animals are recoverable as in other States.

In South Carolina, horses, cattle, hogs, sheep or goats breaking into any field having a crop of any kind growing
or ungathered, with a lawful fence, may be seized and kept confined until notice is given to the owner, within twenty-four hours of the seizure, who shall be bound to pay the owner of such field fifty cents a head for each horse or mule, and twenty-five cents for every head of cattle, hogs, etc., before he is entitled to have the animal delivered up to him. For the second breaking, within one month after the first, the owner is liable to the person injured for all damages sustained, in addition to the fine. Full satisfaction lies for injuring any animal found in any field where the fence is not a lawful one.

**Florida.**

In many Southern States what constitutes a lawful fence is stated with the utmost minuteness, as to height, spaces, etc. In Florida there can be no trespass or damage if the fence is not a lawful one; nor in such case can stakes, canes, or other devices to maim or kill cattle, sheep, swine, etc., be used, under a penalty of ten dollars for each offense, and full damages. Marks upon stock are required.

**Texas.**

No neat cattle belonging to non-residents are allowed to be taken into Texas for grazing or herding purposes, under pain of forfeiture to the county into which they shall have been so taken. Severe penalties for altering the brands of animals are provided in that State.

**Mississippi.**

In this State it is provided that every owner of cattle, horses, mules, hogs, sheep or goats shall be liable for all injuries and trespasses committed by breaking into grounds inclosed by legal fence. If any person, whose fence is not
a lawful one, shall hurt, wound, lame or kill, by shooting or hunting with dogs, or otherwise, any cattle, etc., that may have broken into his inclosure, he shall pay the owner double damages. A ranger is elected in each county to attend specially to estrays, of which he is required to keep a record. When any person finds horses, mules, jacks, cattle, sheep or hogs straying upon his land, he may take them up and forthwith send them to the owner, if known; if unknown, he must give notice to the ranger, or some justice of the peace. The owner of all estrays appraised at ten dollars and not exceeding twenty dollars, is allowed six months, and if less than ten dollars, three months, from the date of certificate of appraisement, to claim and prove his property. It is not lawful for any drover or other person to drive any horses, mules, cattle, hogs or sheep of another from the range to which they belong; but it is made his duty if any such stock join his, to halt immediately at the nearest pen, or some other convenient place, and separate such stock as does not belong to him or to the person by whom he may be employed. For neglect, a forfeit of twenty dollars for every offense is provided, and liability to all damages. Any person may confine and geld any stallions that are above the age of two years, found running at large, at the risk of the owner, but this will not apply to stallions usually kept up, or to those which accidentally escape. Any animal addicted to fence-breaking may be taken up by owner of land, who may recover seventy-five cents a day for keeping, provided owner has been notified, if known; but condition of fence may be shown in mitigation of damages. Double damages may be recovered for injury to animals where fence is not a lawful one. Defacing or altering marks of animals subjects to a penalty of imprisonment in the penitentiary for not more than three years, or fine of not more than $500, and imprisonment in county jail for not more than one year, or both.
Alabama.

Any person is allowed to take up any horse, mare, jack, neat cattle, hog or sheep found running at large, if the owner is unknown. If any stallion or jackass over two years of age is found at large, it must be taken before a justice, who shall cause it to be advertised. The taker-up is entitled to five dollars from the owner, and reasonable compensation for keeping. If such stallion or jackass is not claimed within three months, it may be gelded.

Arkansas.

If any horse, cattle, or other stock break into any inclosure, the fence being of the required height and sufficiency, the owner of the animal shall, for the first offense, make reparation for true damages; for the second offense, double damages; and for the third, the party injured may kill the trespassing beasts, without being answerable. If any stallion or jack over two years old is found running at large, the owner may be fined two dollars for the first offense, and ten dollars for each subsequent offense, and is liable for all damages that may be sustained. Any person may take up such animal, and, if not claimed within two days, may castrate, and recover three dollars for doing so; but the life of the animal must not be endangered. If any such animal cannot be taken up, he may be killed, if notice be first put up at the court-house, and at three other of the most public places in the county for ten days, accurately describing the animals. In Tennessee, stallions and asses over fifteen months old are not allowed to run at large under penalty to the owner of not less than five dollars, or more than twenty-five dollars. The animal may be taken before the nearest justice of the peace, who shall give public notice. If not claimed within three
months the animal may be gelded at the risk and expense of the owner. The party taking him up is entitled to five dollars and reasonable expenses for keeping.

Kentucky.

Breathy and mischievous bulls may be taken up and altered; a jack or stallion may be gelded if found at large, allowing the owner, if known, at the rate of twenty-five miles a day to reach the place where the animal is held, and recover the animal; when the owner is not known, the animal is dealt with as an estray, and may be ordered by a justice to be gelded. If the owner of any distempered cattle permits them to run at large, or drives them through any part of the State, he is liable to a fine of ten dollars for each head; and if any die the owner must cause them to be buried, subject to a penalty of five dollars for neglect in each case.

Stock Laws of the Western States.

Of late years more or less has been done in the several States west to prevent the introduction of animals with infectious, and especially contagious diseases, since the outbreak of pleuro-pneumonia in the Eastern States. Illinois has a State veterinarian whose duty it is to prevent any diseased cattle entering the State, and the State veterinarian has now a general jurisdiction over diseased stock since the outbreak of glanders, and may condemn and cause to be killed horses found with this horrible disease. Congress has passed a general quarantine law for imported live stock, and the Cattle Commission of the United States have the supervision of them.
West Virginia.

There is no law in force in West Virginia to prevent cattle from running at large; but if they break into an inclosure and destroy any grain or crops, the owner is liable; provided the fence is a lawful one. A law exists to prevent diseased sheep from traveling on the highway.

Ohio.

It is unlawful in the State of Ohio for any one to sell, barter or dispose of, or permit to run at large, any horse, cattle, sheep, or other domestic animal, knowing them to be infected with contagious or infectious disease, or to have them indirectly exposed thereto, unless he first duly informs the party to whom he may sell as to the facts. The fine for so doing is not less than twenty dollars nor more than two hundred dollars, with costs, or confinement in the county jail not more than thirty days. For allowing infected animals to come in contact with animals belonging to another, a fine is provided of not less than fifty dollars nor more than five hundred dollars, with costs of prosecution, or confinement in the county jail not less than ten nor more than fifty days. If any horse, mule, ass, or any neat cattle, hogs, sheep, or goats, running at large, break into or enter an inclosure other than inclosures of railroads, the owner is liable for all damages, and the animal so breaking into or entering an inclosure is not exempted from execution issued on any judgment or decree rendered by any court. For allowing any such animal to run at large in any public highway, or upon any uninclosed land, or for herding any of them for the purpose of grazing on premises other than those owned or occupied by the owner or keeper of the animals, the party offending is liable, for every violation, to a fine of not less than one dollar nor more than
five dollars. But a general permission may be granted by
the commissioners of any county for certain animals to run
at large, and in counties where there is no such general
permission, township trustees may grant special permits,
such general and special permits terminating on the first
Monday of March of each year; and special permits are
revocable at the discretion of the trustees, upon three
days' notice in writing to the owner of animals. Special
permits must be directed to individuals, and for particular
animals described therein. The owner of trespassing ani-
mals is liable for all damages upon premises of another,
without reference to the fence which may inclose the
premises. Any person may take up and confine an animal
found at large contrary to law, and the owner may reclaim
the same within ten days. The fees are as follows: For
taking up and advertising each horse or mule, one dollar;
neat cattle, seventy-five cents each; swine, fifty cents each;
sheep or geese, twenty-five cents each; and reasonable
pay for keeping the same. It is unlawful for the owner or
keepers of any animals knowingly to permit them to enter
the inclosure of any railroad, or, having entered, to remain
therein; or to lead or drive any such animals within the
inclosure, or along or upon the track of any railroad, at
any other place than a regular street, road or farm crossing
or way.

Illinois.

In Illinois, as in a number of other Western States,
counties or townships may define by vote whether they will
have fences or not, and how much. The owner of animals
breaking through a legal fence is liable to full damages for
the first trespass, and to double damages for any subsequent
trespass. Where the fence is insufficient, and the land
owner injures or destroys animals, he is answerable in
damages. Stallions over one year old are not permitted to
run at large; but if so found may be gelded, if the owner does not reclaim them, one day for every fifteen miles' distance of the animal from home being allowed, after notice. Diseased horses, mules and asses must be kept within the owner's inclosure, under penalty of twenty dollars damages. Estray hogs must be sold from November first to March first. To convey any Texas or Cherokee cattle into the State between the first day of October and the first day of March renders the party so doing liable to a fine not exceeding two thousand dollars, nor less than five hundred dollars, and imprisonment at the discretion of the court. Any and all fines are paid into the county treasury, subject to the order of the board of supervisors, or county court, for the purpose of being divided pro rata among persons who may have suffered damage or loss on account of any such Texas or Cherokee cattle. All persons or corporations are liable to injured parties for any damage arising from the introduction, by any of them, of any diseased cattle. It is made the duty of any circuit or county judge, or justice of the peace, upon oath of any householder, setting forth that Texas or Cherokee cattle are spreading disease among the native cattle, to forthwith issue a warrant to any sheriff or constable of the county, commanding him to arrest and impound such cattle, and keep them by themselves until the first day of October following. Texas and Cherokee cattle are defined to mean a class or kind of cattle, without reference to the place from which they may have come. In Indiana, laws regulating the running at large of stock are local in their application, county boards designating what animals may or may not run at large. However, when any animal is found at large contrary to local law, and has been taken up, the owner may reclaim it within ten days, after which time the animal may be sold. The laws of the State are in effect prohibitory against bringing in diseased cattle, and it is the duty of the State veterinarian to see that the law is enforced.
Missouri.

The State of Missouri has created a board of cattle inspectors to prevent the spread of the Texas or Spanish fever. The county court of each county is authorized to appoint three competent persons to act as a board for the inspection of cattle supposed to be distempered or affected with the disease known as the Texas or Spanish fever. They may stop any drove of cattle. If they adjudge cattle to be diseased or distempered, and in a condition to communicate any contagious or infectious disease, they are required to order the cattle to be removed from the county without delay, upon the same route upon which they came in, if practicable. If the owners comply with the order, they will not be further liable; but if they or the persons having the cattle in charge willfully delay or neglect to do so, the president of the board will direct the sheriff to drive the cattle out by the route they came in, or to kill them, if the board think it necessary in order to prevent the spread of the disease. The parties owning, or in charge of the cattle ordered to be removed or killed, are liable for all the costs that may accrue in case of examination, removal or killing. The act to prevent the introduction of diseased cattle into the State provides that no Texas, Mexican or Indian cattle shall be driven or otherwise conveyed into any county in the State between the first day of March and the first day of December in each year, but this does not apply to any cattle which have been kept the entire previous winter in the State. Cattle may be carried through the State by railroad or steamboat, provided they are not unloaded, but the railroad companies or owners of the steamboat are responsible for all damages which may result from the Spanish or Texas fever, should the same occur along the line of transportation; and the existence of such disease along the route shall be prima facie evidence that
the disease has been communicated by such transportation. For every head of cattle brought into the State contrary to law, a fine of twenty dollars may be recovered, or the party be imprisoned in the county jail not less than three, nor more than twelve months, or may be subjected to both fine and imprisonment. It is unlawful for any three or more householders to stop any cattle which they may have good reason to believe are passing through any county in violation of the act.

**Michigan.**

In Michigan it is not lawful for any cattle, horses, sheep or swine to run at large on the highway, except in those counties or parts of counties where it shall be otherwise determined by the board of supervisors in such county. Where the law is in force, any person may seize and hold in his possession any animal found running at large, and give notice to a justice of the peace or a commissioner of highways, who is required to post up notices describing the animal. The animal must be sold at public outcry in not less than thirty nor more than sixty days after date of notice; but the owner may redeem the animal by paying costs and compensation for keeping—redemption to be made within one year. An animal found trespassing by the willful act of another, may be taken by the owner on demand, after paying reasonable compensation, but the person committing the act is liable to a fine of twenty dollars. Any person taking up a beast going at large contrary to law, or contrary to any by-law of a township, is entitled to fifty cents per head for all horses, mules, asses and neat cattle, and ten cents per head for all sheep, goats and swine. When any person is injured in his land by animals, he may recover damages in an action for trespass against the owner of the beasts, or by distraining the beasts doing damage, unless the animals doing damage shall have
been lawfully on adjoining lands, and shall have escaped therefrom in consequence of the neglect of the person who has suffered the damage to maintain his part of the division fence.

**Wisconsin.**

The laws of Wisconsin permit towns to make regulations concerning the running of animals at large. The owner or occupant of lands may distrain all beasts doing damage within his inclosure, and when any distress shall be made, the person distraining shall be required to keep such beasts in some place other than the public pound until his damages are appraised; and within twenty-four hours he shall apply to a justice of the peace, who shall appoint three disinterested free-holders to appraise the damage sustained. If within twenty-four hours after appraisement the damages are not paid, the animals may be placed in the public pound, to be there maintained until the amount of damages and costs is recovered by due process of law. If the owner of any sheep infected with contagious disease permits any of them to go at large out of his own inclosure at any season of the year, he shall forfeit the sum of five dollars for each and every such sheep to the person who may enter complaint, for each time they are so found running at large. If the owner neglects to restrain such sheep, any person is authorized to take them up and put them in some safe place other than the public pound. Rams are not permitted to go at large between July 15th and December 1st, and the owner forfeits ten dollars to the person taking up the animal for each time so found abroad.

**Minnesota.**

The electors of each town in the State of Minnesota have power at their annual meetings to determine the num-
ber of pound-masters, and the location of pounds, and regulations for impounding animals, and to fix the time and manner in which cattle, mules, asses and sheep may be permitted to go at large, provided that no cattle, horses, mules nor asses be allowed to go at large between the 15th day of October and the 1st day of April. The owner or occupant of lands may distrain all beasts doing damage upon his lands during the night-time, from eight o'clock in the evening until sunrise; and when any such distress is made the distrainer shall keep such beasts in some secure place other than the public pound, until his damages are appraised, unless the same is made on Sunday, in which case, before the next Tuesday morning thereafter, he shall apply to a justice of the peace of the town, who shall appoint three disinterested persons to appraise damages. No damage can be recovered by the owner of any lands for damage committed by any beasts during the day-time, until it is first proved that the lands were inclosed by a lawful fence. Distress may be made at any time before the beasts doing damage escape from the lands, and without regard to the sufficiency of fences. The owner of any horse or other animals, having the disease known as the glanders, who knowingly permits such animal to run at large, or be driven upon any of the highways of the State, or any hotel-keeper, or keeper of any public barn, who permits any such animal having such disease to be stabled, such person shall be deemed guilty of a misdemeanor, and, upon conviction before any justice of the peace, shall be punished by a fine of not more than one hundred nor less than twenty-five dollars.

Iowa.

In Iowa, no stallion, jack, bull, boar or buck is permitted to run at large. Persons aggrieved are allowed to distrain any such animals and compel the owner to pay damages. If the animal is not redeemed within seven days,
seven days' notice of its sale at public auction must be given, the proceeds to apply on damages after deducting costs. If any domestic animal, lawfully on adjoining land, escapes therefrom in consequence of the neglect of the person suffering the damage to maintain his part of the division fence, the owner of the animal is not liable for any damages. If beasts are not lawfully upon the adjoining land, and came upon it, or if they escaped therefrom into the injured inclosure, in consequence of the neglect of the adjoining owner to maintain a partition fence or any part of one, which it was his duty to maintain, then the owner of the adjoining land shall be liable as well as the owner of the beasts. Fence-viewers appraise all damages. An act of April 8, 1868, forbids any one to bring into the State, or to have in possession any Texas, Cherokee or Indian cattle. Transportation on railroads through the State is not forbidden, nor the driving through any part of the State of such Texas or Southern cattle as have been wintered at least one winter north of the southern boundary of the State of Missouri or Kansas. The penalty of violation is a fine not exceeding $1,000, or imprisonment in county jail, at the discretion of the court, not to exceed six months, together with all damages that may accrue by reason of such violation of the law. Any one driving or importing diseased sheep into the State, knowing the disease to be contagious, is deemed guilty of misdemeanor, and is punishable by fine of not less than fifty dollars nor more than one hundred dollars. The same fine is imposed upon any person who may turn out of his inclosure or sell sheep, knowing them to be diseased.

Kansas.

In Kansas, when a majority of the electors in any township petition county commissioners for orders to confine animals during the night-time, such orders shall be made
and notice thereof be given. The owner is liable for depredations of animals during the continuance of such orders, without regard to condition of fences. Persons damaged in their property have a lien upon the stock. If any stallion or jack over the age of two years is found at large, the owner, if known, must be notified of the fact; and if he fails or refuses to confine the animal, he is liable to a fine of five dollars for the first offense, and ten dollars for each subsequent offense, and all damages. Stallions and jacks, not used for breeding purposes, may be castrated by the person taking them up, if the owner fails, after three days' notice, to reclaim the same, and pay damages; or such animals may be killed after six days' notice. Any bull, boar or stag found running at large may be taken up at any time or place. Electors of townships may decide whether swine may run at large or not, at least ten voters having petitioned for the submission of the question. No horse, mule nor ass diseased with glanders is allowed to be at large, under a penalty of not less than five dollars nor more than $100. Knowingly to import or drive into the State sheep affected with contagious disease is a misdemeanor, with a fine not to exceed $200. The same penalty is provided for any owner allowing such sheep to run at large, together with responsibility for damages to other owners. Rams must be restrained between June 15th and December 15th, under penalty of five dollars for each day allowed at large. Electors of townships determine whether or not sheep shall run at large. In February, 1867, a sanitary measure was passed for the protection of cattle from the ravages of the Spanish fever. Stock from Texas and the Indian Territory brought into the State between the first day of March and the first day in December in any year are not to be driven through the State, except in the remoter parts on the plains, and then not within five miles of any highway or ranch, except by consent of the owner of the latter. Violation of the law
is treated as a misdemeanor, and the first offense is punishable by fine of $100 to $1,000, and imprisonment from thirty days to six months; for subsequent offenses the penalties are doubled.

Nebraska and the Territories.

In Nebraska, cattle and other stock are restrained in particular counties. The legislation concerning cattle, etc., is of a local character in all the far-west States and Territories and also in the State of California.

Oregon.

The laws of Oregon interdict the running at large of any stallion, jack or mule, over eighteen months old, within the months of April, May, June, July, September and October. If not kept for breeding purposes, the animal may be gelded. If kept for breeding purposes, the distraint may return him to the owner, and recover two dollars. The owner of such an animal is liable for damages. Animals affected with contagious diseases must not be brought into the State under a penalty of not less than fifty dollars nor more than five hundred dollars for the introduction of each animal so diseased.

State Laws Relating to Fences.

Laws relating to fences are constantly undergoing changes by amendment by the several State legislatures, especially in the Western States. The general idea is to simplify the laws as to what may constitute a lawful fence, and as rule, to give to localities within the State the power to vote upon the matter, even to doing away with fences altogether. This seemed necessary in much of the
vast prairie region; but cheap transportation by railways, and the low price (in contrast with that of lumber) of wire fencing, is operating again to induce the employment of fencing material more than formerly.

Hedges and fences of living trees are largely employed in the settlement of a new country. These again give way, as the country becomes thickly settled and the land valuable, for the reason that living fences require much room for the extension of roots. Yet in all prairie countries living fences will in time pay their cost if made of valuable timber, since for all ornamental work a tree standing alone and open to the action of storms becomes more valuable in its grain than those standing closely together, and straighter grained. The following synopsis of the fence laws, originally compiled for the Department of Agriculture at Washington, as heretofore stated, will serve to show the general scope of these laws in the various States.

**Fence Laws in General.**

In the older States the laws regulating fences are substantially alike. As to height, a legal fence is generally four and a half feet, if constructed of rails or timber. Ditches, brooks, ponds, creeks, rivers, etc., sufficient to turn stock, are deemed equivalents for a fence. In case a stream or other body of water is considered inadequate to the turning of stock, the facts are investigated by officers known as fence-viewers, who will designate the side of the water upon which a fence shall be erected, if the fence be deemed necessary, the cost to be equally borne by the parties whose lands are divided. Occupants of adjoining lands which are being improved are required to maintain partition fences in equal shares. Neglect to build, or to keep in repair such fences, subjects the negligent party to damages, as well as double, and in some States treble, the
cost of building or repairing, to the aggrieved party. A person ceasing to improve land can not remove his fence unless others interested refuse to purchase within a reasonable time.

A provision in the laws of these States, which is well calculated to serve the interests of neighbors, saving the expense of fence-building, is one permitting persons owning adjoining lots or lands to fence them in one common field, and for the greater advantage of all, allowing them to form an association, and to adopt binding rules and regulations for the management of their common concerns, and such equitable modes of improvements as are required by their common interest; but in all other respects, each proprietor may, at his own expense, inclose, manage, and improve his own land as he thinks best, maintaining his own proportion of the general inclosure.

Fence Laws in the New England States.

The laws regulating fences in the New England States differ only in a few particulars. The required height of a fence in Maine, Massachusetts, and New Hampshire is four feet; in Vermont, four and a half feet; in Rhode Island a hedge with a ditch is required to be three feet high upon the bank of the ditch, well staked, at the distance of two and a half feet, bound together at the top, and sufficiently filled to prevent small stock from creeping through, and the bank of the ditch not to be less than one foot above the surface of the ground. A hedge without ditch to be four feet high, staked, bound, and filled; post-and-rail fence on the bank of a ditch to be four rails high, each well set in post, and not less than four and a half feet high. A stone-wall fence is required to be four feet high, with a flat stone over the top, or surmounted by a good rail or pole; a stone
wall without such flat stone, rail, or post on top, to be four and a half feet high.

In each of the New England States there are plain provisions in regard to keeping up division fences on equal shares, and penalties for refusal to build them, and when built, for neglect to keep them in repair. Fence-viewers in the respective towns settle all disputes as to division fences. Owners of adjoining fields are allowed to make their own rules and regulations concerning their management as commons. No one not choosing to inclose uncultivated land can be compelled to bear any of the expense of a division fence, but afterwards electing to cultivate, he must pay for one-half the fence erected on his line.

Fence Laws in the Middle States.

New Jersey.

Fences in New Jersey are required to be four feet two inches in height, if of posts and rails, timber, boards, brick or stone; other fences must be four and a half feet, and close and strong enough to prevent horses and neat cattle from going through or under. Partition fences must be proof against sheep. Ditches and drains made in or through salt marshes and meadows for fencing and draining the same, being five feet wide and three feet deep, and all ditches or drains made in or through other meadows being nine feet wide at the surface, and four and a half feet wide at the bottom, three feet deep, and lying on mud or miry bottom, are considered lawful fences. Division fences must be equally maintained. If one party ceases improving, he cannot take away his fence without first having given twelve months' notice. Hedge-growing is encouraged by law.
New York.

In New York the provisions for the maintenance of division fences are similar to those of New England; but, whenever a division fence has been injured by flood or other casualty, each party interested is required to replace or repair his portion within ten days of notification. When electors in any town have made rules or regulations prescribing what shall be deemed a sufficient fence, persons neglecting to comply are precluded from recovering compensation for damages done by stock lawfully going at large on the highways, that may enter on their lands. The sufficiency of a fence is presumed until the contrary is established; assessors and commissioners of highways perform the duties of fence-viewers.

Pennsylvania.

In Pennsylvania, towns and counties obtain special legislation as to the running of stock or other cattle at large.

Delaware.

In Delaware, a good structure of wood or stone, or well-set thorn, four and a half feet high, or four feet with a ditch within two feet, is a lawful fence; in Sussex County four feet is the height required. Fence-viewers are appointed by the Court of General Sessions in each "hundred." Partition fences are provided for as in other States.
Fence Laws in the South.

Maryland.

There is no general law in Maryland regulating fences, the law being local and applicable to particular counties.

Virginia.

In Virginia a lawful fence is five feet in height, including the mound to the bottom of the ditch, if the fence is built on a mound. Certain water-courses are specified as equivalent to fences. Four feet is the height of a legal fence in West Virginia, and five feet in North Carolina. In the latter State persons neglecting to keep their fences in order during the season of crops are deemed guilty of misdemeanor, and are also liable to damages. Certain rivers are declared sufficient fences.

Georgia.

The laws of Georgia provide that all fences, or inclosures commonly called worm-fences, shall be five feet high, and from the ground to the height of three feet the rails must not be more than four inches apart. Any inclosure made by means of a ditch or trench must be three feet wide and two feet deep, and if made of both fence and ditch, the latter must be four feet wide and the fence five feet high from the bottom of the ditch. All water-courses that are or have been navigable are deemed legal fences, as far up the stream as navigation has ever extended, whenever, by reason of freshets or otherwise, fences cannot be kept; and the streams are subject to the rules applicable to other fences.
South Carolina.

Fences are required to be six feet high around provisions. All fences strongly and closely made of rails, boards, or posts and rails, or of an embankment of earth capped with rails, or timber of any sort, or live hedges five feet in height, measured from the level or surface of the earth, are deemed lawful; and every planter is bound to keep such lawful fence around his cultivated grounds, except where a navigable stream or deep water-course may be a boundary. No stakes or canes that might injure horses or cattle are allowed in an inclosure.

Florida.

The fences in Florida are required to be five feet in height, but where there is a ditch four feet wide, the five feet may be measured from the bottom of the ditch. If the fence is not strictly according to law, no action for trespass or damages by stock will lie.

Alabama.

In Alabama all inclosures and fences must be at least five feet high, and, if made of rails, be well staked and ridered, or otherwise sufficiently locked; and from the ground to the height of three feet, the rails must be not more than four inches apart; if made of palings, the pales must not be more than three inches apart; or if made with a ditch, four feet wide at the top, the fence, of whatever material composed, must be five feet high from the bottom of the ditch, and three feet from the top of the bank, and close enough to prevent stock of any kind from getting through. No suit for damages can be maintained, if the
fence is not a legal one. For placing in an inclosure any stakes, poles, poison, or anything which may kill or injure stock, a penalty of fifty dollars is provided. Partition fences must be equally maintained.

Mississippi.

Fences in Mississippi are required to be five feet high, substantially and closely built with plank, pickets, hedges, or other substantial materials, or by raising the ground into a ridge, two and a half feet high, and erecting thereon a fence of common rails or other material two and a half feet in height. Owners of adjoining lands, or lessees thereof for more than two years, are required to contribute equally to the erection of fences, if the lands are in cultivation or used for pasturing. No owner is bound to contribute to the erection of a dividing fence, when preparing to build a fence of his own, and to leave a lane on his own land between himself and the adjoining owner; but the failure to erect such fence for sixty days is deemed an abandonment of intention to do so, and determination to adopt the fence already built.

Texas.

In Texas, every gardener, farmer, or planter is required to maintain a fence around his cultivated lands at least five feet high, and sufficiently close to prevent hogs from passing through it, not leaving a space of more than six inches in any one place within three feet of the ground.

Arkansas.

Fences in Arkansas must be five feet high. In all disputed cases, the sufficiency of a fence is to be determined by three disinterested householders, appointed by a justice of the peace. Division fences are provided for as in a majority of the other States.
Tennessee.

In Tennessee, every planter is required to make a fence around his cultivated land at least five feet high. When any trespass occurs, a justice of the peace will appoint two freeholders to view the fence as to its sufficiency, and to ascertain damages. If a person, whose fence is insufficient, should injure any animal which may come upon his lands, he is responsible in damages. In case of any dispute between parties as to a division fence, a justice of the peace will appoint three disinterested freeholders to determine the portion to be maintained by each. No owner, whose fence is exclusively on his own land, can be compelled to allow his neighbor to join it.

Kentucky.

In Kentucky, all sound and strong fences of rails, plank or iron, five feet high, and so close that cattle or other stock cannot creep through, or made of stone or brick four and a half feet high, are deemed legal fences. Division fences cannot be removed without consent of the party on adjoining land, except between November 1st and March 1st, in any year, six months' notice having been given.

Fence Laws in the Western States.

Ohio.

The laws of Ohio provide that whenever a fence is erected by any person on the line of his land, and the person owning the land adjoining shall make an inclosure on the opposite side, the latter shall pay one-half the value of the fence as far as it answers the purpose of a division fence, to be adjudged by the township trustees.
Indiana.

The laws are simple and founded on common sense in this State. Any structure or hedge, or ditch, in the nature of a fence, used for purposes of inclosure, which shall, on the testimony of skillful men, appear to be sufficient, is a lawful fence.

Michigan.

Fences in Michigan must be four and a half feet high, and in good repair; consisting of rails, timber, boards or stone walls, or any combination of these materials. Rivers, brooks, ponds, ditches, hedges, etc., deemed by fence-viewers equivalent to a fence, are held to be legal inclosures. No damages for trespass are recoverable if the fence is not of the required height. Partition fences must be equally maintained as long as parties improve their lands. When lands owned in severalty have been occupied in common, any occupants may have land divided. Fences extending into the water must be made in equal shares, unless otherwise agreed by parties interested. If anyone person determines not to improve any portion of his lands adjoining the partition fence, he must give six months' notice to all the adjoining occupants, after which he will not be required to keep up any part of the fence. Overseers of highways act as fence-viewers.

Illinois.

According to the statute laws of Illinois, unless decided otherwise by counties or districts by a popular vote, fences must be five feet high. The laws regulating division fences are similar to those of the New England States. In cases of dispute three disinterested householders decide as to
the sufficiency of any fence. Proprietors of commons may make their own regulations. Line fences are protected on public highways.

**Missouri.**

In Missouri all fields must be inclosed by hedge or fence. Hedges must be five feet high; fences of posts and rails, posts and palings, posts and plank, or palisades, four and a half feet; turf, four feet, with trenches on either side three feet wide at top and three feet deep; worm (Virginia) fence at least five feet high to top of rider; or, if not ridered, five feet to top rail, and corner locked with strong rails, poles or stakes. Double damage may be recovered from any person maiming or killing animals within his inclosure if adjudged insufficient.

**Wisconsin.**

A legal fence in Wisconsin is four and a half feet high, if of rails, timber, boards or stone walls, or their combinations, or other things which shall be deemed equivalent thereto in the judgment of the fence-viewers. While adjoining parties cultivate lands they must keep up fences in equal shares; double value of building or repairing may be recovered from delinquents. The law regulating division fences is similar in most particulars to those of the New England States and Illinois. Overseers of highways perform the duties of fence-viewers.

**Minnesota.**

In Minnesota four and a half feet is the legal height. Partition fences are to be kept in good repair in equal shares. In case of neglect, complaint may be made by the aggrieved party to the town supervisors, who will proceed
to examine the matter, and if they determine that the fence is insufficient, notice will be given to the delinquent occupant of land; and if he fails to build or repair within a reasonable time, the complainant may build or repair, and may recover double the expense, with interest at the rate of one per cent. per month, in a civil action. No part of a division fence can be removed if the owner or occupant of adjoining land will, within two months, pay the appraised value. When any uninclosed grounds are afterwards inclosed, the owner or occupant is required to pay for one-half of each partition fence; the value thereof to be determined by a majority of the town supervisors. If a party to a division fence discontinues the improvement of his land, and gives six months' notice thereof to the occupants of adjoining lands, he is not required to keep up any part of such fence during the time his lands are unimproved, and he may remove his portion if the adjoining owner or occupant will not pay therefor. County commissioners are the authorized fence-viewers in those counties that are not divided into towns.

Iowa.

A legal fence in Iowa is four and a half feet high, constructed of strong materials, put up in a good, substantial manner. In all counties where, by a vote of the legal voters, or by an act of the General Assembly, it is determined that hogs and sheep shall not run at large, a fence made of three rails of good, substantial material, or three boards not less than six inches wide and three-fourths of an inch thick, such rails or boards to be fastened in or to good, substantial posts, not more than ten feet apart where rails are used; or any other fence which, in the opinion of the fence-viewers, shall be equivalent thereto, is deemed a lawful fence, provided that the lowest or bottom rail shall not be more than twenty nor less than sixteen inches from the
ground, and that the fence shall be fifty-four inches in height. The respective owners of inclosed lands must keep up fences equally as long as they improve. In case of neglect to repair or rebuild, the adjoining owner may do so, and the work being adjudged sufficient by the fence-viewers, and the value determined, the complainant may recover the amount, with interest at the rate of one per cent. per month. If an owner desires to throw his field open, he shall give the adjoining parties six months' notice, or such shorter notice as may be directed by the fence-viewers.

**Kansas.**

In Kansas fences may be of posts and rails, posts and palings, or posts and planks, at least four and a half feet high; of turf, four feet, and staked and ridered, with a ditch on either side at least three feet wide at the top and three feet deep; a worm fence must be at least four feet and a half high to top of rider, or if not ridered, four and a half feet high to top rail, the corners to be locked with strong rails, posts or stakes. The bottom rail, board or plank in any fence must not be more than two feet from the ground in any township, and in those townships where hogs are not prohibited from running at large it must not be more than six inches from the ground. All such fences must be substantially built and sufficiently close to prevent stock from going through. Stone fences are required to be four feet high, eighteen inches wide at the bottom, and twelve at the top. All hedges must be of sufficient height and thickness to protect the field or inclosure. A wire fence must consist of posts of ordinary size for fencing purposes, set in the ground at least two feet deep and not more than twelve feet apart, with holes through posts, or staples on the side, not more than fifteen inches apart, and four separate lines of fence wire, not smaller than
number nine, to be provided with rollers and levers at suitable distances, to strain and hold the wires straight and firm. Owners of adjoining lands must maintain fences equally. In case of neglect of one party to build or repair, another party may do so and recover the amount expended, with interest at the rate of one per cent. per month. A person not improving his land is not required to keep up any portion of a division fence. The trustee, clerk and treasurer in each township act as fence-viewers, to adjust all disputes concerning fences.

Nebraska.

A legal fence in Nebraska is any structure, or hedge, or ditch in the nature of a fence, used for the purpose of inclosure, which is such as good husbandmen generally keep. Division fences must be equally maintained. A party may remove his portion of division fence by giving sixty days' notice. If removed without such notice the party so doing is liable for full damages. Where a fence is injured or destroyed by fire or flood, it must be repaired within ten days after notice by interested persons. Justices of the peace are ex-officio fence-viewers.

Fence Laws of the Pacific Slope.

California.

The legal fences in California are described with great minuteness. Wire fences must consist of posts not less than twelve inches in circumference, set in the ground not less than eighteen inches, and not less than eight feet apart, with not less than three horizontal wires, each one-fourth of an inch in diameter, the first to be eighteen
inches from the ground, the other two above at intervals of one foot, all well stretched and securely fastened from post to post, with one rail, slat, pole or plank of suitable size and strength, securely fastened to the post, not less than four and a half feet from the ground.

Post-and-rail fence must be made with posts of the same size and at the same distances apart and the same depth in the ground as above required, with three rails, slates or planks of suitable size and strength, the top one to be four and a half feet from the ground, the other two at equal distances between the first and the ground, all securely fastened to the post. Picket fences must be of the same height as above, made of pickets not less than six inches in circumference, placed not more than six inches apart, driven in the ground not less than ten inches, all well secured at the top by slats or caps.

Ditch and pole fence—the ditch must not be less than four feet wide on the top and three feet deep, with embankment thrown up inside of ditch, with substantial posts set in the embankment not more than eight feet apart, and a plank, pole, rail or slat securely fastened to posts at least five feet high from the bottom of the ditch. Pole fence must be four and a half feet high, with stakes not less than three inches in diameter, set in the ground not less than eighteen inches, and when the stakes are placed seven feet apart, there must not be less than six horizontal poles well secured to the stakes; if the stakes are six feet apart, five poles; if three or four feet, four poles; if two feet apart, three poles, and the stakes need not be more than two inches in diameter; if one foot apart, one pole, and the stakes need not be more than two inches in diameter. The above is a lawful fence so long as the stakes and poles are securely fastened, and in a fair state of preservation.

Hedge fence is considered lawful, when by reliable evidence it shall be proved equal in strength, and as well suited to the protection of inclosed lands as the other fences described.
Brush fence must be four and a half feet high and at least twelve inches wide, with stakes not less than two inches in diameter, set in the ground not less than eighteen inches, and on each side, every eight feet, tied together at the top, with horizontal pole tied to the outside stake five feet from the ground. In the case of partition fences, if one party refuse or neglect to build or maintain his share, the other may do so and recover the value. Three days' notice to repair is sufficient. The sufficiency of a fence is to be determined by three disinterested householders.

Rights of Married Women.

Property Rights.

Any and all property which a woman owns at her marriage, together with the rents, issues, and profits thereof, and the property that comes to her by descent, devise, bequest, gift, or grant, or which she acquires by her trade, business, labor, or services performed on her separate account, shall, notwithstanding her marriage, remain her sole and separate property, and may be used, collected, and invested by her in her own name, and shall not be subject to the interference or control of her husband, or be liable for his debts, unless for such debts as may have been contracted for the support of herself or children by her as his agent.

A married woman may likewise bargain, sell, assign, transfer, and convey such property, and enter into contracts regarding the same on her separate trade, labor, or business with the like effect as if she were unmarried. Her husband, however, is not liable for such contracts, and
they do not render him or his property in any way liable therefor. She may also sue and be sued in all matters having relation to her sole and separate property in the same manner as if she were sole.

In the following cases a married woman's contract may be enforced against her and her separate estate:

1. When the contract is created in or respecting the carrying on of the trade or business of the wife.

2. When it relates to or is made for the benefit of her sole or separate estate.

3. When the intention to charge the separate estate is expressed in the contract creating the liability.

When a husband receives a principal sum of money belonging to his wife, the law presumes he receives it for her use, and he must account for it, or expend it on her account by her authority or direction, or that she gave it to him as a gift.

If he receives interest or income and spends it with her knowledge and without objection, a gift will be presumed from acquiescence.

Money received by a husband from his wife and expended by him, under her direction, on his land, in improving the home of the family, is a gift, and cannot be recovered by the wife, or reclaimed, or an account demanded.

An appropriation by a wife, herself, of her separate property to the use and benefit of her husband, in the absence of an agreement to repay, or any circumstances from which such an agreement can be inferred, will not create the relation of debtor and creditor, nor render the husband liable to account.

Though no words of gift be spoken, a gift by a wife to her husband may be shown by the very nature of the transaction, or appear from the attending circumstances.

A wife who causelessly deserts her husband is not entitled to the aid of a court of equity in getting possession
of such chattels as she has contributed to the furnishing and adornment of her husband's house. Her legal title remains, and she could convey her interest to a third party by sale, and said party would have a good title, unless her husband should prove a gift.

Wife's property is not liable to a lien of a sub-contractor for materials furnished to the husband for the erection of a building thereon, where it is not shown that the wife was notified of the intention to furnish the materials, or a settlement made with the contractor and given to the wife, her agent or trustee.

Good Business Maxims.

Every man is the architect of his own fortune.
Caution is the father of security.
Never boast of your success.
Speak well of honorable competitors; of dishonorable ones say nothing.
Systematize your business, and keep an eye on expenses. Small leaks sink large ships.
Never fail to take a receipt for money paid, and insist on giving a receipt for money paid.
Keep copies of all important letters.
Be prompt in all things.
Avoid going to law.
Apply the golden rule to your business transactions, and you can't go far astray.
Josh Billings remarks: "I like to see a fellow practice his religion when he measures corn, as well as when he hollers Glory Hallelujah."

Some Hints on Business Law.

Ignorance of the law excuses no one.
It is a fraud to conceal a fraud.
The law compels no one to do impossibilities.
An agreement without consideration is void.
Signatures made with a lead pencil are good in law.
A receipt for money paid is not legally conclusive.
The acts of one partner binds all others.
Each partner individually is responsible for the whole amount of the debts of the firm.
Contracts made on Sunday cannot be enforced.
Contracts for advertisements in Sunday papers are invalid.
A note drawn on Sunday is void.
A contract made with a minor is void.
A contract made with a lunatic is void.
Principals are responsible for the acts of their agents.
Agents are responsible to their principals.
A note obtained by fraud, or from a person in a state of intoxication, cannot be collected.
If a note be lost or stolen, it does not release the maker; he must pay it.
An endorser of a note is exempt from liability if not served with notice of protest with the least possible delay.
There are, of course, exceptions to the above-mentioned general rules, which special cases may develop.

Definitions of Mercantile Terms.

Acceptance.—The written agreement to pay a draft according to its terms.

Account.—The systematic arrangement of debits and credits under the name of a person, species of property or cause.

Assets.—Resources; available means.

Balance.—A term used to note the difference between the two sides of an account, or the sum necessary to make the account balance.
Bill.—The general name for a statement in writing, used in a variety of ways.

Bills Receivable.—Written obligations or promises to pay money due the concern.

Bills Payable.—The concern's written promises to pay.

Capital.—Investment in business.

Days of Grace.—The time allowed by law and custom between the written date of maturity of a note or draft and the date upon which it must be paid.

Discount.—Consideration allowed for the payment of a debt before due.

Draft.—An order for the payment of money.

Drawee.—The person on whom a draft is drawn.

Drawer.—The person who draws the draft.

Endorse.—To subscribe to a thing; to write one's name across the back of a note or draft.

Exchange.—The fundamental principle of trade. Paper by which debts are paid without the transmission of money. Premium and discount arising from the purchase and sale of funds.

Favor.—The polite term for a letter received. A note or draft is in favor of the person to whom it is to be paid.

Honor.—To accept or pay when due.

Interest.—Compensation for the use of money.

Invoice.—A bill of goods bought or sold.

Ledger.—The chief book of accounts.

Liability.—A debt or claim against a person.

Maturity.—The date on which a note or draft falls due.

Maximum.—The highest price or rate.

Minimum.—The lowest price or rate.

Net.—That which remains after a certain reduction.

Net Proceeds.—The amount due a consignor after deducting charges attending sales.

Note.—An incidental remark made for the purpose of explanation. A written obligation to pay money.
Par.—Equal in value.

Principal.—An employer. The head of a commercial house. The amount loaned on which interest accrues.

Protest.—The formal notice that a note or draft was not paid when due, or that the acceptance of a draft was refused.

Stock.—Capital in trade. The title given to the property of a business.

Surety.—Indemnity against loss. A person bound for the performance of a contract by another.

Tender.—An offer for acceptance. A legal tender is an offer of such money as the law prescribes.

Usury.—Illegal interest.

Voucher.—A written evidence of an act performed.

**Business Characters.**

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No. number.

+ sign of addition.

− sign of subtraction.

× sign of multiplication.

÷ sign of division.

= sign of equality.
Horses.

How to Observe Diseases.

We are sometimes asked how it is that we know so exactly what the disease is that this or that animal is affected with, as it cannot speak and narrate its ills and its aches. To this question we might repeat a common truism, "A shut mouth tells no lies;" therefore, nobody is deceived. Nature has but one set of weights and measures, and these only should be used. Thus, if a horse have a corn or bruised heel, he will be as sure to go lame as he would with an ordinary sprain. The difference is, that he not only stretches out the sore foot, but he elevates the heel from the ground, and will not set his foot flat to please, or it may be said to deceive any one. The uneasy eye, the anxious expression, and the sharp, peculiar look, tell the tale of suffering, and bear testimony to a description so faithful and true, that every man should understand how to interpret them.

The Pulse.

The pulse of the horse and the ox is felt on the inner angle of the lower jaw, as being the most convenient place. The state of the pulse tells the condition of the heart, whether the disease is of an exalted or depressed character, or whether sickness is at all present. The pulse is more frequent in young than in old animals. In the full-grown and healthy horse it beats from thirty-two to thirty-eight in the minute; in the ox or cow, thirty-five to forty-two; in the sheep, seventy to seventy-five; and in the dog, from ninety to ninety-eight. In inflammations and fevers the frequency of the pulse is increased. In debility and
depression it is slower, but sometimes quicker than natural. There are the quick pulse, the strong, the sharp, the regular, the intermittent, and many other varieties, both fanciful and real, which few persons can appreciate. The pulse of inflammation and fever numbers from seventy-five to eighty beats in the minute; and in great debility, as in the last stage of glanders, accompanied with tubercles of the lungs, the pulse will number one hundred beats per minute.

**Treatment of Disease.**

Bleeding, in domestic practice, is almost discarded, and in veterinary practice it should never have been employed. And if this fact shall be the means of opening the eyes of
those interested (and who is not?) in the health of the animals supplying us with meat, and the horse (a willing and a faithful help), to the injury done by bleeding in health or disease, the writer will have his reward. Avoid these measures, and substitute a rational and successful system of treating the diseases of your animals. Ascertain whether your horse is suffering from a disease of an exalted or inflammatory kind; substitute aconite, pure air, and cold water for bleeding, and in a few hours you will have no cause to regret the change. If the disease be of a depressed kind, accompanied with weakness and debility, give nux vomica, iron, and a generous diet. If the disease be an eruptive fever, give sulphite of soda to purify the blood. In rheumatism, administer colchicum and carbonate of soda. In mange, apply the sulphuret of potassa to the skin, and thereby destroy the small insects which cause the trouble.

In hard swellings use the preparations of iodine, to cause their absorption. In lameness, allow absolute and entire rest, and apply hot or cold applications and slight irritants to the parts, to remove the products of the sprain. Ascertain the cause of disease, and, having found it, have it removed, and the effects will cease. If the animal be costive from eating dry, concentrated feed, remove it, and give green feed or bran, but do not give physic. If diarrhea be present, leave it, at least for a time, to itself, as it is nature's plan of getting rid of the offending matter. But, if it should continue, chalk and opium, as an astringent, are what is wanted. The reader cannot fail to see how simple, and his experience will demonstrate how successful, these measures are in arresting and curing the diseases of all our domestic animals.

Spasmodic Colic.

Symptoms.—All at once the horse that a few moments ago was well, apparently, shakes his head—leaves his feed,
looks round at his flank, mostly at the right side, as if pointing out the seat of the disease, serapes the ground with his front foot, and almost strikes his belly with one of his hind ones. The spasm continuing, the horse breaks out into a sweat, heaving at the flanks; great excitement, kicking, and rolling; intervals of ease from pain.

Causes.—Drinking cold water when heated, or colder water than commonly used, as a city horse is used to drinking water which is warmer in summer, and colder in winter, than water taken from a pump; washing the belly with cold water; driving horses into a pond of cold water.

Treatment.—Give something to heat the stomach and bowels. Try a bottle of warm ale or porter, adding a little whisky, or a tablespoonful of ground ginger to it. If relief be not obtained in half an hour, give a drench, composed of tincture of aconite root, twenty-five drops; spirit of turpentine, one ounce; one bottle of cold ale or porter. If necessary, give injections of warm water (not hot), soap, and a handful of table salt. Occasionally walk the horse about, to excite the bowels to action.

**Flatulent Colic.**

Pain is considerable at first, which in a few hours gives way to sleepiness (see Coma). This is caused by distention of the bowels with gas, commonly called wind, thereby paralyzing the paragus and nerve centers, and ultimately the brain itself. This variety of colic is readily distinguished from the others by swelling of the belly, particularly at the flanks, called tympanitis, or drum-belly.

Causes.—Indigestion of food in the stomach; fermentation is set up, and there is evolution (giving forth) of carbonic acid gas. This gas is not liberated per rectum from the body as speedily as generated. The horse and cow cannot belch or eruct wind from their stomachs as man
and dog can; hence the frequency of tympanitis in horses and cows.

_Treatment._—Try injections first, as in many cases I have cured this variety by this means alone. If gas or wind come away with the injection, the case will soon end well. When no benefit is derived from the injections, give, in a little cold water, aloes in powder, one ounce; sulphuric ether, one ounce; tincture of opium, two ounces. If these measures fail in giving ease from pain, pour two ounces of chloroform on a small moist sponge, and hold it to the nostrils, not too closely, but admit a portion of air with the fumes of the chloroform (see Medicines). The sponge may be placed in a towel, and the ends carried up around the nose of the horse, to save waste; or place the sponge in the bottom of a nose-bag, and put it on the head, but not too close upon the nose.

_Last Remedy._—It must be confessed that the longer this disease is unrelieved, the more remote is the chance of recovery, as the bowel sometimes contracts upon itself, or nearly closes altogether. To overcome this condition an operation is recommended, which I do not say will be a success, nor yet a failure. When it failed in my hands, it was not because the gas was not let out of the bowels, but
because the blood had become so disintegrated, and the nervous centers so paralyzed, that the sanative powers of the constitution had received too great a shock to ever rally again.

The Operation.—Procure an instrument, called a trocar. If this be not at hand, sharpen a breakfast knife, and measure an equal distance from the haunch bone and the short rib, and not too high upon the back; force the knife into the distended bowel, and turn the knife in the wound thus made, and hold it there until all the imprisoned gas has escaped; and as the gas sometimes still accumulates, keep the knife or instrument in the wound, if it be for half a day. When the knife or instrument is taken out, place a piece of sticking plaster over the wound.

Stones, or hair calculi, are often found, after death, in the bowels of horses subject to colic. I have seen six taken from one mare that I had under treatment. Remember, the great principle in the treatment of colic, in all its forms, is to relieve pain. This also holds good in most diseases of horses. The doctor, if he fail to allay pain, cannot cure the disease.

Stercoral Colic.

Similar to the above variety, but continues longer, and is not quite so severe or painful.

Causes.—Impaction or constipation of the bowels.

Treatment.—Powdered aloes, one ounce; tincture of aconite root, twenty-five drops; chloroform, half an ounce. Mix in a bottle of ale or porter, and give in a drench out of a horn, or stout bottle. The aconite will have to be given every four hours, till the pain has given way. Encourage the operation of the aloes by injections every hour.
Curb.

One of the many diseases of the hock-joint, and consists in a swelling immediately below the point of the hock-joint, and is the result of sprain of the posterior straight ligament; is more frequent in horses, with the hocks inclining forwards. The treatment best adapted is the ointment of the red iodide of mercury, which is a counter-irritant. Apply about the size of a hickory-nut in quantity every sixth day for a few weeks, occasionally greasing or oiling the parts to prevent the skin cracking.
Simple Diarrhea.

Consists of a looseness, or fluid condition of excrement, from something irritant in the bowels, and which does not freely pass away. When this condition is present, and no pain, griping or pawing as in colic, it may be well let alone.

Continued Diarrhea.

This is often the case when irritation does not pass away with the offending matter, and the bowels continue to discharge a thin fluid. There is slight pain or colic. When this is the case, suspect some irritant poison.

Treatment.—From whatever cause the diarrhea may arise, treatment that will allay pain is demanded. First, give twenty to twenty-five drops of the tincture of aconite root in a little cold water. Then give the following powder every two hours, until a change for the better has taken place: Prepared chalk, half an ounce; catechu in powder, one drachm; opium in powder, ten grains. Allow the animal plenty of water to drink, which will help to keep or allay irritation, or what disposition there may be to inflammation. Bran mashes should be given for a few days, so as to overcome the effects of so much drying or binding medicine. Cake meal, or ground flaxseed, will be an excellent assistant in this particular.

Food.

1. All horses must not be fed in the same proportions, without due regard to their ages, their constitutions, and their work. Because the impropriety of such a practice is self-evident. Yet it is constantly done, and is the basis of disease of every kind.
2. Never use bad hay on account of its cheapness. Because there is not proper nourishment in it.

3. Damaged corn is exceedingly injurious. Because it brings on inflammation of the bowels and skin diseases.

4. Chaff is better for old horses than hay. Because they can chew and digest it better.

5. Mix chaff with corn or oats, and do not give them alone. Because it makes the horse chew his food more and digest it better.

6. Hay or grass alone will not support a horse under hard work. Because there is not sufficient nutritive body in either.

7. When a horse is worked hard his food should chiefly be oats and corn; if not worked hard, his food should chiefly be hay. Because oats and corn supply more nourishment and flesh-making material than any other kind of food. Hay not so much.

8. For a saddle or coach-horse, half a peck of sound oats and eighteen pounds of good hay are sufficient. If the hay is not good, add a quarter of a peck more oats. A horse that works harder may have rather more of each; one that works little should have less.

9. Rack feeding is wasteful. The better plan is to feed with chopped hay, from a manger. Because the food is not then thrown about, and is more easily chewed and digested.

10. Sprinkle the hay with water that has salt dissolved in it. Because it is pleasing to the animal's taste, and more easily digested. [A teaspoonful of salt in a bucket of water is sufficient.]

11. Oats and corn should be bruised for an old horse, but not for a young one. Because the former, through age and defective teeth, cannot chew them properly; the young horse can do so, and they are thus properly mixed with the saliva, and turned into wholesome nutriment.

12. Grass must always be cut for hay before the seed
drops. Because the juices that ripen the seed are the most valuable part of the hay. If they are sucked out by its ripening and dropping, the grass will not turn into hay, but will only wither and grow yellow.

13. Vetches and cut grass should always be given in the spring to horses that cannot be turned out into the fields. Because they are very cooling and refreshing, and almost medicinal in their effects; but they must be supplied in moderation, as they are liable to ferment in the stomach if given largely.

14. Water your horse from a pond or stream, rather than from a spring or well. Because the latter is generally hard and cold, while the former is soft and comparatively warm. The horse prefers soft, muddy water to hard water, though ever so clear.

15. A horse should have at least a pail of water, morning and evening; or (still better) four half-pailfuls, at four several times in the day. Because this assuages his thirst without bloating him. But he should not be made to work directly after he has had a full draught of water; for digestion and exertion can never go on together.

16. Do not allow your horse to have warm water to drink. Because, if he has to drink cold water after getting accustomed to warm, it will give him the colic.

17. When your horse refuses his food, after drinking, go no further that day. Because the poor creature is thoroughly beaten.

Thrash.

Thrash.—A diseased condition of the sensitive frog of the foot, and from which a stinking fluid is discharged, which is familiar to every person who is among horses.

Causes.—Too much moisture to the foot, as from animals standing in their own excreta, or from wet stabling, the frog becoming perverted, and deteriorating, and secre-
ting or discharging a blackish colored and otherwise nasty fluid. It sometimes accompanies navicular disease.

Prevention.—Dry stabling, a stall having sufficient inclination or drainage to carry off the fluids. Cleaning the stables regularly.

Treatment.—A few drops of muriatic acid forced into the center of the frog once a day, for a few days. Keep the stables and stalls dry and clean. A few doses of the sulphite of soda in half ounce doses, once a day, for a few days, will do good by its alterative and puritive effects upon the system.

Acute Founder.

Every school-boy is familiar with the name of founder when applied to a lame horse, but few horsemen ever comprehend the nature and seat of this affection. Founder in all its forms is inflammation of the laminae or leaves, which dove-tail into each other, and bind the sensible and insensible portions of the foot together. Hence, it is called by some learned persons in diseases of horses laminitis, by adding the Greek word itis. Founder is again called by some persons fever in the feet. However, as to names, the disease is of often occurrence, and when left to itself, destroys many good horses by leaving them ever afterward sore and tender in front, as the horsemen have it.

Symptoms.—The horse will scarcely move; stands upon his heels, with fore feet and legs stretched out as far he can get to throw the weight off them. Thus, to all appearances, making the animal hollow in the breast, which appearance has given rise to the idea that the horse is chest foundered. The hind legs are brought far under the belly. The head of the horse is erect and high. Fever and constitutional disturbance are very great. The horse is extremely excitable, and breathing fast and laborious. Altogether, the poor suffering horse is the very picture of distress and disease.
Causes.—Giving cold water when overheated and tired from overwork. A tendency in the feet to take on inflammatory action. The animal not in proper health or condition for performing heavy or fast work.

Treatment.—Place the horse in a wide and airy stall, with plenty of good straw for bedding, to encourage the horse to lie down, which will relieve him very much. Indeed, so much is this the case, that it has been recommended that every foundered horse should be forcibly thrown and kept down till the active stage of the disease has passed off. This, however, I do not advise, as the horse is excited enough, without increasing it by throwing him from his feet. Rather give good bedding, and the majority of horses so affected will be ready and willing to lie down of their own accord. After the place is all fixed and the horse moved into it, give him twenty drops of the tincture of aconite root in a cupful of cold water, poured into the mouth with a bottle having a strong neck. Repeat the dose every four hours, till six to eight doses have been given. Apply cold ice-water cloths to the feet. In a few hours, possibly, the shoes can be taken off. At first, this generally cannot be done, except the animal is down. Care should be taken in removing the shoes, so that every nail is made loose before an attempt is made to pull off the shoes. Have as little hammering on the foot as possible, as it will shake the great and over-sensitive frame. Let the cold water be kept on constantly for the first day, or until the active pain gives way. At leisure, the feet can be pared thin on the soles, so they will yield to pressure with the fingers. By getting the animal to lie down as soon as possible after he gets in, the cold water cloths applied, and the aconite given, the animal, in a day or two, may be nothing the worse from the attack. The longer the animal remains before these remedies are applied, the less likely is he to be free from its effects afterwards. Before the horse is again put to work, be assured he has quite recov-
During the treatment, give plenty of cold water to drink. Never give tepid water to a horse while he is sick from disease. Give grass or soft mashes for a day or two, but do not keep a sick horse too long on low feed, as debility and swelling of the legs and various portions of the body will take place.

Remember.—Do not bleed, neither from the neck, nor foot, nor from any place else, in a disease of this kind.

2. Chronic Founder.—Symptoms, Cause and Treatment will be much the same, only it will not be necessary to push the treatment so far. Principally depend upon softening the horn of the feet, paring the soles of the feet, and a few days' rest. The horse, for a week or two afterwards, should be placed in a stall having six inches of sawdust spread over it, and kept a little moist with water poured over it once in a day. When horses are recovering from acute founder, they also might be placed in a stall so prepared. Clay stalls are objectionable.

Grease.

This is a disease of the heels and legs of horses, characterized by an unsightly condition of the parts. The whole being the result of suppurative inflammatory action of the skin and heels of the hind legs, usually, but sometimes of the fore ones; is more common in coarse-bred Western horses, and heavy breeds, than in well or fine-bred horses.

Cause.—Sudden changes of the temperature of the earth, whether from heat to cold, or from wet to dry. This disease always follows sloppy or wet streets, stables or lands, producing a relaxed condition of the parts from too much moisture.

Treatment.—Keep the legs clean and dry, and apply a mixture to the heels twice in the twenty-four hours.
Water, one pint; sulphuric acid, two drachms; corrosive chloride of mercury, one drachm. Mix, and shake up before using. Many cases are readily cured, by simply keeping the heels clean, and anointing with glycerine, or lard, having no salt in it. It must be confessed by everybody, who has had any experience at all in the treatment of this disease, that there is uncertainty of an early cure; some cases will be cured in a short time, and in others it would seem that the discharge would never dry up and be healed. For cases that prove obstinate, the following plan will effect a cure, when other vaunted remedies have failed: Take one box of concentrated lye, and dissolve it in two quarts of water, and bottle up for use when wanted, in the following way: Pour a wine-glassful of the solution of lye into a small bucket of cold water, and wash and bathe the heels and legs for half an hour, morning and night. A great change for the better will be seen in a day or two. This wash seems to have the power of relaxing and softening the skin, and at the same time causes the legs to sweat greatly. Dry them as often after the bathing as you like,
there will pour out great quantities of moisture from the
skin as soon as you have done

**Heaves.**

This is a term in frequent use, but not so well under-
stood as it ought to be, seeing its importance as to the
proper value of an animal. Heaves, then, may be defined
as a difficulty in breathing, whereby the value and useful-
ness of the horse is seriously impaired. There is every
degree of intensity to be seen in this disease. Some
animals are so seriously affected, that it is hard to look at
the terrible efforts made in the art of respiration. The
deep and not suffered-to-be-completed respiration tells the
tale of great asthmatic effort and oppression. In others,
it is so slight that only experts can observe it; not from the
quickness of breathing, nor yet from its depth, but from a
peculiar double beat or hitch, differing from all other varie-
ties of breathing, either of fever, inflammation, or debility.

**Causes.**—Debility of the parvagum nerve; for if this
nerve is divided or cut in its course, heaves, or broken
wind, is set up at once. The real condition of this nerve,
which gives rise to heaves, is not at present known; and it
is difficult, in many cases, to trace and distinguish any
alteration of the nerves, as they may retain their color, yet
their influence may be greatly impaired. For two reasons
I have said debility. First, because, if it was cut, or had
entirely lost its influence, the animal would die in forty-
eight hours. Second, because, by the administration of
powerful tonics, the symptoms of the disease are greatly
relieved, and in some cases they entirely disappear.

**Treatment.**—Horse-dealers, in order to allay the
symptoms, that is, the peculiar breathing, give an ounce
each of powdered sulphate of iron, gentian and ginger
root. It is the largeness of the dose that is given, and
repeated for a few days, that imparts a tonicity to the nerve. Although I have here spoken of this matter, I do not wish to be understood as advocating such treatment, nor as attempting to cheat or deceive any one; but the large dose of iron meets my decided disapproval, as being highly injurious to the horse—although the giving of round or spherical shot, as is practiced in England, is much worse. The treatment, whatever that may be, to do good permanently, must be a gradual and progressive improvement. Five grain doses of arsenic, given once in the twenty-four hours for two weeks; then, after a week's intermission, commencing as before, will soon cure many cases. Give the animal feed in small bulk. Use as little hay, or rough feed, in large bulk, as possible. Improve the condition of the horse by every way or means, and you will relieve the animal.

Hints on Humanity to Animals.

1. Warm the bit in frosty weather, before putting it into the horse's mouth.

Let the horse lick a little salt from your hands whenever you offer the bit.

3. Never startle a horse by striking him suddenly or unexpectedly. This caution is specially important if he has a blind bridle.

4. Uniformly gentle treatment will secure faithful and steady work. Anger, severity, and sudden jerking, endanger your harness, vehicle, and your life, besides permanently injuring your horse.

5. Be well provided with horse-blankets, particularly at night. If you are waiting for passengers, while you look out for your own comfort by a warm fireside, or in thick wrappers, see that your faithful brute companion is also protected from the chilly air.
6. Wash the inside of the collar frequently with castile soap suds, and when it has thoroughly dried, gently warm the leather and soak it with oil, so as to soften it. But do not allow any oil to remain on the surface of the leather, unabsorbed.

7. If the shoulders are tender, feverish, and disposed to chafe, they should be well rubbed, and afterwards washed with salt water. This should be done after unharnessing, so that the parts bathed may be dry before work is resumed.

8. Do not be tempted by extra pay to overload your team. Overloading occasions blindness, spavin, splint, glanders, farcy, and other painful and fatal disorders, and thus risks the loss of your capital, besides injuring yourself by encouraging a cruel disposition.

9. See that the harness fits easily in every part, and that the shoes are tight and well put on. If there are chains connected with any part of the harness let them be well covered with soft padded leather or fur.

10. Let your tones, in addressing the horse, be always gentle, soothing, and pleasant. Pat him often, and encourage every sign of attachment that he gives.

11. Every truck, or other vehicle, should have a prop stick hung to the shafts, to relieve the burthen of the load whenever the team is standing.

12. Curry, rub, and clean well and thoroughly, at least once every day. The effect is worth half the feed. A dirty coat and skin, when the animal is deprived of exercise in pasture, and of rolling on the grass, cannot fail to produce disease.

13. Never use a check rein. It is a false taste that thinks a horse more beautiful when his head is fastened in an unnatural position. The bearing rein keeps a horse in a constant fret, makes him restless and uneasy, and often prevents him from recovering himself in case of a stumble or fall.
14. Your stable should be perfectly level, or very slightly inclined, well lighted, well drained, well ventilated, and well protected from draughts, and from extremes of heat and cold. Keep the crib clean and free from dust, and keep the hay and other fodder as far from the stall as possible, so as to be away from the steam and breath of the animal.

15. If you use ground feed, remember that at many of the mills and stores it is adulterated with marble or plaster of paris, or with the sweepings of canal-boats and barges. Such adulteration not only robs your animals of nourishment, but produces stone, and shortens life.

16. If you suspect adulteration, you can sometimes detect it by heating a portion of the feed to a red heat, in an iron vessel. After the whole has been reduced to
ashes, if they contain plaster, the ashes will soon set or harden, after being mixed with water to the consistency of paste.

17. In hot weather, keep a wet sponge on the head of the horse or mule; cool the mouth and face with wet sponges; furnish drinking water often, and sponge the legs and such parts as are liable to chafe by perspiration or otherwise; drive slowly, and lessen the weight usually imposed in cooler weather; see that the harness is not unnecessarily cumbersome and heavy; the discomfort may be materially relieved by taking off the eye-blinds, which are useless appendages, and cause much annoyance to the animal.

18. Do not urge your beast beyond a walk when the heat is oppressive; finally, use a head-shelter or awning, constructed of wire and covered with canvas, which can be attached to the animal's head without materially adding weight.

19. In icy weather keep your animal sharp shod, renewing the sharpening as often as the shoes become blunt. A few dollars expended in this way will undoubtedly save your horse from serious injury, and, perhaps, from loss of life.

20. Standing on fermenting manure softens the hoof, produces thrush, and brings on lameness. Keep the litter dry and clean, and cleanse the stall thoroughly every morning.

21. Sharp bits make the mouth tender at first, and afterwards callous, so that the horse becomes unmanageable.

22. If your horse kicks and plunges on mounting, look to the stuffing of your saddle, and see if it has become hard and knotty with use.

23. Keep your wheels well greased, and thus reduce the labor of drawing the load.

24. Keep the feet well brushed out, and examine
every night to see if there is any stone or dirt between the hoof and the shoe. Change the shoes as often as once a month.

25. Disease or wounds in the feet or legs soon become dangerous if neglected.

26. When a horse is hot and fatigued from labor, walk him about till cool; groom him quite dry, first with a wisp of straw, and then with a brush; rub his legs well with the hand, to detect any strain, soothe the animal, and detect thorns and splinters; and give him his grain as soon as he is cool, dry, and willing to eat.

27. On the evening before a long journey give double feed; on the morning of starting give only half a feed of grain, or a little hay; on the road feed in small quantities about every two hours.

28. When horses are long out at work provide them with nose-bags and proper food. The nose-bag should be leather at bottom, and of basket-work or open texture above. On coming home give a double feed of grain.

29. Lead the horse carefully into and out of the stable. Accustom him to stand quite still till you are seated. Start at a walk, and go slowly the first and the last mile.

30. Never use the whip if you can help it. It will then always be available as a last resource.

31. Be always on your guard, just feeling the mouth with the bit, lightly and steadily.

32. If a horse shies, neither whip him nor pat him, but speak encouragingly, and let him come slowly towards the object.

33. If you value your own life, the lives of others, or your horse, never drive fast in the dark, or in a town.

34. Never add your own weight to a load that is already heavy enough. Get off and walk when you ascend a hill. If you stop on a hill, put a stone behind the wheel.
**Inflammation**

Inflammation of the various portions or parts of the body will be found treated of under the name of the organ or part affected.

**Influenza.**

This is a name which is properly applied to an epizootic catarrh of frequent occurrence in the spring of the year.

Indeed, it is very rare that we see a cold run its course as such, without some complication of one kind or another.

*Symptoms.*—A chill or shivering fit, succeeded by increased heat of the body, with fever and irritation. Loss of appetite, cough, discharge of mucus from the nose, watering of the eyes, great prostration of strength, followed in a day or two with swellings of the legs, and, in bad cases, of the belly, breast, and in males, of the sheath; such is a true and succinct account of the symptoms of this disease. The symptoms will vary, as in other diseases, with the intensity of the affection.
Causes.—A subtle poison in the air, sudden changes in the dryness or moisture of the earth's surface, easterly winds, cold accompanied with dampness in the air. These are conditions which too often accompany or precede influenza, which differs from an attack of common cold, chiefly in the severity of its effect, causing more fever and greater debility. In England it was first observed in 1819, and again in 1832, and more or less ever since. In the United States it first manifested itself in 1856, and is still seen every spring and fall with symptoms more or less severe.

Treatment.—The mortality in this disease is great, when treated according to the books which our publishers frequently issue—old English books, with new dresses cut to the fashion. Bear this in mind, when undertaking the treatment of a disease of this kind, that one step wrongly taken can never be recalled. Place the horse in a cool (not cold) and airy place, put a light covering upon him, and give him twenty drops of the tincture of aconite root in a little cold water, every four hours, till five doses are given. Place plenty of cold water before the horse so that he can drink as much as he wants. When the aconite has been all given, commence with fifteen-drop doses of the tincture of nux vomica, which repeat every four hours, continuing it for a few days, and if the animal improves, and the appetite returns, nothing more in the way of medicine need be given. Recovery being slow, and the appetite poor, give the following powders, morning, noon and night: Powdered carbonate of ammonia, three ounces; powdered gentian root, two ounces; powdered pimenta berries, two ounces; mix, and divide into twelve powders, and give them mixed in a little cold water, and drench the horse out of a strong-mouthed bottle. The powders will have to be wrapped well, so as to keep them from the air, and prevent the loss of their strength. Twenty drops of commercial sulphuric acid may be given occasionally, in half a bucket of cold water, which the horse will readily drink. Do not
apply blisters or anything to the throat, as is too often done; they can do no good, but positively much harm. Be assured the animal has fully recovered its strength before putting to work. If treated in the manner described, in from five to six days the horse will be almost well again.

**Hide Bound.**

This, properly speaking, is not a disease, but the symptom of a bad condition, "out of sorts," debility, etc.

*Treatment.*—Feed in large bulk, mixed feed—cut hay, corn meal, and bran in good proportion—with no more water than will keep the particles together. Give the following powder in feed every night, for twelve nights:—Powdered sulphate of iron, three drachms; powdered gentian root, four drachms. Mix. If the animal is fat and yet hide bound, substitute the following, instead of that above recommended: Take sulphuret of antimony, three drachms; sulphur in flower, three drachms; sulphite of soda, half an ounce. Mix, and give in one dose, repeating it every night for two weeks. If in the winter, use an extra blanket. If in summer, give cut grass to eat.

**Ring-Bone.**

This is a serious affection, and consists of a circle of bone thrown out from the underlying bone. Sometimes, in addition to this, the cartilages of the foot are converted into bone, and laid in the form of a circle; and hence its name, ring-bone. It is most common in the fore-legs of heavy, coarse-bred horses, with short and straight-up pattern joints. When it occurs in fine-bred horses, it is usually the hind leg which is affected. Ring-bone does not always cause lameness.
Causes.—Hereditary predisposition, from a peculiar formation of pastern-joints, which are found not well adapted to hard work; and hence an effort of nature is set up to strengthen parts which are too weak, by converting an elastic substance into a hard and unyielding mass, and a moving hinge into a fixture.

Treatment.—If it is of recent origin, and the horse is young, much may be done in the way of a cure, by first removing all heat and inflammation by cold water cloths wrapped round the parts for three days, taking them off at night. At the end of that time, get one drachm of the bin-iodide of mercury, mix with one ounce of lard, and apply one-half of the salve by rubbing it in well for ten minutes. Tie up the horse's head for a few hours, and the next day wash off with soap and warm water, daily anointing the parts with lard or oil for a week; then apply the remainder of the salve in the same way, and proceed as before. In old horses not much can be done with ring-bone, as the bones of old animals contain so much earthy (lime) matter that nothing can act upon it.

Spavin.

A variety of disease affecting the hock-joint. Spavin is not now looked upon as in the days of Oliver Goldsmith and William Shakspeare, because in the minds of those distinguished men, and of some of their readers of the present time, spavin is an enormous enlargement of the hock of the horse; whereas, in some of the worse forms of spavin there is no enlargement at all, while the hock-joint is completely destroyed, stiff, or ankylosed. Shakspeare thus refers to Petruchio's horse:—"His horse hipped with an old mothy saddle, the stirrups of no kindred; besides possessed with the glanders, and, like to mose in the chine, troubled with the lampas, infected with the fashions, full of wind galls,
sped with spavins, raised with the yellows, past cure of the fives, stark spoiled with the staggers, begnawn with the bots, swayed in the back, and shoulder shot ten, ne'er legged before, and with a half-checked bit, and a head stall of sheepe's leather."

**Bog Spavin.**—This kind of spavin is situated in front of the hock-joint, and is a soft, fluctuating swelling, which rarely ever causes lameness. It is merely an enlargement or distention of the bursal cavity of the joint, and is filled with the natural fluid of the joint, but increased in quantity and possibly, in some cases, a little changed in quality also.

**Blood Spavin.**—This is the same as bog spavin, but more extensive, and generally involving the hock-joint on its three sides, front, inside, and outside, and giving to the limb a thick, rounded appearance, called thorough-pin (which see). The swelling is soft and fluctuating, and indeed there is no perceptible difference in the nature and result of this form of spavin, and the preceding variety beyond its being more extensive, interfering, perhaps, with the flow of blood in the sub-cutaneous (under the skin) vein, which is seen in front, and partly to the side of the joint, adding very little to the general swelling.

*Causes.*—Hard work and fast driving, especially when horses are young.

*Treatment.*—The application of the ointment of red iodide of mercury, in the hands of some, has done much good; but the enlargement is apt to return when the horse is again put to work, from the fact that more joint-oil, or fluid is poured out. Acupuncture, or forcing small steel instruments into the swelling to let out the fluid, is sometimes resorted to, after which a bandage or truss is fitted to the part to press out the fluid that remains, and to cause the adhesion of the parts together. The difficulty in curing soft spavin is the danger of opening into a cavity or joint containing oil (synovia). An old way of treating such
disease is by striking the parts with a mallet, so as to break the skin, that the fluid can escape; the blow given to the skin being so great as to set up adhesive inflammation, and a closure of the opening.

Bone Spavin.—Consists in the sprouting out of irregular bony matter from the bones of the joint, preventing their smooth and proper action over one another, and causing lameness. This bony growth sometimes attains a good size, and in some cases we find one or two of the bones only involved; in others nearly all of them are affected. The situation of bone spavin is on the inside, and in front of the joint.

Symptoms.—When horses are what is called breeding bone spavin, ordinarily persons think and say the lameness is on the hip (see Hock), from the action which is reflected by the muscles of the hip at every movement made by the hock-joint, and from the fact that there is no enlargement as yet in the joint. The horse is lame on starting, but gets better after a little while, and after standing will start lame again. In the stable, he shifts one hind leg after another, and when resting the lame leg, he stands on the toe. Pain and lameness cease when the joint is consolidated, although remaining a little stiff.

Occult Spavin.—This is a disease similar to bone spavin, the difference being that there is no enlargement of the joint whatever, although the bones of the joint are all diseased, immovable and stiff. This seems to puzzle and perplex horsemen, because they cannot comprehend a bone spavin without an enlargement of the joint outside; and, consequently, the poor horse is sometimes blistered and tormented in every part of the leg, but the right place. The cause, results, and effects of this disease are the same as in bone spavin, excepting that there is no enlargement.

Treatment.—For the two varieties of spavin just described, the treatment should be the same. In young horses, the red iodide of mercury in ointment is the proper
treatment. One drachm of bin-iódide of mercury and one ounce of lard. Mix, and apply once in a week, and lard the parts once a day, till the next application.

Old horses should have a liniment applied, once every second day, to the parts. Oil of olives, two ounces; oil of turpentine, one ounce; creosote, one ounce; mix. This will relieve the pain, and to a great degree the lameness. Spavined horses should have an extra allowance of feed to keep them in condition equal to their more healthy and fortunate neighbors.

**Splint.**

A small bony enlargement, situated usually on the inside of the forelegs, about midway between the knee and the pastern joint. When splint begins to grow, it sometimes produces lameness by stretching the covering of the bone, which, however, soon accommodates itself to the altered structure.

**Cause.**—Working horses when too young, and before the leg and splint bone have become united. Hence, splints disappear when the horse grows older, and the unity of these bones takes place.

**Treatment.**—One or two applications of this ointment: Red iodide of mercury, or tincture of Spanish fly, one ounce; oil of croton, twenty drops. Mix, and apply with rubbing.

**Stringhalt.**

This is an affection of the hind leg, and is known from the peculiar way in which the hind leg or legs are raised from the ground—a quick, spasmodic jerk.

**Causes.**—These are two-fold. *First*—The loss of nervous influence, whereby the extensor pedis muscle—and possibly some others—is deprived of its proper power. *Second*—The peculiar anatomical articulation and general
structure of the hock-joint of the horse are such that when
the leg of a dead horse is stripped of its muscles the liga-
ments are not disturbed at all; and if the legs above and
below the hock be caught hold of by the hands, and the
leg straightened out, the moment the hands are taken from
it, it will spring into a bent position, thereby imitating
stringhalt, as near as can be. Thus the balance of power
is not equal; the articular ligaments of the hock are
stronger than the muscles of the thigh. Hence, the
moment the horse lifts his foot from the ground, the leg is
snatched up by the power of the articulating ligaments.

Treatment.—Restore the lost nervous influence; there-
by the muscles of the thigh are to be brought into healthy
action. This will best be done by good feeding, and one
grain of strychnia nux vomica given daily, for six weeks,
in the horse's feed.

Sweenie.

This word or name is so deeply buried in obscurity that
researches in every quarter have failed to discover its ori-
gin, or secure to it a satisfactory resurrection. It applies,
however, when used by horsemen, to a falling away or
shrinkage of the muscles of the shoulder, and indicates not
so much a lameness in the shoulder as it does a disease
elsewhere—in the foot or leg, as corns and disease of the
pastern-joint. Atrophy should be substituted for sweenie,
as it is generally sympathetic, and, moreover, means that
the body or a part is diminishing in bulk.

Treatment.—Remove the cause of atrophy or sweenie,
and the effects will pass away.

Worms.

The worms which inhabit the body of the horse are of
many varieties. Some of them are harmless, while others
interfere with his health. They are: 1st. The bot or astrus
equi, found inhabiting the stomach. 2d. The oestrus Hæmorrhoidalis or Fundament bot, found in the rectum, and often seen about the anus, and under the tail. 3rd. The strongylus, and Filaria, found in the rectum, and often seen about the anus, and under the tail. 4th. The ascarides vermicularis, found in the aorta, and other blood vessels. 5th. Filaria, found in the aqueous humor of the eye.

Stomach Bot.—These worms are the result of turning horses out to pasture in the summer months, and are produced from the eggs laid or glued to the fore-legs of the horse, by the bot fly.

Symptoms.—An unthrifty coat, and loss of flesh after a run at grass, may be taken as an indication that bots are present within the stomach.

Treatment.—Improve the condition of the horse, so that the debilitating effects of the bots' presence may not interfere with the general health and condition of the horse; for it must be borne in mind that no medicine can, or will, dislodge or destroy these parasites short of killing the horse, also. Once the eggs are in the stomach, which seems to be the natural nursery both for their protection, and the propagation of their species, they cannot be removed by force. In one year from the time the eggs are taken into the stomach, will the bot be a perfect chrysalis, and will fall from the coats of the stomach, and be expelled with the excreta or dung. In a short time after, it will be provided with wings, and fly about, commencing the propagation of its species, which must pass through the same period of probation or incubation, as its progenitors. Give iron and gentian, in addition to good feeding, to prevent the bots from debilitating the animal too much. Take powdered sulphate of iron and gentian root, each three drachms; mix, and make one dose, to be repeated twice a week.
Fundament Bot.—Like that of the stomach, but also the result of a run to the grass. Instead of the eggs being deposited upon the legs, they are stuck to the muzzle or lips of the horse, and are the color of the skin, hence not often seen.

Symptoms.—The following year, during the summer months, the larva of this species will be seen sticking about the anus and under the tail, which, in spirited horses, proves a source of great uneasiness and irritation.

Treatment.—Injections of linseed oil or tobacco smoke.
Diseases of Cattle.

This part of our work is devoted to the explanation and treatment of the various diseases affecting the ox, together with an account of the diseases incident to milch-cows and young calves.

Cattle diseases are, in many particulars, similar to those of the horse. Thus, inflammation, irritation, and fever, are common to all animals. Still, however, there are many diseases affecting cattle, in which we fail to find a counterpart in any disease attacking horses. Among such diseases, we may mention those of contagious typhus, or rinderpest; epizootic aphtha, or the murrain; splenic apoplexy, and quarter evil, or the black leg.

The manner or mode of treating disease in the ox differs no more from that employed in the case of the horse than one disease differs from another. For it must be remem-
bered by every person who undertakes to give medicine to an ox or a cow, that they have four stomachs—1, the rumen, or paunch; 2, the reticulum; 3, the many plus; 4, the abomasum. For this reason, or, as it were, peculiarity, cows or oxen should, under every condition, be treated with medicine in a fluid form only, so that it may pass from one stomach to another without injury, and in the shortest possible time. By giving medicine in the form of a solid—as is sometimes given to the horse—in place of its finding the way into any of the stomachs, it is more likely to break through the floor of the esophagean canal (a platform at the bottom of the gullet), thus not only losing the medicine, but, at the same time, destroying the animal.

**Abortion.**

An affection peculiar to cows, and chiefly attacking those that are kept in the neighborhood of cities and large towns, and in the vicinity of cheese factories. It is rarely seen to any extent in the herds of the breeder and agriculturist. It consists in the cow parting with her calf at any time between the first month of conception and the last month of gestation.

*Premonitory Symptoms.*—By these the event is at times clearly foreshadowed. They are extremely deceptive and uncertain, however, and differ materially with the cause of the trouble. In those cases which resemble an epizootic (epidemic) disease in their course, a short, inaudible, involuntary cough is observed, while, by auscultation of the neck, a slightly roughened sound will be heard in the bronchia, accompanied by weakness of the body. Indeed, the symptoms of this occurrence, when not of sporadic origin, are weakness and debility. This debility and weakness, to most persons, will prove deceptive, because the blood is, or has gone under a morphological change;
and then, and then only, do the calf attachments to the womb or uterus of the mother separate. The cow brightens up, and feels as it were a life de nova, though carrying her dead offspring—which she will continue to do till the fresh stimulus given by the blood that formerly gave life to the calf enables her system to contract the womb, and thereby expel the foreign body.

Causes. — These should not have remained so long a mystery, when we consider how difficult and unreasonable it is for us to expect the cow to thrive and do well when placed in an anomalous condition—one totally foreign to her species—a "factory hand," as much so as the veriest operative in the mills of Lowell and Lawrence. The true causes, to be brief, are—1. Feeding upon slop or other milk-secreting materials. 2. Insufficient feed of whatever description. 3. The attempted reproduction of the species, whilst at the same time a drain is being made upon the system by an excessive and unnatural demand for milk. 4. Irritation of the white membranes of the wind-pipe, changing and weakening the blood. 5. Exudative pleuropneumonia, or other debilitating disease. Any of the above named causes, singly or combined, when acting upon an animal placed at so great a disadvantage, as we
have shown, will necessarily result in outraged nature choosing her great prerogative between life and death and the perfect propagation of her progeny.

Prevention.—This can readily be done, as every intelligent reader will conclude after reviewing the causes. It consists in:

1. Feeding substantial feed, and enough of it, but not excessively sloppy or wet—for in this way, the bowels are kept too loose, relaxing the solids of the body, and thereby inducing over-secretion of milk at the expense of good health.

2. Though the cow be unprofitable, allow some feed, gradually increasing it in quality, and, if necessary, in quantity, as she approaches the time of calving. By this means the extra demands of nature in the increasing size and wants of the calf will be supplied without at all affecting the health or strength of the mother—thus insuring a natural parturition.

3. Dry up the milk in all cows that do not, in the natural order of things, stop secreting milk, say three months preceding their time of calving, by giving sulphate of iron, three drachms, in powder, combined with gentian root; also, in powder, half an ounce, once daily, mixed in feed, for a week to ten days. No milking should be done, other than to prevent injury to the udder if it becomes distended.

4. If there is a cough peculiar to more than one or two cows, allow plenty of good food, with two drachms of the sulphate of iron, and half an ounce each of ginger and gentian, twice daily, to keep the blood in its normal state, to prevent relaxation of the solids of the body terminating in exudation, and to promote absorption.

When any of the cows have been sick of pleuro-pneumonia or other disease, cure them and keep up the strength by tonics and a generous diet, always bearing in mind that it is poor policy and worse economy to starve animals,
especially when suffering from disease. Thus we have mapped out a plan, which, if faithfully followed and put in practice, will accomplish what it is intended to do; and if, in the opinions of others, I am in any way mistaken, I can only say, as did Luther at the diet of Worms, "Hier stehe ich, ich kann nicht anders."

**Sporadic Abortion.**—This variety is the result of accident and disease of the womb itself, and is not to be confounded with abortion arising from causes named in the preceding article.

**Abortion Before Viability.**—A variety of abortion occurring within a few weeks of pregnancy, caused by irritation and excitement of the uterus. To prevent a recurrence of the annoyance, change the pastures or feed of the cows before putting the bull among them.

**Remarks.**—It will no doubt be remarked that the views herein expressed seem to differ with opinions already given, to some extent, to the public. They are nevertheless the same in substance that we have heretofore entertained, and they have given satisfaction to all who have faithfully put them to test. Hundreds of cows in Pennsylvania, in the vicinity of Philadelphia, have not only been prevented from aborting their calves, but prevented from pleuro-pneumonia, also, when both were in the herd at the same time, and immediately preceding the use of iron, etc.

In this connection, we would refer the reader to a lecture by the Hon. W. I. Skinner, of Little Falls, N. Y., in 1868, in which was shown the loss of nine calves by abortion, whereas in the use of iron, etc., the trouble was at once arrested. To those who at any time may have found no relief from its use, if there be any such, we can only say that the fact must be attributable to misapplication, adulteration, bad material, or, peradventure, some other cause. We would ask such persons "Do they not find it as profitable to draw milk year in and year out from
the machine without interruption—which can be occasionally done by the cow aborting—as from cows carrying their calves to full time, and the consequent loss of three months' milk (although an occasional cow remains dry as the result of abortion) when butter, cheese and milk command so high a price?"

The efforts of others to solve the apparent mystery surrounding the cause of abortion have been considerable, and the results have been invariably somewhat contradictory, negative, non-committal, or of questionable utility. Thus the New York State Agricultural Society, through its then president, J. S. Gould, presented a memorial to the Legislature of the State, setting forth the evil results recurring to the dairy interests of the State, and asking for an appropriation to defray the expenses of a commission to investigate the cause, and point out a remedy; also, assuring the Legislature that if the prayer was granted, certain veterinary surgeons and medical men in Philadelphia, etc., were likely to throw light upon the cause, and recommend a cure. Thus, at the very beginning of his efforts, Mr. Gould perpetrates a blunder; for no veterinary surgeon or medical man from Philadelphia was employed on the commission. The choice of Mr. Gould was J. C. Dalton, M.D., of New York, whose report of investigations and their results disappointed many persons who had entertained high expectations from it; for it proved to be negative, and of little use to the dairy interest. The Society evidently was not satisfied with Dalton's report, for next year a new commission was formed, with W. H. Carmalt, of New York, at its head, but with no veterinary surgeon attached to it. His report was rendered in 1869, and though non-committal in character, it contained much valuable information to all interested in the dairy. Amongst the contradictions of the two reports, we will only mention that Dr. Dalton says a cow having once aborted is four times more likely to do so subsequently, and Dr. Carmalt says that she is about twice
as liable. Have they been guessing, or is this discrepancy merely the result of idiosyncrasy?

The experiments of X. A. Willard, Esq.,—a leader in all that pertains to excellency in dairy management—in feeding his cows "bone meal," are in the right direction, but do not go far enough, although apparently successful in preventing the recurrence of abortion. By substituting for bone meal that which contains more of the nutritious combined with the astringent in effect would be preferable; but as we have already intimated, it goes a certain way in meeting one or more of the causes of the trouble.

Prolapsus of the Bladder.

Among cows, during and after difficult calving, there will be sometimes observed a white, shining, watery bag protruding between the lips of the vulva. This is the bladder holding the urine. It is twisted at its neck, and, therefore, cannot be emptied. Many a good cow has been destroyed by ignorant persons mistaking this for some of the watery membranes surrounding the calf, and, therefore, intentionally tearing it asunder.

Treatment.—Carefully examine the distended bag, its shape, and size. Having determined that it is the urinary bladder, carefully cleanse it, if dirty, and pass the hand previously oiled along its surface, ascertaining which way the turn or twist is made. Having satisfactorily known this, take the bladder by the other hand and reverse the turn or twist, and then carefully push the bladder back into its place.

Should the bladder again return, a _tampon_—a roll of soft cotton cloth—should be used to plug up the vulva for an hour or two. If this should not be sufficient, a stick or suture of stout saddler's silk, or other strong material, should be passed through each side of the vulva with a
small packing or darning needle, and may be allowed to remain for a few days.

Calving.

This is an operation of nature, which most dairymen and farmers are familiar with, and upon which we will say comparatively little. Before we do this, however, a short description of the symptoms by which it is known when a cow is in calf, will be given.

Symptoms.—The first and most important symptoms of a cow being with calf, is the absence of oestromania or bulling. This, however, is not altogether relied upon in some cows, for there are cases in which a pregnant cow will receive the bull up to the time of calving. The next, and probably the more sure sign of a cow being with calf, is the increased size of the belly. The hand placed firmly against the flank or portion, where there are no ribs; a hard, firm body will be felt, which is the calf. As time passes along, the movements of the calf in the womb can occasionally be seen. Within a few weeks of calving, the external organs of generation—labia pudendi—increase in size, and discharge a thick mucous. The udder becomes swollen, hot, and full of the first milk—colostrum—which is sure indication that the time for calving is near at hand. This is accompanied by a relaxation of the ligaments of the pelvis, or, as the dairymen say, "she is down in her bones."

Symptoms of Immediate Delivery.—Great restlessness and uneasiness, showing by lying down and rising up, and increasing in severity, until she has been delivered of a calf. From the time of conception, till natural parturition or calving, it is about forty weeks, or two hundred and eighty days.

There are, however, opinions at variance with these dates, founded upon the sex of the calf. If a male, it is
carried longer than if of the opposite sex. These opinions form ground for debate, therefore we will drop theorizing.

Natural Calving.—This resembles the fruit when ripe, breaking from its attachment to the parent tree, and falling into the lap of mother earth. If the pelvic bones are well or proportionately formed in the cow, and the presentation and size of the calf be right, no trouble need be apprehended, and the cow may be left to herself. The natural presentation at full time, and of a full grown calf, is as follows: The amnion, or waterbag, having been ruptured or broken, there will be seen the fore legs and head of the calf resting upon the two feet, and protruding a little. If, however, the cow should labor long with the calf in this position, and she is weak and thin in flesh, she may be assisted. This can be done by taking hold of the two feet and part of the head, and when the cow makes an effort to strain, pull at the calf. If sufficient force cannot be applied by the hands, then place a soft but stout rope round the feet of the calf, and apply traction or force. Before any force whatever is used, be sure that the mouth of the womb is sufficiently dilated; for if this be not the case, then by using force the womb is torn or ruptured, and the death of the cow is the result. Be patient, and time—the prover of all things—will also prove the wisdom of waiting. If after delay, however, both cow and calf should be lost, be consoled by the fact that it is likely the one or both would have been lost any way; for there will be found some one or other of these malformations, either in the pelvis or arch of the pubis of the cow, or an undue proportion of the size of the calf to the pelvic arch through which it is has to pass, to be delivered. In all cases where the calf presents itself in the form above described, and delivery is not effected, rest assured that the pelvic arch of the mother is too small or too narrow. If that be not the case, the calf is over size, from water in the head (Hydrocephalus), or
water in the belly (Dropsy), or both of these conditions combined, which is seen by veterinary surgeons, in large country practice.

Before a calf of this description can be delivered, and the cow relieved, the head of the calf must be pierced, to lessen its size, then a long spear-like instrument—trocar—is used to pierce the belly or abdomen of the calf, to empty the fluid, to lessen also its great size. When that is properly done, and the cow is not too greatly exhausted, she may complete the delivery without further assistance.

Twin Calves.—Twin presentations are as various as they are curious. Thus, we sometimes see a fore leg of one calf, and the hind leg of the other. In this condition of things, it must be evident that no force should be used to bring them away till each calf is properly adjusted in its position. The best and quickest way is to adjust the calf which first presents itself, and if portions of the other be presented also, push them back into the womb. When one calf is safely delivered, not much difficulty will be experienced with the other.

Unnatural Presentation.—We have now arrived at that portion of our subject which, more plainly talking, has reference to when the calf is being forced into the neck of the uterus or womb in any form except the natural position already described. The unnatural position of calves, about to be delivered, is happily rare, and forms the exception to the natural law of presentation. However rare these presentations are, they nevertheless are sometimes seen. Thus the feet are presented, and the head of the calf doubled on its neck, and in the womb. This condition is best remedied by tying a rope round the fore feet, or both together, and raising the hind parts of the cow off the ground; thus forcing the calf down to the fundus, or bottom of the womb. This being done, reach the hand in and seize the calf by the head, and bring it with you, while an assistant is pulling upon the rope attached to the fore legs.
By adopting this plan a safe and speedy delivery will be effected. English veterinary surgeons, with Professor Simmonds at their head, say this is the most dangerous form of presentation, involving the life of both cow and calf. Why do they say so, and how does it prove so to them? Because they vainly endeavor by force to bring the head of the calf into the neck of the womb, when there is no room to do so, without first elevating the hind portion of the cow sufficiently for the calf to fall to the bottom of the womb, where there is plenty of room to turn, not only the head, but the whole of the body also.

Another form of malformation is, where we have the head and neck within the neck of the uterus or womb, without the fore feet and legs. The only alternative in this case is to remove the head by cutting it off from the neck; leaving, however, sufficient skin for attaching a rope to it. But if the head has not fairly passed out, an attempt should be made to put it back into the womb again, and not bring it out. Before pushing it back, fix a rope round the lower jaw. The legs one by one should be searched for by the hand, and when found secured by another rope. After both fore legs and head are thus fairly within the grasp, use traction or gentle force, and take advantage of every strain made by the cow, and by these means the calf will be safely delivered.

The next unnatural form consists in the presentation of one or other of the fore legs, where the nose is pressed downwards, and the crown of the head only is seen or felt. Secure the leg which is seen by a cord, push on the crown of the head or elevate the hind parts of the cow a little, to force the calf slightly down in the womb; then pass a cord round the lower jaw, and find the other fore leg, securing it by a rope. The rope attached to the jaw should be first pulled to straighten the head on the neck, then the cord attached to the legs should be pulled simultaneously, and the head and feet as they are presented should be guided
by the hands of an assistant until the head and both fore legs have fairly entered the proper channel.

The next presentation is what is called a *breech* presentation—the tail and buttocks are here presented for delivery, which, of course, cannot be effected in such position. The only chance of a safe delivery is to get hold of the hind legs, which is not easily effected; but perseverance, assisted by ingenuity, can do much, when it is well known what is required. In this case, get hold of both hind legs, and when they have been secured, and brought into the proper channel, delivery can be easily effected.

The next and last presentation which we notice, is where the crown of the head is presented, and the calf is lying upon its back. This is a tedious labor, and to effect a delivery at all, the calf must be turned, which, by the by, is not an easy task; still, however, it can be done by securing the head and fore legs with a rope. Should all efforts fail, do not exhaust the strength of the cow, but hasten to detach the legs of the calf, opening its belly, and in some cases, the head also, to lessen its size, thereby securing the delivery of a mutilated calf, but a living cow. The subject is far from being at this point exhausted, but we have gone sufficiently far for our pages. We will now proceed to another subject connected with calving, and that is the retention of the after-birth, or *retentio secundarium*, as it is called, or, as the dairy folks say, the cleansing of the cow.

**Retention of the Placenta, or Afterbirth.**

If the cow has gone her full time with calf, and is in a healthy condition, the afterbirth will not be retained long after she has given birth to her calf. When a cow does not cleave properly, and within a reasonable time, there is then something otherwise wrong with her health, such as
debility and want of vitality in the system. It is this that must be looked to, and not the want of timely cleansing that demands attention, as being the cause of the cow not doing well after calving. Remedy these existing causes, and the cow will cleanse properly enough. Contrary to the generally received opinion of farmers and others, the retention of the afterbirth for a day or two will do no harm, provided that decomposition does not take place with the afterbirth; for in such cases, the whole system of the cow is apt to be contaminated and poisoned.

_Treatment._—Cows not having cleansed properly within twenty-four hours after calving, should be given the following mixture: Epsom salts, one pound; powdered ginger, one ounce; powdered fænugreek, one ounce; caraway seeds, half an ounce; mix, and give in three or four bottles of warm ale, porter or warm water, sweetened with molasses. This mixture not having the desired effect in twelve hours, the hand, well greased should be introduced, and the afterbirth at the attachments, called cotyledons, gently pressed. This must not be accompanied with much pulling, as pressure with the finger and thumb will be all that is wanted. This operation may be followed by giving the cow a little warm ale or molasses water, with half an ounce of powdered ergot of rye; and in half an hour, an additional half ounce. This will cause contraction of the womb, and expulsion of the placenta. When decomposition or putrefaction of the afterbirth has taken place, which is known by the black color, the womb should be well washed out with a weak solution of chloride of lime. Administer, also, by the mouth, one ounce, three times in the day, of sulphite of soda for a week, to neutralize any of the poison of putrefaction that may have been absorbed into the blood. Give the cow good and nutritious feed to support her strength.
Choking.

This is of frequent occurrence among cattle or cows fed on potatoes, turnips, etc.

Treatment.—When the potato is lodged in the upper or middle third of the gullet, the mouth of the animal is to be held open by means of a balling-iron, or some other contrivance, while a person, having a small hand, should pass a cord like a clothes-line, with a loop on the end of it, and try to get the noose over and beyond the obstruction. If the substance be low down in the gullet, manipulations may be tried from outside, by tightening the skin upon the obstruction, and trying to move it up, if possible, but downwards, if it will go without too great force being used. Failing to remove it either up or down, try to dislodge it by pouring small quantities of oil or melted lard, not hot, down the throat. If this also prove ineffectual, the probang should be used; or in its stead, a strong, flexible cane or rattan may be tried; but care should be taken to have the cane go down the right passage. If coughing is set up on the introduction of the cane, have it withdrawn, as it has entered the air passages; but try till it has been properly entered down to the obstruction. With patience and perseverance, the difficulty will usually be overcome. Still, however, there are cases which require the gullet to be opened over the place of obstruction, a safe operation, requiring only a simple cut through the skin and outer surface of the gullet, which will readily heal without much trouble, by bringing the lips of the wound together, with a stitch or two of strong, but small, twine or saddler's silk, by means of a small packing needle. Feed the cow or ox, for a week or more, upon soft or prepared food till the wound has healed. When cows or oxen remain long in a choked condition, the throat is apt to swell from the accumulation of gas in the first stomach, which will have to be
treated as for hoven or tympanitis—occurring usually from eating clover or rank and wet grass. (See Hoven.)

Loss of the Cud.

This occurrence is the symptom of, and not a disease. Loss of the cud, or rumination, accompanies almost every disease of any importance attacking the ox or cow. When rumination has ceased for a time, and is resumed again, it is a good symptom that the animal is somewhat better, and an indication that the functions of the body are about being resumed again, and are demanding food for their nourishment. Loss of cud is among the first symptoms observed by farmers in case of bronchitis, pleuro-pneumonia, hoven, aphtha, etc.

Simple Diarrhea.

This variety does not call for much description, as it is only an effort of nature to get rid of something that is injurious. By its removal the purging will stop. Simple diarrhea rarely calls for treatment, but if it should, change of feed and pasture land will be the first things to be attended to; and, if necessary, after a trial of new feed and pasture, a few powders composed of prepared chalk, two ounces; ginger, half an ounce; opium, one drachm, may be mixed and given in the form of a drench, with wheat flour gruel. Repeat the dose, if it be necessary, but never be in a hurry to give astringents in looseness of the bowels, as much mischief may be done by controverting the efforts of nature, which are always of salutary effect, if not too violent for the condition of the beast, and in that case interference is necessary.
Chronic Diarrhea.

This condition is sometimes called the *Rot*, from the belief that the animal is rotten. Chronic, or indeed, any kind of diarrhea should not be looked upon as a disease at all, but merely a symptom of internal irritation of some kind.

*Causes.*—This is an important inquiry in cattle pathology, for farmers are sometimes disappointed when they are told the animal will die within a given time, not knowing the nature of the disease of which diarrhea and dysentery are but the symptoms. Chronic diarrhea is the sequel to tuberculous consumption already described under that head; or dysentery may show itself before even consumption is either thought of or recognized. However, chronic diarrhea or dysentery is the result of tubercles situated on, and in the white membranes throughout the body.

*Treatment.*—Generous diet, composed of linseed or cake meal. Commercial sulphuric acid, gentian, and sulphate of iron, are the medicines employed. In addition to this treatment, which has already been recommended for consumption, I would advise weekly inhalations of sulphurous acid gas in the manner recommended under that head in the list of medicines ([which see]), for this is one of those diseases which will be greatly benefited by its proper use.

Diarrhea in Calves.

This is a frequent affection among young calves, and destroys thousands of them every year.

*Cause.*—Depending upon the character of the milk; not so much its quality as the time and manner of giving it. Thus, calves are not allowed to suck their own mothers;
frequently they are not allowed to suck at all, but have to
drink the milk out of a bucket, and then it is often cold
before they are allowed to have it. The rapidity with
which they drink their allowance, which is often too much
for them, gorges the stomach and paralyzes the digestive
functions. Hence, the white diarrhea so often seen
among young calves.

Symptoms.—The symptoms one would think alike in all
animals; but this is not the case here, or so far as the
diarrhâea of calves is concerned. They have voracious
appetite, swelling of the belly with occasional pain, dis-
charges of wind or gas, and white or yellowish-colored
excrement or dung, while in some bad cases the true milk
is passed unchanged by the action of either stomach or
bowels.

Prevention.—This is better than cure, and consists in
allowing the calf, until several weeks old, to suck its own
mother, not only morning and night, but at least three
times in the day, dividing the periods as evenly as possible.
Thus, by allowing calves to suck the milk for themselves,
paralyzation and gorging the stomach with cold milk is
avoided, and thereby white diarrhea prevented.

Treatment.—Give three drachms of carbonate of soda in
well boiled flour gruel once a day. If this is not conve-
nient, give a tablespoonful of common rennet after each
feed of milk the calf takes; this will materially aid proper
digestion by its power in decomposing the milk and fitting
it for assimilation.

Pleuro-pneumonia.

Pleuro-pneumonia is a compound disease, as its name
indicates—pleuro and pneumonia. My own opinion is,
however, and it is almost a certainty, I think, that the sin-
gle name pleurisy would cover the whole ground; for the
pathology of the disease unmistakably points to this one
fact, that the lungs are not affected as a disease from the beginning, but the solid, spotted and mottled condition of the lungs are but the effects of disease of the pleural covering, and the consequent effusions of serum into the chest, floating and surrounding the lungs, together with weakness, low vitality, and debility of the animal affected. This, then, is the reason why the lungs have become diseased, and the consequent double name given to the affection.

However much men may doubt it, this disease is nothing more than buccas inflammation, extending from the coverings of the mouth and nose down to the pleural membranes within the chest, speedily followed by an extensive outpouring of fluid called serum, and it is not till this fluid has accumulated in sufficient quantity that the evidences of disease show itself to the farmer or breeder. Cows are not so nervous, nor yet so excitable as horses, whether in health or sickness, and hence the absence of those symptoms in the early stage of the disease in cows, which are so early shown in horses, when affected by the same sickness. Farmers should remember this, for in early detection lies often the life of the animal.

Again, and in support of my theory, if the lungs were one of the primary seats of the disease, it would not be reasonable to expect the animal to live for a week, and in some cases a month, as is the case with animals affected with this disease. In no disease of the lungs, excepting tubercles, will animals live so long as those do when affected with pleuro-pneumonia, thus entirely disproving the theory universally entertained by those who have an idea to offer upon the subject.

The length of time animals live with this disease, together with the serum, the condition of the lungs, and the adhesions so often seen connecting the lungs with the sides of the chest, does not go to prove the incurability of the disease at all, as has been so often asserted; but on the contrary, it goes to show the curability of the disease, and
the ignorance of those who have been guilty of so bold and unwarranted an assertion, thereby deceiving the honest cow-keeper and breeder to their great loss, and in some cases to their ruin. Pleuro-pneumonia then I take to be a disease similar to typhoid influenza in the horse, affecting the white membranes of the nose, mouth, windpipe and chest, speedily followed by outpouring of fluid into the cavity of the thorax or chest, gradually increasing in volume till the lungs are nearly submerged, solidifying them, thus arresting aeration, or proper oxygenation of the blood, together with shreds of plastic lymph connecting and interfering still further with the action of whatever healthy lung there may be left: and thus by a gradual, but progressive process, the vital power gives way, and the poor beast dies from suffocation, or asphyxia, in from one week to two months or more—depending if the cow be in calf, and what condition otherwise the animal may be in. The better the condition, the longer will they live, and the more likely are they to live, even without medicine, thus giving the lie to its incurability.

Cause.—Some subtle poison in the atmosphere sometimes, which is not always present; sudden and severe changes in the temperature, cold, heat, dryness and moisture, easterly winds, and possibly some other conditions which may be present, but not recognized, and which give rise to what is called the predisposing cause, for since we have those various changes in the condition of the weather, without producing the disease, something is wanted in the animal economy to act as a predisposing cause, two causes being necessary to produce epizootic disease, namely: the predisposing cause which resides in the system, and the exciting cause, which belongs to the atmosphere. Atmospheric cause is being clearly proven from the fact of the early symptoms of the disease being irritation of the mucous membranes of the nostrils, nose, eyes, etc. That this may be properly understood, let any person enter the
too frequently over-heated lecture room or theater, with its impure air, and on coming out to the keen air of night, how readily the membranes of the eyes drop tears, and sneezing from irritation of the nose takes place. Pleuro-pneumonia being a disease chiefly attacking milch cows and working oxen, and rarely affecting herds of cattle in the field, we are carried back again in our inquiries to the cow-house, barn-yard and its surroundings. There we find the slop feed stimulating the cow to over secretion of milk, and at the expense of her general health and condition—the smoking and putrefying dung heap—the imperfect ventilation and over-heated stable—the giving of stimulating feed, and immediately after turning the heated cow out to the cold, and sometimes frozen watering trough, to quench her thirst. In one or other of these anomalies, or all combined, will be found the cause of this epizootic disease—contagion, if it is really contagious, which I honestly doubt and even deny; however, if so, then they cannot be the only exciting and predisposing causes of the disease.

Symptoms.—As has been already stated, the early symptoms are irritation of the membranes of the nose, windpipe, etc. The symptoms of this irritation are not perceived by the farmer, till effusions of fluid are poured into the chest in considerable quantities, interfering with the movements of the lungs, and consequently the breathing or respiration; then and then only does the farmer observe that the animal is sick. The presence of irritation in the windpipe can be detected by placing the ear close to the windpipe, previously tightening the skin upon it, when a slight grating sound is heard. The immediate effect of irritation of the windpipe of the cow is a slight discharge of an acrid fluid, of the appearance of water, from the corners of the eyes and nose, which is, however, sometimes so slight that most persons fail to see it, and if they did, would attach no importance to it—so the first, and most
important time and symptom is passed by uncared for, unheeded and unchecked. The next and important symptom is a half involuntary cough, or rather a husking sound—not the clear cough which horses give when similarly affected. When cough is heard, it may then be said the incubative stage has passed away. I have said incubative, although not believing in the existence of such a thing, if it be not in the passive condition of the minds of men, who give credence to such a theory. The milk now becomes smaller in quantity, thin and blue; cough louder and oftener; breathing quick and labored, accompanied with a grunt; rumination is irregular, and the appetite precarious. Such then are the symptoms that may be seen by the ordinary observer. Auscultation and percussion applied to the sides of the chest, are not to be relied upon by persons who are not accustomed to the chest murmurs, or sounds in health and diseases. Animals in good condition rally from the attack and get well, without assistance from medicine or art. In weak and low conditioned animals, the disease and symptoms are gradual and progressive, and they finally die in from two weeks to two months.

*Treatment.*—The success of the treatment here recommended, will depend upon: 1st. Whether the animal be in good or low condition. 2d. Whether the cow be heavy with calf. 3d. Whether the disease has been discovered, and treatment applied in good season. These are important inquiries, having much depending upon them, for this disease is much more frequent and fatal in cows heavy with calf, and animals in low condition. If the disease has been observed within forty-eight hours from the time of attack, give the following powders every four hours between six o'clock in the morning and at ten at night, or at six, ten, two, six and ten o'clock.

Tincture of aconite root, two drachms and a half; powdered gentian root, three ounces; powdered ginger root, three ounces; sulphate of iron, two ounces; mix well, and
divide into five powders and give as above directed. After the five powders have been given, continue with the same powders, but without the aconite, and give them only three times in the day, instead of five as above directed. Half an ounce of the sulphite of soda may be added to each powder with advantage. The powder will have to be mixed in a large bottle of water, and sweetened with molasses. Allow plenty of pure air, cold water and good strong feed, but not too much at a time; this will be better than thin, poor and non-strengthening slop, which is so injurious and deceptive, and so often recommended and adopted in cases of sickness. In the early stages of the disease, the carbonate of amon.onia given in three drachm doses, along with the other powders, will do much good. There are two points I have ever sought to obtain, in the treatment of this disease. 1st. To maintain the appetite. 2d. To restore and maintain it if it be lost.

Rupture in Calves.

The rupture we are now considering is what is known by the name umbilical, which occurs in young colts and calves, and consists in the protrusion of a portion of the bowel and intestine through the navel, thus forming a small tumor. This condition is often congenital, or found on the calf at birth.

Treatment.—Force the bowel up into the belly, gather the loose skin together, tie a well-waxed cord tightly round it close to the belly, and a strong pin may be forced through the skin below the ligature or cord, to keep it from falling off before the loose skin comes away. In a few days the skin will fall off, leaving a healthy sore without any hole or rupture.

Another form of treatment is to place a bandage round the body, and a pad over the rupture, as is recommended
for the same condition in colts (which see). Whatever the plan that may be adopted for the cure of umbilical hernia in calves, they must be kept separate from one another, as each will suck the other, thus preventing closure of the rupture and healing of the parts.

Spaying.

This is the name given to an operation for the removal of the ovaries or female testicles from the milk cow and young female oxen. The object for the removal of the ovaries from young cows that never have had a calf is to prevent them from ever having a desire for the male, so that they will be the more easily fattened and fitted for the market. Young cows so operated upon are henceforth called heifers.

Advantages of Spayed Cows.

The following are the reasons why dairymen should spay their cows, when not intended for breeding:

1. Spayed cows are more easily kept in good condition than cows not spayed.

2. They are less liable to sickness of an epizootic kind, and when sick, more certain and easy of cure.

3. When epizootic diseases are present in the vicinity, or even in the herd, spayed cows are always in condition, and fit for the butcher. To prevent loss and save expense in the treatment, with the attendant risk of loss of some, and loss of condition and milk of all that are affected, they can be sold without loss—which is not the case with cows not spayed, and when pleuro-pneumonia is among them.

4. Spayed cows give the same quantity and quality of milk all the year round, if they are properly fed and cared for.
5. Ten spayed cows will give the year round as much milk as double the number of cows not spayed, thus saving the interest on the outlay for ten cows, together with the absence of risk from loss of some of the principal by death of one or more from sickness, or accident, not to speak of the feed of ten cows. Between the feed of ten cows and their manure, the farmer can best estimate the difference in value.

6. With spayed cows there is no risk to run from milk fever, nor trouble with cows called bullers.

7. To fatten a cow, spay her instead of giving her the bull, as is the present custom—by which feed and time are consumed, and the animal is not made very fat after all, for she has to provide the fattening substance to the calf in the womb, which, if she had been spayed, would have been appropriated to herself; nor is this all, for the calf in the belly of the cow is at once discounted by the butcher, as it is not a salable article in market.

8. Spayed cows cannot abort or slink their calves.

Having thus had a bird's-eye view of the advantages to be derived from spayed cows, let us look in the same manner at the disadvantages of spayed ones.

1. The expense of the operation, and attendant risk of the animal dying—although this is not great (about one in the hundred). The expense of the operation will be from three to five dollars, which will depend upon the distance the operator has to travel, and how many animals are to be operated upon.

2. Spayed cows are apt to accumulate fat and flesh, so that they will become dry much sooner than cows not spayed. Still there can be little loss, for a fat cow is always ready for sale. These, then, are the objections to the spaying of cows, if objections they may be called. We now leave the subject to those who are more immediately interested.
Teats.

Teats of milch cows are often subject to diseases and derangement.

1. Milk stones sometimes stop the flow of milk, and are felt within the milk channel, when the teat is pressed between the fingers. For their removal, take a silver probe or knitting needle, and, if possible, force the obstruction up into the udder.

2. Strictures of the milk channel of the teat cause a small stream of milk to flow, and impair the usefulness of that quarter of the udder. This can also be remedied by using a silver probe or needle, commencing, however, with a small size, and gradually using thicker or larger ones, till the channel is as large as wanted. This operation will have to be carried on for a week or two, the first day using the small probe three times in the day, and following the next day with the larger size, and so continuing with other sizes, till finally cured.

3. Warts are of occasional trouble to the cow, and to those who milk her. Irritation and sometimes swelling is induced, which cause closure in the channel of the teat. Warts are to be removed with a pair of sharp scissors.

4. Sore teats are cured by the simple ointment, one ounce, and one drachm of the rust of copper, commonly called verdigris, added to it.
Diseases of Sheep.

The following is an essay, for which the United States Agricultural Society awarded their medal and diploma, in the year 1861, to Robert McClure, of Philadelphia, Pa.

The diseases of sheep which are laid under contribution are: 1. Those that are the most frequent and destructive, therefore of the greatest interest and concern to the sheep farmer. 2. Those in which treatment and preventative means can be employed with profit and success. 3. Those the pathology of which has been in a measure or entirely misunderstood, therefore wrongly treated, and the preventative measures neglected or misapplied.

These diseases will embrace a large number of maladies that have been treated of separately in the work by the late Mr. Youatt as independent affections, when literally a great many diseases alluded to by this indefatigable writer are but different degrees and conditions of the same morbid phenomena.
I would here say it is a pleasure to think that some addition has been made of late to the stock of veterinary knowledge as regards this useful animal, and I trust that the time is proximate when the good sense of American farmers will demand that a knowledge of the diseases and general management of sheep shall form a prominent feature in the education of the veterinary surgeon.

**Braxy-Enterites—Inflammation of the Bowels.**

**Inflammation** of the bowels is commonly known by the unmeaning name of "Braxy."* It is a disease of more frequent occurrence among this class of domestic animals than any other I know of, chiefly affecting young sheep in their first year, and in cold and stormy weather, and exposed situations. It is not unfrequent when sheep have been feeding on turnips in the winter season, to find in the morning, after a cold, wet night, as many as a dozen, out of a few score, dead, dying, or affected by this disease.

**Symptoms.** — They will be observed to be very restless; lying and rising; resting on one side, and then on the other; walking up and down as if looking for a place to lay down, but can find no place to suit.

**Treatment.** — Give castor oil, two ounces; calomel, five grains; laudanum, two drachms; molasses, two ounces; beat up with an egg, and as much warm water as will be sufficient for a small drench, to be poured out of the stroupe or pipe of a common tea or coffee pot. Repeat this in half doses every six hours.

**Prevention.** — In stormy weather, and when they have

* Sheep affected by this disease are generally on the turnip field, and in good condition. If so, and the animal is very sick, never attempt to cure; as in most cases death will take place before medical agents (be they ever so well directed) can take effect. Therefore, it will be the better plan to cut the neck, letting out the blood, thereby saving time and trouble, and preserving the mutton in good order.
been feeding upon turnips, particularly where fenced in, remove them to pasture a little elevated, and as sheltered as possible from the storm, until the weather improves, and the turnip or other fields become drier; place common or rock salt in covered troughs, which will tend to keep their bowels open. Salt is a good laxative for cattle and sheep.

**Diarrhea.**

*Treatment.*—Powdered opium, two grains; powdered gentian and powdered ginger, one drachm each; mix. To be given in an infusion of linseed, and repeated if necessary.

**Hydrocephalus Hydatideus, Sturdy, Etc.**

A singular disease; a very prevalent and fatal one, if left to run its course; so much so, indeed, that in France alone no less than one million sheep die yearly, or are destroyed by this pest of the ovine race. The symptoms by which this disease is accompanied are as follows: In the commencement, the animals will be observed to stop in the midst of their grazing, and then start away in a gallop over the field. They seem, at times, to be utterly unconscious of where they are, separating themselves from the rest of the herd. By-and-by, they become dull, and have a peculiar staggering gait. If there is a brook or rivulet within their reach, you are almost sure to find them standing by it, apparently becoming giddy, not unfrequently tumbling in, and thus being lost. They lose flesh, the countenance becomes haggard, and, subsequently, the animals thus affected commence a rotary motion, going round and round in the same direction, with the head inclined to the same side of the body. Now it almost ceases to feed or ruminate, as it cannot restrain the rotary motions, and
is becoming rapidly blind. Death generally ensues from starvation.

Veterinary writers and agriculturists have differed very materially as to the cause of hydatid, some attributing it to certain poisonous plants—but these have never been pointed out; others considering it a species of serous apoplexy, and others still contending that it arises from local weakness of the brain, etc., etc. Autopsical examinations have, however, proved it to arise from a different cause, viz.: Coenurias cerebralis, or hydatid in the brain, found floating in a serous fluid, contained within a sac or bladder, thus constituting Sturdy, Gid, Turnsick, etc. It attacks sheep from the sixth to the eighteenth month.

The most common consists in the lamb or young sheep picking from the pastures the ova or larvae of the taenia solium, which infests the shepherd's dog. If echinococcus, polymorphus or ventriorium, be swallowed by the dog, they are developed into tape-worm, with but few serrations. The minute ova are gathered and swallowed with the food of the sheep or lamb, and are taken up from the surface of the intestines. They find their way into the blood, and, finding a convenient nidus among the loose textures of the
brain, are there deposited. Nature sets to work and encloses these foreign bodies in a membranous sac, so that otherwise they may not produce fatal consequences, and in the short period of three months they are found to have reached the size of a filbert.

Conversely, if these hydatids are swallowed by the dog, they are developed into tapeworms. Hydatids may be prevented in sheep by curing or preventing tapeworms in other animals, especially the dog. As before mentioned, hydatids only affect young sheep, and spring from the ova of the taenia. Herds managed without dogs are found to be quite free from the disease. However, dogs may be used with impunity when the sheep are upwards of eighteen months old.

Treatment.—The treatment of this infection, until lately, has been varied, barbarous, and cruel; one practicing and recommending the cutting and pulling out the ears, and another of hunting the poor animals with dogs, and, if possible, running them over some precipice, frequently maiming or killing them. A strong knitting-needle forced up the nostrils has long been used, with occasional success; but a small case of instruments, consisting of four pieces, is much better and safer, and, if properly used, will cure from seventy to eighty sheep out of a hundred thus affected, and can be used by any intelligent shepherd or farmer with perfect safety. In operating, observe carefully the side to which the sheep turns, as it invariably turns to the side of the skull which is affected, and which must be first operated upon. Secure and tie fast all the four feet, and place the animal on a table. Let your assistant sit down on the end of the table. Clip away all wool from the brow, sides, and crown of the head. Ascertain, by the fingers, if the skull yields on pressure at any particular spot on the side to which the sheep turned; if so, shave the wool from the soft part. Use first the instrument with the adjusting screw, its use being to
prepare for the other, it being made a little wider than the trocar, with canula, so that the silver may not be broken in piercing the bone. Care, however, must be taken to stop when the point is fairly through the skull; this is easily ascertained. The guard must then be screwed back. This done, take it out and insert the trocar and canula in the same hole, until past the split in the silver canula; then withdraw the trocar, leaving the canula sticking in the head, when the water will be forced from the hydatid, showing that it has been pierced. Put the point of the syringe into the canula, and draw out repeatedly, emptying each time until no more water will come out, or the cyst has been drawn into the canula, which now withdraw, taking care that the skin of the hydatid be caught hold of by the forceps, which the operator should have ready in his hand.

Having removed the hydatid, leave the mouth of the wound open, only placing a piece of clean rag as a pledget over it, as water will escape for a day or two. Put on the angular hood to keep the cloth and padding in their place, and secure it by worsted ties. Care must be taken, if the sheep has not been able to eat for some days, that it get a bottle of gruel before operating, as the less disturbance it is subjected to for some hours after the operation the better, the brain taking a little time to adjust itself to the cavity that has been made by the removal of the hydatid. Neither must the sheep be put on too rich pasture, as on recovering they are apt to take too much food, which may cause inflammation in the head. Mark well the side that has been operated on, as it very frequently happens that there are more hydatids than one. In a week or two, if the sheep be observed turning to the opposite side, secure it a second time, and proceed as before. There are occasionally more than one or two in the same subject, and at the same time. Indeed, I have known as many as five, and not one of them less in size than the yolk of an egg. But
two are quite common, one on each side of the brain, nearly under the seat of the horn. Occasionally there is one behind the first lobe of the brain, which is also easily taken out.

Louping Ill.—Tabes Dorsalis—Phrenitis.

In every-day language this is properly called inflammation of the brain. Youatt, in his work on sheep, has been at the trouble to write out no less than six different diseases, all of which might have been treated under this head, being essentially the same in character, cause, and effect. It is characterized by extreme dullness, followed by excitement and madness. In horses, these symptoms continue for about two days; but in cattle and sheep, much longer. The seat of the disease is the pia mater, or the vascular internal membrane of the brain, which is found after death to be rough and yellow, with extravasated lymph and serum at the base of the brain.

*Treatment.*—Give croton oil, six drops; syrup of ginger, one tablespoonful; in a little gruel, so thin that it will run from the tea-pot. Apply cold water or ice to the head, and see that the poor animal does not hurt itself against the wall or fence.

The causes of this disease are sometimes the result of injury to the head. It also arises from other than external injuries, the principal of which are exposure to cold, and a powerful sun in an exposed situation. But the most common causes are the eating from the pasture poisoning plant, or weeds, as the atropa belladonna (deadly nightshade), conium maculatum (common hemlock), cicuta virosa (water hemlock), diphinium staphysagria (stavesacre), felis fœomina (female fern)—all of which, if taken in sufficient quantity, will produce disease in the brain. I could easily swell the list of poisonous plants, but it is not my intention
to include in this work information of so unimportant a character.

**Paronychia Ovium—Foot-rot.**

This disease has been more prevalent within the last thirty years than previous to that time, which is accounted for to some extent in the varieties and breeds of sheep and in the increasing number. So much is this so, that farmers cannot find highland pasture sufficient for them, and they are brought down and put on moist lowland pasture, where they can find plenty of food without traveling much; hence, the growth of horn is more than the wear, or the supply more than the demand. Subsequently the horn becomes over-grown and turns upon the sole, and bruising the sensitive structures, earth and sand soon find their way into the cavities produced, causing inflammation of the laminæ, lameness, and secretion of fetid pus.

**Causes.**—As before stated, it results from an increased supply of horn which turns up from the toe, pressing upon and irritating the sensitive structures of the foot.

This affection of the feet is almost certain to follow the removal of heavy bred sheep, such as the black-faced Cheviot and Southdown, from their native and upland pastures to rich meadow and arable lands. Their native walks being rough and rugged—the grass not so plenty, which insure the sheep walking over a large tract of land in order to procure their food—hence the waste and supply of hoof is balanced.

**Treatment.**—Whenever the sheep is observed to go lame, it must be caught and the feet examined. Remove all filth and sand; then cut off every loose and unsound portion of horn with a stout pocket-knife, and apply the following to the sore parts: Oil of turpentine, two ounces; sulphuric acid, half an ounce; olive oil, one ounce; mix. To be applied with a small piece of sponge or cloth on the
end of a stick; or a goose feather will answer very well. If sores occur on the digital space (divisions), or elsewhere, they should be touched with nitric acid or a little of the old butter of antimony (terchloride of antimony), by means of a feather. These appliances should be continued twice weekly, or as often as is necessary, until a change for the better takes place.

Prevention.—To prevent this disease, the growth of horn must be kept down; and if the sheep are on soft land, they must be examined every month, and the superfluous horn must be cut off. Some shepherds advocate driving along a hard road to wear the hoofs; I do not recommend such a course, as it does sheep a great deal of harm. The better way is to drive them into a sheepfold and examine their feet.

Draining and liming the land very often puts a stop to foot-rot; the drainage to harden and dry the land, the liming to remove the soft, mossy herbage which is a great cause of the disease in sheep. It is not contagious in sheep, but in cattle, occurring in connection with murrain or vesicular epizootic, it is deadly contagious.

Pneumonia.

Treatment.—Nitre, one dram; digitalis, twenty grains; tartar emetic, twenty grains; mix. To be given in linseed tea, once per day, in inflammation of the lungs, common cold accompanied with fever, or any disease, that is necessary to arrest the inordinate action of the heart.

Psora, Scabies, Scab.

When a sheep, or flock of sheep, are affected with scab, which is easily known by their continually standing by the fence and rubbing posts, scratching, and tearing the wool
off their back and sides, they will scarcely ever be seen grazing or lying down quietly and masticating their food, as is the case with sheep in perfect health. This disease in sheep is the same as mange in horses, dogs, and cattle; and it is the result of the attacks of minute insects, or mites (acari), burrowing in the skin, producing great irritation and itching, and manifesting itself in small pimples, with dryness, scurfiness and baldness of the skin. This disease is contagious; therefore, to prevent the spread of the infection, the healthy must be separated from the diseased sheep. Keeping sheep clean, and occasionally washing in the summer season, in a great measure prevents a suitable nidus for the acari, and diminishes the prevalence of scab.

Before putting healthy sheep on the same pasture, it will be necessary to wash all the rubbing posts with the solution of the chloride, or common lime, which will literally burn up the virus. To make the impossibility of infection doubly sure (neat cattle and cows are as liable to take it as sheep), the best plan is to take a crop of hay and turn it over for a crop of corn, or any other purpose.

*Treatment.*—The object to be attained in curing this disease is the destruction of the acari, which is necessarily the same in all animals; but in sheep the material used must be in a fluid form, so as to penetrate the wool.

The following is both an excellent cure and preventative of scab in sheep: *R. Acid Arseniosi, lbij; Sulph. Ferri, lb. ccv; Aquae, cong. lxv.* Translation—Powdered arsenious acid, two pounds; sulphate of iron, two hundred and five pounds; water, sixty-five gallons; mix. Boil until the fluid is reduced to one-third, and then add as much water as has been lost by evaporation. This preparation is the celebrated "Bain de Tessier," so highly prized in France. The following will answer the same purpose, which will not stain the wool, as it contains no sulphate of iron, and will, no doubt, be preferred by many to the proceeding one on that account: Arsenious acid, two pounds; sulphate of
zinc, ten pounds; water, sixty gallons; mix. Prepare as the foregoing one. Each of these valuable sheep-dipping mixtures are sufficient to cure and dip one hundred sheep.

The way sheep-dipping mixtures are sometimes used is far wrong, as was the case in the celebrated sheep-poisoning case at Burton, England, where the animals were driven, immediately after their bath, containing twenty ounces of arsenic, twenty ounces of soda-ash, and two ounces of sulphur, to their pasture, with their wool saturated with it, and consequently dripping from the wool on the grass that the sheep were just eating.

The improved plan in dipping sheep is: First—The solution or the mixture is to be put in a tub, or other vessel, sufficiently large to allow the sheep (except the head) to be immersed in it, without the mixture running over the sides of the tub or vessel. Second—When the sheep is taken out, it must be placed in another tub or vessel, and the liquid pressed from the wool, and returned again into the dipping vessel. Third—The sheep must be kept enclosed in a sheep-fold, or other sufficiently airy place, where there is no food of any kind that a sheep will eat, until the wool is perfectly dry.

Several of the veterinary professors of the Edinburgh veterinary colleges, after the above sheep-poisoning case occurred, instituted a series of experiments to prove whether arsenical baths were dangerous, and if sheep could be poisoned by immersion therein. The following is the result of their experience. ("Edinburgh Veterinary Review" for April, 1859):

1. That the immersion of sheep, whether sound, or suffering from scab, with extensive eruptions or "foot-rot," with free exposure of the vascular structure of the feet, in arsenical solutions, varying in strength, is unattended by prejudicial effects, and proves salutary to the diseased animals.

2. That the congregating of sheep after dipping, where
food is not allowed them, is unattended with danger; and I can distinctly testify to the absence of all risk from sheep licking each other.

3. That all sheep having remained damp from twenty-four to thirty-six hours after being dipped, cutaneous absorption of arsenical solution might have been going on rapidly during the prolonged period in which the sheep continued wet; but no unfavorable symptoms ensued—indeed the reverse.

4. The absence of the slightest change in health, or of the manifestation of symptoms which usually ensue on the administration of arsenic to the lower animals, even in medicinal doses by the mouth, leads us to infer that if a minute quantity of arsenic, in solution, can penetrate the system of a sheep by absorption by the skin, it is quite insufficient to develop the physiological action of the compound.

5. A solution of arsenic is not more readily absorbed from limited abraded surfaces than from the healthy skin, owing probably to the arsenic acting as an astringent on the sores, and rendering the latter as impenetrable, probably, as the uninjured skin. This remark does not apply to large wounds.

6. It appears impossible to poison sheep by bathing them in arsenical solutions, provided the liquid is not introduced directly or indirectly into the stomach by the mouth. By the direct means of introduction of the constituents of a "dripping mixture" in the stomach of a sheep is meant making the sheep swallow the liquid whilst being bathed; and by the indirect means is implied the penetration of arsenical solution into the stomach by food poisoned by the liquid dropping from the bodies of the sheep, the wool of which has not been pressed, or from a number of sheep injudiciously congregated over food they subsequently eat.

7. Arsenical solutions, whether weaker than ordinary
dipping mixtures, or much stronger, are likewise incapable of being absorbed by the skin of sheep or man.

8. Sheep will partake of grass and other food which has been smeared or soaked with an arsenical solution, notwithstanding the presence of soft soap and soda.

Arsenical baths and mixtures are not only used for the cure and prevention of scab, but are the most highly, and, I think, justly valued preservatives of the fleece of sheep, and are a protection to the propagation of many parasites.

**Rot — Cachexia Aquosa — Chlorosis.**

The very name of this disease is a terror to many sheep-farmers who have suffered and lost so much by it. It is so destructive amongst sheep, that it is estimated that in the rainy winters of 1829–30 two million sheep died or were destroyed by the disease alone. It again made its appearance in Great Britain during the very wet years 1852–53. The symptoms by which the disease can be detected in its early stage are very talent; but if there are suspicions of this disease, it can readily be detected by the color of the mucous membranes, or the muces of the mouth; the appendages of the eye being of a pale yellow; the animal costive, and the urine of a high color, thus indicating disease of the liver. As the disease is more advanced there is little difficulty in coming to a true and proper diagnosis of the case, as all the muscular fibers assume a uniform yellow brown color, and the wool has a matted and dry appearance, and subsequently the muscles waste, and digestion is impaired, and at length the animal dies in from two to four months. Where a flock of sheep do not thrive and acquire fat and flesh on good feed and pasture, something must be wrong; and the sooner it is found out the better, as they may have acquired the disease.
before they where bought. The better way would be to have one of the worst ones brought in and destroyed, and then have a thorough examination, which will set everything to rest, and point out the line of duty which is open to be pursued in the treatment and prevention of the disease, ere it be too late to do good.

It is very frequent in wet seasons, in wet and undrained lands, and is characterized by an enlarged and softened condition of the liver, and accumulation of the common fluke (distomum hepaticum), in the biliary ducts and gall bladder.

Post-mortem appearances show most clearly the nature and extent of the disease, as before mentioned. There is found a large number of these flukes in the liver, and that organ very much enlarged, soft, and flabby; the bile and all the serous fluids are of a yellow color, and, on account of the debilitating nature of the disease, a large quantity of the exudative matter is found in the belly and chest. There is one appearance that will never deceive: the liver is not of that pale and, I would say, cooked appearance which is usually presented after ordinary "Hepatitis;" but in most cases is all covered with livid spots not unlike the mottled appearance of the lungs of cattle that have died of epizootic pleuro-pneumonia. In a word, the liver is the only true seat of this disease.

Cause.—The cause of this disease, until lately, was often a surmise and supposition. Then the question arose, why it has been a precept with careful shepherds not to let the sheep graze on dewy grass, or wet and marshy land? Why the dew and wet land was considered so dangerous none could tell, and least of all the bucolic guardian. Although unable to give a reason why, he could aver and prove that it was so. The rational conclusion is, that many creatures pass the early portion of their predatory existence in the bodies of one species of animal, and their maturity in another. Their eggs are deposited in the
former, but are not developed until expelled and cast upon the earth or manure-heap to shift for themselves.

They lie on the smoking dung-pile or such places, and far away from the sheep, in which they can find food and develop themselves. The rain washes them into the earth, or they are carried to the fields with the manure. The humidity serves to develop them; they fix themselves upon the moist grass, and with it these tiny enotozoa are carried into the stomachs of the sheep. Once there, their work is soon accomplished.

Treatment.—The successful treatment of the disease embraces particularly that of prevention. As before mentioned, it is chiefly caused by wet and damp pasture lands—hence the proposition for their restoration will be: First, their removal to a high and healthy pasture, giving them hay and nourishing food, such as a little bruised oil cake, or linseed-meal, and placing covered troughs in the field containing rock, or common salt, which sheep are very fond of licking, and which moreover regulates their bowels, and gives them an appetite for food and water. Second, give each sheep epsom salts, two ounces; oil of turpentine, one ounce; pulverized ginger, half an ounce. To be given in half a pint of molasses-water, to be followed up with tonics, if they are found necessary. The following will answer a good purpose: Sulphate of iron, in powder, ten grains; gentian, in powder, thirty grains; ginger, in powder, thirty grains. To be given in linseed-meal gruel once a day for a few days. It is the experience of almost every sheep-farmer, and sometimes too dearly bought, that to place sheep on wet and marshy land, even for a few days, is certain to generate this disease, notwithstanding the animals may have been in perfect health prior to his placing them there. Before placing the sheep on pasture where there is access to any bog or marsh, it will amply repay the time and trouble to fence it in; or have sufficient
sheep-drains opened through it six months before any sheep are put on it.

Sheep-drains are wide, and not filled up with tiles or stones, but left open. The shepherd can find time to keep both the sheep in order and the drain clean of rubbish, except in the lambing and clipping season.

**Poisoning by Sheep Laurel — Kalmia.**

A shrub, the leaves and young twigs of which sheep and lambs are very fond, and when eaten by them to considerable quantity gives rise to a disease called hoven or impaction of the rumen, accompanied by a staggering gait, sleepiness, and inability to walk.

*Treatment.*—To be successful must be timely as well as energetic, with a view to arousing the power of the stomach, and for this purpose two drachm doses of the spirits of ammonia may be given in a tumbler full of cold water once in the hour, till three or four doses are given; withholding the medicine when the animal recovers, though one dose only has been given.

**Small-Pox — Variola Oving.**

Fortunately this disease has as yet been confined to Europe, and more especially the continental portion, where it may be said to be never absent. In France and Italy it occurs frequently, and causes much loss and destruction. England was visited with it in 1847, when it was communicated to a flock at Datchett, and another at Pinnar, by some Merinoes from Spain. In 1862, it again occurred, but this time very suddenly, and in a very severe form among the flocks in Wiltshire; for which re-appearance neither infection nor traceable contagion could be assigned
as the cause. The light shed upon it makes it appear to be an instance of the origination of a more malignant type of variola ovina. Such is, in fact, assigned to this disease in Africa, it being well established that certain injurious atmospheric influences produce skin diseases and facilitate the appearance of pastular eruptions. From the nature of the disease in its being produced both by atmospheric causes and contagion, it soon assumes an epizootic form, and causes more destruction than any other malady affecting this useful animal. Out of a flock of 1720, ninety-two were attacked in a natural way, of which fifty-per cent. died. Of eight hundred inoculated cases, only thirty-six per cent. died. The mortality from this disease is never less than twenty-five per cent., and not unfrequently whole flocks have been swept away, death taking place in the early stages of the eruption, and others in suppurative and ulcerative stages.

*Symptoms.*—These may be mapped out as follows: The animal is seized with a shivering fit, succeeded by stupidity, which remains till death or recovery takes place. On the second or third day pimples are seen on the inside of the thighs and arm-pits, accompanied with redness of the eyes, complete loss of appetite and other symptoms which are common to other diseases of the same animal.

*Prevention.*—Two plans are resorted to for the purpose of preventing the spread of the affection, which promise a certainty of success. The first and best plan is, isolation and destruction. This plan proved a great protection to the sheep-farmers of Wiltshire in 1862. In well-known epizootic diseases, where individual cases occur and are pointed out and well recognized, as soon as the fever sets in, and before the eruptions appear, they should be slaughtered at once and buried. The loss of one or two sheep is nothing to the consequences of the spread of a disease of this kind. By doing so the disease has been known to be confined to a few cases in a large flock.
Treatment.—In treating this disease, resort has been had to a plant called *sarracenia purpura*, Indian cup, or pitcher plant, which is used for treating this disease in man by the Micmac tribe of Indians in British North America. (See Horse and Cattle Medicines, in this book.) Take from one to two ounces of the root (dried if to be had), and slice it in thin pieces; place in an earthen pot; add a quart of cold water, and allow the liquid to simmer gently over a slow, steady fire from two to three hours, so as to lose one-fourth of the quantity. Give of this tea or decoction three wine-glassfuls at once, and the same quantity from four to six hours after, when a cure will generally be effected. Weaker and smaller doses are certain preventives of small-pox, whether in men or animals. The public are indebted to Dr. Norris, Physician to the Halifax (Nova Scotia) Dispensary, for the manner of preparing this highly important article. Sulphurous acid gas will be found useful in small-pox. (For manner of using, see Horse and Cattle Medicines, in this book.)

**Medicines.**

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**Acids.**

These are derived from the mineral, vegetable and animal kingdoms, and are of a sour taste—hence the name acid. Some acids are solid, others fluid, and all are easily dissolved in water. Acids are mostly poisonous, except when highly diluted, or mixed with water.

**Pyroligneous Acid.**

This is gotten by the distillation of wood, and sometimes sold in a diluted form as white vinegar. It is used with salt by horsemen for sore backs and shoulders.
Acetic Acid.

This acid is eight times stronger than ordinary vinegar.

Use.—Sometimes used in sprains, and for the destruction of the poison of insects, by adding one ounce of camphor to four ounces of the acid.

Muriatic Acid.

This is commonly called the spirit of salt.

Use.—A good tonic in debilitating diseases in horse and cattle, and can be advantageously employed in pleuro-pneumonia in cattle, for it relieves the quick breathing, and keeps up the strength.

Dose.—Forty to sixty drops given largely diluted, or mixed with cold water, and repeated three to four times in the day.

Externally.—It is used for sores in the feet of horses, by pouring a few drops in the nail-hole or sore. Ten drops poured into the fistulous openings of poll-evil or quittor in the foot, daily, sometimes cures the disease.

Nitric Acid, or Aqua Fortis.

This, given properly, and largely diluted, is an excellent tonic, and is used for the same purpose, and in the same doses as the preceding.

Sulphuric Acid.

Possibly this acid is preferable to any other of the acids for internal use, in weakness and debility. It is
given in from forty to sixty drop doses, also largely diluted with water. Horses and cattle will usually drink water, when acid is in it. In all kinds of fevers, sulphuric acid is an excellent medicine to give. In mixing it, the acid's to be added to the water, not the water to the acid.

Prussic Acid.

A highly dangerous poison. There are two forms of this acid kept in the drug stores. Scheels' contains five per cent., and that of the colleges about two per cent.

Use.—Given in locked-jaw in the horse with considerable success.

Dose.—Half to one drachm once a day. If the horse be young, half a drachm will be enough. Two drops to the ounce of water is an excellent wash to the skin of all animals, in mange and inveterate itching. Great care, however, must be exercised in its use, whether internally or externally. It is sold under the name of hydrocyanic acid.

Aconite—(Aconitum Napellus, Wolfsbane, Monkshood).

An active poison, and one of the garden plants of parts of Europe. The tincture is that portion which is used in diseases of horses and cattle.

Tincture of Aconite Root.—One of the most powerful, certain and successful sedatives which can be used. It has done away with bleeding, blistering and physicking, which were formerly thought proper agents wherewith to combat and cure disease. It is not only sedative, but it is a nauseant, calmative, anodyne, stimulant, diaphoretic and antiphlogistic. It controls fever, and allays pain and inflammation; and is the only medicine, excepting hellebore, which can excite the horse, the ox, or the elephant, to
vomit. Although these animals cannot vomit, it is the one to cause them to make the effort. If, according to the founder of homœopathy, mercury was a divine metal, no less surely may aconite be considered a divine vegetable; for without it, or something as good, what can be so successful in curing lung fever, founder, inflammation of any part of the body, colic from eating green food, and fever accompanying cattle diseases of whatever kind? Nothing controls the circulation and action of the heart so promptly as aconite. The nervous centers of the body are no less ready to obey its action. Hence, its value in allaying fever, irritation, excitement and pain, from whatever cause.

Aconite should never be carried too far, or prostration and weakness will follow. Never give more than eight doses when twenty drops are the dose, nor more than six doses when twenty-five drops are the dose. Or, in other words, never, in any disease, give more than two drachms, or one hundred and twenty drops, whether the dose has been ten, twenty or twenty-five drops. In pleuro-pneumonia and other diseases, iron and the mineral acids should follow aconite.

Alcohol.

Spirit of wine entirely free from water, and is used for making tinctures of the various plants. It is the foundation of many lotions and liniments. Alcohol may be given to horses having a chill, in half-pint doses, mixed with a little warm water, not too hot.

Aloes.

This is the expressed juice of several plants of same name. Aloes are of several varieties: Barbadoes, Socotorine, Cape, and Hepatic—all of which differ in color, and some of them in strength. Barbadoes and the Socotorine are the varieties kept in the drug stores.
**Use.**—Aloes is used as a purgative, or cathartic, for horses only. Cattle do not respond to aloes, nor is it a proper internal medicine for those animals.

**Dose.**—From six to eight drachms, made into a bolus, or ball, with two drachms of powdered ginger and molasses, to cause them to stick together.

Tincture of aloes is an excellent application to a healthy sore. In the form of a compound tincturé, which is composed of aloes and myrrh, it is preferred, by some persons, to the simple tincture.

**Alum.**

A compound salt, containing sulphuric acid, potash, and alumina.

**Use.**—It is applied to sores, to arrest bleeding, and in the form of burnt alum, is used to touch indolent sores, which are not disposed to heal quickly.

**Ammonia.**

Liquid ammonia is commonly called spirits of harts-horn.

**Use.**—A diffusible stimulant, and is given in cases of flatulent colic. Formerly it was in much repute among farriers, mixed with oil, as a liniment, but it is not now considered of much value, and is apt to blemish.

**Dose.**—Two drachms to half an ounce, as an anti-spasmodic, in flatulent colic.

**Carbonate of Ammonia.**—A highly valuable medicine, when given in weakness, debility, and prostration, from influenza, lung fever, bronchitis, etc.

**Dose.**—From two drachms to half an ounce, which may be repeated three times in the day, and should be given, mixed in cold gruel, so that the latent, or hidden heat, will
not be developed, as it would be, if given in anything warm, thereby scalding the throat while drenching.

Muriate of Ammonia.—This possesses the same properties as the above, but is not so strong.

Acetate of Ammonia.—Is made extemporaneously, by dissolving the carbonate in strong acetic acid, till effervescence ceases; then adding water to it till it is of the strength of ordinary vinegar.

Use.—An excellent form of ammonia when given in weakness and debility. Indeed, ammonia, and its several preparations, need only to be used to convince of their utility in supporting the vital powers, and thereby curing disease.

Anæsthetics.

Medicines which induce insensibility.

Aniseed.

A warm carminative, and used in conjunction with fennel, greek and cardamoms, in weed, and fevers in milch cows, and for indigestion and loss of appetite in horses.

Dose.—For horses and cows, one to two ounces, given three times in the day.

Anodynes.

These are medicines which allay pain. (See Aconite, Opium, Morphia, Chloroform, and Ether.)

Antimony.

A metal. Many preparations of antimony are kept in the drug stores.
Tartarized Antimony.

This is commonly called Tartar Emetic, and was formerly relied upon in the treatment of lung, or chest diseases in horses, and cattle; but, to the great surprise of the knowing ones, recent experiments have shown that tartar emetic has no sedative effect whatever; upon horses, cattle, sheep, or other herbivorous animals. Pounds of tartar emetic have been given to horses, cattle and sheep, without any effect, excepting increasing the appetite a little, and having no effect upon either the respiration, or circulation, whatever. Therefore, tartar emetic we will leave to the dogs and to man.

Tartar emetic ointment is sometimes recommended, to be applied to the region of the kidneys, where the Spanish fly dare not be used.

Ter Sulphuret of Antimony, or Black Antimony.

This is a favorite, with many horsemen, for making a horse shine.

Ter Chloride of Antimony.

This is a useful medicine for diseases of the feet of horses, cattle, and sheep; it owes its properties to hydrochloric acid. It is commonly called, by old farriers, buttyre of antimony. In foul claw in cattle, and sores in the feet of horses, a piece of cotton should be moistened with it, and laid upon the sore.

Antiseptics.

Medicines which arrest decay and putrefaction.
Antispasmodics.

Medicines capable of relieving spasms, as in colic.

Areca Nut.

An effective cure for tape-worm in the dog.

Dose. — About two grains of the nut, to every pound of the animal's weight, and given in the form of a pill, or suspended in milk.

Arnica Montana.—(Leopard's Bane).

Tincture of Arnica.— A valuable remedy for sprains and bruises. A lotion is made as follows: Tincture of arnica, one ounce; water, two ounces. Cloths, kept wet with it, should be laid on the part which is sore.

Arsenic.

A well-known poison.

Use.— A splendid tonic, improving health, condition, and wind of the horse.

Dose.— When given once a day, five grains will be a safe dose, for an ordinary-sized horse. If given twice a day, two and a half grains will be enough.

Arsenic should be given mixed in feed, in large bulk, such as cut feed, so as to protect the stomach as much as possible, whilst at the same time reaping its advantages. These doses should be continued at least for two weeks, stepping at that time for one week, and commencing again as before. This will insure safety, with the benefits of the arsenic, and an improved condition in both wind and body.
In Switzerland, and other parts of the world, arsenic is relied upon for the cure of heaves in the horse.

Fowler's *Solution of Arsenic.*—Made as ordered by the colleges, contains four grains of arsenic, to the ounce of the solution, or fluid.

**Asafoetida.**

This is a gum-resin, having a smell like onions. Asafoetida is a stimulant and vermifuge, and is given to horses for loss of appetite, and to produce a fine silken coat upon them. It is given to dogs to expel worms. Dose, for the horse and the cow, two drachms, and for dogs, ten to twenty grains.

*Tincture.*—Where the stimulant effect is wanted, the tincture is a good form, and is given in about the same doses as the gum for all animals.

**Asarabacca.**

This is used in horses where matter is lodged in the nares of the nose, and it is desirable that it should be brought down; and also in sheep and calves, with *faliria bronchi*, or worms in the air passages. For horses, blow a drachm up each nostril out of a cone of paper, taking care that the person does not inhale it himself. For a flock of sheep or a number of calves, confine them in a close shed, with sufficient air, and throw a considerable quantity among them, so the animals will inhale it. Sneezing and snorting take place, followed by mucous and small worms from the nose. This action is called *errhine*.

**Astringents.**

*Medicines* which are capable of drying up discharges, whether from the bowels or from a sore. The principal
medicines of this class are opium, tannin, oak-bark and chalk.

Atropine.

The active principle of Belladonna.

Belladonna—{(Atropia Belladona).}

Belladonna is used in veterinary practice for the same purposes as opium, but it is to be preferred to opium on account of its having no binding effect on the bowels. The extract is the preparation used, and is prescribed in all animals for colic, rheumatism, coughs, sore-throat, bronchitis, influenza and lock-jaw. Doses, half a drachm to forty or fifty grains, dissolved in half an ounce of the sweet spirits of nitre, and repeated three times a day in the doses above mentioned. In diseases of the eye, it is considered valuable, as it has the power of contracting the iris of the eye, thus causing enlargement of the pupil, and breaking up adhesions between the iris and the lens. It also facilitates operations on the eye.

Benzoin.

A gum-resin, the tincture of which is known as the old Friar's Balsam, and is an excellent application for sores and unhealthy ulcers.

Benzole.

This is a watery carbon, and is obtained from coal-tar. It is used to destroy lice and other insects in the skins of all our domestic animals.
**Subnitate of Bismuth.**

*Use.*—For dogs, when affected with vomiting and purging.

*Dose.*—Five to fifteen grains, given on sugar; may be repeated.

**Bole Armenia.**

Formerly in great repute among old horse doctors for many diseases of all the animals, and it entered into almost every mixture. It is useless.

**Borax—(Biborate of Soda).**

A good application for ringworm, for which purpose dissolve half an ounce of borax in eight ounces of water.

**Bromide of Potassium.**

*Use.*—For arresting the growth of fibrous tumors, so often met with in all animals.

*Doses.*—For horses and cattle, from one to three drachms, and for dogs, five to ten grains, repeated three times in the day, for a considerable period.

**Buckthorn.**

A syrup is made of the berries, and kept in the drug stores, and is recommended as a mild purgative in dogs having distemper.

**Calamine.**

An impure carbonate of zinc. Oxide of zinc should be used or substituted for it. Used in the healing of wounds, both in powder and ointment.
Calcium, or Quicklime.

Lime is used in indigestion and acidity in all animals; in tympanitis in the horse, in hoven in cattle, and in the form of lime-water. Mixed with linseed oil in equal quantities, it makes the celebrated Carron oil, so called from its constant use among the men employed in the Carron Iron Works, when any of them get burnt. Lime-water and calomel make the yellow wash, and corrosive sublimate and lime-water make the black wash, so highly recommended in unhealthy, and in ill-conditioned ulcers, and sores. It is used as a disinfectant in stables and barns.

Dose.—Quicklime is given to horses and cattle, in from one to two drachms. Lime-water is given in five-ounce doses to horses and cattle. For calves with diarrhea, two ounces of lime water, a drachm of powdered gentian root, and from three to five drops of the tincture of aconite root, given three times a day, is an excellent remedy.

Calomel—(Chloride of Mercury).

Calomel should be rarely used in horse and cattle practice, from the fact that animals are not so subject to scrofulous diseases, and liver complaints, as man is, and as these are the diseases chiefly calling for calomel, we can, in veterinary practice, do without it, so far as internal use is concerned. For external application, in the form of the black and yellow wash, it is valuable. Calomel sprinkled on unhealthy ulcers and sores is valuable, quickly changing their appearance. Calomel is sometimes used in thrush of the foot of the horse, inserted into the cleft of the frog. In cattle with foul claw, and in sheep with sore feet, it can be used to great advantage. A dog can take as much aloes as will kill a man, but a man can take as much calomel as will kill several dogs.
LIVE STOCK MEDICINES.

Camphor.

Camphor is a slight stimulant, followed by calmatic effect. Hence it is recommended in cases of irritation and nervous excitement, and enters into all mixtures used in cases of chronic cough. Three to five grains of camphor, and extract of belladonna five grains, rubbed down in a little whisky or alcohol, and mixed in three ounces of water, is an excellent remedy in allaying irritation in dogs having distemper. An excellent rubifacient can be made with camphor, one ounce; acetic acid, No. 8, four ounces. To allay irritation in a sore, camphor and sweet oil is a good application.

Doses.—Camphor is given to horses and cattle, in from two to four drachms, repeating the dose three or four times a day.

Cantharides.

(See Spanish Fly.)

Capsicum.

(See Pepper.)

Carbolic Acid.

This is a product of coal tar, and was formerly known to the scientific world as phenile or phenic acid, but is now generally known as carbolic acid. Its smell resembles that of creosote, which is carbolic acid and a fixed oil, and is very offensive to most persons. Its form is that of an acid solution, though sometimes sold in crystals. Its great importance is due to its property of coagulating the albumen of the animal tissue, and hence its value in sores, wounds and ulcers. It may be applied with safety to all
parts of the body or legs, and is invaluable for destroying lice, wood-ticks, and all forms of parasite life, and by merely washing or moistening those parts of the legs and bodies of horses, cattle and sheep, and chosen by the bot, horse or other flies to deposit their eggs, their hatching or even deposit may be prevented.

As a disinfectant in stables and buildings affected with fevers and all kinds of distempers, it was found extremely serviceable in England, in checking the ravages of the rinderpest by washing the floors and stalls; and, adding a teaspoonful of the solution of the acid to a bucketful of water, in whitewashing the walls and ceilings.

*External Use.*—For sores and wounds, when unhealthy, a good application may be made by adding one drachm of the acid to one pint of water. This will destroy all putrefaction, and induce the wound to take on a healthy action.

**Cardamons.**

The seeds of a plant.

*Use.*—Given to milch cows in case of loss of appetite, and fevers. Generally it is united with fenugreek, ginger, or gentian root, mixed in warm ale, or molasses water. This mixture will cure ephemeral or fevers of a day’s duration, when other medicines have failed.

*Dose.*—One to two ounces.

**Carbonate of Lime.**

A chalk which is sold in the drug stores under the name of creta preparata, or prepared chalk.

*Doses*—For horses and cattle, one to two ounces is the dose. For calves, two to three drachms, given in wheat-flour gruel, with a drachm of ginger, or caraway seed, for curing diarrhea.
**Caraway.**

The seeds of a garden plant, and used for the same purposes as the preceding.

**Cascarilla.**

The bark of a tree.

*Use.*—A bitter tonic, and resembles in some particulars that of quinine.

*Doses.*—For horses and cattle, one to two ounces, mixed in gruel.

**Castor-Oil.**

The expressed oil of the seeds of the *Ricinus Communis*.

*Use.*—However useful castor-oil may be as a purgative in the human family, it is certainly a dangerous poison when given in sufficient quantities to induce purging, in either the horse, cow or sheep. It produces irritation and inflammation of the coats of the bowels, without relief from purging.

For the dog, castor-oil may be a proper and useful purgative; and for the pig, also. Aloes and linseed oil is the purgative for the horse; epsom, or glauber salts, for the ox and the sheep. Whatever suits man, as a purge, will answer for the dog and pig.

**Cassia—(False Cinnamon).**

Much cheaper than cinnamon, and may be given to horses and cattle, in powder, mixed in gruel, for loss of appetite.

*Dose.*—One to two ounces, for horses or cattle.
Catechu.

An extract from a species of *acacia*.

*Use.*—An astringent, binding the bowels in diarrhea, is used in combination with chalk and opium.

*Dose.*—For horses and cattle, two to five drachms. For sheep and swine, one to three drachms. For the dog, ten to twenty grains.

For superpurgation in horses and cows my favorite combination is as follows: Catechu, two to five drachms; prepared chalk, one to two ounces; powdered opium, ten to thirty grains; mix, and drench with wheat-flour gruel.

Chalk.

(See Carbonate of Lime.)

Chamomile.

*The flowers of anthemis noblis.*

*Use.*—A very mild tonic, possibly too much so for the horse or cow. We have better ones, although, perhaps not so well known.

Charcoal.

Occasionally given to cows in chronic diarrhea.

*Dose.*—Half an ounce to one ounce, given suspended in gruel of any kind. Externally, charcoal is very valuable, when applied to badly smelling wounds and ulcers. It immediately corrects the fætor, and rapidly disposes them to heal. Charcoal and brewers' yeast are good cleansers of putrid sores and ulcers, and are worthy of more extensive use.
Chenopodium Anthelminticum—(Wormseed).

An excellent remedy for worms in dogs. Drop from two to five drops of the oil in a little soup, or give from ten to twenty grains of the bruised seed, for four successive nights, and then follow with a dose of castor-oil.

Chlorine Gas.

CHLORINE GAS is prepared by pouring hydrochloric acid on the black oxide of manganese, also by heating sulphuric acid with common salt and the manganese.

Use.—This gas is a disinfectant, and for this purpose it is made and used as follows: Take an ounce or so (depending upon the size of the place to be disinfected) of black oxide of manganese, and hydrochloric acid of sufficient quantity, carry them to the place where they are to be used, pour the one into the other, and close the doors, having first removed all the animals out of the place. A spirit lamp, placed under the bottom of the vessel holding the materials, will insure a greater volume of gas. (See Disinfectants.)

Chlorine, when sufficiently and properly used, is considered to be of great advantage in arresting the ravages of glanders, farcy, and other distempers in the horse, of pleuro-pneumonia and contagious typhus in cattle, and small-pox in sheep. It is to be hoped that farmers generally will provide themselves with proper apparatus for this purpose. It will not cost above three dollars, and consists of a small lamp with a stand so formed that a small glass bottle, commonly called a Florence flask, can sit right above the blaze of the lamp, while from its wide and open mouth issues the disease-healing and health-restoring gas.
Chloric Ether.

Chloroform, dissolved in spirits of wine.

Chloride of Potassium.

Similar to chloride of soda, or common salt.

Chloride of Lime.

Use. — As a disinfectant, from its antiseptic and deodorizing effects, and is an excellent stimulant to unhealthy ulcers. Chloride of lime has been highly recommended in tympanitis in the horse, and hoven in cattle, arising from eating wet clover.

Dose. — From two to four drachms, given, mixed with cold water.

As a disinfectant it may be sprinkled on the stable or barn floor every morning; but a good way would be to suspend it in a box having many small holes in it and hung from the roof of the house. If the house be large, two or more boxes may be used.

Chloroform — (Terchloride of Formyle).

Chloroform is an excellent stimulant, when given to horses having a chill, or shivering fit, from congestion, or from cold, and is equal to turpentine, for the cure of colic. An excellent liniment is made, by adding one ounce of chloroform to two of olive oil.

Dose. — Chloroform is given to the horse and cow, in doses from one to two drachms, mixed in weak whisky, and repeated every two or three hours, or till the colic is relieved.
Inhalation. — The inhalation of chloroform, by either horse, or ox, is attended with risk, provided the animal be not secured or tied, so that it cannot get loose; because some horses and cattle become completely wild, when the effects of the inhalation commence to act upon the brain. On the other hand, some horses will quietly stand up, others as quietly lay down under it.

Two to four ounces are sufficient to produce anesthesia, or loss of sensibility. The usual way of giving chloroform by inhalation is, by pouring about two ounces of chloroform on a soft and moist sponge, whilst the animal is tied down, and holding the sponge to one nostril only, covering the nose loosely with a large towel, to save the fumes of the chloroform, using great care not to exclude the admission of pure air with the fumes of the chloroform.

In all operations lasting any length of time, whether in the horse or the cow, humanity and fine feeling demand the outlay for a little chloroform. It is not necessary to completely destroy all feeling — just sufficient to blunt the sensibility of the nerve centers.

Cholagogues.

Medicines which increase the flow of bile.
Examples: Calomel, podophyllin, irridin, leptandrin, etc.

Cinchona.

Peruvian, or Jesuit Bark.—There are several barks of cinchona, used in medicine, and from which the sulphate of quinine is made. Cinchona, or its barks, are not used in horse and cattle diseases.

Quinine is the only preparation used; but its high price is against its general use in veterinary practice. Among
valuable horses, it is frequently used to hasten recovery from influenza, lung fever, etc.

Dose.—Twenty to forty grains, repeated from three to four times a day.

Quinine is apt to be adulterated with arsenic, as proved to be the case with many samples used during the late war.

Cochineal.

An insect used as a dye for coloring tinctures and other medicines for the purpose of deception. Druggists color water with it, for filling the show bottles usually found in their store windows.

Cod Liver Oil.

In all animals, cod liver oil increases fat and flesh. In diseases affecting digestion and assimilation cod liver oil can be of no use. It materially relieves broken wind or heaves in horses. For hastening, or forcing animals intended for show, cod liver oil is just what is wanted, as it not only hastens the fattening process, but increases the quality and appearance of the meat.

Dose.—For swine, two ounces daily. For small pigs, one ounce.

Colchicum—Meadow Saffron.

The seeds and root are the parts usually employed in medicine, sometimes in powder; but the best is in the form of tincture.

Use.—Given in all rheumatic affections of the joints, and in lumbago, and also in diseases of the eye of the horse, depending on rheumatism of that organ.
Dose.—Of the cromor seed in powder for horses and cattle, the dose is from one to two drachms, given in the animal’s feed twice in the day, for a week or two. The wine of colchicum will answer for the dog, in from five to fifteen drop doses, twice a day, in a little water.

Collodion.

Use.—Collodion is used for dressing wounds and cuts, instead of sticking plaster, and is applied in the following manner: Clip the hair from the edges of the wound, take a camel’s hair pencil, or a soft brush, and paint the surface and edges of the wound well, and in a few minutes, the ether, which holds the gun-cotton in solution, evaporates, leaving over the sore a complete covering, resembling the gold-beater’s skin, thus completely shielding the sore from the action of the air. Hence, its value.

Copper, Sulphate of—(Blue Vitriol).

This is one of the most useful articles that can be used in horse and cattle diseases, both internally and externally. Internally used, sulphate of copper is a powerful tonic and builder up of the system, and is recommended in all diseases characterized by a low state of the system. Farcy, glanders, purpura, etc., in the horse have, in several cases, yielded to its effects. Sulphate of copper should never be given alone, but should be combined with gentian or ginger. After the fever has passed off in cases of pleuro-pneumonia the sulphate of copper is an excellent medicine to support the vital powers, and prevent effusions in the chest, which is the cause of death, in most cases, from this disease.

Dose.—In horses and cattle, one to three drachms are the proper doses, given twice in the day.
The external use of the sulphate of copper is often called for as a caustic in wounds and sores growing proud flesh, which are readily controlled by it, simply by touching the parts with a piece of the crystal in powder, or in solution.

For diseases of the eye I think it has no superior. For this purpose use three grains of the powdered sulphate to an ounce of rain water, and apply with a soft feather, or, what is better, a camel's hair pencil.

For wounds which have no proud flesh in them, eight to ten grains to the ounce of water is a good and cheap application.

Copper, Acetate of.—This is used only for sores in the form of an ointment. Take of the acetate or verdigris one drachm, and add to it an ounce of the simple ointment. I have known sores to heal from its use which have bid defiance to almost every other application.

Coriander.

The Seeds.—This is a useful article, and may be considered an excellent medicine for young calves having weak stomachs. The bruised seeds should be given, in two drachm doses, in the milk which is given to the calf.

Creosote.

This is a peculiar smelling fluid derived from tar. Creosote has had the credit of curing glanders in man, and is a good remedy in pleuro-pneumonia in cattle, but we have better ones, and not so costly. Cases of farcy and glanders in the horse are greatly benefited by its use.

For horses and cattle, use from one to one and a half drachms, made into a mass, with flour and molasses, and
the whole crumbled down into some gruel. Make a drench, to be poured down the throat.

As an external remedy, it is of great advantage in mange, sores, ulcers, caries of the bones, canker, thrush in the horse's feet, and the foot-rot so troublesome in sheep. Indeed, the more the virtues of creosote are known to farmers, raisers and breeders of stock, the more will it be valued and the greater will be the advantages derived from it. (See Prescriptions.)

**Croton Oil.**

A DANGEROUS medicine when improperly used, but a useful one, nevertheless, when the hasty action of the bowels is wanted, as in milk fever in cows.

*Dose.*—For the cow ten to fifteen drops, given along with epsom or glauber salts.

**Digitalis—(Digitalis Purpura).**

THE action of this powerful medicine has been much sought for as a sedative in lung diseases; but since we have become acquainted with the superior qualities of aconite, digitalis is not now worth keeping in the veterinary *Metcria Medica.* Moreover, digitalis is a dangerous medicine, from the fact that it accumulates in the system, for a time, and all at once its effect is manifested in the weak action of the heart, so that in many cases the heart ceases to beat altogether.

*Doses.*—For horses and cattle, twenty grains of the powdered leaves.

**Disinfectants.**

I have, in two portions of this book, referred to the importance of a better acquaintance on the part of farmers and stock raisers' with this subject.
Volatile Disinfectants may be divided as follows:

1. Chlorine.
2. Nitrous acid fumes.
3. Sulphurous acid.

These diffuse themselves through the air of stables and barns, and neutralize the poisonous gases which are given off from the excrement of animals, whether in health or disease.

Fixed Disinfectants.—These are such as can be mixed with the excreta and decaying matter, without destroying them for manure.

1. Perchloride of iron.
2. Permanganate of potash.
3. Gypsum—Sulphate of lime. This is not a great one, but it is useful.

4. Charcoal. This, in fine powder, should be thrown into damp stables and barn-yards, as it will not only remove unpleasant smells, but will make good manure. Refuse tan bark and other vegetable substances, made into charcoal, is cheap, and of great utility as a disinfectant, and adds much to the quantity and value of the manure.

Fixed, but Noxious Disinfectants.—These are disinfectants which, when mixed with manure, render it valueless as such.

1. Chloride of Zinc. (Burnet's Disinfectant Fluid.)
2. Nitrate of Lead. (Ledoyer's Disinfectant.)
3. Sulphate of Copper, and Zinc Solution. (Larnaudes.)

Chlorinated Soda Solution may be mixed with manure, without destroying its qualities as such.

Chloride of Lime. Solid, or in powder, does not destroy the manuring qualities of vegetable, and other materials usually converted into manures.
Diuretics.

Medicines, which, when given to animals, increase the flow of urine. They are used in cases of swellings and dropsies of the body and legs of horses.

Elecampane—(Inula Helenium).

The root of this plant is highly thought of, and much used, by horsemen, in coughs and colds. Some make a tea of it, or decoction, and give it to the horse to drink. It is certainly a warm and grateful aromatic, and a good expectorant. The plant should be gathered when the seed is ripening.

Slippery Elm Bark.

This bark, when scalded with hot water, makes a useful poultice for irritable wounds, ulcers and sores. A decoction of the bark will answer every purpose for which flaxseed or linseed is used, or recommended, as in diseases of the kidneys, and bladder, produced by the use of Spanish fly, and from over-dosing with rosin, and other diuretics. In diarrhea, in all animals, slippery elm tea, or decoction, will serve a good purpose, by sheathing the covering of the bowels, which is apt to become irritated and inflamed in violent superpurgation.

Emetics.

Medicines which produce vomiting. Horses, cattle and sheep cannot vomit whilst the stomach remains entire. In cases of rupture of that viscus, however, vomiting is occasionally seen. Emetics are useful in diseases of the dog and swine. Tartar emetic, or sulphate of zinc, given
in from two to five grain doses, will cause dogs and swine to vomit.

**Epsom Salts—(Sulphate of Magnesia).**

This is a valuable medicine, in diseases of cattle and sheep. No other purgative should ever be thought of, or given to either cattle or sheep. Even supposing other purgatives to be as good, none, certainly, can be so cheap as epsom and glauber salts, or the sulphate of soda. For all purgative purposes, the one is as good as the other. Salts should be largely diluted with water; for the quantity of fluid given with them facilitates their operation. In domestic practice, half an ounce of salts, in one tumbler full of water, will operate as strongly as one ounce, in half the quantity of water.

**Doses.**—For ordinary sized cows, one to two pounds is the dose, mixed with four quarts of cold water; one ounce of ginger in powder, and the whole sweetened with molasses, or coarse sugar. For average sized calves, two to four ounces; for sheep, four to six ounces. A few drops of commercial sulphuric acid—say twenty to sixty drops—will greatly remove the nauseous taste.

**Ergot.**

*Diseased Rye.*—This is a curious, as well as a valuable medicine.

**Use.**—In the calving, lambing, and foaling season, it is sometimes of great service, but should be carefully handled; as, for instance, if given to any animal about to deliver her young, and when the mouth of the womb containing the young is not sufficiently opened, the administration of this remedy would be attended with extreme danger, as the womb, by the powerful contraction set up,
caused by the ergot to expel its contents, would likely be ruptured or torn, followed by the death of the animal. When the animal seems to have exhausted its strength, and the passage is open, and the young is coming in a natural way, then only should the ergot be given. If there should be a malformation in the young, or in the pelvis of the mother, it would be equally unwise to give ergot.

*Doses.*—For a mare or cow, half to one ounce of the powder is the dose. For sheep, swine, and large-sized bitches, one drachm is the dose. Small bitches, ten to thirty grains.

**Essential Oils**—*(Volatile Oils).*

(See Oils.)

**Ether**—*(Sulphuric Ether).*

This is a valuable article of the veterinary *materia medica*, and is used in diseases of all the animals.

*Use.*—It is used as a stimulant, and is given in weakness, fevers, and in colic, as an antispasmodic. Ether is scarcely strong enough to produce anesthesia in horses and cattle.

*Dose.*—For horses and cattle, one to two ounces is the dose as a stimulant, and antispasmodic. Ether should be given in cold water, to prevent its volatilization on its exposure to the air. Twice its own volume of alcohol added to it makes the spirit of sulphuric ether.

**Euphorbium.**

*A resinous juice*, expressed from a cactus-like vegetable which grows in Morocco.

*Use.*—This is only used for external purposes, and is
among the very few articles in veterinary medicines capable of blistering the thick skin of the ox.

**Expectorants.**

This is a class of useful medicines, which cause a separation of the mucus from the throat, and air passages, thereby relieving cough and other symptoms usually attendant upon throat diseases.

**Febrifuges.**

Medicines capable of relieving fever.

**Fenugreek.**

The seeds of this annual plant, found growing in the south of Europe, is a useful cattle medicine, given in one ounce doses, for loss of appetite, ephemeral fevers, etc. It is usually, however, combined with ginger, gentian, and other medicines of that class.

**Fern.**

The Male—*Aspidium Felix Mas.*

*Use.*—Given to animals affected with worms. A good remedy.

*Dosages.*—For the horse, one pound of the root in powder is the dose. For sheep, three to five ounces. For the dog, with tape-worm, it is invaluable, destroying the worm in two hours. A purgative should be given next day.

**Friar's Balsam.**

This is the compound tincture of benzoin, and is an excellent article when applied to sores and wounds, as the
fluid soon evaporates, and leaves a resinous covering over the wound, thus shielding it from the action of the air. (See Benzoin.)

**Galbanum.**

A dried juice, having medicinal properties similar to asafetida.

**Galls—Nut Galls.**

These are rough excrescences on oak trees, resulting from holes being made in the bark by an insect.

*Use.*—A powerful astringent, binding the bowels of all animals affected with dysentery and diarrhea. Also a good application to the greasy heels of horses.

*Dosages.*—For horses and cattle, powdered galls are given in from four to six drachms. For sheep and swine, thirty to sixty grains. When externally applied the powdered nut may be sprinkled on the sore.

**Gallic Acid.**

(See Tannin.)

**Gamboge.**

This is a gum resin from a tree growing in the Island of Ceylon.

*Use.*—A useful purgative for cattle. (See Epsom Salts.)

*Dosages.*—For cattle, six to eight drachms is the dose. For sheep, thirty grains, given in solution; should be given with other medicines of the same class.
Gentian Root—Gentiana Lutea.

This is an invaluable medicine in the treatment of diseases of horses and cattle, where the appetite is to be restored and kept up. In debility, weakness, swellings of the legs and body, and where the stomach is out of order, as is the case so often in fevers, and as a sequel to debilitating diseases, gentian, combined with iron, is an excellent tonic, and cheap. Gentian, combined with ammonia and pimenta berries, will make a horse eat almost whether he will or not.

**Doses.**—For horses and cattle, half to one ounce is the dose, repeating it three times in the day. For sheep, one drachm. For dogs, five to ten grains. For horses and cattle, it is best given mixed in gruel, and in a drench out of a strong-necked bottle. Gentian root should enter into all condition powders.

The colleges order a tincture to be made, but the powder is all that is wanted in the treatment of horse and cattle diseases.

Ginger—Zingiberis.

A well-known root, and a useful article to have in the house.

**Use.**—Ginger is given in cases of gripes, or colic, whether in horses or cattle, and should enter every dose of purgative medicine given to all the animals. Ginger is useful in loss of appetite in horses, and in calves is an excellent medicine to give with chalk, and other things, in scours, or diarrhea.

**Doses.**—For horses and cattle, one to two ounces is the dose; for sheep, two drachms; for calves of three months old, one drachm, and for younger ones less. The essence of ginger, of the drug shops, is well adapted to use, as the
active principle of the ginger is given without so much inert or dead matter.

**Glauber’s Salts — Sulphate of Soda.**

- A good purgative for cattle and sheep. (See Epsom Salts.)

**Glycerine.**

- A fluid which scarcely ever dries up, and is the saccharine principle of fats. Bower’s glycerine is the best in the American market, and is inodorous, or without smell, which is the best indication of its purity.

**Use.**—Many sores on all animals readily heal by the application of glycerine, especially scratches, and sores about the heels of horses. Glycerine will be found invaluable for the use of companies, in all our cities, having horse railroads, where the authorities allow the use of salt on the streets for the removal of snow. The slush so-formed first chills, then scalds the skin of the heels, so that in a short time the skin cracks, and nasty sores are the result, which are difficult to cure. To prevent this condition of things, and to protect the heels of horses from the injurious effects of the salt and slush, the application of glycerine should be made to the heels morning and mid-day, whilst the salt, slush, and snow are upon the streets.

**Tincture of Guaiacum.**

- This is a resin and valuable medicine in cases of rheumatism in old horses, and in rheumatic lameness in dogs.

**Doses.**—For horses, the dose of the tincture will be half an ounce twice in the day, given in cut feed, or in a drench with cold water. For dogs, ten to twenty drops, given in a spoonful of cold water or soup.
Gum Arabic—(Gum Acacia).

This is an importation from Alexandria, in Egypt. There are several varieties of gum.

Gum Senegal.

*This is similar to the above.

Gum Tragacanth.

*This is another variety of gum.

*Use.*—The gums are demulcents, emollient and soothing to an inflamed part, as the bowels in diarrhea, the kidneys and bladder, when diseased and irritated.

*Doses.*—For horses and cattle, from one to two ounces. For calves and sheep, four drachms. Gum should be given, dissolved in warm water, and drenched out of a bottle or ox-horn.

Hartshorn.

*This is an impure solution of ammonia. (See Ammonia.)*

Hellebore—Hellebrosus Niger.

Recommended in poll-evil, wherein a piece of the root is to be inserted in the fistulous opening. No dependence should be placed in it. Better agents are at hand.

Hemlock—Conium Maculatum.

Formerly recommended in inflammation. It is of benefit in the form of a poultice to cancerous sores.
Hemp, Indian—(Cannabis Indica).

The colleges order a tincture and an extract. In the seat of Europe, the resin of the plant is known as *churrus*, and its preparations are known as *gunjoli*, *bang* and *hachlish*. According to the accounts which have reached us, in regard to the use of this article, no such action can be produced upon man from any preparation of hemp in use in America, as is represented to be produced among the subjects of His Majesty, the Sultan of Turkey. The genuine preparations of Indian hemp produce in man great excitement, high spirits, great laughter, talkativeness, pleasing thoughts, and a great appetite for food and sexual excitement, followed by sleep, from which the person recovers without any unpleasant effects. Experiments instituted by the writer with this medicine upon horses do not warrant its introduction into the list of horse and cattle medicines.

Henbane—(Hyoscyamus Niger.)

An extract and a tincture is ordered to be kept in the drug stores. *Hyoscyamus* is indicated in all cases where belladonna is used. It has, however, little effect upon animals chewing the cud. To horses, it is occasionally given to relieve cough and irritation of the throat or windpipe.

*Dose.*—For horses, one or two drachms of the extract is the dose, which should be given, rubbed down in a little cold water, and repeated several times in the day. Better drugs and less expensive ones, answer a better purpose. This medicine was formerly relied upon for the cure of insane persons, but is now almost discarded for that purpose.
Iodine.

A chemical preparation manufactured from kelp or seaweed and used both rightfully and wrongfully in many diseases. However, iodine itself is, I think, of little value as a medicine, but when united chemically with iron, copper, mercury, lead, arsenic and potassium, it certainly is one of the most useful and indispensable of medical agents, given internally, and applied externally.

Dose.—Iodine is given to the horse and ox in from twenty to forty grains; for dogs, use from three to six grains. An ointment of iodine is made as follows: Take one part of iodine to eight parts of lard. This is a good ointment to apply to soft swellings on the body of the horse, and should be applied by rubbing with the hand.

Iodide of Potassium—(Hydriodate of Potash).

This is a chemical union of potash with iodine, a costly remedy for horse and cattle diseases, and in most cases can be done very well without. Its action is that of an absorbent, and it is, therefore, used in swelling of the glands, and other parts of the body. To get its full benefit, it should be given in syrup or molasses, so that the iodine will not be lost, leaving the water only behind.

Dose.—From twenty to thirty grains for horses and cattle, repeated three times in the day. For the dog, five grains.

Iodide of Arsenic.—Highly recommended by some persons for glanders, farcy and purpura in the horse.

Dose.—Five grains given once a day, in cut or mixed feed.

Iodide of Copper.—A valuable remedy, but costly. It should be used only for valuable horses, in cases of
debility and loss of condition, mingled with cut or mixed feed.

*Dose.*—From one to two drachms, given twice or three times in the day.

**Iodide of Iron.**—This is even more valuable than that of the iodide of copper, and is given for the same purpose, and in the same doses. To use the iodide of iron once will insure its use again. Its high price is the only drawback. Iodide of iron enters into the powders and balls which are given to the English race-horses, whilst in the trainer's hands—a high recommendation.

**Iodide of Sulphur.**—A valuable remedy in mange, and other skin diseases, which may be given internally, also, in the same disease.

*Dose.*—For horses, give two to four drachms in the animal's feed. For mangy dogs, give ten to fifteen grains once a day. Give it at night, as warmth assists its action very much.

**Iodide of Lead.**—Too weak for veterinary practice, but excellent for swellings on the body of man. It is only used externally. Iodide of lead is of a beautiful yellow color.

**Iodide of Mercury.**—*Bin-Iodide of Mercury—Red Iodide of Mercury, etc.* This preparation of iodine is a medicine that the educated veterinary surgeon cannot do without in the practice of his profession; for there is nothing which will so well meet his wants. Iodide of mercury is not used internally, in any disease, as calomel contains the same internal action as that of the iodide.

*Use.*—It is used in all cases of induration and swelling of the glands of the neck; tumors, whether of bone or soft tissue; splints, spavins, ring-bones, wind-galls, shoulder-joint lameness, or thoroughpin, and will answer well for an ordinary blister, for whatever purpose. The only objection
to it, as a blister over an extensive surface, is its painful operation.

Iodide of mercury is used as an ointment as follows: One part of the red iodide of mercury to eight parts of hog's lard, well mixed together. This ointment is to be well rubbed into the parts to be cured; swelling will follow its action, but will subside in a few days, if one application be enough—which will be known, if the enlargement has been broken or has disappeared. If not, apply in from five to six days again, scarcely rubbing so hard as at the first application, as the skin is more easily acted upon this time. But whether one, two, or half a dozen applications be necessary, let sufficient time elapse before each succeeding application so as not to prevent the hair growing, thereby blemishing the part. Apply lard once a day between each application, and occasionally wash the parts with water, not too warm, and lard or oil the part when dry. The horse's head should be tied up, so that he cannot get at the parts with his mouth. A few hours will be long enough. Place plenty of soft bedding under the feet, to that, by stamping, the horse will not break or hurt his feet.

Observe,—When, apparently, the tumor, gland, or other enlargement, does not disappear or go away at once, surprise is sometimes expressed to see it totally go away, as if of its own accord. Thus the red iodide of mercury exercises a powerful influence, long after its use has been dispensed with. Iodide of mercury occupies, in my estimation, in external diseases, as prominent a position as the preparations of aconite do in internal affections, whether in horses or cattle.

Several other preparations of iodide are made by the manufacturing chemists; such as the iodide of gold and silver—which are of no use in horse and cattle diseases.
Ipecacuanha.—(Cephaelis Ipecacuanha).

In veterinary practice, ipecacuanha is only used for dogs, in fifteen to thirty grains, as an emetic, when first attacked with distemper.

Iron.—(Ferrum).

This is one of the most valuable medicines we have to recommend, in many of the most important diseases of all the animals; a fact readily seen, when it is stated that iron is a constituent of the blood of all warm-blooded animals, and without iron being in proper quantity in the blood of an animal, it cannot be healthy—is anemic, or impoverished in blood. In fact, iron is an elementary principle, essential to health.

Metallic iron is rarely used in veterinary practice, except it be in the form of iron filings, given by some persons in cases of worms in horses. The sulphate is just as good for this purpose. Iron filings, called Ferrum Redactum, are much used in the weakly and sickly female. To prevent the filings from oxidizing, or rusting, they are put into a tube, similar to a gun-barrel, at a strong heat, and are then plunged into cold water, which gives them a sky-blue color; the finer the blue, the better the medicine. For the valuable dog, iron filings, in this form, may be given, in from five to ten grain doses. The following preparation of iron will be used for the horse and ox:

1. Carbonate of Iron.—Ferri Carbonas. This preparation of iron is only used in veterinary practice, for the dog, on account of its mildness.

2. Sesquioxide of Iron.—Rust of Iron—Ferugo. This form of iron is only used by veterinary surgeons, in poisoning from arsenic, as an antidote, by forming in the stomach an insoluble arsenite of the protoxide of iron.
3. Sulphate of Iron.—*Ferri Sulphas—Green Vitrol-Copperas*. This is one of the best and cheapest preparations of this valuable metal, that can be used in diseases of horses and cattle.

*Use.*—In medicinal doses the sulphate of iron is tonic and astringent; therefore, it is used in cases of weakness, want of condition, looseness of the bowels, swellings of legs, body, sheath, breast, etc. It is improving, adding richness to the blood, and giving tonicity and health to the fibrous, serous tissues, from which the fluid causing the swelling arises. In pleuro-pneumonia in cattle, after fever has abated, nothing will restore and prevent effusions of serum, or fluid, in the chest, like sulphate of iron; and effusions in the chest of cows, and neat cattle, is the cause of very many deaths. The effusions form connecting links between the lungs and the sides, from which adhesions take place in that disease, and from which the animal can never be restored to good health, although it may live for a year or two. How important, then, is a medicine offering so much hope!

In addition to the diseases just named, sulphate of iron is the medicine to be used in all cases where the powers of life are low and depressed. In red water in cattle, bleeding internally in all animals, dysentery, purpura, scarlatina, and in debilitat ing diseases generally, no medicine offers so much as the sulphate of iron.

*Observe.*—Sulphate of iron should not be given while inflammation and fever lasts; it is time enough to give it after all irritation has subsided. It should always be combined with a vegetable tonic, such as gentian, or ginger. Iron changes the dung to a green color, as if the animal was at pasture.

*Dosage.*—For horses and cattle, the dose is two to three drachms, with the same quantity of powdered gentian, two to three times in the day, to be given, mixed in a quan-
tity of cold water. Drench out of a bottle, if the animal does not eat it readily, mixed with cut or soft feed.

4. **Perchloride of Iron.**—Whether in a fluid or solid state, this preparation is valuable for bleeding wounds, to stop the flow of blood—which it will readily do, if properly applied, and the blood vessel that is wounded is not too large. It should be applied with a soft brush, or a pledget of soft cloth or cotton dipped in it and laid over the wound, and kept bandaged. Perchloride of iron should be kept in every farm, or country house, for this purpose. It should be kept in a glass-stoppered bottle to keep it pure.

**Jalap—(Convulvulus Jalape).**

This root derives its name from a town in Mexico, called Xalapa, and grows fully six thousand feet above the sea level. It is, in veterinary practice, used only as a purge for the dog, in from twenty to sixty grains.

**Juniper Berries—(Juniperis Communis—The Fruit).**

This medicine is valuable in horse and cattle diseases, as a stimulant to the stomach in loss of appetite, and in convalescence from debilitating diseases.

_Dose._—For horses and cattle, one to two ounces is a dose. Dogs, twenty to forty grains.

**Kino.**

A juice of several plants. This is used as an astringent in diarrhea in all animals, and is considered more powerful than catechu (which see).
Kousso.

The flowers of this plant are brought from Abyssinia.

Use.—To expel, or destroy tape-worm in man, and the dog, and is prepared and used in the following manner: Take of kousso half an ounce, of warm water half a pint, let it stand till cool, and give it, flowers and all; and give next day a dose of castor-oil.

Laudanum.

(See Opium.)

Laxative.

A mild purge.

Lead—(Plumbum).

 Metallic lead in the form of shot, is used by our horse dealers, to relieve temporarily the heaving, or symptoms of broken wind, or heaves in horses. It will be needless for me to say, that if the lead is not speedily converted into an insoluble oxide, the animals so treated will die in a month or two. (See Lead Poisoning.)

Acetate of Lead—(Sugar of Lead).

Solution of acetate of lead is known by the name of Goulard’s Extract of Lead, and was formerly, and is still by some persons recommended, and used in cases of sprains, and as a wash for diseased eyes. Better and less injurious agents are now used by the educated veterinary surgeon.
Goulard's Extract, or lead-water, should never be used in diseases of the eye, as it can do no good beyond what cold water can do, but it dulls the eye, by making it hazy and opaque. It will be well to remember this, and act upon it, not minding what old and antiquated books and individuals may say or think in regard to what is here recommended.

Linseed—(*Linum Usitatissimum*).

Ground flaxseed makes the best poultice, as it is less irritable and retains its moisture better than most articles in use for that purpose.

Cake Meal.—That portion which is kept after the oil has been expressed from the seed, is a good feed for horses and cows, given occasionally, and makes a good and much cheaper poultice than the most costly seed.

Oxide of Lead.

This preparation of lead is used in the manufacture of common sticking plaster, or Diachylon.

Iodide of Lead.

(See Iodine.)

Linseed Oil—(*Oleum Lini*).

This is a good and safe purgative for the horse, and should be given by farmers and non-professional persons in preference to any other article. The English veterinary surgeons use linseed oil for colic in the horse, in the following combination: Linseed oil, one pint, and two ounces each of oil of turpentine and laudanum. In cases of chok-
ing, in either horses or cattle, a half pint of linseed oil should be poured down the throat, so that by its emollient properties the substance may pass readily down the gullet. For horses, one to two pints is the dose used for a purgative. For scalds and burns, linseed oil is mixed with lime-water.

**Liquorice Root**—*(Glycyrrhiza Radix).*

This was formerly in use for making balls for horses, but it is now superseded by molasses.

**Lobelia Inflata**—*(Indian Tobacco).*

This medicine is in great use by the eclectic physicians in the United States as an emetic, which fact, I believe, has induced Dr. Dadd to recommend it to veterinary surgeons and horsemen of this country. Does the doctor not yet know that the horse, the ox and the sheep cannot vomit? Therefore, it is not entitled to a position, for such purpose, in the veterinary *Materia Medica.*

**Logwood**—*(Hoematoxylon Campechianum).*

This is a valuable medicine not well known, and consequently not appreciated. One of the very best astringents for binding the bowels in diarrhea and dysentery, in all animals, and especially when accompanied with irritation of the bowels. Logwood is cheap, sold in chips, and is prepared and given in the following manner:

Logwood chips, two ounces; boiling water, one pint. Allow it to stand till cold, then strain through cloth, or a fine sieve. For horses and cows, this quantity will make one dose. For calves with scours, one to three ounces will be the dose, which repeat if the case demands it. A safe remedy, and cheap.
LIVE STOCK MEDICINES.

Lupuline—(The Hop).

Makes a good poultice, applied to the udders of cows, when lumpy and hard. It hastens the suppurative process.

Magnesia—(Oxide of Magnesium).

Used sometimes in young foals and calves, when they have no appetite. A good antidote for arsenical poisoning. For these animals, two drachms to six is the dose. A little ginger should be added to it to prevent griping. Carbonate of Magnesia. — Magnesia Alba. The action of this is similar to the preceding. Sulphate of Magnesia. (See Epsom Salts.)

Manganese.

A metal used as a disinfectant, in combination with some one of the mineral acids. For the way to use it, see Disinfectants.

Marsh Mallow—(The Root of Althea Officinalis).

Used in the form of an ointment, but not of much utility. It, however, still holds a place in horse and cattle medicines. It can be done without.

Marigold—(Calendula Officinalis).

A garden plant. Tincture of Marigold. This is a good application to sores, ulcers and abscesses, and is applied with soft cloths, saturated or moistened with it, and laid over the affected part. It is a new remedy in burns and scalds.
Mercury.

A liquid metal called quicksilver. In its metallic state it is not used as a medicine. There, however, is a prevalent idea in the minds of ignorant persons that doctors and veterinary surgeons give this substance to force a passage through the bowels, and that if it fails, the bowels and stomach will be ruptured or torn. If the patient should die, the blame is not unfrequently laid on the use of quicksilver by the doctor, when this substance was never thought of for any such purpose. Quicksilver has no action whatever on the animal system, either in health or sickness.

Mercury With Chalk.—Gray Powder. Used in diarrhea in calves, in doses from ten to fifteen grains, given with a little ginger, and mixed with wheat-flour gruel. Iodide of Mercury. (See Iodine.)

Bi-Chloride of Mercury—(Corrosive Sublimate).

A dangerous poison, and should never be given to any animal. It is, however, used in solution, in some skin diseases, as in ring-worm and mange. When so used, only a small portion of the body should be washed with it in one day. For this purpose, take four grains of the sublimate to two ounces of rain water. For a dog, two grains to the ounce, in water, will be strong enough. Nitrate of Mercury. Ointment. This is the citron or golden ointment, and is a good remedy in ring-worm. Unfortunately, however, it spoils with long keeping, and not being made extemporaneously, it is often rancid and of little value.

Oxide of Mercury.—Red Precipitate. Used in the treatment of unhealthy ulcers and sores, in the form of
powder and ointment. It is the principle in the yellow wash already spoken of in connection with the subject of lime (which see). Sulphate of Mercury, *Turbitth Mineral*, a medicine of no use, which should be expunged from the books on horse and cattle diseases. Sub-Chloride of Mercury (*Calomel*), a medicine I never use, and will not recommend for *internal* administration. In the form of the black wash, and sprinkled upon sores, it is a good remedy. Calomel is recommended for thrush in the feet of horses, and is inserted in the cleft of the frog.

**Mercurial Ointment.**

This is sold in the drug stores. The ointment of mercury is chiefly used in skin diseases, as mange in horses and dogs. But a better remedy will be found in sulphur, and its preparations, which are not only more safe, but more certain of curing the case.

**Mezeron—Daphne Mezerum.**

A plant, from the bark of which an extract is made, and from the extract an ointment composed of one drachm to four parts of lard, which is used for the purpose of keeping up the irritation of blisters.

**Mustard Seed—Sinapis Nigra.**

Used as an irritant on parts of the body, where the Spanish fly would be improper and dangerous. On the belly, and over the loins, are the usual places where mustard is applied. In lumbago, and sprains of the back and loins, and in pain in the bowels, mustard is useful. The mode of application of mustard is as follows: If the hair
of the part be long, cut it off, then foment the part with warm water, and immediately rub into the parts a handful of the best flour of mustard. This is more effectual than laying a paste or poultice without rubbing.

Volatile Oil of Mustard makes a good counter-irritant, when a few drops are rubbed into the skin. Vinegar added to mustard does not, as is thought, produce a better effect. Warm water answers every purpose.

Myrrh.

A gum-resin, used in the form of a tincture, and a compound tincture, for sores, and a good application in sore mouth from the bit, or other cause.

Narcotics.

Are medicines which act upon the brain, and thereby allay pain. Example: Opium, and its preparations; aconite, and chloroform.

Neatsfoot Oil.

Used for skin diseases, and for allaying the irritation of blisters, and keeping the skin from cracking.

Nervines.

Medicines relieving pain, without producing narcotism.

Nitre—Saltpetre.

This medicine has long been used as a diuretic, and as a febrifuge in low fevers. Cheaper and better medicines
are daily in use for this purpose. Nitre is not a cheap medic
cine, nor yet is it an indispensable one. The days are long
since past when emetic, tartar, nitre and digitalis were the
remedies used in all cases of inflammation, irritation and
fever. This formula has in its day deceived many a man,
and has been the means whereby many thousands of valu-
able animals have been lost. Wherever nitre is indicated,
I use the sulphite of soda, and have no cause to regret the
change. A bundle of fresh-cut grass given to a horse will
have a better and more soothing effect than nitre. Instead
of being given in any disease, nitre should be left to fulfill
its destiny in the making of gun-powder to liberate the
toiling millions of other lands from the hands of the despot
and the oppressor.

**Nitric Acid.**

*(See Acids.)*

**Nux Vomica—Strychos Nux Vomica.**

An active poison in large doses, but a valuable agent in
the cure of diseases in all animals. The powdered nut is
uncertain in its effects, therefore the *tincture* and the
*alkaloid* should only be used.

*Use.*—A nervine, and used when the nerves are
depressed and weak, just asaconite is used when the
nerves are strong and excited. The one medicine is used
in depression, and the other in diseases with exalted
symptoms. Paralysis or palsy is the loss of power in the
motor nerves of the part affected. Therefore, nux vomica
is used in twitching of the muscles of all animals; and in
glass eye in the horse, depending upon the want of nervous
energy in the optic, or nerve of vision.
Tincture.—*Dose.*—For horses and cattle, the dose is from ten to twenty drops, repeated three to four times in the day.

Strychnine.—*Dose.*—To horses and cattle, give one grain, once a day, gradually increasing the dose till three grains are given in the day. To get the full benefit from it, it will have to be given for a week or two, if the beast has not got well by that time. In the use of strychnine, care and good judgment must be exercised, for it must be remembered that however useful a drug or medicine may be, its abuse is readily accomplished. Strychnine should be administered in feed, if the animal will eat it; if not, give it in gruel in the form of a drench. Twelve grains is the dose required to kill a full grown horse.

Arsenite of Strychnia is recommended by the French veterinary surgeons, in *nasal* discharges, but with what effect is not stated. If it does not cure, as I suppose it does not, it only serves to show to my mind how utterly ignorant veterinary surgeons are in regard to the true pathology of these discharges, supposed to be *glianders*. Mr. Gangee, on the *International* Veterinary Congress, held at Hamburg, says: "When the subject of glianders was mentioned, no one responded." Why? certainly not that they knew all about it. No, the contrary is the case, for they knew nothing at all about its nature, and hence we have the French using a drug the least of all likely to change, arrest, or cure the disease. Prussian blue is said to contain ten per cent. of strychnia; some packages contain as high as sixty grains.

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**Oak Bark—Quercus Cortex.**

This is a good astringent for outward use, or for use, or for sores which discharge or run matter. The bark is boiled: half an ounce to a pint of water. This decoction
is an excellent remedy for drying up the moisture of greasy heels, so troublesome in horses. In diarrhea in calves, given in four drachm doses, much good will result.

**Oils.**

There are two varieties of oils used in medicine—fixed and volatile.

**Fixed Oils.**—Castor, olive, linseed, croton and neats-foot oil. The uses of these oils will be found treated of under their respective heads.

**Opium**—(Papaver Somniferum).

The dried juice of the white poppy, and is one of the most remarkable substances in nature. There are several varieties of opium: Turkey, Egyptian, East Indian, Persian, and European opium. The medical preparations of opium are several:

* Morphia, or morphine, is the most important preparation of opium, and sold in the drug stores in the form of white crystals, as also in that of a liquid—liquor morphia acqua and liquor morphia sulphas. Either of these preparations of opium are much better medicines than the crude opium itself. Each fluid ounce contains one grain of the morphine, or the true principle of the opium, and one grain of morphine is equal to three grains of opium, or to forty-five drops of the tincture of opium, commonly called laudanum. Opium is a narcotic, or reliever of pain, and is especially recommended in milk fever in cows. The dose of the acetate, sulphate, or muriate, in crystals, for the horse, is from twenty to forty grains. For the cow with milk fever, from forty to eighty grains. To a medical man,
such large doses may seem enormous, for in man the dose is from half to one grain.

Horses will scarcely show the least effects from the administration of from two to four drachms of the powdered opium. On cattle, opium has even much less power than on horses. Cows can take one ounce, and sheep half a drachm of powdered opium, without suffering. The doses of crude, or powdered opium for horses, are from one to two drachms, and for cattle, two to four drachms. In veterinary practice, opium is not now so much used, as aconite answers almost every purpose for which opium was given, and without in any way binding the bowels. But in case of milk fever, opium, or its alkaloid morphia, is well worthy of a trial, and if taken in time, will scarcely disappoint any one.

Tincture of Opium. — Laudanum. — Every fifteen drops of the tincture contain one grain of opium. Laudanum is the most costly of all the preparations of opium; and not only that, the large quantity of alcohol, or spirits of wine it contains, is a decided objection to its use in many diseases. Crude opium rubbed down with a little water will be far better when it is to be used at once, or not kept for any time. Laudanum is used in lotions and liniments for the relief of pain, and it enters into eye washes, for the same purpose.

Wine of opium contains spices. Not much used.

Codia, narcotine, narceine, paramorphia, papaverine, meconine and meconic acid, are the various constituents of opium, but they are not used in medicine, either in domestic or veterinary.

Battley's sedative drops, so well and familiarly known throughout the world, wherever the English language is spoken, though a secret, are known to contain opium water and a little spirit, and are one-third stronger than laudanum.
Pariera Brava.

A root which is to be sliced, and have one pint of water added to one ounce of the root. Boil, and strain when cold. This is a good tonic for horses. Mix with the feed, half a pint to the dose.

Peach Leaves.

One ounce infused in the same way as tea, with one pint of water, is an excellent application for the skin of animals having the itch and skin diseases.

Peppermint— (Mentha Piperita).

The essence of this garden plant is sometimes given to horses having colic, and given in doses of twenty drops. Dogs can have three drops for a dose, in the same disease.

Pepper.

A plant, and fruit, of the genus Piper.

Black Pepper.—Piper Nigrum. Occasionally given to horses affected with colic.

Jamaica Pepper.—Pimento—Allspice. This is a valuable medicine for horses and cattle affected with fever, loss of appetite and indigestion. From three to five drachms constitute a dose, given in combination with ammonia.

Capsicum.—Cayenne Pepper. This is also used for the same purpose as the above, and given in from twenty to thirty grain doses.

Pepsin.

The active principle of the gastric juice of animals. Its cost prevents its use in calves having diarrhea, when the
discharges are like milk. A good substitute for pepsin is rennet, which farmers should have about them, not only for cheese-making purposes, but for use in looseness, or scours in calves. It assists the stomach to digest the milk, which, in diarrhea, lays upon the stomach without being digested or changed. Hence the white diarrhea, so often seen in calves.

**Petroleum — Rock Oil.**

This substance was formerly highly recommended in chest diseases, but it has been succeeded by more certain and successful drugs for this purpose. However, it is still occasionally used as an external application for sores, and for the destruction of lice, etc., in the skin. It is apt to leave a blemish by causing the hair to fall off, and in some cases, in which I have seen it used too extensively, the hair did not come again. The better way to use coal-oil is to mix equal parts with some other oil having no acrid principle.

**Pitch — (Burgundy Pitch).**

The concrete juice of the abies excelsa. This is used in the composition of the plaster formerly used over the loins, in weakness, sprains, lumbago, etc., in the horse. Not now recommended.

**Phosphorus.**

An elementary substance resembling wax. There is, however, another resembling brick-dust, when in a mass. The preparations of phosphorus are numerous: Hypophosphate of ammonia, hypophosbate of iron, and the phosphate of lime, or bone, or earth, phosphate of soda, and of quinine. Phosphoric acid, diluted, is the one which should be used in veterinary practice.
Phosphoric Acid.—Is used in diseases of the bones of young colts. For young colts, the dose will vary from ten to sixty drops, given diluted in cold water.

Pomegranate Punica—(Granatum).

The bark of the root of this tree is used for the destruction of tape-worm in all animals. Take of the bark one ounce; water, one pint; and boil down one-half. The dose for the dog will be a small wine-glassful.

Poppies.

(See Opium.)

Potash—(Oxide of Potassium).

Preparations of Potash are many:

Caustic Potash.—Used as its name indicates, as a caustic, and is a favorite one of mine. Many persons object to it on account of its extreme fluidity, which I consider to be its most valuable property, as, if it did not readily assume a fluid form, its caustic properties would not be so good. Indeed, according to its fluidity, when applied to a part, so is its caustic property. For the quick reduction of proud flesh, it has no superior.

Carbonate of Potash.—This is sometimes used as an antacid, but is not much used in horse and cattle diseases.

Sulphuret of Potash.—Hepar Sulph.—Liver of Sulphur.—This is a valuable remedy when applied to mange in all animals. Dissolve an ounce in a pint of water, first having rubbed the mangy part with fine sand, to expose the insect to the action of the sulphuret.
Sulphate of Potash.—(See Glauber's Salts.)
Iodide of Potash.—(See Iodine.)
Nitrate of Potash.—(See Saltpetre.) The acetate and tartrate of potash are not used in veterinary practice.
Chlorate of Potash.—Used for the same purposes as the nitrate, and in the same doses. The same may be said of the permanganate.

**Prussic Acid.**

(See Acid.)

**Pumkin Seeds.**

An excellent remedy for destroying tape-worm.

**Purgatives.**

Medicines which empty the bowels.

**Pyroxylic Spirit—Wood Naphtha.**

Used to relieve chronic cough, and is given in half-ounce doses in gruel.

**Quinine.**

(See Cinchona.)

**Rennet.**

(See Pepsin.)

**Rhubarb—Rheum Palmatum.**

Rhubarb is a tonic and purgative in dogs, and other carnivorous animals, but in horses and cattle it has scarcely any
effect whatever, further than improving the appetite. Better, and much more efficient and cheaper drugs are used in horse and cattle diseases. I know of a gentleman farmer, who uses the spiced rhubarb in young calves, in cases of looseness of the bowels, and in diarrhea. The dose of the spiced rhubarb is from one to two teaspoonfuls, repeating it two to three times a day.

Ricinus Communis.

(See Castor-oil.)

Rochelle Salts.

(A tartrate of Potash and Soda.)

Saffron—Crocus Sativus.

(See Colchicum.)

Sagapenum.

This is a gum, and is used for same purposes as asafetida.

Sal Ammonia—Chloride of Ammonia.

(See Ammonia.)

Salt.—Table Salt.

Chloride of Sodium, a valuable condiment, when given with the food of animals. Salt is a laxative in horses, cattle and sheep, and is considered a preventive of sheep rot.
Sal Volatile.

This is the compound spirit of ammonia. (See Ammonia.)

Sassafras—Laurus Sassafras.

This is a favorite remedy with farmers for their horses, and is given to them in the spring of the year, to strengthen and improve the appetite. Sassafras may be given to horses, either in the form of a powder, or as a decoction, or tea, and mixed with the food.

Sarracenia Purpura—Indian Cup or Pitcher Plant.

This plant is found growing along the coast of Labrador, and the shores of the Gulf of Mexico, on wet and marshy land.

Use.—This plant has recently proved to be one of the most useful in the whole list of medicines, and from all accounts, it is and will still be a blessing to thousands who may become affected with small-pox. For small-pox in cattle and sheep, it is not only a sure remedy, but also as good a preventive for the disease. The form and manner of using this medicine is in that of a tea. The time, however, will soon be when the chemist will provide us with an extract, or an alkaloid of this plant, which will enable us to give the essence of the plant without any inert matter. Take from one to two ounces of the dried root, and slice in thin pieces, place in an earthen pot, or other vessel, and add a quart of cold water, and allow the liquid to simmer gently over a slow fire, for two or three hours, so as to lose one-fourth of the quantity. Give to cattle,
half a pint; and to sheep, two wine-glassfuls; repeating
the dose in six hours, when a cure will generally be
effected.

Savin—(Juniperus Rabina).

THE oil of juniper is used in veterinary practice, for the
purpose of destroying worms in all animals. For horses
and cattle, the dose is from three to four drachms, and for
the dog, three to five drops. An ointment of the dried
savin tops is used for the purpose of keeping up the action
of blisters. Take one part of the fresh tops to sixteen parts
of lard.

Sedatives.

MEDICINES which allay inordinate action of the heart.

Senega, Polygala Senega—(Snakeroot).

THIS, like other of our native herbs, is often used by
country folks in the spring of the year. They give a deco-
tion, or tea of the snakeroot to their horses. It is an excel-
lent remedy in coughs, bronchitis, cold, etc. Take one
ounce, boil in a pint and a half of water, and strain through
a sieve or strainer. For a horse, half pint, mixed in his
feed, night and morning.

Nitrate of Silver—(Lunar Caustic).

USED as a caustic to unhealthy sores and ulcers; and a
solution, three to four grains to an ounce of rain or distilled
water, is used to the eye in purulent ophthalmia. The
nitrate of silver is too costly for general use. The sulphate
of copper or blue stone will, for most purposes, answer as
well, and is very cheap.
Sialagogues.

Medicines which increase the secretion of saliva, such as aconite in large doses, and second crop clover, after it has been exposed to cold nights or a little frost.

Soap.

A combination of fatty acid with an alkali.

Soap Liniment — (Opodeldoc).

A very useful application for sprains, bruises, and for stiff joints.

Soda.

A mineral alkali.

Carbonate of Soda.—Useful as an antacid, in doses of from two to four drachms.

Sulphate of Soda.—(See Glauber’s Salts.)

Sulphite of Soda.—This is made by passing a stream of sulphurous acid through a concentrated solution of carbonate of soda. It is a valuable article in the treatment of diseases of horses and cattle. The sulphite of soda possesses the power of neutralizing the action of zuminis, ferments, or leavens, when introduced into the circulation. Professor Polli, of Milan, has clearly demonstrated that this substance is capable of purifying the blood of noxious matters, and further, he has by his experiments upon dogs, proved that glanders can be cured by it; for he says, that forty-five grains of the virus of glanders taken from the nares of the nose of a glandered horse, and injected into the circulation of a dog, after the disease had shown itself
in the dog, was readily cured by the administration of the sulphite of soda. Upwards of seventy cases have thus been experimented upon by this distinguished professor—all going to show the value of soda, as a purifier of the blood, by its alterative effects.

Sulphite of soda is a remedy in all cases of eruptions on the skin, in farcy, glanders and purpura in the horse, and in pleuro-pneumonia and rinderpest, etc., in cattle. Wherever pus is thrown out as a product of disease, the sulphite of soda should be given. Dogs with distemper should have it to keep the circulation pure of pus. The blood of the dog becomes contaminated in this way, and hence, the good dog falls a victim to this scourge of fine bred animals.

_Dose._—For horses and cattle, the dose is from half an ounce to one ounce, given twice in the day. For dogs, twenty grains given in camphor water. In farcy and glanders or other diseases, accompanied with debility, the soda should be combined with gentian and other tonics.

**Spanish Fly—(Lytta Cantharides).**

An insect ground into powder, and mixed with lard or oil, making what is familiarly known as a blister. The Spanish fly is, besides its blistering qualities, a very valuable internal medicine, a powerful tonic and alterative, and has been used with success, in the hands of Mr. Vines, of London, England, in the cure of farcy and glanders in the horse. In the same diseases, and where the lungs were free from tubercles, I have cured them with the Spanish fly, gentian, copper, and the sulphite of soda. Spanish fly is given to the horse in five grain doses once a day only, and mixed in cut or soft feed. Horses are more easily affected by Spanish fly than mares. Blisters of Spanish fly are made as follows: Powdered Spanish fly, one drachm;
hogs's lard, six drachms; mix, and apply, by rubbing with the hand into the part to be blistered; wash off the part the next day, oil or lard it for a week, and the swelling will leave when the irritation has gone out of the part.

The tincture of Spanish fly was formerly used as the basis of the old sweating blister. An excellent application for the removal of a splint, or soft tumors about the legs of horses, is made as follows: Tincture of Spanish fly, one ounce; oil of croton, twenty drops; well rubbed into the parts, it acts like magic; that is, if the tumor can be removed at all by any means.

**Specifics.**

**Medicines** which cure disease, but the manner of action is unknown.

**Spermaceti.**

This is a solid crystalline fat, found in the large head of the sperm whale. There is a plan, however, by which it is said that spermaceti can be made out of the muscles of a dead cow or horse, by enclosing the flesh in a box perforated with holes, and sinking it in a running stream of water for a month or more, when the flesh will be converted into a mass of tough, solid matter. After which, it is treated with nitrous acid, poured over it to remove the offensive smell, and to separate the fat. Another plan is, to pour nitrous acid over the flesh without immersion in the brook, and which is said to convert the flesh in the short period of three days into a yellow colored spermaceti. Another plan is mentioned by Lord Bacon in his work Sylva Sylvarium, in which he says that the flesh of an animal may be changed into a fatty substance by cutting it into pieces, putting it into a glass vessel, covering with parchment, and allowing it to stand for six or seven hours
in boiling water. Experiments of this kind might result in profit to those who would undertake them. The use of spermaceti in horse and cattle diseases is for the making of ointments and salves, especially in hot weather, when lard cannot be conveniently carried without the risk, not only of losing a portion of the ointment, but of soiling the clothing, or other articles coming in contact with it.

**Spirits of Nitrous Ether.**

Sweet spirits of nitre is well known to most persons as a good household remedy for fevers, etc. In the treatment of diseases of horses and cattle, sweet spirits of nitre is used as a stimulant and antispasmodic. It is also used in the case of a horse having a chill, and in colic. For colic, it was formerly given in combination with laudanum.

*Dose.*—For horses and cattle, the dose of sweet spirits of nitre will be from one to two ounces, given in cold water to prevent loss.

**Spirits of Wine—Alcohol.**

This is used for making tinctures for medicinal purposes from the various plants in use. It is also a good stimulant; much better than the bad whisky which is so often poured down the throats of horses affected with colic.

**Starch.**

A good remedy in diarrhea in all animals, when combined with a few grains of opium and a little ground ginger, or a few drops of the tincture, commonly called the essence.
Sponge.

A valuable article for the cleansing of wounds and sores.

Styptics.

Substances having the quality of stopping bleedings from wounds. Examples: Perchloride of iron, cobwebs, the hot iron, and the bandage.

Sudorifics.

Medicines which produce sweating.

Sugar of Milk.

Much used by homœopathists, both domestic and veterinary, in the form of powder, but oftener in the form of globules or small pellets. Not recommended for the treatment of any disease. Molasses is the best form in which to give sugar to animals, and it is useful in cases of sick cows, mixed in a drench.

Sugar of Lead.

(See Acetate of Lead.)

Sulphur—Brimstone.

Sulphur is kept in the drug store in three forms, flowers of sulphur, milk of sulphur, and sulphur vivum. Sulphur is chiefly used for skin diseases, in the form of an ointment. It is believed by many persons to be a great
preventive of diseases and distempers in all animals, and
is one of the ingredients of an incongruous mass extolled
and recommended by the Hon. Isaac Newton, Commissioner of Agriculture, as a preventive of cattle diseases. Whatever may be the medicinal virtue possessed by sulphur, it certainly has no prophylactic effects, mixed with tar, etc. The simple ointment of sulphur is made as follows: one part of the flowers, or sulphur vivum, mixed with four parts of lard. In winter, when lard is hard, oil should be used instead, thus forming a liniment of sulphur more easy of application. Sulphur, as a laxative for horses and cattle, should be given in doses from one to three ounces, and administered in gruel, in the form of a drench. For dogs the dose is one to two drachms. It is not recommended as an internal medicine.

Sulphuric Acid.

(See Acids.)

Sulphurous Acid Gas.

This is one of the most powerful disinfectants we have. The great objection to its general use for this purpose is its poisonous character when breathed or inhaled to any extent. But from recent experiments instituted by Dr. James Dewor, of Kirkcaldy, Scotland, for testing the efficacy of sulphurous acid gas as a disinfectant, results are shown which lead to the conviction that diseases such as cholera in man, and rinderpest and pleuro-pneumonia in cattle, may not only be prevented, but much modified by this, hitherto considered, poisonous gas. The method of generating sulphurous acid gas is very simple and inexpensive. It is only necessary to have a small chaffern of red hot cinders from a coal fire, a small crucible on the hot cin-
ders, and a piece of sulphur-stick about as large as a man's thumb placed into it. This will fumigate a large cattle shed or stable in twenty minutes. Contrary to expectation, the animals seem to enjoy it, and it acts at the same time as a tonic on man and beast. The shed or other house must be well ventilated, by having the windows a little open before, during, and after the fumigation. Sanitary rules must be enforced in regard to cleanliness, removal of dung-heaps, etc. During the prevalence of such epizootics as are above named, the fumigation may be made according to the foregoing directions, four or five times in the day. It is further said that the treatment has not only cured some cases of the above named diseases, but that mange, ring-worm and lice have also vanished before it, and that greasy heels in horses have also been cured by it, while severe cases of tubercles of the lungs, glanders, and farcy have also been relieved by the inhalation of this gas. This is well worthy a fair trial, and if it but accomplish half what is claimed for it, a great and cheap fumigation and disinfectant is within the reach of any one. But, bear in mind, that it is a poisonous gas, and to prevent a deleterious effect, have free ventilation through the whole place.

**Tannin.**

This is the acid of barks, and is valuable, mixed with water, in running ulcers and sores, and in diarrhea, in all animals. The powder sprinkled upon bleeding sores will in many cases stop them. One drachm to a pint of cold water makes a good eye-wash, and in many cases dries up the scum, and removes it altogether. It is certainly a cheap and useful remedy, and can do no harm to the eye.

**Doses.**—For horses and cattle, in diarrhea, the dose of tannic acid is from half to one drachm, given in gruel as a drench. For calves with the same disease, give from ten
to twenty grains as a dose, mixed with wheat-flour gruel. Snuffed up the nostrils by man, in bleeding from the nose, it will in most cases arrest it at once.

**Tannin of Krameria.**—This is used for the same purpose as the preceding, but it is a better styptic, or arrester of bleeding from the skin or other sores.

**Sulphate of Zinc—White Vitriol.**

This is a valuable article for healing wounds and sores. It is not administered internally to any animal, except as an emetic to dogs. As an external wash for sores, one part of zinc to twenty of rain-water will answer for most purposes. For eye-wash, three to four grains to the ounce of water. This is one of the best applications which can be applied to the eye in cases of purulent ophthalmia.

**Tannate of Glycerine.**

An excellent application for the eyes, in purulent ophthalmia, and for moist sores, wherever situated upon the body.

**Tar.**

**Pix Liquida.**—Tar is not now used internally to the extent it formerly was. To cattle it is still given in a disease of the throat called clyers. For this purpose egg-shells are filled with good Barbadoes tar, and suspended on the end of a split stick, and gently pushed down the throat of the ox. As an external application, tar is still used on sores about cattle, to keep the flies off; and it is used to make stopping for horses' feet, singly, and mixed with clay. It is kept in every horse-shoeing shop for putting on the soles, usually with cotton, and having leather nailed on with the shoe.
Oil of Tar.—This is an excellent application when mixed with equal parts of sweet, or some fish oil, to promote the growth of horn on the foot of the horse. To give it a dark color to suit the foot, lamp-black may be stirred in, in sufficient quantity to make a black hoof ointment, which will be found an excellent formula for this purpose.

Tartar Emetic.

(See Antimony.)

Tobacco—Nicotiana Tobacum.

Tobacco is used as a medicine, principally in skin diseases, and for the destruction of lice and other insects, in the wool of sheep. Tobacco smoke is a favorite remedy with some veterinarians, for the removal and killing of worms, and in constipation, and colic. For these purposes, better and safer agents are in every-day use. Tobacco in all, or any of its forms, is dangerous, being followed by great sickness, nausea and prostration, from which many animals are ultimately destroyed.

Tragacanth.

(See Gum.)

Turpentine — Terebinthae.

The various varieties of turpentine in market.

Common Turpentine.—The produce of the pinus palustris, of North Carolina, and other States, and also of Norway, and the north of Europe. The pinus sylvestris, or Scotch fir, yields considerable turpentine.
LIVE STOCK MEDICINES.

Venice Turpentine.—This is procured from the *Larix Europea*.

Canada Balsam.—Procured from the *Abies Balsamea*, and is considered to be the purest of all the turpentines; hence it is called sometimes, the balsam of Gilead.

Frankincense.—A product of Norway, and the north of Europe. This variety enters into the composition of what is known as Burgundy pitch, and is used in veterinary practice for making adhesive plasters for the loins of horses having been sprained, or having lumbago.

Oil of Turpentine.—This is commonly called the spirits of turpentine, and is used very largely in horse and cattle diseases, both for internal administration and external application. It is a powerful stimulant, diuretic, and antispasmodic, and is, therefore, used in colic in the horse, in puerperal apoplexy in cows, and in general debility in all animals. As an external embrocation, it is very efficient when combined with an equal portion of sweet oil, but very dangerous when applied to the skin of the horse alone. The horse will become restless, and, in some cases, utterly unmanageable.

The doses of oil of turpentine for horses and cows are from one to two ounces, always mixed with its own bulk of oil, especially for horses. For dogs affected with tape-worm, half to one drachm is the dose, mixed with the yolk of an egg.

Rosin, or Resin.—The residue left from the distillation of turpentine, which is chiefly used by horsemen to cause the horse to urinate more freely. Much mischief is often done to horses by the administration of rosin. Indeed, most diseases of the kidney and of the loins can be traced to over-dosing with this substance. The oftener rosin is given to the horse, the more he appears in the eyes of the driver to stand in need of his favorite dose. The kidneys become overworked, the desire to urinate is more
frequent, less urine is voided each time, and the poor man does not see the mischief he has already done, but hastens to give the horse more to remedy the urinary defect he has thus been instrumental in producing. It will be well to remember that powerful diuretics, like powerful purgatives, tend only to weaken and debilitate. If there be a urinary defect, find out the cause, and, if possible, have it removed, and the effect will cease, "sublata causa, tollitur effectus," but do not attempt to do so by force, and against all science and common sense. Other preparations of turpentine have already been noticed. (See Tar.)

Urse Ursi.

The leaves of the whortleberry. They were once in repute in diseases of the horse, but are now fallen, and others have taken their place. They were used chiefly in diseases of the bladder and kidney.

Valerian — Valeriana Officinalis.

However useful valerian may be in nervous irritation in man, it is not so useful in veterinary patients. Camphor, and the gum resins, or asafoetida, answer our purpose better than valerian.

Valerianate of Soda.

This has been found useful in chorea, or twitching of the muscles in the dog, in doses of from one to two grains.

Valerianate of Iron.—A good tonic for the dog.

Valerianate of Quinine.—An excellent remedy for agues in man.
Veratrum—White Hellebore.

If we had not so useful a sedative medicine as we have in aconite, I would certainly recommend the tincture of white hellebore root in all diseases for which aconite is recommended. On account of its being more dangerous than aconite, in case of overdose, I will not say much more about it, as wherever white hellebore is found in the country stores, aconite will be there also. Hence, there can be no good reason for recommending it when aconite can be procured.

Veratrina.—The alkaloid of white hellebore, and is one of the most destructive of the deadly poisons. Nothing could be more so than this preparation of hellebore; and what is more, at present no test is known whereby to detect its presence within the stomach or system.

Wax.

This substance is used for giving hardness and consistency to ointments, and is a favorite with me in the form of shoemaker's wax, for the purpose of filling up cracks and holes in the feet of horses, to keep out sand and dirt. To be applied as follows: Make the wax in the form of a stick, so that it can be held by one end, while you hold a hot iron to the other, and hold it over the hole or crack, so that the warm wax will drop into it. When the part is full, wet the finger, and by this means the wax can be smoothed, so that ordinary observers can scarcely observe a deficiency in the foot. The hole or crack must be perfectly dry, and free from moisture, or else the wax will not stick very long. When dry, and the wax is put properly in, it will last for a month, or till the next shoeing time.
Willow Bark.

A much neglected, valuable and cheap medicine. This bark has within it a crystalline substance called salicine, which is an excellent substitute for the expensive quinine. Farmers and others will do well to gather it in sufficient quantity, and have it dried; and in the spring of the year, or when any of the horses are weak, or out of sores, take of the willow bark one pound, and boil in four quarts of water, till two quarts are left; then strain for use, and give a tumblerful, mixed in cut feed, once or twice in the day. This will be found much better than the black snakeroot already spoken of under its proper head.

Yeast.

Brewer's yeast is one of the best applications for an unhealthy sore or ulcer, as it immediately changes its look and smell. A mixture of yeast and charcoal is a domestic remedy not to be overlooked in the treatment of sores, especially in the summer time. The yeast and the charcoal are to be mixed in the form of a poultice, and used as such, occasionally changing it so that full benefit may be given to the sore by its use. After the sore is cleansed and corrected, it may be then healed as a simple, healthy sore, by other remedies amply described through the book.

Zinc.

There are several preparations of zinc, which are used in the treatment of horse and cattle diseases, but chiefly in the form of external applications.

Oxide of Zinc.—This is a white powder, like wheat-flour, and is useful when applied as a powder in greasy
heels and other sores which discharge a sanious fluid from them. Oxide of zinc is often used in the form of an ointment mixed with lard. An excellent ointment is also made by soap shaved down, moistened with a little water, and having oxide of zinc added to it. This is a good form for greasy heels and scratches on horses that have to work every day. It keeps down irritation and fever, prevents swelling of the legs, and is easily washed off on the horse coming into the stable for the night.

Carbonate of Zinc.—This is used under the old name of calamine, either in the form of a powder or an ointment. The ointment is made by adding four parts of lard to one of calamine. It is good for healing sores.

Sulphate of Zinc.—This preparation of zinc has already been described under the head of sulphate of zinc which see).

Chloride of Zinc.—Butter of Zinc. This, as well as the other forms of zinc, is not used as an internal medicine, except the sulphate, which is occasionally given to the dog as an emetic.

Chloride of zinc is a powerful disinfectant and deodorizer, and is used in the healing of wounds and sores. The solution is the usual form of using it. Two grains of the chloride of zinc to an ounce of rain-water makes a good eye-wash. For ordinary sores, four to five grains of the zinc to one ounce of rain-water, is a good application. One characteristic of the preparations of zinc when applied to sores is, no proud flesh can or will arise during their use. The chloride of zinc is used by some veterinarians as a caustic, but for this purpose better caustics, and cheaper ones, will be found elsewhere described.

Acetate of Zinc.—This is made by dissolving oxide or carbonate of zinc in acetic acid. The chief use of the acetate of zinc is for the healing of wounds. In European stables it is employed for the purpose of wetting bandages
applied to old hunters and other horses, whose legs cannot be otherwise kept fine and free from swelling. The bandages usually employed in such cases are made of wash-leather, which is so extensively used for drying carriages after being washed, and is called chamois leather.

**Zingiberis.**

*(See Ginger.)*

**Zyloidine.**

This is a white substance, which is insoluble, and is obtained from starch, concentrated nitric acid, and cold water.

**Prescriptions and Preparations.**

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**Cerates.**

Used for dressing sores and ulcers.

**Simple Cerate.**—Take yellow or white wax, three ounces; olive oil, two ounces; melt them on a slow fire.

**Turner's Cerate.**—Take of simple cerate, five ounces; prepared calamine, one ounce; mix, and stir till cold.

**Cerate of Zinc.**—Take simple cerate, six ounces; melt, and add oxide of zinc, one ounce, and stir till cold.

**Resin Cerate.**—*Yellow Basilicon.*—Take yellow resin and yellow wax, of each half a pound, then add eight ounces of olive oil or lard, melt together over a slow fire,
and strain through a flannel cloth while hot. This is an old, but excellent application for sores, scalds burns, etc.

**Clysters.**

For colic of all kinds, take warm water of about blood heat, one stable-bucket full; four ounces of common table salt, soap sufficient to make a good lather or froth; of this, three to four quarts may be injected in the rectum every half hour till the animal is well. For the expulsion of the fundamental bots, injections of flaxseed oil are an excellent and safe method. Tobacco smoke injections are sometimes used for their removal, as well as in cases of constipation. To give injections of tobacco smoke, an instrument having both force and suction is necessary. Tobacco smoke is not recommended for either of these affections by the author.

**Drenches.**

Used in cases of colic: Take sulphuric ether, half an ounce; laudanum, two ounces; flaxseed oil, one pint; mix. Or, take spirits of turpentine, one ounce; tincture of aconite root, twenty-five drops; aloes, one ounce in solution; mix. Or, take warm ale, two pints; ground ginger, half an ounce; tincture of aconite root, twenty drops; mix. Used in flatulent colic, accompanied with swelling of the belly: Take laudanum, two ounces; aloes in solution, one ounce; chloride of lime, half an ounce; mix. Or, take tincture of aconite root, twenty drops; aloes in solution, one ounce; sulphite of soda, one ounce; mix. Or, take spirits of hartshorn, three drachms; aloes in solution, one ounce; water, one pint; mix.
Eye Lotions and Washes.

Astringent Eye Lotion.—Take sulphate of zinc, five grains; rain-water, one ounce; mix.

Lotion for Purulent Discharges from the Eye.—Take sulphate of copper, three grains; laudanum, ten drops; rain-water, one ounce; mix.

For the Same.—Nitrate of silver, four grains; rain-water, one ounce; mix, and apply with a camel's hair pencil once in the day.

Soothing Eye-wash.—Take extract of belladonna, half a drachm; rain-water or distilled water, six ounces; dissolve and strain. This is to be used warm, as a fomentation to the eye.

Mild Astringent Eye-water.—Alum, four grains; rain-water, one ounce; mix.

Sedative Eye-wash.—Take sulphate of atropine, three grains; rain or distilled water, one ounce; mix, and strain. The reader of this book will remember that belladonna, or atropine, when applied to the eye, will cause the pupil of the eye to dilate.

Eye Salves.

Nitrate of Silver Ointment.—Take nitrate of silver, twelve grains; dissolve in as many drops of water; simple cerate, one ounce; mix.

Precipitate Ointment.—Take red precipitate of mercury, three grains; pure lard, two drachms; mix, and use when the eyelids are red and oozing.

Freezing Mixtures.

Take sal ammoniac, five parts; nitre, five parts; cold water, sixteen parts; mix. Or, take sal ammoniac, and
nitre, of each five parts; Glauber's salts, eight parts; cold water, sixteen parts; mix. The article to be cooled should be placed in a tin vessel, which should be put in the mixture just as a butter kettle would be placed in ice water. By throwing a handful of sal ammoniac, or coarse salt or nitre, upon ice or snow, a low degree of cold will be produced, sufficient for all purposes. Freezing mixtures are of much benefit applied to sprains, when ice cannot be had.

**Liniments or Embrocations.**

These are for external applications, and are used in the cure of sprains, bruises, chronic swellings, etc.

**Liniment of Ammonia.**—Take solution of ammonia, two ounces; sweet oil, six ounces; mix.

**Liniment of Camphor.**—Take camphor, one ounce; olive or sweet oil, three ounces; mix.

**Liniment of Aconite.**—Take tincture of aconite root, two ounces; olive or sweet oil, four ounces; creosote, one ounce; mix. This is one of the most valuable embrocations which can be applied to a painful bruise, or sprain of whatever kind. It allays and removes inflammation, irritation and pain.

**Liniment of Lead.**—Take soap (castile), five ounces; camphor, one drachm; Goulard's extract of lead, half an ounce; boiling water, one pint. Cut the soap into thin pieces, and the camphor in fine powder, and stir them into the Goulard's extract, then pour in the boiling water.

**Soap Liniment.**—Opodeldoc.—Take castile, or even white soap, three ounces; oil of rosemary, two drachms; oil of thyme, one drachm; camphor, one ounce; spirits of wine, one pint. The camphor is to be in fine powder, and the soap in fine shavings. The camphor, oils and soap are to be dissolved in the spirits of wine. Place the vessels holding these articles by the fire till the soap is dissolved.
It should be kept in wide-mouthed bottles, of from four to six onces' capacity.

*Observe.*—The oils of rosemary and thyme, entering into the mixture, are not so much for their medical virtues as for the fine smell. In horse and cattle practice, these oils can be dispensed with; or, add the same quantity of olive oil.

**Soap Liniment.—Common.**—This may be used instead of the opodeldoc. Take soap in shavings, four ounces; camphor, in powder, one ounce; spirits of wine, one pint; laudanum, half an ounce; and dissolve. This is a cheap and useful liniment for sprains and bruises.

**Turpentine Liniment.**—Take spirits, or oil of turpentine, two ounces; olive oil, two ounces; mix.

**Lime Liniment.**—Take equal parts of lime-water and linseed oil, and shake them well together till a white, thick, creamy, or saponaceous compound is made. This is used in cases of burns and scalds, whether in man or beast. Spread some of the liniment on a soft cotton cloth, lay it on the burned part, and when dry renew again.

**Carbolic Acid Liniment.**—Carbolic acid, one drachm; olive oil, eight ounces; mix. Or, water alone may be used for ordinary sores instead of the oil; but for scratches, the same quantity of glycerine will answer a better purpose.

**Creosote Liniment.**—Take creosote, one ounce; oil of turpentine, one ounce; olive oil, two ounces; mix. This is a favorite liniment for sprains, bruises, and sores, and gives relief from pain when rubbed upon the sprained hock-joint and stiff joints generally.

**Ointments.**

**Blistering Ointment.**—Take of Spanish fly, in powder, one drachm; hog's lard, six drachms; mix. This is the ordinary blistering ointment. The old formula is, one
of Spanish fly to four of lard. The weaker ointment answers the better purpose.

**Red Iodide Ointment.**—Take of bin-iodide of mercury, one drachm; hog’s lard, one ounce; mix. This is the most useful ointment the veterinary surgeon can employ, or possess, for the cure of splints, ring-bones, spavins, indurated or hardened tumors, and the reduction of enlargements of the glands of the neck. Iodide ointment should only be used once in five days, or till the effects of the previous application have subsided a good deal. This precaution is necessary to prevent a blemish being made by the hair falling off and not growing again, which should always be avoided.

**Green Ointment.**—Take of simple serate or ointment, one ounce; add one drachm of verdigris (diacetate of copper), and mix. This ointment will heal sores when other applications have failed.

**Sulphur Ointment.**—Take of iodide of sulphur, one drachm; hog’s lard, one ounce; mix. Used in mange and skin diseases.

**Zinc Ointment.**—Take carbonate of zinc, one drachm; hog’s lard, one ounce; mix. A good healing ointment.

**Liver of Sulphur Ointment.**—Take of liver of sulphur, one drachm; hog’s lard, one ounce; mix. Used in mange and other skin diseases. A more cleanly and easily managed form, performing all its actions, is one part of the liver of sulphur to eight parts of water.

**French Hoof Ointment.**—Take of olive oil, wax, lard, honey and white turpentine, equal parts. Dissolve, or digest over a slow fire. For black hoofs, a little ivory-black, stirred in while hot, will give it sufficient color. For blue feet, add sufficient Prussian blue or indigo along with the ivory-black till a blue tint is given to the ointment.

**Common Hoof Ointment.**—The hoof ointment sold for such is composed of Venice turpentine wax, and suet in quantities sufficient to give consistence or thickness to
the mass. Oil of tar and oil of olives, or some of the fish oils, equal parts, and sufficient lamp or ivory-black stirred in to give thickness to the whole, is probably the best ointment which can be used for the hoof of the horse.

Plasters.

Plasters are not often called for in horse and cattle diseases, but some cases arise which require a plaster over the back or loins, such as chronic sprains, lumbago, etc. Take Burgundy pitch, four parts; wax, one part; camphor, half drachm; Spanish fly, half a drachm; melt over a slow fire, spread on soft leather, and lay over the loins while warm. This will be sufficient for all purposes where a plaster is indicated. Plasters should be worn six weeks, so that the horse will reap some benefit from them.

Poultices.

Carrot Poultice.—Take of washed carrots, boil till soft, strain off the water, and bruise the carrots into a fine pulp or mass; spread upon strong cloth. Used for sores of an unhealthy kind.

Linseed Meal Poultice.—Take of boiling water one quart, stir in sufficient linseed meal with a wooden stick or spoon, and beat it well so as to have no lumps. To be spread on strong cloth or canvas, and applied.

Yeast and Charcoal Poultice.—Take yeast, one pint, and powdered charcoal sufficient to give consistence to the whole when well stirred in. This is a valuable poultice, and is not as well known as it ought to be. Used in sores discharging a stinking matter, which it soon arrests.
Spirits.

Proof Spirits.—The rectified spirits of wine, three parts by measure; water, two parts by measure; mix. This is the proper strength for making tinctures. Keep the rectified spirits by itself till wanted, the water can be added when needed.

Spirits of Camphor.—Take of camphor, two and a half ounces; rectified spirits, one pint; dissolve. Used for sprains, bruises and sores.

Tinctures.

Tincture of Arnica.—Take arnica flowers, four ounces; alcohol, one quart; macerate, or steep for one week, and strain.

Tincture of Aconite Root.—Take of the dried and bruised root, four ounces; alcohol, half a pint; macerate for two weeks, and strain. This medicine no farmer can very well do without. Those who do without it do not know its actual value. Twenty drops of the tincture of aconite root, under certain circumstances, is as valuable as the animal which may stand in need of its great curative virtues. Measured by its power in curing disease, its weight in gold is not its value.

Compound Tincture of Benzoin.—Commonly called Friar’s Balsam. Take of gum benzoin, one and a half ounces; storax, one ounce; balsam of tolu, half an ounce; aloes, in powder, two drachms; alcohol, one pint; macerate for one week, and strain or filter. Used for healing sores.

Tincture of Aloes and Myrrh.—Take aloes, in powder, one ounce; saffron, half an ounce; tincture of myrrh, half a pint; macerate for two weeks, and strain. Used for healing sores and wounds.
Tincture of Iodine.—Take of iodine, half an ounce; iodide of potassium, one ounce; alcohol, one pint; macerate for a day or so, and it is fit for use; Used as an injection for abscesses and empty cavities. It is also used by some for enlargements, in the same way as it is used for erysipelas in man, by painting the affected part.

Waters.

LIME-WATER.—Take a lump of lime or limestone of about a pound weight, lay it on a soup plate and wet it with water, which will soon convert the hard stone into a fine powder. Then put it into a stone jar holding a gallon or upwards, fill in one gallon of water, and cork it closely. It is now ready for use when wanted. The same lime may be used repeatedly, by pouring fresh water, as the other is taken out. This water is what the lime liniment is partly composed of.

TAR-WATER.—(Bishop Berkeley's Recipe.) Pour a gallon of cold water on a quart of liquid tar; stir, mix and work them together thoroughly with a wooden ladle or flat stick for five or six minutes. Then let the vessel stand, closely covered for three days and nights. Carefully skim the surface, without moving the vessel, pour off the clear solution, and keep it in bottles well corked for use. This is a useful medicine for man and horse in chest diseases, and it would be well worthy of a trial in chronic cough in the horse.

Medicines to be Kept on Hand.

The following medicines should be kept in every farmhouse, where there are horses and cows. If the farmer should not think it of sufficient importance, he should at least ascertain what is kept in the village or country store,
so that he may know exactly where to get what he may at any moment stand in need of, for his horse or cow, in case of accident or sickness. Medicines should be kept in bottles; some in wide, and others in narrow-mouthed ones. A plain label should be affixed to every bottle, and on those known to be poisonous, a dark-colored label should be used and marked Poison. This will often prevent mistakes and accident.

**Tincture of Aconite Root.**—One ounce.
**Red Iodide of Mercury.**—One drachm.
**Tincture of Nux Vomica.**—One ounce.
**Spirits of Turpentine.**—Two ounces.
**Epsom Salts.**—Two pounds.
**Simple Cerate, or Ointment.**—Two ounces.
**Linseed Oil.**—One quart.
**Aloes.**—One ounce.
**Carbonate of Ammonia.**—One pound.
**Gentian Root.**—Half a pound.
**Sulphur.**—Half a pound.
**Olive Oil.**—Half a pint.
**Chalk.**—Two pounds.
**Powdered Opium.**—One ounce.
**Ginger.**—One pound.
**Fenugreek.**—One pound.
**Sulphate of Iron.**—Half a pound.
**Caustic Potash.**—Six sticks.
**Glycerine.**—Half a pound.

**Lime-water.**
**Tannin.**—One ounce.
**Catechu.**—One ounce.
**Sulphuric Ether.**—Two ounces.
**Blue Stone.**—Two ounces.
**Oxide of Zinc.**—Four ounces.
**Sulphuric Acid.**—One pound.
**Spirits of Salt.**—One pound.
**Sulphite of Soda.**—One pound.
Spanish Fly.—Half an ounce.
Carbolic Acid (in crystals).—One ounce.
Creosote.—Half an ounce.
Alcohol.—One pint.
Cotton, or Tow.—One pound.
Laudanum.—Two ounces.
Nitrate of Silver.—Two sticks.
Chloride of Lime.—A few pounds.
Powdered Charcoal.—A few pounds.
Black Oxide of Manganese.—Three ounces.
Roll Sulphur.—Half a pound.
Liver of Sulphur.—Three ounces.

Table of Doses According to Age.

If the dose is for a full-grown animal, of whatever kind, let it be one ounce.
A colt of one year will require one-third of an ounce.
A two year old will require one-half of an ounce.
A three year old will require three-fourths of an ounce.

The same proportion may be observed in cattle, from one year old and upwards. But a calf, a week or two old, will require another division of dose, still following the same rule. The dose for a one year old is one-third of the dose of an adult, or full-grown ox. Then the dose for a calf of four weeks will be one-twelfth of that given to a one year old, and a two months' old calf or colt, will require one-sixth of that of a one year old animal. For a one week old animal, the dose will be one-fourth of that of the animal aged four weeks. The rule and the dose are merely approximated, but it is the best and only plan we can offer, as a rule or guide for a posological table. Some persons have advocated a decrease in the dose for old animals. This I cannot favor, as but few horses live to be so
old that a full dose of medicine would be an injury to them. The great trouble with aged horses, is not from a failure of the constitution and the general system, but from defect in the teeth, whereby, in winter, they are nearly starved, because of inability to masticate what they eat. If their food could be prepared, as is done for old men, their lives and usefulness would be prolonged; then it would be time enough to think of diminishing the dose for old horses.

**Articles Necessary for Measuring, Weighing, Etc.**

One pair of scales and weights capable of weighing from one grain to one ounce.

Two glass measures, one measuring from five drops to sixty—the other from one drachm to six ounces.

One wedgewood mortar, with pestle to match.

One tile for making ointment upon.

Two spatulas, or round-edged knives, for mixing and dividing powders, and mixing ointments.

A few small bottles with corks, to hold from one to eight ounces.

A few labels for pasting on the bottles, with directions for the use of the medicine.

A few labels with the word “poison.”

A few sponges.

One ox's horn cut sloping at the wide end for drenching horses or cattle, which is better than a bottle. A bottle made of block tin, in the shape of a champagne bottle, is a good article for drenching with.

**Equivalents.**

A tablespoonful is equal to half an ounce by measure.

A desert-spoonful is equal to two fluid drachms.

A teaspoonful is equal to one fluid drachm.
A wineglassful is equal to one and a half fluid ounces. The surest way, however, to get the true quantity is to have the article measured by properly graduated weights and measures. It will not, however, be necessary to weigh each powder separately. Thus, half a pound of ginger can be equally divided into ten or twelve equal parts with a knife, without the trouble of weighing each powder separately.

**Swine.**

**American Swine.**

In the United States, swine have been an object of attention since its earliest settlement, and whenever a profitable market has been found for pork abroad, it has been exported to the full extent of the demand. Swine are not, however, indigenous to this country, but were doubtless originally brought hither by the early English settlers; and the breed thus introduced may still be distinguished by the traces they retain of their parent stock. France, also, as well as Spain, and, during the existence of the slave-trade, Africa, have also combined to furnish varieties of this animal, so much esteemed throughout the whole country, as furnishing a valuable article of food. For nearly twenty years following the commencement of the general European wars, soon after the organization of our national government, pork was a comparatively large article of commerce; but exports for a time diminished and it was not until within a more recent period that this staple has been brought up to its former standard as an article of exportation to that country. The recent use
which has been made of its carcass in converting it into lard oil, has tended to still further increase its consumption.

They are reared in every part of the Union, and, when properly managed, always at a fair profit. At the extreme North, in the neighborhood of large markets, and on such of the Southern plantations as are particularly suited to sugar or rice, they should not be raised beyond the number required for the consumption of the coarse or refuse food produced. Swine are advantageously kept in connection with a dairy or orchard; since, with little additional food besides what is thus afforded, they can be put in good condition for the butcher.

On the rich bottoms and other lands of the West, however, where Indian corn is raised in profusion and at small expense, they can be reared in the greatest numbers and yield the largest profit. The Sioto, Miami, Wabash, Illinois, and other valleys, and extensive tracts in Kentucky, Tennessee, Missouri, and some adjoining States, have for many years taken the lead in the production of swine; and it is probable that the climate and soil, which are peculiarly suited to their rapid growth, as well as that of their appropriate food, will enable them to hold their position as the leading pork-producers of the North American Continent.

The breeds cultivated in this country are numerous;
and, like our native cattle, they embrace many of the best, and a few of the worst, to be found among the species. Great attention has been paid, for many years, to their improvement in the Eastern States; and nowhere are there better specimens than in many of their yards. This spirit has rapidly extended West and South; and among most of the intelligent farmers, who make them a leading object of attention, on their rich corn-grounds, swine have attained a high degree of excellence. This does not consist in the introduction and perpetuity of any distinct races, so much as in the breeding up to a desirable size and aptitude for fattening, from such meritorious individuals of any breed, or their crosses, as come within their reach.

The Byefield.

This breed was formerly in high repute in the Eastern States, and did much good among the species generally. They are white, with fine curly hair, well made and compact, moderate in size and length, with broad backs, and at fifteen months attaining some three hundred to three hundred and fifty pounds net.

The Bedford.

The Bedford, or Woburn, is a breed originating with the Duke of Bedford, on his estate at Woburn, and brought to their perfection, probably, by judicious crosses of the Chinese hog on some of the best English swine. A pair was sent by the duke to this country, as a present to General Washington; but they were dishonestly sold by the messenger, in Maryland, in which State, and in Pennsylvania, they were productive of much good at an early day, by their extensive distribution through different States. Several other importations of this breed have been made
LIVE STOCK — SWINE.

at various times, and especially by the enterprising masters of the Liverpool packets, in the neighborhood of New York. They are a large, spotted animal, well made, and inclining to early maturity and fattening. This is an exceedingly valuable hog, but nearly extinct, both in England and in this country, as a breed.

The Leicester.

The old Leicestershire breed, in England, was a perfect type of the original hogs of the midland counties; large, ungainly, slab-sided animals, of a light color, and spotted with brown or black. The only good parts about them were their heads and ears, which showed greater traces of breeding than any other portions. These have been materially improved by various crosses, and the original breed has nearly lost all its peculiarities and defects. They may now be characterized as a large, white hog, generally coarse in the bone and hair, great eaters, and slow in maturing. Some varieties differ essentially in those particulars, and mature early on a moderate amount of food. The crosses with small compact breeds are generally thrifty, desirable animals.

The Yorkshire.

The old Yorkshire breed was one of the very large varieties, and one of the most unprofitable for a farmer, being greedy feeders, difficult to fatten, and unsound in constitution. They were of a dirty white or yellow color, spotted with black, had long legs, flat sides, narrow backs, weak loins, and large bones. Their hair was short and wiry, and intermingled with numerous bristles about the head and neck, and their ears long. When full-grown and fat, they seldom weighed more than from three hundred and fifty to four hundred pounds.
These have been crossed with pigs of the improved Leicester breed; and where the crossings have been judiciously managed, and not carried too far, a fine race of deep-sided, short-legged, thin-haired animals has been obtained, fattening kindly, and rising to a weight of from two hundred and fifty to four hundred pounds, when killed between one and two years old; and when kept over two years, reaching even from five hundred to seven hundred pounds.

They have also been crossed with the Chinese, Neapolitan, and Berkshire breeds, and hardy, profitable, well-proportioned animals thereby obtained. The original breed, in its purity, size, and defectiveness, is now hardly to be met with, having shared the fate of other large old breeds, and given place to smaller and more symmetrical animals. The *Yorkshire white* is among the large breeds deserving commendation among us. To the same class belong, also, the large *Miami white* and the *Kenilworth*; each frequently attaining, when dressed, a weight of from six hundred to eight hundred pounds.

**The Suffolk.**

The old Suffolks are white in color, long-legged, long-bodied, with narrow backs, broad foreheads, short hams, and abundance of bristles. They are by no means profitable animals. A cross between the Suffolk and Lincoln has produced a hardy animal, which fattens kindly, and attains the weight of from four hundred to five hundred and fifty, and even seven hundred pounds. Another cross, much approved by farmers, is that of the Suffolk and Berkshire.

There are few better breeds, perhaps, than the improved Suffolk—that is, the Suffolk crossed with the Chinese. The greater part of the pigs on the late Prince Albert's
farm, near Windsor, were of this breed. They are well-formed, compact, of medium size, with round, bulky bodies, short legs, small heads and fat cheeks. Many, at a year or fifteen months old, weigh from two hundred and fifty to three hundred pounds; at which age they make fine bacon hogs. The sucking-pigs are also very delicate and delicious.

Those arising from Berkshire and Suffolk are not so well shaped as the latter, being coarser, longer-legged, and more prominent about the hips. They are mostly white, with thin, fine hair; some few are spotted, and are easily kept in fine condition; they have a decided aptitude to fatten early, and are likewise valuable as store-pigs.

The Berkshire.

The Berkshire pigs belong to the large class, and are distinguished by their color, which is a sandy or whitish brown, spotted regularly with the dark brown or black spots, and by their having no bristles. The hair is long, thin, somewhat curly, and looks rough; the ears are fringed with long hair round the outer edge, which gives them a ragged or feathery appearance; the body is thick, compact, and well formed; the legs short, the sides broad, the head well set on, the snout short, the jowl thick, the
ears erect, skin exceedingly thin in texture, the flesh firm and well flavored, and the bacon very superior. This breed has generally been considered one of the best in England, on account of its smallness of bone, early maturity, aptitude to fatten on little food, hardihood, and the females being good breeders. Hogs of the pure original breed have been known to weigh from eight hundred to nine hundred and fifty pounds.

Numerous crosses have been made from this breed; the principal foreign ones are those with the Chinese and Neapolitan swine, made with the view of decreasing the size of the animal, improving the flavor of the flesh, and rendering it more delicate; and the animals thus attained are superior to almost any others in their aptitude to fatten; but are very susceptible to cold, from being almost entirely without hair. A cross with the Suffolk and Norfolk also is much improved, which produces a hardy kind, yielding well when sent to the butcher; although, under most circumstances, the pure Berkshire is the best.

No other breeds have been so extensively diffused in the United States, within comparatively so brief a period, as the Berkshires, and they have produced a marked improvement in many of our former races. They weigh variously, from two hundred and fifty to four hundred
pounds net, at sixteen months, according to their food and style of breeding; and some full-grown have dressed to more than eight hundred pounds. They particularly excel in their hams, which are round, full and heavy, and contain a large proportion of lean, tender, and juicy meat of the best flavor.

None of our improved breeds afford long, coarse hair or bristles; and it is a gratifying evidence of our decided improvement in this department of domestic animals, that our brush-makers are obliged to import most of what they use from Russia and northern Europe. This improvement is manifest not only in the hair, but in the skin, which is soft and mellow to the touch; in the finer bones, shorter head, upright ears, dishing face, delicate muzzle, and wild eye; and in the short legs, low flanks, deep and wide chest, broak back, and early maturity.

Breeding and Management

In the selection of a boar and sow for breeding, much more attention and consideration are requisite than is generally imagined. It is as easy, with a very little judgment and management, to procure a good as an inferior breed; and the former is much more remunerative, in proportion to the outlay, than the latter can possibly ever be.

The object of the farmer or breeder is to produce and retain such an animal as will be best adapted to the purpose he has in view, whether that is the consumption of certain things which could not otherwise be so well disposed of, the converting into hams, bacon, and pork, or the raising of sucking-pigs and porkers for the market.
Almost all farmers keep one or more pigs to devour the offal and refuse, which would otherwise be wasted. This is, however, a matter totally distinct from breeding swine. In the former case, the animal or animals are purchased young for a small price, each person buying as many as he considers he shall have food enough for, and then sold to the butcher, or killed, when in proper condition; and thus a certain degree of profit is realized. In the latter, many contingencies must be taken into account: the available means of feeding them; whether or not the food may be more profitably disposed of; the facilities afforded by railroads, the vicinity of towns, or large markets, etc., for disposing of them.

In the breeding of swine, as much as that of any other live stock, it is important to pay great attention, not only to the breed, but also to the choice of individuals. The sow should produce a great number of young ones, and she must be well fed to enable her to support them. Some sows bring forth ten, twelve, or even fifteen pigs at a birth; but eight or nine is the usual number; and sows which produce fewer than this must be rejected. It is, however, probable that fecundity depends also on the boar; he should, therefore, be chosen from a race which multiplies quickly.

If a bacon and a late market be objects, the large and heavy varieties should be selected, care being taken that the breed has the character of possessing those qualities
most likely to insure a heavy return — growth, and facility of taking fat. Good one-year bacon-hogs being in great demand, they may be known by their long bodies, low bellies, and short legs. With these qualities are usually coupled long, pendulous ears, which attract purchasers. If, however, hogs are to be sold at all seasons to the butchers, the animals must attain their full growth and be ready for killing before they are a year old. This quality is particularly prominent in the Chinese breed; but among our ordinary varieties, hogs are often met with better adapted for this purpose than for producing large quantities of bacon and lard. The Berkshire crossed with Chinese is an excellent porker.

The sow should be chosen from a breed of proper size and shape, sound and free from blemishes and defects. In every case — whether the object be pork or bacon — the points to be looked for in the sow are a small, lively head; a broad and deep chest; round ribs; capacious barrel; a haunch falling almost to the hough; deep and broad loin; ample hips; and considerable length of body, in proportion to its height. One qualification should ever be kept in view, and, perhaps, should be the first point to which the attention should be directed — that is, smallness of bone. She should have at least twelve teats; for it is observed that each pig selects a teat for himself and keeps to it, so that a pig not having one belonging to him would be starved. A good sow should produce a great number of pigs, all of equal vigor. She must be very careful of them, and not crush them by her weight; above all, she must not be addicted to eating the afterbirth, and, what may often follow, her own young. If a sow is tainted with those bad habits, or if she has difficult labors, or brings forth dead pigs, she must be spayed forthwith. It is, therefore, well to bring up several young sows at once, so as to keep those only which are free from defects. Breeding sows and boars should never be raised from defective
animals. Sows that have very low bellies, almost touching the ground, seldom produce large or fine litters. A good-sized sow is generally considered more likely to prove a good breeder and nurse, and to farrow more easily and safety than a small, delicate animal.

The ancients considered the distinguishing marks of a good boar to be a small head, short legs, a long body, large thighs and neck, and this latter part thickly covered with strong, erect bristles. The most experienced modern breeders prefer an animal with a long, cylindrical body; small bones; well-developed muscles; a wide chest, which denotes strength of constitution; a broad, straight back; short head and fine snout; brilliant eyes; a short, thick neck; broad, well-developed shoulders; a loose, mellow skin; fine, bright, long hair, and few bristles; and small legs and hips. Some give the preference to long, flapping ears; but experience seems to demonstrate that those animals are best which have short, erect, fine ears. The boar should always be vigorous and masculine in appearance.

Few domesticated animals suffer so much from in-and-in breeding as swine. Where this system is pursued, the number of young ones is decreased at every litter, until the sows become, in a manner, barren. This practice also undoubtedly contributes to their liability to hereditary diseases, such as scrofula, epilepsy, and rheumatism; and when those possessing any such diseases are coupled, the ruin of the flock is easily and speedily effected, since they are propagated by either parent, and always most certainly and in most aggravated form, when occurring in both. As soon as the slightest degeneracy is observed, the breed should be crossed from time to time, keeping sight, however, while so doing, of the end in view. The Chinese will generally be found the best which can be used for this purpose; since a single cross, and even two, with one of these animals, will seldom do harm, but often effect con-
siderable improvements. The best form of the progeny resulting from this cross must be selected as breeders, and with them the old original stock crossed back again. Selection, with judicious and cautious admixture, is the true secret of forming and improving the breed. Repeated and indiscriminate crosses are as injurious as an obstinate adherence to one particular breed, and as much to be avoided.

The following rules for the selection of the best stock of hogs will apply to all breeds:

Fertility.—In a breeding sow, this quality is essential, and it is one which is inherited. Besides this, she should be a careful mother. A young, untried sow will generally display in her tendencies those which have predominated in the race from which she has descended. Both boar and sow should be sound, healthy, and in fair, but not over-fat, condition.

Form.—Where a farmer has an excellent breed, but with certain defects, or too long in the limb, or too heavy in the bone, the sire to be chosen, whether of a pure or of a cross breed, should exhibit the opposite qualities, even to an extreme; and be, moreover, one of a strain noted for early and rapid fattening. If in perfect health, young stock selected for breeding will be lively, animated, hold up the head, and move freely and nimbly.

Bristles.—These should be fine and scanty, so as to show the skin smooth and glossy; coarse, wiry, rough bristles usually accompany heavy bones, large, spreading hoofs, and flapping ears, and thus become one of the indications of a thick-skinned and low breed.

Color.—Different breeds of high excellence have their own colors; white, black, parti-colored, white-and-black, sandy, mottled with large marks of black, are the most prevalent. A black skin, with short, scanty bristles, and small stature, demonstrate the prevalence of the Neapolitan strain, or the black Chinese, or, perhaps, an admixture of
both. Many prefer white; and in sucking-pigs, destined for the table, and for porkers, this color has its advantages, and the skin looks more attractive; it is, however, generally thought that the skin of black hogs is thinner than that of white, and less subject to eruptive diseases.

The influence of a first impregnation upon subsequent progeny by other males is at times curiously illustrated. This has been noticed in respect of the sow. A sow of the black-and-white breed, in one instance, became pregnant by a boar of the wild breed of a deep chestnut color. The pigs produced were duly mixed, the color of the boar being very predominant in some. The sow being afterwards put to a boar of the same breed as herself, some of the produce were still stained, or marked, with the chestnut color which prevailed in the first litter; and the same occurred after a third impregnation, the boar being then of the same kind as herself. What adds to the force of this case is, that, in the course of many years' observation, the breed in question was never known to produce progeny having the slightest tinge of chestnut color.

A sow is capable of conceiving at the age of six or seven months; but it is always better not to let her commence breeding too early, as it tends to weaken her. From ten to twelve months—and the latter is preferable—is about the best age. The boar should be, at least, a twelve-month old—some even recommend eighteen months, at least—before he is employed for the purpose of propagating his species. If, however, the sow has attained her second year, and the boar his third, a vigorous and numerous offspring is more likely to result. The boar and sow retain their ability to breed for almost five years; that is, until the former is upward of eight years old, and the latter seven. It is not advisable, however, to use a boar after he has passed his fifth year, nor a sow after her fourth, unless she has proved a peculiarly valuable breeder—in which case, she might produce two or three more litters.
A boar left on the pasture, at liberty with the sows, might suffice for thirty or forty of them; but as he is commonly shut up, and allowed access at stated times only, so that the young ones may be born at nearly the same time, it is usual to allow him to serve from six to ten—on no account should he serve more. The best plan is, to shut up the boar and sow in a sty together; for, when turned in among several females, he is apt to ride them so often that he exhausts himself without effect. The breeding boar should be fed well and kept in high condition, but not fat. Full-grown boars being often savage and difficult to tame, and prone to attack men and animals, should be deprived of their tusks.

Whenever it is practicable, it should always be so arranged that the animals shall farrow early in the spring, and at the latter end of summer, or quite the beginning of autumn. In the former case, the young pigs will have the run of the early pastures, which will be a benefit to them, and a saving to their owners; and there will also be more whey, milk and other dairy produce which can be spared for them by the time they are ready to be weaned. In the second case, there will be sufficient time for the young to have grown and acquired strength before the cold weather comes on, which is always very injurious to sucking pigs.

Points of a Good Hog.

It may be not amiss to group together what is deemed desirable under this head. No one should be led away by mere name in his selection of a hog. It may be called a Berkshire, or a Suffolk, or any other breed most in estimation, and yet, in reality, may possess none of this valuable blood. The only sure way to avoid imposition is, to make name always secondary to points. If a hog is found possessing such points of form as are calculated to insure early
maturity and faculty of taking on flesh, no one needs to care but little by what name he is called; since no mere name can bestow value upon an animal deficient in the qualities already indicated.

The true Berkshire—that possessing a dash of the Chinese and Neapolitan varieties—comes, perhaps, nearer to the desired standard than any other.

The chief points which characterize such a hog are the following: In the first place, sufficient depth of carcass, and such an elongation of body as will insure a sufficient lateral expansion. The loin and breast should be broad.

The breadth of the former denotes good room for the play of the lungs, and, as a consequence, a free and healthy circulation, essential to the thriving or fattening of any animal. The bone should be small, and the joints fine—nothing is more indicative of high breeding than this; and the legs should be no longer than, when fully fat, would just prevent the animal's belly from trailing upon the ground. The leg is the least profitable portion of the hog, and no more of it is required than is absolutely necessary for the support of the rest. The feet should be firm and sound; the toes should lie well together, and press straightly upon the ground; the claws, also, should be even, upright and healthy.
The form of the head is sometimes deemed of little or no consequence, it being generally, perhaps, supposed that a good hog may have an ugly head; but the head of all animals is one of the very principal points in which pure or impure breeding will be most obviously indicated. A high-bred animal will invariably be found to arrive more speedily at maturity, to take flesh more easily, and at an earlier period, and, altogether, to turn out more profitably than one of questionable or impure stock. Such being the case, the head of the hog is a point by no means to be overlooked. The description of head most likely to promise—or, rather to be the accompaniment of—high breeding, is one not carrying heavy bones, not too flat on the forehead, or possessing a snout too elongated; the snout should be short, and the forehead rather convex, curving upward; and the ear, while pendulous, should incline somewhat forward, and at the same time be light and thin. The carriage of the pig should also be noticed. If this be dull, heavy, and dejected, one may reasonably suspect ill health, if not some concealed disorder actually existing, or just about to break forth; and there cannot be a more unfavorable symptom than a hung-down, slouching head. Of course, a fat hog for slaughter and a sow heavy with young, have not much sprightliness of deportment.

Color is, likewise, not to be disregarded. Those colors are preferable which are characteristic of the most esteemed breeds. If the hair is scant, black is desirable, as denoting connection with the Neapolitan; if too bare of hair, a too intimate alliance with that variety may be apprehended, and a consequent want of hardihood, which—however unimportant, if pork be the object—renders such animals a hazardous speculation for store purposes, on account of their extreme susceptibility of cold, and consequent liability to disease. If white, and not too small, they are valuable as exhibiting connection with the Chinese. If light, or sandy, or red with black marks, the favorite Berkshire is
detected; and so on, with reference to every possible variety of hue.

**Treatment During Pregnancy.**

Sows with pigs should be well and judiciously fed; that is to say, they should have a sufficiency of wholesome, nutritious food to maintain their strength and keep them in good condition, but should by no means be allowed to get fat; as when they are in high condition, the dangers of parturition are enhanced, the animal is more awkward and liable to smother and crush her young, and, moreover, never has as much or as good milk as a leaner sow. She should also have a separate sty; for swine are prone to lie so close together that if she is even among others, her young would be in great danger; and this sty should be perfectly clean and comfortably littered, but not so thickly as to admit of the young being able to bury themselves in the straw.

As the time of her farrowing approaches, she should be well supplied with food, especially if she be a young sow, and this her first litter, and also carefully watched, in order to prevent her devouring the afterbirth, and thus engendering a morbid appetite which will next induce her to fall upon her own young. A sow that has once done this can never afterward be depended upon. Hunger, thirst, or irritation of any kind, will often induce this unnatural conduct, which is another reason why a sow about to farrow should have a sty to herself, and be carefully attended to, and have all her wants supplied.

**Abortion.**

This is by no means of so common occurrence in the case of the sow as in many other of the domesticated animals. Various causes tend to produce it: insufficiency
of food, eating too much succulent vegetable food, or unwholesome, unsubstantial diet; blows and falls; and the animal's habit of rubbing itself against hard bodies, for the purpose of allaying the irritation produced by the vermin or cutaneous eruptions to which it is subject. Reiterated copulation does not appear to produce abortion in the sow; at least to the extent it does in other animals.

The symptoms indicative of approaching abortion are similar to those of parturition, but more intense. These are, generally, restlessness, irritation, and shivering; and the cries of the animal evince the presence of severe labor-pains. Sometimes the rectum, vagina, or uterus, becomes relaxed, and one or the other protrudes, and often becomes inverted at the moment of the expulsion of the foetus, preceded by the placenta, which presents itself foremost.

Nothing can be done at the last hour, to prevent abortion; but, from the first, every predisposing cause should be removed. The treatment will depend upon circumstances. Where the animal is young, vigorous, and in high condition, bleeding will be beneficial—not a copious blood-letting, but small quantities taken at different times; purgatives may also be administered. If, when abortion has taken place, the whole of the litter was not born, emollient injections may be resorted to with considerable benefit; otherwise, the after treatment should be made the same as in parturition, and the animal should be kept warm, quiet, and clean, and allowed a certain degree of liberty. Whenever one sow has aborted, the causes likely to have produced this accident should be sought, and an endeavor made, by removing them, to secure the rest of the inmates of the piggery from a similar mishap.

In cases of abortion, the foetus is seldom born alive, and often has been dead for some days; where this is the case—which may be readily detected by a peculiarly unpleasant putrid exhalation, and the discharge of a fetid liquid from the vagina—the parts should be washed with a
diluted solution of chloride of lime, in the proportion of one part of chloride to three parts of water, and a portion of this lotion gently injected into the uterus, if the animal will submit to it. Mild doses of Epsom salts, tincture of gentian, and Jamaica ginger, will also act beneficially in such cases, and, with attention to diet, soon restores the animal.

**Parturition.**

The period of gestation varies according to age, constitution, food, and the peculiarities of the individual breed. The most usual period during which the sow carries her young is, according to some, three months, three weeks, and three days or one hundred and eight days; according to others, four lunar months, or sixteen weeks, or about one hundred and thirteen days. It may safely be said to range from one hundred and nine to one hundred and forty-three days.

The sow produces from eight to thirteen young at a litter, and sometimes even more. Young and weakly sows not only produce fewer pigs, but farrow earlier than those of maturer age and sounder condition; and besides, as might be expected, their offspring are deficient in vigor; oftentimes, indeed, puny and feeble. Extraordinary fecundity is not, however, desirable, for nourishment cannot be afforded to more than twelve, the sow’s number of teats. The supernumerary pigs must therefore suffer; if but one, it is, of course, the smallest and weakest; a too numerous litter are all, indeed, generally undersized and weakly, and seldom or never prove profitable; a litter not exceeding ten will usually be found to turn out most advantageously. On account of the discrepancy between the number farrowed by different sows, it is a good plan, if it can be managed, to have more than one breeding at the same time, in order that the number to be suckled by each
may be equalized. The sow seldom recognizes the presence of a strange little one, if it has been introduced among the others during her absence, and has lain for half an hour or so among her own offspring in their sty.

The approach of the period of farrowing is marked by the immense size of the belly, by a depression of the back, and by the distention of the teats. The animal manifests symptoms of acute suffering, and wanders restlessly about, collecting straw, and carrying it to her sty, grunting piteously meanwhile. As soon as this is observed, she should be persuaded into a separate sty, and carefully watched. On no account should several sows be permitted to farrow in the same place at the same time, as they will inevitably irritate each other, or devour their own or one another's young.

The young ones should be taken away as soon as they are born, and deposited in a warm spot; for the sow being a clumsy animal, is not unlikely in her struggles to overlie them; nor should they be returned to her, until all is over, and the afterbirth has been removed, which should always be done the moment it passes from her; for young sows, especially, will invariably devour it, if permitted, and then, as the young are wet with a similar fluid, and smell the same, they will eat them also, one after another. Some advise washing the backs of young pigs with a decoction of aloes, colocynth, or some other nauseous substance, as a remedy for this; but the simplest and easiest one is to remove the little ones until all is over, and the mother begins to recover herself and seek about for them, when they should be put near her. Some also recommend strapping up the sow's mouth for the first three or four days, only releasing it to admit of her taking her meals.

Some sows are apt to lie upon and crush their young. This may best be avoided by not keeping her too fat or heavy, and by not leaving too many young upon her. The straw forming the bed should likewise be short, and not in
too great quantity, lest the pigs get huddled up under it, and the sow unconsciously over-lie them in that condition.

It does not always happen that the parturition is effected with ease. Cases of false presentation, of enlarged fetus, and of debility in the mother, often render it difficult and dangerous. The womb will occasionally become protruded and inverted, in consequence of the forcing pains of difficult parturition, and even the bladder has been known to come away. These parts must be returned as soon as may be; and if the womb has come in contact with the dung or litter, and acquired any dirt, it must be washed in lukewarm water, and then returned, and confined in its place by means of a suture passed through the lips of the orifice. The easiest and perhaps the best way, however, is not to return the protruded parts at all, but merely tie a ligature round them and leave them to slough off, which they will do in the course of a few days without effusion of blood, or further injury to the animal. No sow that has once suffered from protrusion of the womb should be allowed to breed again.

**Treatment While Suckling.**

Much depends upon this; as many a fine sow and promising litter have been ruined for want of proper and judicious care at this period. Immediately after farrowing, many sows incline to be feverish; where this is the case, a light and sparing diet only should be given them for the first day or two, as gruel, oatmeal porridge, whey, and the like. Others, again, are very much debilitated, and require strengthening; for them, strong soup, bread steeped in wine, or in a mixture of brandy and sweet spirits of nitre, administered in small quantities, will often prove highly beneficial.

The rations must gradually be increased and given
more frequently; and they must be composed of wholesome, nutritious, and succulent substances. All kinds of roots—carrots, turnips, potatoes, and beet-roots—well steamed or boiled, but never raw, may be given; bran, barley, and oatmeal, bran flour, Indian corn, whey, sour, skim, and butter-milk, are all well adapted for this period; and, should the animal appear to require it, grain well bruised and macerated may be added. Whenever it is possible, the sow should be turned out for an hour each day, to graze in a meadow or clover-field, as the fresh air, exercise, and herbage will do her immense good. The young pigs must be shut up for the first ten days or fortnight, after which they will be able to follow her, and take their share of the benefit.

The food should be given regularly at certain hours; small and often-repeated meals are far preferable to large ones, since indigestion or any disarrangement of the functions of the stomach vitiates the milk, and produces diarrhea and other similar affections in the young. The mother should always be well fed, but not over-fed; the better and more carefully she is fed, the more abundant and nutritious will her milk be, the better will the sucking pigs thrive, and the less will she be reduced by suckling them.

When a sow is weakly, and has not a sufficiency of milk, the young pigs must be taught to feed as early as possible. A kind of gruel, made of skim-milk and bran, or oatmeal, is a good thing for this purpose, or potatoes, boiled and then mashed in milk or whey, with or without the addition of a little bran or oatmeal. Toward the period when the pigs are to be weaned, the sow must be less plentifully fed, otherwise the secretion of milk will be as great as ever; it will, besides, accumulate, and there will be hardness, and perhaps inflammation of the teats. If necessary, a dose of physic may be given to assist in carrying off the milk; but, in general, a little judicious
management in the feeding and weaning will be all that is required.

**Treatment of Young Pigs.**

For the first ten days, or a fortnight, the mother will generally be able to support her litter without assistance, unless, as has been already observed, she is weakly, or her young are too numerous; in either of which cases they must be fed from the first. When the young pigs are about a fortnight old, warm milk should be given to them. In another week, this may be thickened with some species of farina; and afterward, as they gain strength and increase in size, boiled roots and vegetables may be added. As soon as they begin to eat, an open frame or railing should be placed in the sty, under which the little pigs can run, and on the other side of this should be the small troughs containing their food; for it never answers to let them eat out of the same trough with their mother, because the food set before her is generally too strong and stimulating for them, even if they should secure any of it, which is, to say the least, extremely doubtful. Those intended to be killed for sucking-pigs should not be above four weeks old; most kill them for this purpose on the twenty-first or twenty-second day. The others, excepting those kept for breeding, should be castrated at the same time.

**Castration and Spaying.**

Pigs are chiefly castrated with a view to fattening them; and doubtless, this operation has the desired effect—for at the same time that it increases the quiescent qualities of the animal, it diminishes also his courage, spirits, and nobler attributes, and even affects his form. The tusks of a castrated boar never grow like those of the natural animal, but always have a dwarfed, stunted appearance.
operation, if possible, should be performed in the spring or autumn, as the temperature is the more uniform, and care should be taken that the animal is in perfect health. Those which are fat and plethoric should be prepared by bleeding, cooling diet and quiet. Pigs are castrated at all ages, from a fortnight to three, six and eight weeks, and even four months old.

There are various modes of performing this operation. If the pig is not more than six weeks old, an incision is made at the bottom of the scrotum, the testicle pushed out, and the cord cut, without any precautionary means whatever. When the animal is older, there is reason to fear that hemorrhage, to a greater or less extent, will supervene; consequently, it will be advisable to pass a ligature round the cord a little above the spot where the division is to take place.

By another mode—to be practiced only on very young animals—a portion of the base of the scrotum is cut off, the testicles forced out, and the cord sawn through with a somewhat serrated but blunt instrument. If there is any hemorrhage, it is arrested by putting ashes in the wound. The animal is then dismissed and nothing further done with him.

On animals two and three years old, the operation is sometimes performed in the following manner: An assistant holds the pig, pressing the back of the animal against his chest and belly, keeping the head elevated, and grasping all the four legs together; or, which is the preferable way, one assistant holds the animal against his chest, while another kneels down and secures the four legs. The operator then grasps the scrotum with his left hand, makes one horizontal incision across its base, opening both divisions of the bag at the same time. The testicles are then pressed out with his finger and thumb, and removed with a blunt knife, which lacerates the part without bruising it and rendering it painful. Laceration only is requisite in order
to prevent the subsequent hemorrhage which would occur if the cord were simply severed by a sharp instrument. The wound is then closed by pushing the edges gently together with the fingers, and it speedily heals. Some break the spermatic cord without tearing it; they twist it, and then pull it gently and firmly until it gives way.

In other cases, a waxed cord is passed as tightly as possible round the scrotum, above the epididymus, which completely stops the circulation, and in a few days the scrotum and testicles will drop off. This operation should never be performed on pigs of more than six weeks of age, and the spermatic should always, first of all, be measured. It, moreover, requires great nicety and skill; otherwise accidents will occur, and considerable pain and inflammation be caused. Too thick a cord, a knot not tied sufficiently tight, or a portion of the testicle included in the ligature, will prevent its success.

The most fatal consequence of castration is tetanus, or lockjaw, induced by the shock communicated to the nervous system by the torture of the operation.

Spaying.

This operation consists in removing the ovaries, and sometimes a portion of the uterus, more or less considerable, of the female. The animal is laid upon its left side, and firmly held by one or two assistants; an incision is then made into the flank, the forefinger of the right hand introduced into it, and gently moved about, until it encounters and hooks hold of the right ovary, which it draws through the opening; a ligature is then passed round this one, and the left ovary felt for in like manner. The operator then severs these two ovaries, either by cutting or tearing, and returns the womb and its appurtenances to their proper position. This being done, he closes the
wound with two or three stitches, sometimes rubs a little oil over it, and releases the animal. All goes on well, for the healing power of the pig is very great.

The after-treatment is very simple. The animals should be well littered with clean straw, in styes weather-tight and thoroughly ventilated; their diet should be cared for; some milk or whey, with barley-meal, is an excellent article; it is well to confine them for a few days, as they should be prevented from getting into cold water or mud until the wound is perfectly healed, and also from creeping through fences.

The best age for spaying a sow is about six weeks; indeed, as a general rule, the younger the animal is when either operation is performed, the quicker it recovers. Some persons, however, have two or three litters from their sows before they operate upon them; where this is the case, the result is more to be feared, as the parts have become more susceptible, and are, consequently, more liable to take on inflammation.

Weaning.

Some farmers wean the pigs a few hours after birth, and turn the sow at once to the boar. The best mode, however, is to turn the boar into the hog-yard about a week after parturition, at which time the sow should be removed a few hours daily from her young. It does not injure either the sow or her pigs, if she takes the boar while suckling; but some sows will not do so until the drying of their milk.

The age at which pigs may be weaned to the greatest advantage is when they are about eight or ten weeks old; many, however, wean them as early as six weeks, but they seldom turn out as well. They should not be taken from the sow at once, but gradually weaned. At first they should be removed from her for a certain number of hours
each day, and accustomed to be impelled by hunger to eat from the trough; then they may be turned out for an hour without her, and afterward shut up while she also is turned out by herself. Subsequently, they must only be allowed to suck a certain number of times in twenty-four hours; perhaps six times at first, then four, then three, and, at last, only once; and meanwhile they must be proportionally better and more plentifully fed, and the mother's diet in a like manner diminished. Some advise that the whole litter should be weaned at once; this is not best, unless one or two of the pigs are much weaker and smaller than the others; in such case, if the sow remain in tolerable condition, they might be suffered to suck for a week longer; but this should be the exception, and not a general rule.

Pigs are more easily weaned than almost any other animals, because they learn to feed sooner; but attention must, nevertheless, be paid to them, if they are to grow up strong, healthy animals. Their styes must be warm, dry, clean, well-ventilated, and weather-tight. They should have the run of a grass meadow or enclosure for an hour or two every fine day, in spring and summer, or be turned into the farm-yard among the cattle in the winter, as fresh air and exercise tend to prevent them from becoming rickety or crooked in the legs.

The most nutritious and succulent food that circumstances will permit should be furnished them. Newly-weaned pigs require five or six meals in the twenty-four hours. In about ten days, one may be omitted; in another week, a second; and then they should do with three regular meals each day. A little sulphur mingled with the food or a small quantity of Epsom or Glauber salts dissolved in the water, will frequently prove beneficial. A plentiful supply of clear, cold water should always be within their reach; the food left in the trough after the animals have finished eating should be removed, and the trough thoroughly rinsed out before any more is put into it. Strict attention
should also be paid to cleanliness. The boars and sows should be kept apart from the period of weaning.

The question, which is more profitable, to breed swine, or to buy young pigs and fatten them, can best be determined by those interested; since they know best what resources they can command, and what chance of profits each of these separate branches offers.

Ringing.

This operation is performed to counteract the propensity which swine have of digging and furrowing up the earth. The ring is passed through what appears to be a prolongation of the septum, between the supplemental, or snout-bone, and the nasal. The animal is thus unable to obtain sufficient purchase to use his snout with any effect, without causing the ring to press so painfully upon the part that he is forced to desist. The ring, however, is apt to break, or it wears out in process of time, and has to be replaced.

The snout should be perforated at weaning-time, after the animal has recovered from castration or spaying; and it will be necessary to renew the operation as it becomes of large growth. It is too generally neglected at first; but no pigs, young or old, should be suffered to run at large without this precaution. The sow's ring should be ascertained to be of sufficient strength previously to her, taking the boar, on account of the risk of abortion, if the operation is renewed while she is with pig. Care must be taken by the operator not to go too close to the bone, and that the ring turns easily.

A far better mode of proceeding is, when the pig is young, to cut through the cartilaginous and ligamentous prolongations, by which the supplementary bone is united to the proper nasals. The divided edges of the cartilage
will never reunite, and the snout always remains powerless.

**Feeding and Fattening.**

Roots and fruits are the natural food of the hog, in a wild as well as in a domesticated state; and it is evident that, however omnivorous it may occasionally appear, its palate is by no means insensible to the difference in eatables, since, whenever it finds variety, it will select the best with as much cleverness as other quadrupeds. Indeed, the hog is more nice in the selection of his vegetable diet than any of the other domesticated herbivorous animals. To a certain extent he is omnivorous, and may be reared on the refuse of slaughter-houses; but such food is not wholesome, nor is it natural; for, though he is omnivorous, he is not carnivorous. The refuse of the dairy-farm is more congenial to his health, to say nothing of the quality of its flesh.

Swine are generally fattened for pork at from six to nine months old; and for bacon, at from a year to two years. Eighteen months is generally considered the proper age for a good bacon hog. The feeding will always, in a great measure, depend upon the circumstances of the owner—upon the kind of food which he has at his disposal, and can best spare—and the purpose for which the animal is intended. It will also, in some degree, be regulated by the season; it being possible to feed pigs very differently in the summer from what they are fed in the winter.

The refuse wash and grains, and other residue of breweries and distilleries, may be given to swine with advantage, and seem to induce a tendency to lay on flesh. They should not, however, be given in too large quantities, nor unmixed with other and more substantial food; since, although they give flesh rapidly when fed on it, the meat is not firm, and never makes good bacon. Hogs eat acorns,
and beech-mast greedily, and so far thrive on this food that it is an easy matter to fatten them afterwards. Apples and pumpkins are likewise valuable for this purpose.

There is nothing so nutritious, so eminently and in every way adapted for the purpose of fattening, as are the various kinds of grain—nothing that tends more to create firmness as well as delicacy in the flesh. Indian corn is equal, if not superior, to any kind of grain for fattening purposes, and can be given in its natural state, as pigs are so fond of it that they will eat up every kernel. The pork and bacon of animals that have been thus fed are peculiarly firm and solid. Animal food tends to make swine savage and feverish, and often lays the foundation of serious inflammation of the intestines. Weekly washing with soap and a brush adds wonderfully to the thriving condition of a hog.

In the rich corn regions of our States, upon that grain beginning to ripen, as it does in August, the fields are fenced off into suitable lots, and large herds are successively turned into them, to consume the grain at their leisure. They waste nothing except the stalks, which in that land of plenty are considered of little value, and they are still useful as manure for succeeding crops; and whatever grain is left by them, leaner droves which follow will readily glean. Peas, early buckwheat, and apples, may be fed on the ground in the same way.

There is an improvement in the character of the grain from a few months' keeping, which is fully equivalent to the interest of the money and the cost of storage. If fattened early in the season, hogs will consume less food to make an equal amount of flesh than in colder weather; they will require less attention; and, generally, early pork will command the highest price in market.

It is most economical to provide swine with a fine clover pasture to run in during the spring and summer; and they ought also to have access to the orchard, to pick up all the
unripe and superfluous fruit that falls. They should also have the wash of the house and the dairy, to which add meal, and let it sour in large tubs or barrels. Not less than one-third, and perhaps more, of the whole grain fed to hogs, is saved by grinding and cooking, or souring. Care must, however, be taken that the souring be not carried so far as to injure the food by putrefaction. A mixture of meal and water, with the addition of yeast or such remains of a former fermentation as adhere to the sides or bottom of the vessel, and exposure to a temperature between sixty-eight and seventy-seven degrees Fahrenheit, will produce immediate fermentation.

In this process there are five stages: the saccharine, by which the starch and gum of the vegetables, in their natural condition, are converted into sugar; the vinous, which changes the sugar into alcohol; the mucilaginous, sometimes taking the place of the vinous, and occurring where the sugar solution, or fermenting principle, is weak, producing a slimy, glutinous product; the acetic, forming vinegar from the vinous or alcoholic stage; and the putrefactive, which destroys all the nutritive principles and converts them into a poison. The precise points in fermentation, when the food becomes most profitable for feeding, has not as yet been satisfactorily determined; but that it should stop short of the putrefactive, and probably the full maturity of the acetic, is certain.

The roots for fattening ought to be washed, and steamed or boiled; and when not intended to be fermented, the meal may be scalded with the roots. A small quantity of salt should be added. Potatoes are the best roots for swine; then parsnips; orange or red carrots, white or Belgian; sugar-beets; mangel-wurtzels; rutabagas, and then white turnips, in the order mentioned. The nutritive properties of turnips are diffused through so large a bulk that it is doubtful if they can ever be fed to fattening swine with advantage; and they will barely sustain life when fed to them uncooked.
There is a great loss in feeding roots to fattening swine, without cooking. When unprepared grain is fed, it should be on a full stomach, to prevent imperfect mastication, and consequent loss of the food. It is better, indeed, to have it always before them. The animal machine is an expensive one to keep in motion; and it should be the object of the farmer to put his food in the most available condition for its immediate conversion into fat and muscle.

The following injunctions should be rigidly observed, if one would secure the greatest results:

1. Avoid foul feeding.
2. Do not omit adding salt in moderate quantities to the mess given.
3. Feed at regular intervals.
4. Cleanse the troughs previously to feeding.
5. Do not over-feed; give only as much as will be consumed at the meal.
6. Vary the food. Variety will create, or, at all events, increase appetite, and it is most conducive to health. Let the variations be governed by the condition of the dung cast, which should be of medium consistence, and of a grayish-brown color; if hard, increase the quantity of bran and succulent roots; if too liquid, diminish, or dispense with bran, and make the mess firmer; add a portion of corn.
7. Feed the stock separately, in classes, according to their relative conditions. Keep sows with young by themselves, store-hogs by themselves, and bacon-hogs and porkers by themselves. It is not advisable to keep the store-hogs too high in flesh, since high feeding is calculated to retard development of form and bulk. It is better to feed pigs intended to be put up for bacon loosely and not too abundantly, until they have attained their full stature; they can then be brought into the highest possible condition in a surprisingly short space of time.
8. Keep the swine clean, dry and warm. Cleanliness,
dryness and warmth are essential, and as imperative as feeding; for an inferior description of food will, by their aid, succeed far better than the highest feeding will without them.

**Piggeries.**

Few items conduce more to the thriving and well-being of swine than airy, spacious, well-constructed styes, and above all, cleanliness. They were formerly too often housed in damp, dirty, close, and imperfectly-built sheds, which was a fruitful source of disease and of unthrifty animals. Any place was once thought good enough to keep a pig in.

In large establishments, where numerous pigs are kept, there should be divisions appropriated to all the different kinds; the boars, the breeding sows, the newly weaned, and the fattening pigs should all be kept separate; and in the divisions assigned to the second and last of these classes, it is best to have a distinct apartment for each animal, all opening into a yard or inclosure of limited extent. As pigs require warmth, these buildings should face the south, and be kept weather-tight and well drained. Good ventilation is also important; for it is idle to expect animals to make good flesh and retain their health, unless they have a sufficiency of pure air. The blood requires this to give it vitality and free it from impurities, as much as the stomach requires wholesome and strengthening food; and when it does not have it, it becomes vitiated, and impairs all the animal functions. Bad smells and exhalations, moreover, injure the flavor of the meat.

Damp and cold floors should be guarded against, as they tend to induce cramp and diarrhea; and the roof should be so contrived as to carry off the wet from the pigs. The walls of a well-constructed sty should be of solid masonry; the roof sloping, and furnished with spouts
to carry off the rain; the floors either slightly inclined toward a gutter made to carry off the rain, or else raised from the ground on beams or joists, and perforated so that all urine and moisture shall drain off. Bricks and tiles, sometimes used for flooring, are objectionable, because, however well covered with straw, they still strike cold. Wood is far superior in this respect, as well as because it admits of those clefts or perforations being made, which serve not only to drain off all moisture, but also to admit fresh air.

The manure proceeding from the pig-sty has often been much undervalued, and for this reason, that the litter is supposed to form the principal portion of it; whereas it constitutes the least valuable part, and, indeed, it can scarcely be regarded as manure at all—at least by itself—where the requisite attention is paid to the cleanliness of the animals and of their dwellings. The urine and the dung are valuable, being from the very nature of the food of the animals, exceedingly rich and oleaginous, and materially beneficial to cold soils and grass-lands. The manure from the sty should always be collected as carefully as that from the stable or cow-house, and husbanded in the same way.

The door of each sty ought to be so hung that it will open inward or outward, so as to give the animals free ingress and egress. For this purpose, it should be hung across from side to side, and the animal can push it up to effect its entry or exit; for, if it were hung in the ordinary way, it would derange the litter every time it opened inward, and be very liable to hitch. If it is not intended that the pigs shall leave their sty, there should be an upper and lower door; the former of which should always be left open when the weather is warm and dry, while the latter will serve to confine the animal. There should likewise be windows or slides, which can be opened or closed at will, to give admission to the fresh air, or exclude rain or cold.
Wherever it can be managed, the troughs—which should be of stone or cast metal, since wooden ones will soon be gnawed to pieces—should be so situated that they can be filled and cleaned from the outside, without interfering with or disturbing the animals at all; and for this purpose it is well to have a flap, or door, with swinging hinges, made to hang horizontally on the trough, so that it can be moved to and fro, and alternately be fastened by a bolt to the inside or outside of the manger. When the hogs have fed sufficiently, the door is swung inward and fastened, and so remains until feeding-time, when the trough is cleansed and refilled without any trouble, and then the flap drawn back, and the animals admitted to their food. Some cover the trough with a lid having as many holes in it as there are pigs to eat from it, which gives each pig an opportunity of selecting his own hole, and eating away without interfering with or incommoding his neighbor.

A hog ought to have three apartments, one each for sleeping, eating, and evacuations; of which the last may occupy the lowest, and the first the highest level, so that nothing shall be drained, and as little carried into the first two as possible. The piggery should always be built as possible to that portion of the establishment from which the chief part of the provision is to come, since much labor will thus be saved. Washings, and combings, and brushings, as has been previously suggested, are valuable adjuncts in the treatment of swine; the energies of the skin are thus roused, the pores opened, the healthful functions aided, and that inertness, so likely to be engendered by the lazy life of a fattening pig, counteracted.

A supply of fresh water is essential to the well-being of swine, and should be freely furnished. If a stream can be brought through the piggery, it answers better than anything else. Swine are dirty feeders and dirty drinkers, usually plunging their fore feet into the trough or pail, and
thus polluting with mud or dirt whatever may be given to them. One of the advantages, therefore, to be derived from the stream of running water is, its being kept constantly clean and wholesome by its running. If this advantage cannot be procured, it is desirable to present water in vessels of a size to receive but one head at a time, and of such height as to render it impossible, or difficult, for the drinker to get his feet into it. The water should be renewed twice daily. If swine are closely confined in pens, they should have as much charcoal twice a week as they will eat, for the purpose of correcting any tendency to disorders of the stomach. Rotten wood is an imperfect substitute for charcoal.

Diseases and Their Remedies.

By reason of being generally considered a subordinate species of stock, swine do not, in many cases, share in the benefits which an improved system of agriculture and the present advanced state of veterinary science have conferred upon other domesticated animals. Since they are by no means the most tractable of patients, it is anything but an easy matter to compel them to swallow anything to which their appetite does not incite them; and, hence, prevention will be found better than cure. Cleanliness is the great point to be insisted upon in the management of these animals. If this, and warmth, be only attended to, ailments among them are comparatively rare.

As, however, disappointment may occasionally occur, even under the best system of management, a brief view of the principal complaints with which they are liable to be attacked is presented, together with the best mode of treatment to be adopted in such cases.
Catching the Pig.

Swine are very difficult animals to obtain any mastery over, or to operate on, or examine. Seldom tame, or easily handled, they are at such periods most unmanageable—kicking, screaming, and even biting fiercely. The following method of getting hold of them has been recommended: Fasten a double cord to the end of a stick, and beneath the stick let there be a running noose in the cord; tie a piece of bread to the cord, and present it to the animal; and when he opens his mouth to seize the bait, catch the upper jaw in the noose, run it tight, and the animal is fast.

Another method is, to catch one foot in a running noose suspended from some place, so as to draw the imprisoned foot off the ground; or, to envelop the head of the animal in a cloth or sack.

All coercive measures, however, should, as far as possible, be avoided; for the pig is naturally so averse to being handled that in his struggles he will often do himself far more mischief than the disease which is to be investigated or remedied would effect.

Drenching.

Whenever it is possible, the medicine to be administered should be mingled with a portion of food, and the animal thus cheated or coaxed into taking it; since many instances are on record, in which the pig has ruptured some vessel in his struggles, and died on the spot, or so injured himself as to bring on inflammation and subsequent death.

Where this cannot be done, the following is the best method: Let a man get the head of the animal firmly
between his knees — without, however, pinching it — while another secures the hinder parts. Then let the first take hold of the head from below, raise it a little, and incline it slightly toward the right, at the same time separating the lips on the left side so as to form a hole into which the fluid may be gradually poured — no more being introduced into the mouth at a time than can be swallowed at once. Should the animal snort or choke, the head must be released for a few moments, or he will be in danger of being strangled.

Catarrh.

This ailment — an inflammation of the mucous membranes of the nose, etc. — is, if taken in time, easily cured by opening medicines, followed up by warm bran-wash — a warm, dry sty — and abstinence from rich grains, or stimulating, farinaceous diet. The cause, in most cases, is exposure to drafts of air, which should be guarded against.

Cholera.

For what is presented concerning this disease, the author is indebted to G. W. Bowler, V. S., of Cincinnati, Ohio, whose familiarity with the various diseases of our domestic animals, and the best modes of treating them, entitles his opinion to great weight.

The term "cholera" is employed to designate a disease which has been very fatal among swine in different parts of the United States; and for the reason, that its symptoms, as well as the indications accompanying its termination, are very nearly allied to what is manifested in the disease of that name which visits man.

Epidemic cholera has, for several years past, committed fearful ravages among the swine of, particularly, Ohio, Indiana, and Kentucky. Indeed, many farmers, who, until
recently, have been accustomed to raise large numbers of these animals, are, in a great measure, disinclined to invest again in such stock, on account of the severe losses—in some instances to the extent of the entire drove upon particular places.

Various remedies have, of course, been prescribed; but the most have failed in nearly every case where the disease has secured a firm foothold. Preventives, are, therefore, the most that can, at present, be expected; and in this direction something may be done. Although some peculiar change in the atmosphere is, probably, an impelling cause of cholera, its ravages may be somewhat stayed by removing other predisposing associate causes.

Granting that the hog is a filthy animal and fond of rooting among filth, it is by no means necessary to persist, for that reason, in surrounding him with all the nastiness possible; for even a hog, when penned up in a filthy place, in company with a large number of other hogs—particularly when that place is improperly ventilated—is not as healthy as when the animals are kept together in smaller numbers, in a clean and well-ventilated barn or pen. Look, for a moment, at a drove of hogs coming along the street, the animals all fat and ready for the knife. They have been driven several miles, and are scarcely able to crawl along, many of them having to be carried on drays, while others have died on the road. At last they are driven into a pen, perhaps, several inches deep with the manure and filth deposited there by hundreds of predecessors; every hole in the ground has become a puddle; and in such a place, some one hundred or two hundred animals are piled together, exhausted from the drive which they have had. They lie down in the mud; and in a short time, one can see the steam beginning to rise from their bodies in volumes, increasing their already prostrate condition by the consequent inhalation of the noxious gas thus thrown off from the system; the blood
becomes impregnated with poison; the various functions of the body are thereby impaired; and disease will inevitably be developed, in one form or another. Should the disease known as hog cholera prevail in the neighborhood, the chances are very greatly in favor of their being attacked by it, and, consequently, perishing.

The symptoms of cholera are as follows: The animal appears to be instantaneously deprived of energy; loss of appetite; lying down by himself; occasionally moving about slowly, as though experiencing some slight uneasiness internally; the eyes have a very dull and sunken appearance, which increases with the disease; the evacuations are almost continuous, of a dark color, having a fetid odor, and containing a large quantity of bile; the extremities are cold and soreness is evinced when the abdomen is pressed; the pulse is quickened, and sometimes hardly perceptible, while the buccal membrane—that belonging to the cheek—presents a slight purple hue; the tongue has a furred appearance. The evacuations continue fluid until the animal expires, which may be in twelve hours from the first attack, or the disease may run on for several days.

In a very short time after death, the abdomen becomes of a dark purple color, and upon examination, the stomach is found to contain but a little fluid; the intestines are almost entirely empty, retaining a slight quantity of the dark colored matter before mentioned; the mucous membrane of the alimentary canal exhibits considerable inflammation, which sometimes appears only in patches, while the other parts are filled with dark venous blood—indicating a breaking up of the capillary vessels in such places.

Treatment.—As a preventive, the following will be found valuable: Flour of sulphur, six pounds; animal charcoal, one pound; sulphate of iron, six ounces; cinchona pulverized, one pound. Mix well together in a large
mortar; afterwards give a tablespoonful to each animal, mixed with a few potato-peelings and corn-meal, three times a day. Continue this for one week, keeping the animal at the same time in a clean, dry place, and not allowing too many together.

**Crackings.**

These will sometimes appear on the skin of a hog, especially about the root of the ears and of the tail, and at the flanks. They are not at all to be confounded with mange, as they never result from anything but exposure to extremes of temperature while the animal is unable to avail himself of such protection as, in a state of nature, instinct would have induced him to adopt. They are peculiarly troublesome in the heat of summer, if he does not have access to water, in which to lave his parched limbs and half-scorched carcass.

Anoint the cracked parts twice or three times a day with tar and lard, well melted up together.

**Diarrhea.**

Before attempting to stop the discharge in this disease—which, if permitted to continue unchecked, will rapidly prostrate the animal, and probably terminate fatally—ascertain the quality of food which the animal has recently had.

In a majority of instances, this will be found to be the cause. If taken in its incipient stage, a mere change to a more binding diet, as corn, flour, etc., will suffice for a cure. If acidity is present—produced, probably, by the hogs having fed upon coarse, rank grasses in swampy places—give some chalk in the food, or powdered egg-shells, with about half a drachm of powdered rhuBarb; the dose, of
course, should vary with the size of the animal. In the acorn season, they alone will be found sufficiently curative, where facilities for obtaining them exist. Dry lodging is indispensable; and diligence is requisite to keep it dry and clean.

**Fever.**

The symptoms of this disease are, redness of the eyes, dryness and heat of the nostrils, the lips, and the skin generally; appetite gone, or very defective; and, generally, a very violent thirst.

Bleed as soon as possible; after which house the animal well, taking care, at the same time, to have the sty well and thoroughly ventilated. The bleeding will usually be followed, in an hour or two, by such a return of appetite as to induce the animal to eat a sufficient quantity of food to be made the vehicle for administering external remedies, The best is bread, steeped in broth. The hog, however, sinks so rapidly when his appetite is near gone, that no depletive medicines are, in general, necessary or proper; the fever will ordinarily yield to the bleeding, and the only object needs to be the support of his strength, by small portions of nourishing food, administered frequently.

Do not let the animal eat as much as his inclination might prompt; when he appears to be no longer ravenous, remove the mess, and do not offer it again until after a lapse of three or four hours. If the bowels are confined, castor and linseed oil, in equal quantities, should be added to the bread and broth, in the proportion of two to six ounces.

A species of fever frequently occurs as an *epizootic*, oftentimes attacking the male pigs, and generally the most vigorous and best-looking, without any distinction of age, and with a force and rapidity absolutely astonishing. At other times, its progress is much slower; the symptoms
are less intense and alarming; and the veterinary surgeon, employed at the outset, may meet with some success.

The causes are, in the majority of instances, the bad styes in which the pigs are lodged, and the noisome food which they often contain. In addition to these is the constant lying on the dung-heap, whence is exhaled a vast quantity of deleterious gas; also, the remaining far too long on the muddy or parched ground, or too protracted exposure to the rigor of the season.

When an animal is attacked with this disease, he should be separated from the others, placed in a warm situation, some stimulating ointment applied to the chest, and a decoction of sorrel administered. Frictions of vinegar should also be applied to the dorsal and lumbar region. The drinks should be emollient, slightly imbued with nitre and vinegar, and with aromatic fumigation about the belly. If the fever then appears to be losing ground, which may be ascertained by the regularity of the pulse, by the absence of the plaintive cries before heard, by a less laborious respiration, by the absence of convulsions, and by the non-appearance of blotches on the skin, there is a fair chance of recovery. Then administer, every second hour, as before directed, and give a proper allowance of white water, with ground barley and rye.

When the symptoms redouble in intensity, it is best to destroy the animal; for it is rare that, after a certain period, much chance of recovery exists. Bleeding is seldom of much avail, but produces, occasionally, considerable loss of vital power, and augments the putrid diathesis.

**Foul Skin.**

A simple irritability, or foulness of skin, will usually yield to cleanliness, and a washing with a solution of chloride of lime; but, if it is neglected for any length of time, it assumes a malignant character—scabs and blotches, or
red and fiery eruptions appear—and the disease rapidly passes into mange, which will be hereafter noticed.

**Inflammation of the Lungs.**

This disease, popularly known as heavings, is scarcely to be regarded as curable. Were it observed in its first stage, when indicated by loss of appetite and a short, hard cough, it might, possibly, be got under by copious bleeding, and friction with stimulating ointment on the region of the lungs; minute and frequent doses of tartar emetic should also be given in butter—all food of a stimulating nature carefully avoided—and the animal kept dry and warm. If once the heavings set in, it may be calculated with confidence that the formation of tubercles in the substance of the lungs has begun; and when these are formed, they are very rarely absorbed.

The causes of the disease are damp lodging, foul air, want of ventilation, and unwholesome food. When tubercular formation becomes established, the disease may be communicated through the medium of the atmosphere, the infectious influence depending upon the noxious particles respired from the lungs of the diseased animal.

The following may be tried, though the knife is probably the best resort, if for no other reason, at least to provide against the danger of infection: Shave the hair away from the chest, and beneath each fore-leg; wet the part with spirits of turpentine, and set fire to it, having previously had the animal well secured, with his head well raised, and a flannel cloth at hand with which to extinguish the flame after it has burned a sufficient time to produce slight blisters; if carried too far, a sore is formed, productive of no good effects, and causing unnecessary suffering. Calomel may also be used, with a view to promote the absorption of the tubercles; but the success is questionable.
Jaundice.

The symptoms of this disease are, yellowness of the white of the eye; a similar hue extending to the lips; and sometimes, but not invariably, swelling of the under part of the jaw.

Treatment.—Bleed freely; diminish the quantity of food; and give an active aperient every second day. Aloes are, perhaps, the best, combined with colocynth; the dose will vary with the size of the animal.

Leprosy.

This complaint commonly commences with the formation of a small tumor in the eye, followed by a general prostration of spirits; the head is held down; the whole frame inclines toward the ground; universal languor succeeds; the animal refuses food, languishes, and rapidly falls away in flesh; blisters soon make their appearance beneath the tongue, then upon the throat, the jaws, the head, and the entire body.

The causes of this disease are want of cleanliness, absence of fresh air, want of due attention to ventilation, and foul feeding. The obvious treatment, therefore, is, first, bleed; clean out the sty daily; wash the affected animal thoroughly with soap and water, to which soda or potash has been added; supply him with a clean bed; keep him dry and comfortable; let him have gentle exercise, and plenty of fresh air; limit the quantity of his food, and diminish its rankness; give bran with wash, in which add, for an average-sized hog—say one of one hundred and sixty pounds weight—a tablespoonful of the flour of sulphur, with as much nitre as will cover a dime daily. A few grains of powdered antimony may also be given with effect.
Lethargy.

Symptoms—Torpor; desire to sleep; hanging of the head; and, frequently, redness of the eyes. The origin of this disease is, apparently, the same as that of indigestion, or surfeit, except that, in this instance, it acts upon a hog having a natural tendency to a redundancy of blood.

Treatment.—Bleed copiously; then administer an emetic. A decoction of camomile flowers will be safest; though a sufficient dose of tartar emetic will be far more certain. After this, reduce for a few days the amount of the animal’s food, and administer a small portion of nitre and sulphur in each morning’s meal.

Mange.

This cutaneous affection owes its existence to the presence of a minute insect, called *acarus scabiei*, or mange-fly, which burrows beneath the cuticle, and occasions much irritation and annoyance in its progress through the skin.

Its symptoms are sufficiently well known, consisting of scabs, blotches, and sometimes multitudes of minute pustules on different parts of the body. If neglected, these symptoms become aggravated; the disease spreads rapidly over the entire surface of the skin, and if allowed to proceed on its course unchecked, will before long produce deep-seated ulcers and malignant sores, until the whole carcass of the affected animal becomes a mass of corruption.

The cause is to be looked for in dirt, accompanied by hot-feeding. Hogs, however well and properly kept, will occasionally become affected with this disease from contagion. Few diseases are more easily propagated by contact than mange. The introduction of a single affected pig into an establishment may, in one night, cause the
seizure of scores of others. No foul-skinned pigs, therefore, should be introduced into the piggery; indeed, it would be an excellent precaution to wash every animal newly purchased with a strong solution of chloride of lime.

Treatment.—If the mange is but of moderate violence, and not of very long standing, the best mode is to wash the animal, from snout to tail, leaving no portion of the body uncleansed, with soft soap and water. Place him in a dry and clean sty, which is so situated as to command a constant supply of fresh air, without, at the same time, an exposure to cold or draught; furnish a bed of clean, fresh straw. Reduce his food, both in quality and quantity; let boiled or steamed roots, with buttermilk, or dairy-wash take the place of any food of a heating or inflammatory character. Keep him without food for five or six hours, and then give to a hog of average size two ounces of Epsom salts in a warm bran mash—to be increased or diminished, of course, as the animal's size may require. This should be previously mixed with a pint of warm water, and added to about half a gallon of warm bran mash, and it will act as a gentle purgative. Give in every meal afterward one tablespoonful of flour of sulphur, and as much nitre as will cover a dime, for from three days to a week, according to the state of the disease. When the scabs begin to heal, the pustules to retreat, and the fiery sores to fade, a cure may be anticipated.

When the above treatment has been practiced for fourteen days, without effecting a cure, prepare the following: train oil, one pint; oil of tar, two drachms; spirits of turpentine, two drachms; naphtha, one drachm; with as much flour of sulphur as will form the foregoing into a thick paste. Rub the animal previously washed with this mixture; let no portion of the hide escape. Keep the hog dry and warm after this application, and allow it to remain on his skin for three days. On the fourth day wash him
again with soft soap, adding a small quantity of soda to the water. Dry him well afterward, and let him remain as he is, having again changed his bedding, for a day or so; continue the sulphur and nitre as before. Almost all cases of mange, however obstinate, will, sooner or later, yield to this treatment. After he is convalescent, whitewash the sty, and fumigate it by placing a little chloride of lime in a cup, or other vessel, and pouring a little vitriol upon it. In the absence of vitriol, boiling water will answer nearly as well.

**Murrain.**

This resembles leprosy in its symptoms, with the addition of staggering; shortness of breath, and discharge of viscid matter from the eyes and mouth.

The treatment should consist of cleanliness, coolness, bleeding, purging, and limitation of food. Cloves of garlic are recommended; and as in all febrile diseases there exists a greater or less disposition to putrefaction, it is probable that garlic, from its antiseptic properties, may be useful.

**Measles.**

This is one of the most common diseases to which hogs are liable. The symptoms are, redness of the eyes, foulness of the skin, and depression of spirits; decline, or total departure of the appetite; small pustules about the throat, and red and purple eruptions on the skin. The last are more plainly visible after death, when they impart a peculiar appearance to the grain of the meat, with fading of its color, and distention of the fibre, giving an appearance similar to that which might be produced by puncturing the flesh.
Treatment.—Allow the animal to fast, in the first instance, for twenty-four hours, and then administer a warm drink, containing a drachm of carbonate of soda, and an ounce of bole armenian; wash the animal, cleanse the sty, and change the bedding; give at every feeding, or thrice a day, thirty grains of flour of sulphur, and ten of nitre.

This malady is attributable to dirt, combined with the giving of steamed food or wash to hogs at too high a temperature. It is troublesome to eradicate, but usually yields to treatment, and is rarely fatal.

Quinsy.

This is an inflammatory affection of the glands of the throat.

Treatment.—Shave away the hair, and rub with tartar-emetic ointment. Fomenting with very warm water is also useful. When external suppuration takes place, it is to be regarded as a favorable symptom. In this case, wait until the swellings are thoroughly ripe; then with a sharp knife make an incision through the entire length, press out the matter, wash with warm water, and afterward dress the wound with any resinous ointment, or yellow soap with coarse brown sugar.

Staggers.

This disease is caused by an excessive determination of blood to the head.

Treatment.—Bleed freely and purge.

Surfeit.

This is another name for indigestion. The symptoms are panting, loss of appetite, swelling of the region about
the stomach, etc., and frequently throwing up the contents of the stomach.

_Treatment._—In general, this affection will pass away, provided only it is allowed to care itself, and all food carefully kept from the animal for a few hours; a small quantity of sweet grains, with a little bran mash, may then be given, but not nearly as much as the animal would wish to take. For a few days the food should be limited in quantity, and of a washy, liquid nature. The ordinary food may then be resumed, only observing to feed regularly, and remove the fragments remaining after each meal.

**Swelling of the Spleen.**

_The symptom_ most positively indicative of this disease is the circumstance of the affected animal leaning toward one side, cringing, as it were, from internal pain, and bending toward the ground.

The _cause_ of the obstruction on which the disease depends, is over-feeding—permitting the animal to indulge its appetite to the utmost extent that gluttony may prompt, and the capacity of its stomach admits. A very short perseverance in this mode of management—or, rather, mismanagement—will produce this, as well as other maladies, deriving their origin from a depraved condition of the secretions and the obstruction of the excretory ducts.

_Treatment._—Clean out the alimentary canal by means of a powerful aperient. Allow the animal to fast for four or five hours, when he will take a little sweet wash or broth, in which may be mingled a dose of Epsom salts, proportioned to its size. This will generally effect the desired end—a copious evacuation—and the action of the medicine on the watery secretions will also relieve the existing diseased condition of the spleen.

If the affection has continued for any length of time,
the animal should be bled. A decoction of the leaves and tops of wormwood and liverwort, produced by boiling them in soft water for six hours, may be given in doses of from half a pint to a pint and a half, according to the size, age, etc., of the animal. Scammony and rhubarb, mixed in a bran-wash, or with Indian meal, may be given with advantage on the following day; or equal portions of blue-pill mass and compound colocynth pill, formed into a bolus with butter. The animal having been kept fasting the previous night, will probably swallow it; if not, let his fast continue a couple of hours longer. Lower his diet, and keep him on reduced fare, with exercise, and, if it can be managed, grazing, until the malady has passed away. If he is then to be fattened, it should be done gradually; be cautious of at once restoring him to full diet.

Tumors.

These are hard swellings, which make their appearance on different parts of the body. They are not formidable, and require only to be suffered to progress until they soften; then make a free incision, and press out the matter. Sulphur and nitre should be given in the food, as the appearance of these swellings, whatever be the cause, indicates the necessity of alterative medicines.
Poultry.

The Bolton Gray.

These fowls—called, also, Dutch Every-day Layers, Pencilled Dutch Fowl, Chittaprats, and, in Pennsylvania, Creole Fowl—were originally imported from Holland to Bolton, a town in Lancashire, England, whence they were named.

They are small sized, short in the leg, and plump in the make; color of the genuine kind, invariably pure white in the whole cappel of the neck; the body white, thickly spotted with black, sometimes running into a grizzle, with one or more black bars at the extremity of the tail. A good cock of this breed may weigh from four to four and a half pounds; and a hen from three to three and a half pounds.
The superiority of a hen of this breed does not consist so much in a rapid as in continued laying. She may not produce as many eggs in a month as some other kinds, but she will, it is claimed, lay more months in the year than probably any other variety. They are said to be very hardy; but their eggs, in the judgment of some, are rather watery and innutritious.

The Chittagong.

The Chittagong is a very superior bird, showy in plumage, exceedingly hard, and of various colors. In some, the gray predominates, interspersed with lightish yellow and white feathers upon the pullets. The legs are of a reddish flesh-color; the meat is delicately white, the comb is large and single, wattles very full, wings very fat, good size. The legs are more or less feathered; the model is graceful, carriage proud and easy, and action prompt and determined.

This breed is the largest in the world, the pullets usually weighing from eight to nine pounds when they begin to lay, and the cocks from nine to ten pounds at the same age. They do not lay as many eggs in a year as smaller hens; but they lay as many pounds of eggs as the best breeds. This breed has been, by some, confounded with the great Malay; but the points of difference are very noticeable. There is less offal, the flesh is finer, although the size is greatly increased, their fecundity is greater, and the offspring arrive earlier at maturity than in the common Malay variety.

There is also a red variety of the Chittagong, which is rather smaller than the gray. These have legs sometimes yellow and sometimes blue; the latter color, perhaps, from some mixture with the dark variety; the wings and tail are short. Sometimes there is a rose-colored comb, and a top-
knot, through crossing. This variety may weigh sixteen or eighteen pounds a pair, as ordinarily bred. The eggs are large and rich, but not very abundant, and they do not hatch remarkably well.

There is, besides, a dark-red variety; the hens yellow or brown, with single serrated comb, and no top-knot; legs heavily feathered, the feathers black and the legs yellow. The cock is black on the breast and thighs.

The Chittagongs are generally quite leggy, standing some twenty-six inches high; and the hens twenty-two inches. A first cross with the Shanghae makes a very large and valuable bird for the table, but not for breeding purposes.

**The Blue Dun.**

The variety known under this name originated in Dorsetshire, England. They are under the average size, rather slenderly made, of a soft and pleasing bluish-dun color, the neck being darker, with high, single combs, deeply serrated. The cock is of the same color as the hen, but has, in addition, some handsome dark stripes in the long feathers of the tail, and sometimes a few golden, or even scarlet marks, on the wings. They are exceedingly impudent, familiar, and pugnacious.

The hens are good layers, wanting to sit after laying a moderate number of eggs, and proving attentive and careful rearers of their own chickens, but rather savage to those of other hens. The eggs are small and short, tapering slightly at one end, and perfectly white. The chickens, on first coming from the egg, sometimes bear a resemblance to the gray and yellow catkin of the willow, being of a soft bluish gray, mixed with a little yellow here and there.

Some class these birds among the game fowls, not recognizing them as a distinct race, upon the ground that, as there are Blue Dun families belonging to several breeds
— the Spanish, the Polish, the Game, and the Hamburghs, for example—it is more correct to refer each Blue Dun to its own proper ancestry.

The Cochin China.

The Cochin China fowl are said to have been presented to Queen Victoria from the East Indies. In order to promote their propagation, her majesty made presents of them occasionally to such persons as she supposed likely to appreciate them. They differ very little in their qualities, habits, and general appearance from the Shanghaes, to which they are undoubtedly nearly related. The egg is nearly the same size, shape, and color; both have an equal development of comb and wattles—the Cochins slightly differing from the Shanghaes, chiefly in being somewhat fuller and deeper in the breast, not quite so deep in the quarter, and being usually smooth-legged, while the Shang-
haes, generally, are more or less heavily feathered. The plumage is much the same in both cases; and the crow in both is equally sonorous and prolonged, differing considerably from that of the Great Malay.

The cock has a large, upright, single, deeply-indented comb, very much resembling that of the Black Spanish, and, when in high condition, of quite as brilliant a scarlet; like him, also, he has sometimes a very large white ear-hole on each cheek, which, if not an indispensable or even a required qualification, is, however, to be preferred, for beauty at least. The wattles are large, wide, and pendent. The legs are of a pale flesh-color; some specimens have them yellow, which is objectionable. The feathers on the breast and sides are of a bright chestnut-brown, large and well-defined, giving a scaly or imbricated appearance to those parts. The hackle of the neck is of a light yellowish brown; the lower feathers being tipped with dark brown, so as to give a spotted appearance to the neck. The tail-feathers are black, and darkly iridescent; back, scarlet orange; back-hackle, yellow-orange. It is, in short, altogether a flame-colored bird. Both sexes are lower in the leg than either the Black Spanish or the Malay.

The hen approaches in her build more nearly to the Dorking than to any other breed, except that the tail is very small and proportionately depressed; it is smaller and more horizontal than in any other fowl. Her comb is of moderate size, almost small; she has, also, a small, white ear-hole. Her coloring is flat, being composed of various shades of very light brown with light yellow on the neck. Her appearance is quiet, and only attracts attention by its extreme neatness, cleanliness and compactness.

The eggs average about two ounces each. They are smooth, of an oval shape, equally rounded at each end, and of a rich buff color, nearly resembling those of the Silver Pheasant. The newly-hatched chickens appear
very large in proportion to the size of the egg. They have light, flesh-colored bills, feet and legs, and are thickly covered with down, of the hue commonly called "carroty." They are not less thrifty than any other chickens, and feather somewhat more uniformly than either the Black Spanish or the Malay. It is, however, most desirable to hatch these—as well as other large-growing varieties—as early in the spring as possible; even so soon as the end of February. A peculiarity in the cockerels is, that they do not show even the rudiments of their tail-feathers till they are nearly full-grown. They increase so rapidly in other directions, that there is no material to spare for the production of these decorative appendages.

The merits of this breed are such that it may safely be recommended to people residing in the country. For the inhabitants of towns it is less desirable; as the light tone of its plumage would show every mark of dirt and defilement; and the readiness with which they sit would be an inconvenience, rather than otherwise, in families with whom perpetual layers are most in requisition. Expense apart, they are equal or superior to any other fowl for the table; their flesh is delicate, white, tender and well flavored.

The Dominique.

This seems to be a tolerably distinct and permanent variety, about the size of the common dunghill fowl. Their combs are generally double—or rose, as it is sometimes called—and the wattles small. Their plumage presents, all over, a sort of greenish appearance, from a peculiar arrangement of blue and white feathers, which is the chief characteristic of the variety; although, in some specimens, the plumage is inevitably gray in both cock and hen. They are very hardy, healthy, excellent layers, and
capital incubators. No fowl have better stood the tests of mixing without deteriorating than the pure Dominique.

Their name is taken from the island of Dominica, from which they are reported to have been imported. Take all in all, they are one of the very best breeds of fowl which we have; and although they do not come into laying so young as the Spanish, they are far better sitters and nursers.

The Dorking.

This has been termed the Capon Fowl of England. It forms the chief supply for the London market, and is distinguished by a white or flesh-colored smooth leg, armed with five, instead of four toes, on each foot. Its flesh is extremely delicate, especially after caponization; and it has the advantage over some other fowls of feeding rapidly, and growing to a very respectable size when properly managed.

For those who wish to stock their poultry yards with fowls of the most desirable shape and size, clothed in rich and varigated plumage, and, not expecting perfection, are willing to overlook one or two other points, the Speckled Dorkings—so called from the town of Surrey, England,
which brought them into modern repute — should be selected. The hens, in addition to their gay colors, have a large, vertically flat comb, which, when they are in high health, adds very much to their brilliant appearance, particularly if seen in bright sunshine. The cocks are magnificent. The most gorgeous hues are lavished upon them, which their great size and peculiarly square-built form display to the greatest advantage. Their legs are short; their breast broad; there is but a small proportion of offal; and the good, profitable flesh is abundant. The cocks may be brought to considerable weight, and the flavor and appearance of their meat are inferior to none. The eggs are produced in reasonable abundance; and, though not equal in size to those of Spanish hens, may fairly be called large.

They are not everlasting layers, but at due or convenient intervals manifest the desire of sitting. In this respect, they are steady and good mothers when the little ones appear. They are better adapted than any other fowl, except the Malay, to hatch superabundant turkeys' eggs; as their size and bulk enable them to afford warmth and shelter to the young for a long period. For the same reason, spare goose eggs may be entrusted to them.

With all these merits, however, they are not found to be a profitable breed, if kept thorough-bred and unmixed. Their powers seem to fail at an early age. They are also apt to pine away and die just at the point of reaching maturity. They appear at a certain epoch to be seized with consumption — in the Speckled Dorkings the lungs seeming to be the seat of the disease. The White Dorkings are, however, hardy and active birds, and are not subject to consumption or any other disease.

As mothers, an objection to the Dorking is, that they are too heavy and clumsy to rear the chickens of any smaller and more delicate bird than themselves. Pheasants, partridges, bantams, and Guinea fowl are trampled under
foot and crushed, if in the least weakly. The hen, in her affectionate industry in scratching for grub, kicks her smallest nurslings right and left, and leaves them sprawling on their backs; and before they are a month old, half of them will be muddled to death with this rough kindness.

In spite of these drawbacks, the Dorkings are still in high favor; but a cross is found to be more profitable than the true breed. A glossy, energetic game-cock, with Dorking hens, produces chickens in size and beauty little inferior to their maternal parentage, and much more robust. The supernumerary toe on each foot almost always disappears with the first cross; but it is a point which can very well be spared without much disadvantage. In other respects, the appearance of the newly-hatched chickens is scarcely altered. The eggs of the Dorkings are large, pure white, very much rounded, and nearly equal in size at each end. The chickens are brownish-yellow, with a broad brown stripe down the middle of the back, and a narrower one on each side; feet and legs yellow.

The Fawn-Colored Dorking. — The fowl bearing this name is a cross between the white Dorking and the fawn-colored Turkish fowl. They are of lofty carriage, handsome, and healthy. The males of this breed weigh from eight to nine pounds and the females from six to seven; and they come to maturity early for so large a fowl. Their tails are shorter and their eggs darker than those of other Dorkings; their flesh is fine and their eggs rich. It is one of the best varieties of fowl known, as the size is readily increased without diminishing the fineness of the flesh.

The Black Dorking. — The bodies of this variety are of a large size, with the usual proportions of the race, and of a jet-black color. The neck-feathers of some of the cocks are tinged with a bright gold color, and those of some of the hens bear a silvery complexion. Their combs are usually double, and very short, though sometimes cupped, rose, or single, with wattles small; and they are
usually very red about the head. Their tails are rather shorter and broader than most of the race, and they feather rather slowly. Their legs are short and black, with five toes on each foot, the bottom of which is sometimes yellow. The two back toes are very distinct, starting from the foot separately; and there is frequently a part of an extra toe between the two.

This breed commence laying when very young, and are very thrifty layers during winter. Their eggs are of a large size, and hatch well; they are perfectly hardy, as their color indicates, and for the product are considered among the most valuable of the Dorking breed.

The Dunghill Fowl.

This is sometimes called the Barn-door fowl, and is characterized by a thin, serrated, upright comb, and wattles hanging from each side of the lower mandible; the tail rises in an arch, above the level of the rump; the feathers of the rump are long and line-like, and the color is finely variegated. The female's comb and wattles are smaller than those of the cock; she is less in size, and her colors are more dull and somber.

In the best specimens of this variety, the legs should be white and smooth, like those of the Dorking, and their bodies round and plump. Being mongrels, they breed all colors, and are usually from five to seven or eight pounds per pair.

The Frizzled Fowl.

This fowl is erroneously supposed to be a native of Japan, and, by an equally common error, is frequently called the "Friesland," under the apprehension that it is derived from that place. Its name, however, originates from its peculiar appearance. It is difficult to say whether
this is an aboriginal variety, or merely a peculiar instance of the morphology of feathers; the circumstance that there are also frizzled Bantams, would seem to make in favor of the latter position.

The feathers are ruffled or frizzled, and the reversion makes them peculiarly susceptible of cold and wet, since their plumage is of little use as clothing. They have thus the demerit of being tender as well as ugly. In good specimens, every feather looks as if it had been curled the wrong way with a pair of hot curling-irons. The plumage is variegated in its colors; and there are two varieties, called the Black and White Frizzled. The stock, which is rather curious than valuable, is retained in this country more by importation than by rearing.

Some writers say that this variety is a native of Asia, and that it exists in a domestic state throughout Java, Sumatra, and all the Philippine Islands, where it succeeds well. It is, according to such, uncertain in what country it is still found wild.

The Spangled Hamburgh.

The Spangled Hamburgh fowl are divided into two varieties, the distinctive characteristics being slight, and almost dependent upon color; these varieties are termed the Golden and Silver-Spangled.

*The Golden-Spangled* is one of no ordinary beauty; it is well and very neatly made, has a good body, and no very great offal. On the crest, immediately above the beak, are two small, fleshy horns, resembling, to some extent, an abortive comb. Above this crest, and occupying the place of a comb, is a very large brown or yellow tuft, the feathers composing it darkening toward their extremities. Under the insertion of the lower mandible—or that portion of the neck corresponding to the chin in man—is a full, dark-colored tuft, somewhat resembling a beard. The
wattles are very small; the comb, as in other high-crested fowls, is very diminutive; and the skin and flesh white. The hackles on the neck are of a brilliant orange, or golden yellow, and the general ground-color of the body is of the same hue, but somewhat darker. The thighs are of a dark-brown, or blackish shade, and the legs and feet are of a bluish gray.

In the *Silver-Spangled* variety, the only perceptible difference is, that the ground color is a silvery white.

The extremity and a portion of the extreme margin of each feather are black, presenting, when in a state of rest, the appearance of regular semi-circular marks, or spangles—and hence the name, "Spangled Hamburgh"; the varieties being termed *gold* or *silver*, according to the prevailing color being bright yellow, or silvery white.

The eggs are of moderate size, but abundant; chickens easily reared. In mere excellence of flesh and as layers, they are inferior to the Dorking or the Spanish. They weigh from four and a half to five and a half pounds for the male, and three and a half for the female. The former stands some twenty inches in height, and the latter about eighteen inches.
The Plymouth Rock.

This name has been given to a very good breed of fowls, produced by crossing a China cock with a hen, a cross between the Fawn-colored Dorking, the Great Malay and the Wild Indian.

At a little over a year old the cocks stand from thirty-two to thirty-five inches high, and weigh about ten pounds; and the pullets from six and a half to seven pounds each. The latter commence laying when five months old, and prove themselves very superior layers. Their eggs are of a medium size, rich, and reddish-yellow in color. Their plumage is rich and variegated; the cocks usually red or speckled, and the pullets darkish brown. They have very fine flesh, and are fit for the table at an early age. The legs are very large, and usually blue or green, but occasionally yellow or white, generally having five toes upon each foot. Some have their legs feathered, but this is not usual. They have large and single combs and wattles, large cheeks, rather short tails, and small wings in proportion to their bodies.

They are domestic, and not so destructive to gardens as smaller fowls. There is the same uniformity in size and general appearance, at the same age of the chickens, as in those of the pure bloods of primary races.

The Poland.

The Poland, or Polish fowl, is quite unknown in the country which would seem to have suggested the name, which originated from some fancied resemblance between its tufted crest and the square-spreading crown of the feathered caps worn by the Polish soldiers.

The breed of crested fowls is much esteemed by the curious, and is bred with great care. Those desirous of
propagating any singular varieties separate and confine the individuals, and do not suffer them to mingle with such as have the colors different. The varieties are more esteemed in proportion to the variety of the colors, or the contrast of the tuft with the rest of the plumage. Although the differences of plumage are thus preserved pretty constant, they seem to owe their origin to the same breed, and cannot be reproduced pure without careful superintendence. The cocks are much esteemed in Egypt, in consequence of the excellence of their flesh, and are so common that they are sold at a remarkably cheap rate. They are equally abundant at the Cape of Good Hope, where their legs are feathered.

The Polish are chiefly suited for keeping in a small way, and in a clean and grassy place. They are certainly not so fit for the farm-yard, as they become blinded and miserable with dirt. Care should be exercised to procure them genuine, since there is no breed of fowls more disfigured by mongrelism than this. They will, without any cross-breeding, occasionally produce white stock that are very pretty, and equally good for laying. If, however, an attempt is made to establish a separate breed of them,
they become puny and weak. It is, therefore, better for those who wish for them to depend upon chance; every brood almost of the black produces one white chicken, as strong and lively as the rest.

These fowls are excellent for the table, the flesh being white, tender, and juicy; but they are quite unsuitable for being reared in any numbers, or for general purposes, since they are so capricious in their growth, frequently remaining stationary in this respect for a whole month, getting no larger; and this, too, when they are about a quarter or half grown—the time of their life when they are most liable to disease. As aviary birds, they are unrivaled among fowls. Their plumage often requires a close inspection to appreciate its elaborate beauty; the confinement and fretting seem not uncongenial to their health; and their plumage improves in attractiveness with almost every month.

The great merit, however, of all the Polish fowls is, that for three or four years they continue to grow and gain in size, hardiness, and beauty—the male birds especially. This fact certainly points out a very wide deviation in constitution from those fowls which attain their full stature and perfect plumage in twelve or fifteen months. The similarity of coloring in the two sexes—almost a specific distinction of Polish and perhaps Spanish fowls—also separates them from those breeds, like the Game, in which the cocks and hens are remarkably dissimilar. Their edible qualities are as superior, compared with other fowls, as their outward apparel surpasses in elegance. They have also the reputation of being everlasting layers, which further fits them for keeping in small enclosures; but, in this respect, individual exceptions are often encountered—as in the case of the Hamburghs—however truly the habit may be ascribed to the race.

There are four known varieties of the Polish fowl, one of which appears to be lost to this country.
The Black Polish.—This variety is of a uniform black—both cock and hen—glossed with metallic green. The head is ornamented with a handsome crest of white feathers, springing from a fleshy protuberance, and fronted more or less deeply with black. The comb is merely two or three spikes, and the wattles are rather small. Both male and female are the same in color, except that the former has frequently narrow strips of white in the waving feathers of the tail, a sign, it is said, of true breeding. The hens, also, have two or three feathers on each side of the tail, tinged in the tip with white. They do not lay quite so early in the spring as some varieties, especially after a hard winter; but they are exceedingly good layers, continuing a long time without wanting to sit, and laying rather large, very white, sub-ovate eggs. They will, however, sit at length, and prove of very diverse dispositions; some being excellent sitters and nurses, others heedless and spiteful.

The chickens, when first hatched, are dull black, with white breasts, and white down on the front of the head. They do not always grow and get out of harm’s way so quickly as some other sorts, but are not particularly tender.
In rearing a brood of these fowls, some of the hens may be observed with crests round and symmetrical as a ball, and others in which the feathers turn all ways, and fall loosely over the eyes; and in the cocks, also, some have the crest falling gracefully over the back of the head, and others have the feathers turning about and standing on end. These should be rejected, the chief beauty of the kind depending upon such little particulars. One hen of this variety laid just a hundred eggs, many of them on consecutive days, before wanting to incubate; and after rearing a brood successfully, she laid twenty-five eggs before moulting in autumn.

The Golden Poland.—These are sometimes called Gold-spangled, as their plumage approaches to that of the Gold-spangled Hamburghs; but many of the finest specimens have the feathers merely fringed with a darker color, and the cocks, more frequently than the hens, exhibit a spotted or spangled appearance. Many of them are disfigured by a muff or beard; as to which the question has been raised whether it is an original appendage to these birds or not. A distinct race, of which the muff is one permanent characteristic, is not at present known. This appendage, whenever introduced into the poultry-yard, is not easily got rid of; which has caused some to suspect either that the original Polish were beardless, or that there were two ancient races.

The Golden Polands, when well bred, are exceedingly handsome; the cock has golden hackles, and gold and brown feathers on the back; breast and wings richly spotted with ochre and dark brown; tail darker; large golden and brown crest, falling back over the neck; but little comb and wattles. The hen is richly laced with dark-brown or black on an ochre ground; dark-spotted crest; legs light-blue, very cleanly made, and displaying a small web between the toes, almost as proportionately large as that in some of the waders.
They are good layers, and produce fair-sized eggs. Many of them make excellent mothers, although they cannot be induced to sit early in the season. The chickens are rather clumsy-looking little creatures, of a dingy-brown, with some dashes of ochre about the head, breast and wings. They are sometimes inclined to disease in the first week of their existence; but, if they pass this successfully, they become tolerably hardy, though liable to come to a pause when about half-grown. It may be noted as a peculiarity in the temper of this breed, that, if one is caught, or attacked by any animal, the rest, whether cocks or hens, will instantly make a furious attack upon the aggressors, and endeavor to effect the rescue of their companion.

The Silver Polands.—These are similar to the preceding in shape and markings, except that white, black, and gray are exchanged for ochre or yellow, and various shades of brown. They are even more delicate in their constitution, more liable to remain stationary at a certain point of their adolescence, and, still more than the other varieties, require and will repay extra care and accommodation. Their top-knots are, perhaps, not so large, as a general thing; but they retain the same neat bluish legs and slightly-webbed feet. The hens are much more ornamental than the cocks; though the latter are sure to attract notice. They may, unquestionably, be ranked among the choicest of fowls, whether their beauty or their rarity is considered. They lay, in tolerable abundance, eggs of moderate size, French-white, much pointed at one end; and when they sit, acquit themselves respectably.

The newly-hatched chickens are very pretty; gray, with black eyes, light lead-colored legs, and a swelling of down on the crown of the head, indicative of the future top-knot, which is exactly the color of a powdered wig, and, indeed, gives the chicken the appearance of wearing
one. There is no difficulty in rearing them for the first six weeks or two months; the critical time being the interval between that age and their reaching the fifth or sixth month. They acquire their peculiar distinctive features at a very early age, and are then the most elegant little miniature fowls which can possibly be imagined. The distinction of sex is not very manifest till they are nearly full-grown; the first observable indication being in the tail. That of the pullet is carried uprightly, as it ought to be; but in the cockerel, it remains depressed, awaiting the growth of the sickle-feathers. The top-knot of the cockerel inclines to hang more backward than that of the pullets. It is remarkable that the Golden Polish cock produces as true Silver chickens, and those stronger, with the Silver Polish hen, as the Silver Polish cock would bring.

The Silver Polands have all the habits of their golden companions, the main difference being the silvery ground instead of the golden. This variety will sometimes make its appearance even if merely its Golden kind is bred, precisely as the Black Polish now and then produce some pure White chickens that make very elegant birds.

The Shanghae.

For all the purposes of a really good fowl—for beauty of model, good size, and laying qualities—the thoroughbred Shanghae is among the best, and generally the most profitable of domestic birds. The cock, when full-grown, stands about twenty-eight inches high, if he is a good specimen; the female, about twenty-two or twenty-three inches. A large comb or heavy wattles are rarely seen on the hen at any age; but the comb of the male is high, deeply indented, and his wattles double and large. The comb and wattles are not, however, to be regarded as the
chief characteristics of this variety, nor even its reddish-yellow feathered leg; but the abundant, soft, and downy covering of the thighs, hips, and region of the vent, together with the remarkable short tail, and large mound of feathers piled over the upper part of its root, giving rise to considerable elevation on that part of the rump. It should be remarked, also, that the wings are quite short and small in proportion to the size of the fowl, and carried very high up the body, thus exposing the whole of the thighs, and a considerable portion of the side.

These characteristics are not found, in the same degree, in any other fowl. The peculiar arrangement of feathers gives the Shanghae in appearance, what it has in reality—a greater depth of quarter, in proportion to the brisket, than any other fowl.

As to the legs, they are not very peculiar. The color is usually reddish-white, or flesh color, or reddish-yellow, mostly covered down the outside, even to the end of the
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toes, with feathers. This last, however, is not always the case. The plumage of the thorough-bred is remarkably soft and silky, or rather downy; and is, in the opinion of many, equally as good for domestic purposes as that of the goose. The feathers are certainly quite as fine and soft, if not as abundant.

In laying qualities, the pure Shanghae equals, if it does not excel, any other fowl. The Black Poland, or the Bolton Gray, may, perhaps, lay a few more eggs in the course of a year, in consequence of not so frequently inclining to sit; but their eggs are not so rich and nutritious. A pullet of this breed laid one hundred and twenty eggs in one hun-

dred and twenty-five days, then stopped six days, then laid sixteen eggs more, stopped four days, and again continued her laying. The eggs are generally of a pale yellow, or nankeen color, not remarkably large, compared with the size of the fowl, and generally blunt at the ends. The comb is commonly single, though, in some specimens, there is a slight tendency to rose.

The flesh of this fowl is tender, juicy, and unexceptionable in every respect. Taking into consideration the goodly size of the Shanghae—weighing, as the males do, at maturity, from ten to twelve pounds, and the females from seven and a half to eight and a half, and the males and females of six months eight and six pounds respectively—the economical uses to which its soft, downy feathers may
be applied, its productiveness, hardiness, and its quiet and docile temper, this variety must occupy, and deservedly so, a high rank among our domestic fowls; and the more it is known, the better will it be appreciated.

The White Shanghae.—This variety is entirely white, with the legs usually feathered, and differ in no material respect from the red, yellow, and Dominique, except in color. The legs are yellowish, or reddish-yellow, and sometimes of flesh color. Many prefer them to all others. The eggs are of a nankeen, or dull yellow color, and blunt at both ends.

It is claimed by the friends of this variety that they are larger and more quiet than other varieties, that their flesh is much superior, their eggs larger, and the hens more profitable. Being more quiet in their habits, and less inclined to ramble, the hens are invaluable as incubators and nurses; and the mildness of their disposition makes them excellent foster-mothers, as they never injure the chickens belonging to other hens.

These fowls will rank among the largest coming from China, and are very thrifty in our climate. A cock of this
variety attained a weight of eight pounds, at about the age of eight months, and the pullets of the same brood were proportionably large. They are broad on the back and breast, with a body well rounded up; the plumage white, with a downy softness—in the latter respect much like the feathering of the Bremen goose; the tail-feathers short and full; the head small, surmounted by a small, single, serrated comb; wattles long and wide, overlaying the cheek-piece, which is also large, and extends back on the neck; and the legs of a yellow hue, approaching a flesh-color, and feathered to the ends of the toes.

The Spanish.

This name is said to be a misnomer, as the breed in question was originally brought by the Spaniards from the West Indies; and, although subsequently propagated in Spain, it has for some time been very difficult to procure good specimens from that country. From Spain, they were taken in considerable numbers into Holland, where they have been carefully bred, for many years; and it is from that quarter that our best fowls of this variety come.

The Spanish is a noble race of fowls, possessing many merits; of spirited and animated appearance; of considerable size; excellent for the table, both in whiteness of flesh and skin, and also in flavor; and laying exceedingly large eggs in considerable numbers. Among birds of its own breed it is not deficient in courage; though it yields, without showing much fight, to those which have a dash of game blood in their veins. It is a general favorite in all large cities, for the additional advantage that no soil of smoke or dirt is apparent on its plumage.

The thorough-bred birds should be entirely black, as far as feathers are concerned; and when in high condition, display a greenish, metallic lustre. The combs of both
cock and hen are exceedingly large, of a vivid and most brilliant scarlet; that of the hen droops over upon one side. Their most singular feature is a large white patch, or ear-hole, on the cheek—in some specimens extending over a great part of the face—of a fleshy substance, similar to the wattle; it is small in the female, but large and very conspicuous in the male. This marked contrast of black, bright red, and white, makes the breed of the Spanish cock as handsome as that of any variety which we have; in the genuine breed, the whole form is equally good.

Spanish hens are celebrated as good layers, and produce very large, quite white eggs, of a peculiar shape, being very thick at both ends, and yet tapering off a little at each. They are, by no means, good mothers of families, even when they do sit—which they will not often condescend to do—proving very careless, and frequently trampling half their brood under foot. The inconveniences of this habit are, however, easily obviated by causing the eggs to be hatched by some more motherly hen.

This variety of fowl has frequently been known to lose nearly all the feathers in its body, besides the usual quantity on the neck, wings, and tail; and, if they molt late, and the weather is severe, they feel it much. This must often happen in the case of an "everlasting layer"; for, if the system of a bird is exhausted by the unremitting production of eggs, it cannot contain within itself the material for supplying the growth of feathers. They have not, even yet, become acclimated in this country, since continued frost at any time is productive of much injury to their combs; frequently causing mortification in the end, which at times terminates in death. A warm poultry-house, high feeding, and care that they do not remain too long exposed to severe weather, are the best means of preventing this disfigurement. Some birds are occasionally produced, handsomely streaked with red on the hackle and back. This is no proof of bad breeding, if other points are right.
The chickens are large, as would be expected from such eggs, entirely shining black, except a pinafore of white on the breast—in which respect they are precisely like the Black Polish chickens—and a slight sprinkling under the chin, with sometimes also a little white round the back and eyes; their legs and feet are black. Many of them do not get perfectly feathered till they are three-fourths grown; and, therefore, to have this variety come to perfection in a country where the summers are much shorter than in their native climate, they must be hatched early in spring, so that they may be well covered with plumage before the cold rains of autumn. There is, however, a great lack of uniformity in the time when they get their plumage; the pullets are always earlier and better feathered than the cockerels—the latter being generally half naked for a considerable time after being hatched, though some feather tolerably well at an early age.

The Black is not the only valuable race of Spanish fowl;
there is, also, the *Gray*, or *Speckled*, of a slaty gray color, with white legs. Their growth is so rapid, and their size, eventually, so large, that they are remarkably slow in obtaining their feathers. Although well covered with down when first hatched, they look almost naked when half-grown, and should, therefore, be hatched as early in spring as possible. The cross between the Pheasant-Malay and the Spanish produces a particularly handsome fowl.

As early pullets, for laying purposes in the autumn and winter after they are hatched, no fowls can surpass the Spanish. They are believed, also, to be more precocious in their constitution; and consequently to lay at an earlier age than the pullets of other breeds.

**Breeding and Management.**

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**Breeding.**

GOOD fowls are very profitable in the keeping of intelligent breeders. It is stated, by those most competent to express the opinion, that four acres of land, devoted to the rearing of the best varieties of poultry, will, at ordinary prices, be quite as productive as a farm of one hundred and fifty acres cultivated in the usual way. The eggs of the common and cheaper kinds which might be used for incubators and nurses, would pay—or could be made to pay, if properly preserved, and sold at the right time—all expenses of feed, etc.; while good capons of the larger breeds will bring, in any of our larger markets, from three to five dollars per pair, and early spring chickens from twenty to twenty-five cents per pound.

To make poultry profitable, then, it is only necessary that the better kinds be bred from, that suitable places be
provided for them, that they be properly fed, and carefully and intelligently managed. These requirements are too rarely complied with, in every respect, to enable a correct opinion to be formed as to what may be made out of poultry under the most favorable circumstances.

A few general principles, well understood and faithfully applied, will prove of great value. By "in-and-in breeding" is meant commerce between individuals of the same brood, or brother and sister, so to speak; by "close breeding," commerce between the parent and his offspring, in whatever degree.

**Crossing the Breed.**

To insure successful and beneficial crossing of distinct breeds, in order to produce a new and valuable variety, the breeder must have an accurate knowledge of the laws of procreation, and the varied influences of parents upon their offspring. All the breeds in this country are crosses, produced either by accident or design. Crossing does not necessarily produce a breed; but it always produces a variety, and that variety becomes a breed only where there is a sufficiency of stamina to make a distinctive race, and continue a progeny with the uniform or leading characteristics of its progenitors.

**High Breeding.**

When uniformity of plumage can be effected in mixed breeds or varieties without a resort to in-and-in, or close breeding, and without sacrificing the health and vigor of the race, it is desirable; and, in many instances, it can be accomplished in a satisfactory manner. What are called highly-bred fowls are, however, too often the deteriorated offspring of progenitors far below the original stock.
Genuine high breeding consists in the selection of parent stock of the same race, perfect in all the general characteristics, and of remote consanguinity. This should be resorted to periodically, in order to secure the best results.

If a race is pure—that is, if the species or variety is absolutely distinct and unsophisticated—the progeny resembles the progenitors in almost every respect. The mixture of races, where the consanguinity is remote, is productive of decided benefits.

To illustrate, in the case of fowls: when the blood is unmixed—as with the Guelderlands, and some others—

the offspring, in all respects, resemble their parents; in plumage, general habits, form, outline, etc. In this case, they look almost identically the same. But when the blood is mixed—as with the Cochin Chinas, and many others—the plumage will vary widely, or slightly, according to circumstances, though many or most of the general characteristics may remain the same. The close breeding, to which many resort for the purpose of procuring uniformity, generally results in an absolute deterioration of the race in important respects.

In some cases, close breeding—and, occasionally, in-and-in—seems to be in accordance with the laws of Nature; as with the wild turkey, which, in its natural state, resorts
to these modes of breeding, and yet the race does not change in appearance or degenerate. The reason is, that the breed is pure. In comparing any number of these birds, not the least dissimilarity is discoverable; they all look alike, as they always have, and always will. They are changed, or deteriorated, only by crossing or confinement.

Most breeds of the hen kind degenerate rapidly from close, or in-and-in breeding, because they are not perfect of their kind; that is, the breed is not pure, but of mixed blood; and in such objectionable breeding the race degenerates just in proportion as the breed is imperfect or impure. The perfect Guelderland will admit of these modes of breeding, for a great length of time, without deterioration; but the impure or mixed will rapidly degenerate. This is also true of all breeds, wherein the characteristic marks are uniform and confirmed, showing perfection in the race.

As a general rule, however, close and in-and-in breeding should be carefully avoided, where the race is not absolutely perfect, if it is desired to improve the breed; and as all the breeds of this kind of fowls are of mixed blood, the danger of such breeding is greater or less, in exact proportion as the distinctive characteristics are variant or fixed; and the danger still increases, if the breed is composed of strains of blood greatly dissimilar, or of races widely differing in the conformation or general habits.

Preserving the Distinctive Breeds.

As to the time when the different breeds of hens should be separated in the spring, in order to preserve the breed pure, the most ample experience indicates that, if the eggs be preserved, and set after a separation of two days, the breed will be perfect, the offspring having all the characteristics or distinctive marks.
When a valuable breed is produced, either by accident or design, it should be preserved, and the subsequent breeding should continue from that stock; otherwise, there is no certainty of the purity of the blood of the new breed, for it does not follow that a different parentage, though of the same name or original breed precisely, will produce the same new breed, or anything resembling it. The Dorking fowl, for instance, was originally produced by crossing the Great Malay with the English Game, as an accident; but it by no means follows that Dorkings are the uniform, or even the common result of such a cross, for hundreds of similar experiments have proved unsuccessful. The breeding, therefore, to be pure-blooded, must continue from the stock originally produced by accident; and as such breeding produces the leading characteristics of the race with great uniformity, the genuineness of the breed cannot be doubted.

In order to produce a good cross, the parentage should be healthy, and from healthy races, not materially dissimilar in their general habits. The size of the leg should always be looked to, in order to judge accurately as to purity of blood. If the leg is large for the breed—that is, if larger than the generality of the same breed—the purity of the blood, the fineness of the flesh, and most of the other valuable qualities, can be relied on; but, if the legs are
smaller than most others of the same breed, the fowl is spurious and of deteriorated blood. The fifth toe and feathered legs of some breeds were originally the result of accident; but by long and careful breeding, they have become incorporated into the nature of certain races of general, though not universal or essential, requisites. When a fowl exhibits any special marks indicative of all the races or breeds from which the cross originated, it is a sure evidence of extraordinary purity of blood, and of the superior excellence of the race. The best fowls of the race should always be selected for crossing or general breeding; otherwise the breeds will degenerate.

The quality—that is, the fineness, juiciness and richness of flavor—of the flesh of domestic fowls is of much more importance than their size. All coarse-meated fowls should, therefore, be rejected, no matter how large they may be. There is no difficulty in discriminating between coarse and fine fowls at any time. In the case of chickens, if the down is straight and stands out, and the body and limbs are loosely joined, the meat is coarse; but if the down is glossy, and lies close to the body, and the body and limbs are compactly formed, the meat is fine; and when grown, if the fowl is light in weight, in proportion to its size, the flesh is coarse; but if heavy, the flesh is fine.

There is also a fitness in the quality of the flesh; for, if the meat is fine, the bones are fine, and the feathers are fine; and the converse holds true. If the flesh is fine, it is juicy and richly flavored; if coarse, it is dry, fibrous and insipid.

The color of the legs, too, is quite material in judging of the quality of fowls. All other things being equal, dark-legged fowls have the finest flesh, and are most hardy. Turkeys, which have the finest flesh of any fowl of their size, have black legs; the game-cock, likewise, which is universally acknowledged to be the finest-fleshed of any of the domestic fowls, except the Wild Indian fowl of Cal-
cutta, has dark legs. It does not, however, of necessity follow that all dark-legged fowls are fine, or that all yellow or white-legged ones are coarse, since much depends upon the breed; but it is true that the darkest leg which pertains to the breed indicates the finest fowl.

The color of the feathers, also, has more or less to do with the quality of the fowl. Some breeds have a much more brilliant plumage than others; but when brilliancy of plumage is here spoken of, it is to be understood in comparison with others of the same breed. If, therefore, a fowl is selected of rich and glossy plumage, when compared

with others of the same breed, the legs will be dark of the kind, and the quality of the bird will excel.

The best breeding is to cross or mix the races; this process improves the breeds, in all respects. When the object in view is to perpetuate distinct varieties of uncontaminated blood, the first requisite is to procure fowls known to be of pure blood, and possessing all the necessary characteristics of their kind. Labor is lost, unless the fowl selected is a perfect specimen of the variety; for whatever imperfection exists is likely to be perpetuated in the progeny. Regard should be had to plumage, size, and form, in making a selection either of a cock or a pullet; and those are preferable which are hatched earliest in the year. The age of the fowls is a matter of considerable
importance; and, though it is true that a pullet will lay the greatest number of eggs in her first year, yet it is believed that the chickens which are hatched from the second year's eggs are more vigorous and hardy. Old hens are generally preferred to pullets as sitters, on account of their more sedate and matronly character. A young cock, though more active in his earliest days, and likely to bestow his attention on the hens with less reserve, is not, however, best for use in keeping up a breed. The eggs impregnated by him after his first season are likely to produce the strongest chickens. It is an error to suppose—as is often represented—that his procreative power is decayed or vitiated after three or four years. On the contrary, a healthy, vigorous cock, if not allowed to walk with too many hens, may be valuable and useful in the poultry-yard for a longer time.

An error is often committed by assigning too many hens to one cock; and the result is a weakly and otherwise deteriorated progeny. No more than five hens should be allowed to associate with a single cock, when the quality of the breed is a matter of interest. Three, indeed, would be the better number for restriction; but five is the farthest limit which can be safely assigned.

Most persons, in obtaining a single vigorous cock and hen of a desirable variety, find their anticipations more than realized in the production of a fine progeny. The plumage is brilliant, and the chickens are of increased size, and remarkably strong and healthy. This desirable state of things continues so long as the cock is restricted to a small number of hens; but as soon as his harem is enlarged, different effects are manifested, and a deterioration in the stock is clearly observable—attributable, not to close-breeding, but to the increased disproportion of the females to the male, and the consequent overtasking of his powers.

In breeding-time, great cleanliness should be preserved
in the lodgings of the fowls, and the quantity and quality of food should be attended to. They should not be suffered to feed to repletion, and such kinds of food as are most nutritious should be carefully provided. Variety of food is essential; and a proper proportion of animal and green food should be given with their usual fare. Suitable arrangements should, of course, be made to prevent any intermixture of breeds. A constant vigilance in this respect is the price of success; and when all proper precautions are taken, the breeder may be perfectly secure that his anticipations will be realized.

Selection of Stock.

The habits of the domestic fowl, in a wild state, are too little known to ascertain whether the cocks always associate with the hens, or only occasionally. Though hens will lay some eggs without pairing, as this is not natural, the number will, for the most part, be less, and the laying uncertain; it is, therefore, indispensable to attend to the laws of Nature in this respect.

The number of hens to be allowed to one cock should vary with the object in view. The limit for valuable breeding purposes has already been indicated. If profit is sought for, in the production of eggs alone, one cock—if a stout, young, and lively bird—may have as many as twenty-four hens.

The choice of a cock is a very important thing. He is considered to have every requisite quality when he is of a good middling size; carries his head high; has a quick, animated look; a strong and shrill voice; a fine red comb, shining as if varnished; wattles of a large size, and of the same color as the comb; the breast broad; the wings strong; the plumage black, or of an obscure red; the thighs very muscular; the legs thick, and furnished with
strong spurs; and the claws rather bent and sharply pointed. He ought, also, to be free in his motions, to crow frequently, and to scratch the ground often in search of worms, not so much for himself as to treat his hens. He ought, withal, to be brisk, spirited, ardent, and ready in caressing the hens; quick in defending them, attentive in soliciting them to eat, in keeping them together, and in assembling them at night.

In breeding game cocks, the qualities required are every mark of perfect health, such as a ruddy complexion; the feathers close, short, and not feeling cold or dry; the flesh firm and compact; and a full breast, betokening good lungs; a tapering and thinness behind. He should be full in the girth, well coupled, lofty and aspiring, with a good thigh, the beam of his leg very strong, the eye large and vivid, and the beak strong, crooked, and thick at the base.

A cock is at his prime at two years old, though cocks are sometimes so precocious as to show every mark of full vigor at four months, while others of the same brood do not appear in that state for several months afterward. When marks of declining vigor are perceived, the cock must be displaced to make way for a successor, which should be chosen from among the finest and bravest of the supernumerary young cocks, that ought to be reared for this special purpose.

The change of cocks is of much importance, and is frequently very troublesome to manage, for peace does not long subsist between them when they hold a divided dominion in the poultry-yard, since they are all actuated by a restless, jealous, hasty, fiery, ardent disposition; and hence their quarrels become no less frequent than sanguinary. A battle soon succeeds to provocation or affront. The two opponents face each other, their feathers bristling up, their necks stretched out, their heads low, and their beaks ready for the onslaught. They observe each other in silence with fixed
and sparkling eyes. On the least motion of either, they stand stiffly up, and rush furiously forward, dashing at each other with beak and spur in repeated sallies, till the more powerful or the more adroit has grievously torn the comb and wattles of his adversary, has thrown him down by the heavy stroke of his wings, or has stabbed him with his spurs.

In the choice of a hen for sitting, a large bird should be selected, with large, wide-spreading wings. Though large, she must not, however, be heavy or leggy. No one of judgment would sit a Malay, as, in such case, not only would many eggs remain uncovered, but many, also, would be trampled upon and broken. Elderly hens will be more willing to sit than young and giddy pullets.

After the common hen, which, on account of her fecundity, is deservedly esteemed, the tufted hens may be justly ranked; particularly from being more delicate eating, because she fattens more readily, on account of laying less. The large breed, though less prolific, is preferable in rearing chickens for the market, or for making capons. With regard to these three kinds, the general opinion of breeders is, that the first is more prolific in the number of eggs, while the others produce larger chickens, which bring good prices.

The Spanish fowl are not generally good sitters, but are excellent layers; the Dorkings reverse the order, being better sitters than layers. These qualities will be found to extend pretty generally to hens partaking of the prevailing colors of these two varieties; the black being usually the best layers, and but careless or indifferent sitters, while gray or checkered hens are the best that can be produced.

**Feeding.**

Experiments have demonstrated that what may be called the gastric juice in fowls has not sufficient power to dissolve their food, without the aid of the grinding action
of the gizzard. Before the food is prepared for digestion, therefore, the grains must be subjected to a triturating process; and such as are not sufficiently bruised in this manner, before passing into the gizzard, are there reduced to the proper state, by its natural action. The action of the gizzard is, in this respect, mechanical; this organ serving as a mill to grind the food to pieces, and then, by means of its powerful muscles, pressing it gradually into the intestines, in the form of pulp. The power of this organ is said to be sufficient to pulverize hollow globules of glass in a very short time, and solid masses of the same substance in a few weeks. The rapidity of this process seems to be proportionate, generally, to the size of the bird. A chicken, for example, breaks up such substances as are received into its stomach less rapidly than the capon; while a goose performs the same operation sooner than either. Needles, and even lancets, given to turkeys, have been broken in pieces and voided, without any apparent injury to the stomach. The reason, undoubtedly, is, that the larger species of birds have thicker and more powerful organs of digestion.

It has long been the general opinion that, from some deficiency in the digestive apparatus, fowls are obliged to resort to the use of stones and gravel, in order to enable them to dispose of the food which they consume. Some have supposed that the use of these stones is to sheath the gizzard, in order to fit it to break into smaller fragments the hard, angular substances which might be swallowed; they have also been considered to have a medicinal effect; others have imagined that they acted as absorbents for undue quantities of acids in the stomach, or as stimulants to digestion; while it has even been gravely asserted that they contribute directly to nutrition.

Repeated experiments, however, have established that pebbles are not at all necessary to the trituration of the hardest kinds of substances which can be introduced into
their stomachs; and, of course, the usual food of fowls can be bruised without their aid. They do, however, serve a useful auxiliary purpose. When put in motion by the muscles, they are capable of producing some effects upon the contents of the stomach; thus assisting to grind down the grain, and separating its parts, the digestive fluid, or gastric juice, comes more readily in contact with it.

Varieties of Food.—Fowls about a poultry-yard can usually pick up a portion of their subsistence, and, under favorable circumstances, the largest portion. When so situated, the keeping of poultry pays decidedly the best. The support even of poultry not designed for fattening should not, however, be made to depend entirely upon such precarious resources. Fowls should be fed with punctuality, faithfulness, and discretion.

They are fond of all sorts of grain—such as Indian corn, wheat, oats, rye, buckwheat, barley, millet, etc.; but their particular preferences are not so likely to guide in the selection of their food, as the consideration of what is most economical, and easiest to be produced on the part of their owner. They will readily eat most kinds of vegetables in their green state, both cooked and raw. They likewise manifest an inclination for animal food—such as blood, fish, and flesh—whether raw or otherwise; and seem by no means averse to feeding on their own species. Insects, worms, and snails they will take with avidity.

It is usual to give to domestic fowls a quantity of grain once, at least, daily; but, commonly, in less quantity than they would consume, if unrestricted. They feed with great voracity; but their apparent greediness is not the criterion by which the possibility of satisfying them is to be judged. Moderate quantities of food will suffice; and the amount consumed will usually be proportioned to the size of the individuals. Whatever is cheapest, at any given time, may be given, without regard to any other considerations. Different circumstances and different seasons may occasion
a variation in their appetite; but a gill of grain is, generally speaking, about the usual daily portion. Some very voracious fowls, of the largest size, will need the allowance of a third of a pint each day.

Wheat is the most nutritive of cereal grains—with, perhaps, the exception of rice—as an article of human food. It is, therefore, natural to suppose that it is best for fowls, and the avidity with which they eat it would induce the conclusion that they would eat more of this than any other grain. Yet it appears that when fowls have as much wheat as they can consume, they will eat about a fourth part less than of oats, barley, or buckwheat; the largest quantity of wheat eaten by a fowl in one day being, according to several experiments, about three-sixteenths of a pint. The difference in bulk is, however, compensated by the difference in weight, these three-sixteenths of wheat weighing more than one-fourth of a pint of oats. The difference in weight is not, in every instance, the reason why a fowl is satisfied with a larger or smaller measure of one sort than another. Rye weighs less than wheat; but still a fowl will be satisfied with half the quantity of this grain. Indian corn ranks intermediately between wheat and rye; five-fourths of a pint of Indian corn with fowls being found, by experiment, equal to six-fourths of wheat, and three-fourths of rye.

In estimating the quantity of grain daily consumed by the common fowl, it is wise to use data a little above than below the average. It may, therefore, safely be said that a fowl of the common size, having free access to as much as can be eaten through the day, will consume, day by day, of oats, buckwheat, or barley, one-fourth of a pint; of wheat, three-sixteenths; of Indian corn, five thirty-seconds; and of rye, three thirty-seconds.

It has been conclusively settled, by experiments instituted to that end, that there is the best economy in feeding poultry with boiled grain rather than with dry, in every case where Indian corn, barley, and wheat can be procured. The expense
of fuel, and the additional trouble incident to the process of cooking, are inconsiderable in comparison with the advantages derived. Where oats, buckwheat, or rye are used, boiling is useless, when profit is concerned.

Bran.—It is an erroneous notion that money can be saved by feeding bran to fowls; since, then, so little of the farina of the grain remains in it, that the nourishment derived from its use is hardly worth mentioning. When boiled, as it always must be, its bulk is but slightly increased. Two measures of dry bran, mixed with water, are equal to but three-fifths of a measure of dry barley.

Millet.—This is recommended as excellent food for young chickens. Fowls always prefer it raw; though, as its bulk is increased one-half by boiling, it is doubtless more economical to feed it cooked.

Rice.—Fowls are especially fond of this food, although they lose their relish for it when allowed to have it at their discretion. It should always be boiled; but its expense puts it out of the question as a daily diet. When used continuously, it should always be mixed with some substance containing less nutritive matter, in order that the appetite may not be cloyed by it.

Potatoes.—These are very nutritious, and are usually acceptable to fowls, when properly prepared. When raw, or in a cold state, they appear to dislike them; they should therefore be boiled and given when moderately hot; when very hot, it is said that fowls will injure themselves by eating them, and burning their mouths. They should also be broken into pieces of convenient size; otherwise, they will be avoided. Occasionally raw pieces of potato will be devoured; but fowls cannot be said to be fond of the root in this state. The same remark applies to most other roots, especially to carrots and parsnips; these should always be prepared, in order to be wholesome and palatable. Fowls should never be confined to a root diet, in any case; but such food should be mingled or alternated with a sufficient quantity of grain.
Green Food.—Indulgence in this kind of diet is absolutely necessary to the health of fowls, and is also advantageous in an economical point of view. The more delicate kinds of green vegetables are eaten with the utmost avidity; all succulent weeds, grass and the leaves of trees and shrubs will also be consumed. If hens have green plots to graze in during the day, the expense of their keeping will be reduced one-half. All the refuse of the kitchen, of a vegetable nature should be freely thrown into the poultry-yard.

Green food, however, will not answer for an exclusive diet. Experiment has shown that fowls fed with this food alone for a few days together exhibit severe symptoms of relaxation of the bowels; and, after the lapse of eight or nine days, their combs become pale and livid, which is the same indication of disease in them that paleness of the lips is in the human species.

Earth-Worms.—These are regarded as delicacies by the inhabitants of the poultry-yard; and the individual who is fortunate enough to capture one is often forced to undergo a severe ordeal in order to retain his captive. Earth-worms are more plentiful in moist land, such as pastures, etc., than in that which is cultivated; in gardens, also, they exist in vast numbers. When it is desirable to take worms in quantities, it is only necessary to thrust a stake or three-pronged fork into the ground, to the depth of about a foot, and to move it suddenly backward and forward, in order to shake the soil all around; the worms are instinctively terrified by any motion in the ground, and, when disturbed, hasten to the surface.

It is advisable to store worms, on account of the trouble and difficulty of making frequent collections. They may be placed in casks, filled one-third full with earth, in quantities at least equal in bulk to the earth. The earth should be sprinkled occasionally, to prevent it from becoming too dry. Care should, however, be exercised that the earth
does not become too moist; since, in such an event, the worms will perish. In rainy weather, the casks should be protected with a covering.

Animal Food.—Fowls readily eat both fish and flesh meat, and have no reluctance to feeding even on their own kind, picking much more faithfully than quadrupeds. Blood of any kind is esteemed by them a delicacy; and fish, even when salted, is devoured with a relish. They seem to be indifferent whether animal food is given to them in a cooked or raw state; though, if any preference can be detected, it is for the latter. They are sometimes so greedy that they will attack each other in order to taste the blood which flows from the wounds so inflicted; and it is quite common for them, in the moulting season, to gratify themselves by picking at a sprouting feather on their own bodies and those of their companions. They appear to be partial to suet and fat; but they should not be allowed to devour these substances in large quantities, on account of their tendency to render them inconveniently fat.

It is highly advantageous to fowls to allow them a reasonable quantity of animal food for their diet, which should be fed to them in small pieces, both for safety and convenience. Bones and meat may be boiled; and the liquor, when mixed with bran or meal, is healthy, and not expensive.

Insects.—Fowls have a decided liking to flies, beetles, grasshoppers, and crickets; and grubs, caterpillars, and maggots are held by them in equal esteem. It is difficult, however, to supply the poultry-yard with this species of food in sufficient quantity; but enough may be provided, probably, to serve as luxuries. Some recommend that pailfuls of blood should be thrown on dunghills, where fowls are allowed to run, for the purpose of enticing flies to deposit their eggs, which, when hatched, produce swarms of maggots for the fowls. With the same view, any sort of garbage or offal may be thrown out, if the
dunghill is so situated—as it always should be—that its exhalations will not prove an annoyance.

Laying.

The ordinary productiveness of a single individual of the family of domestic fowls is astonishing. While few hens are capable of hatching more than fifteen eggs, and are incapable usually of sitting more than twice in the year, frequent instances have occurred of hens laying three hundred eggs annually, while two hundred is the average number. Some hens are accustomed to lay at longer intervals than others. The habit of one variety is to lay once in three days only; others will lay every other day; and some produce an egg daily. The productiveness of hens depends, undoubtedly, upon circumstances, to a great degree. Climate has a great influence in this respect; and their lodging and food, as well as the care bestowed upon them, have more or less effect in promoting or obstructing their fecundity.

There seems to be, naturally, two periods of the year in which fowls lay—early in the spring, and in the summer; and this fact would seem to indicate that, if they were left to themselves, like wild birds, they would bring forth two broods in a year. The laying continues, with few interruptions, till the close of summer, when the natural process of moulting causes them to cease. This annual process commences about August, and continues through the three following months. The constitutional effect attending the beginning, continuance, and consequences of this period—a very critical one in the case of all feathered animals—prevents them from laying, until its very close, when the entire coat of new feathers replaces the old, the washing of the nutritive juices, yielded by the blood for the express purpose of promoting this growth, is a great drain upon this system; and the constitutional forces, which would
otherwise assist in forming the egg, are rendered inoperative. The approach of cold weather, also, at the close of the moulting period, contributes to the same result. As the season of moulting is every year later, the older the hen is the later in the spring she will begin to lay. As pullets, on the contrary, do not moul the first year, they commence laying sooner than the elder hens; and it is possible, by judicious and careful management, so to arrange, in a collection of poultry tolerably numerous, as to have eggs throughout the year. It is a singular fact that pullets hatched very late in autumn, and therefore of stunted growth, will lay nearly as early as those hatched in spring. The checking of their growth seems to have a tendency to produce eggs of course, very tiny ones at first.

When a hen is near to the time of laying, her comb and wattles change from their previous dull hue to a bright red, while the eye becomes more bright, the gait more spirited, and she occasionally cackles for three or four days. These signs rarely prove false; and when the time comes that she desires to lay, she appears very restless, going backward and forward, visiting every nook and corner, cackling meanwhile, as if displeased because she cannot suit herself with a convenient nest. Not having looked out for one previously, she rarely succeeds in pleasing herself till the moment comes when she can no longer tarry, when she is compelled to choose one of the boxes or baskets provided for this purpose in the poultry-house where she settles herself in silence and lays.

In some instances, a hen will make a choice of a particular nest in which to lay, and when she finds, upon desiring to lay, that this is pre-occupied by another hen, she will wait till it is vacated; but, in other cases, hens will go into any nest which they find, preferring, for the most part, those having the greatest number of eggs. The process of laying is, most probably, rather painful, though the hen
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does not indicate this by her cries; but the instant she has done she leaves the nest, and utters her joy by peculiarly loud notes, which are re-echoed by the cock, as well as by some of the other hens. Some hens, however, leave the nest in silence, after laying:

It seems ever to have been an object of great importance, in an economical point of view, to secure the laying of hens during those parts of the year when, if left to themselves, they are indisposed to deposit their eggs. For this purpose many methods have been devised, the most of which embrace an increase of rich and stimulating food. Some recommend shutting hens up in a warm place during winter, and giving them boiled potatoes, turnips, carrots and parsnips. Others assign as the reason for their not laying in winter, in some climates, that the earth is covered with snow, so that they can find no ground, or other calcareous matter, to form the shells; and advise, therefore, the bones of meat or poultry should be pounded and given to them, either mixed with their food, or by itself, which they will greedily eat. Upon the whole, it would seem that the most feasible means of obtaining fresh eggs during the winter is to have young hens—pullets hatched only the previous spring being the best—to use extreme liberality in feeding, and to cautiously abstain from over-stocking the poultry-yard.

As serviceable food to increase laying, scraps of animal food, given two or three times a week, answer admirably; the best mode of doing so is throwing down a bullock's liver, leaving it with them, and permitting them to pick it at will; this is better raw than boiled. Lights, or guts, or any other animal refuse, will be found to answer the same purpose; but these substances require, or, at all events, are better for boiling. Cayenne pepper—in fact all descriptions of pepper, but especially cayenne pepper in pods—is a favorite food with fowls; and, being a powerful stimulant, it promotes laying.

An abundant supply of lime, in some form, should not
be omitted; either chopped bones, old mortar, or a lump of chalky marl. The shell of every egg used in the house should be roughly crushed and thrown down to the hens, which will greedily eat them. A green, living turf will be of service, both for its grass and the insects it may contain. A dusting-place, wherein to get rid of vermin, is indispensable. A daily hot meal of potatoes, boiled as carefully as for the family table, then chopped, and sprinkled or mixed with bran, will be comfortable and stimulating. After every meal of the household, the bones and other scraps should be collected and thrown out.

As to the number of eggs, the varieties which possess the greatest fecundity are the Shanghaes, Guelderlands, Dorkings, Polish, and Spanish. The Polish and Spanish lay the largest eggs; the Dorkings, eggs of good size; while the Game and the smaller kinds produce only small eggs. Those eggs which have the brightest yoke are the finest flavored; and this is usually the case with the smaller kinds. The large eggs of the larger varieties which have yolks of a pale color, and are inferior in flavor.

**Preservation of Eggs.**

Eggs, after being laid, lose daily, by transpiration, a portion of the matter which they contain, notwithstanding the compact texture of their shell, and of the close tissue of the flexible membranes lining the shell, and enveloping the white. When an egg is fresh, it is full, without any vacancy; and this a matter of common observation, whether it be broken raw, or when it is either soft or hard-boiled. In all stale eggs, on the contrary, there is uniformly more or less vacancy, proportioned to the loss they have sustained by transpiration; hence, in order to judge of the freshness of an egg, it is usual to hold it up to the light, when the transparency of the shell makes it appear whether or not
there is any vacancy in the upper portion, as well as whether the yolk and white are mingled and muddy, by the rotting and bursting of their enveloping membranes.

The transpiration of eggs, besides, is proportional to the temperature in which they are placed, cold retarding and heat promoting the process; hence, by keeping fresh-laid eggs in a cool cellar, or, better still, in an ice-house, they will transpire less, and be preserved for a longer period sound, than if they are kept in a warm place, or exposed to the sun's light, which has also a good effect in promoting the exhalation of moisture. As, therefore, fermentation and putridity can only take place by communication with the air at a moderate temperature, such connection must be excluded by closing the pores of the shell.

It is an indispensable condition of the material used for this purpose, that it shall be incapable of being dissolved by the moisture transpired from the interior. Spirits of wine varnish, made with lac, answers the requirement; this is not very expensive, but is rather an uncommon article in country places, where eggs are most abundantly produced.

A better material is a mixture of mutton and beef suet, which should be melted together over a slow fire, and strained through a linen cloth into an earthen pan. The chief advantage in the use of this is, that the eggs rubbed over with it will boil as quickly as if nothing had been done to them, the fat melting off as soon as they touch the water. The transpiration is as effectually stopped by the thinnest layer of fat as by a thick coating, provided that no sensible vestige be left on the surface of the shell. All sorts of fat, grease, or oil are well adapted to this purpose; by means of butter, hog's lard, olive oil, and similar substances, eggs may be preserved for nine months as fresh as the day upon which they were laid.

Another method is, to dip each egg into melted pork-lard, rubbing it into the shell with the finger, and pack them in old fig-drums, or butter firkins, setting every egg upright,
with the small end downward. Or, the eggs may be packed in the same way in an upright earthen pan; then cut some rough sheep's tallow, procured the same day that the animal is killed, into small pieces, and melt it down; strain it from the scraps, and pour it while warm, not hot, over the eggs in the jar till they are completely covered. When all is cold and firm, set the vessel in a cool, dry place till the contents are wanted.

Eggs will also keep well when preserved in salt, by arranging them in a barrel, first a layer of salt, then a layer of eggs, alternately. This can, however, also act mechanically, like bran or saw-dust, so long as the salt continues dry; for, in that case, the chlorine, which is the antiseptic principle of the salt, is not evolved. When the salt, however, becomes damp, its preservative principle will be brought into action, and may penetrate through the pores of the shell.

Immersing eggs in vitriol, or sulphuric acid, is likewise a very effectual means of preserving them; the sulphuric acid acts chemically upon the carbonate of lime in the shell, by setting free the carbonic acid gas, while it unites with the lime, and forms sulphate of lime, or plaster of Paris. Another method is, to mix together a bushel of quick-lime, two pounds of salt, and eight ounces of cream of tartar, adding a sufficient quantity of water, so that eggs may be plunged into the paint. When a paste is made of this consistence, the eggs are put into it, and may be kept fresh, it is said, for two years.

Another method of preserving eggs a long while fresh, depends upon a very different principle. Eggs that have not been rendered reproductive by the cock have been found to continue very uncorrupted. In order, therefore, to have eggs keep fresh from spring to the middle or even to the end of winter, it is only necessary to deprive the hens of all communication with the cocks, for at least a month before the eggs are put away.

It ought not to be overlooked, in this connection, that
eggs not only spoil by the transpiration of their moisture and the putrid fermentation of their contents, in consequence of air penetrating through the pores of the shell, but also by being moved about and jostled, when carried to a distance by sea or land. Any kind of rough motion, indeed, rup-
tures the membranes which keep the white, the yolk, and the germ of the chicken in their appropriate places; and upon these being mixed, putrefaction is promoted.

Choice of Eggs for Setting.

Eggs for hatching should be as fresh as possible; if laid the very same day, so much the better. This is not always possible when a particular stock is required; but, if a numerous and healthy brood is all that is wanted, the most recent eggs should be selected. Eggs may be kept for this purpose in either of the ways first mentioned; or they may be placed on their points in a box, in a cool, dry place; the temperature about sixty or sixty-five Fahrenheit; the bottom of the box should be covered with a layer of wheat bran, then a layer of eggs put in, and covered with bran; and so on, alternating. In this mode, evaporation is prevented, and the eggs are almost as certain to hatch out, at the end of six weeks, or even two months, as when they were laid.

It is difficult to fix the exact term during which the vitality of an egg remains unextinguished; as it, unquestionably, varies from the very first, according to the vigor of the parents of the inclosed germ, and fades away gradually till the final moment of non-existence. The chickens in stale eggs have not sufficient strength to extricate themselves from the shell; if assisted, the yolk is found to be partially absorbed into the abdomen, or not at all; they are too faint to stand; the muscles of the neck are unable to lift their heads, much less to peck; and although they may sometimes be saved by extreme care, their usual fate is to be trampled to
death by the mother, if they do not expire almost as soon as they begin to draw their breath. Thick-shelled eggs, like those of geese, Guinea fowls, etc., will retain life longer than thin-shelled ones, as those of hens and ducks. When choice eggs are expected to be laid, it is more prudent to have the hen which is to sit upon them wait for them, than to keep other eggs waiting for her. A good sitter may be amused for two or three weeks with a few addle-eggs, and so be ready to take charge of those of value immediately upon their arrival.

As to the choice of eggs for hatching, such should be taken, of course, as are believed to have been rendered productive. Those of medium size—the average size that the hen lays—are most apt to fulfill this requirement. A very fair judgment may be formed of eggs from their specific gravity; such as do not sink to the bottom in a bowl of tepid water should be rejected.

The old-time notion, that small, round eggs produce females, and long, pointed ones males—originally applied, by the ancients, to eating rather than hatching purposes—may be considered exploded. The hen that lays one round egg continues to lay all her eggs round; and the hen that lays one oblong, lays all oblong. According to this theory, then, one hen would be the perpetual mother of cocks, and another the perpetual producer of pullets; which is absurd, as daily experience proves.

The same fate has been meted out to that other venerable test of sex, the position of the air-bag at the blunt end of the shell. "If the vacancy is a little on one side, it will produce a hen; if it is exactly in the center, a cock." Upon this assumption, the cock should be a very rare bird; since there are very few eggs indeed in which the air-bottle is exactly concentric with the axis of the egg. In many breeds, on the contrary, the cockerels bear a proportion of at least one-third, and sometimes two-thirds, especially in those hatched during winter, or in unfavorable seasons; the immediate cause,
doubtless, being that the eggs producing a more robust sex possess a stronger vitality.

Nor are these two alleged tests—the shape of the egg, and the position of the air-tube—consistent with each other; for, if the round egg produces a pullet, and an egg with the air-bag a little on one side does the same, then all round eggs should have the air-bag in that position, or one test contradicts the other; and the same argument applies to the long or oval egg. The examination of a few eggs by the light of a candle will satisfy any one that the position of the air-bag differs as much in a long egg as it does in a round.

There are, indeed, no known means of determining beforehand the sex of fowl; except, perhaps, that cocks may be more likely to issue from large eggs, and hens from small ones. As, however, the egg of each hen may be recognized, the means are accessible of propagating from those parents whose race it is judged most desirable to continue.

**Incubation.**

The hen manifests the desire of incubation in a manner different from that of any other known bird. Nature having been sufficiently tasked in one direction, she becomes feverish and loses flesh; her comb is livid; her eyes are dull; she bristles her feathers to intimidate an imaginary enemy; and, as if her chickens were already around her, utters the maternal "cluck."

When the determination to sit becomes fixed—it is not necessary to immediately gratify the first faint inclinations—the nest which she has selected should be well cleaned, and filled with fresh straw. The number of eggs to be allowed will depend upon the season, and upon the size of egg and hen. The wisest plan is not to be too greedy; the number of chickens hatched is often in inverse proportion to the number of eggs set—five have only been obtained from
sixteen. An odd number is, however, to be preferred, as being better adapted to covering in the nest. Hens will, in general, well cover from eleven to thirteen eggs laid by themselves. A bantam may be trusted with about half a dozen eggs of a large breed, such as the Spanish. A hen of the largest size, as a Dorking, will successfully hatch, at the most, five goose-eggs.

When hens are determined to sit at seasons of the year at which there is little chance of bringing up chickens, the eggs of ducks or geese may be furnished her; the young may be reared, with a little painstaking, at any time of the year. The autumnal laying of the China and of the common goose is very valuable for this purpose. Turkey-hens frequently have this fit of unseasonable incubation.

Where, however, it is inconvenient to gratify the desire, one or two doses of jalap will often entirely remove it; and fowls often lay in three weeks afterward. Some place the would-be sitter in an aviary, for four or five days at most, and feed her but sparingly; from the commencement of her confinement, she will gradually leave off clucking, and when this has ceased, she may be again set free, without manifesting the least desire to take to the nest again, and in a short time the hen will commence laying with renewed vigor. The barbarous measures sometimes resorted to should be frowned upon by every person with humane feelings.

Three weeks is the period of incubation; though chickens are sometimes excluded on the eighteenth day. When the hen does not sit close for the first day or two, or in early spring, it will occasionally be some hours longer; when the hen is assiduous, and the weather hot, the time will be a trifle shorter. Chickens have been known to come out as late as the twenty-seventh day.

It may not be uninteresting to note the changes which the egg passes through in hatching. In twelve hours, traces of the head and body of the chicken may be discerned; at the end of the second day, it assumes the form
of a horseshoe, but no red blood as yet is seen; at the
fiftieth hour, two visicles of blood, the rudiments of the
heart, may be distinguished, one resembling a noose folded
down upon itself, and pulsating distinctly; at the end of
seventy hours, the wings may be seen, and, in the head,
the brain and the bill, in the form of bubbles; toward the
end of the fourth day, the heart is more completely formed;
and on the fifth day the liver is discernible; at the end of
one hundred and thirty hours, the first voluntary motions
may be observed; in seven hours more, the lungs and
stomach appear; and, in four hours after this, the intestines,
the loins, and the upper jaw. At the end of the one hun-
dred and forty-fourth hour, two drops of blood are observa-
ble in the heart, which is also further developed; and, on
the seventh day, the brain exhibits some consistence. At
the one hundred and ninetieth hour, the bill opens, and the
muscular flesh appears on the breast; in four hours more,
the breast-bone is seen; and, in six hours afterward, the
ribs may be observed forming from the back. At the ex-
piration of two hundred and thirty-six hours, the bill
assumes a green color, and, if the chicken be taken out of
the egg, it will visibly move. At two hundred and sixty-
four hours, the eyes appear; at two hundred and eighty-
eight hours, the ribs are perfect; and at three hundred and
thirty-one hours, the spleen approaches near to the stomach,
and the lungs to the chest; at the end of three hundred
and fifty-five hours, the bill frequently opens and shuts.
At the end of the eighteenth day, the first cry of the chicken
is heard; and it gradually acquires more strength, till it is
enabled to release itself from confinement.

After the hen has set a week, the fertility of the eggs
may be satisfactorily ascertained by taking a thin board
with a small orifice in it, placing a candle at the back, and
holding up each egg to the points of light. The barren
eggs may then be removed, and used, hard-boiled, for
young chickens. Some reserve this for the eleventh or
twelfth day.
About the twenty-first day, the chicken is excluded from the egg; for the purpose of breaking the shell of which it is furnished with a horny-pointed scale, greatly harder than the bill itself, at the upper tip of the bill—a scale which falls off, or becomes absorbed, after the chicken is two or three days old—the chicken is rolled up in the egg in the form of a ball, with its fore part toward the highest end, and its beak uppermost, the hard scale nearly touching the shell.

The first few strokes of the chicken's beak produce a small crack, rather nearer the larger than the smaller end of the egg, and the egg is said to be chipped. From the first crack, the chicken turns gradually round, from left to right, chipping the shell as it turns, in a circular manner, never obliquely. All do not succeed in producing the result in the same time; some being able to complete the work within an hour, and others taking two or three hours, while half a day is most usually employed, and some require twenty-four hours, or more, but rarely two days. Some have greater obstacles to overcome than others, all shells not being alike in thickness and hardness.

When chickens do not affect their escape easily, some little assistance is needed; but the difficulty is to know when to give it, as a rash attempt to help them, by breaking the shell, particularly in a downward direction toward the smaller end, is often followed by a loss of blood, which can ill be spared. It is better not to interfere, until it is apparent that a part of the brood have been hatched for some time, say twelve hours, and that the rest cannot succeed in making their appearance. It will then generally be found that the whole fluid contents of the egg, yolk and all, are taken up into the body of the chicken, and that weakness alone has prevented its forcing itself out. The causes of such weakness are various; sometimes, insufficient warmth, from the hen having set on too many eggs; sometimes the original feebleness of the vital spark; but, most frequently, the staleness of the eggs employed for incubation.
POULTRY.

The chances of rearing such chickens are small; but, if they survive the first twenty-four hours, they may be considered as safe. The only thing to be done is to take them from the hen till she is settled at night, keeping them in the meanwhile as snug and warm as possible. If a gentle hand can persuade a crust of bread down their throats, it will do no harm; but all rough and clumsy manipulation will utterly defeat the end in view. Animal heat will be their greatest restorative. At night, they should be quietly slipped under their mother; the next morning will disclose the sequel.

The period of incubation in the Guinea fowl is twenty-eight days, or one month; in the pea fowl, from twenty-seven to twenty-nine days; in turkeys, a month; in ducks, thirty or thirty-one days; and in geese, from twenty-seven to thirty days.

Poultry-Houses.

The three grand requisites in a poultry-house are cleanliness, dryness, and warmth. A simple arrangement for this purpose is a shed built against the gable of the house, opposite to the part warmed by the kitchen fire, in which are placed cross-bars for roosting, with boxes for laying in, or quantities of fresh straw. This should always have an opening, to allow the poultry-house to be cleansed out, at least once a week. Fowls will never thrive long amidst uncleanness; and even with the utmost care a place where they have been long kept becomes tainted, as it is called; the surface of the ground becomes saturated with their exuviae, and is therefore no longer conducive to health.

To avoid this effect, some persons in the country frequently change the sites of their poultry-houses, to obtain fresh ground; while others, who cannot thus change, purify the houses by fumigations of blazing pitch, by washing with hot lime water, and by strewing large quantities of pure sand both within and without. Washing the floor every week is
a necessity; for which purpose it is advantageous to have the house paved either with stones, bricks, or tiles. A good flooring, however, and cheaper than either of these, may be formed by using a composition of lime and smithy ashes, together with the riddlings of common kitchen ashes; these, having been all finely broken, must be mixed together with water, put on the floor with a mason's trowel, and nicely smoothed on the surface. If this is put on a floor which is in a tolerably dry situation, and allowed to harden before being used, it will become nearly as solid and compact as stone, and is almost as durable.

The inside of the laying-boxes should be frequently washed with hot water, to free them from vermin, which greatly torment the sitting hens. For the same purpose, poultry should always have a heap of dry sand, or fine ashes, laid under some covered place or thick tree near their yard, in which they may dust themselves; this being their means of ridding themselves of the vermin with which they are annoyed.

In every establishment of poultry-rearing, there ought to be some separate crib or cribs, into which to remove fowl when laboring under disease; for, not only are many of the diseases to which poultry are liable highly contagious, but the sick birds are also regarded with dislike by such as are in health; and the latter will, generally, attack and maltreat them, aggravating, at least, their sufferings, if not actually depriving them of life. The moment, therefore, that a bird is perceived to droop, or appears pining, it should be removed to one of these infirmaries.

Separate pens are also necessary, to avoid quarreling among some of the highly-blooded birds, more particularly the game fowl. They are also necessary when different varieties are kept, in order to avoid improper or undesirable commixture from accidental crossing. These lodgings may be most readily constructed in rows parallel to each other; the partitions may be formed of lattice-work, being thus
POULTRY.

rather ornamental, and the cost of erection but trifling. Each of these lodgings should be divided into two compartments, one somewhat larger than the other; one to be close and warm, for the sleeping-room; and the other, a large one, airy and open, that the birds may enjoy themselves in the daytime. Both must be kept particularly dry and clean, and be well protected from the weather.

A hen-ladder is an indispensable piece of furniture, though frequently absent. This is a sort of ascending scale of perches, one a little higher than the other; not exactly above its predecessor, but somewhat in advance. By neglecting the use of this very simple contrivance, many valuable fowls may be lost or severely injured, by attempting to fly down from their roost—an attempt from succeeding in which the birds are incapacitated, in consequence of the bulk of their body preponderating over the power of their wings.

Some people allow their fowl to roost abroad all night, in all weathers, in trees, or upon fences near the poultry-house. This is a slovenly mode of keeping even the humblest live-stock; it offers a temptation to thieves, and the health of the fowls cannot be improved by their being soaked all night long in drenching rain, or having their feet frozen to the branches or rails. There is no difficulty in accustoming any sort of poultry, except the pea fowl, to regular housing at night.

It is better that turkeys should not roost in the same house with the domestic fowl, as they are apt to be cross to sitting and laying hens.

No poultry-house is what it ought to be, it may be suggested, in conclusion, unless it is in such a state as to afford a lady, without offending her sense of decent propriety, a respectable shelter on a showery day.
IN our climate, the disorders to which poultry are liable, are comparatively, few in number, and they usually yield to judicious treatment. The little attention that has too generally been bestowed upon this subject may be accounted for from the circumstance that, in an economical point of view, the value of an individual fowl is relatively insignificant; and while the ailments of other domesticated animals generally claim a prompt and efficient care, the unhappy inhabitants of the poultry-yard are too often relieved of their sufferings in the most summary manner. There are reasons, which will justify a more careful regard in this matter, besides the humanity of adding to the comfort of these useful creatures; and the attempt to cure, in cases of disease, will often be rewarded by their flesh being rendered more palatable, and their eggs more wholesome.

Most of the diseases to which fowls are subject are the result of errors in diet or management, and should have been prevented, or may be removed by a change, and the adoption of a suitable regimen. When an individual is attacked it should be forthwith removed, to prevent the contamination of the rest of the flock. Nature, who proves a guardian to fowls in health, will nurse them in their weakness, and act as a most efficient physician to the sick; and the aim of all medical treatment should be to follow the indications which Nature holds out, and assist in the effort which she constantly makes for the restoration of health.

Asthma.

This common disease seems to differ sufficiently in its characteristics to warrant a distinction into two species. In
one it appears to be caused by an obstruction of the air-cells, by an accumulation of phlegm, which interferes with the exercise of their functions. The fowl labors for breath, in consequence of not being able to take in the usual quantity of air at an inspiration. The capacity of the lungs is thereby diminished, the lining membrane of the windpipe becomes thickened, and its minute branches are more or less affected. These effects may, perhaps, be attributed to the fact that, as our poultry are originally natives of tropical climates, they require a more equal temperature than is afforded, except by artificial means, however well they may appear acclimated.

Another variety of asthma is induced by fright or undue excitement. It is sometimes produced by chasing fowls to catch them, by seizing them suddenly, or by their fighting with each other. In these cases, a blood-vessel is often ruptured, and sometimes one or more of the air-cells. The symptoms are, short breathing, opening of the beak often, and for quite a time; heaving and panting of the chest, and, in case of a rupture of a blood-vessel, a drop of blood appearing on the beak.

Treatment.—Confirmed asthma is difficult to cure. For the disease in its incipient state, the fowl should be kept warm, and treated with repeated doses of hippo-powder and sulphur, mixed with butter, with the addition of a small quantity of Cayenne pepper.

Costiveness.

The existence of this disorder will become apparent by observing the unsuccessful attempts of the fowl to relieve itself. It frequently results from continued feeding on dry diet, without access to green vegetables. Indeed, without the use of these, or some substitute—such as mashed potatoes—costiveness is sure to ensue. The want of a sufficient supply of good water will also occasion the disease, on
account of that peculiar structure of the fowl which renders them unable to void their urine, except in connection with the *faeces* of solid food, and through the same channel.

*Treatment.*—Soaked bread, with warm skimmed-milk, is a mild remedial agent, and will usually suffice. Boiled carrots or cabbage are more efficient. A meal of earthworms is sometimes advisable; and hot potatoes, mixed with bacon-fat, are said to be excellent. Castor-oil and burned butter will remove the most obstinate cases; though a clyster of oil, in addition, may sometimes be required, in order to effect a cure.

**Diarrhea.**

There are times when fowls dung more loosely than at others, especially when they have been fed on green or soft food; but this may occur without the presence of disease. Should this state, however, deteriorate into a confirmed and continued laxity, immediate attention is required to guard against fatal effects. The causes of diarrhea are dampness, undue acidity in the bowels, or the presence of irritating matter there.

The symptoms are lassitude and emaciation; and, in very severe cases, the voiding of calcareous matter, white, streaked with yellow. This resembles the yoke of a stale egg, and clings to the feathers near the vent. It becomes acrid, from the presence of ammonia, and causes inflammation, which speedily extends throughout the intestines.

*Treatment.*—This, of course, depends upon the cause. If the disease is brought on by a diet of green or soft food, the food must be changed, and water sparingly given; if it arises from undue acidity, chalk mixed with meal is advantageous, but rice-flour boluses are most reliable. Alum-water, of moderate strength, is also beneficial. In cases of bloody flux, boiled rice and milk, given warm, with a little magnesia, or chalk, may be successfully used.
Fever.

The most decided species of fever to which fowls are subject occurs at the period of hatching, when the animal heat is often so increased as to be perceptible to the touch. A state of fever may also be observed when they are about to lay. This is, generally, of small consequence, when the birds are otherwise healthy; but it is of moment, if any other disorder is present, since, in such case, the original malady will be aggravated. Fighting also frequently occasions fever, which sometimes proves fatal.

The symptoms are an increased circulation of the blood; excessive heat; and restlessness.

Treatment.—Light food and change of air; and, if necessary, aperient medicine, such as castor-oil, with a little burned butter.

Indigestion.

Cases of indigestion among fowls are common, and deserve attention according to the causes from which they proceed. A change of food will often produce crop-sickness, as it is called, when the fowl takes but little food, and suddenly loses flesh. Such disease is of little consequence, and shortly disappears. When it requires attention at all, all the symptoms will be removed by giving their diet in a warm state.

Sometimes, however, a fit of indigestion threatens severe consequences, especially if long continued. Every effort should be made to ascertain the cause, and the remedy must be governed by the circumstances of the case.

The symptoms are heaviness, moping, keeping away from the nest, and want of appetite.

Treatment.—Lessen the quantity of food, and oblige the fowl to exercise in an open walk. Give some powdered cayenne and gentian, mixed with the usual food. Iron-rust,
mixed with soft food, or diffused in water, is an excellent tonic, and is indicated when there is atrophy, or diminution of the flesh. It may be combined with oats or grain. Milk-warm ale has also a good effect, when added to the diet of diseased fowls.

Lice.

The whole feathered tribe seem to be peculiarly liable to be infested with lice; and there have been instances when fowls have been so covered in this loathsome manner that the natural color of the feathers has been undistinguishable. The presence of vermin is not only annoying to poultry, but materially interferes with their growth, and prevents their fattening. They are, indeed, the greatest drawback to the success and pleasure of the poultry fanciers; and nothing but unremitting vigilance will exterminate them, and keep them exterminated.

Treatment.—To attain this, whitewash frequently all the parts adjacent to the roosting-pole, take the poles down and run them slowly through a fire made of wood shavings, dry weeds, or other light waste combustibles. Flour of sulphur placed in a vessel, and set on fire in a close poultry-house, will penetrate every crevice, and effectually exterminate the vermin. When a hen comes off with her brood, the old nest should be cleaned out, and a new one placed; and dry tobacco-leaves, rubbed to a powder between the hands, and mixed with the hay of the nest, will add much to the health of the poultry.

Flour of sulphur may also be mixed with Indian meal and water, and fed in the proportion of one pound of sulphur to two dozen fowls, in two parcels, two days apart. Almost any kind of grease, or unctuous matter, is also certain death to the vermin of domestic poultry. In the case of very young chickens, it should only be used in a warm, sunny day, when they should be put into a coop with their
mother, the coop darkened for an hour or two, and every thing made quiet, that they may secure a good rest and nap after the fatigue occasioned by greasing them. They should be handled with great care, and greased thoroughly; the hen, also. After resting, they may be permitted to come out and bask in the sun; and in a few days they will look sprightly enough.

To guard against vermin, however, it should not be forgotten that cleanliness is of vital importance; and there must always be plenty of slacked lime, dry ashes, and sand, easy of access to the fowls, in which they can roll and dust themselves.

**Loss of Feathers.**

This disease, common to confined fowls, should not be confounded with the natural process of moulting. In this diseased state, no new feathers come to replace the old, but the fowl is left bald and naked; a sort of roughness also appears on the skin; there is a falling off in appetite, as well as moping and inactivity.

*Treatment.*—As this affection is, in all probability, constitutional rather than local, external remedies may not always prove sufficient. Stimulants, however, applied externally, will serve to assist the operation of whatever medicine may be given. Sulphur may be thus applied, mixed with lard. Sulphur and cayenne, in the proportion of one quarter each, mixed with fresh butter, is good to be given internally, and will act as a powerful alterative. The diet should be changed; and cleanliness and fresh air are indispensable.

In diseased moulting, where the feathers start and fall off, till the naked skin appears, sugar should be added to the water which the fowls drink, and corn and hemp-seed be given. They should be kept warm, and occasionally be treated to doses of cayenne pepper.
This disorder, known also as the gapes, is the most common ailment of poultry and all domestic birds. It is especially the disease of young fowls, and is most prevalent in the hottest months, being not only troublesome but frequently fatal.

As to its cause and nature, there has been some diversity of opinion. Some consider it a catarrhal inflammation, which produces a thickening of the membrane lining the nostrils and mouth, and particularly the tongue; others assert that it is caused by want of water, or by bad water; while others describe it as commencing in the form of a vesicle on the tip of the tongue, which occasions a thickened state of the skin, by the absorption of its contents. The better opinion, however, is, that the disease is occasioned by the presence of worms, or *fasciolae*, in the windpipe. On the dissection of chickens dying with this disorder, the windpipe will be found to contain numerous small, red worms, about the size of a cambric needle, which, at the first glance, might be mistaken for blood-vessels. It is supposed by some that these worms continue to grow, until, by their enlargement, the windpipe is so filled up that the chicken is suffocated.

The common symptoms of this malady are the thickened state of the membrane of the tongue, particularly toward the tip; the breathing is impeded, and the beak is frequently held open, as if the creature was gasping for breath; the beak becomes yellow at its base; and the feathers on the head appear ruffled and disordered; the tongue is very dry; the appetite is not always impaired; but yet the fowl cannot eat, probably on account of the difficulty which the act involves, and sits in a corner, pining in solitude.

*Treatment.*—Most recommend the immediate removal of the thickened membrane, which can be effected by anointing the part with butter or fresh cream. If necessary, the scab
may be pricked with a needle. It will also be found beneficial to use a pill, composed of equal parts of scraped garlic and horse-radish, with as much cayenne pepper as will outweigh a grain of wheat; to be mixed with fresh butter, and given every morning; the fowl to be kept warm.

If the disease is in an advanced state, shown by the chicken’s holding up its head and gaping for want of breath, the fowl should be thrown on its back, and while the neck is held straight, the bill should be opened, and a quill inserted into the windpipe, with a little turpentine. This being round, will loosen and destroy a number of small, red worms, some of which will be drawn up by the feather, and others will be coughed up by the chicken. The operation should be repeated the following day, if the gaping continues. If it ceases, the cure is effected.

It is stated, also, that the disease has been entirely prevented by mixing a small quantity of spirits of turpentine with the food of fowls; from five to ten drops, to a pint of meal, to be made into dough. Another specific recommended is to keep iron standing in vinegar, and put a little of the liquid in the food every few days.

Some assert that it is promoted by simply scanting fowls in their food; and this upon the ground that chickens which are not confined with the hen, but both suffered to run at large and collect their own food, are not troubled with this disease. There can be little doubt that it is caused by inattention to cleanliness in the habits and lodgings of fowls; and some, therefore, think that if the chicken-houses and coops are kept clean, and frequently washed with thin whitewash, having plenty of salt and brine mixed with it, that it would be eradicated.

Roup.

This disease is caused mainly by cold and moisture; but it is often ascribed to improper feeding and want of cleanli-
ness and exercise. It affects fowls of all ages, and is either acute or chronic; sometimes commencing suddenly, on exposure; at others gradually, as the consequence of neglected colds, or damp weather or lodging. Chronic roup has been known to extend through two years.

The most prominent symptoms are difficult and noisy breathing and gaping, terminating in a rattling in the throat; the head swells, and is feverish; the eyes are swollen, and the eye-lids appear livid; the sight decays, and sometimes total blindness ensues; there are discharges from the nostrils and mouth, at first thin and limpid, afterward thick, purulent, and fetid. In this stage, which resembles the glanders in horses, the disease becomes infectious.

As secondary symptoms, it may be noticed that the appetite fails, except for drink; the crop feels hard; the feathers are staring, ruffled, and without the gloss that appears in health; the fowl mopes by itself and seems to suffer much pain.

_Treatment._—The fowls should be kept warm, and have plenty of water and scalded bran, or other light food. When chronic, change of food and air is advisable. The ordinary remedies—such as salt dissolved in water—are ineffectual. A solution of sulphate of zinc, as an eye-water, is a valuable cleansing application. Rue-pills, and a decoction of rue, as a tonic, have been administered with apparent benefit.

The following is recommended: of powdered gentian and Jamaica ginger, each one part; Epsom salts, one and a half parts; and flour of sulphur, one part; to be made up with butter, and given every morning.

The following method of treatment is practiced by some of the most successful poulterers in the country. As soon as discovered, if in warm weather, remove the infected fowls to some well-ventilated apartment, or yard; if in winter, to some warm place; then give a dessert-spoonful of castor-oil; wash their heads with warm castile-soap suds, and let them remain till next morning fasting. Scald for them Indian meal,
adding two and a half ounces of Epsom salts for ten hens, or in proportion for a less or larger number; give it warm, and repeat the dose in a day or two, if they do not recover.

Perhaps, however, the best mode of dealing with roup and all putrid affections is as follows: Take of finely pulverized, fresh-burnt charcoal, and of new yeast, each three parts; of pulverized sulphur, two parts; of flour, one part; of water, a sufficient quantity; mix well, and make into two doses, of the size of a hazel nut, and give one three times a day. Cleanliness is no less necessary than warmth; and it will sometimes be desirable to bathe the eyes and nostrils with warm milk and water, or suds, as convenient.
To Preserve Health and Save Doctor's Bills.

The preservation of health is of far greater importance than to dose a man after he is sick. To gratify "a false hunger," or slake "a false thirst," are only provocative to disease. It should be remembered that we live not by what we eat, but by what we digest. Neither Walpole, who thought that with diet and patience all diseases might be cured; nor Montesquieu, who held that health, purchased by vigorously watching over diet, was but a tedious disease, was far from the mark. But a wise discretion in eating is better than all.

Heed the Stomach.—"What is one man's meat is another man's poison," is an old saying, and a true one. If every person would study his own individual powers, and learn to respect his stomach, to remember that he has no more right to overload it with improper food than he has to drink to intoxication, he would save himself many an unnecessary ache and ailment. Chronic dyspepsia never came of regular occupation, abundant exercise, early hours, and generous, but not imprudent diet. If you wake in the morning with a headache and lassitude, you have probably not taken the advice of the "self-monitor," which has its home in the stomach.

Conform to Nature.—Dean Nowell, although he may have blazed the way for red noses, did not grow strong by drinking ale. The Rajpoots who slay infants from pride do not kill so many infants as do Christian mothers with too much stuffing. The Bolton ass did not become fleet-footed by chewing tobacco and taking snuff. The New Zealand warriors were not made stout nor brave because their moth-
ers thrust stones in their stomachs, as infants. And Brantome's uncle, who took gold, steel and iron in powders, from weaning-time until twelve years of age, did not thereby acquire the strength to stop "a wild bull in full course."

**Study and Relaxation.**

Do not drive your children to study too young. From six to eight years is early enough for regular school-going. Of course their education begins as soon as they begin to notice things and run about—in object-lessons and toy instructors, lettered blocks, etc.; but they should not really be put to school before the age mentioned, and not thus early if they languish under study. Until a child is ten years old regular study should not be permitted. It must be more play than study. Then, the wise teacher, up to the age of twelve, will mix plenty of play with study. From this time on the study may be more and more continued; but no labor, except a few light chores, should be included. Out of school hours let the child have play. Labor, however light, does not stand the child instead of play. "All work and no play makes Jack a dull boy." Hard study, with little exercise, fills the graveyard with young bones. The midnight lamp nourishes the mature man's mind; but dreamless sleep for the youth makes a healthy brain.

**The Sick-room.**

*Cheerfulness and Quiet.*—In the sick-room there should be no unnecessary noise, and, above all, no confusion. Neither should there be "solemn silence." Some cheerful conversation is often better than medicine. In any event, never allow a friend with long-drawn, solemn face, or a procession of them, to walk in, and, with a shake of the head, after gazing, to walk out again. Because a person is ill—
even dangerously so — there is no reason why the nurse or visitors should carry on their faces the you-will-never-get-well look. It would dishearten any invalid that it did not exasperate, and neither disheartenment nor exasperation is good for the sick, even though it be said that when the sick are “strong enough to get mad,” they are “strong enough to get well.”

The Nurse.— The nurse should be soft-handed, deft in her work, of cheerful disposition, even-tempered, and, above all, intelligent. She should have delicate tact in cooking, for while every operation of cooking be cleanly in the extreme, here the cooking, while simple, should be delicate. The beef tea must be pleasing to the eye as well as grateful to the palate. The steak or chops should be tender and cooked to a turn. The egg should be so boiled or poached as to be good to look at. Some tempting, simple, easily digested pudding, that comes as a surprise, is ten times more grateful than if the patient has been promised it, and then given the impatience of longingly waiting for it. A simple drink of water, if fresh from the well or spring, is always welcome; however pure it may be, it is nauseous if it has stood in the room until warm. It is all these little things, these attentions, that mark the careful from the careless nurse. In fact, no person should undertake the office of nurse unless loving kindness and self-abnegation are strong personal traits. With members of a family, these feelings are, of course, present. Happy is the patient who can always command such service.

In severe sickness, it is the physician, his medicines, and the soothing offices of the nurse, that bring the patient through. Here fully as much depends upon the nurse as upon the doctor. A time comes when no longer medicine but food is needed. With convalescence it is the cook who takes the place of the doctor, and here the nurse’s best efforts are shown.

Weak Patients.— Very weak patients must be rallied;
stimulants may be necessary. There may be a nervous difficulty in swallowing; the nurse should keep her wits about her. The physician may have ordered a fixed quantity, say a teacupful of some liquid food every three or four hours; the patient's stomach rejects it. Will the nurse follow the given rule? No. She will try a single tablespoonful, once an hour, or even a teaspoonful every fifteen minutes. Perhaps a stimulant is necessary. These are things—the knowledge of them—that every nurse should inform herself upon and be ready to act upon.

**Cookery for Invalids.**

*General Rules.*—In addition to what has just been said, it is only necessary to give the following:

1. There must be no smoke for broiling.
2. All soups should be made with the most gentle simmering.
3. All fruits and vegetables must be perfectly fresh.
4. An hour before cooking vegetables, put them in cold water to which a little salt has been added to free them from any possible insects. Wash clean, drain, and drop into water that is boiling fast. Take them from the water and drain the instant they are done.

These general directions relating to cooking will suffice as to the processes in invalid cookery. Some special recipes for dishes palatable and wholesome will be given presently. These will, of course, consist of the most simple dishes, not highly seasoned or spiced.

**Table of Foods and Time of Digestion.**

The table given below is compiled to show the average time required for the digestion of different foods, but of course it is only approximate, since in the real digestion of
foods no two systems will act precisely alike. The result will perhaps surprise many persons, who have been led into error in the supposed digestibility of certain foods. For instance, oysters are generally supposed to be among the most easily digested of foods. They are not even approximately so, except when eaten raw. Roast goose is by many supposed to digest slowly, but this is a great mistake.

**AVERAGE TIME FOR DIGESTION.**

<table>
<thead>
<tr>
<th>Name of Article</th>
<th>Hrs.</th>
<th>Min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples, sweet</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Apples, sour</td>
<td>2</td>
<td>00</td>
</tr>
<tr>
<td>Beans, green in pod, boiled</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>Beef, fresh, roasted rare</td>
<td>3</td>
<td>00</td>
</tr>
<tr>
<td>Beef, fresh, broiled</td>
<td>3</td>
<td>00</td>
</tr>
<tr>
<td>Beef, fresh, dried</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Beef, fresh, fried</td>
<td>4</td>
<td>00</td>
</tr>
<tr>
<td>Beets, boiled</td>
<td>3</td>
<td>45</td>
</tr>
<tr>
<td>Bread, wheat, fresh</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Bread, corn</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Butter, melted</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Cabbage, with vinegar, raw</td>
<td>2</td>
<td>00</td>
</tr>
<tr>
<td>Cabbage, boiled</td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>Cheese, strong old</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Codfish</td>
<td>2*</td>
<td>00</td>
</tr>
<tr>
<td>Custard, baked</td>
<td>2</td>
<td>45</td>
</tr>
<tr>
<td>Ducks, tame, roasted</td>
<td>4</td>
<td>00</td>
</tr>
<tr>
<td>Ducks, wild</td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>Eggs, boiled hard</td>
<td>3</td>
<td>30</td>
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### Scarlet Fever

This disease, technically called scarlatina, is distinguished by a great diversity of symptoms as well as by varying
degrees of severity. The mildest form is comparatively trivial in its effects upon the individual, while its severest form is one of the most destructive diseases with which we are acquainted. Physicians generally distinguish for convenience three varieties of the disease, according to the degree of severity, and to the amount of complication in the throat. These varieties are called scarlatina simplex, scarlatina anginosa, and scarlatina maligna. It must be understood, however, that these are not distinct diseases, but merely convenient terms for the designation of different manifestations of the same disease.

Cause.—Scarlatina, like the other infectious diseases, is due to a specific virus of poison, as to the exact nature of which we are not yet informed. Like the other infectious diseases, it seems to arise only by communication from individuals who are already afflicted. Some cases, it is true, cannot be traced to contagion, but seem to arise quite spontaneously, without previous exposure to the disease; but it must be remembered that scarlet fever, like small-pox, can be communicated by articles of clothing or of furniture which have once been impregnated with the virus. Yet it by no means follows that exposure to the contagion will induce the disease. This general principle is applicable, of course, to all infectious diseases. There must be not only exposure to contagion, but also a certain susceptibility on the part of the exposed individual, in order that the disease may be developed. Yet the susceptibility to scarlet fever seems to be less general than in any other of the infectious diseases; for it is no uncommon observation that several of the children, even in the same family, who are exposed at the same time to the scarlet fever contagion, escape the disease. Indeed, it is even observed that while one child in a family suffers from the disease, others living in the same house during the entire illness of the first, escape completely. Such facts as these have caused some physicians to doubt the contagiousness of scarlet fever. But it must be
remembered that there is precisely the same ground for doubting the contagiousness of any other infectious disease, since similar facts, not perhaps so numerous, can be adduced in regard to each. The specific virus of scarlatina, like that of certain other infectious diseases, retains its power of inducing the disease for months, and may be transferred in the clothes of the attendants or visitors.

The disease rarely occurs twice in the same individual, although such repetition is more frequent in the case of scarlet fever than of most of the other infectious diseases; instances are known in which the same individual has suffered even three times from scarlet fever. The disease occurs most frequently in the third and fourth years of life; the susceptibility to it seems to decrease rapidly after the fifth year, and almost subsides in adult life. During the first and second years also the susceptibility seems to be slight, for cases in children of that age are certainly rare. Instances are reported in which the foetus has contracted the disease before birth, though such cases are certainly far less numerous than the analogous ones of small-pox.

Symptoms.—The period of incubation, so-called—that is, the interval between exposure and the first manifestation of the disease—is shorter in scarlet fever than in most of the eruptive fevers. It is usually stated at two to five days, though it seems to vary between one and six days. At this interval after exposure, there commonly occurs a pronounced chill, which may, however, be absent. Another symptom is usually vomiting, a symptom rarely absent in children. The child, in many cases, complains of soreness of the throat and pain upon swallowing, though it is a by no means constant symptom. When it does occur, there is usually also considerable reddening of the inside of the throat, and swelling of the glands at the angle of the jaw. The other symptoms vary with the intensity of the attack. In some, there is intense fever, headache, and general prostration, perhaps even delirium; on the other hand, there may be no indication of constitutional affection, except slight fever.
This stage of invasion usually lasts only twenty-four, or, at most, forty-eight hours. On the second day there appears, usually first on the body and limbs, rapidly extending over the entire surface, a brilliant scarlet rash. While this is the usual order of its occurrence, it sometimes happens that the rash will be first perceptible on the face and neck. It consists at first of minute red specks or dots, which soon run together, forming irregular shaped patches; yet even in these patches, it can be seen, upon close inspection, that the redness is not uniform and continuous, but is made up of a mass of minute points of a deep-red color, while the intervening skin is tinged less intensely red. The color disappears upon pressure with the finger, and white lines may be made by drawing a pencil or finger-nail over the surface. The redness is usually most intense and persistent on those parts where the skin is especially thin and delicate—along the inner surface of the arms and legs and at the elbow. In some instances the entire surface is continuously red, producing the appearance which has been likened to that of a boiled lobster. The surface is usually smooth, but may cause a feeling of minute elevations. Sometimes very small watery blisters may be scattered over the skin.

The patient is usually annoyed by a general itching sensation which may amount even to positive pain; the skin is somewhat swollen, a condition which becomes evident when the patient attempts to close the hands, or places the feet upon the floor. Just as there are great differences in the intensity of the skin eruptions, so the soreness of the throat may vary extremely; at times the entire difficulty seems to be concentrated in the throat. In all cases, probably, there is more or less swelling of the tonsils, and usually a whitish deposit upon their surface; in the severer cases the swelling in the throat becomes so great as to prevent the patient from swallowing anything but liquids, and even to interfere seriously with breathing, so that the voice acquires a nasal twang. Sometimes there is an escape of blood into and on the surface of the throat.
The tongue usually presents certain characteristic appearances in scarlet fever; it is often sprinkled over with projecting red points, looking as if it had been dusted with red sand. Later the coating of the tongue is cast off, leaving its surface clean and red, the points above described now projecting so as to resemble the appearance of a strawberry; hence the name strawberry tongue, an appearance quite characteristic of this disease.

In scarlet fever the appearance of the eruption is not accompanied as in small-pox by a cessation of the fever; on the contrary the constitutional symptoms are often increased; the degree of fever is more intense during the eruptive stage of scarlet fever than in any of the other eruptive fevers. During this stage, too, the most serious mental and constitutional symptoms occur; delirium is usual, and convulsions (in children) very common; hence the greatest care is required on the part of the attendants, since patients not infrequently injure themselves, even precipitate themselves from windows during such delirium.

The eruption ordinarily lasts four to six days, though here, too, variations occur. Of fifty-four cases reported by Jenner, the rash disappeared on the fifth day of the disease in one case; in three cases on the sixth day; in five cases on the seventh day; in thirteen cases on the eighth day; in twelve cases on the ninth day; in eight on the tenth; in four on the eleventh, and in two on the thirteenth, fourteenth and sixteenth day, respectively.

Stage of Desquamation.—About the sixth day the rash begins to fade, and in the succeeding days the surface of the skin is cast off in the shape of scales, usually of small size, like bran, though sometimes in large pieces; indeed the entire skin of a finger of a hand may be cast off entire like the finger of a glove. This desquamation may last from six to twelve days, or may not be finished for several weeks.

Such is the history of an ordinary mild case of scarlet fever without complications; yet a large number of cases,
whether mild or severe during the original disease, are accompanied by complications which are often more serious in the permanence of their effects than any feature of the disease itself. Among these complications are serious affections of the throat. These are so common that one variety of the disease has been accordingly named scarlatina anginosa. In these cases (which are probably sometimes considered diphtheria) the swelling and ulceration in the throat and the consequent interference with respiration are so great as to concentrate the attention upon this part of the body. The rash is usually slight, and may be overlooked. The tonsils become enormously enlarged, ulcerated, covered with a brown film or false membrane, and often produce a great amount of matter; in these cases the glands around the angle of the jaw are greatly enlarged and sometimes become abscesses, which either break spontaneously or are opened. Another complication, especially apt to occur in these cases of severe sore throat, is deafness, partial or complete. The reason for this lies in the fact that the cavity of the ear is connected with the throat by means of a bony channel called the eustachian tube. The inflammation may, and frequently does, spread from the throat into and through this tube into the middle ear; the result is the formation of matter—an abscess—in the ear and the consequent loss of hearing. In some cases there may be recovery of a certain amount of hearing even after suppuration has occurred in the ear. Sometimes the local disease in the throat is so violent as to cause extensive mortification of these structures—sloughing—and this may extend even to the mouth. Then, again, a severe inflammation of the larynx (the upper part of the windpipe) may cause speedy death. Sometimes, too, the membrane surrounding the brain, and even this organ itself, becomes inflamed, resulting in more or less permanent derangements of the mental functions. From the same cause paralysis of the face or of the limbs may follow. Sometimes, too, affections of the eyes, resulting in serious impairment of vision, are observed.
But one of the most frequent and serious complications of scarlet fever is inflammation of the kidneys. It would seem, indeed, that this should be regarded almost as an essential part of the disease, though in a considerable number of cases the kidneys resume their natural state soon after the fever subsides. The complication with inflammation of the kidneys is indicated by swelling of the skin—dropsy—usually first noticed under the eyes, and then spreading over the face, trunk and extremities. A certain amount of dropsy is a usual feature in all but the mildest cases of scarlet fever, and it is often one of the last symptoms to disappear. But a dropsy which persists for some time after recovery usually indicates serious inflammation of the kidneys. This inflammation may exist without noticeable dropsy, and can be, under these circumstances, detected only by an examination of the urine, microscopical as well as chemical. In every case of scarlet fever the physician should acquaint himself by frequent examination of the urine as to the condition of the kidneys; for, though everything else may go on well, the patient may succumb to this kidney disease even at a time when convalescence seems at hand. In every case in which, after the appearance of the eruption, the patient has repeated convulsions, or lies stupid and unconscious, the condition of the kidneys may afford a key to the situation.

Diphtheria.

One of the most frequent and important affections, next to the essential fevers, is diphtheria. This disease prevails often as an epidemic, and in the intervals between these epidemics is always more or less prevalent. Unlike many of the infectious diseases, it seems to be independent of ordinary hygienic regulations—attacks all classes of the community, and at all times of the year. It is supposed
that Washington and the Empress Josephine were among its victims during epidemics.

While the disease may occur quite unexpectedly, yet it is equally certain that a large number, if not the majority, of cases designated diphtheria by some physicians, as well as the non-professional, have no right whatsoever to that name. For diphtheria is a general, a constitutional affection, usually manifesting itself, it is true, by inflammation in the throat, among other symptoms, but by no means comprised in a local inflammation, whether in the throat or elsewhere. The numerous cases in which the throat is red and sore, and perhaps a few whitish points are visible on the tonsils—such cases are not necessarily diphtheria, and in fact have rarely any of the characteristic signs of diphtheria. There may be, it is true, mild cases of the disease, in which the constitutional symptoms are not sufficiently severe to invalid the patient completely; yet in most instances, even when the local disturbances in the throat are not severe, the patient is nevertheless unquestionably ill.

Symptoms.—The symptoms of diphtheria, while agreeing in most essentials, present wide diversities in the degree of those features. One of these differences occurs in the development of disease. Sometimes the onset is very rapid and acute; the patient suffers a severe chill, followed at once by a high fever. In other cases, again, the commencement is gradual and insidious; the patient complains for some days or a week of vague and indefinite illness, perhaps even without alluding to any unusual soreness in the throat. It may even happen that the discovery of the throat affection is made accidently, especially in the case of children. The consideration of the symptoms may be, for convenience, divided into those which affect the system generally, and those which are associated immediately with the inflammation in the throat.

The sensibility of the throat would seem to be somewhat diminished in this disease, since there is rarely so much pain
and soreness as would seem inseparable from the extreme swelling and inflammation that are seen actually to exist. A point which should never be forgotten in household practice is to inspect the throat whenever an individual is suffering from any indefinite ailment; if this were a more general practice, mothers would often be spared the surprise and chagrin which occurs when, upon the first visit of the physician, he discovers in the throat of the child, who may have been ill several days, a thick, white coating of diphtheritic membrane. The act of swallowing is sometimes accompanied with considerable pain, but not necessarily so, even though the throat be considerably inflamed. Another symptom which may be present early in the disease is a paralysis of certain muscles concerned in swallowing, so that this act is but imperfectly performed; as a result fluids return through the nostrils. In these cases there may also be an acrid discharge from the nose, causing soreness of the adjacent parts of the skin. Then, again, the simple mechanical effect of the swelling in the throat may interfere seriously with swallowing, and even breathing.

Although the local affection is usually manifested first, and chiefly in the throat, yet it is not necessarily limited to this part of the body, but may extend also into the larynx. Under these circumstances, the symptoms of true croup are added to those of diphtheria. Weakness of the voice, a peculiar character of the tone, difficult, labored and audible respiration, with the characteristic "croupy" cough, mark the spread of the disease to the larynx. This, however, is not an extremely common complication; many symptoms indicating difficult respiration may be caused by the swelling in the throat, without any interference with the larynx. For diphtheria proper is entirely distinct from croup in the location of the throat inflammation, as well as in its essential nature.

As has been said, there are mild cases in which the patient is scarcely compelled to take his bed; yet the gravity
of the case is not always indicated by its severity at the outset. There is not usually so high a grade of fever as characterizes scarlet fever; at times, indeed, the skin seems only naturally warm to the hand. An occasional symptom is the rupture of small blood vessels, causing reddish spots on the skin; a similar rupture in the vessels of the nose accounts for the bleeding from the nostrils which is sometimes observed. There is no skin eruption characteristic of diphtheria, although various forms of rash not infrequently occur during the course of the disease.

The digestion is quite deranged, even before the swelling of the throat makes swallowing difficult. This derangement of digestion is indicated, as in other constitutional diseases, by loss of appetite, coating of the tongue, often vomiting. This is a symptom of considerable practical importance and gravity, for it interferes seriously with the success of efforts for sustaining the patient's strength, and in probably no other disease is his strength so soon exhausted as in diphtheria. The mind is not usually affected unless the case terminate fatally. In children, it is true, convulsions occur, as they may from other causes, even when slight. Dropsy, so frequent in scarlatina, is an unusual symptom of diphtheria.

The disease may last one to two weeks, before the patient begins to convalesce. Fatal cases may, of course, terminates much sooner. There is a malignant form of diphtheria which, like malignant scarlet fever, may destroy the patient's life before the characteristic symptoms of the disease are manifested. Yet diphtheria is by no means over when the patient begins to convalesce, since some of the numerous complications may seriously impair his health for months subsequently.

Perhaps no other of the infectious diseases brings in its train such a number and variety of complications as diphtheria. First of all is the paralysis of the muscles concerned in swallowing and in articulation. These muscles may not be affected until the severer symptoms of the disease have
subsided; and they may recover their power within a few weeks; so long as the difficulty endures, there will be difficulty in swallowing; and fatal accidents have been known to occur from this very cause—the food passing into the windpipe and causing strangulation. Sometimes it is even necessary to feed the patient through a stomach-tube. The paralysis may also affect other muscles than those engaged in swallowing; the muscles of the eye are occasionally affected, the iris being paralyzed so as to keep the pupils dilated. The result is that the patient is unable to read ordinary print, becomes, in fact, far-sighted; then again the arms or legs—often the latter—may exhibit partial or complete paralysis. There may be impairment of sensation also, as well as of motion; that is, the power of feeling may be partly or completely lost. This loss is usually limited to a portion of the face; or there may be loss of power to perceive light; there may be also a change in direction of one or both eyes—the individual is, in other words, cross-eyed. So, too, the muscles concerned in breathing may become paralyzed, giving rise to difficulty in the performance of this act, and even causing danger from the failure to breathe. There may be also impairment of the muscles concerned in the evacuation of the bowels and bladder; also impairment of sexual power and instinct.

The characteristic feature of diphtheria, by which alone we are enabled to express a positive opinion as to its nature, is the peculiarity of the local inflammation; this, it is true, is usually found in the throat, but not necessarily so, since we recognize as diphtheria cases in which the same local inflammation is found on other mucous membranes, those of the intestine and of the female genital organs especially. As seen in the throat, the first appearance is usually redness, accompanied by swelling of the tonsils; the surface of these is soon covered with a thin grayish substance, which, in the course of a day or two, is much increased in thickness and becomes white or ash-colored. This substance—the diph-
The diphtheritic membrane—varies much in its extent and location. In bad cases it forms an almost unbroken sheet over the tonsils and perhaps on the back of the throat as well; but in most instances it appears merely in small patches scattered over the tonsils and back part of the mouth and pharynx. The gray membrane is surrounded by an intensely red area. When these gray patches are detached there appears to be a bright red surface with numerous bleeding points. Furthermore, the detachment of one layer may be followed by the formation of a second and even of a third membrane on the same spot. In this characteristic—the bleeding surface upon gentle removal of the membrane—is found one of the characteristics of the diphtheritic as distinguished from other gray patches in the throat. It is no uncommon thing to find, even in healthy throats, and especially in those subject to a little catarrh, grayish white spots, particularly on the surface of the tonsils. These should not be mistaken for diphtheritic membrane; they are not surrounded by the intensely red area, they do not cling to the surface with the same tenacity, nor do they leave, when detached, a bleeding surface. These are the cases which are so often miscalled diphtheria.

The true diphtheria is usually accompanied by swelling of the glands at the angle of the jaw; this swelling may subside with the affection in the throat, or may result in the formation of abscesses.

Cause.—Like the other infectious diseases, diphtheria is due to a specific virus or poison; that it is eminently communicable, admits of no doubt, though it seems, with our present knowledge, that it may also originate without previous exposure of the individual to a patient suffering from the disease. The malignant form of diphtheria occurs especially as an epidemic. It is an interesting fact, that these epidemics were unknown in America between 1771 and 1856, while since this latter date they have frequently visited all
parts of our land. Such an epidemic is often restricted to a particular section of country; it may even prevail on one bank of a stream, while the other side escapes unvisited. The greatest susceptibility to the disease appears to be childhood, between three and twelve years especially; yet people of all ages are susceptible to a greater or less extent.

The chances for recovery from diphtheria vary extremely with many circumstances. The scattered, so-called sporadic, cases are attended with far less mortality than the average epidemic. One of the dangers is from an extension of the inflammation to the larynx; such cases usually terminate fatally. A second peril is from exhaustion; in some instances, as has been already narrated, death occurs within a day or two, before the local effects of the disease have been manifested in the throat. Such cases evidently die overwhelmed with the violence of the poison; and many other instances occur in which the patient, though resisting for days the onset of the disease, finally succumbs before the condition of his throat is such as to imperil life. A third danger is one which cannot be foreseen, and scarcely explained, that is, sudden fainting, from which the patient cannot be aroused; this has repeatedly occurred in individuals who were apparently convalescent, but who, upon some unusual effort, even getting out of bed, have swooned and died. In view of this fact, it is important to use especial care during the convalescence from diphtheria, particularly in those who have suffered from severe attacks. If death occurs from simple exhaustion, it is apt to happen during the second week of the disease.

Treatment.—The treatment of diphtheria resolves itself into two chief aims: general treatment, that is the support of the patient's strength; and local measures, to subdue and restrain the inflammation in the throat. For this latter purpose, measures vary according to the severity of the inflammation and to the effect upon the throat. It will rarely be advisable to use strong caustics; in the most cases a
gargle of some antiseptic properties will best answer the purpose. One of the best of them is the following:

Hyposulphite of soda - - Three ounces.
Glycerine - - - Two ounces.
Water - - - Six ounces.

Half an ounce of this solution may be placed in a glass of water and used as a gargle at short intervals. If the patient be a child too young to gargle, this solution may be applied directly to the throat by means of a camel's hair brush. Much comfort and benefit will also be derived from permitting the patient to hold pieces of ice in the mouth until dissolved. Instead of the above solution, the familiar mixture of muriatic acid and honey in equal parts; lime water; carbolic acid (one part to twenty of water), may all be employed. If there be much difficulty in breathing, relief will be obtained by saturating the atmosphere of the room with steam; or a tent may be made out of a sheet and placed around the bed; a kettle of boiling water may be made to discharge its steam into this tent, and thus accomplish the desired object. Cloths wrung out in hot water may also be applied to the neck.

Yet the greater reliance must be placed upon the constitutional treatment, for which alcohol in some form is absolutely indispensable. There is but little danger of intoxicating the patient. Half an ounce of brandy may be given every hour to a patient twelve or thirteen years old, with the best results, if the case be one of extreme exhaustion. Another important agent is quinine, a grain of which may be administered in the whisky or brandy every hour or two during the day. If the patient be very young, say three or four years old, half a teaspoonful of brandy and a quarter of a grain of quinine would be a sufficient dose. Sometimes considerable difficulty is experienced in persuading the patient to take nourishment. The danger from this must be recognized and necessary measures employed to meet the requirements of the case.
In cases where the larynx is obstructed by the formation of false membrane, the outlook is extremely serious; yet, even in these, it is sometimes possible to save the life apparently lost, by making an opening into the windpipe—an operation technically called tracheotomy—whereby the imminent danger, suffocation, is the verdict. This fact is mentioned here, not because the operation should ever be undertaken by other than a skillful surgeon, but simply to emphasize the value of tracheotomy in proper cases. There are, it is true, instances in which the patient must eventually die of exhaustion, and the result could not be averted by the simple admission of air to the lungs. Yet it is equally true that there are many instances where death occurs from suffocation, and in which a timely performance of tracheotomy would undoubtedly have saved life, as it has done in numerous other instances. The difficulty lies in the fact that parents obstinately refuse to listen to any suggestion for the use of the knife until it becomes evident that the child must die, and then the operation is, of course, too late; and there is no doubt that the responsibility for many a child’s death rests upon the unreasoning dread and prejudice of the parent against an operation.

**Measles.**

The disease, also known as morbilli and rubeola, is of far less importance, with regard to the immediate danger to life, than either small-pox or scarlet fever; and yet there so often follow in the train of measles complications which may have a permanent effect upon the health and vigor of the individual, that the disease is, nevertheless, one of considerable importance to recognize measles because of the similarity of this disease with scarlet fever, and the consequent possibility of mistaking one for the other.

The period of incubation—the interval between exposure
and the onset of the symptoms—is from ten to fifteen days; then occurs the stage of invasion. The onset of the disease resembles a severe cold or an attack of influenza. The individual sneezes repeatedly, and there is an acrid discharge from the nostrils; the eyes are also usually inflamed, red and watery. There is also soreness of the throat, hoarseness, and a dry, painful cough. At the same time there is usually a chilly sensation, perhaps shivering, but rarely a distinct and pronounced chill. Then begins a fever, usually less intense than that of scarlet fever; the appetite is impaired; nausea and vomiting may occur; there are wandering pains in various parts of the body, especially in the head and limbs; there is general debility and languor. In children more marked symptoms, such as convulsions and bleeding at the nose, may occur; sometimes, too, the disease is ushered in with an attack of false croup. After a time, which varies somewhat, though averaging about four days from the beginning of the symptoms, there occurs the stage of eruption. The rash is usually seen on the forehead and temples, rapidly spreading over the face and neck. Within forty-eight hours the entire body and extremities are covered. It will be noticed, therefore, that the spread of the rash in measles is less rapid than in scarlet fever or small-pox.

The rash begins with minute red specks similar to those of the scarlatinal rash, except that the color is a less intense red; the rash of measles, moreover, is usually arranged in somewhat crescentic patches. The specks at this stage resemble the pimples of small-pox before the formation of vesicles, but they do not give that shot-like sensation to the finger; they are more like flea-bites. The eruption is often attended, like that of scarlet fever, with considerable itching, and there may be some swelling of the skin, especially on the face. Sometimes a few vesicles may be observed among the dark-red patches. The fever continues until about the fourth day after the appearance of the rash,
when both fever and eruption gradually disappear. The rash begins to fade where it began to appear—on the face.

Most of the symptoms which were present before the appearance of the rash—the inflammation and discharge from the eyes, nose and throat—continue during the eruption.

Stage of Desquamation.—The fading of the eruption and the scaling of the skin occupy ordinarily four to eight days. The skin does not peel off to the same extent as in scarlet fever, the scales being always small and not patches. The fever which has persisted during the eruption now begins to decline, though the cough and inflammation in the eyes may continue for some days subsequently.

Such is the history of an ordinary case of measles; there are several variations from this type, and several complications may aggravate the gravity of this disease. The affections of the eyes, nose and bronchial tubes, though quite characteristic of this disease, are sometimes wanting; and there are cases which are unmistakably measles, though the peculiar rash is but imperfectly developed. Sometimes, too, severe cases of measles, like those of scarlet fever, are characterized by the escape of blood from the blood-vessels into the skin, making diffuse dark-red patches.

Among the complications which often follow measles are obstinate affections of the eye and of the larynx, and severe inflammation of the lungs; somewhat less frequently there occur attacks of diphtheria and true croup. A possible complication also is deafness, originating in the same way as was described in connection with scarlet fever.

The more important points distinguishing this disease from scarlet fever and small-pox are the length of the period of incubation, the long interval after the first symptoms before the rash appears, the affection of the eyes, nose and air passages, the appearance of the eruption first on the face and its gradual extension over the body, the dark-red color
of the rash, and its arrangement in circular or crescent-shaped patches. Until the appearance of the rash, it is impossible to decide definitely upon the nature of the complaint, and hence, in those exceptional cases in which the rash does not appear, a definite diagnosis is almost impossible.

_Treatment._—The directions already given for the treatment of mild cases of scarlet fever apply equally well to measles, except that, in the latter complaint, there is rarely any necessity for local treatment of the throat. Sometimes it becomes necessary to make cold applications to the eyes, or to administer a few drops of paregoric for the cough. The usual indications for treatment consist in the complications already described. Only one requires especial notice here — the tendency to consumption, which seems to be conferred in some cases of this disease. This should be borne in mind in the after-treatment of measles.

**Diarrhea.**

_Diarrhea_ is a symptom rather than a disease—a symptom of numerous disorders; among them typhoid fever and cholera. Yet, aside from these cases, there occur numerous instances of diarrhea which appear to be largely local diseases of the intestines, and not dependent upon any constitutional disease.

_Symptoms._—The disorder is so familiar that no detailed account of symptoms is necessary. It is, however, important to distinguish diarrhea from another disease characterized by frequent liquid stools—dysentery. In the latter affection there is an inflammation of the mucous membrane lining the intestinal canal; and the discharges are usually mixed with blood and slime, and are attended with great pain.

For convenience we may distinguish cases of diarrhea as acute and chronic. The acute diarrhea is familiar to us all
as the result of errors and indiscretions in diet, being produced by excessive indulgence in food as well as by eating certain indigestible articles. This diarrhea is usually transient and subsides spontaneously in a few days. In such cases there should be no meddling interference with the discharge, which is really Nature's effort to rid the stomach and intestines of irritating material. If at the end of a day or two the discharge continues to be profuse and frequent, the following prescription may be given:

Aromatic syrup of rhubarb - Two ounces.
Magnesia - One drachm.
Compound spirits of lavender - One drachm.
Camphor, water - Each one ounce.

Mix, and take half a teaspoonful every half hour.

Diarrhea sometimes results not from indigestion, but mental emotion, or from exposure to cold. In these cases, also, the affection is usually cured spontaneously within a few days.

The chronic forms of diarrhea are by no means so simple nor so easily managed as the acute form. A chronic diarrhea is in most cases a symptom of some serious disease of the intestinal canal; and the physician's tact and knowledge are tested to the uttermost to detect the origin of the difficulty. Sometimes the cause is to be found in a tuberculous condition of the intestines; sometimes the difficulty lies in obstinate indigestion or dyspepsia; at other times the fault is to be found in disease of the liver, and still again cases occur in which inflammation of the kidney is responsible for the diarrhea. In fact a chronic diarrhea, notwithstanding its apparent simplicity as a disease, is one of the most troublesome and often intricate affections which the physician is called upon to treat. It will be, therefore, out of place to attempt a detailed account of the means for recognizing the various causes of diarrhea in the individual cases.

Yet certain general measures will be found advantageous in all cases of chronic diarrhea, and may be mentioned here.
In every case the regulation of the diet is a matter of importance, for persons often acquire improper habits of eating, the avoidance of which suffices in itself to cure the diarrhea. It will be well to keep the patient upon animal food largely, avoiding fresh fruits and vegetables. Milk, eggs and broth, re-enforced by rare meat and old bread, will be found most suitable, especially if taken in small quantities and at shorter intervals than usual. Starchy food may be allowed when properly cooked, as well as a moderate indulgence in ripe fruits. In this disease, too, attention should be directed to the teeth, since the difficulty may arise from imperfect mastication of the food.

The medicines to be used vary extremely, according to the nature of the case; some chronic cases of diarrhea, those especially which have originated during military life and are especially frequent among soldiers, have been cured by large doses of ipecac—twenty grains every four hours. This measure is not, however, to be adopted until milder ones have failed, since it causes profound nausea and vomiting. Various admixtures are found to be beneficial in different cases, among them the following:

Camphor, - - - - 20 grains.
Ipecac, - - - -
Opium, - - - - Each six grains.

Mix and make twelve pills. Take one every four hours; or
Prepared chalk, - - - One drachm.
Tincture of kino, - - - Three ounces.
Laudanum, - - - One ounce.
White sugar, - - -
Gum arabic, - - - Each one drachm.

Mix. Take a teaspoonful every three or four hours.

In many cases the following combination will be effectual:
Subnitrate of bismuth, - - Four drachms.
Tannin, - - - Half a drachm.
Ipecac, - - - Fifteen grains.

Mix and make eight powders. Take one every two hours.
A prescription commonly known as Hope's mixture is often beneficial; it is made as follows:

Nitric acid, - - - Four drops.
Laudanum,  - - - One drachm.
Camphor water, - - - Four ounces.

Take a tablespoonful every two or three hours.

In all cases of chronic diarrhea the patient should be extremely careful to protect himself against sudden changes of temperature, against wetting the feet, etc. He will find it advisable to be warmly clothed, even during the summer, and so long as the diarrhea is severe, to avoid unnecessary physical effort.

Whooping-Cough.

This affection is by many classed among nervous diseases, notwithstanding the apparently infectious nature of the complaint. The symptoms of whooping-cough are so familiar that no description is necessary.

Treatment.—The paroxysms can usually be shortened by the use of emetics, which not only provoke vomiting but also loosen the phlegm. For this purpose, we may give a full dose of ipecac or squills.

Aside from this measure, but little treatment seems beneficial. In fact the mild cases do best without medicine, if care be taken to avoid exposure to the cold and to wrap the body well in flannel under-clothing.

To cut short the disease, a great many remedies have been administered; the fact that these remedies are so numerous indicates that no one of them can be relied upon for all cases. Good results have been reported from the use of belladonna. The following mixture will be found of service:

Extract of belladonna, - - - One grain.
Mucilage of gum arabic, - - - Two ounces.
Give twenty or thirty drops of this every three hours. We may also use to advantage the following prescription:

- Fluid extract of hyoscyamus, - - Half a drachm.
- Orange flower water, - - - Four ounces.

Mix and give a tablespoonful every three hours. This dose is suited to a child of twelve years, and must be correspondingly reduced for a younger child.

**Sunstroke.**

The term sunstroke is applied to a condition of nervous prostration induced by excessive heat. Although this condition may result from the heat of the sun, it may just as well follow exposure to heat without sunlight; indeed cases of sunstroke occur in individuals who are working in the shade, or even at night. The condition might be better termed *heat-stroke* than sunstroke.

In a certain proportion of cases the condition seems to be one closely resembling apoplexy. In many other cases the bodily state may be likened to that which exists in a severe fainting spell.

There may be no premonitory symptoms to warn the patient of an approaching attack; he is suddenly seized with a severe pain in the head, a sense of fullness of the stomach, followed by nausea and vomiting, dizziness, dimness of vision, and sometimes ringing in the ears; immediately he becomes very weak, especially in the lower limbs, and unless speedily supported, falls to the ground. In a very few moments after the beginning of the attack the patient is unconscious; the general symptoms are, in severe cases, those of apoplexy, except that the patient is not paralyzed. The breathing is slow and snoring, and may be occasionally accompanied by a moaning sound. Convulsions frequently occur.

This condition may last but a few minutes and be termi-
nated by death. It sometimes happens that the patient expires even before assistance can reach him. In other cases, after this state has lasted for from twenty minutes to four hours, the patient gradually recovers consciousness, and in a few days is convalescent.

The most notable features in these cases, and one which demands particular attention in the treatment, is the excessive temperature of the body. While the body heat, during health, ranges from 98 to 99 degrees, it may rise during an attack of sunstroke to 108 degrees, 110, or even 112 degrees. The surface of the body is usually, though not always, quite warm.

The most important agent in the induction of sunstroke is undoubtedly excessive heat. Yet there are certain influences which predispose the individual to the effect of the heat. Excessive exertion, especially muscular effort, seems to favor the development of sunstroke; many cases occur in those who are engaged in manual labor, yet this is not invariably the case. It has been noticed that a considerable number of cases occur in individuals who have just completed a hearty meal.

Cases of sunstroke are more common in tropical than in other climates, notwithstanding the assumed power of the natives to withstand excessive heat.

About one-half of all individuals attacked with sunstroke die of the affection. The occurrence of convulsions, of deep and loud breathing, and of persistent unconsciousness, indicate that the attack will prove fatal. Perhaps the best index to the patient's condition and prospects is to be found in the pulse; if this be very rapid and feeble, so that it can scarcely be felt or counted, the condition is most grave.

In other cases the patient does not lose consciousness completely, or if he does, his condition resembles profound sleep rather than the stupor of apoplexy. In these cases the pulse is usually quite perceptible, though it may be quite rapid and feeble.
Treatment.—In the treatment of sunstroke, it is important to remember that there are two different types of the affection, and two different modes of treatment adapted to each.

For those cases in which the skin is cool, the pulse so feeble as to be almost imperceptible, the breathing easy and natural, the patient must be stimulated, and that as soon as possible. The clothing should be loosened, especially from the neck; the patient’s head should be kept low, the air allowed to circulate around the body; half a tablespoonful of whisky or brandy may be administered every fifteen minutes until six doses have been taken; hartshorn should be applied to the nostrils. If there be any vomiting, the whisky or brandy may be administered as an injection into the rectum. In this case, an ounce (two tablespoonfuls) may be given for each dose.

It is highly important that such a patient be not moved nor agitated; he should not, therefore, be taken home nor to a hospital, unless the distance be short, but should be treated at once at the nearest convenient place.

The skin may be rubbed thoroughly with whisky and water. But in this form of the affection no cathartics should be given.

In those cases of sunstroke that resemble apoplexy, another line of treatment is required. In these cases the patient is usually unconscious, the pulse is slow and full, the breathing is slow and snoring. In these cases the patient should be packed in ice; these are the cases in which the body heat runs very high, and constitutes the chief element of danger. The object of treatment is, therefore, to cool the body as rapidly and as early as possible. For this purpose, lumps of ice wrapped in coarse cloths may be laid entirely around the body of the patient, especially around the head; if an ice cap can be procured—a rubber bag made to cover the entire head—it should be used.
THE NURSERY AND SICK ROOM.

If it be impossible to procure ice immediately, the patient may be laid in a bath of cold water, and a stream of water poured upon his head and neck. In short, without going further into details, it will suffice to repeat that the chief object is to lower the temperature of the body; the means to be employed may vary with the circumstances of the case.

In every case, one or two drops of croton oil should be placed upon the tongue; and if it can be arranged, light mustard plasters should be applied to the soles of the feet and to the calves.

Sprains.

A sprain is a wrenching of a joint, whereby some of the ligaments—the bands which unite the bones—are torn or severely stretched. In many cases there occurs also an injury to the bones.

The severity of the injury varies extremely. A severe sprain, while containing no element of danger to the life of the patient, is nevertheless a serious injury, which may result in the permanent impairment of the functions of the joint.

Treatment.—The first item in the treatment of a sprain is perfect rest of the limb. In many cases it is advisable to apply a splint in order to prevent any unconscious movement of the part. The splints are essentially the same as those which have been described in treating of fractures.

A most valuable feature for reducing the swelling and pain consists in wrapping the joints with cloths saturated with water as hot as can be comfortably endured. These fomentations should be continued for three or four hours. So soon as the pain and swelling have somewhat subsided an elastic bandage or cap should be placed around the joint.

Care should be taken in avoiding any violent movements of the affected joint for some weeks after the injury. Some stiffness may occur, which may be overcome by having the
joint moved regularly every day by an assistant. The restorations of the motions can also be furthered by the use of some stimulating liniment, such as the ammonia liniment.

In some cases serious disease of the bone follows a sprain. This is the result of the original accident and cannot be averted by treatment.

**Bruises.**

A bruise consists in the rupture of blood vessels by application of violence, and the escape of the blood into the surrounding tissues.

If no further injury be inflicted than the simple damage to the flesh, perfect recovery may be expected with no other detriment than the annoyance and pain occasioned by the violence.

*Treatment.*—The object of treatment is to prevent, so far as possible, the escape of blood into the tissues, and to promote the absorption of the blood which has already escaped.

To check the flow of blood some cold application should be made to the part. Ice or ice-water is the most convenient, and can readily be obtained. It is not wise to apply leeches or to use other measures for removing the blood which has accumulated in the tissues; for this blood is already clotted, and can best be removed by the natural process of absorption.

The only danger to be apprehended occurs in cases of extensive lacerations of the tissues, by which a large blood-vessel has been injured. In such cases there is some danger of mortification of the skin, and even of the flesh underneath.

In such instances it is absolutely necessary to keep the part constantly moist and warm. This can be done by applying hot fomentations over the entire surface, and renewing them as often as the temperature is decreased.

In rare instances the blood accumulated in the tissues putrefies, giving rise to the formation of matter. In this case the skin should be freely opened and the blood removed,
after which the wound should be thoroughly and repeatedly cleansed with the following solution:

| Listerine | - | - | - | Two ounces. |
| Water     | - | - | - | Ten ounces. |

**Burns and Scalds.**

The effects of burns or scalds vary with the degree of the injury. If the damage to the tissues be not severe, nothing but local treatment is required; if, on the other hand, the surface be extensively burned, the patient exhibits the signs of shock or collapse.

The pain consequent upon a burn or scald can be most quickly relieved by immersing the patient in a bath with a temperature of about 70 or 75 degrees F. If this be not obtainable, cloths saturated with warm water may be laid upon the part.

After the burn has been thus treated for an hour, the limb should be enveloped in cotton which has been saturated in carbolic acid solution, two ounces of the acid being thoroughly mixed with two quarts of water. If this be not at hand, the burned surface should be thickly sprinkled with flour.

If the burn be superficial it will be necessary only to cover the part with a piece of thin cloth, smeared with vaseline, which may be allowed to remain for a day and then removed. If, however, the burn be a deep one, there will be mortification of the surface, and pieces of skin and flesh will be separated by the formation of matter. It is very important that the dressing which is applied be not allowed to adhere to the surface, since it will stick to the skin, and its removal will occasion the patient much pain.

In cases of deep burns, the most satisfactory dressing consists in placing the limb, or the entire patient, as the case requires, in a permanent warm bath. The pain is thereby relieved, and the separation of the mortified flesh proceeds
most rapidly and satisfactorily. This method is employed almost exclusively in the renowned hospital at Vienna, Austria.

If this cannot be accomplished, the limb should be enveloped in soft cloths spread with vaseline; this dressing should be changed every day. So soon as matter begins to form, the parts should be thoroughly washed with warm water containing a little carbolic acid or listerine (two ounces of listerine to eight ounces of water), at every dressing.

If there be much pain in the burned surface, it can be relieved by dissolving a tablespoonful of baking soda in a pint of water, and applying this by means of soft cloths to the surface. These cloths must be wet every hour, in order to prevent them from drying and sticking to the surface beneath.

When the pieces of mortified flesh become of a dark color there will usually be a fetid discharge. These pieces of flesh must be removed with the scissors; before doing this the limb should be bathed for half an hour in warm water.

If the burn be extensive; the patient is collapsed; the skin is pale and cold, the pulse rapid and feeble, the patient sometimes unconscious. Stimulants must be applied at once; hot bottles or flat-irons wrapped in flannel should be applied to the feet and to the sides of the body; ammonia should be held near the nostrils, and a tablespoonful of whisky or brandy may be given in milk. If there be much pain, ten drops of laudanum may be added to the whisky.

After the patient rallies from the shock, care should be taken to supply him with liquid diet only for several days. Indeed, no indigestible articles should be allowed for a week or two after the injury, since such cases are frequently complicated with ulceration of the small intestine, a complication which would be aggravated by the use of solid or indigestible food.
Toothache.

The most frequent causes of toothache are:

First—Decay of the tooth extending to the nerve contained in the pulp of the tooth.

Second—Inflammation of the membrane surrounding the root of the tooth. This usually causes a swelling of the gum, and the formation of an abscess or a "gum-boil."

Third—The general condition of the body, which predisposes to neuralgia.

Treatment.—The treatment depends upon the source of the pain. There is no one remedy which can be relied upon to cure toothache in general.

If the tooth be decayed, a dentist should be consulted and his opinion sought as to the advisability of removing the tooth.

In many cases it is possible for him to devitalize the pulp of the tooth, fill the cavity, and retain a useful member.

Until the services of a dentist can be procured the pain can be alleviated by the application of oil of cloves, creosote, chloroform, laudanum, or Jamaica ginger. The cavity of the tooth should be cleaned with a little cotton; a few drops of one of the substances named is then placed upon a small wad of cotton, which is then gently inserted into the cavity of the tooth.

If the toothache be caused by inflammation at the root of the tooth, it can sometimes be quieted by painting the gum with a mixture of tincture of aconite and tincture of iodine in equal parts. Sooner or later, however, matter will form at the root of the tooth; the abscess should be opened at once. Such teeth are usually of no service, and may be extracted.

Toothache which originates not in any local difficulty around the tooth, but in a constitutional condition, must be
treated by internal remedies. In many cases advantage will be derived from the internal use of quinine, two grains of which may be taken three times a day.

Toothache is sometimes of malarial origin; it may come on every second day, just like the chills and fever of ague. In such cases it must be treated by quinine.

**Teas and other Refreshing Drinks.**

**Linseed Tea, for Gout, Gravel, etc.—** As an accessory it is in good repute. Take one tablespoonful of flaxseed, one quart of water and a little orange-peel. Boil ten minutes in a clean porcelain kettle, sweeten with honey, add the juice of a lemon, to allay irritation of the chest. Omitting the lemon, it is good for irritation of the lungs, gout and gravel.

**Chamomile Tea as a Strengthener.**—Use one pint of boiling water to about thirty chamomile flowers. Steep, strain, sweeten with honey or sugar, and drink a cupful half an hour before breakfast, to promote digestion and restore the action of the liver. A teacupful of the tea, in which has been stirred a full dessert-spoonful of sugar and a very little ginger, is an excellent tonic and stimulant for an old person, taken two hours before dinner.

**White-Wine Whey.**—Let a pint of milk come to a boil; add half a gill of white-wine; allow the whole to come to a boil, and pour into a basin to cool. When the curd has settled, the whey is excellent for coughs and colds.

**Hop Tea.**—This is considered good as an appetizer and strengthener of the digestive organs. Take one-half ounce of hops, upon which is poured a quart of boiling water; let it stand fifteen minutes; strain, and give a small teacupful half an hour before breakfast.

**Effervescent Drink.**—Put the juice of a lemon, strained, in a tumbler of water, with sugar enough to
sweeten it. Add half a teaspoonful of bicarbonate of soda, and drink while effervescing.

Sherbet.—Take one pound of best powdered sugar, two ounces of carbonate of soda and three ounces of tartaric acid. Mix all thoroughly and keep in a bottle corked tight. When wanted for use, put a teaspoonful of the powder in a tumbler, add a drop of essence of lemon, fill with ice-water, stir and drink.

Simple Remedies for the Sick.

Every family should know something of simple remedies, especially those who live far from physicians. Often some simple remedy given in time will cure; or, at least, carry the patient until permanent relief can be obtained. For this reason we give a variety of recipes collected from the best authorities, with appropriate doses, the doses given being for adults. For children's doses, see table of proportionate doses in the next section. The most of them are simple and easily procured. Castor-oil is now much less used than formerly, but is too valuable in certain cases to omit.

Acid, Acetic.—Vinegar distilled from wood and purified, used as a lotion for its cooling properties, removing warts. It is not given internally, except in combination with other remedies.

Acid, Benzoic.—Used in chronic bronchitis. Dose: 5 grains to ½ drachm, twice a day.

Acid, Sulphuric—(Diluted). Sulphuric acid mixed with 11 times its bulk of water. Used in dyspepsia, also to check sweatings, salivation and diarrhea; also as a gargle.

Acid, Tartaric.—Used in fevers with some soda of potassa, as an effervescing draught, instead of citric acid;
the acid is dissolved in water as a substitute for lemon juice, and added to soda. Dose: 15 to 25 grains.

Aloes, Barbadoes.—Used in dyspepsia and head affections; also as a common purgative. Dose ¼ grain to 5 grains, well powdered or dissolved in hot water.

Alum.—Used internally in hemorrhages and mucous discharges; externally as a wash in ophthalmia, or as a gargle in relaxed uvula. Dose: 10 to 20 grains.

Ammonia, Liquor of.—Ammonia condensed in water. Used, when largely diluted, in fainting, asphyxia, hysteria, spasms, acidities of the stomach; and externally as an irritant of the skin. Dose: 5 to 15 minims.

Asafoetida, Gum.—Used in hysteria, flatulence, colic, etc. Dose: 5 to 10 grains.

Borax, Biborate of Soda.—Used in intestinal irritation of infants. Externally applied to thrush, and to cutaneous diseases. Dose: 5 to 30 grains. Externally applied, dissolved in 8 times its weight of honey or mucilage.

Camphor.—Used in hysteria, asthma, chorea, and generally in spasmodic diseases. Externally, in muscular pains, bruises, etc. Dose: 3 to 5 grains, in pills. When dissolved in water, as camphor mixture, the quantity is scarcely appreciable.

Capsicum.—Used in dyspepsia, flatulence, externally as an ingredient in gargles for relaxed sore throat. Dose: 3 to 5 grains, in pills; 2 drachms to 8 ounces form the strength for using as a gargle, diluted largely with water.

Cascarailla Bark.—Stimulant, stomachic and tonic. Used in dyspepsia, flatulent colic, chronic dysentery and gangrene. Dose: 20 to 30 grains of this powder 3 or 4 times a day.

Castor-Oil.—Mildly aperient. Used in colic and in those cases of constipation which will not bear drastic purgatives; also for mixing with gruel for the ordinary enema. Dose: A teaspoonful to 1 or 2 tablespoonfuls; an ounce is the proper quantity for mixing with gruel to make an enema.
Simple Cerate.—Add 20 ounces of melted wax to a pint of olive oil, and mix while warm, stirring until cold. Used for covering blisters or other healing sores.

Chalk, Prepared.—Used in acidities of the stomach and bowels, and to correct the irritation which is established in diarrhea. Externally, as a mild application to sores and burns. Dose: 10 to 15 grains.

Chamomile Flowers.—Tonic, stomachic and carminative. The warm infusion, when weak, is emetic. Externally, soothing. Used in dyspepsia, hysteria, flatulence, and also to work off emetics. Dose of the powder: 30 to 40 grains, twice a day.

Charcoal.—Vegetable. Used as an ingredient in tooth-powder; also to mix with other substances in forming a poultice for foul ulcers. Sometimes given internally. Dose: 10 to 20 grains.

Cinchona Bark.—(Yellow.) Astringent, tonic, antiseptic and febrifuge. Used in typhoid fevers, and in all low states of the system, being in such cases superior to quinine. Dose: 10 to 50 grains, in wine or wine and water.

Cinnamon Bark, Oil and Water.—Used as a warm and cordial spice to prevent the griping of purgatives, etc.

Cod-Liver Oil.—Prepared from the liver of the codfish. Nutritive, and acting also on the general system, from containing very small doses of iodine and bromine. Dose: 1 drachm carried up to 4 in any convenient vehicle, as infusion of cloves.

Decoction of Barley.—(Barley water.) Wash 2½ ounces of pearl barley, then boil it in ½ pint of water for a short time. Throw this water away, and pour on the barley 4 pints of hot water; boil slowly down to 2 pints and strain. Soothing and nourishing. Used as a diluent drink in fevers and in inflammation of mucous surfaces, especially those of the urinary organs.
Decoction of Barley (Compound).—Boil 2 pints of barley water (see above) with 2½ ounces of sliced figs, 4 drachms of bruised fresh licorice, 2½ ounces of raisins, and 1 pint of water, down to 2 pints, and strain. Effect, the same as barley water, but, in addition, laxative.

Decoction of Broom (Compound).—Take ½ ounce of broom, ½ ounce of juniper berries, and ½ ounce of bruised dandelion; boil in 1½ pints of water down to a pint, and strain. Diuretic, and slightly aperient. Used in dropsy. Dose: 1½ ounces to 2 ounces, twice or thrice a day.

Decoction of Cinchona.—Boil 10 drachms of bruised yellow cinchona in 1 pint of water for 10 minutes, in a closed vessel, then strain. Used in fevers, malignant sore-throat, and dyspepsia. Dose: 1½ ounces to 3 ounces, 3 times a day.

Decoction of Dandelion.—Boil 4 ounces of bruised dandelion in 1½ pints of distilled water, to a pint, and strain. Used in torpid conditions of the liver, jaundice, habitual constipation, etc. Dose: 2 or 3 ounces, 2 or 3 times a day.

Decoction of Iceland Moss.—Boil 5 drachms of Iceland moss in 1½ pints of water down to a pint, and strain. Used in consumption and dysentery. Dose: 1 to 2 ounces.

Decoction of Poppyheads.—Boil 5 ounces of bruised poppyheads in 3 pints of water for ¼ hour, and strain. Used as a fomentation in painful swellings and inflammations.

Decoction of Quince-seed.—Boil 2 drachms of quince-seed in 1 pint of water, in a tightly-covered vessel, for 10 minutes, and strain. Used in thrush and irritable conditions of the mucous membranes.

Decoction of Sarsaparilla (Compound).—Mix 4 pints of boiling decoction of sarsaparilla, 10 drachms of sliced sassafras, 10 drachms of guaiacum-wood shavings, 10 drachms of bruised stick-licorice, and 3 drachms of mezeron-bark; boil ¼ hour, and strain. Used in cutaneous diseases,
chronic rheumatism, and scrofula. Dose: 2 ounces, 2 or 3 times a day.

**Extract of Hop.**—Physical properties. A dark-colored, bitter extract, without much smell. Tonic and sedative. Used in chronic dyspepsia and loss of sleep. Dose: 10 to 15 grains.

**Infusion of Cascarilla.**—Macerate 1½ ounces of bruised cascarilla in 1 pint of boiling water for 2 hours, in a covered vessel, and strain. Stomachic and tonic. Used in dyspepsia, diarrhea, and general debility. Dose: 1 ounce to 2 ounces.

**Infusion of Gentian (Compound).**—Macerate 2 drachms of sliced gentian, 2 drachms of dried orange-peel, 4 drachms of lemon-peel, in 1 pint of boiling water, for 1 hour, in a covered vessel, and strain. Stomachic and tonic. Used in dyspepsia and general debility. Dose: 1½ to 2 ounces, 2 or 3 times a day.

**Infusion of Horseradish (Compound).**—Macerate 1 ounce of horseradish, sliced, and 1 ounce of bruised mustard seed in 1 pint of boiling water 2 hours, in a covered vessel, and strain. Then add a fluid ounce of the compound spirit of horseradish. The same as the root. Dose: 1 to 3 ounces, 3 or 4 times a day.

**Infusion of Quassia.**—Macerate 10 drachms of quassia, sliced, in 1 pint of boiling water 2 hours, in a covered vessel. Tonic and stomachic. Used in dyspepsia. Dose: 1½ to 2 ounces.

**Infusion of Roses (Compound).**—Put 3 drachms of the dried red-rose leaves into 1 pint of boiling water, then add 1½ fluid drachms of diluted sulphuric acid. Macerate for 2 hours, and strain the liquor; lastly, add 6 drachms of sugar. Therapeutical effects: Astringent, refrigerant, and antiseptic. Used as a drink in fevers; also a vehicle for sulphate of magnesia, quinine, etc. Dose: 1½ to 2 ounces.

**Liquor of Acetate of Lead.**—Used as a lotion to inflamed surfaces when largely diluted with water.
Liquor of Potash.—Used in acidity of the stomach and bowels; also in irritability of the stomach and of the bladder, and in cutaneous diseases. Dose: 10 to 30 drops, in beer or bitter infusion, or lemonade.

Magnesia, Carbonate of.—Used in dispepsia with costiveness, in the constipation of children and of delicate grown persons. Dose: ½ to 1 or 2 drachms.

Mercury, Chloride of Calomel.—Used in chronic diseases of the liver and general torpidity of the stomach and bowels; in dropsy, in combination with other medicines. A most dangerous medicine when employed by those who are not aware of its powerful effects. Dose: 1 grain twice a day as an alterative, 4 to 5 grains as an aperient, combined with or followed by some mild vegetable purgative.

Mixture of Iron.—All mixtures of iron should be prepared by capable druggists.

Poultice of Charcoal.—Macerate, for a short time, before the fire, 2 ounces of bread in 2 fluid ounces of boiling water; then mix, and gradually stir in 10 drachms of linseed meal; with these mix 2 drachms of powdered charcoal, and sprinkle 1 drachm on the surface. Used in gangrene.

Poultice of Yeast.—Mix 5 ounces of yeast with an equal quantity of water, at 100°; with these stir 1 pound of flour, so as to make a poultice; place it by the fire till it swells, and use. Stimulant, emollient. Used in indolent abscesses and sores.

Quinine, Sulphate of.—Physical properties: Colorless, inodorous, lustrous, bitter efflorescent crystals, totally soluble in water previously acidulated with sulphuric acid. Stomachic, stimulant, febrifuge and tonic. Used in general debility, neuralgia, and after fever. Dose: 1 to 3 grains.

Spigelia.—A very useful remedy for round worms. Dose: 10 to 20 grains of the powder, given fasting; or 1/2 to 3 ounces of the infusion made by pouring 1 pint of water on 1/2 ounce of the root.

Syrup of Iodide of Iron.—Is used because the iodide of iron is liable to injury from change. Alterative, and affording the effects of iron and iodine. Used in scrofulous diseases, and in cachectic states of the system. Dose: 1/2 drachm to 1 drachm.

Wine of Iron.—Stomachic and tonic. Used the same as other iron medicines. Dose: 30 to 60 minims.

Doses and Their Graduation.

All who have charge of sick-rooms where the physician is not in regular attendance should understand the proportionate doses for various ages; but here, again, proper calculation must be made for development, constitutional differences, etc. The nurse should also know something of how certain medicines act on different systems. The following table will give a general idea of the proportionate dose to get ordinary action of medicine, allowing that a person of twenty-five to forty years of age requires a full dose.

**Table of Proportionate Doses.**

<table>
<thead>
<tr>
<th>Age</th>
<th>80</th>
<th>65</th>
<th>50</th>
<th>25-40</th>
<th>20</th>
<th>16</th>
<th>12</th>
<th>8</th>
<th>5</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doses</td>
<td>1/4</td>
<td>3/8</td>
<td>1/8</td>
<td>1/4</td>
<td>1/8</td>
<td>1/4</td>
<td>1/8</td>
<td>1/8</td>
<td>1/8</td>
<td>1/8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>12</th>
<th>6</th>
<th>2 to 1 Months.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doses</td>
<td>1-5</td>
<td>1-8</td>
<td>1-15 1-24.</td>
</tr>
</tbody>
</table>

Adult women require about three-fourths the full dose of men.

**Measures for Doses.**—A tumbler is estimated to contain four or five fluid ounces; a wineglass one and one-half or two fluid ounces; a tablespoon about one-half fluid ounce; a teaspoonful one fluid drachm; a minim is one drop.
Penmanship.

The History of its Rise and Progress.

WRITING is the art of expressing ideas by visible signs or characters inscribed on some material. It is either ideographic or phonetic. Ideographic writing may be either pictorial, representing objects by imitating their forms, or symbolic, by imitating their nature or proportions. Phonetic writing may be syllabic or alphabetic; in the former each character represents a syllable; in the latter, a single letter. Of the origin of this art nothing is positively known. The Egyptians ascribe it to Thoth; the Greeks, to Mercury or Cadmus; and the Scandinavians, to Odin.

The first step towards writing was probably the rude pictorial representation of objects, without any indication of the accessories of time or place; the next, the application of a symbolic signification to some of the figures, so that the picture of two legs, for example, represented not only two legs, but also the act of walking. Pictures, abbreviated for convenience, gradually became conventional signs, and in time these characters were made to stand for the sound of spoken language.

The various systems of writing of the ancient world had probably at least three different sources—the Egyptian, the Assyrian and the Chinese system, all of which were originally hieroglyphic. The Egyptians practiced four distinct styles of writing—the hieroglyphic, hieratic, demotic or enchorial, and Coptic. Hieroglyphic writing, which was in use much earlier than 3,000 B.C., was probably at first ideographic; its symbols became gradually
used to represent abstract ideas, and in time acquired a phonetic value. The phonetic characters are both syllabic and alphabetic. In the latter, pictorial figures are used to express the initial letters of the words which they represent; for example, the figure of an eagle, akhom, stands for a, of an owl, mulag, for m, etc.

The hieratic writing, which probably came into use 2,000 B.C., was a simplified form of the hieroglyphic style, in which the pictorial symbols developed through a stage of linear hieroglyph into a kind of curious hand. The demotic or enchorial writing was of a still simpler form of the hieroglyphic, and a nearer approach to the alphabetic system. It was in use from about the seventh century B.C. till the second century A.D., when it was gradually superseded by the Coptic, which grew out of the hieratic and demotic under Greek influences.

The Ethiopians also used hieroglyphs similar to those of the Egyptians, and their current written language resembled the Egyptian demotic, but its alphabet had fewer symbols. At a later period a third graphic system, somewhat analogous to the Coptic, came into use, which may be called Ethiopic Greek. With what people the Assyrian Cuneiform or Sphenographic styles of writing originated is not known, but it was originally without doubt a hieroglyphic system, and became gradually modified by the different nations which occupied the Assyrian empire, until it assumed the form of the present known inscriptions.

There are three classes of Cuneiform characters—the Assyrian or Babylonian, the Scythian or Median, and the Persian. The first is the most complicated, containing from 600 to 700 symbols; the second is less complicated, but contains about 100 symbols, or three times as many as the third, which is almost purely alphabetic. Of these three original systems, the Egyptian is by far the most important, for from its hieratic symbols was probably derived the
Standard Hand,

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

1234567890

Ladies Hand

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

Specimens

Due William M. Huntington, on order,
Eighteen Hundred and seventy-seven Dollars.

The secret of happiness is always having something to do
and doing that something with zeal and cheerfulness of heart.
Phœnician alphabet, the parent of almost all the principal graphic systems of the world.

The Roman letters were used in Italy until the latter part of the sixth century, when the Lombardic style was introduced. This is also sometimes called Roman, because used by the Popes in their bulls; it continued in use until the thirteenth century.
The Visigothic style, carried into Spain by the Visigoths, was legally abolished in 1091, and Latin letters were adopted for all public instruments. In France the Merovingian style prevailed from the close of the 6th century to the end of 8th. Charlemagne introduced the Caroline, which, having degenerated before the close of the 10th century, was restored by Hugh Capet, and was subsequently called the Capetian. It was in use in England, France, and Germany till the middle of the 12th century, when the modern Gothic spread all over Europe. The present German alphabet is a modification of this.

There are no traces of writing in Britain before the Roman conquest, when Latin letters were introduced. What is called the Roman-Saxon, resembling the Roman, prevailed until the middle of the 8th century; the set Saxon succeeded it, lasting until the middle of the 9th; this was followed by the running-hand Saxon of the time of Alfred; the mixed Saxon, combining the Roman, Lombardic, and Saxon letters; and the elegant Saxon, which was introduced in the 10th century, and did not become obsolete until the middle of the 12th. The Norman style, quaint, illegible, affected, and composed of letters nearly Lombardic, came in with William the Conqueror.

The modern Gothic dates in England from the 12th century; the old English, from the middle of the 14th. The English court had a barbarous corruption of the Norman, which was contrived by the lawyers of the 16th century, and lasted till the reign of George II, when it was abolished by law.

The utmost diversity exists among different nations in the manner or direction of writing; but in general the Semitic races wrote from right to left, and the Aryan from left to right.

In form ancient manuscripts were either rolls, *volumnia* or flat pages like our printed books, *codices*. The Egyptian papyri are usually in rolls of an indefinite length, according
to the subject matter, but some of the smaller ones are flat.

The transcripts of manuscripts were committed by the Greeks and Romans principally to slaves, who were esteemed of great value when they excelled in the art. There were also at Rome professional copyists, some of whom were women. About the 5th century, associations of scribes, who worked under stringent rules, were formed. In the middle ages copying was almost exclusively in the hands of ecclesiastics, who were called clerks, *clerici*. In the Imperial library at Vienna is a Roman calendar executed in the first half of the 4th century. In the Vatican there is a fragment of a Virgil of the 4th century. The most ancient manuscripts extant are the papyrus rolls from the tombs of Egypt, where the dryness of the climate and of the sand beneath which they were buried preserved them in an almost perfect condition for thousands of years.

**How to Learn to Write.**

Begin with good paper, good pens, good ink.

In a good copy the letters should be of elegant form, and constructed on natural principles. Every letter should be as perfect as it is possible for human skill to execute, that wherever it occurs it may present an unvarying model to the pupil. The turns and slopes should be alike, the loops of the same length and width, the proper distances between the letters carefully observed, and shade duly distributed.

Curlicues, flourishes, and ornamental capitals may delight an amateur in a show-case; a thorough business man detests them in his correspondence. In a lady's writing they are simply vulgar.

The course of instruction given in the copies should constitute a system, arranged in that order of progression which
is indicated by a careful analysis of the forms of the letters and of the powers of the human hand, so that each advance may prepare the way for the next, and the steps not be farther apart than the necessities of the case compel. To this end, the simpler forms should precede the more complex; the short, the long. Those that have similar curves and turns and identical parts should be together. Words should precede sentences. The columns should be first narrow, then broader, to accustom the hand by degrees to move easily on the given rests across the longest word. These columnar sections, intended to be written down, are the gradual preparation for the sentences, which occupy the width of the page. The selection of the words for the columns should be in accordance with the same principle of progressiveness,—first the easier, then the more difficult combinations. In them the loops should so occur that when the copy is written they may be handsomely distributed, and the general appearance of the page be harmonious.

A good paper costs more, but it is indispensable. It should be tolerably thick, well laid, with a smooth surface, moderately glazed; so that the ink will not show through when dry, and that there may be no roughness or little hairs for the pen to pick up, and that the pen may glide along without jar on the muscles or nerves of the fingers and hand,—a very important consideration, now that steel pens are used, as paralysis has in several instances resulted from their use, and their injurious effect must needs be greater on a rough surface. A white paper is generally to be preferred to a blue, indeed is almost invariably used.

The pen should be fine-pointed, so that a good hairline can be made, and have a good springy nib, that the shades may be cleanly cut, and that the writing may not be rendered stiff, a result inevitably following the use of a "hard" pen. They should be of a uniform character as much as possible,—not one very hard and another very
soft. Slight differences cannot be avoided; those that vary least are the best, if they are right in other respects.

A new pen is often greasy, owing to a certain process in the manufacture, and will not retain the ink. Dip it and raise it from the ink slowly, then wipe it; repeat this two or three times and the trouble will be removed.

Good ink is a very difficult thing to procure. It should be sufficiently fluid to flow easily from the pen, dark enough to enable the pupil to see at the time what he is writing, and to judge of hair-strokes and shades. It must not evaporate rapidly from the inkstand, nor leave a layer of mud in it; neither should it mould. Frost should not affect it. Ink should stain the paper in order to be permanent. Its color when thoroughly dry should be a deep black, which neither time nor exposure to the sun can change.

Pupils will learn by experiment that, if they raise the pen from the ink suddenly, it will be too full, and apt to blot; if very slowly, the attraction of the fluid will leave none in the pen; and, therefore, a moderate motion must be used. One experiment is worth hours of talking. Attention to this will save many a blot. Cleanliness is as absolutely necessary for the well-being of the pen as for our own.

Pens should be carefully cleaned at the close of the exercise. Always dip and wipe a new pen two or three times before it is written with, or it will be very likely to make a blot. To avoid the same mishap, the pen should never be wiped on the outside of the pen-wiper, but always between the leaves of it. Should the pen-wiper then happen to get on the book, no damage will be done.

A stiff blotter will last the longest, but common blotting-paper, or a piece of newspaper, or any paper, will answer, not indeed for blotting, but for the use we now designate. The copy-book must be kept perfectly clean, and the blotter is to be used for that purpose. The right hand
does not soil the book, for it rests on the nails of two fingers and only touches the page with them. It is the left hand that does the mischief. To obviate it, place the blotter so as to cover each column as soon as it is dry after being written, and rest the left hand on that, and not on the page.

Position, Rests, and Movements.

The immediate human instrument in writing is the arm. It consists of three parts, the upper-arm, the fore-arm, and the hand. The two connections of these are the elbow and wrist. The arm is attached to the body by the shoulder-joint. The position of the body must, therefore, evidently depend upon the use we wish to make of the arm and hand. This use, then, must be determined first. Various ones have been advocated by different teachers. The three following are the most strongly distinguished; the others arise from combinations of two or more of them. First, considering the shoulder as a point of suspension, and moving the whole arm without any support, and without any motion of the finger-joints. There are, however, very few who possess sufficient muscular strength and steadiness of nerve to write thus. It is the true movement for striking large capitals and flourishing. Secondly, resting the fore-arm near the elbow and on the nails of the third and fourth fingers, and forming the letters by its movement without any help from the pen-fingers. Thirdly, resting the fore-arm and hand as in the last, while the letters are formed by the movement of those fingers only which hold the pen. This generally leads to a feeble, constrained style.

There must be Freedom of Style,—This condition can only be fulfilled by keeping the arm free from all unnatural constraint. This precludes it from affording any support to the body. Again, the letters are to be written across the page on a horizontal line. A requirement of
beauty is that this line should be straight. This is secured without much difficulty where the base is ruled. The only important thing is to keep on it. If, now, we take pen in hand, use the elbow, placed opposite the middle of the page, for a pivot, and move the hand across, we find that the arc of a circle is described, touching the base line in only two points. In the middle it rises a full half inch above the base line. This is a difficulty to be overcome. Once more, whilst mere form does not demand consideration here, because readiness in shaping letters can only be acquired by practice, yet uniformity of slope and similarity of turns, which are required, will evidently greatly depend upon the maintenance of the same relative position of the pen, hand, and fore-arm for each letter. If we now observe a little farther the movement above described, we find that in it the position of the hand in relation to each succeeding letter is changed, and assumes a new direction. How can this difficulty be overcome? Again, it is clear that we shall be able to write much faster, if the pen touches the paper lightly, than if it presses on it heavily; this also contributes greatly to freedom of style. Finally, in order to acquire boldness of style, powerful muscles must, if possible, be brought into play in aid of the slight muscles of the fingers, while forming the letters. This would also help to prevent fatigue. To sum up, the essentials of the work to be done are: long continuance, freedom, forming the letters on a horizontal straight line across the page, uniformity of slope and similarity of turns, rapidity and boldness. The conditions we have found to be hereby imposed on the arm are: avoidance of unnatural constraint, relief of all unnecessary pressure, movement of the hand and fore-arm across the page with the same relative position to each letter, and counteraction of the curve arising from this movement, adequate support, and use of powerful muscles.

The Human Instrument.—A little in front of the elbow, at the thickest part of the fore-arm, we find a mass of mus-
cle. If the arm is placed on the desk, suspended from the shoulder, and resting lightly on this mass as a support, we find an excellent ability for moving the fore-arm on it with freedom from left to right and back again, within a certain limited distance, the muscle rolling under the arm. We will name this support the rolling rest. It is of the highest importance to observe the peculiar movement of the fore-arm on this rest. It is not to be so used as that, when the hand passes to the left, the elbow moves to the right, and vice versa. The fore-arm moves sideways as the muscle rolls under it, with sufficient play, when it is placed at right angles to the base line and opposite the middle of a word or short clause, to carry the hand across from one end of it to the other without changing its direction. Bending the wrist sideways to the right—a most cramping movement, and painful if frequently repeated—is thus rendered quite unnecessary, and should be carefully watched against.

By turning the third and fourth fingers under, so that the hand can rest on the corner of their nails, or, if preferred, on the little finger only, another support, like the runners of a sleigh, is provided, capable of moving freely over the paper. We name this the sliding rest. To avoid friction, the wrist should not touch the desk; by means of the two rests, it may easily and comfortably be kept a little raised.

These, then, we conceive to be natural positions and rests—namely, the right hand and fore-arm in the same straight line, at right angles to the line of writing, and opposite the middle of a long word or a clause of moderate length. The fore-arm is supported on the rolling rest, the hand on the sliding rest, and the wrist slightly raised.

The left fore-arm and hand are placed at right angles to the right fore-arm, with the fingers on the blotter, which covers the part already written, to steady the book, and move it when necessary. The left fore-arm is therefore in the direction of the line of writing.
What now are the movements of the right fore-arm and hand? On the rolling rest the whole fore-arm moves, so as always to be parallel to its first position, and carries with it the hand supported on the sliding rest. The rolling rest is stationary; the sliding rest glides along the paper on a horizontal line—that is, parallel to the line of writing; this is its only movement. The whole fore-arm and hand move gradually to the right in this way, with a nearly continuous motion, for the formation of the successive letters, so that their relative position to every letter is the same. All stop-ages of the nails and jerks to get the hand forward are to be absolutely forbidden. This movement of the hand is named the sliding movement; the movement of the fore-arm we have named the comital movement (Lat. comes, a companion), because it accompanies the hand.

Since the comital movement is more or less limited, some further means must be found of keeping the fore-arm and hand in the right relative position to the letters. Two methods offer themselves to us for selection. One is, to draw the paper to the left as we write. The other, which we prefer, is, by means of a lift from the shoulder, to place the fore-arm and hand in a position farther to the right; this should be done only at the end of a word. To distinguish this movement, we have named it the lateral movement. In performing it, the hand slides as before. Experiment will now demonstrate that, by the adoption of the rolling rest and the lateral movement, the difficulty mentioned above, of the curve formed by the hand crossing the page, is entirely done away with.

For the Attaining of Boldness of Style, the powerful muscles of the fore-arm must be brought into action by a straight play of the whole fore-arm forwards and backwards, in direction of the slope on the rolling rest, over the sliding rest,—a fixed point, so far as this movement is concerned. This gives a full heft, through the medium of the hand, to the fingers which move the pen, and, as a conse-
quence, boldness of style, just as a large and massive stone rolling down a hill maintains its course over considerable inequalities of surface, while the slightest obstacle diverts a small and light one. This play of the fore-arm we name the muscular movement. The resulting play of the hand, as the medium of its transmission to the pen-fingers, we name the medial movement.

We are now prepared to form a correct judgment as to the best position of the body for the accomplishing of these movements most naturally, and consequently with the least fatigue. It may be summed up in two words. *The body must be upright and self-supported.* Its relative position to the desk is a matter of comparative indifference; only, all the pupils should conform to one plan. Each position has its advantages and inconveniences. The simplest division of positions is two-fold; the right side to the desk, and the face to the desk.

Where we adopt the former, we direct the pupil to turn on his seat, so that his right side may be directly to the desk without touching; the body to be erect, and supported by the spinal column; the left foot slightly advanced. The book is adjusted with the back to the front edge of the desk, and at a two-seated desk, the top edge of one at the outside edge of the desk, of the other in a line with the inkstand. When opened, the left side of the page to be written is to be placed at the edge of the desk. The left hand is brought across, and the fingers placed on the left side of the page to keep it steady. The right fore-arm is placed on the desk, parallel with the front edge. If necessary, from short-sightedness or bad adaptation of the height of the seats to the desks, the body may be inclined forward from the seat,—never by rounding the back and contracting the chest,—and the head may be bowed somewhat forward by bending the neck. *The advantages of this plan of seating the scholars are:* the perfectly natural position of the body; the freedom of the right arm from
all avoidable weight, and its ability to form the movements required; the certainty that both rests are on the desk; and the facility with which the teacher can look down the files and along the lines in large classes, and see that every pen is rightly held, and every movement correctly made.

An objection to this position is made on the ground that, in business, when using large account-books, it is impossible. We reply, that we adopt this position for learners, because it is very convenient for the teacher. When the art is acquired, the position becomes comparatively a matter of indifference.

Where we adopt the second method of seating, namely, the body fronting the desk fairly, or with more or less inclination of the right or left side to it, we take care of these two points: that both rests of the right fore-arm shall be on and be kept on the desk, and that the book is at right angles to the right fore-arm. The following troubles are apt to arise: A tendency to sprawl over the desk, and, as a necessary consequence, to press the chest against it,—a practice most injurious. The book gets turned from its proper position at right angles to the right fore-arm. When writing down a column, a habit we strongly commend for learners, the book must be continually pushed up, or the back rest of the arm will get more and more off the desk. Indeed, pupils, are sometimes found actually resting the wrist on the front edge of the desk. On the other hand, this is often the only position the seats admit of; it is the position that must be adopted, when writing in large account-books; and there is no necessity that the above faults should prevail. They certainly will not under the care of a faithful teacher. We conclude, then, that the position of the body at the desk is matter of indifference, provided it is upright and self-supported.

The next point which claims our attention is the manner of holding the pen, and the movement of the pen-fingers. We have seen that the hand is supported on the sides of
the nails of the third and fourth fingers. Their ends, being bent under, are separated from the others, and there is room for the execution of the pen-finger movements. The fingers should touch one another at the second joints, as far as the shape of the hand permits; this gives unity and support.

The pen is held by means of the thumb and the first and second fingers. Place the right extremity of the holder against the left side of the second finger just below the nail; the end of the finger will thus be above the pen. Next, adjust the holder obliquely across the left side of the third portion of the first finger, just behind the second joint, the middle finger being at the same time slightly bent. The first two portions of the forefinger may now be closed down on the holder, which will be found to cross and touch them diagonally. The first and second fingers touch throughout. Next, let the upper corner of the fleshy part of the thumb, near the nail, be placed, by slightly bending the thumb, against the lower half of the left side of the holder, opposite the first joint of the middle finger, and the pen will be found in a secure and natural position, both for extension and retraction. It will be observed that we have given the medium position of the pen. The fingers and thumb with the joints slightly bent outwards, straightening them would extend the pen; bending them still more would retract it. The pen is really held between three points—the side of the end of the second finger, the side of the third portion of the first finger behind the second joint in front of the knuckle, and the side of the end of the thumb. The first finger is like the lid of a box placed on it to keep the pen from jumping out; it is also the principal agent in affecting the pressure for the shades. As to movement, the thumb may be regarded as a spring. The first and second finger, by contraction of their muscles, press against it; we relax its muscles, and it yields by bending: thus the downward strokes are made. By relaxing, in turn, the
muscles of the fingers, and straightening the thumb by calling its muscles into action, it pushes back the fingers, and the up-strokes are formed. The movement is twofold and alternate, extending and retracting, to form oblique lines, ovals, or horizontals.

The pen must be held with the least possible grasp. It is to be at right angles to the base line, and thus in a line with the forearm. Great care must be taken to guard against a wrong position of the hand and pen. The pen must be so held that the right side is turned a little down, so that the right nib touches the paper first when the pen is put down. With this right nib the hair strokes are made. The nibs, so to speak, are at right angles to the slope; not horizontal. By this means the shades can be made smooth. When it is neglected, the shades will be "scratchy," or rough on one side. A glance at the holder tells the teacher in a moment if the hand is right. With beginners it will be found almost as variable as a weathercock. Now it is inclined to the right, showing that the hand is lying down—a fault requiring constant watchfulness, and arising from neglect of the comital movement of the forearm; now to left, showing that the hand is turned too far over in that direction. Now the end points outwards, showing the elbow has got away; again, it points inwards, showing that the wrist is bent to the right.

The body with the right side to the desk, or directly facing it, or with either side more or less turned to it. It is to be upright and self-supported.

The force-arms rest lightly on the desk at right angles to one another. The right is supported by the rolling rest, and the hand by the sliding rest. The left arm has the fingers on the left side of the book, to steady it and to move it when necessary. The copy-book is placed with its vertical lines in the direction of the right forearm, and its horizontal lines in that of the left. It must be kept far enough on the desk to allow the rests also to be on. This position
of the book at right angles to the right fore-arm is invariable, whatever direction the arm may be in on the desk.

The rolling rest is the muscle in front of the elbow; the sliding rest, the corners of the nails of the third and fourth fingers bent under.

The Movements of the Fore-arm are Three.—The comital, which accompanies the sliding movement of the hand, and is made sidewise on the rolling rest. The muscular, which causes the medial movement of the hand, and gives heft to the pen-fingers. It is a play of the arm forwards and backwards on the rolling rest. The consequent medial movement of the hand is made over the sliding rest, of which the only movement is in a horizontal line. The lateral is the lifting and moving the whole fore-arm and hand to the right; it is rendered necessary by the limited scope of the comital.

The simplest movement for beginners is to form the letters by the motion of the fingers, moving the hand and arm along by the united sliding and comital movements, which should be nearly continuous. When thoroughly familiar with these, after considerable practice, the medial and muscular movements may be added to give freedom and boldness of style. The lateral will not be needed until sentences are written.

The movements of the pen fingers are in different directions, by extension and retraction; thus are written oblique straight lines; ovals, direct, inverted and alternate; and horizontal lines. The shades are made by pressure. As to these, great care is needed. They must be made in ovals, with a gradual increase and diminution of pressure. The usual fault is to make them too abrupt, or with the greatest thickness too long continued. The moment the thickest point is reached, the pressure should begin to diminish. Special directions are given in the analysis of the letter, where needed.
Elements and Principles.

Words are represented in writing by a single letter, or by a combination of letters. Letters are complex; they can be resolved into forms common to several of them; thus, the form repeated in $u$ is found also in $i$ and $w$; or, they are expressed by one such form as $j$, found in $g$ and $y$. In some there are parts not found in any other.

In writing, the letters are placed on horizontal lines, either ruled or imaginary. Some of the letters and parts of others are longer than the rest. The letter $o$, which is the pure oval, is taken as the standard of size. We name the line on which the writing rests the Base Line. Suppose a line parallel to this to be drawn so as to touch the top of the $o$. This, whether ruled or imaginary, is named the Head Line. The distance between the base and head lines is called one space, and gives the height of the first four principles, wherever they enter into the formation of letters. The dot of the $r$, the point of the $s$, the top of the second part of the $k$, are one-third of a space higher.

Suppose, now, six lines parallel to the base line to be drawn, three above the head line, and three below the base line, at intervals equal to the first space. We shall have eight parallel lines, bounding seven equal spaces, in a vertical direction. We call the middle space the first; the next above and below, the second; the next, the third; and the last, the fourth. One of these spaces is taken for the unit of measurement.

Rule.—Loop letters are four spaces, and double loops seven; $t$ and $d$ two and a half, $q$ three and a half, $p$ five, two above and two below the first space. All the rest are one space, except $r$, $s$, and the second part of $k$, which are one and a third.

The capitals are four spaces.
It will be observed that $f$, long $s$, and $p$ extend as far above the first space as they do below; and that the top of $p$ is a little higher than that of $t$ and $d$, and the bottom of $q$ a little lower than that of $p$.

The commencing and ending lines of the letters are always to begin and terminate at the base and head lines respectively.

There are two grammatical divisions of letters, distinguished by their forms; the small letters, which form the main body of writing; and the capitals, which are used on special occasions. We shall begin with the analysis of the small letters, because they occur oftenest, and because their forms are simpler. We shall not take them up in their alphabetical order, but in that which gives the easiest first, and shows their similarity, arising from the possession of common principles. This is the method adopted in our copy-books, in order to render our system of teaching gradually progressive.

**The Capital Letters—General Rules.**

The height of the capitals is four spaces, the same as the loop letters.

*A.* This letter has three parts. The first part is generally written upwards, the upper curve very slight. The second part is very slightly curved to one-third from the top, then it is a straight line, of which the shade gradually increases. The third part is the cross. It starts from the right foot, coincides for a half space, crosses to the left and forms a loop, the center of which is one-third the height of the letter, and on the double curve line. A line from the top through the center of the letter would be on the main slope; hence it will be seen that the second part, or down-stroke, has a little less than the main slope, the first part a little more. Observe that the width of the letter gradually
increases from the top to the base, and regulate the first up-stroke accordingly.

$N$. This letter consists of three parts. The first two are the same as in $A$, except in slope; at the bottom of the second a very narrow turn is made, and a curve carried up from it, parallel to the first up-stroke, four-fifths the height of the height of the letter. The spaces on a horizontal line across the middle are equal. The shade begins as in $A$, and is heaviest just before the turn. A line drawn through the centre of the letter, dividing it into two equal lateral halves, would be on the main slope. Observe the gradual increase and diminution of width in the two sections. See the cautions on $A$.

$M$. This letter has four parts. The first three are the same as $N$, except that the third stroke is carried to the full height. The fourth part is curved from the top, and closes with the direct oval. Observe the shades carefully. A line through the centre, dividing the letter into equal lateral halves, would be on the main slope. The widths at the top and the two at the base are equal. On a horizontal line through the middle there are three equal spaces.

$T$ has two parts. The strongest curve is in the lower section. There is no shade except in the third principle and dot.

$F$ is $T$ crossed in the middle by a small double curve placed horizontally, which is itself crossed by a small straight line on the main slope.

$P$. This letter has two parts, the stem and the cap. It is on the main slope. The cap begins with the inverted oval, two-thirds the height, on the main slope, crossing the stem at eight angles, the highest point of the cap being in the middle of the line between the section of the oval and the stem; it is continued with the right curve, and terminates on the stem in a dot at half the height of the letter. On the short diameter of the first oval produced to the stem, there are four equal spaces; on a parallel line
from the left curve of the oval crossing the stem to the other curve, two equal spaces. A line on the main slope through the oval would pass through the dot.

B. The stem and cap are like P, only that the right side is carried down one-third instead of a half, and the dot is omitted. The separation between the upper and lower sections of the right side is made by a horizontal loop. The lower curve ends with the inverted oval. A straight line drawn on the main slope, touching the right side of the upper curve, would pass through the center of the lower oval; the lower right curve, therefore, projects beyond the upper. Across the first oval to stem on its short diameter produced, there are four equal spaces similarly as to the last oval, three. On a parallel line from the right side of the first oval to the right side of the upper lobe, there are two equal parts.

R is like B as far as the separating loop, which is here made at right angles to the main slope. After that the descending curve is turned back to finish with the direct oval. Across each of the two ovals to the stem on their short diameters produced, there are four equal spaces. On a parallel line from the right side of the first oval to the right side of the upper lobe there are two equal spaces. A line on the main slope through the oval would pass through the dot.

X. The capital-stem is made first, writing downwards. Then the inverted oval and direct oval joined by a straight line on the main slope. The two parts of the letter coincide through half the height, commencing at one-fourth from the top. Across the ovals there are four equal spaces. The remark on the dot applies also.

S. Begin on base line with the right curve on the slope of the connecting lines to half the height of the letter, then form a loop on the main slope, half the height, complete a double curve, and end with a dot on the commencing line. The dot is half a space high, and on the main slope. The double curve is the essential part of this letter.
Notice how the loop is formed on the upper part, and the greater intensity of curve is on the lower part. Let the shade begin just below the loop, and be nicely graduated. Give much attention to the lower turn and the dot. An oblique line through the loop lengthwise has similar curves formed on the double curve, on the upper left and lower right side.

L. This letter begins like S, but the double curve, instead of making a turn to end with the dot, is carried to the left to form a horizontal loop, which rests on the base line, and whose thickness is half a space; it descends on the right side to touch the base line at precisely the same distance from the crossing as on the left side, and ends with the direct oval incomplete. The lower curve of the stem is stronger than the upper. It will be observed that the upper curve of the horizontal loop, and the curve to the right which touches the base line, together form a double curve. The right section only of the direct oval is used. The shade begins as in the S, below the loop. The bottom of this letter, which may be termed the L-foot, occurs also in D, Q, and one form of Z. Take care that the direct oval is made on the main slope.

J. Begin with the left curve at the height of one space from the base line, carry it round to the right to form a circular loop, and continue to curve to the height of the letter. The second part of the capital-stem and dot passing through the center of the circular loop, whose center is also in the middle of the stem. Take care that the upper part of the head is not made too broad. Modify the curve gently to accord with the upper part of the stem.

Y. This letter begins as the I, but the circular loop is not so high; its lower curve is one space from the base line, and the double curve is carried down to form a loop, the same length as j, three spaces below the line. The left curve of the loop crosses at the base line. A line through the length of the loop should pass through the upper part
of the letter. Notice the slight intensity of the curve in both parts of the stem. The heaviest shade is in the middle of the right side of the loop. The loop is one space wide.

_H._ The commencement is the third principle. Next, the double curve with a loop, the hair-stroke of which is carried across and upwards, on the same slope, to form another loop similar to the first; this side is finished with the direct oval. The first section is a little lower than the second, which is the full height. The middle of the hair-line between the two stems is half the height of the letter; hence each loop is a little less than half the height. An oblique line through the center, dividing the central space equally, would be on the main slope. The width between the down-strokes at the middle is one space. The second loop is longer than the first.

_K._ The first part is _T_. The second part consists of the left curve turned back to make a small separating loop, then continued symmetrically with the upper part, and closed with the direct oval. The separate curve is inclined as in _R_, and is one-third the height of the letter from the top. The slope is the same as in _H_.

_V._ Commencement. Next, down-stroke straight, shaded heaviest near the turn, which is narrow, like those of the small letters. Then, up-stroke parallel to previous one, branching off into the left curve, and terminated at the same height as the top of the introductory part. An oblique line through the center, dividing the letter into two equal parts, would be on the main slope.

_W._ Commencement. Next, double curve down, ending on the base line; then, double curve up with more slope. The second down-stroke is like the second of _A_, very slightly curved one-third, and then straight. The final stroke is the left curve, as in _N_. The spaces on a horizontal line drawn through the middle of the letter are equal. A line from the middle point at the top through the center of the letter would be on the main slope.
Z. Commencement. The down-stroke and foot like $L$, except that the lower curve of the stem is a little less intense. It has the main slope.

D. This letter begins with the double curve, commenced at the height of the letter; its foot is like that of $L$ until it touches the base line on the right side, whence it is carried up as the right side of an oval, crosses the stem near its top, and ends with the direct oval. The highest part of the letter is well in front of the stem.

Q. Begin with the inverted oval, and end like $L$. The oval is on the main slope.

C. Begin with the left curve from the base line to half the height; next, make a loop half the height; end with the direct oval. Take care that the loop does not pitch over too much. It necessarily has more that the main slope.

E. Begin with the left curve a little distance from the base line, carry it two-thirds high, and make a loop one-third; continue the curve to form a small separating, nearly horizontal, loop to the right, and close with the direct oval. The separating loop is a little inclined down to the right, to correspond to the lower oval.

G. Begin with the left curve; then, a loop two-thirds the height of the letter; continue the down-stroke as the bottom of an oval, whose width is twice that of the loop, the bottom of the turn being one-fourth from the base line. End with a double curve and dot: the double curve is half the height of the letter. Both parts of the letter are on the main slope. A line through the length of the loop would pass through the dot.

Y. This letter begins with the inverted oval, continues like third principle to one-fourth from the base line, but the lower turn much narrower than the upper, and ends with the double curve and dot; height, two-thirds.

U. Begin with the inverted oval; continue as $Y$, except that it rests on the base line. The second part is a straight
line ending with a direct oval. The top of the second part lower than that of the first. Its width is two spaces.

**Classification of Letters.**

Classification relates to the arrangement of the letters in groups, according to their possession of common forms. Since every letter must have something peculiar to distinguish it from others which have a common principle, classification includes a description of this peculiarity, which is termed the characteristic.

**Classes of Small Letters.**

The most natural and convenient division of the small letters seems to give four classes. Some letters will be found to belong to two of them. The reason of the position here assigned is obvious.

**First Class.**—Those letters which consist chiefly of the first, second, and third principles, i, u, n, m, v, w, x.

**Second Class.**—Those formed from the oval, or the fourth principle, o, a, c, e.

These two classes contain all the short letters except two.

**Third Class.**—Those which have stems formed of the first element, p, q, t, d. These are called the Stem Letters.

**Fourth Class.**—Those which have the fifth and sixth principles, h, k, l, b, j, g, y, z, f, long s. These are the Loop Letters.

Besides these, there are two letters whose forms are anomalous, r, s.

**Characteristics.**

The characteristics of the letters are as follows:

In the First Class. Of i, one straight line with turn at the bottom and the dot above it; of u, two straight lines
with *turns* at the bottom; of *n*, two straight lines with *turns* at the top; of *m*, three straight lines with *turns* at the top; of *v*, its two nearly parallel sides and the dot; of *w*, its alternately parallel sides and the dot; of *x*, the straight line forming the cross.

In the Second Class. Of *o*, the oval; of *a*, the addition of the first principle; of *c*, the dot; of *e*, the loop.

In the Third Class. Of *p*, the third principle affixed; of *q*, the fourth principle prefixed; of *t*, the cross; of *d*, the fourth principle prefixed to the *i*-stem without the cross.

In the Fourth Class. Of *h*, the third principle affixed; of *k*, the knot or kink; of *l*, the turn at the bottom; of *b*, the parallel sides of the lower part and the dot; of *j*, the dot; of *g*, the fourth principle prefixed; of *y*, the third principle prefixed; of *z*, the second principle and shoulder; in the other form, the zig-zag; of *f*, the knot.

In the anomalous letters. Of *r*, the dot and shoulder; of *s*, the twist on the right side.

**Of Capitals.**

We give the Capitals in the order of their introduction.  
*O*,— *A*, *N*, *M*,— *P*, *F*,— *P*, *B*, *R*, *X*,— *S*, *L*,— *I*, *J*,— *H*,  
*K*,— *V*, *W*,— *Z*, *D*, *Q*,— *C*, *E*,— *G*, *Y*, *U*.

**Occurrence of Principles.**

The capital-stem, or line of beauty, ending with a dot, occurs in fourteen letters, *A*, *N*, *M*, *T*, *F*, *P*, *B*, *R*, *X*, *S*, *I*, *K*, *G*, *Y*.

The capital-stem is written:

Generally upwards and light, in three letters, *A*, *N*, *M*.

Downwards, light and short, in two letters, \( G, Y \).
Downwards and shaded in the lower curve, in three letters, \( I, L, S \).
Downwards, prolonged into a loop, shaded on the right side, in one letter, \( \mathcal{Y} \).
The third principle of small letters is used for the commencement of seven letters, \( T, G, H, K, V, W, Z \).
The direct oval, when of full size, forms the \( O \).
Four-fifths of the vertical height, it is the end or front of \( D \).
Half the height, it terminates eight letters, \( M, R, X, H, K, C, E, U \).
One-third the height, it ends \( L, Z, Q \).
The inverted oval, two-thirds the height, commences seven letters, \( P, B, R, X, Q, U, Y \).
Half the height it ends one letter \( B \).
A curve and circular loop are used for the head of \( I, \mathcal{Y} \).
The loop, half the height of the letter, is found in six letters, \( S, L, \mathcal{Y}, H, C, G \); one-third the height, in \( E \).
The knot, kink, or small separating loop, is found in three letters, \( B, R, K \); turned in the opposite direction, in \( E \).
The horizontal loop, or \( L \)-foot, is found in four letters, \( L, D, Q, Z \).
The first element, very slightly curved to one-third from the top, is found in \( A, N, M, W \); straight throughout, and closed by a turn, in \( V \).

**Combination of Letters.**

Combination treats of the arrangement of letters in words at proper distances. This is generally spoken of as spacing. It is effected by the connecting lines of the two letters running into one another, and thus forming one line, which may be distinguished as the combining line.
Good taste requires that the letters in a word should look about the same distance apart; in other words, that the space on the line which the word occupies should be evenly filled. If this is neglected, the writing will look "patchy,"—crowded in one place, scattered in another. We propose, therefore, to give rules for these distances, and to point out the reasons on which they depend.

Every letter ends with a straight line having a diagonal connecting line with a turn, as \( u \), or without a turn, as \( f, q \); or is an oval with a horizontal connecting line; or is open on the right side, as \( c \) and \( e \). Every letter begins with a straight line, having a diagonal connecting line without a turn, as \( u, h, p \), or with a turn, as \( n, y \); or is an oval, as \( o, a \); or is open on the left side, as \( s \), in which the up-stroke is merely the connecting line. The combination of these different classes of letters may be determined by the following rules:

Rule 1.—When two straight lines, or a straight line and an oval, are united by one turn and a combining line, or by a combining line only, the distance between them is one space, the height of \( o \): as \( ii, ni, it, lh, ip; io, ie; gi, go, gu, etc \). Between \( is, us, etc. \), the distance is really the same, because the width of \( s \) equals that of \( o \): but since we have to measure to the right side, it is a space and a half.

Remark.—In \( it, lh, ip \), where the combining line joins the straight line at one-half, one-third, and the top, respectively, the distance is kept by giving less slope to the combining line. In \( gi, gu, etc. \), the same means are used.

Rule 2.—When two straight lines are united by two turns and a combining line, the distance is one space and a half; as \( in, ir, nu, my, pn, etc. \)

Remark.—This gives room enough to make the turns properly, and the line crossing diagonally prevents the distance from seeming too wide.

Rule 3.—When two ovals, or an oval and a straight line, are united by a combining line only, or by a combin-
ing line and turn, the distance is three-quarters of a space; as oo, oe, od, ba, ve, wo; oi, ot, oh, op, vi; on, vn, etc. The last part of b, v, w, is equivalent to the oval. In os the distance is really the same, since s is the width of o; but as we measure to the right side, it is a little more than one space.

Remark.—A full space for the distance mentioned in the first part of this rule would be too much, because, as the connecting line is horizontal, there is nothing to disguise it. We have, therefore, to bring the main lines nearer.

Rule 4.—When c or e precedes a letter beginning like u, or an oval, the distance is one space and a half; as ci, ci, cl, el, ep; co, eo, ee, etc.

Remark.—The distance in this case is measured from the left side of the c and e, and is crossed by the combining line diagonally.

General Remark.—The combining line does not have an invariable slope, but is determined by the necessities arising from the rules of combination.

Rule 5.—Words are written about one space apart. This, however, depends very much on whether we wish to give the writing a free or a condensed appearance.
BOOK-KEEPING.
Book-Keeping.

There are, properly speaking, only two methods of book-keeping, founded on distinct principles, viz., Single and Double Entry. Single Entry is the more simple, and is generally adopted by shopkeepers and others who deal in a great variety of articles, where the sales are small and numerous; and to such it is peculiarly applicable, as they have seldom time to record them particularly. There is merely required a memorial of occurrences, in the order of time, with a Ledger, in which the names of all parties between whom transactions take place are entered; debtor and creditor accounts of each party being arranged on the two opposite pages which are presented at an opening, the first on the right hand, and the second on the left. By this method the Ledger is defective, since it contains no accounts of cash, bills, or goods; consequently it affords to the owner no knowledge of these particulars, but only records the debts due to and by him, with, at most, the accounts of stock, family expenses, and shop furniture. The Italian method of Double Entry differs from Single Entry chiefly in making cash, stock, goods, etc., parties as well as persons, and in making a debtor and creditor account in every transaction. Thus, if cloth is sold to A, A is made debtor to cloth, and cloth creditor to A; if cash is received from B, cash is made debtor to B, and B creditor to cash; and in every case the party, whether animate or inanimate, which receives is debtor to that which pays, and inversely. A double entry is therefore requisite in every transaction, and a balance may at any time be struck between things as well as persons; and in order to avoid the confusion which would arise in a direct transfer of account from the Wastebook to the Ledger before the
proper relation of debtor and creditor in each transaction is distinctly ascertained and recorded, they are first entered in the Journal in the same form in which they must appear in the Ledger. But in order to form a proper criterion of the existing methods of book-keeping, it will be necessary to compare them as we will now do, before proceeding further.

As the Ledger, when kept by Single Entry, contains no accounts of cash, bills, and goods, it consequently affords to the owner no knowledge of these particulars; but these must be collected from the subsidiary books. In a simple trade, such as the set by single entry which follows this, the information wanted may be obtained by the present arrangement of the Day-book, Cash-book, and Stock-book; but in an extensive and diversified concern this arrangement would by no means be advisable, as the objects in question could not be easily and concisely obtained. Posting from a number of books, when one only is necessary, is of itself an insuperable objection, because it is more liable to errors and omissions; and from the unsightly appearance these books would exhibit by the multiplicity of figures, the eye would soon become fatigued and bewildered. It is both a slovenly and tedious method to enter each sum singly into the Ledger, and unnecessarily swells the accounts with lines, as by the Italian method, which increase the labor and difficulty of balancing. Besides, previous to taking a general balance, the number of entries, such as interest, commission, and postage, arising from the accounts current, must unavoidably be made either with a journal entry, or each entered singly by a simple transfer from one account to another, which is, in fact, a double entry, and would be both awkward and improper. The Cash-book might be constructed with columns to show the monthly amounts of the cash received and paid on account of bills receivable and bills payable, etc.; yet the information in other respects would not be obtained, for the
amounts of the sales, of consignments and shipments, etc., monthly, would not be shown by Single entry.

Although the Ledger, by the Italian method of book-keeping, contains accounts of cash, bills, goods, and other property, yet the arrangement of it and the Journal is by no means adequate to the purposes of an extensive and complicated concern. By making all the original entries in one book, namely, the Waste-book, a jumble of transactions so heterogeneous is produced as cannot fail to render the business not only more complex in itself, and consequently more difficult, than if a separate book were kept for each kind; but when dispatch is required, as in selling, shipping goods, etc., the greatest inconvenience is experienced, as only one person can be employed at once in making the entries. But the principal defects lie in journalizing daily, in posting each sum singly into the Ledger, and opening separate accounts for each kind of goods. Hence the impracticability of following this method without the books of an extensive business falling behind, the patience of the book-keeper exhausted, or, perhaps his health destroyed. Besides swelling the Journal and particularizing the Ledger to an unwieldy size, it renders the balancing of the latter a laborious and, in most cases, a difficult task.

By the practice at present followed in the counting-house, the Waste-book is not recognized by that title. It is represented, however, by a number of subsidiary books, suited to the nature of the business carried on, each containing such transactions as exclusively apply to its title. Thus, a Cash-book, in which is entered the money received and payed; a Bill-book, in which are recorded the bills received and accepted; a Purchase-book, or Invoice-book Inward, in which are entered or posted invoices of all goods purchased; a book of shipments, or Invoice-book Outward, in which are entered all goods shipped; an Account Sales-book, in which are entered the particulars of such goods
as are sold on commission, with the charges attending them; a Day-book, in which are entered the sales of goods on the merchant's own account, with such other transactions as do not apply to any of the above books: An Account Current-book, containing duplicates of the accounts as they stand in the Ledger, with the particulars of each article drawn out in a plain circumstantial manner, being exact copies of the accounts transmitted or delivered to the persons whose names they bear. These are the principal subsidiary books used either in inland or foreign trade, and form which the Journal or Ledger are made. The division of the Waste-book into a number of books adapted to the nature of the business, is a valuable modern improvement, both for simplicity and dispatch. By bringing each kind of transactions together, and dividing the labor among a number of hands, the utmost simplicity, accuracy, and dispatch are obtained.

The arrangement of the Journal, by combining together each class of accounts, and carrying only the amounts of these once a month into the Ledger, not only simplifies the Journal, but greatly abridges the former of these books, because no more than twelve lines yearly will be required in general at the accounts, though transactions be ever so numerous.

The Ledger, when kept by this method, may therefore be considered a general index to the Journal, as that book is to the subsidiary books. By this means the case of each account is brought into a concise point of view, and is easily examined, without fatiguing the eye with a multiplicity of figures, which unavoidably takes place when each sum is posted separately, as by the Italian method. It must also be observed that instead of opening distinct accounts for each kind of goods, as by the Italian method, only one general account of goods is by the present practice opened; for when the articles are numerous, one account of goods in the Ledger is quite sufficient, and will be found
BOOK-KEEPING.

swto aner every useful purpose. In an extensive business, where separate accounts for each kind of goods have been attempted, it was found difficult to keep the Journal and Ledger from falling behind. The Stock-book is the proper place for every particular of this sort, which may be kept exclusively by one of the junior clerks, when the business requires it. The result of the general account in the Ledger of goods will always correspond with the particular profits and losses from the Stock-book.

But superior as the present practice is for saving both time and labor in posting, it will be found still more so at balancing the Ledger. What was formerly a laborious, and, in some cases, next to an impracticable task, where that book was posted daily, namely, to bring the stock and balance accounts to agree (chiefly owing to the numerous entries on the property and nominal accounts), is by the present method completely avoided, and that which was before the labor of weeks, can now be accomplished in as many hours or days.

It will be of more advantage to the learner to procure or prepare for himself several sheets of ruled paper, with cash columns, and enter each transaction in the order of time, than to trace the entries in the Day-book and Cash-book which we have prepared. In the first case he will find the task, as he proceeds, familiar and interesting, while his knowledge and self-reliance will be increasing; whereas, in the other case, he will acquire so superficial an acquaintance with the accounts that it will soon vanish from his memory. The Day-book is arranged so as to admit of entries being made both of sales and purchases, the former on the right side, and the latter on the left. By this means he will be taught what debit and credit entries are before he is called upon to post the Ledger, and, moreover, avoid the risk of carrying error and confusion forward to the last stage of his work. It has been observed that in an extensive business it is preferable to enter the purchases in one
book and the sales in another; and by adding these up monthly the amounts of each would be shown, which would enable the owner to extend or lessen the purchases as circumstances point out. The Day-book, as now given, will also serve this purpose, only that instead of having separate books for the sales and purchases, they are here arranged in one, and disposed, as we have said, in the form of debtor and creditor. It therefore follows that if we add at any time to the credit side the value of the article remaining on hand, the difference betwixt the sums total on the two sides will show the whole gain or loss upon the goods, and by entering the charges, etc., attending the business, with the discount, both against and in favor of it, to the proper sides, this book will exhibit the result of the whole.

The following general rule is sufficient to direct the learner respecting debtor and creditor. The person from whom you buy goods on trust, or receive money, is Creditor, and, on the contrary, the person to whom you sell goods on credit, or pay money, is Debtor.

For instance, if you buy goods on credit from John Carter, he, being the deliverer, is creditor for the value, and when you pay him for them, he being the person who receives, is debtor. On the same principle, if you sell goods on credit to Phillip Meek, he, being the receiver, is debtor; and when he pays you for them, he, being the deliverer, is creditor. The same rule is observed when you contract or discharge a debt by any other transaction. Thus the person who becomes indebted to you is debtor, and the person to whom you become indebted is creditor. In the same manner, the person whose debt you pay is made debtor, and he who pays a debt to you, or for you, is creditor.

In the Day-book, enter on the debtor, or left hand, page all the purchases, with the discounts allowed by you, as these occur; also all the petty expenses, monthly. Enter on the creditor, or right-hand page, all the sales, with the
discount or interest allowed to you; also the value of goods on hand at balancing.

The Cash-book.—This book is very useful, whether the Ledger be kept by Single or Double Entry, in order to show at all times the money you receive and pay, and how much at any time should remain in hand. On the debtor, or left-hand page, is entered every sum you receive; and on the creditor, or right-hand page, every sum you pay. The difference between the two sides is called a balance, which should always agree with the money remaining in hand. This book is generally added up and the amounts set down, at the end of each month; and the balance is entered on the credit side to make the two sides equal, and likewise upon the debtor side of succeeding month.

The Bill-book is divided into two parts. In the first are entered all bills which you receive, and are therefore called Bills Receivable. It is ruled with a number of columns for recording the several clauses of the bill. When kept correctly the blank spaces of the last column towards the right hand will always show the bills which remain in your possession. As soon as a bill passes out of your hands, by being either paid, discounted, or endorsed to another person, it must be marked off in the above column. In the second part are entered all the bills which you accept, or agree to pay, and are therefore called Bills Payable. As soon as you pay a bill, it should also be marked off in the column towards the right hand; when, of course, the blank spaces will just present such bills of yours as are unpaid.

A dealer who does a cash business only requires but a single book—the Cash-book. In it he enters on its appropriate side all his transactions: one the one said all he pays out, and what for, on the other all he receives and its vouchers. The balance between the two sides will at any time show the state of his affairs. Suppose, for instance, his Cash-book shows on the debtor side a total transaction
of $1,450.73, and on the credit side $659.32, the difference, $791.41, is the sum which he ought to have on hand. These will appear in the Cash-book, thus:

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,450.73</td>
<td>659.32</td>
</tr>
<tr>
<td>Balance</td>
<td>791.41</td>
</tr>
<tr>
<td>1,450.73</td>
<td>1,450.73</td>
</tr>
</tbody>
</table>

To balance brought forward . . . 791.41

The transactions of which the foregoing forms a total may be like the following:

<table>
<thead>
<tr>
<th>CASH.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880.</td>
<td></td>
</tr>
<tr>
<td>Jan. 1. Capital...</td>
<td>1,000.00</td>
</tr>
<tr>
<td>2. Sales...</td>
<td>10.15</td>
</tr>
<tr>
<td>3. &quot;</td>
<td>8.94</td>
</tr>
<tr>
<td>4. &quot;</td>
<td>17.20</td>
</tr>
<tr>
<td>5. &quot;</td>
<td>12.80</td>
</tr>
<tr>
<td>6. &quot;</td>
<td>19.72</td>
</tr>
<tr>
<td>8. &quot;</td>
<td>20.07</td>
</tr>
<tr>
<td>9. &quot;</td>
<td>10.15</td>
</tr>
<tr>
<td>11. &quot;</td>
<td>24.44</td>
</tr>
<tr>
<td>12. &quot;</td>
<td>18.41</td>
</tr>
<tr>
<td>13. &quot;</td>
<td>7.16</td>
</tr>
<tr>
<td>15. &quot;</td>
<td>9.62</td>
</tr>
<tr>
<td>16. &quot;</td>
<td>18.27</td>
</tr>
<tr>
<td>17. &quot;</td>
<td>21.00</td>
</tr>
<tr>
<td>19. &quot;</td>
<td>26.81</td>
</tr>
<tr>
<td>20. &quot;</td>
<td>41.94</td>
</tr>
<tr>
<td>22. &quot;</td>
<td>73.20</td>
</tr>
<tr>
<td>23. &quot;</td>
<td>64.16</td>
</tr>
<tr>
<td>24. &quot;</td>
<td>47.23</td>
</tr>
</tbody>
</table>

$1,450.73

Jan. 1. Pd. Smith & Co. for 10

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>bbls. flour...</td>
<td>52.50</td>
</tr>
<tr>
<td>2. Expenses...</td>
<td>20.15</td>
</tr>
<tr>
<td>3. &quot;</td>
<td>10.00</td>
</tr>
<tr>
<td>4. &quot;</td>
<td>19.50</td>
</tr>
<tr>
<td>5. &quot;</td>
<td>4.25</td>
</tr>
<tr>
<td>6. &quot;</td>
<td>1.30</td>
</tr>
<tr>
<td>8. Wages...</td>
<td>50.00</td>
</tr>
<tr>
<td>9. Expenses...</td>
<td>24.00</td>
</tr>
<tr>
<td>10. &quot;</td>
<td>19.72</td>
</tr>
<tr>
<td>11. &quot;</td>
<td>60.40</td>
</tr>
<tr>
<td>12. &quot;</td>
<td>72.16</td>
</tr>
<tr>
<td>13. &quot;</td>
<td>40.01</td>
</tr>
<tr>
<td>15. &quot;</td>
<td>27.90</td>
</tr>
<tr>
<td>16. Wages...</td>
<td>50.00</td>
</tr>
<tr>
<td>17. Expenses...</td>
<td>27.00</td>
</tr>
<tr>
<td>18. &quot;</td>
<td>19.25</td>
</tr>
<tr>
<td>20. &quot;</td>
<td>7.14</td>
</tr>
<tr>
<td>22. Wages...</td>
<td>50.00</td>
</tr>
<tr>
<td>23. Expenses...</td>
<td>17.84</td>
</tr>
<tr>
<td>24. &quot;</td>
<td>86.20</td>
</tr>
</tbody>
</table>

$659.32

A single operation will enable you to ascertain at any time the state of your affairs. Thus:

Balance of cash on hand - - - 791.41
Cost of goods in stock - - - 200.00

991.41
If you owe anything on your stock, you must arrive at the result differently. Thus:

Balance of cash on hand - - 791 41
Cost of goods in stock - - 400 00

\[ 1,191 \ 41 \]

Deduct amounts due to various persons for

stock - - - - - 200 00

\[ \text{Balance as before} \ - \ - \ - \ - 991 \ 41 \]

So if you give no credit, but sell only for cash over your counter, you need only the one book, the Cash-book, which will at any time you wish, if correctly kept, show the actual state of your business.

But as very few tradesmen or dealers confine themselves to a cash business, it becomes necessary to have other books, so when credit is given a Ledger is demanded, so that the dealer may at all times know not only what cash he has on hand, but what money is owing him.

Suppose you are a bookseller, and your customers keep running accounts, you will find it necessary to have at least three books, a Cash-book, for the entries of moneys received and paid out; a Blotter, as it is usually called, for recording the daily transactions; and a Ledger, for posting the accounts.

A customer, say Mr. Robert Walpole, comes to you and asks how his account stands. Looking at the index in the front of your ledger, you find Mr. Walpole's account on page 96. Turning to this page, you discover the following statement:
The debtor side, or what he owes you, is $144.25, and the creditor side, or what you owe him, is $130.00; the difference, $14.52, being in your favor, is therefore his debit to you. If he pays you, enter it on the cash-book and on the credit side of the account in the ledger, thus making it balance.

NARRATIVE OF TRANSACTIONS.

1878.

Jan. 1. Began trade with $2,000.

---

Bought goods as follows:

- Of J. W. Bouton...... $150.20
- Of Dodd, Mead & Co., 241.00
- Of A. S. Barnes & Co., 300.00

---

Sold 24 Annuals over the counter for ready money, amounting to........... 14.80

Jan. 2. Paid J. W. Bouton, Cash, 80.00

- Paid Dodd, Mead & Co. do 120.00
- Paid A. S. Barnes & Co. do 150.00
- Paid D. Appleton & Co. do 61.00

Accepted the following bills drawn on me:

- J. W. Bouton, at 2 months 40.00
- D., M. & Co., at 2 months 90.00
- A. S. B. & Co., at 3 months 60.00
- D. A. & Co., at 1 month 40.00

Bought of A. D. F. Randolph, goods, value..... 198.64

Jan. 3. Sold Tenter & Co., of Philadelphia, as follows:

- 120 Dodd, Mead & Co.'s hand books at 20c. ...... 24.00
- 80 Novels ...... 26.00
- 40 Assorted books; 24.00

Terms, half Cash, half Bills at 3 months.

Received from Tenter & Co.'s house in town, cash 35.20

Idem, bill at 3 months.... 36.20

HOW THEY ARE TO BE ENTERED

IN THE BOOKS.

This item being Cash in hand must be placed on the debtor side of the Cash Book.

To be entered in the Day Book as goods bought at the time of receiving the invoices. Each name, with the relative amount of invoice, to form a separate entry.

To the Dr. side of Cash Book, as ready money received for goods.

To be entered on the Cr. side of Cash Book, each name and amount forming a separate line.

To be entered in the Bills Payable Book, on separate lines, according to the printed form sold for that purpose.

As before.

To be charged in the Day Book, explaining every particular relating to the conditions of sale, and how forwarded.

To be entered in Cash Book as cash received for account of Tenter & Co., Philadelphia.

To be entered in the Bills Receivable to the account of Tenter & Co., Philadelphia, according to the printed forms.
Sold R. Flock, of Pittsburgh, 42 assorted books 50 80
Received from Flock's house in town, cash...... 20 00
And a bill at 3 months date.................. 30 80

Jan. 4. Sold Roberts Bros, Boston 36 Elements of Commerce 74 32
Received from Roberts Bros., of New York, for account of their house in Boston, their acceptance at 2 months for........ 74 32
Paid A. D. F. Randolph on account of what I owe him:
Bill paid to me by Flock............. 38 50
Bill paid to me by Roberts Bros., 74 32
Together.................. 105 12

This is a very peculiar entry, and one which persons ignorant of book-keeping will find comparatively difficult to arrange. As it is, however, a transaction which occurs continually, due attention ought to be given to it.

There are two ways of entering it—one by the Cash Book, the other by the Day Book. If by the former, the amount must be first entered on the Dr. side as received for the bills, and then the Cr. side as paid to the parties. This, however, is a mode I do not like, because, in the first place, it is not a cash transaction at all; and secondly, because an entry on the Dr. side of the Cash Book is obliged to be created in order to balance the other on the Cr. side. An entry by the Day Book is far the best, as nothing more is necessary than to charge the person to whom the bills are paid, with the amount of them, in the same way as for goods sold. The latter method is the one adopted in the examples.

Bought of W. H. Vernon, 20 reams of paper...... 170 00
Sold him 240 odd volumes all at................ 82 30
Sold for ready money over the counter, 6 vols. Hume and Smollett's History of England.................. 6 60

Jan. 6. Paid trade charges and wages this day........ 4 22

Paid expenses to this day...... 6 60
Feb. 5. Paid cash for my acceptance to D. Appleton & Co.................. 40 00

Mar. 5. Idem to J. W. Bouton...... 40 00
Idem Dodd, Mead & Co., 90 00
Apr. 5. Idem A. S. Barnes & Co., 60 00
6. Received the amount of Tenter's acceptance, paid me on the 30 Jan.,........ 36 20

7. Flock's acceptance returned to me by A. D. F. Randolph, to whom I had paid it, it not having been honored by the acceptor 30 80
8. Paid one month's Rent...... 80 00
Income Tax 20 24
City Taxes 15 20

To be entered on the Cash Book, under the head of Trade Expenses.

Idem. To be entered in the Cash Book to the charge of Bills Payable, specifying the number of the Bill, D. Appleton & Co. having been debited with the amount when my acceptance was given.


Idem. To be entered in the Cash Book to the account of Bills Receivable, specifying the number, Tenter & Co. having been credited for the bill, when I received it from them.

As I was obliged to take up this Bill, in other words, to pay it, for account of Flock, who ought to have paid it, I charge Flock in the Cash Book with the amount I pay to A. D. F. Randolph.

In the Cash Book, in the same way I entered trade and other expenses.
Nov. 1. Sold the following goods:

- Ramsden & Co. 20 00
- S. Green 18 24
- G. Barrows 80 00
- W. Sinn 120 00
- V. S. Brown 74 20

To be entered in the Day Book, as before.

Dec. 1. Received the following acceptances, at three months:

- Ramsden & Co. 20 00
- S. Green 18 24
- G. Barrows 80 00
- W. Sinn 120 00
- V. S. Brown 74 20

To be entered in the Day Book, as before.

Dec. 20. Bought goods as follows:

- From Leggat Bros. 52 20
- From Houghton, Mifflin & Co. 200 00
- From S. R. Wells 192 40
- From Jas. R. Osgood & Co. 170 80

To be entered in the Day Book, as before.

Dec. 30. Gave my acceptances as follows, at three months:

- Leggat Bros. 52 20
- To Houghton, Mifflin & Co. 200 00
- To S. R. Wells 192 40
- To James R. Osgood & Co. 170 80

To be entered in the Bills Payable Book, as before.

Having entered all these various items in their proper books, as explained, we proceed to transfer them under their respective heads in the Ledger, which is technically called Posting. First, taking the Day Book, we post all entries on the date of the 1st of January; then follows the Cash Book in the same way, and finally the two Bill Books, care being taken to mark the proper page of the Ledger in the columns left for that purpose in the other books, and vice versa to note in the Ledger, in like manner, the folio of the book from which the entry has been extracted. Thus, day by day, all the entries in the Ledger are condensed from these four books.

All the items contained in the Cash Book, Bill Receivable and Payable Books, and Day Book having been properly posted in the Ledger, the next operation will be to Balance! This is generally done on the last day of the year, at which time the value of the stock on hand is taken. By reference to the Ledger, it will be seen how those accounts are ruled off which balance of themselves, and in what way the balances of the others are brought down, some
being amounts we owe, and others due to us. The balances
due us stand upon the Debtor side of each account, and
those we owe on the Creditor side.

Having done this, we next proceed to draw up the
Balance Sheet, by which we shall ascertain the amount of
profit made or loss incurred upon the year's transactions,
after having paid all expenses and trade charges. In order,
to do this properly, we must collect into one sum all we owe,
and into another all we are possessed of, and the difference
between the two will be the amount we are worth. The
amount we owe are to be found in the Ledger and the Bills
Payable Book. The amounts due to us in the Ledger, also,
and the Bills Receivable Book. Besides these we must
reckon as assets, Cash in hand, as will appear by balancing
Cash Book, and stock on hand, which must be taken at a
proper valuation.

On the next will be found a General Balance Sheet,
drawn up according to these instructions.
AMOUNTS DUE TO ME, OR ASSETS.

<table>
<thead>
<tr>
<th>Folio in Ledger</th>
<th>Accounts extracted</th>
<th>Bal's, as per Ledger</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>B. Flock</td>
<td>$30 80</td>
</tr>
</tbody>
</table>

Amount of book debts due to me .................................. $30 80
*Bills Receivable in my hands not yet due .................. 312 44
Balance of Cash in hand ........................................ 1,315 80
Estimated value of stock in hand ............................... 1,390 28

$3,049 24

Balance in my favor .............................................. $2,090 44

Which shows that after paying house and trade charges, rent and taxes, I have made a clear net profit of $90.44 on my capital of $2,000.

* Enumerate each item.
**BOOK-KEEPING.**

31st December, 1880

**AMOUNTS I OWE, OR LIABILITIES.**

<table>
<thead>
<tr>
<th>Folio in the Ledger</th>
<th>Amounts extracts</th>
<th>Balances as per Ledger</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>J. W. Bouton</td>
<td>$30.20</td>
</tr>
<tr>
<td>2</td>
<td>Dodd, Mead &amp; Co.</td>
<td>31.00</td>
</tr>
<tr>
<td>3</td>
<td>A. S. Barnes &amp; Co.</td>
<td>90.00</td>
</tr>
<tr>
<td>4</td>
<td>D. Appleton &amp; Co.</td>
<td>22.60</td>
</tr>
<tr>
<td>5</td>
<td>A. D. F. Randolph</td>
<td>82.60</td>
</tr>
<tr>
<td>6</td>
<td>W. H. Vernon</td>
<td>87.00</td>
</tr>
</tbody>
</table>

Amount of book debts due BY me. $343.40

Bills accepted by me not yet due* 614.40

Balance carried down 2,090.44

$3,049.24

* Enumerate each bill separately.
<table>
<thead>
<tr>
<th></th>
<th>Dr.</th>
<th>Cash</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 1</td>
<td>* To capital</td>
<td>$2,000</td>
</tr>
<tr>
<td></td>
<td>* Cash received for goods (ready money)</td>
<td>14 80</td>
</tr>
<tr>
<td>3.</td>
<td>6 Tenter &amp; Co., received for account of their house in Baltimore</td>
<td>36 00</td>
</tr>
<tr>
<td>6</td>
<td>7 Flock</td>
<td>20 20</td>
</tr>
<tr>
<td>4.</td>
<td>* Cash received for goods (ready money)</td>
<td>6 60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$2,067 60</td>
</tr>
<tr>
<td>Feb. 1</td>
<td>To balance</td>
<td>$1,654 40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$1,654 40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$1,614 40</td>
</tr>
<tr>
<td>March 1</td>
<td>To balance</td>
<td>$1,614 40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$1,614 40</td>
</tr>
<tr>
<td>April 1</td>
<td>To balance</td>
<td>$1,484 40</td>
</tr>
<tr>
<td>6.</td>
<td>* Bill receivable, No. 101, received in cash, this day</td>
<td>38 24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$1,522 04</td>
</tr>
<tr>
<td>May 1</td>
<td>To balance</td>
<td>$1,315 80</td>
</tr>
</tbody>
</table>

**Note:** The amounts marked in the folio margin with a star, are not by single entry, posted in the Ledger; the Cash Book alone, under that system, being quite sufficient for their registry. Only accounts with persons are kept; not with things as in Double Entry. At the same time they may, if wished be posted under their respective heads as matters of reference, but care must be taken not to include them in the balance, of which they form no part.
<table>
<thead>
<tr>
<th>DATE</th>
<th>DESCRIPTION</th>
<th>CR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 2</td>
<td>By amount paid J. W. Bouton</td>
<td>$80.00</td>
</tr>
<tr>
<td></td>
<td>Dodd, Mead &amp; Co.</td>
<td>$120.00</td>
</tr>
<tr>
<td></td>
<td>A. S. Barnes &amp; Co.</td>
<td>$150.00</td>
</tr>
<tr>
<td></td>
<td>D. Appleton &amp; Co.</td>
<td>$62.00</td>
</tr>
<tr>
<td></td>
<td>By Trade Charges, Expenses and Wages to this day</td>
<td>$11.20</td>
</tr>
<tr>
<td></td>
<td>Balance to next month</td>
<td></td>
</tr>
<tr>
<td>Feb. 5</td>
<td>By Bill payable, No. 104, due this day</td>
<td>$40.00</td>
</tr>
<tr>
<td></td>
<td>Balance</td>
<td>$1,614.40</td>
</tr>
<tr>
<td>March 5</td>
<td>By Bill payable, No. 101, due this day</td>
<td>$40.00</td>
</tr>
<tr>
<td></td>
<td>do do do 102, do</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Balance</td>
<td>$1,484.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$1,614.40</td>
</tr>
<tr>
<td>April 5</td>
<td>By Bill Payable, No. 103, due this day A. D. F. Randolph for Flock's Acceptance, due this day, returned unpaid</td>
<td>$60.00</td>
</tr>
<tr>
<td>7</td>
<td>One month's rent due this day</td>
<td>$30.80</td>
</tr>
<tr>
<td>8</td>
<td>Income Taxes</td>
<td>$20.24</td>
</tr>
<tr>
<td></td>
<td>City Taxes</td>
<td>$15.20</td>
</tr>
<tr>
<td></td>
<td>Balance</td>
<td>$206.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$1,315.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$1,522.04</td>
</tr>
</tbody>
</table>
### DAY BOOK.

<table>
<thead>
<tr>
<th>Folio in Ledger</th>
<th>January 1, 1880</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bought of J. W. Bouton</td>
</tr>
<tr>
<td></td>
<td>Goods as per invoice.</td>
</tr>
<tr>
<td></td>
<td>$150 20</td>
</tr>
<tr>
<td>2</td>
<td>Bought of Dodd, Mead &amp; Co.</td>
</tr>
<tr>
<td></td>
<td>Goods as per invoice.</td>
</tr>
<tr>
<td></td>
<td>$240 10</td>
</tr>
<tr>
<td>3</td>
<td>Bought of A. S. Barnes</td>
</tr>
<tr>
<td></td>
<td>Goods as per invoice.</td>
</tr>
<tr>
<td></td>
<td>$300</td>
</tr>
<tr>
<td>4</td>
<td>Bought of D. Appleton &amp; Co.</td>
</tr>
<tr>
<td></td>
<td>Goods as per invoice.</td>
</tr>
<tr>
<td></td>
<td>$124 60</td>
</tr>
<tr>
<td>5</td>
<td>Bought of A. D. F. Randolph</td>
</tr>
<tr>
<td></td>
<td>Goods as per invoice.</td>
</tr>
<tr>
<td></td>
<td>$188 60</td>
</tr>
<tr>
<td>6</td>
<td>Sold Tenter &amp; Co.</td>
</tr>
<tr>
<td></td>
<td>Half Cash.</td>
</tr>
<tr>
<td></td>
<td>Half Three Month's Bill.</td>
</tr>
<tr>
<td></td>
<td>120 Dodd, Mead &amp; Co.'s Hand Books.</td>
</tr>
<tr>
<td></td>
<td>$24 00</td>
</tr>
<tr>
<td></td>
<td>80 Novels.</td>
</tr>
<tr>
<td></td>
<td>$26 00</td>
</tr>
<tr>
<td></td>
<td>40 Books (assorted).</td>
</tr>
<tr>
<td></td>
<td>$24 00</td>
</tr>
<tr>
<td></td>
<td>$74 00</td>
</tr>
<tr>
<td>7</td>
<td>Sold B. Flock</td>
</tr>
<tr>
<td></td>
<td>84 Assorted Books.</td>
</tr>
<tr>
<td></td>
<td>$50 80</td>
</tr>
<tr>
<td>8</td>
<td>Sold Roberts Bros.</td>
</tr>
<tr>
<td></td>
<td>72 Elements of Commerce.</td>
</tr>
<tr>
<td></td>
<td>$74 32</td>
</tr>
<tr>
<td></td>
<td>Forwarded per U. S. Express.</td>
</tr>
<tr>
<td>5</td>
<td>Paid A. D. F. Randolph</td>
</tr>
<tr>
<td></td>
<td>Flock's Acceptance, due April 7.</td>
</tr>
<tr>
<td></td>
<td>$30 80</td>
</tr>
<tr>
<td></td>
<td>Roberts Bros.' Acceptance, due March 7.</td>
</tr>
<tr>
<td></td>
<td>$74 32</td>
</tr>
<tr>
<td></td>
<td>$107 12</td>
</tr>
</tbody>
</table>
**DAY BOOK (Continued.)**

<table>
<thead>
<tr>
<th>Folio in Ledger</th>
<th>Description</th>
<th>Date</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Bought of W. H. Vernon 200 Reams of Paper</td>
<td>January 4, 1880</td>
<td>$170.00</td>
</tr>
<tr>
<td>9</td>
<td>Sold W. H. Vernon 240 Odd Volumes, all for November 1st</td>
<td></td>
<td>$82.30</td>
</tr>
<tr>
<td>10</td>
<td>Sold Ramsden &amp; Co. Books</td>
<td></td>
<td>$20.00</td>
</tr>
<tr>
<td>11</td>
<td>Sold S. Green Books</td>
<td></td>
<td>$18.24</td>
</tr>
<tr>
<td>12</td>
<td>Sold G. Barrows Books</td>
<td></td>
<td>$80.00</td>
</tr>
<tr>
<td>13</td>
<td>Sold W. Sinn Books</td>
<td></td>
<td>$120.00</td>
</tr>
<tr>
<td>14</td>
<td>Sold V. S. Brown Books</td>
<td>December 20th</td>
<td>$74.20</td>
</tr>
<tr>
<td>15</td>
<td>Bought of Leggat Bros. Goods as per invoice</td>
<td></td>
<td>$52.00</td>
</tr>
<tr>
<td>16</td>
<td>Bought of Houghton, Mifflin &amp; Co. Goods as per invoice</td>
<td></td>
<td>$200.00</td>
</tr>
<tr>
<td>17</td>
<td>Bought of S. R. Wells Goods as per invoice</td>
<td></td>
<td>$192.40</td>
</tr>
<tr>
<td>18</td>
<td>Bought of J. R. Osgood &amp; Co. Goods as per invoice</td>
<td></td>
<td>$170.80</td>
</tr>
</tbody>
</table>

N. B.—The folios should be marked in red ink.
### 1880. BILLS RECEIVABLE.

<table>
<thead>
<tr>
<th>Folio</th>
<th>Number of the bill</th>
<th>On whose account</th>
<th>Date</th>
<th>Time</th>
<th>When due</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>101</td>
<td>Tenter &amp; Co.</td>
<td>Jan. 3</td>
<td>3 months</td>
<td>April 6</td>
<td>$36 20</td>
</tr>
<tr>
<td>7</td>
<td>102</td>
<td>S. Block</td>
<td>Jan. 4</td>
<td>3</td>
<td>March 7</td>
<td>$32 32</td>
</tr>
<tr>
<td>8</td>
<td>103</td>
<td>Roberts Bros.</td>
<td>Jan. 4</td>
<td>2</td>
<td></td>
<td>$74 32</td>
</tr>
<tr>
<td>10</td>
<td>104</td>
<td>Ramsden &amp; Co.</td>
<td>Dec. 1</td>
<td>3</td>
<td>March 4</td>
<td>$143 32</td>
</tr>
<tr>
<td>11</td>
<td>105</td>
<td>S. Green</td>
<td>Dec. 1</td>
<td>3</td>
<td></td>
<td>$20 00</td>
</tr>
<tr>
<td>12</td>
<td>106</td>
<td>G. Barrows</td>
<td>Dec. 1</td>
<td>3</td>
<td></td>
<td>$18 24</td>
</tr>
<tr>
<td>13</td>
<td>107</td>
<td>W. Sinn</td>
<td>Dec. 1</td>
<td>3</td>
<td></td>
<td>$80 00</td>
</tr>
<tr>
<td>14</td>
<td>108</td>
<td>V. S. Brown</td>
<td>Dec. 1</td>
<td>3</td>
<td></td>
<td>$120 00</td>
</tr>
</tbody>
</table>

### 1880. BILLS PAYABLE.

<table>
<thead>
<tr>
<th>Folio</th>
<th>Number of Bill</th>
<th>By whom drawn</th>
<th>Date</th>
<th>Time</th>
<th>When due</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>101</td>
<td>J. W. Bouton</td>
<td>Jan. 2</td>
<td>2 months</td>
<td>March 5</td>
<td>$40 00</td>
</tr>
<tr>
<td>2</td>
<td>102</td>
<td>Dodd, Mead &amp; Co.</td>
<td>Dec. 1</td>
<td>3</td>
<td>April 5</td>
<td>$90 00</td>
</tr>
<tr>
<td>3</td>
<td>103</td>
<td>A. S. Barnes &amp; Co.</td>
<td>Dec. 1</td>
<td>3</td>
<td>Feb. 5</td>
<td>$60 00</td>
</tr>
<tr>
<td>4</td>
<td>104</td>
<td>D. Appleton &amp; Co.</td>
<td>Dec. 1</td>
<td>3</td>
<td></td>
<td>$40 00</td>
</tr>
<tr>
<td>15</td>
<td>105</td>
<td>Legget Bros.</td>
<td>Dec. 30</td>
<td>3</td>
<td>April 2</td>
<td>$230 00</td>
</tr>
<tr>
<td>16</td>
<td>106</td>
<td>Houghton, Mifflin &amp; Co.</td>
<td>Dec. 30</td>
<td>3</td>
<td></td>
<td>$52 20</td>
</tr>
<tr>
<td>17</td>
<td>107</td>
<td>S. K. Wells</td>
<td>Dec. 30</td>
<td>3</td>
<td>April 2</td>
<td>$200 00</td>
</tr>
<tr>
<td>18</td>
<td>108</td>
<td>Jas. R. Osgood &amp; Co.</td>
<td>Dec. 30</td>
<td>3</td>
<td>April 2</td>
<td>$122 40</td>
</tr>
</tbody>
</table>

$615 40
### THE LEDGER.

#### Folio 1.

<table>
<thead>
<tr>
<th>Folio 1.</th>
<th>Dr.</th>
<th>J. W. BOUTON.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 2</td>
<td>1</td>
<td>To cash.</td>
<td>$80.00</td>
</tr>
<tr>
<td>Dec 31</td>
<td></td>
<td>To bills payable, No. 101</td>
<td>150.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 1</td>
<td>1</td>
<td>By goods.</td>
<td>$150.20</td>
</tr>
<tr>
<td>Dec 31</td>
<td></td>
<td>By balance brought down</td>
<td>150.20</td>
</tr>
</tbody>
</table>

#### Folio 2.

<table>
<thead>
<tr>
<th>Folio 2.</th>
<th>Dr.</th>
<th>DODD, MEAD &amp; CO.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 2</td>
<td>1</td>
<td>To cash.</td>
<td>$120.00</td>
</tr>
<tr>
<td>Dec 31</td>
<td></td>
<td>To bal. carried down...</td>
<td>241.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 1</td>
<td>1</td>
<td>By goods.</td>
<td>$241.00</td>
</tr>
<tr>
<td>Dec 31</td>
<td></td>
<td>By bal. brought down...</td>
<td>241.00</td>
</tr>
</tbody>
</table>

#### Folio 3.

<table>
<thead>
<tr>
<th>Folio 3.</th>
<th>Dr.</th>
<th>A. S. BARKES &amp; CO.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 2</td>
<td>1</td>
<td>To cash.</td>
<td>$150.00</td>
</tr>
<tr>
<td>Dec 31</td>
<td></td>
<td>To bal. carried down...</td>
<td>300.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 1</td>
<td>1</td>
<td>By goods.</td>
<td>$300.00</td>
</tr>
<tr>
<td>Dec 31</td>
<td></td>
<td>By bal. brought down...</td>
<td>300.00</td>
</tr>
</tbody>
</table>

#### Folio 4.

<table>
<thead>
<tr>
<th>Folio 4.</th>
<th>Dr.</th>
<th>D. APPLETON &amp; CO.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 2</td>
<td>1</td>
<td>To cash.</td>
<td>$62.00</td>
</tr>
<tr>
<td>Dec 31</td>
<td></td>
<td>To bal. carried down...</td>
<td>124.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 1</td>
<td>1</td>
<td>By goods.</td>
<td>$124.60</td>
</tr>
<tr>
<td>Dec 31</td>
<td></td>
<td>By bal. brought down...</td>
<td>124.60</td>
</tr>
</tbody>
</table>

#### Folio 5.

<table>
<thead>
<tr>
<th>Folio 5.</th>
<th>Dr.</th>
<th>A. D. F. RANDOLPH</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 4</td>
<td>1</td>
<td>No two bills receivable, paid them.</td>
<td>$188.60</td>
</tr>
<tr>
<td>Dec 31</td>
<td></td>
<td>To bal. carried down...</td>
<td>188.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 4</td>
<td>1</td>
<td>By goods.</td>
<td>$188.60</td>
</tr>
<tr>
<td>Dec 31</td>
<td></td>
<td>By bal. brought down...</td>
<td>188.60</td>
</tr>
</tbody>
</table>
## THE PRACTICAL HOME FARMER.

<table>
<thead>
<tr>
<th>Folio 6.</th>
<th>TENTER &amp; CO., PHILADELPHIA.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1886</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>To goods.</td>
<td>$72.40</td>
</tr>
<tr>
<td>3</td>
<td>1 By bill receivable No. 101</td>
<td>$30.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>72.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>72.40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Folio 7.</th>
<th>W. S. SINN, PARTSBURG, WEST VA.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1886</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>To goods.</td>
<td>$50.80</td>
</tr>
<tr>
<td>3</td>
<td>1 By bill receivable No. 102</td>
<td>$20.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50.80</td>
</tr>
<tr>
<td>Apr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>To your acceptance returned unpaid.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1 By bal. carried down</td>
<td>$30.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30.80</td>
</tr>
<tr>
<td>Dec.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>To bal. brought down.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>30.80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Folio 8.</th>
<th>ROBERTS BROS., BOSTON.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1886</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>To goods.</td>
<td>$74.32</td>
</tr>
<tr>
<td>4</td>
<td>1 By bill receivable No. 103</td>
<td>$74.32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Folio 9.</th>
<th>W. H. VERNON.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1886</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>To goods.</td>
<td>$82.30</td>
</tr>
<tr>
<td>4</td>
<td>1 By goods.</td>
<td>$169.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>82.30</td>
</tr>
<tr>
<td>Dec.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>To bal. carried down.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>169.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>169.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>169.30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Folio 10.</th>
<th>RAMSDEN &amp; CO.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1886</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>To goods.</td>
<td>$20.20</td>
</tr>
<tr>
<td>1</td>
<td>1 By bill receivable No. 104</td>
<td>$20.20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Folio 11.</th>
<th>S. GREEN.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1886</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>To goods.</td>
<td>$18.24</td>
</tr>
<tr>
<td>1</td>
<td>1 By bill receivable No. 105</td>
<td>$18.24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Folio 12.</th>
<th>GEORGE BARROWS.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1886</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>To goods.</td>
<td>$80.00</td>
</tr>
<tr>
<td>1</td>
<td>1 By bill receivable No. 106</td>
<td>$80.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Folio 13.</th>
<th>W. S. SINN.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1886</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>To goods.</td>
<td>$120.00</td>
</tr>
<tr>
<td>1</td>
<td>1 By bill receivable No. 107</td>
<td>$120.00</td>
</tr>
</tbody>
</table>
BOOK-KEEPING.

Folio 14.  

V. S. BROWN.  

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov 1880</td>
<td>To goods</td>
</tr>
<tr>
<td>Dec 1880</td>
<td>By bill receivable No. 108</td>
</tr>
</tbody>
</table>

Folio 15.  

LEGGAT BROS.  

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 1880</td>
<td>To bills payable, No. 105</td>
</tr>
<tr>
<td>Dec 1880</td>
<td>By goods</td>
</tr>
</tbody>
</table>

Folio 16.  

HOUGHTON, MIFFLIN & CO.  

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 1880</td>
<td>To bills payable, No. 106</td>
</tr>
<tr>
<td>Dec 1880</td>
<td>By goods</td>
</tr>
</tbody>
</table>

Folio 17.  

S. R. WELLS.  

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 1880</td>
<td>To bills payable, No. 107</td>
</tr>
<tr>
<td>Dec 1880</td>
<td>By goods</td>
</tr>
</tbody>
</table>

Folio 18.  

JAMES R. OSGOOD & CO.  

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 1880</td>
<td>To bills payable, No. 108</td>
</tr>
<tr>
<td>Dec 1880</td>
<td>By goods</td>
</tr>
</tbody>
</table>

After the Ledger has been duly examined, and it is seen that the balances are struck and brought down correctly, proceed to observe if those balances are transferred properly to the general Balance Sheet at page 213, which is the last operation of all.

Beyond this, Book-keeping by Single Entry "can no further go." It is only a confined system, and its results are never demonstrated or proved. Errors of omission, of addition, and of wrong posting, may, and in large establishments do, frequently occur without any means of detection except the tiresome and frequently fallacious method of a re-examination of the entire books by another person. But by Double Entry, provided the system be a correct one, no error of any kind can escape without detection, because everything is verified by an infallible rule. Nevertheless the dilligent study of the method of Single Entry is absolutely necessary as a preparatory step towards acquiring a knowl-
edge of the other. No one can keep a set of books by Double Entry who does not understand Single Entry, because the one is based upon the other. When the learner has well studied what has already been laid before him, let him pass on to the following pages, where he will find the same transactions registered by Double Entry.

**Book-keeping by Double Entry.**

This method differs from the former chiefly in making cash, stock, goods, etc., parties, as well as persons, and in making a debtor and creditor account in every transaction. Thus, if cloth is sold to A, A is made debtor to cloth, and cloth creditor to A; if cash is received from B, cash is made debtor to B, and B creditor to cash; and in every case the party, whether animate or inanimate, which receives is debtor to that which pays, and inversely. In Single Entry the record is single, and there it ends, whereas in Double Entry every transaction has a debit and credit, and every account in which it is not so represented is imperfect. Two parties are necessarily engaged in every transaction, and therefore each of them requires in his Ledger two separate accounts, one for himself, and a second for his customer or furnisher, as the case may be. Now, by the use of what are called nominal accounts representing the proprietor in his own Ledger, the double receptacle is provided which every transaction requires. The nominal accounts receive the counter entries of all the personal accounts, and through their operation the merchant is enabled to ascertain whether his business is profitable or the reverse. These accounts are those of Stock, Profit and Loss, and its branches. Stock is a term used to represent the proprietor, and it contains on the credit side the amount of the money, goods, or other property brought into trade; and on the debtor, the owner's liabilities. In Profit and Loss, the credit side exhibits the gain of the
business, and the debit the loss. In Single Entry, nominal accounts have no place. There is a record only of the side of the accounts belonging to the person dealing with the concern, and none whatever of that which represents the owner. Such a method enables us to balance the accounts of each party, but exhibits no register by which the state of the stock in trade, and the balances of capital and cash, can be at once ascertained without a separated and independent investigation.

We have seen, that by Single Entry the items are transferred from the Cash Book, Day Book, and Bill Books, at once, into the Ledger; but in Double Entry, another book, called the Journal, is necessarily used, in which the items from all the others are first arranged in proper form, and then passed into the Ledger. Thus, posting by Single Entry is done from several books; whereas by Double Entry from the Journal alone.

The old Italian method of keeping a Journal is fraught with so many crudities, useless repetitions, and technical jargon, that it has been long abandoned for one a thousand fold more simple in its construction, and perfect in its results. Instead of continually entering "Sundries Dr. to Cash," "Interest Dr. to Sundries," "Commission Dr. to A. B. C.," and "D. E. F. Dr. to Commission," with a multitude of such anomalies, the Journal is divided into two parts (the right and left hand side of the book), the one called the Debtor side and the other the Creditor side. Under the Debtor side must be entered uninterruptedly everything that is to be debited; and under the Creditor side, everything that is to be credited; and both sides must agree, if the entering has been done correctly.

In addition to the simplicity of this arrangement, there are other advantages which may not be overlooked. In the first place, all the entries on one side of the Journal are posted upon the same side in the Ledger, a convenience which every bookkeeper will know how to prize. Next, all
the items for each account in a month are consolidated in one entry previous to posting, thus greatly reducing that labor, and offering the phenomenon of a Ledger wherein no account for one year can have more than twelve lines, one for each month; and, finally, the totals of each month in the Journal added together must correspond with the gross amount of all the totals in the Ledger, the last and surest demonstration of correctness which figures can offer.

Let us proceed to Journalize according to this method all the entries contained to the preceding Day Book, Cash Book, Bills Payable Book and Bills Receivable Book, (for which see pages 213, 214) begging the learner meanwhile, to recollect the following rules:

1st. When Goods are sold, the buyers must be debited and Trade Account credited with the amount.

2d. When goods are bought Trade Account must be debited and the sellers credited for the amount.

3d. When Cash is paid, the parties receiving it must be debited and Cash Account credited, and when it is received the Account must be debited and the payers credited.

4th. When Acceptances are given, the persons on whose account they are drawn must be debited, and Bills Payable credited; and when they are received Bills Receivable must be debited and the party on whose account they are received must be credited.

5th. When Accepted Bills become due and are paid, Bills Payable must be debited and Cash credited; and when Bills to be received become due and are paid, Cash must be debited with the amount, and Bills Receivable credited.

Finally. No entry can be made in the Ledger unless it be extracted from the Journal, consequently everything must go into the Journal first.

These rules must be most carefully heeded in order to rapidly acquire the science of book-keeping.
THE JOURNAL.
### Journal

<table>
<thead>
<tr>
<th>Description</th>
<th>Dr.</th>
<th>Journal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenter &amp; Co. Goods sold as per invoice</td>
<td>74 00</td>
<td></td>
</tr>
<tr>
<td>D. Flock, ditto</td>
<td>50 80</td>
<td></td>
</tr>
<tr>
<td>Roberts Bros. ditto</td>
<td>74 32</td>
<td></td>
</tr>
<tr>
<td>A. R. F. Randolph Paid them Bill Receivable, No.</td>
<td>102 30 80</td>
<td>105 12</td>
</tr>
<tr>
<td>Idem 103.</td>
<td>74 32</td>
<td></td>
</tr>
<tr>
<td>W. H. Vernon Goods, as per invoice</td>
<td>82 82</td>
<td></td>
</tr>
<tr>
<td>J. W. Bouton Bill Payable, No. 101</td>
<td>80 00</td>
<td></td>
</tr>
<tr>
<td>Dodd, Mead &amp; Co. Bill Payable, No. 102</td>
<td>120 00</td>
<td></td>
</tr>
<tr>
<td>A. S. Barnes &amp; Co. Bill Payable, No. 103</td>
<td>210 00</td>
<td></td>
</tr>
<tr>
<td>D. Appleton &amp; Co. Bill Payable, No. 104</td>
<td>210 00</td>
<td></td>
</tr>
<tr>
<td>Bills Receivable Amount received this months as</td>
<td>102 00</td>
<td></td>
</tr>
<tr>
<td>per Bill Receivable book</td>
<td>142 20</td>
<td></td>
</tr>
<tr>
<td>Cash Amount received this month, as per Cash Book</td>
<td>2,076 34</td>
<td></td>
</tr>
<tr>
<td>Trade Account Goods bought this month:</td>
<td>1,182 68</td>
<td></td>
</tr>
<tr>
<td>1. Of J. W. Bouton</td>
<td>150 20</td>
<td></td>
</tr>
<tr>
<td>1. Dodd, Mead &amp; Co.</td>
<td>241 00</td>
<td></td>
</tr>
<tr>
<td>1. A. S. Barnes &amp; Co.</td>
<td>300 00</td>
<td></td>
</tr>
<tr>
<td>1. D. Appleton &amp; Co.</td>
<td>124 60</td>
<td></td>
</tr>
<tr>
<td>1. W. H. Vernon 170 00</td>
<td>170 00</td>
<td></td>
</tr>
<tr>
<td>2. A. D. F. Randolph 186 60</td>
<td>186 60</td>
<td></td>
</tr>
<tr>
<td>6. Cash paid charges as per Cash Book 10 28</td>
<td>1,182 68</td>
<td></td>
</tr>
<tr>
<td>Bills Payable 40 00</td>
<td>40 00</td>
<td></td>
</tr>
<tr>
<td>Dr. Bills Payable 5. Cash paid No. 104</td>
<td>90 00</td>
<td></td>
</tr>
<tr>
<td>Ditto</td>
<td>40 00</td>
<td></td>
</tr>
<tr>
<td>Bills Payable 5. Cash paid, No. 102</td>
<td>130 00</td>
<td></td>
</tr>
<tr>
<td>April, 60 00</td>
<td>60 00</td>
<td></td>
</tr>
<tr>
<td>B. Flock. His bill returned unpaid</td>
<td>30 80</td>
<td></td>
</tr>
<tr>
<td>Charges on Trade Cash paid No. 103</td>
<td>115 44</td>
<td></td>
</tr>
<tr>
<td>7. His bill returned unpaid</td>
<td>30 80</td>
<td></td>
</tr>
<tr>
<td>8. Cash for rent 80 00</td>
<td>80 00</td>
<td></td>
</tr>
<tr>
<td>Taxes</td>
<td>20 24</td>
<td></td>
</tr>
<tr>
<td>Taxes</td>
<td>15 20</td>
<td></td>
</tr>
<tr>
<td>&quot;Cash.&quot; 30. Amount received this month, as</td>
<td>242 41</td>
<td></td>
</tr>
<tr>
<td>per Cash Book</td>
<td>36 20</td>
<td></td>
</tr>
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</table>
### January, 1880.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>J. W. Bouton.</strong></td>
<td></td>
</tr>
<tr>
<td>1. Goods as per invoice</td>
<td>150</td>
</tr>
<tr>
<td>2. ditto</td>
<td>241</td>
</tr>
<tr>
<td>3. ditto</td>
<td>300</td>
</tr>
<tr>
<td>4. ditto</td>
<td>124</td>
</tr>
<tr>
<td><strong>D. Appleton &amp; Co.</strong></td>
<td></td>
</tr>
<tr>
<td>1. ditto</td>
<td>186</td>
</tr>
<tr>
<td>2. ditto</td>
<td>170</td>
</tr>
<tr>
<td><strong>A. D. F. Randolph.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>W. H. Vernon.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Bills Payable.</strong></td>
<td></td>
</tr>
<tr>
<td>31. Amount of Bills accepted this month, as per Bill Book</td>
<td>230</td>
</tr>
<tr>
<td><strong>Tenter &amp; Co.</strong></td>
<td></td>
</tr>
<tr>
<td>3. Bill Receivable No. 101, 36 20</td>
<td></td>
</tr>
<tr>
<td>Cash received</td>
<td>36</td>
</tr>
<tr>
<td><strong>B. Flock.</strong></td>
<td></td>
</tr>
<tr>
<td>4. Bill Receivable No. 102, 30 80</td>
<td></td>
</tr>
<tr>
<td>Cash received</td>
<td>30</td>
</tr>
<tr>
<td><strong>Roberts Bros.</strong></td>
<td></td>
</tr>
<tr>
<td>4. Bill Receivable No. 102</td>
<td></td>
</tr>
<tr>
<td>Trade Account</td>
<td></td>
</tr>
<tr>
<td>1. Capital invested this day 2,000</td>
<td>74</td>
</tr>
<tr>
<td>Goods sold this month:</td>
<td>32</td>
</tr>
<tr>
<td>3. To Tenter &amp; Co., 74 00</td>
<td></td>
</tr>
<tr>
<td>4. Flock, 50 80</td>
<td></td>
</tr>
<tr>
<td>5. Roberts Bros., 74 32</td>
<td></td>
</tr>
<tr>
<td>6. W. H. Vernon, 82 30</td>
<td></td>
</tr>
<tr>
<td>1. Cash received</td>
<td>14</td>
</tr>
<tr>
<td>4. Ditto, 6 60</td>
<td></td>
</tr>
<tr>
<td><strong>Cash.</strong></td>
<td></td>
</tr>
<tr>
<td>31. Amount paid this month as per Bill Book</td>
<td>230</td>
</tr>
<tr>
<td><strong>Bills Receivable.</strong></td>
<td></td>
</tr>
<tr>
<td>4. No. 102, paid A. D. F. Randolph, 30 88</td>
<td>420</td>
</tr>
<tr>
<td>No. 103, ditto</td>
<td>74</td>
</tr>
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</table>

**1880. Cash.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>26. Amount paid this months as per Bill Book</td>
<td>40</td>
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</table>

**1880. Cash.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>31. Amount paid this month, as per Bill Book</td>
<td>130</td>
</tr>
</tbody>
</table>

**1880. Cash.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30. Amount paid this month, as per Bill Book</td>
<td>206</td>
</tr>
</tbody>
</table>

**Bills Receivable.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Cash received, No. 101, 36 00</td>
<td>242</td>
</tr>
</tbody>
</table>
### THE PRACTICAL HOME FARMER.

**Dr.**

<table>
<thead>
<tr>
<th>Ramsden &amp; Co.</th>
<th>1. Goods sold them</th>
<th>November, 20 00</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. Green.</td>
<td>1. Goods sold him</td>
<td>18 24</td>
</tr>
<tr>
<td>G. Barrows.</td>
<td>1. Goods sold him</td>
<td>80 00</td>
</tr>
<tr>
<td>W. Sinn.</td>
<td>1. Goods sold him</td>
<td>120 00</td>
</tr>
<tr>
<td>V. S. Brown.</td>
<td>1. Goods sold him</td>
<td>74 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>312 44</td>
</tr>
</tbody>
</table>

#### Trade Account.

<table>
<thead>
<tr>
<th>December,</th>
</tr>
</thead>
<tbody>
<tr>
<td>20. Goods bought this month:</td>
</tr>
<tr>
<td>Of Leggat Bros.</td>
</tr>
<tr>
<td>Houghton, Millin &amp; Co.</td>
</tr>
<tr>
<td>S. R. Wells</td>
</tr>
<tr>
<td>Jas. R. Osgood &amp; Co.</td>
</tr>
<tr>
<td>Leggat Bros.</td>
</tr>
<tr>
<td>Houghton, Millin &amp; Co.</td>
</tr>
<tr>
<td>S. R. Wells</td>
</tr>
<tr>
<td>J. R. Osgood.</td>
</tr>
<tr>
<td>Bills Receivable.</td>
</tr>
<tr>
<td>30. Bill Payable, No. 105</td>
</tr>
<tr>
<td>30. Iden</td>
</tr>
<tr>
<td>30. Iden</td>
</tr>
<tr>
<td>31. Amount received this month, as per Bill Book</td>
</tr>
</tbody>
</table>

### THE

*Wherein the contents of the*

**Dr.**

<table>
<thead>
<tr>
<th>1880</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 3 To Goods</td>
</tr>
<tr>
<td>B.</td>
</tr>
<tr>
<td>Jan. 3 To Goods</td>
</tr>
<tr>
<td>April 7 To bill returned</td>
</tr>
<tr>
<td>81 60</td>
</tr>
<tr>
<td>To Balance</td>
</tr>
</tbody>
</table>

**Dr.**

<table>
<thead>
<tr>
<th>ROBERTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 4 To Goods</td>
</tr>
</tbody>
</table>
### BOOK-KEEPING.

**Continued.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>Trade Account.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Goods sold this month:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. To Ramsden &amp; Co.</td>
<td>20 00</td>
</tr>
<tr>
<td></td>
<td>2. S. Green</td>
<td>18 24</td>
</tr>
<tr>
<td></td>
<td>3. G. Barrows</td>
<td>80 00</td>
</tr>
<tr>
<td></td>
<td>4. W. Sinn</td>
<td>120 00</td>
</tr>
<tr>
<td></td>
<td>5. V. S. Brown</td>
<td>74 10</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>312 44</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
<th>Cr.</th>
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</thead>
<tbody>
<tr>
<td>1880</td>
<td>Leggat Bros.</td>
<td>52 20</td>
</tr>
<tr>
<td></td>
<td>Houghton, Mifflin &amp; Co.</td>
<td>200 00</td>
</tr>
<tr>
<td></td>
<td>S. R. Wells</td>
<td>192 40</td>
</tr>
<tr>
<td></td>
<td>J. R. Osgood &amp; Co.</td>
<td>170 80</td>
</tr>
<tr>
<td></td>
<td>Bills Payable.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20. Goods bought by him</td>
<td>615 40</td>
</tr>
<tr>
<td></td>
<td>20. Idem</td>
<td>20 00</td>
</tr>
<tr>
<td></td>
<td>20. Idem</td>
<td>19 84</td>
</tr>
<tr>
<td></td>
<td>20. Idem</td>
<td>40 00</td>
</tr>
<tr>
<td></td>
<td>20. Idem</td>
<td>120 00</td>
</tr>
<tr>
<td></td>
<td>20. Idem</td>
<td>74 20</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>1,544 84</td>
</tr>
</tbody>
</table>

---

### LEDGER.

*preceding Journal are posted.*

<table>
<thead>
<tr>
<th>Description</th>
<th>Cr.</th>
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</thead>
<tbody>
<tr>
<td>&amp; CO.</td>
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</tr>
<tr>
<td>1880.</td>
<td></td>
</tr>
<tr>
<td>Jan. 31 By, Sundries</td>
<td>74 00</td>
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</tbody>
</table>

---

### FLOCK.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 31 By Sundries</td>
<td>50 80</td>
</tr>
<tr>
<td>By Balance</td>
<td>30 80</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>81 60</td>
</tr>
</tbody>
</table>

---

### BROS.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>By Bill Receivable</td>
<td>74 32</td>
</tr>
<tr>
<td>Date</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Jan. 4</td>
<td>To Sundries</td>
</tr>
<tr>
<td></td>
<td>To Balance</td>
</tr>
<tr>
<td>Jan. 4</td>
<td>To Goods</td>
</tr>
<tr>
<td></td>
<td>To Balance</td>
</tr>
<tr>
<td>Jan. 2</td>
<td>To Sundries</td>
</tr>
<tr>
<td></td>
<td>To Balance</td>
</tr>
<tr>
<td>Jan. 2</td>
<td>To Sundries</td>
</tr>
<tr>
<td></td>
<td>To Balance</td>
</tr>
</tbody>
</table>

(The table above represents transactions recorded in a journal, showing debits (Dr.) and credits (A. D. F., W. H., J. W., DODD, A. S. BAR, D. APPLE) for various dates and descriptions.)
<table>
<thead>
<tr>
<th>Account</th>
<th>Date</th>
<th>Description</th>
<th>Debit</th>
<th>Credit</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randolp</td>
<td>Jan. 2</td>
<td>By Goods</td>
<td>-</td>
<td>188.60</td>
<td>188.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>By Balance</td>
<td>-</td>
<td>-</td>
<td>82.60</td>
</tr>
<tr>
<td>Vernon</td>
<td>Jan. 4</td>
<td>By Goods</td>
<td>-</td>
<td>189.30</td>
<td>189.30</td>
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<tr>
<td></td>
<td></td>
<td>By Balance</td>
<td>-</td>
<td>-</td>
<td>87.00</td>
</tr>
<tr>
<td>Bouton</td>
<td></td>
<td>By Sundries</td>
<td>-</td>
<td>150.20</td>
<td>150.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>By Balance</td>
<td>-</td>
<td>-</td>
<td>30.10</td>
</tr>
<tr>
<td>Mead &amp; Co</td>
<td>Jan. 4</td>
<td>By Sundries</td>
<td>-</td>
<td>241.00</td>
<td>241.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>By Balance</td>
<td>-</td>
<td>-</td>
<td>31.00</td>
</tr>
<tr>
<td>Nes &amp; Co</td>
<td>Jan. 1</td>
<td>By Goods</td>
<td>-</td>
<td>300.00</td>
<td>300.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>By Balance</td>
<td>-</td>
<td>-</td>
<td>90.00</td>
</tr>
<tr>
<td>Ton &amp; Co</td>
<td>Jan. 1</td>
<td>By Goods</td>
<td>-</td>
<td>124.60</td>
<td>124.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>By Balance</td>
<td>-</td>
<td>-</td>
<td>22.60</td>
</tr>
<tr>
<td>Date</td>
<td>Description</td>
<td>Amount</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
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## BOOK-KEEPING.

### RECEIVABLE.

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### PAYABLE.

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<td>Dr.</td>
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<td>BERGER</td>
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<td>Dec. 1</td>
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<td>BROWN</td>
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<td>Dec. 20</td>
<td>BROS.</td>
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<td>Dec. 20</td>
<td>MIFFLIN &amp; CO.</td>
<td>By Goods</td>
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<td>Dec. 20</td>
<td>WELLS</td>
<td>By Goods</td>
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<tr>
<td>Dec. 20</td>
<td>&amp; CO.</td>
<td>By Goods</td>
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In the preceding Ledger we have posted under the head of Trade Account all goods bought and charges incurred (both in business and family matters) to the Debit; and to the Credit, the amount of my capital and goods sold, consequently the balance of this account added to the amount of stock on hand always shows the profit of the business. For instance:

Balance of the account - - - - - - - 700 16
Value of stock on hand, as estimated in the Balance Sheet by Single Entry - - - - 1,390 28

Total balance in my favor as shown in the Balance Sheet by Single entry - - - - 2,090 44

But in partnership accounts, such a plan would not do, because domestic expenses cannot be charged to trade, nor should the respective capitals be included. In such cases separate accounts must be opened for each individual, which must be credited with their separate capitals and debited with their relative charges. At the end of the year, a balance is struck, the profit or loss determined, and the sum total divided into proper proportions, and transferred from the general Trade or Profit and Loss Account, each individual's debit or credit, as the case may be.

N. B.—A Profit and Loss Account is merely another name for a Trade Account. All bad debts must be charged to that Account which shows the Profit and Loss (whatever the name may be), and the bad Accounts themselves closed by transfer.

Let us now see if the Ledger is correct. To determine this, first extract all the totals, Dr. Cr. (before the balances are struck), which must not only agree with each other, but correspond as well with the sums total in the Journal. Put all the amounts at debit on one side, and the amounts at credit on the other. The totals must agree with the totals in the Journal. If this prove to be the fact,
it is thus *demonstrated* that everything in the Journal has been posted in the Ledger.

Having thus seen that the totals on both sides of the Ledger not only agree with each other, but correspond as well with those of the Journal, which is *proof positive* that the books are correct, the next and last care will be to see that the balances are properly struck and brought down, which is done by extracting them, and observing that both sides are alike.

If they agree, the balancing has been properly done.

This is the final operation at the end of a year; and the Journal of the next should have for its first entries Debtor and Creditor, an exact copy of the Balance Sheet, registered the same as all other items, and included in the monthly total.
The Letter-Writer.
Though scrawt in mystery thy birth,
Wonders have been thy going forth,
For man what treasures hast thou kept,
That otherwise would ever slept.
From age to age thou hast brought down
The wisdom and the high renown
Of Hero, Poet, Statesman, Sage,
Increasing light with every age.

Rev. L. L. Hager.
EVERY position in life demands letter-writing. A letter is the great link between parents and children, between lovers, between friends; while in business relations it makes fortunes, or mars them. A good letter must, firstly, be absolutely correct in every mechanical detail; then style comes into question; then the matter, which must be intelligible to the meanest as well as the highest understanding. The great art of letter-writing is to be able to write gracefully and with ease, and no letter should wear the appearance of having been laboriously studied.

The first point to be observed in your letter is that you write in a clear, legible hand, a hand that anybody and everybody can read. You may fill your pages with the most exquisite and sparkling ideas, but if they cannot be read except to the torture of the peruser, your diamond thoughts lose all their glitter, and people to whom you write, instead of being anxious to receive a letter from you, will mentally groan at the very idea of its receipt, knowing the toil and trouble that awaits them in its perusal.

Be patient, then, and plod on steadily until you write a bold, clear, clean hand, and never let a scrap of your writing pass from you that is not carefully executed.

Never erase. It is much better, though wearying the task, to commence all over again. An erasure is a sore to the eye.

Orthography is next to be considered. Bad spelling is disgraceful, and many people spell badly from simple carelessness. Read carefully the works of the best authors. Write extracts from these works, and you will intuitively spell correctly. Your sense will become offended at a
misspelt word. Use the simplest language. Always have a dictionary (pocket) beside you, but never consult it unless you are in doubt. Once consulted, you should remember the word ever afterward. Never divide your words into syllables at the end of the line unless you cannot help it. If you have space for the first syllable, let your hyphen be bold. Thus:

It is sometimes a great consolation to me that, etc., etc.

A word of one syllable must not be divided. Bring it bodily over to the next line.

Compound words must be divided into the simple words composing them. Thus: War-whoop, not warw-hoop; bread-stuff, not breadst-uff.

**Punctuation.**

In order to have the meaning of words readily understood, it becomes necessary to divide those words into paragraphs, sentences and clauses, by means of punctuation. As an instance of the absence of punctuation and the farcical result, just read this:

Lost on Broadway on Thursday evening last an umbrella by an elderly gentleman with a carved ivory head.

Take the following rules and mark them well:

Put a comma wherever you would make a trifling pause, were you speaking; as, "He came, he saw, he conquered."

A semicolon makes a longer pause, and an incomplete sentence; as, "Julia is handsome; Agnes is beautiful." The semicolon separates the sentence more distinctly than the comma.

The colon marks a sentence which is complete in itself, but is followed by some additional remark; as, "Shun vice: it will lead to ruin." The colon is also used to per-
cede a quotation, and point it off from the rest of the sentence; as, Shakespeare says: "Assume a virtue, if you have it not."

A period is used to denote that a sentence is complete; as, "A bird in the hand is worth two in the bush."

The dash is used to denote a sudden pause, or abrupt change of sense; as, "I have loved her madly, wildly—but why speak of her?"

The interjection point is used only to denote an exclamation; as, "Alas! all my joys have flown!"

The parenthesis is used to enclose a portion of a sentence which if left out would not destroy the sense; as, "I value this flower (a faded flower) very highly."

The apostrophe is used to mark the possessive case, and also the omission of a letter or letters in a word; as, "Frederick's hair is black," or, "Gen'l Grant is getting old."

The caret is used to mark an omitted word, which word must be written immediately above it; as, wet "What a day!"

The hyphen is used to connect compound words, and at the end of a line shows that more syllables are carried over to the next line.

Quotation marks are used before and after every quotation, to separate and define it; as, "Many are called, but few are chosen."

**Capital Letters.**

The capital letters only set apart the sentences and paragraphs, but while their proper use adds greatly to the beauty of an epistle, their omission or improper use will make the pages present a perfectly absurd appearance.
Begin every paragraph with a capital letter.

Begin every sentence following a period with a capital letter.

Begin all proper names with a capital letter.

Begin all titles, as President, Vice-President, General, Doctor or Captain, with a capital letter.

Begin all names of place, as Chicago, Long Branch, Niagara, with a capital letter.

Begin the words, North, South, East, West, and their compounds and abbreviations, as North-east, S. W., with a capital letter.

Begin the names of the Deity and Heaven, or the pronoun used for the former, as, in His mercy—Thou, Father, with a capital letter.

Begin all adjectives formed from the names of places or points of the compass, as English, Northern, with a capital letter.

Begin every line of poetry with a capital letter.

Begin all quotations with a capital letter.

Begin all titles of books, and usually each important word of the title, as, Bancroft's History of the United States with a capital letter.

Begin the name of any historical event, as the Cival War, with a capital letter.

The pronoun I and the interjection O must invariably be written with a capital letter.

Begin all the names of the months, as June, April, with a capital letter.

Begin all addresses, as, Dear Sir—Dear Madam, with a capital letter.

Capital letters must never be placed in the middle of a word; never, except in accordance with the foregoing rules, in the middle of a sentence.
Style.

You cannot blindly follow any rules as regards style, as your style will ever be your own. Quote as little as possible, and be niggardly with your adjectives. Avoid long sentences, and florid language. Parenthesis should be carefully punctuated; as, "John (who is, as you are aware, a confirmed toper) is considerably better."

Begin a letter this way:

Richmond, Va.,
June 1st, 1882.

or

New York, Sept. 7th, 1882.

Avoid postscripts. They are only embarrassing. Take your envelope, and having neatly folded your letter, place it in the envelope, close the envelope and write in the most legible manner:

Put
Stamp
here.

Mr. George Bowen,
327 State Street,
Chicago,
Ill.

Be very careful not to repeat the same word. Tautology is a crime in writing. Read this and see how you like it:

"Willie has come. Johnny will come to-morrow. Will
you come and spend a day with us? Make Susie come. Summer has come at last."

This is tautology. Do not underline unless in very extreme cases.

"You know, darling, how intensely I love you," is perhaps excusable.

Never abbreviate except in business. Dates should be given in figures, and money, in parentheses, thus ($10,000). Date carefully.

Abbreviate the names of the States in the following fashion:


Replies.

There is no greater mark of good-breeding and politeness, than the prompt reply to a letter. Never lose a moment, if possible, in replying to one. If the reply requires delay, write to acknowledge receipt of the letter. Never reply by proxy if you are able to write yourself.

Never write on a half sheet of paper.

Avoid pedantry.

Never write a congratulatory letter upon mourning-paper, even if you are in mourning.

Never try to patch and ill-formed letter.
If you add your own address to a letter, put it under your signature, thus:

Very respectfully,

Robert R. White,

154 R—— St.,

New Orleans, La.

Never write an anonymous letter. Treat it with silent contempt.

Never gossip. Friendly intelligence, if you are certain it is true, may be communicated.

Date every letter clearly and carefully. It is often of the utmost importance to know when a letter was written.

Sit erect when writing, as, if you write constantly, a stoop will surely injure your figure and your health.

Henry Blackford, Esq.,

70 West 50th Street,

New York.

Introducing

Charles Kendrick, of Louisville, Ky.

We give examples of the forms of letters in general use. These will act as guides to the inexperienced.

**Letters of Introduction.**

Never seal a letter of introduction. Mention the business in which the party whom you are introducing is, or
was engaged. Write the name of the party introduced in the left-hand corner of the envelope containing the introduction. Thus: you wish to introduce Mr. Charles Kendrick, of Louisville, Ky., to Mr. Henry Blatchford, of New York. Direct your letter as above.

If you want to be stylish, send your letter of introduction, with your card, by the servant at the private residence of the person to whom you are introduced. Send a letter with your card, if you present it at a merchant's office.

**Introducing One Lady to Another.**

*Chicago, June 1, 1882.*

Dear Emily:

This letter will introduce my dear friend, Mrs. Thomas Frost, of whom you have heard me speak so much. I feel assured that this introduction will prove of considerable pleasure to both of you.

Any attention you show her during her stay in Gotham will be appreciated by

Your affectionate friend,

Julia M. Haws.

Mrs. Joseph M. Minturn.

**Introducing a Young Lady Seeking Employment.**

*Poughkeepsie, June 1, 1882.*

Dear Mr. Jones:—

The young lady whom this letter will make known to you is desirous of obtaining employment in your city, and I use our old acquaintanceship as the bridge to your good offices in her behalf. She has received a very liberal education and would prove of immense value to a family whose young children need careful and judicious teaching. She is
gentle, amiable and willing. I trust you may be able to serve her.

I am, etc.,

Dear Mr. Jones,
Your sincere friend,
R. A. Appleton.

Mr. W. F. Jones.


ALBANY, June 1, 1882.

My Dear Sir:

Recognizing your well-merited and extensive influence in the commercial circles in your city, I beg to introduce to you W. James Farms, who is desirous of obtaining a clerkship in a counting-house. He is a gentleman of capacity and ability. His character stands A 1, and he is as industrious as he is energetic. He considers New York a better field than this place, and prefers to try his chances there to remaining here. He can refer to me. Trusting that you will lend him a helping hand, I am,

Yours, very truly.

Joseph Lynch, Esq.

Introducing a Sister to a Schoolmate.

WILKESBARRE, June 8, 1882.

Dear Rosie:

This letter will introduce my sister Polly. I do not think that I need say another word. I love you both. You will love both of us. I will write a long letter very soon.

Yours, as ever,

Mary.

Miss Rosie Irwin.
Introducing a Young Married Lady to a Friend in Her New Home.

Stanford, Conn., June 1, 1882.

My Dear Mamie:

Mrs. Holcroft will present this note, and when I tell you that she is a bride, and is about to settle in your town, I feel that I have secured her a pleasant friendship, and that she will find in you an old new friend in the midst of strangers. I know that you will pay her all the attention that lies in your power for the sake of auld lang syne.

Your loving friend,

Blossie.

Mrs. W. T. Marsden.

Introducing a Daughter About to Make a Visit.

Cleveland, O., June 1, 1882.

My Dear Mrs. Becker:

My daughter Ellen will present this in person, as her introduction to her mother's old friend, whose kind invitation to spend a few weeks she accepts, con amore. That she will have a delightful time is amongst the few certainties of this very uncertain life. You may find her a little shy and reserved, but under your care she will soon feel herself as much at home as in Euclid Avenue, Cleveland. With warmest regards to your husband, and lots of love to yourself, I am,

Your sincere friend,

Catherine E. Lawson.

Mrs. Joseph Becker.
Introducing a Gentleman to a Lady Friend.

Warrenport, Me., June 1, 1882.

My Dear Miss Tentine:

My friend Mr. Robert George Balfin by whom this letter will be presented, is about to settle in Dayton. As your hospitality is proverbial, may I hope for a little slice of it for him? And I look forward to good reports from both of you as to the ripening of a friendship the seed of which is now sown by

Your very sincere friend,

John G. Shear.

Letters on Business.

Letters on business should be brief, to the point, and clearly and cleanly written. No flourishes either in diction or penmanship. There is no time for such ornamentation in business.

Ordering a Supply of Goods for a Store in the Country.

Spike, Thompson County, Ky., June 1, 1882.

Messrs. Park & Tilford, New York:

Gentlemen—I have just opened a large grocery store in this place, and the prospects of success seems assured. I should be happy to deal with your firm. I can refer you to Robinson & Charles, of 270 Broadway, New York. This being our first transaction, I shall be prepared to pay the express co. upon delivery of goods, if you will forward me your ac. with the usual cash discount by a previous mail.

Enclosed please find order, which I should wish filled as promptly as is consistent with your convenience.

Very respectfully,

R. M. Macarthy.
Reply.

BROADWAY, NEW YORK, June, 3, 1882.

Mr. R. M. Macarthy:

Dear Sir—Your favor of the 1st to hand. We shall be pleased to open an account with you, Messrs. Robinson & Charles having spoken very highly of you.

We have this day forwarded to your address the goods according to your invoice, but being desirous of obtaining your approval of their quality and value, will await your examination for the enclosed bill, which is subject to 5 per cent. discount for prompt cash. A post-office order or draft on one of our city banks will suit our convenience equally well as collection by Dodd's Express.

Hoping to receive further orders, we are,

Yours respectfully,

Park & Tilford.

Letter Offering the Ms. of a Book to a Publisher.

WILMINGTON, N. C., April, 2, 1882.

Messrs. Provost & Co.,

Publishers, Tremont St., Boston, Mass.:

Gentlemen—I have just written a society novel of the present day, and wish to have it put upon the market as soon as practicable. Please inform me if you are willing to publish it, and at what terms.

This is my first novel, but under the name of "Daisy Dean" I have contributed quite a number of short stories to Frank Leslie's and other popular publications. I may mention that my style is what is termed "breezy;" that is, bright and crisp.

Awaiting an early reply, I am, gentlemen.

Very truly yours,

Mrs. J. F. Murray.
Reply.

292 Treton St., Boston, Mass., April 4, 1882.
Mrs. J. F. Murray:

Dear Madam—Having made all our arrangements for publications for the year, we are compelled to decline the offer of your MS., and trust that you may be successful elsewhere.

We are, dear madam,
Your obedient servants,
Provost & Co.,
Per W. F.

Letter Proposing to Sell Goods on Commission.

Messrs. Short & Stelt:

Gentlemen—I have been in business in this town for over twelve years, and refer to the National Bank, and to Mr. James E. Townsend, ex-Mayor and a prominent citizen. I see a good opening for increasing my sales, and am desirous of a supply of your goods to sell on commission. If required I will give you full security against any loss.

Should this proposition meet your views, please fill the accompanying order, and give me the benefit of your most favorable terms.

Respectfully,
John Riley.

Reply.

Baltimore, Feb. 2, '82.

Mr. John Riley—

Dear Sir—We have to-day forwarded by Dodd's Express the goods ordered per your letter of the 28th ult.;
the inquiries about you as suggested by you, having proved most satisfactory. The commission is 10 per cent. The bill of sale accompanies each package.

Trusting that opening will lead to a long connection of mutual benefit,

We are yours respectfully,

Short & Stelt.

Requesting the Settlement of an Account.

Milwaukee, Wis., July 30, 1882.

Mr. T. W. Ingram:

Dear Sir—As we have a large payment to make at the end of next week, and as your account remains unsettled, we must beg of you to send us a check for same by Tuesday next. We are reluctant to press you, but we are pressed ourselves.

Very respectfully,

Smith & Brown.

Requesting Payment of Rent.

E. 29th St., New York, March 27, 1882.

Mr. Patrick K. Chiselhurst:

Dear Sir—I must call your attention to the fact that, although your agreement for the house rented by you from me stipulates monthly payments in advance, you have failed to pay for three months, and are now in arrears $206.

If you fail to pay the account within six days, I shall be reluctantly compelled to place the matter in the hands of my lawyer for collection.

Very respectfully,

Thomas Vosburg.
From a Lady in the Country Ordering Goods.

Messrs. Calice & Twist,
Washington Street, Boston:
Gentlemen—Please send me by Dodd’s Express the following goods:
12 yards of green gauze.
24 yards gingham.
2 pair of six-botton gloves, lavender color, size 6½, Dent’s make.
6 pocket handkerchiefs, plain white, with broad hem-stitched border.
Also send pattern of black satin of a good quality, price marked.
The goods must be sent to Warrington by rail, and to Mr. William Snipe, 240 State Street, who will pay C. O. D.
Direct as follows:

Mrs. Wilson Toft,
Warrington Station,

From a Farmer in Ireland, Proposing to Emigrate.

Ballinkill, Co. Mayo, August 1, 1882.
To Mr. John Murphy, Tippins Cove, Burke County, Montana.
Sir—Pat Lynch, of Coolamore, tells me that you could give me all the information I want about that part of the county you are now in.
I have been farming about 60 acres for the last fifteen years, and have saved up £500.
I want to know what sort of a county you are in; climate, soil, water, and all that, and what I could get for
my £500; also, if any inducements are held out to men of
my class. I have a wife and seven children—4 boys and 3
girls. The boys, thanks be to God, are all able to take a
hand at farm work.
Pat Lynch will answer for me.
Yours obediently,
Murty Joyce.

Reply.

Tippins Cove, Burke Co., Montana.

To Mr. Murphy Joyce:

My dear Friend—If Pat Lynch, my old friend, advised
you to emigrate here he did well. I have been here now
for five years, and no inducement would tempt me to leave
it. For half of your £500 you can buy as many acres as
you wish to farm, and our little settlement is growing so
rapidly that in a short time your land will be worth double
what you pay for it. Come to me straight, and stop with
me, all of you, till your log hut is built.

The climate here is healthy and invigorating; the soil
fine, and a little river of good water is close by, while the
woods give us all the fuel we require. You can come to
within fifty miles of me by rail, but I'll have horses and
wagons at the station to take you and your family here.
Let me hear full details of your starting, and give my
warmest regards to Pat Lynch. I wish he was coming, too,
with all my heart.

Yours faithfully,
John Murphy.

To the Father of a Young Lady, Asking her Hand in
Marriage.

Washington Avenue, Brooklyn, March 12, 1882.

Sir—I venture to hope that you will call all your
friendly feelings to my assistance, in considering a proposal
I am about to lay before you, in which my happiness is completely concerned.

For a long time past your daughter, Effie, has held a strong hold over my affections, and I have reason to believe that I am not indifferent to her. My position is such as to warrant my belief that I could support her in the style of comfort which she so well deserves, and which it has been your constant aim to provide for your children. As regards my character and disposition, I trust they are sufficiently well known to you to give you confidence in the prospect of your child's happiness.

I have not, however, ventured on any express declaration of my feelings, without first consulting you on the subject, as I feel persuaded that the straightforward course is always the best, and that a parent's sanction will never be wanting when the circumstances of the case justify its being accorded.

Anxiously awaiting the result of your consideration on this important and interesting subject, I remain, sir,

Your most faithful and obedient servant,

Edward L. Spring.

To W. Parsons, Esq.

Favorable.

Meadow Bank, March 13, 1882.

My Dear Edward Spring:

I thank you very much for the manly and honorable way in which you have addressed me in reference to my daughter's hand. I have long since perceived that your attentions to her were of a marked character, and that they appeared to give her much pleasure. I know no reason whatever to oppose your wishes, and, if I may judge from the manner in which she received the communication from myself, you will find a by no means unwilling listner.
Dine with us to-morrow at six o'clock, if you are not engaged, and you will then have an opportunity of pleading your own cause. Meanwhile, believe me, with every confidence in your integrity and good feeling,

Yours most sincerely,

William Parsons.

To E. L. Spring, Esq.

Unfavorable.

Meadow Bank, March 13, 1882.

Dear Sir:

It is always painful to return an unfavorable answer, but such is unfortunately my task on the present occasion.

My daughter has for a long time been engaged to a gentleman whose character and position give her no cause to regret the engagement. At the same time she duly appreciates the compliment implied by your preference, and unites with me in the sincere wish that, as an esteemed friend, you may meet with a companion in every way calculated to ensure your happiness.

Believe me, dear sir,
Your sincere friend,

William Parsons.

To E. L. Spring, Esq.

A Gentleman After Meeting a Lady at a Party, Asking Permission to Pay His Addresses.

18 W. 36th St., N. Y., July 27, 1882.

Dear Miss Winslow:

I must crave your pardon for the somewhat bold address I am about to make, trusting that its apparent presumption may be excused by the consideration that my feelings are deeply enlisted in its success. The marked
attentions paid you at Mrs. Burke's party could not, I flatter myself, have failed to attract your notice, nor have been wholly disagreeable to yourself. Cherishing this pleasing belief, I am encouraged to crave the privilege of being permitted to improve my acquaintance with a lady for whom I entertain so high an esteem.

The company in which we met will, I trust, be considered a sufficient guarantee of my character and position to warrant me in looking forward to an early renewal of the happy hours spent in your company. Your kind permission once granted, I shall lose no time in seeking, for my addresses, the sanction of your parents; but I do not feel at liberty to take such a step until well assured that it will be agreeable to your wishes.

May I entreat the favor of an early reply? which, dear Miss Winslow, will be anxiously awaited by

Your devoted admirer,

William Thropcake.

To a Widow From a Widower.

120th St., New York, Nov. 19, 1882.

My Dear Madam— I am emboldened to lay open to you the present state of my feelings, being so convinced of your good sense and amiable disposition, that I feel assured you will deal candidly with me in your reply.

Like yourself, I have been deprived of the partner of my earlier life, and, as I approach the middle state of existence, I feel more and more the want of some kindred spirit to share with me whatever years are reserved to me by Providence. My fortune is such as to enable me to support a lady in the manner which I feel to be due to your accomplishments and position, and I sincerely hope that you will think carefully over my proposal; and if you can make up your mind to share my fortune and affections, I
trust that no efforts will be wanting on my part to ensure you the happiness you so well deserve.

I need scarcely say that an early answer, on a matter so much connected with my future happiness, will be a great favor to,

My dear madam,
Your devoted friend and admirer,
Arthur Borstop.

To Mrs. Wadlow.

A Gentleman Asking His Betrothed to Name the Day.

2 Allen's Ford, St. Louis, July 8, 1882.

My Own Darling Wife that is to be:—

Let me implore of you to name the day that will make us one—that day which is to bring us together for all time. You blushed last night when I urged the question, and put me off with some pretty, but pitiful excuse. For once, darling, let me dictate and say Wednesday. Won't you, my precious pet?

Yours,
Ted.

A Young Man in Colorado to His Betrothed in New York.


Dearest Elizabeth—You have doubtless received letters from me lately, describing my situation here, and stating the projects that I had under consideration. In one of those letters, allusion is made to a speculation in land in the neighborhood of this place, with the remark that, if it were successful, I should be able to make good my promise, and claim you as the partner of my joys and sorrows for life. My most sanguine expectations have been more than realized.
Herewith you will receive a draft on the National Park bank in New York, for $500, of which I pray you to make use in providing such articles as may be necessary to replenish your wardrobe, in anticipation of our speedy marriage, after my return home. Pray present your dear mother with my affectionate regards, and say that I can never forget, now that I have the power, that it is my duty to assist and cherish her declining years. I also send some few trinkets, made of Leadville gold, which you will please present on my behalf to your sisters, as tokens of my brotherly regard; for such I now consider my relations towards them.

With my kindest regards to all, and trusting that I may soon be permitted to embrace my dearest, I remain

Her devoted,

Mark Tapley.

Complaints of a Lady's Coolness.

CEDAR ST., PHILADELPHIA, March 1.

Dear Susan—The change in your behavior toward me — from the kindness of an attached friend to the cool indifference of a distant acquaintance — indicates but too plainly that, by some means, I have had the misfortune to excite your displeasure; though how or when I cannot imagine. Recently, I have several times attempted to seek an explanation, but, in every instance, my courage failed me at the critical moment, and, as a last resort, intrusting to my pen the duty which my lips should have performed, I now write to you, to ask wherein I have offended. Whatever may be your reply, rest assured that my feelings toward yourself cannot be changed, and that your beloved image will ever be enshrined in the breast of

Your affectionate friend,

E. L. Dwyer.
Explaining an Apparent Slight.

Boston, March 8, 1882.

Dearest Julia—How could you consider me capable of inflicting a slight upon yourself, in whom are centered all my hopes of happiness? Nothing more than ordinary courtesy was intended by my attentions to Miss Frith. That she was a comparative stranger to the Stanleys, induced me to pay her those attentions which have occasioned you so much annoyance, but which otherwise I would not have considered myself justified in tendering.

I regret from my soul that anything should have occurred to originate in your mind a doubt of my sincerity.

Your truly affectionate,

George Rogers.

To Miss Julia Tilghman,
No. —— N. Fifteenth St., Philadelphia.

On Receiving a Favorable Reply to a Proposal.

Newton, N. Y., March 20, 1882.

Darling—Words cannot express my rapture on finding your note on my table last night. How delightful was it to find a letter—and such a letter!—from one whom I may now hope to hail as the companion of my whole future life! The weight taken off my mind by the candid and gentle confession of one whose love seemed too great a happiness to hope for, is beyond description. To-morrow I shall hasten to the presence of her from whom I hope I may never henceforth be parted; but I could not retire to rest without making one feeble attempt to express my ecstasy at finding that hopes so flattering have not been in vain.

Believe me, darling,
Your devoted and happy Tom.
Complaining of Not Receiving a Letter.

Clifton, January 7, 1882.

Dear Agnes—Four days have passed without my receiving a letter from you, and I am in painful anxiety lest illness should be the cause. Pray write quickly, or I shall really feel inclined to quarrel with you as an idle girl; nay, I shall absolutely grow jealous, and fancy that some more favored suitor is undermining the affections of my dear girl.

But I have no fears. I too well know that your innate goodness of heart would prevent your trifling with the feelings of any one; so, hoping that you will take this little scolding in good part, and relieve the offense by a very long letter as speedily as your dainty fingers can write, believe me,

Dear Agnes,
Your affectionate
Ed.

On a Birthday.

New London, June 1, 1882.

My dearest Fannie—How sad it is that I am hindered from being with you on this dearest of all days of the year.

Accept, dearest, the enclosed portrait. I feel that its original is too deeply stamped on your heart to require any effigy to remind you of him. It is, however, the most appropriate present I could offer to the cause of my happiness on this brightest of all days.

God grant that every succeeding year may see you increase in all that is charming in body and mind, and believe me,

My dearest Fannie,
Your own
John.
A Complaint.

July 10, 1882.

Dear Maudie:

It is with pain I write to you in aught that can seem like a strain of reproach, but I confess that your conduct last night both surprised and vexed me. You received Mr. Watson's attentions in so marked a way that I feel it due to myself to comment on your conduct. Believe me, I am in no way given to idle jealousy; still less am I selfish or unmanly enough to wish to deprive any girl on whom I have so firmly fixed my affections of any pleasure to be obtained in good society. But my peace of mind would be lost forever, did I believe that I had lost one atom of your affection.

Pray write, and assure me that you still preserve your undivided affection for

Your devoted, but grieved
Fred.

Congratulating a Friend on his Marriage.

Omaha, August 20, 1882.

My Dear Tom:

As you have entered the enviable state of wedlock, and are no longer the merry bachelor formerly the butt of my crude jests, I must address you in a tone of greater gravity than has been my custom. My dear friend, I sincerely congratulate you upon this desirable change; for in your choice of a partner you have given evidence of the possession of a sound judgment and much good taste. If my beneficent wishes were the only requisite to insure your happiness in the married state, you would never have occasion to regret the step you have recently taken; for there is no one whom I more ardently desire to see surrounded with all the blessings of this life.
Have the kindness to present my respectful compliments to Mrs. Armitage, and believe me ever to remain
Your sincere well-wisher and friend,
Edward Keogh.

Congratulating a Gentleman upon his Marriage.

Yankton, June 1, 1882.

Dear Bill:
I have just received the welcome message that informs me of your new happiness. I hasten to offer you my most sincere congratulations and hearty good wishes. May every year of your married life find you happier than the last, and may Mrs. Chiffins find you as loyal a husband as you have been a friend.
From my inmost heart, dear Billy, I say, God bless you and your bride with His choicest blessings.

Ever your friend,
George Meyers.

William Chiffins, Esq.

Congratulating a Lady upon her Marriage.


Dear Josie:
Your cards have just reached me, and I write at once to try to express my heartfelt pleasure at your happy prospects. It is a great pleasure to your loving friends to be able to feel so much esteem and affection for the gentleman to whom you have confided your life’s happiness, and to hope, as I do, that every year will unite your hearts more closely.
That heaven may bless you both, dear Josie, is the earnest prayer of
Your loving
Mrs. Clifford Doyle.
Congratulating a Friend on the Birth of a Son.

Batavia, N. Y., July 5, 1882.

My Dear Joe:

What luck! A son born on the great 4th. May he prove as good, as pure, and as honest a man and patriot as George Washington. What more can I say, old fellow, except to add that I earnestly trust that Mrs. Clithroe and George W. are doing well?

Yours, always sincerely,

A. D. Heryv

Joseph Clithroe, Esq.

Congratulating a Friend on the Birth of a Daughter.

Pegasus, Westchester Co., N. Y., April 10, 1882.

Dear Millie:

I congratulate you most heartily on your new acquaintance, and if "missy" only grows up like "mamma," the boys will be around pretty lively. I suppose your husband is two feet taller. Take great care of yourself and the wee little lady. I hope very soon to come round to congratulate you in person.

Your very sincere friend,

James Todhunter.

Mrs. E. F. Everligh.

Seeking a Clerkship.

Troy, May 4, 1882.

Gentlemen—Perceiving by your advertisement in the N. Y. Herald that you are in want of a clerk, I beg to inclose testimonials, and venture to hope that from my previous experience in the line of business you pursue I should be of some use in your establishment. My habits
of life are such as to assure regularity in the discharge of my duties, and I can only assure you that, should you honor me with your confidence, I shall spare no pains to acquit myself to your satisfaction.

I remain, gentlemen,

Your obedient servant,

Harry Sanderson.

To Messrs. Griffiths & Co.

Application for Subscription to a Charity.

Midgeville, Tenn., October 8, 1882.

Sir [or Madame]:—I take the liberty of inclosing a prospectus of an institution which is likely to have a most beneficial effect upon the poor in our neighborhood. [Here state particulars.] From your well-known liberality, I trust you will excuse this appeal from a stranger in furtherance of an act of benevolence, and remain,

Sir [or Madame],

Your most obedient servant,

Julia [or John] Smith.

Declining.

30 West 27th St., New York, Oct. 29, 1882.

Mr. Thomas Jones regrets exceedingly that the numerous applications for kindred purposes near home render it impossible for him to comply with the request contained in Mr. [or Mrs.]'s letter of the 18th October.

A Friend in the Country Asking a City Friend About Board.

Erie, Pa., August 14, '82.

Dear William,—In a few days I will have occasion to visit New York, and, being a comparative stranger, I wish
to be as near the business center as possible, though located in a private boarding-house, as I have a strong aversion to hotel life. My object in writing is to ask you to recommend to me some private boarding-house, and to engage rooms in advance of my arrival, so that I may proceed thither at once on landing from the cars. Leaving the selection entirely to yourself, and hoping to hear from you soon, I remain,

Yours faithfully,
Isaac Jenkins.

Application for a Loan.

State St., Chicago, July 27, '82.

Dear Sir — I am temporarily embarrassed through the failure of my New York correspondent to remit. The sum of $2,000 would relieve my present necessities, but I dislike borrowing money of professional lenders, and would rather solicit the aid of some one of my numerous freinds. My first thought was of yourself; and, therefore, my object in writing is to ask if you can spare me the required sum without in any way interfering with your buisiness arrangements? You may rely upon having it returned to you on the 15th prox., and perhaps before that time. Pray reply at your earliest convenience, and oblige

Your obedient servant,
George White.

To Phillip Duke, Esq.

Reply in the Affirmative.

Grove St., Cincinnati, July 30, '82.

Dear Sir — Your letter of yesterday was duly received, and it gratifies me to be able to say that you can have the loan asked for. Inclosed you will find a check for the
amount, which you will return at the date named and oblige,

Yours, very sincerely,

P. Duke.

To Geo. White, Esq.

Declining to Lend Money.

BOSTON, April 8, 1882.

My Dear Sir — I have always made it a principle in life never to borrow or lend money, not even when members of my own family have been concerned. As Shakespeare says:

"Neither a borrower nor a lender be,  
For loan oft loses both itself and friend."

I therefore trust you will excuse conduct which may seem harsh and uncourteous on my part, but which I have ever found to be the safest, and, in the long run, the kindest course for all parties.

I remain, my dear sir,  
Yours very faithfully,

Joseph Johnson.

To Howard Wells, Esq.

Soliciting Renewal of a Promissory Note.

ARK ST., MOBILE, May 7, '82.

Gentlemen — You have in your possession my note for $1,000, payable May 14, which I am sorry to say I cannot meet at maturity, owing to a combination of circumstances adverse to my interests, and not anticipated. If you will do me the favor to renew it for ninety days, with interest added, I do not doubt my ability to redeem it when due.
A compliance with this request will confer an obligation upon, and oblige,

Your obedient servant,

THOMAS MORAN.

To Messrs. Sadlier & Co.,
30 William St., N. Y.

To a Firm, With an Installment.

DEAN ST., SAN FRANCISCO, CAL., May 20, 1882.

Gentlemen—Inclosed please find $500, in notes of San Francisco banks, which I will thank you to place to my credit, as the first installment upon my bill, now overdue nearly two months. The balance will be remitted during the second week in June, if not before that time. I regret the inconvenience caused you by my delay, which is a result of our system of long credits, and entirely beyond my power to control.

I remain, gentlemen,

Your obliged and faithful servant,

WILLIAM DEMPSEY.

Messrs. Hatch, Wight & Co.,
333 Broadway, New York.

Offering a Loan of Money for Business Purposes.


Dear Robert—Knowing that you are desirous of starting in business for yourself, I write to say that it is in my power to offer you a loan of two thousand dollars ($2,000) without interfering in any way with my own business or expenditures. I trust that you will let me have a friend's
privilege, and accept the money on such terms as will best suit you.

With best wishes for your success,

I am your friend,

Austin Keep.

ROBERT ROWE, ESQ.

Letters of Condolence.

Letters of condolence, though a necessity between friends, are very difficult to compose, since the more earnestly and touchingly they are written, the more deeply will they probe the wounds still bleeding under the stab of affliction. The shorter such letters are, the better. Let them be short and sincere, and always wind up with a hope that Providence will assuage the grief with which it has pleased Him in His far-seeing wisdom to afflict your friend.

On the Death of a Husband.

FORDHAM, N. Y., NOV. 29, 1882.

MY DEAR MRS. MANNING:

Words fail to convey my feelings of sorrow on receipt of the intelligence of the death of my old and esteemed friend, your late husband. My own grief at the loss of a true friend teaches me how crushing must be your affliction. May the Almighty in His goodness console you in this dark hour of your tribulation.

Believe me always your true and sincere friend,

JOSEPH BUTLER.

On the Death of a Wife.

PROVIDENCE, R. I., November 8, 1882.

MY DEAR GEORGE:

I know how futile it is to address words, idle words, to you in this moment of supreme anguish, with which it has
pleased God to visit you, and shall not say more than that the loss of your pure, good, and beautiful wife is a source of deep sorrow to the numerous friends who had the privilege of knowing her, and to none more than

Yours, in deep sympathy and affection,

Terrence Barker.

On the Death of a Son.

Norwalk, Conn., June 5, 1882.

My Dear Julia;

If God has plucked the bright blossom from your home it is for a purpose none of us dare divine. He alone can pour balm upon your crushed heart. The holy joy is yours of knowing that angel eyes now watch for your coming, and that your beautiful boy will receive you when "life's dark day is done."

If the tenderest or much-loving sympathy could soothe you, dear Julia, learn that you have it from your

Friend,

Laura.

On the Death of a Mother.


My Dear Charles:

You have lost your mother. There is a very wail in the words. She may never be replaced. The dear good lady has passed away to a better land, cheered by the knowledge of your love and affectionate tenderness, consoled by the thought that her teaching, when you were a little boy at her knee, has not been in vain, and that she leaves behind her for a little while a son who treads the path of rectitude and of honor. Dear Charles, ever remember that your darling mother watches you from on
high, and as she was devoted to you in life, so is she devoted to you in death.

God sustain you under this heavy affliction.

Your true friend,

John Traver.

REPLIES TO ADVERTISEMENTS.

In replying to advertisements never omit to mention the name of the paper in which the advertisement appeared, also its date, and a brief allusion to the matter in the advertisement.

Be as concise as possible, covering the ground in a few well chosen sentences.

Book-keeper.

28 Washington St.,
Boston, Mass., October 20, 1882.

To Messrs. Winsole, Bird & Co.:

Gentlemen—In reply to your advertisement is this day's Transcript for a competent book-keeper, I respectfully beg to offer myself as candidate for that position. I have been in the employment of Mr. Thomas Lepy, 19 Tremont street, in this city—the large dry-goods store—in the capacity of book-keeper for the past three years, and am about to leave on the 1st proximo, as Mr. Lepy is about to retire from business.

Mr. Lepy has authorized me to refer to him in reference to character and ability. I can also refer to Messrs. Bose & Pickwick, 17 Remsen Street, with whom I clerked for a year and a half.

Hoping to be fortunate enough to suit your requirements,

I am, gentlemen,

Respectfully,

Joseph Sutcliff.
General Employment.

Newburg, 11th Sept., 1882.

Sir—I hasten to reply to your advertisement in the N. Y. Sun of to-day. I am most desirous of obtaining employment, and would not consider present emolument so much an object as the prospect of a permanent and respectable situation.

I am a young man (age 21), and single. I have received a good commercial education, and am versed in book-keeping and accounts generally. In other respects I am willing to render myself generally useful, and, although I have not hitherto filled a situation, I doubt not but that in a short time I shall be able to fulfil any duties assigned to me.

In the event of your doing me the honor to select me for the proffered employment, I could furnish you with satisfactory testimonials as to character, and could, if necessary, provide guarantees for fidelity.

Trusting that I may have the honor of hearing from you in reply,

I remain, sir,

Your obedient servant,

Joseph L'Estrange.

To W. Henry Cullinan,
27 Wand St., N. Y.

From a Young Man to a Friend Soliciting a Situation.

Mohawk, March 28, 1882.

Dear Edward:

When you left Galveston, you were kind enough to promise that should it be in your power to forward my interest in any manner you would feel a pleasure in so doing. I am now in want of a position, my former em-
ployer having sold his business, and his successor having, as he informs me, a sufficient number of hands for all the work he is likely to have. If, therefore, you should hear of any situation or employment which you consider likely to suit me, either in my own business, that of a clerk, or in any other in which I can make myself useful, your recommendation would greatly oblige, and be of material service to,

Dear Edward,
Yours, very truly,
John James.

Asking Permission to Refer to a Person.

New Haven, Conn., July 7, 1882.

Dear Sir:

As I have had the honor of being known to you for some years, during which period I trust my conduct has impressed you favorably, I take the liberty of soliciting at your hand the following favor:

Messrs. Sebthorp, of Beaver Street, New York, are in want of a correspondent at London, and as I am about to proceed there on some affairs of my own, and shall probably take up my residence in that capital for some years, I am anxious to secure a post which appears to me in every way eligible, and accords with my views exactly.

As a matter of course, Messrs. Lebthorp desire testimonials as to my capacity and integrity, and as you are in a position to speak positively on these points, I have written to ask you whether I may so far trespass on your kindness as to mention your name by way of reference.

Should you kindly grant this request, I need scarcely assure you that my endeavor will be to prove to both Messrs. Sebthorp and yourself that you have not been mistaken in your opinion of me, while I shall ever feel grateful for this
further instance of the interest evinced by you in the welfare of

Yours truly obliged,

WALTER MOTT.

To Mr. GEORGE FOULKE, 7th St., Cincinnati, O.

Clerk.

29 GROVE ST., ST. LOUIS, MO., NOV. 16, 1882.

Mr. ISAAC WATERS:

Sir—I see by this day's Chronicle that you are in want of a competent Clerk, and I respectfully beg to apply for the position. Owing to the financial difficulties of my late employers, Messrs. Kendrick & Warts, with whom I was Clerk for eight years, I am out of employment. I can refer to either of these gentlemen for a testimonial as to my industry, good conduct and ability. I may add that I am a teetotaler.

Hoping to receive a favorable reply,

I am, Respectfully,

RUDOLPH MEYER

Cook.

100 WEST 28TH ST., NEW YORK, MARCH 18, 1882.

MRS. WILLIAM HOWARD:

RESPECTED MADAM—Having seen your advertisement for a plain Cook in this day's Herald, I respectfully apply for the place.

I can cook plain joints and do all manner of plain cooking, as my present employer, Mrs. James Posnett, is willing to testify. As Mrs. Posnett is going to Europe on the 1st of April, I will be out of place on that day. A line to Mrs. Posnett will satisfy all inquiries in regard to my character and capacity.

Respectfully,

JANE MATTHEWS.
Governess.

19 Bleecker St., Boston, July 27, 1882.

Mrs. E. F. Slocum:

Madam—In reply to your advertisement in to-day's 
Courier for a Governess to teach three little girls French, 
German and English, I hasten to inform you that I am 
graduate of Vassar Class '80; that I have resided one year 
in Paris and five months in Vienna, sojourning in both 
capitals for the purpose of completing my knowledge of 
French and German.

I have been Governess in the family of Mr. George F. 
Witmore, but owing to the death of my dear little pupil, 
their only daughter, Ada, I have been thrown out of 
employment. In addition to my College and Academy 
testimonials, I beg to refer to Mrs. Witmore, Holly Park, 
Brookline, and to the Rev. Mr. Brooks, St. Matthew's 
Church.

Hoping to be favored by your selection,

I am, madam,

Yours respectfully,

Miriam J. Packard.

A Few Lines Accompanying a Gift.

A WEDDING GIFT.

200 Fifth Avenue, New York, 18th April.

Nelly Suter sends her best love, and best wishes, to 
Susie Lorimer, and a little bracelet as a souvenir of an 
event that Nelly trusts will ever prove as happy and auspicious as she wishes it to be.

Christening Gift.

Heath House, June 18, 1882.

God-papa sends little Mamie a coral; to enable her to 
cut her teeth, but not the acquaintance of

Joseph Chambers.
Flowers.

15 Madison Avenue, 19 July.

Roses become Miss Irwin so much, that Mr. Harnett earnestly hopes to see the accompanying bunch in Miss Irwin's corsage this evening at Wallack's.

Music.

13 Chestnut St., Philadelphia, November, 28th '82.

Mr. John St. Ruth presents his compliments to Miss Delamore and begs to send her a few selections from the operas, her singing last night at Mr. Hamlyn's having reminded him of the most celebrated prima donnas.

European Etiquette in Addressing Letters.

Letters to the Queen; to the Prince and Princess of Wales; to Relatives of the Queen; to Dukes, Duchesses, Marquises; Earls, Countesses, etc., etc.; to Judges: Members of the Privy Council, Clergymen, etc.

Letters for her Majesty the Queen are sent under cover, either to the Prime Minister, or to whomsoever has charge for the time being of her Majesty's private correspondence. The inclosure is directed "To her Majesty the Queen." Official communications are ordinarily addressed, "To the Queen's most excellent Majesty." Letters to the Queen should be commenced, "Madam," or "Most graceful Sovereign," or "May it please your Majesty," according to the nature of the communication; and should be concluded, "I have the honor to remain, with the pro-
foundest respect, madam, your Majesty's most faithful and dutiful subject."

Letters for the Prince and Princess of Wales should be sent under cover to Lieut-Col. Knollys, and the inclosure directed to "His Royal Highness the Prince of Wales," or "Her Royal Highness the Princess of Wales."

The sons and daughters, brothers and sisters, and uncles and aunts of the Queen are all addressed as "Royal Highness," but her Majesty's nephews and cousins are addressed simply as "Your Highness."

Letters to members of the Royal Family should begin, "Sir," or "Madam," and end, "I have the honor to remain, sir (or madam), your Royal Highness's most dutiful and most obedient servant."

A letter to a Duke or Duchess, not members of the Royal Family, should be addressed, "To His Grace, the Duke of——;" "To Her Grace, the Duchess of——." It should begin with "My Lord Duke;" but a duchess, in common with all other ladies, from the Queen downwards, is addressed as "Madam."

In writing to a marquis, address the letter, "To the Most Hon. the Marquis of——;" and to a marchioness, "To the Most Hon. the Marchioness of——." Begin, "My Lord Marquis."

In writing to an earl or countess, address, "To the Right Hon. the Earl (or Countess) of——." Begin letters to earls, viscounts, or barons, with "My Lord." A letter to a viscount or viscountess should be addressed, "To the Right Hon. the Viscount (or Lady Viscountess)——." A letter to a baron should be addressed, "To the Right Hon."

The younger sons of earls, and all the sons of viscounts and barons, are addressed, "The Hon.——, Esquire;" and the daughters, and sons' wives, "The Hon. Mrs.——, or Miss——." Letters should begin, "Sir," or "Madam."

In addressing ambassadors, begin "My Lord," and use the title "Your Excellency" throughout, wherever the pro-
noun "you" would ordinarily be used. The same title is used in addressing the Lord-Lieutenant of Ireland, and the Governor of Western Australia. The Governor-General of Canada and the Governor of Dover Castle are addressed as "Right Honorable."

A letter to a baronet is addressed to "Sir William ——, Bart.;" one to a knight, "Sir William ——." Begin letters to baronets, knights, or their wives, "Sir," or "Madam," except, of course, in cases where acquaintance exists, when formality ceases, and letters are begun, "Dear Sir William ——;" "Dear Lady ——."

Though the word "Esquire" means, in these days, little or nothing, yet it is considered more polite, when addressing persons of position, to write the word in full. In addressing a French gentleman, also, it is impolite to use the initial of "Monsieur" only. The word must be written in full, and it is very frequently written twice, thus:

"A Monsieur.

"Monsieur ——."

Judges are addressed as "Right Honorable." In addressing a consul, write, "To A. B., Esq., Consul to Her Brittanic Majesty, at ——."

In directing a letter to any member of the Privy Council, prefix "Right Hon." to the name, and add after it the title of the office held. Observe the same rules in addressing members of the Royal Household. Letters or addresses to the House of Peers as a body are addressed, "To the Right Hon. the Lords Spiritual and Temporal in Parliament assembled;" and to the House of Commons, "To the Honorable the Commons of the United Kingdom of Great Britain and Ireland."

The Speaker of the House is addressed as "The Right Hon. ——, Esquire, Speaker of the House of Commons." Individual members, who have no title, are addressed by their Christian and surname, followed by "Esq., M. P.," except, of course, in those cases where they have a title.
When clergymen have titles, these should be inserted after the word Rev., in addressing a letter. The following are the forms for addressing our Church dignitaries: “To His Grace the Archbishop of ——.” “To the Right Rev. the Bishop of ——.” “The Rev. John Smith, D. D.” “The Very Rev. the Dean of ——.” “The Very Rev. John Smith, D. D., Dean of ——.” “The Ven. Archdeacon ——.” Rectors and curates are addressed as “The Rev. John Smith;” “The Rev. William Jones.”


Various Forms of Invitations.

Mr. and Mrs. Henry A. Bogert
At Home
Saturday, November 5th, from 3 to 6 o’clock, P. M.
Wednesdays, Nov. 16th and 30th, from 8 to 11 P. M.
Dec. 14th and 28th.

Flushing.
Political.
Mr. Chas. Pratt
requests the pleasure of your company
at No. 232 Clinton Avenue,
on Tuesday evening, March 16th,
at 9.30 o'clock, to meet
Hon. Seth Low
immediately after his address at the Adelphi
Academy.

Mr. and Mrs. James Parker
request the pleasure of your company at "The Castle,"
Perth Amboy, N. J., on Thursday, November
15th, 1882, at 8 P. M., to celebrate the 25th
Anniversary of their marriage and his 50th Birthday.
Also to meet Mr. and Mrs. James Parker, Jr.

In Memoriam.
Arthur G. Coler,
Died June 15th, 1880,
At Springfield, Ill.,
Aged 13 Years and 5 Months.
Brooklyn, June 26th, 1880.

Mr. & Mrs. Henry M. Alexander.
request the honor of your presence
on
Tuesday evening, November fifteenth,
from eight until eleven o'clock,
to meet the
Rev. Professor Patton,
of
Princeton Theological Seminary,
16 West 25th St.

R. S. V. P.
The Officers
of the
Naval Station, New York,
request the pleasure of your company
at a
Farewell Reception
given to
Admiral & Mrs. Cooper,
on Tuesday, March 21st, 1882,
from 2 to 5 p. m.
Navy Yard, Brooklyn,
Dancing.

1877.

Wooden Wedding.
Mr. & Mrs. Jacob Flint,
At Home
Thursday evening, December 30, 1882,
at half-past eight o'clock.
232 East St.

1880.

Mr. and Mrs. Wm. H. Bonnett
requests the pleasure of your company
at the marriage of their daughter,
Louise Earle,
to
Henry Whitney Bates,
on Thursday, June first,
at half-past three o'clock, P. M.,
from the residence of her uncle,
S. S. Marvin, Esq.,
Emsworth, Pennsylvania,
1882.
The Dancing Class requests the pleasure of your company Wednesday evening, 18 at eight o'clock, at the residence of M
Compliments of R. S. V. P.

Your presence is requested at the marriage ceremony of
Miss Anna Ward Crawford,
and
Mr. George De Witt Thornton,
Wednesday afternoon,
October twelfth, at half-past three o'clock,
St. Paul's Church,
Norwalk, Conn.
1881.

18 West St.
DEPARTMENT AND SOCIETY.
The Philosophy of Etiquette.

There is a philosophy in all the requirements of good breeding, whether in the etiquette of the table, the street, the call or in the discharge of other social duties and pleasures. The requirements which polite society demand of its votaries are not mere arbitrary rules, but will be found to be invariably the result of a careful study of the greatest good and pleasure of the greatest number. Take, for instance, a very gross and marked example: etiquette requires that the food shall be borne to the mouth on the fork and never on the knife. It is, evidently, most unclean, and, therefore, disagreeable, to see a person thrust a knife into his mouth, and exceedingly trying to delicate nerves to see him in continual danger of involuntarily enlarging his mouth by an awkward slip of the knife.

If you have ever eaten next to a left-handed person at a crowded table, you need not be told of the philosophy of the rule that every one should, at least, eat "right-handed."

What is true of these is also true of all the other demands of etiquette, and he is unwise, as well as boorish, who will not adapt himself to custom in such particulars after ascertaining what the usages of good society are.

Etiquette for Ladies.

Introductions.

introduce persons who are mutually unknown is to undertake a serious responsibility, and to certify to each the respectability of the other. Never undertake this
responsibility without, in the first place, asking yourself whether the persons are likely to be agreeable to each other; nor, in the second place, without ascertaining whether it will be acceptable to both parties to become acquainted.

Always introduce the gentlemen to the lady—never the lady to the gentlemen. The chivalry of etiquette
assumes that the lady is invariably the superior in right of her sex, and that the gentleman is honored in the introduction.

Never present a gentleman to a lady without first asking her permission to do so.

When you are introduced to a gentleman, never offer your hand. When introduced, persons limit their recognition of each other to a bow.

Persons who have met at the house of a mutual friend without being introduced should not bow if they afterwards meet elsewhere. A bow implies acquaintance; and persons who have not been introduced are not acquainted.

If you are walking with one friend, and presently meet with, or are joined by, a second, do not commit the too frequent error of introducing them to each other. You have even less right to do so than if they encountered each other at your house during a morning call.

There are some exceptions to the etiquette of introduction. At a ball, or evening party where there is dancing, the mistress of the house may introduce any gentleman to any lady without first asking the lady's permission. But she should first ascertain whether the lady is willing to dance; and this out of consideration for the gentleman, who may otherwise be refused. No man likes to be refused the hand of a lady, though it be only for a quadrille.

A sister may present her brother, or a mother her son, without any kind of preliminary.

Friends may introduce friends at the of the house of a mutual acquaintance; but, as a rule, it is better to be introduced by the mistress of the house. Such an introduction carries more authority with it.

Introductions at evening parties are now almost wholly dispensed with. Persons who meet at a friend's house are ostensibly upon an equality, and pay a bad compliment to the host by appearing suspicious and formal. Some old-fashioned country hosts still persevere in introducing
each new comer to all the assembled guests. It is a custom that cannot be too soon abolished, and one that places the last unfortunate visitor in a singularly awkward position. All that she can do is to make a semicircular courtesy, like a concert singer before an audience, and bear the general gaze with as much composure as possible.

An introduction given at a ball for the mere purpose of conducting a lady through a dance does not give the gentleman any right to bow to her on a future occasion. If he commits this error, she may remember that she is not bound to see, or return, his salutation.

Letters of Introduction.

Do not lightly give or promise letters of introduction. Always remember that when you give a letter of introduction you lay yourself under an obligation to the friend to whom it is addressed. If she lives in a great city, such as Chicago or Boston, you in a measure compel her to undergo the penalty of escorting the stranger to some of those places of public entertainment in which the capital abounds. If your friend be a married lady, and the mistress of a house, you put her to the expense of inviting the stranger to her table. We cannot be too cautious how we tax the time and purse of a friend, or weigh too seriously the question of mutual advantage in the introduction. Always ask yourself whether the person introduced will be an acceptable acquaintance to the one to whom you present her; and whether the pleasure of knowing her will compensate for the time or money which it costs to entertain her. If the stranger is in any way unsuitable in habits or temperament, you inflict an annoyance on your friend instead of a pleasure. In questions of introduction never oblige one friend to the discomfort of another.

Those to whom letters of introduction have been given
should send them to the person to whom they are addressed, and inclose a card. Avoid delivering a letter of introduction in person. It places you in the most undignified position imaginable, and compels you to wait while it is being read, like a servant who has been told to wait for an answer. If the receiver of the letter be a really well-bred person, she will call upon you or leave her card the next day, and you should return her attention within the week.

If, on the other hand, a stranger sends you a letter of introduction and her card, you are bound by the laws of politeness and hospitality, not only to call upon her the next day, but to follow up that attention with others. If you are in a position to do so, the most correct proceeding is to invite her to dine with you. Should this not be within your power, you can probably escort her to some of the exhibitions, bazaars, or concerts of the season; any of which would be interesting to a provincial visitor. In short, etiquette demands that you shall exert yourself to show kindness to the stranger, if only out of compliment to the friend who introduced her to you.

If you invite her to take dinner with you, it is a better compliment to ask some others to meet her than to dine with her tête-a-tête. You are thereby giving her an opportunity of making other acquaintances, and are assisting your friend in still farther promoting the purpose for which she gave her the introduction to yourself.

A letter of introduction should be given unsealed, not alone because your friend may wish to know what you have said of her, but also as a guarantee of your own good faith. As you should never give such a letter unless you can speak highly of the bearer, this rule of etiquette is easy to observe. By requesting your friend to fasten the envelope before forwarding the letter to its destination, you tacitly give her permission to inspect its contents.
Visiting Cards.

Visits of ceremony should be short. If even the conversation should have become animated, beware of letting your call exceed half-an-hour's length. It is always better to let your friends regret rather than desire your withdrawal.

On returning visits of ceremony you may, without impoliteness, leave your card at the door without going in. Do not fail, however, to inquire if the family be well.

Should there be daughters or sisters residing with the lady upon whom you call, you may turn down a corner of your card, to signify that the visit is paid to all. It is in better taste, however, to leave cards for each.

Unless when returning thanks for "kind inquiries," or announcing your arrival in, or departure from, town, it is not considered respectful to send round cards by a servant.

Leave-taking cards have P. P. C. (pour prendre congé) written in the corner. Some use P. D. A. (pour dire adieu).

Autographic facsimiles for visiting cards are affectations in any persons but those who are personally remarkable for talent, and whose autographs, or facsimiles of them, would be prized as curiosities.

Visits of condolence are paid within the week after the event which occasions them. Personal visits of this kind are made by relations and very intimate friends only. Acquaintances should leave cards with narrow mourning borders.

On the first occasion when you are received by the family after the death of one of its members, it is etiquette to wear slight mourning.

Umbrellas should invariably be left in the hall.

Never take favorite dogs into a drawing-room when you make a morning call. Their feet may be dusty, or they may bark at the sight of strangers, or, being of a too friendly disposition, may take the liberty of lying on a lady's gown,
or jumping on the sofas and easy chairs. Where your friend has a favorite cat already established before the fire, a battle may ensue, and one or both of the pets be seriously hurt. Besides, many persons have a constitutional antipathy to dogs, and others never allow their own to be seen in the sitting-rooms. For all or any of these reasons, a visitor has no right to inflict upon her friend the society of her dog as well as of herself. Neither is it well for a mother to take young children with her when she pays morning visits; their presence, unless they are unusually well trained, can only be productive of anxiety to both yourself and your hostess. She, while striving to amuse them, or to appear interested in them, is secretly anxious for the fate of her album, or the ornaments on her etagere; while the mother is trembling lest her children should say or do something objectionable.

If other visitors are announced, and you have already remained as long as courtesy requires, wait till they are seated, and then rise from your chair, take leave of your hostess, and bow politely to the newly-arrived guests. You will, perhaps, be urged to remain, but, having once risen, it is best to go. There is always a certain air of gaucherie in resuming your seat, and repeating the ceremony of leave-taking.

If you have occasion to look at your watch during a call, ask permission to do so, and apologize for it on the plea of other appointments.

In receiving morning visitors, it is not necessary that the lady should lay aside the employment in which she may be engaged, particularly if it consists of light or ornamental needle-work. Politeness, however, requires that music, drawing, or any occupation which would completely engross the attention, be at once abandoned.

You need not advance to receive visitors when announced, unless they are persons to whom you are desirous of testifying particular attention. It is sufficient if a lady rises to receive her visitors, moves forward a single step to
shake hands with them, and remains standing till they are seated.

When your visitors rise to take leave, you should rise also, and remain standing till they have quite left the room.

A lady should dress well, but not too richly, when she pays a morning visit.

**Conversation.**

There is no conversation so graceful, so varied, so sparkling, as that of an intellectual and cultivated woman. Excellence in this particular is, indeed, one of the attributes of the sex, and should be cultivated by every gentlewoman who aspires to please in general society.

In order to talk well, three conditions are indispensable, namely — tact, a good memory, and a fair education.

Remember that people take more interest in their own affairs than in anything else which you can name. If you wish your conversation to be thoroughly agreeable, lead a mother to talk of her children, a young lady of her last ball, an author of his forthcoming book, or an artist of his exhibition picture. Having furnished the topic, you need only listen; and you are sure to be thought not only agreeable, but thoroughly sensible and well-informed.

Be careful, however, on the other hand, not always to make a point of talking to persons upon general matters relating to their profession. To show an interest in their immediate concerns is flattering; but to converse with them too much about their own arts looks as if you thought them ignorant of other topics.

Remember in conversation that a voice "gentle and low" is, above all other extraneous acquirements, "an excellent thing in woman." There is a certain distinct but
subdued tone of voice which is peculiar to only well-bred persons. A loud voice is both disagreeable and vulgar. It is better to err by the use of too low rather than too loud a tone.

Remember that all "slang" is vulgar.

The use of proverbs is equally vulgar in conversation; and puns, unless they rise to the rank of witticisms, are to be scrupulously avoided. A lady-punster is a most unpleasing phenomenon, and we would advise no young woman, however witty she may be, to cultivate this kind of verbal talent.

Long arguments in general company, however entertaining to the disputants, are tiresome to the last degree to all others. You should always endeavor to prevent the conversation from dwelling too long upon one topic.

Religion is a topic which should never be introduced into society. It is the one subject on which persons are most likely to differ, and least able to preserve temper.

Never interrupt a person who is speaking. It has been aptly said that "if you interrupt a speaker in the middle of his sentence, you act almost as rudely as if, when walking with a companion, you were to thrust yourself before him, and stop his progress."

To listen well is almost as great an art as to talk well. It is not enough only to listen. You must endeavor to seem interested in the conversation of others.

It is considered extremely ill-bred when two persons whisper in society, or converse in a language with which all present are not familiar. If you have private matters to discuss, you should appoint a proper time and place to do so, without paying others the ill compliment of excluding them from your conversation.

If a foreigner be one of the guests at a small party, and does not understand English sufficiently to follow what is said, good breeding demands that the conversation shall be
carried on in his own language. If at a dinner-party, the same rule applies to those at his end of the table.

If upon the entrance of a visitor you carry on the threda of a previous conversation, you should briefly recapitulate to him what has been said before he arrived.

Do not be always witty, even though you should be so happily gifted as to need the caution. To outshine others on every occasion is the surest road to unpopularity.

Always look, but never stare, at those with whom you converse.

In order to meet the general needs of conversation in society, it is necessary that a gentlewoman should be acquainted with the current news and historical events of, at least, the last few years.

Never talk upon subjects of which you know nothing, unless it be for the purpose of acquiring information. Many young ladies imagine that because they play a little, sing a little, draw a little, and frequent exhibitions and operas, they are qualified judges of art. No mistake is more egregious or universal.

Those who introduce anecdotes into their conversation are warned that these should invariably be, “short, witty, eloquent, new, and not far-fetched.”

Scandal is the least excusable of all conversational vulgarities.

**Dress.**

To dress well requires something more than a full purse and a pretty figure. It needs taste, good sense, and refinement. Dress may almost be classed as one of the fine arts. It is certainly one of those arts the cultivation of which is indispenensible to any person moving in the upper or middle classes of society. Very clever women are too frequently indifferent to the graces of the toilette; and women who wish to be thought clever affect indifference. In the one
case it is an error, and in the other a folly. It is not enough that a gentlewoman should be clever, or well-educated, or well-born. To take her due place in society, she must be acquainted with all that this little book proposes to teach. She must, above all else, know how to enter a room, how to perform a graceful salutation, and how to dress. Of these three important qualifications, the most important, because the most observed, is the latter.

Let your style of dress always be appropriate to the hour of the day. To dress too finely in the morning, or to be seen in a morning dress in the evening, is equally vulgar and out of place.

Light and inexpensive materials are fittest for morning wear; dark silk dresses for the promenade or carriage; and low dresses of rich or transparent stuffs for the dinner and ball. A young lady cannot dress with too much simplicity in the early part of the day. A morning dress of some simple material, and delicate whole color, with collar and cuffs of spotless linen, is, perhaps, the most becoming and elegant of morning toilettes.

Never dress very richly or showily in the street. It attracts attention of no enviable kind, and is looked upon as a want of good breeding. In the carriage a lady may dress as elegantly as she pleases. With respect to ball-room toilette, its fashions are so variable, that statements which are true of it to-day may be false a month hence. Respecting no institution of modern society, is it so difficult to pronounce half-a-dozen permanent rules.

We may, perhaps, be permitted to suggest the following leading principles; but we do so with diffidence. Rich colors harmonize with rich brunette complexions and dark hair. Delicate colors are the most suitable for delicate and fragile styles of beauty. Very young ladies are never so suitably attired as in white. Ladies who dance should never wear dresses of light and diaphanous materials, such as tulle, gauze, crape, net, etc., over colored silk slips,
Silk dresses are not suitable for dancing. A married lady who dances only a few quadrilles may wear a *decolleté* silk dress with propriety.

Very stout persons should never wear white. It has the effect of adding to the bulk of the figure.

Black and scarlet, or black and violet, are worn in mourning.

A lady in deep mourning should not dance at all.

However fashionable it may be to wear very long dresses, those ladies who go to a ball with the intention of dancing, and enjoying the dance, should cause their dresses to be made short enough to clear the ground. We would ask them whether it is not better to accept this slight deviation from an absurd fashion, than to appear for three parts of the evening in a torn and pinned-up skirt?

Well-made shoes, whatever their color or material, and faultless gloves, are indispensable to the effect of a ball-room toilette.

Much jewelry is out of place in a ball-room. Beautiful flowers, whether natural or artificial, are the loveliest ornaments that a lady can wear on these occasions.

At small dinner parties, low dresses are not so indispensable as they were held to be some years since. High dresses of transparent materials, and low bodices with capes of black lace, are considered sufficiently full dress on these occasions. At large dinners only the fullest dress is appropriate.

Very young ladies should wear but little jewelry. Pearls are deemed most appropriate for the young and unmarried.

Let your jewelry be always the best of its kind. Nothing is so vulgar, either in youth or in age, as the use of false ornaments.

There is as much propriety to be observed in the wearing of jewelry as in the wearing of dresses. Diamonds, pearls, rubies, and all transparent precious stones, belong to evening dress, and should on no account be worn before
dinner. In the morning let your rings be of the more simple and massive kind; wear no bracelets; and limit your jewelry to a good brooch, gold chain and watch. Your diamonds and pearls would be as much out of place during the morning as a low dress or a wreath.

It is well to remember in the choice of jewelry that mere costliness is not always the test of value; and that an exquisite work of art, such as a fine cameo, or a natural rarity, such as black pearl, is a more distinguished possession than a large brilliant, which any rich and tasteless vulgarian can buy as easily as yourself. Of all precious stones, the opal is one of the most lovely and least common-place. No vulgar woman purchases an opal. She invariable prefers the more showy ruby, emerald or sapphire.

A true gentlewoman is always faultlessly neat. No richness of toilette in the afternoon, no diamonds in the evening, can atone for unbrushed hair, a soiled collar, or untidy slippers at breakfast.

Never be seen in the street without gloves. Your gloves should fit to the last degree of perfection.

In these days of public baths and universal progress, we trust that it is unnecessary to do more than hint at the necessity of the most fastidious personal cleanliness. The hair, the teeth, the nails; should be faultlessly kept; and a muslin dress that has been worn once too often, a dingy pocket-handkerchief, or a soiled pair of light gloves are things to be scrupulously avoided by any young lady who is ambitious of preserving the exterior of a gentlewoman.

Remember that the make of your corsage is of even greater importance than the make of your dress. No dressmaker can fit you well, or make your bodices in the manner most becoming to your figure, if the corsage beneath be not of the best description.

Your shoes and gloves should always be faultless.

Perfumes should be used only in the evening, and then in moderation. Let your perfumes be of the most delicate
and *recherche* kind. Nothing is more vulgar than a coarse, ordinary scent; and of all coarse, ordinary scents, the most objectionable are musk and patchouli.

Finally, every lady should remember that to dress well is a duty which she owes to society; but that to make it her idol is to commit something worse than a folly. Fashion is made for woman; not woman for fashion.

**Morning and Evening Parties.**

The morning party is a modern invention. It was unknown to our fathers and mothers, and even to ourselves till quite lately. A morning party is given during the months of June, July, August, September, and sometimes October. It begins about two o'clock and ends about seven, and the entertainment consists for the most part of conversation, music, and (if there be a garden) croquet, lawn tennis,
archery, etc. The refreshments are given in the form of a *dejeuner a la fourchette*. Receptions are held during the winter season.

Elegant morning dress, general good manners, and some acquaintance with the topics of the day and the games above named, are all the qualifications especially necessary to a lady at a morning party, and "At Homes;" music and elocution at receptions.

An evening party begins about nine o'clock p.m., and ends about midnight, or somewhat later. Good-breeding neither demands that you should present yourself at the commencement, nor remain till the close of the evening. You come and go as may be most convenient to you, and by these means are at liberty, during the height of the season, when evening parties are numerous, to present yourself at two or three houses during a single evening.

When your name is announced, look for the lady of the
house, and pay your respects to her before you even seem to see any other of your friends who may be in the room. At very large and fashionable receptions, the hostess is generally to be found near the door. Should you, however, find yourself separated by a dense crowd of guests, you are at liberty to recognize those who are near you, and those whom you encounter as you make your way slowly through the throng.

If you are at the house of a new acquaintance and find yourself among entire strangers, remember that by so meeting under one roof you are all in a certain sense made known to one another, and should, therefore, converse freely as equals. To shrink away to a side-table and affect to be absorbed in some album or illustrated work; or, if you find one unlucky acquaintance in the room to fasten upon her like a drowning man clinging to a spar, are gaucheries which no shyness can excuse.

If you possess any musical accomplishments, do not wait to be pressed and entreated by your hostess, but comply immediately when she pays you the compliment of inviting you to play or sing. Remember, however, that only the lady of the house has the right to ask you. If others do so, you can put them off in some polite way, but must not comply till the hostess herself invites you.

Be scrupulous to observe silence when any of the company are playing or singing. Remember that they are doing this for the amusement of the rest; and that to talk at such a time is as ill-bred as if you were to turn your back upon a person who was talking to you and begin a conversation with some one else.

If you are yourself the performer, bear in mind that in music, as in speech, "brevity is the soul of wit." Two verses of a song, or four pages of a piece, are at all times enough to give pleasure. If your audience desire more they will ask for it; and it is infinitely more flattering to be encored than to receive the thanks of your hearers, not so
much in gratitude for what you have given them, but in relief that you have left off. You should try to suit your music, like your conversation, to your company. A solo of Beethoven's would be as much out of place in some circles as a comic song at a Quaker's meeting. To those who only care for the light popularities of the season, give Verdi, Suppe, Sullivan, or Offenbach. To connoisseurs, if you perform well enough to venture, give such music as will be likely to meet the exigencies of a fine taste. Above all, attempt nothing that you cannot execute with ease and precision.

If the party be of a small and social kind, and those games called by the French *les jeux innocents* are proposed, do not object to join in them when invited. It may be that they demand some slight exercise of wit and readiness, and that you do not feel yourself calculated to shine in them; but it is better to seem dull than disagreeable, and those who are obliging can always find some clever neighbor to assist them in the moment of need.

Impromptu charades are often organized at friendly parties. Unless you have really some talent for acting and some readiness of speech, you should remember that you only put others out and expose your own inability by taking part in these entertainments. Of course, if your help is really needed, and you would disoblige by refusing, you must do your best, and by doing it as quiet and coolly as possible, avoid being awkward or ridiculous.

Even though you may take no pleasure in cards, some knowledge of the etiquette and rules belonging to the games most in vogue is necessary to you in society. If a fourth hand is wanted at euchre, or if the rest of the company sit down to a round game, you would be deemed guilty of an impoliteness if you refused to join.

The games most commonly played in society are euchre, draw-poker, and whist.
The Dinner-Party.

To be acquainted with every detail of the etiquette pertaining to this subject is of the highest importance to every lady. Ease, savoir-faire, and good-breeding are nowhere more indispensable than at the dinner-table, and the absence of them is nowhere more apparent. How to eat soup and what to do with a cherry-stone are weighty considerations when taken as the index of social status; and it is not too much to say, that a young woman who elected to take claret with her fish, or ate peas with her knife, would justly risk the punishment of being banished from good society.

An invitation to dinner should be replied to immediately, and unequivocally accepted or declined. Once accepted, nothing but an event of the last importance should cause you to fail in your engagement.

To be exactly punctual is the strictest politeness on these occasions. If you are too early, you are in the way; if too late you spoil the dinner, annoy the hostess, and are hated by the rest of the guests. Some authorities are even of opinion that in the question of a dinner-party "never" is better than "late"; and one author has gone so far as to say, "if you do not reach the house till dinner is served, you had better retire, and send an apology, and not interrupt the harmony of the courses by awkward excuses and cold acceptance."

When the party is assembled, the mistress or master of the house will point out to each gentleman the lady whom he is to conduct to the table.

The lady who is the greatest stranger should be taken down by the master of the house, and the gentleman who is the greatest stranger should conduct the hostess. Married ladies take precedence of single ladies, elder ladies of younger ones, and so forth.
When dinner is announced, the host offers his arm to the lady of most distinction, invites the rest to follow by a few words or a bow, and leads the way. The lady of the house should then follow with the gentleman who is most entitled to that honor, and the visitors follow in the order that has been previously arranged. The lady of the house frequently remains, however, till the last, that she may see her guests go in their prescribed order; but the plan is not a convenient one. It is much better that the hostess should be in her place as the guests enter the dining-room, in order that she may indicate their seats to them as they enter, and not find them all crowded together in uncertainty when she arrives.

The plan of cards, with the names of the guests on them, opposite their chairs, is a very useful one. The lady of the house takes the head of the table. The gentleman who led her down to dinner occupies the seat on her right hand, and the gentleman next in order of precedence, that on her left. The master of the house takes the foot of the table. The lady whom he escorted sits on his right hand, and the lady next in order of precedence on his left.

As soon as you are seated at table, remove your gloves, place your table napkin across your knees, and remove the roll which you will probably find within it to the left side of your plate.

The soup should be placed on the table first. All well-ordered dinners begin with soup, whether in summer or winter. The lady of the house should help it, and send it round without asking each individual in turn. It is as much an understood thing as the bread beside each plate, and those who do not choose it are always at liberty to leave it untasted.

In eating soup, remember always to take it from the side of the spoon, and to make no sound in doing so. If the servants do not go round with wine, the gentlemen should help the ladies and themselves to sherry or sauterne immediately after the soup.
You should never ask for a second supply of either soup or fish; it delays the next course, and keeps the table waiting.

Never offer to "assist" your neighbors to this or that dish. The word is inexpressibly vulgar—all the more vulgar for its affectation of elegance. "Shall I send you some mutton?" or "may I help you to canvas back?" is better chosen and better bred.

As a general rule, it is better not to ask your guests if they will partake of the dishes; but to send the plates round, and let them accept or decline them as they please. At very large dinners it is sometimes customary to distribute little lists of the order of the dishes at intervals along the table. It must be confessed that this gives somewhat the air of a dinner at an hotel; but it has the advantage of enabling the visitors to select their fare, and, as "forewarned is forearmed," to keep a corner, as the children say, for their favorite dishes.

As soon as you are helped, begin to eat; or, if the viands are too hot for your palate, take up your knife and fork and appear to begin. To wait for others is now not only old-fashioned, but ill-bred.

Never offer to pass on the plate to which you have been helped.

In helping soup, fish, or any other dish, remember that to overfill a plate is as bad as to supply it too scantily.

Silver fish knives will now always be met with at the best tables; but where there are none, a piece of crust should be taken in the left hand, and the fork in the right. There is no exception to this rule in eating fish.

We presume it is scarcely necessary to remind our fair reader that she is never, under any circumstances, to convey her knife to her mouth. Peas are eaten with the fork; tarts, curry and puddings of all kinds with the spoon.

Always help fish with a fish-slice, and tart and puddings with a spoon, or, if necessary, a spoon and fork.
Asparagus must be helped with the asparagus-tongs.

In eating asparagus, it is well to observe what others do, and act accordingly. Some very well-bred people eat it with the fingers; others cut off the heads, and convey them to the mouth upon the fork. It would be difficult to say which is the more correct.

In eating stone fruit, such as cherries, damsons, etc., the same rule had better be observed. Some put the stones out from the mouth into a spoon, and so convey them to the plate. Others cover the lips with the hand, drop them unseen into the palm, and so deposit them on the side of the plate. In our own opinion, the latter is the better way, as it effectually conceals the return of the stones, which is certainly the point of highest importance. Of one thing we may be sure, and that is, that they must never be dropped from the mouth to the plate.

In helping sauce, always pour it on the side of the plate.

If the servants do not go round with the wine (which is by far the best custom), the gentlemen at a dinner-table should take upon themselves the office of helping those ladies who sit near them.

Unless you are a total abstainer, it is extremely uncivil to decline taking wine if you are invited to do so.

It is particularly ill-bred to empty your glass on these occasions.

Certain wines are taken with certain dishes, by old-established custom—as sherry or sauterne, with soup and fish; hock and claret with roast meat; punch with turtle; champagne with sweet-bread or cutlets; port with venison; port or burgundy, with game; sparkling wines between the roast and the confectionery; madeira with sweets; port with cheese; and for desert, port, tokay, madeira, sherry, and claret. Red wines should never be iced, even in summer. Claret and burgundy should always be slightly warmed; claret-cup and champagne should, of course, be iced.
Instead of cooling their wines in the ice-pail, some hosts introduce clear ice upon the table, broken up in small lumps, to be put inside the glasses. This cannot be too strictly reprehended. Melting ice cannot but weaken the quality and flavor of the wine. Those who desire to drink wine and water can ask for iced water if they choose; but it savors too much of economy on the part of a host to insinuate the ice inside the glasses of his guests when the wine could be more effectually iced outside the bottle.

A silver knife and fork should be placed to each guest at dessert.

It is wise never to partake of any dish without knowing of what ingredients it is composed. You can always ask the servant who hands it to you, and thereby avoid all danger of having to commit the impoliteness of leaving it, and showing that you do not approve of it.

Never speak while you have anything in your mouth.

Be careful never to taste soups or puddings till you are sure they are sufficiently cool; as, by disregarding this caution, you may be compelled to swallow what is dangerously hot, or be driven to the unpardonable alternative of returning it to your plate.

When eating or drinking, avoid every kind of audible testimony to the fact.

Finger-glasses, containing water slightly warmed and perfumed, are placed to each person at dessert. In these you may dip the tips of your fingers, wiping them afterwards on your table-napkin. If the finger-glass and doyley are placed on your dessert-plate, you should immediately remove the doyley to the left of your plate, and place the finger-glass upon it. By these means you leave the right for the wine-glasses.

Be careful to know the shapes of the various kinds of wine-glasses commonly in use, in order that you may never put forward one for another. High and narrow, and very broad and shallow glasses, are used for champagne; large
goblet-shaped glasses for burgundy and claret; ordinary
wine glasses for sherry and madeira; green glasses
for hock; and somewhat large, bell-shaped glasses for
port.

Port, sherry, and madeira are decanted. Hocks and
champagnes appear in their native bottles. Claret and
burgundy are handed round in a claret-jug.

The servants leave the room when the dessert is on the
table:

Coffee and liquors should be handed round when the
dessert has been about a quarter of an hour on the table.
After this the ladies generally retire.

The lady of the house should never send away her
plate, or appear to have done eating, till all her guests
have finished.

If you should unfortunately overturn or break anything,
do not apologize for it. You can show your regret in your
face, but it is not well-bred to put it into words.

To abstain from taking the last piece on the dish, or the
last glass of wine in the decanter, only because it is the
last, is highly ill-bred. It implies a fear on your part that
the vacancy cannot be supplied, and almost conveys an
affront to your host.

To those ladies who have houses and servants at com-
mand, we have one or two remarks to offer. Every house-
keeper should be acquainted with the routine of a dinner
and the etiquette of a dinner-table. No lady should be
utterly dependent on the taste and judgment of her cook.
Though she need not know how to dress a dish, she should
be able to judge of it when served. The mistress of the
house, in short, should be to a cook what a publisher is to
his authors—that is to say, competent to form a judgment
upon their works, though himself incapable of writing even
a magazine article.

If you wish to have a good dinner, and do not know in
what manner to set about it, you will do wisely to order it
from some first-rate restaurateur. By these means you insure the best cookery and faultless carte.

Bear in mind that it is your duty to entertain your friends in the best manner that your means permit. This is the least you can do to recompense them for the expenditure of time and money which they incur in accepting your invitation.

“To invite a friend to dinner,” says Brillat Savarin, “is to become responsible for his happiness so long as he is under your roof.”

A dinner, to be excellent, need not consist of a great variety of dishes; but everything should be of the best, and the cookery should be perfect. That which should be cool should be cool as ice; that which should be hot should be smoking; the attendance should be rapid and noiseless; the guests well assorted; the wines of the best quality; the host attentive and courteous; the room well lighted, and the time punctual.

Every dinner should begin with soup, be followed by fish, and include some kind of game. “The soup is to the dinner,” we are told by Grisnod de la Regniere, “what the portico is to a building, or the overture to an opera.”

To this aphorism we may be permitted to add that a chasse of cognac or curacoa at the close of a dinner is like the epilogue at the end of a comedy.

Never reprove or give directions to your servants before guests. If a dish is not placed precisely where you would have wished it to stand, or the order of a course is reversed, let the error pass unobserved by yourself, and you may depend that it will be unnoticed by others.

The duties of hostess at a dinner-party are not onerous; but they demand tact and good breeding, grace of bearing, and self-possession of no ordinary degree. She does not often carve. She has no active duties to perform; but she must neglect nothing, forget nothing, put all her guests at their ease, encourage the timid, draw out the silent, and pay
every possible attention to the requirements of each and all around her. No accident must ruffle her temper. No disappointment must embarrass her. She must see her old china broken without a sigh, and her best glass shattered with a smile.

Staying at a Friend's House—Breakfast, Luncheon, Etc.

A visitor is bound by the laws of social intercourse to conform in all respects to the habits of the house. In order to do this effectually, she should inquire, or cause her personal servant to inquire, what those habits are. To keep your friend's breakfast on the table till a late hour; to delay the dinner by want of punctuality; to accept other invitations, and treat his house as if it were merely an hotel to be slept in; or to keep the family up till unwonted hours, are alike evidences of a want of good feeling and good-breeding.

At breakfast and lunch, absolute punctuality is not imperative; but a visitor should avoid being always the last to appear at table.

No order of precedence is observed at either breakfast or luncheon. Persons take their seats as they come in, and, having exchanged their morning salutations, begin to eat without waiting for the rest of the party.

If letters are delivered to you at breakfast or luncheon, you may read them by asking permission from the lady who presides at the urn.

Always hold yourself at the disposal of those in whose house you are visiting. If they propose to ride, drive, walk, or otherwise occupy the day, you may take it for granted that these plans are made with reference to your enjoyment. You should, therefore, receive them with cheerfulness, enter into them with alacrity, and do your best to seem pleased, and be pleased, by the efforts which your friends make to entertain you.
You should never take a book from the library to your own room without requesting permission to borrow it. When it is lent, you should take every care that it sustains no injury while in your possession, and should cover it, if necessary.

A guest should endeavor to amuse herself as much as possible, and not be continually dependent on her hosts for entertainment. She should remember that, however welcome she may be, she is not always wanted.

A visitor should avoid giving unnecessary trouble to the servants of the house.

The signal for retiring to rest is generally given by the appearance of the servant with wine, water, and biscuits, where a late dinner hour is observed and suppers are not the custom. This is the last refreshment of the evening, and the visitor will do well to rise and wish good night shortly after it has been partaken of by the family.

**General Hints.**

Do not frequently repeat the name of the person with whom you are conversing. It implies either the extreme of hauteur or familiarity.

Never speak of absent persons by only their Christian or surnames; but always as Mr. ——, or Mrs. ——. Above all, never name anybody by the first letter of his name. Married people are sometimes guilty of this flagrant offense against taste.

Look at those who address you.

Never boast of your birth, your money, your grand friends, or anything that is yours. If you have traveled, do not introduce that information into your conversation at every opportunity. Any one can travel with money and leisure. The real distinction is to come home with enlarged views, improved tastes, and a mind free from prejudice.
If you present a book to a friend, do not write his or her name in it unless requested. You have no right to presume that it will be rendered any the more valuable for that addition; and you ought not to conclude beforehand that your gift will be accepted.

Never undervalue the gift which you are yourself offering; you have no business to offer it if it is valueless. Neither say that you do not want it yourself, or that you should throw it away if it were not accepted, etc., etc. Such apologies would be insults if true, and mean nothing if false.

No compliment that bears insincerity on the face of it is a compliment to all.

Presents made by a married lady to a gentleman can only be offered in the joint names of her husband and herself.

Married ladies may occasionally accept presents from gentlemen who visit frequently at their houses, and who desire to show their sense of the hospitality which they receive there.

Acknowledge the receipt of a present without delay.

Give a foreigner his name in full, as Monsieur de Vigny—never as Monsieur only. In speaking of him, give him his title, if he has one. Foreign noblemen are addressed viva voce as Monsieur. In speaking of a foreign nobleman before his face, say Monsieur le Comte, or Monsieur le Marquis. In his absence, say Monsieur le Comte de Vigny.

Converse with a foreigner in his own language. If not competent to do so, apologize, and beg permission to speak English.

To get in and out of a carriage gracefully is a simple but important accomplishment. If there is but one step, and you are going to take the seat facing the horses, put your left foot on the step, and enter the carriage with your right, in such a manner as to drop at once into your seat. If you
are about to sit with your back to the horses, reverse the process. As you step into the carriage, be careful to keep your back towards seat you are about to occupy, so as to avoid the awkwardness of turning when you are once in.

**Etiquette for Gentlemen.**

**Introductions.**

To introduce persons who are mutually unknown is to undertake a serious responsibility, and to certify to each the respectibility of the other. Never undertake this responsibility without in the first place asking yourself whether the person are likely to be agreeable to each other: nor, in the second place, without ascertaining whether it will be acceptable to both parties to become acquainted.

Always introduce the gentleman to the lady—never the lady to the gentleman. The chivalry of etiquette assumes that the lady is invariably the superior in right of her sex, and that the gentleman is honored by the introduction.

Never present a gentleman to a lady without first asking her permission to do so.

When you are introduced to a lady, never offer your hand. When introduced, persons limit their recognition of each other to a bow.

Persons who have met at the house of a mutual friend without being introduced, should not bow if they afterwards meet elsewhere; a bow implies acquaintance, and persons who have not been introduced are not acquainted.

If you are walking with one friend, and presently meet with, or are joined by, a second, do not commit the too frequent error of introducing them to each other. You have
even less right to do so than if they encountered each other
your house during a morning call.

There are some exceptions to the etiquette of introduc-
tions. At a ball or evening party, where there is dancing,
the mistress of the house may introduce any gentleman to
any lady without first asking the lady's permission. But
she should first ascertain whether the lady is willing to dance;
and this out of consideration for the gentleman, who may
otherwise be refused. No man likes to be refused the hand
of a lady, though it be only for a quadrille.

A brother may present his sister, or a father his son,
without any kind of preliminary; but only when there is no
inferiority on the part of his own family to that of the ac-
quaintance.

Friends may introduce friends at the house of a mutual
acquaintance, but, as a rule, it is better to be introduced by
the mistress of the house. Such an introduction carries
more authority with it.

Introductions at evening parties are now almost wholly
dispensed with. Persons who meet at a friend's house are
ostensibly upon an equality, and pay a bad compliment to
the host by appearing suspicious and formal. Some old-
fashioned country hosts yet persevere in introducing each
newcomer to all the assembled guests. It is a custom that
cannot be too soon abolished, and one that places the last
unfortunate visitor in a singularly awkward position. All that
he can do is to make a semi-circular bow, like a concert
singer before an audience, and bear the general gaze with
as much composure as possible.

If, when you enter a drawing-room, your name has been
wrongly announced, or has passed unheard in the buzz of
conversation, make your way at once to the mistress of the
house, if you are a stranger, and introduce yourself by name.
This should be done with the greatest simplicity, and your
professional or titular rank made as little of as possible.

An introduction given at a ball for the mere purpose of
conducting a lady through a dance does not give the gentleman any right to bow to her on a future occasion. If he commits this error, he must remember that she is not bound to see or return his salutation.

Letters of Introduction.

Do not lightly give or promise letters of introduction. Always remember that when you give a letter of introduction you lay yourself under an obligation to the friend to whom it is addressed.

No one delivers a letter of introduction in person. It places you in the most undignified position imaginable, and compels you to wait while it is being read, like a footman who has been told to wait for an answer.

If, on the other hand, a stranger sends you a letter of introduction and his card, you are bound by the laws of politeness and hospitality, not only to call upon him the next day, but to follow up that attention with others. If you are in a position to do so, the most correct proceeding is to invite him to dine with you. Should this not be within your power, you have probably the entree to some private collections, club-houses, theatres, or reading-rooms, and could devote a few hours to showing him these places.

A letter of introduction should be given unsealed, not alone because your friend may wish to know what you have said of him, but also as a guarantee of your own good faith. As you should never give such a letter unless you can speak highly of the bearer, this rule of etiquette is easy to observe. By requesting your friend to fasten the envelope before forwarding the letter to its destination you tacitly give him permission to inspect its contents.

Let your note paper be of the best quality and proper size.
Visiting—Morning Calls—Cards.

A morning visit should be paid between the hours of 2 and 4 p. m. in winter, and 2 and 5 in summer.

Visits of ceremony should be short. If even the conversation should have become animated, beware of letting your call exceed half an hour's length. It is always better to let your friends regret rather than desire your withdrawal.

On returning visits of ceremony you may, without impoliteness, leave your card at the door without going in. Do not fail, however, to inquire if the family be well.

Should there be daughters or sisters residing with the lady upon whom you call, you may turn down a corner of your card, to signify that the visit is paid to all. It is in better taste, however, to leave cards for each.

Unless when returning thanks for "kind inquiries," or announcing your arrival in, or departure from, town, it is not considered respectful to send cards round by a servant.

Leave-taking cards have P. P. C. (pour prendre conge) written in the corner. Some use P. D. A. (pour dire adieu).

The visiting cards of gentlemen are half the size of those used by ladies.

Visits of condolence are paid within the week after the event which occasions them. Personal visits of this kind are made by relations and very intimate friends only. Acquaintances should leave cards with narrow mourning borders.

On the first occasion when you are received by the family after the death of one of the members, it is etiquette to wear slight mourning.

When a gentleman makes a morning call, he should never leave his hat or riding-whip in the hall, but should take both into the room. To do otherwise would be to make himself too much at home. The hat, however, must never
be laid on a table, piano, or any article of furniture; it should be held gracefully in the hand. If you are compelled to lay it aside, put it on the floor.

Umbrellas should invariably be left in the hall.

Never take favorite dogs into a drawing-room when you make a morning call. Their feet may be dusty, or they may bark at the sight of strangers, or, being of too friendly a disposition, may take the liberty of lying on a lady's gown, or jumping on the sofas and easy chairs. Where your friend has a favorite cat already established before the fire, a battle may ensue, and one or both of the pets be seriously hurt. Besides many persons have a constitutional antipathy to dogs, and others never allow their own to be seen in the sitting-rooms. For all or any of these reasons a visitor has no right to inflict upon his friend the society of his dog as well as of himself.

If, when you call upon a lady, you meet a lady visitor in her drawing-room, you should rise when that lady takes her leave.

If other visitors are announced, and you have already remained as long as courtesy requires, wait till they are seated and then rise from your chair, take leave of your hostess, and bow politely to the newly arrived guests. You will, perhaps, be urged to remain, but having once risen, it is always best to go. There is always a certain air of gaucherie in resuming your seat and repeating the ceremony of leave-taking.

If you have occasion to look at your watch during a call, ask permission to do so, and apologize for it on the plea of other appointments.

Conversation.

Let your conversation be adapted as skillfully as may be to your company. Some men make a point of talking common-places to all ladies alike, as if a woman could only be a
triflers. Others, on the contrary, seem to forget in what respects the education of a lady differs from that of a gentleman, and commit the opposite error of conversing on topics with which ladies are seldom acquainted. A woman of sense has as much right to be annoyed by the one, as a lady of ordinary education by the other. You cannot pay a finer compliment to a woman of refinement and esprit than by leading the conversation into such a channel as may mark your appreciation of her superior attainments.

In talking with ladies of ordinary education, avoid political, scientific, or commercial topics, and choose only such subjects as are likely to be of interest to them.

Remember that people take more interest in their own affairs than in anything else which you can name. If you wish your conversation to be thoroughly agreeable, lead a mother to talk of her children, a young lady of her last ball, an author of his forthcoming book, or an artist of his exhibition picture. Having furnished the topic, you need only listen; and you are sure to be thought not only agreeable, but thoroughly sensible and well-informed.

Be careful, however, on the other hand, not always to make a point of talking to persons upon general matters relating to their profession. To show an interest in their immediate concerns is flattering; but to converse with them too much about their own arts looks as if you thought them ignorant of other topics.

Do not use a classical quotation in the presence of ladies without apologizing for, or translating it. Even this should only be done when no other phrase would so aptly express your meaning. Whether in the presence of ladies or gentlemen, much display of learning is pedantic and out of place.

There is a certain distinct, but subdued tone of voice which is peculiar to only well-bred persons. A loud voice is both disagreeable and vulgar. It is better to err by the use of too low rather than too loud a tone.

Remember that all "slang" is vulgar.
Do not pun. Puns, unless they rise to the rank of wit-\ticisms, are to be scrupulously avoided.

Long arguments in general company, however enter-
taining to the disputants, are tiresome to the last degree to
all others. You should always endeavor to prevent the
conversation from dwelling too long upon one topic.

Religion is a topic which should never be introduced in
society. It is the one subject on which persons are most
likely to differ, and least able to preserve temper.

Never interrupt a person who is speaking.

To listen well is almost as great an art as to talk well.
It is not enough only to listen. You must endeavor to
seem interested in the conversation of others.

It is considered extremely ill-bred when two persons
whisper in society, or converse in a language with which
all present are not familiar. If you have private matters to
discuss, you should appoint a proper time and place to do
so, without paying others the ill compliment of excluding
them from your conversation.

If a foreigner be one of the guests at a small party, and
does not understand English sufficiently to follow what is
said, good-breeding demands that the conversation shall be
carried on in his own language. If at a dinner-party, the
same rule applies to those at his end of the table.

If, upon the entrance of a visitor, you carry on the thread
of a previous conversation, you should briefly recapitulate
to him what has been said before he arrived.

Always look, but never stare, at those with whom you
converse.

In order to meet the general needs of conversation in
society, it is necessary that a man should be well acquainted
with the current news and historical events of, at least, the
last few years.

Never talk upon subjects of which you know nothing,
unless it be for the purpose of acquiring information. Many
young men imagine that because they frequent exhibitions
and operas they are qualified judges of art. No mistake is more egregious or universal.

Those who introduce anecdotes into their conversation are warned that these should invariably be "short, witty, eloquent, new, and not far-fetched."

Scandal is the least excusable of all conversational vulgarities.

In conversing with a man of rank, do not too frequently give him his title.

**The Promenade.**

A well-bred man must entertain no respect for the brim of his hat. "A bow," says La Fontaine, "is a note drawn at sight." You are bound to acknowledge it immediately, and to the full amount. True politeness demands that the hat should be quite lifted from the head.

On meet friends with whom you are likely to shake hands, remove your hat with the left hand in order to leave the right hand free.

If you meet a lady in the street whom you are sufficiently intimate to address, do not stop her, but turn round and walk beside her in whichever direction she is going. When you have said all that you wish to say, you can take your leave.

If you meet a lady with whom you are not particularly well acquainted, wait for her recognition before you venture to bow to her.

In bowing to a lady whom you are not going to address, lift your hat with that hand which is farthest from her. For instance, if you pass her on the right side, use your left hand; if on the left, use your right.

If you are on horseback and wish to converse with a lady who is on foot, you must dismount and lead your horse, so as not to give her the fatigue of looking up to your level. Neither should you subject her to the impropriety of carrying
on a conversation in a tone necessarily louder than is sanctioned in public by the laws of good breeding.

When you meet friends or acquaintances in the streets, at the exhibitions, or any public places, take care not to pronounce their names so loudly as to attract the attention of the passers-by. Never call across the street; and never carry on a dialogue in a public vehicle, unless your interlocutor occupies the seat beside your own.

In walking with a lady, take charge of any small parcel, parasol, or book with which she may be encumbered.

**Dress.**

A gentleman should always be so well dressed that his dress shall never be observed at all. Does this sound like an enigma? It is not meant for one. It only implies that perfect simplicity is perfect elegance, and that the true test of taste in the toilet of a gentleman is its entire harmony, unobtrusiveness and becomingness. If any friend should say to you, "What a handsome waistcoat you have on!" you may depend that a less handsome waistcoat would be in better taste. If you hear it said that Mr. So-and-So wears superb jewelry, you may conclude beforehand that he wears too much. Display, in short, is ever to be avoided, especially in matters of dress. The toilet is the domain of the fair sex. Let a wise man leave its graces and luxuries to his wife, daughters, or sisters, and seek to be himself appreciated for something of higher worth than the stud in his shirt or the trinkets on his chain.

To be too much in the fashion is as vulgar as to be too far behind it. No really well-bred man follows every new cut that he sees in his tailor's fashion book.

In the morning wear frock coats, double-breasted waistcoats, and trousers of light or dark colors, according to the season.

In the evening, though only in the bosom of your own
family, wear only black, and be as scrupulous to put on a dress coat as if you expected visitors. If you have sons, bring them up to do the same. It is the observance of these minor trifles in domestic etiquette which marks the true gentleman.

For evening parties, dinner parties, and balls, wear a black dress coat, black trousers, black silk or cloth waistcoat, white cravat, white or gray kid gloves, and thin patent leather boots. A black cravat may be worn in full dress, but is not so elegant as a white one.

Let your jewelry be of the best, but the least gaudy description, and wear it very sparingly. A single stud, a gold watch and guard, and one handsome ring, are as many ornaments as a gentleman can wear with propriety.

It is well to remember in the choice of jewelry that mere costliness is not always the test of value; and that an exquisite work of art, such as a fine cameo, or a natural rarity, such as a black pearl, is a more distingue possession than a large brilliant, which any rich and tasteless vulgarian can buy as easily as yourself. For a ring, the gentleman of fine taste would prefer a precious antique intaglio to the handsomest diamond or ruby that could be bought at Tiffany’s.

Of all precious stones, the opal is one of the most lovely and the least common-place. No vulgar man purchases an opal. He invariably prefers the more showy diamond, ruby, sapphire, or emerald.

Unless you are a snuff-taker, never carry any but a white pocket-handkerchief.

If in the morning you wear a long cravat fastened by a pin, be careful to avoid what may be called alliteration of color. We have seen a turquois pin worn in a violet-colored cravat, and the effect was frightful. Choose, if possible, complementary colors, and their secondaries. For instance, if the stone in your pin be a turquois, wear it with brown, or crimson mixed with black, or black and orange. If a ruby, contrast it with shades of green. The same rule
holds good with regard to the mixture and contrast of colors in your waistcoat and cravat. Thus, a buff waistcoat and a blue tie, or brown and blue, or brown and green, or brown and magenta, green and magenta, green and mauve, are all good arrangements of color.

Colored shirts may be worn in the morning; but they should be small in pattern and quiet in color.

In these days of public baths and universal progress, we trust that it is unnecessary to do more than hint at the necessity of the most fastidious personal cleanliness. The hair, the teeth, the nails, should be faultlessly kept; and a soiled shirt, a dingy pocket-handkerchief, or a light waistcoat that has been worn once too often, are things to be scrupulously avoided by any man who is ambitious of preserving the exterior of a gentleman.

**Morning and Evening Parties.**

Elegant morning dress, general good manners, and some acquaintance with the topics of the day and the games above named, are all the qualifications especially necessary to a gentleman at a morning party.

An evening party begins about nine o'clock p.m., and ends about midnight, or somewhat later. Good-breeding neither demands that you should present yourself at the commencement, nor remain till the close of the evening. You come and go as may be most convenient to you, and by these means are at liberty, during the height of the season when evening parties are numerous, to present yourself at two or three houses during a single evening.

At very large and fashionable receptions, the hostess is generally to be found near the door. Should you, however, find yourselves separated by a dense crowd of guests, you are at liberty to recognize those who are near you, and those whom you encounter as you make your way through the throng.
If you are at the house of a new acquaintance and find yourself among entire strangers, remember that by so meeting under one roof you are all in a certain sense made known to one another, and should therefore converse freely, as equals. To shrink away to a side table and affect to be absorbed in some album or illustrated work; or, if you find one unlucky acquaintance in the room, to fasten upon him like a drowning man clinging to a spar, are *gaucherities* which no shyness can excuse. An easy and unembarrassed manner, and the self-possession requisite to open a conversation with those who happen to be near you, are the indispensible credentials of a well-bred man.

At an evening party, do not remain too long in one spot. To be afraid to move from one drawing room to another is the sure sign of a neophyte in society.

If you have occasion to use your handkerchief, do so as noiselessly as possible. To blow your nose as if it were a trombone, or to turn your head aside when using your handkerchief, are vulgarities scrupulously to be avoided.

Never stand upon the hearth with your back to the fire or stove, either in a friend's house or your own.

Never offer any one the chair from which you have just risen, unless there be no other disengaged.

If, when supper is announced, no lady has been specially placed under your care by the hostess, offer your arm to whichever lady you may have last conversed with.

If you possess any musical accomplishments, do not wait to be pressed and entreated by your hostess, but comply immediately when she pays you the compliment of inviting you to play or sing. Remember, however, that only the lady of the house has the right to ask you. If others do, you can put them off in some polite way; but must not comply till the hostess herself invites you.

If you sing comic songs, be careful that they are of the most unexceptionable kind, and likely to offend neither the tastes nor prejudices of the society in which you find yourself.
If the party be of a small and social kind, and those games called by the French *les jeux innocents* are proposed, do not object to join in them when invited. It may be that they demand some slight exercise of wit and readiness, and that you do not feel yourself calculated to shine in them; but it is better to seem dull than disagreeable, and those who are obliging can always find some clever neighbor to assist them in the moment of need. The game of "consequences" is one which unfortunately gives too much scope to liberty of expression. If you join in this game, we cannot too earnestly enjoin you never to write down one word which the most pure-minded woman present might not read aloud without a blush. Jests of an equivocal character are not only vulgar, but contemptible.

Improptu charades are frequently organized at friendly parties. Unless you have really some talent for acting and some readiness of speech, you should remember that you only put others out and expose your own inability by taking part in these entertainments. Of course, if your help is really needed and you would disoblige by refusing, you must do your best, and by doing it as quietly and coolly as possible, avoid being awkward or ridiculous.

Should an impromptu polka or quadrille be got up after supper at a party where no dancing was intended, be sure not to omit putting on gloves before you stand up. It is well always to have a pair of white gloves in your pocket in case of need; but even black are better under these circumstances than none.

Even though you may take no pleasure in cards, some knowledge of the etiquette and rules belonging to the games most in vogue is necessary to you in society.

Never let even politeness induce you to play for high stakes. Etiquette is the minor morality of life; but it never should be allowed to outweigh the higher code of right and wrong.

Be scrupulous to observe silence when any of the company
are playing or singing. Remember that they are doing this for the amusement of the rest; and that to talk at such a time is as ill-bred as if you were to turn your back upon a person who was talking to you and begin a conversation with some one else.

If you are yourself the performer, bear in mind that in music, as in speech, "brevity is the soul of wit." Two verses of a song, or four pages of a piece, are at all times enough to give pleasure. If your audience desire more they will ask for it; and it is infinitely more flattering to be encored than to receive the thanks of your hearers, not so much in gratitude for what you have given them, but in relief that you have left off. You should try to suit your music, like your conversation, to your company. A solo of Beethoven's would be as much out of place in some circles as a comic song at a Quakers' meeting. To those who only care for the light popularities of the season, give Verdi. To connoisseurs, if you perform well enough to venture, give such music as will be likely to meet the exigencies of a fine taste. Above all, attempt nothing that you cannot execute with ease and precision.

In retiring from a crowded party it is unnecessary that you should seek out the hostess for the purpose of bidding her a formal good-night. By doing this you would, perhaps, remind others that it was getting late, and cause the party to break up. If you meet the lady of the house on your way to the drawing-room door, take your leave of her as unobtrusively as possible, and slip away without attracting the attention of her other guests.

The Dinner Table.

To be acquainted with every detail of the etiquette pertaining to this subject is of the highest importance to every gentleman. Ease, savoir faire, and good-breeding are
nowhere more indispensable than at the dinner-table, and the absence of them is nowhere more apparent.

An invitation to dine should be replied to immediately, and unequivocally accepted or declined. Once accepted, nothing but an event of the last importance should cause you to fail in your engagement.

To be exactly punctual is the strictest politeness on these occasions. If you are too early, you are in the way; if too late, you spoil the dinner, annoy the hostess, and are hated by the rest of the guests. Some authorities are even of opinion that in the question of a dinner-party "never" is better than "late;" and one author has gone so far as to say, "if you do not reach the house till dinner is served, you had better retire to a restaurater's, and thence send an apology, and not interrupt the harmony of the courses by awkward excuses and cold acceptance."

When the party is assembled, the mistress or master of the house will point out to each gentleman the lady whom he is to conduct to table. If she be a stranger, you had better seek an introduction; if a previous acquaintance, take care to be near her when the dinner is announced; offer your arm, and go down according to precedence. This order of precedence must be arranged by the host or hostess.

When dinner is announced, the host offers his arm to the lady of most distinction, invites the rest to follow by a few words or a bow, and leads the way. The lady of the house should then follow with the gentleman who is most entitled to that honor, and the visitors follow in the order that the master of the house has previously arranged. The lady of the house frequently remains, however, till the last, that she may see her guests go down in their prescribed order; but the plan is not a convenient one. It is much better that the hostess should be in her place as the guests enter the dining-room, in order that she may indicate their seats to them as they come in, and not find them all crowded together in uncer-
tainty when she arrives. If cards with names are on the table, seek that of the lady whom you have taken to dinner.

The number of guests at a dinner-party should always be determined by the size of the table. When the party is too small, conversation flags, and a general air of desolation pervades the table. When they are too many, every one is inconvenienced. A space of two feet should be allowed to each person. It is well to arrange a party in such wise that the number of ladies and gentlemen be equal.

The lady of the house takes the head of the table. The gentleman who led her to dinner occupies the seat on her right hand, and the gentleman next in order of precedence that on her left. The master of the house takes the foot of the table. The lady whom he escorted sits on his right hand, and the lady next in order of precedence on his left.

The gentlemen who support the lady of the house should offer to relieve her of the duties of hostess. Many ladies are well pleased thus to delegate the difficulties of carving, and all gentlemen who accept invitations to dinner should be prepared to render such assistance when called upon. To offer to carve a dish, and then perform the office unskillfully, is an unpardonable gaucherie. Every gentleman should carve, and carve well.

As soon as you are seated at table, remove your gloves, place your table napkins across your knees, and remove the roll which you find probably within it to the left side of your plate.

The soup should be placed on the table first.

In eating soup, remember always to take it from the side of the spoon, and to make no sound in doing so.

If the servants do not go round with wine the gentlemen should help the ladies and themselves to sherry or sauterne immediately after the soup.

You should never ask for a second supply of either soup or fish; it delays the next course and keeps the table waiting.
Never offer to "assist" your neighbors to this or that dish. The word is inexpressibly vulgar—all the more vulgar for its affectation of elegance. "Shall I send you some mutton?" or "may I help you to canvas-back?" is better chosen and better bred.

If you are asked to take wine, it is polite to select the same as that which your interlocutor is drinking. If you invite a lady to take wine, you should ask her which she will prefer, and then take the same yourself. Should you, however, for any reason prefer some other vintage, you can take it by courteously requesting her permission.

As soon as you are helped, begin to eat; or, if the vians are too hot for your palate, take up your knife and fork and appear to begin. To wait for others is now not only old-fashioned, but ill-bred.

Never offer to pass on the plate to which you have been helped.

In helping soup, fish, or any other dish, remember that to overfill a plate is as bad as to supply it too scantily.

Silver fish-knives will now always be met with at the best tables; but where there are none, a piece of crust should be taken in the left hand, and the fork in the right. There is no exception to this rule in eating fish.

We presume it is scarcely necessary to remind the reader that he is never, under any circumstances, to convey his knife to his mouth. Peas are eaten with the fork; tarts, curry, and puddings of all kinds with the spoon.

Always help fish with a fish-slice, and tart and puddings with a spoon, or, if necessary a spoon and fork.

Asparagus must be helped with the asparagus-tongs.

In eating asparagus, it is well to observe what others do, and act accordingly. Some very well-bred people eat it with the fingers; others cut off the heads, and convey them to the mouth upon the fork. It would be difficult to say which is the more correct.

In eating stone fruit, such as cherries, damsons, etc., the
same rule had better be observed. Some put the stones out from the mouth into a spoon, and so convey them to the plate. Others cover the lips with the hand, drop them unseen into the palm, and so deposit them on the side of the plate. In our own opinion, the latter is the better way, as it effectually conceals the return of the stones, which is certainly the point of highest importance. Of one thing we may be sure, and that is, that they must never be dropped from the mouth to the plate.

In helping sauce, always pour it on the side of the plate.

If the servants do not go round with the wine (which is by far the best custom), the gentlemen at a dinner table should take upon themselves the office of helping those ladies who sit near them. Ladies take more wine in the present day than they did fifty years ago, and gentlemen should remember this, and offer it frequently. Ladies cannot very well ask for wine, but they can always decline it. At all events they do not like to be neglected, or to see gentlemen liberally helping themselves, without observing whether their fair neighbors' glasses are full or empty.

The habit of taking wine with each other has almost wholly gone out of fashion. A gentleman may ask the lady whom he conducted down to dinner, or he may ask the lady of the house to take wine with him. But even these last remnants of the old custom are fast falling into disuse.

Unless you are a total abstainer, it is extremely uncivil to decline taking wine if you are invited to do so. In accepting, you have only to pour a little fresh wine into your glass, look at the person who invited you, bow slightly, and take a sip from the glass.

It is particularly ill-bred to empty your glass on these occasions.

Certain wines are taken with certain dishes, by old-established custom—as sherry or sauterne, with soup and fish; hock and claret, with roast meat; punch, with turtle;
champagne, with sweet-bread and cutlets; port, with venison; port or burgundy, with game; sparkling wines, between the roast and the confectionery; madeira, with sweets; port, with cheese; and for dessert, port, tokay, madeira, sherry and claret. Red wines should never be iced, even in summer. Claret and burgundy should always be slightly warmed; claret-cup and champagne-cup should, of course, be iced.

Instead of cooling their wines in the ice-pail, some hosts introduce clear ice upon the table, broken up in small lumps, to be put inside the glasses. This cannot be too strongly reprehended. Melted ice can but weaken the quality and flavor of the wine. Those who desire to drink wine and water can ask for iced water, if they choose, but it savors too much of economy on the part of the host to insinuate the ice inside the glasses of his guests, when the wine could be more effectually iced outside the bottle.

A silver knife and fork should be placed to each guest at dessert.

If you are asked to prepare fruit for a lady, be careful to do so by means of the silver knife and fork only, and never to touch it with your fingers.

It is wise never to partake of any dish without knowing of what ingredients it is composed. You can always ask the servant who hands it to you, and you thereby avoid all danger of having to commit the impoliteness of leaving it, and showing that you do not approve of it.

Never speak while you have anything in your mouth.

Be careful never to taste soups or puddings till you are sure they are sufficiently cool; as, by disregarding this caution, you may be compelled to swallow what is dangerously hot, or be driven to the unpardonable alternative of returning it to your plate.

When eating or drinking, avoid every kind of audible testimony to the fact.

Finger-glasses, containing water slightly warmed and
perfumed, are placed to each person at desert. In these you may dip the tips of your fingers, wiping them afterwards on your table-napkin. If the finger-glass and doyley are placed on your desert-plate, you should immediately remove the doyley to the left of your plate, and place the finger-glass upon it. By these means you leave the right for the wine-glasses.

Be careful to know the shapes of the various kinds of wine-glasses commonly in use, in order that you may never put forward one for another. High and narrow, and very broad and shallow glasses, are used for champagne; large, goblet-shaped glasses for burgundy and claret; ordinary wine-glasses for sherry and madeira; green glasses for hock; and somewhat large, bell-shaped glasses for port.

Port, sherry, and madeira are decanted. Hock and champagnes appear in their native bottles. Claret and burgundy are handed around in a claret jug.

Coffee and liquors should be handed round when the desert has been about a quarter of an hour on the table. After this, the ladies generally retire.

Should no servant be present to do so, the gentleman who is nearest the door should hold it for the ladies to pass through.

When the ladies are leaving the dining-room, the gentlemen all rise in their places, and do not resume their seats till the last lady is gone.

If you should unfortunately overturn or break anything, do not apologize for it. You can show your regret in your face, but it is not well-bred to put it into words.

Should you injure a lady's dress, apologize amply, and assist her, if possible, to remove all traces of the damage.

To abstain from taking the last piece on the dish, or the last glass of wine in the decanter, only because it is the last, is highly ill-bred. It implies a fear that the vacancy cannot be supplied, and almost conveys an affront to your host.

In summing up the little duties and laws of the table, a
popular author has said that—"The chief matter of consideration at the dinner-table—as, indeed, everywhere else in the life of a gentleman—is to be perfectly composed and at his ease. He speaks deliberately; he performs the most important act of the day as if he were performing the most ordinary. Yet there is no appearance of trifling or want of gravity in his manner; he maintains the dignity which is so becoming on so vital an occasion. He performs all the ceremonies, yet in the style of one who performs no ceremonies at all. He goes through all the complicated duties of the scene as if he were 'to the manner born.'"

To the giver of a dinner we have but one or two remarks to offer. If he be a bachelor, he had better give his dinner at a good hotel. If a married man, he will, we presume, enter into council with his wife and his cook. In any case, however, he should always bear in mind that it is his duty to entertain his friends in the best manner that his means permit; and that this is the least he can do to recompense them for the expenditure of time and money which they incur in accepting his invitation.

In conclusion, we may observe that to sit long in the dining-room after the ladies have retired is to pay a bad compliment to the hostess and her fair visitors; and that it is still worse to rejoin them with a flushed face and impaired powers of thought. A refined gentleman is always temperate.
Party and Ball-Room Etiquette.

How to Organize a Dancing Party or Ball.

As the number of guests at a dinner-party is regulated by the size of the table, so should the number of invitations to a ball be limited by the proportions of the dancing or ball-room. A prudent hostess will always invite a few more guests than she really desires to entertain, in the certainty that there will be some deserters when the appointed evening comes round; but she will at the same time remember that to overcrowd her room is to spoil the pleasure of those who love dancing, and that a party of this kind, when too numerously attended, is as great a failure as one at which too few are present.

A room which is nearly square, yet a little longer than it is broad, will be found the most favorable for a ball. It admits of two quadrille parties, or two round dances at the same time. In a perfectly square room this arrangement is not so practicable or pleasant. A very long and narrow room, and their number in this country is legend, is obviously of the worst shape of dancing, and is fit only for quadrilles and country dances.

The top of the ball-room is the part nearest the musicians. In a private room, the top is where it would be if the room were a dining-room. It is generally at the farthest point from the door. Dancers should be careful to ascertain the top of the room before taking their places, as the top couples always lead the dances.

A good floor is of the first importance in a ball-room. In a private house, nothing can be better than a smooth, well-stretched holland, with the carpet beneath.
Abundance of light and free ventilation are indispensable to the spirits and comfort of the dancers.

Good music is as necessary to the prosperity of a ball as good wine to the excellence of a dinner. No hostess should tax her friends for this part of the entertainment. It is the most injurious economy imaginable. Ladies who would prefer to dance are tied to the pianoforte; and so few amateurs have been trained in the art of playing dance music, with that strict attention to time and accent which is absolutely necessary to the comfort of the dancers, a total and general discontent is sure to be the result. To play dance music thoroughly well is a branch of the art which requires considerable practice. It is as different from every other kind of playing as whale fishing is from fly fishing. Those who give private balls will do well ever to bear this in mind, and to provide skilled musicians for the evening. For a small party, a piano and cornopean make a very pleasant combination. Unless where several instruments are engaged we do not recommend the introduction of the violin; although in some respects the finest of all solo instruments, it is apt to sound thin and shrill when employed on mere inexpressive dance tunes, and played by a mere dance player.

Invitations to a ball or dance should be issued in the name of the lady of the house, and written on small note-paper of the best quality. Elegant printed forms, some of them printed in gold or silver, are to be had at every stationer's by those who prefer them. The paper may be gilt-edged, but not colored.

An invitation to a ball should be sent out at least ten days before the evening appointed. A fortnight, three weeks, and even a month may be allowed in the way of notice.

Not more than two or three days should be permitted to elapse before you reply to an invitation of this kind. The reply should always be addressed to the lady of the house, and should be couched in the same person as the invitation. The following are the forms generally in use:—
Mrs. Molyneux requests the honor of Captain Hamilton's company at an evening party, on Monday, March the 11th instant

Dancing will begin at Nine o'clock.

Thursday, March 1st.

Captain Hamilton has much pleasure in accepting Mrs. Molyneux's polite invitation for Monday evening, March the 11th instant.

Friday, March 2d.

The old form of "presenting compliments" is now out of fashion.

If Mrs. Molyneux writes to Captain Hamilton in the first person, as "My dear Sir," he is bound in etiquette to reply "My dear Madam."

The lady who gives a ball * should endeavor to secure an equal number of dancers of both sexes. Many private parties are spoiled by the preponderance of young ladies, some of whom never get partners at all, unless they dance with each other.

A room should in all cases be provided for the accommodation of the ladies. In this room there ought to be several looking-glasses; attendants to assist the fair visitors in the arrangement of their hair and dress; and some place in which the cloaks and shawls can be laid in order, and found at a moment's notice. It is well to affix tickets to the cloaks, giving a duplicate at the same time to each lady, as at the public theatres and concert rooms. Needles and thread should also be at hand, to repair any little accident incurred in dancing.

Another room should be devoted to refreshments, and kept amply supplied with coffee, lemonade, ices, wine, and biscuits during the evening. Where this cannot be arranged, the refreshments should be handed round between the dances.

The question of supper is one which so entirely depends on the means of those who give a ball or evening party,

* It will be understood that we use the word "ball" to signify a private party where there is dancing as well as a public ball.
that very little can be said upon it in a treatise of this description. Where money is no object, it is of course always preferable to have the whole supper, "with all appliances and means to boot," sent in from some first-rate house. It spare all trouble, whether to the entertainers or their servants, and relieves the hostess of every anxiety. Where circumstances render such a course imprudent, we would only observe that a home-provided supper, however simple, should be good of its kind, and abundant in quantity. Dancers are generally hungry people, and feel themselves much aggrieved if the supply of sandwiches proves unequal to the demand.

**Ball-Room Toilette for Ladies.**

The style of a lady's dress is a matter so entirely dependent on age, means, and fashion, that we can offer but little advice upon it. Fashion is so variable, that statements which are true of it to-day may be false a month hence. Respecting no institution of modern society is it so difficult to pronounce half-a-dozen permanent rules.

We may perhaps be permitted to suggested the following leading principles; but we do so with diffidence. Rich colors harmonize with rich brunette complexions and dark hair. Delicate colors are the most suitable for delicate and fragile styles of beauty. Very young ladies are never so suitably attired as in white. Ladies who dance should wear dresses of light and diaphanous materials, such as tulle, gauze, crape, net, etc., over colored silk slips. Silk dresses are not suitable for dancing. A married lady who dances only a few quadrilles may wear a decolletée silk dress with propriety.

Very stout persons should never wear white. It has the effect of adding to the bulk of the figure.

Black and scarlet or black and violet are worn in mourning.
A lady in deep mourning should not dance at all.
However fashionable it may be to wear very long dresses, those ladies who go to a ball with the intention of dancing and enjoying the dance, should cause their dresses to be made short enough to clear the ground. We would ask them whether it is not better to accept this slight deviation from an absurd fashion, than to appear for three parts of the evening in a torn and pinned-up skirt.

Well-made shoes, whatever their color or material, and faultless gloves, are indispensable to the effect of a ball-room toilette.

Much jewelry is out of place in a ball-room. Beautiful flowers, whether natural or artificial, are the loveliest ornaments that a lady can wear on these occasions.

**Ball-Room Toilette for Gentlemen.**

A black suit, thin enameled boots, a white neckcloth, and white or delicate gray gloves, are the chief points of a gentleman's ball-room toilette. He may wear a plain-bosomed skirt with one stud. White waistcoats are now fashionable. Much display of jewelry is no proof of good taste. A handsome watch-chain with, perhaps, the addition of a few costly trifles suspended to it, and a simple shirt stud, are the only adornments of this kind that a gentleman should wear.

A gentleman's dress is necessarily so simple that it admits of no compromise in point of quality and style. The material should be the best that money can procure, and the fashion unexceptionable. So much of the outward man depends on his tailor, that we would urge no gentleman to economize in this matter.

**Etiquette of the Ball-Room.**

On entering the ball-room, the visitor should at once seek the lady of the house, and pay his respects to her,
Having done this, he may exchange salutations with such friends and acquaintances as may be in the room.

If the ball be a public one, and a gentleman desires to dance with any lady to whom he is a stranger, he must apply to a member of the floor committee for an introduction.

Even in private balls, no gentleman can invite a lady to dance without a previous introduction. This introduction should be effected through the lady of the house or a member of her family.

No lady should accept an invitation to dance from a gentleman to whom she has not been introduced. In case any gentleman should commit the error of so inviting her, she should not excuse herself on the plea of a previous engagement or of fatigue; as to do so would imply that she did not herself attach due importance to the necessary ceremony of introduction. Her best reply would be to the effect that she would have much pleasure in accepting his invitation if he would procure an introduction to her. This observation may be taken as applying only to public balls. At a private party the host and hostess are sufficient guarantees for the respectability of their guests; and although a gentleman would show a singular want of knowledge of the laws of society in acting as we have supposed, the lady who should reply to him as if he were merely an impertinent stranger in a public assembly-room would be implying an affront to her entertainers. The mere fact of being assembled together under the roof of a mutual friend, is in itself a kind of general introduction of the guests to each other.

An introduction given for the mere purpose of enabling a lady and gentleman to go through a dance together does not constitute an acquaintanceship. The lady is at liberty, should she feel like doing so, to pass the gentleman the next day without recognition.

To attempt to dance without a knowledge of dancing is not only to make one's self ridiculous, but one's partner also.
No lady or gentleman has a right to place a partner in this absurd position.

Never forget a ball-room engagement. To do so is to commit an unpardonable offense against good breeding.

It is not necessary that a lady or gentleman should be acquainted with the steps in order to walk gracefully and easily through a quadrille. An easy carriage and a knowledge of the figure is all that is requisite. A round dance, however, should on no account be attempted without a thorough knowledge of the steps and some previous practice.

No person who has not a good ear for time and tune need hope to dance well.

At the conclusion of a dance the gentleman bows to his partner, and either promenades with her round the room or takes her to a seat. Where a room is set apart for refreshments he offers to conduct her thither. At a public ball no gentleman would, of course, permit a lady to pay for refreshments. Good taste forbids that a lady and gentleman should dance too frequently together at either a public or private ball. Engaged persons should be careful not to commit this conspicuous solecism.

If a lady happens to forget a previous engagement, and stands up with another partner, the gentleman whom she has thus slighted is bound to believe that she has acted from mere inadvertence, and should by no means suffer his pride to master his good temper. To cause a disagreeable scene in a private ball-room is to affront your host and hostess, and to make yourself absurd. In a public room it is no less reprehensible.

Always remember that good breeding and good temper (or the appearance of good temper) are inseparably connected.

Young gentlemen are earnestly advised not to limit their conversation to remarks on the weather and the heat of the room. It is to a certain extent incumbent on them to do something more than dance when they invite a lady to join
a quadrille. If it be only upon the news of the day, a gentleman should be able to afford at least three or four observations to his partner in the course of a long half hour.

Gentlemen who dance cannot be too careful not to injure the dresses of the ladies who do them the honor to stand up with them. The young men of the present day are singularly careless in this respect, and when they have torn a lady's delicate skirt appear to think the mischief they have done scarcely worth the trouble of an apology.

A gentleman conducts his last partner to the supper-room, and having waited upon her while there, re-conducts her to the ball-room.

Never attempt to take a place in a dance which has been previously engaged.

A thoughtful hostess will never introduce a bad dancer to a good one, because she has no right to punish one friend in order to oblige another.

It is not customary for married persons to dance together in society.

Glossary.

We subjoin a glossary of all the French words and expressions that have long since been universally accepted as the accredited phraseology of the ball-room.

A vos places, back to your own places.
A la fin, at the end.
A droite, to the right.
A gauche, to the left.
Balancez, set to your partners.
Balancez aux coins, set to the corners.
Balancez quatre en ligne, four dancers set in a line, joining hands, as in La Poule.
Balancez en moulinet, gentlemen and their partners give each other right hands across, and balancez in the form of a cross.
Balancez et tour des mains, all set to partners and turn to places.
(See Tour des mains.)
Ballotez, do the same four times without changing your places.
PARTY AND BALL-ROOM ETIQUETTE.

Chaine Anglaise, opposite couples right and left.
Chaine des dames, ladies change.
Chaine Anglaise double, right and left.
Chaine des dames double, all the ladies perform the ladies' chain at the same time.

Chassez croisez, do the chassé step from left to right, or right to left, the lady passing before the gentleman in the opposite direction — that is, moving right if he moves left, and vice versa.

Chassez croisez et déchassez, change places with partners, ladies passing in front, first to the right, then to the left, back to places.

It may be either à quatre — four couples — or les huit — eight couples.

Chassez à droite — à gauche, move to the right — to the left.

Le cavalier seul, gentleman advances alone.
Les cavaliers seuls deux fois, gentlemen advance and retire twice without their partners.
Changez vos dames, change partners.
Contre partie pour les autres, the other dancers do the same figure.

Demi promenade, half promenade.
Demi chaine Anglaise, half right and left.
Demi moulinet, ladies all advance to center, right hands across, and back to places.

Demi tour à quatre, four hands half round.
Dos-à-dos, lady and opposite gentleman advance, pass round each other back to back, and return to places.

Les dames en moulinet, ladies give right hands across to each other, half round, and back again with left hands.
Les dames donnent la main droit — gauche — à leurs cavalier, ladies give the right — left — hands to partners.

En avant deux et en arrière, first lady and vis-à-vis, gentleman advance and retire. To secure brevity, en avant is always understood to imply en arrière when the latter is not expressed.

En avant deux fois, advance and retreat twice.
En avant quatre, first couple and their vis-à-vis advance and retire.
En avant trois, three advance and retire, as in La Pastorale.

Figurez devant, dance before.
Figurez à droite — à gauche, dance to the right — to the left.
La grande tour de rond, all join hands and dance completely round the figure in a circle back to places.
Le grand rond, all join hands, and advance and retreat twice, as in La Finale.
Le grand quatre, all eight couples form into squares.
La grande chaîne, all the couples move quite round the figure, giving alternately the right and left hand to each in succession, beginning with the right, until all have regained their places, as in last figure of the Lancers.
La grande promenade, all eight (or more) couples promenade all round the figure back to places.
La main, the hand.
La même pour les cavaliers, gentlemen do the same.
Le moulinet, hand across. The figure will explain whether it is the gentlemen or the ladies, or both, who are to perform it.
Pas de Allemande, the gentleman turns his partner under each arm in succession.
Pas de Basque, a kind of sliding step forward, performed with both feet alternately, in quick succession. Used in the Redowa and other dances. Comes from the South of France.
Glissade, a sliding step.
Le Tiroir, first couple cross, with hands joined, to opposite couple's place, opposite couple crossing separately outside them; then cross back to places, same figure reversed.
Tour des mains, give both hands to partner, and turn her round without quitting your places.
Tour sur place, the same.
Tournez vos dames, the same.
Tour aux coins, turn at the corners, as in the Caledonians, each gentleman turning the lady who stands nearest his left hand, and immediately returning to his own place.
Traversez, cross over to opposite place.
Retraversez, cross back again.
Traversez deux, en donnant la main droite, lady and vis-à-vis, gentleman cross, giving his right hand, as in La Poule.
Vis-à-vis, opposite.
Figure en tournant, circular form.
ETIQUETTE.
Etiquette of Riding and Driving.

RIDING is an accomplishment in which all ladies and gentlemen should be proficient. Riding, like swimming, cannot be taught by precept; it must be taught early and practiced constantly—as little in the school and as much upon the road as possible.

A lady’s riding-habit should be simple, close-fitting, and made by a first-rate tailor. The later habit is much shorter and narrower than the old style, and is always worn with pantaloons of the same materials underneath.

A lady can indulge her love of luxury only in her riding-whip. This may be jeweled, and as elegant as she may wish. Her gloves must always be unexceptionable.

The art of mounting must be properly acquired, since in riding, as in other things, it is proficiency in trifles that proclaims the artist.
The lady, having mounted the riding-steps, places her left foot in the stirrup, rises into her seat, and lifts the right leg into its place, taking care to let the habit fall properly.

If no riding-steps are at hand, her escort or groom must assist her to mount. Hence she must learn to mount in both ways. In the latter case, she places her left foot in the right hand of the gentleman or servant; he lifts it vigorously but gently, and she springs lightly into the saddle.

A lady who rides much, and wishes to keep her figure straight, should have two saddles, and change from one to the other.

The great point in riding is to sit straight in the middle of your saddle, to know the temper of your horse, and to be able to enjoy a good gallop in moderation.

Ladies should not lean forward in riding.

They should not rise in the saddle in trotting.

They should know how to hold the reins, and the different uses of each.

A gentleman, in riding, as in walking, gives the lady the wall.

In assisting a lady to mount, hold your hand at a convenient distance from the ground, that she may place her foot in it. As she springs, assist her with the impetus of your arm. Practice only will enable you to do this properly.

A gentleman should be able to mount on either side of his horse. He places his left foot in the stirrup, his left hand on the saddle, and swings himself up, throwing his right leg over the horse's back. Nothing is more awkward than to see a man climb into a saddle with both hands.

The correct position is to sit upright and well back in the saddle; to keep the knees pressed well in against the sides of the saddle, and the feet parallel to the horse's body; to turn the toes in rather than out. The foot should be about half-way in the stirrup.

The great desideratum in the art of riding is plenty of confidence. A timid person can never be a good rider.
When escorting a lady be sure that her horse is quite safe, every part of its harness in perfect condition, and keep on the alert to assist her on the slightest sign of danger.

A gentleman riding with two ladies will keep to the right of both, unless it be necessary for him to ride between them in order to render some assistance.

In dismounting, the gentleman will take the lady’s left hand in his right, remove the stirrup and place her foot in his left hand, lowering her gently to the ground.

Keep on the right or off side, and never presume to touch her mount any more than you would that of a gentleman friend.

Etiquette of Driving.

The art of driving is simple enough, but requires practice. No one should pretend who does not understand every part of the harness and be able to harness or unharness a horse himself.
A good driver will use his horse well, whether it be his own or another's. He will turn corners gently, and know when to drive fast and when to ease him up.

In the carriage, a gentleman places himself with his back to the horses, leaving the best seat for the ladies. Only very elderly gentlemen are privileged to take the back seat to the exclusion of young ladies. No gentleman driving alone with a lady should sit beside her, unless he is her husband, father, son or brother. Even an affianced lover should remember this rule of etiquette.

To get in and out of a carriage gracefully is quite an accomplishment. If there is but one step, and you are going to face the horses, put your left foot on the step and the other in the carriage, so that you can drop at once into your seat. If you are to sit the other way, reverse the process. Be careful to turn your back the way you intend sitting, so as to avoid turning around.

A gentleman should be careful to avoid stepping on the
lady's dress in getting into the carriage. He should be careful also not to catch it in the door as he closes it.

A gentleman should always get out of a carriage first, in order to assist the lady in alighting.

When a gentleman intends taking a lady driving in a one-seated vehicle, he should always be sure his horse is a safe one before trusting himself with it, as he is obliged to get out to assist the lady in and out of the vehicle. When helping her in he should be careful always to hold the reins so that he can check the animal in case it should start suddenly.

The dress should never be lifted in alighting from a carriage, but left to trail upon the ground.

**Etiquette of the Street.**

A LADY will bow first if she meets a gentleman acquaintance on the street.

A lady will not stop on the street to converse with a gentleman. If he wishes to chat with her he will turn and walk by her side until he has finished his conversation, then raise his hat and leave her.

It is not etiquette for a lady to take the arm of a gentleman on the street in the day time, unless he be a lover or husband, and even then it is seldom done in America.

In England it is permissible for a lady to accept the arm of even an ordinary acquaintance on the street. In foreign cities it is not *comme il faut* for ladies to appear on the street at all without a gentleman.

A gentleman escorting two ladies may offer each an arm, but a lady should never, under any circumstances, walk between two gentlemen holding an arm of each.
On meeting friends or acquaintances on the street or in public places, you should be careful not to call their names so loudly as to attract the attention of those around.

Never call across the street, and never carry on a conversation in a public vehicle unless you are seated side by side.

Gentlemen should never stare at ladies on the street.

In walking with a lady a gentleman should take charge of any small parcel, book, etc., with which she may be burdened.

Never recognize a gentleman unless you are perfectly sure of his identity. Nothing is more awkward than a mistake of this kind.

A well-bred man must entertain no respect for the brim of his hat. True politeness demands that the hat be removed entirely from the head. Merely to nod or to touch the brim of your hat is a lack of courtesy. The body should not be bent at all in bowing.

A gentleman will always give a lady the inside of the walk on the street.

Ladies should avoid walking rapidly on the street, as it is ungraceful.

A gentleman walking with a lady should accommodate his step to hers. It looks exceedingly awkward to see a gentleman two or three paces ahead of a lady with whom he is supposed to be walking.

Staring at people, expectorating, looking back on the street, calling in a loud voice, laughing, etc., are very bad manners on the street.

A gentleman attending a lady will hold the door open for her to pass. He will also perform the same service for any lady passing in or out unattended.

A gentleman may assist a lady from an omnibus, or over a bad crossing, without the formality of an introduction. Having performed the service, he will bow and retire.

No gentleman will smoke when standing or walking with a lady on the street.
A quiet and unobtrusive demeanor upon the street is the sign of a true lady, who goes about her own affairs in a business-like way and has always a pleasant nod and smile for friends and acquaintances.

**Etiquette of Traveling.**

No class of people carry with them so many distinguishing marks as the experienced and the inexperienced traveler.

The former is always cool and collected, occupies the best seat in the middle of the car on the shady side and next to the window, and is especially remarkable for a total lack of flurry and excitement.

All this is owing to the fact that he has had a long and varied experience as a traveler, and in that way gained a knowledge of the minor points in traveling, which go far
toward begetting that state of peaceful confidence which is the source of much envy to the uninitiated

The experienced traveler is always on time; he keeps a time-table of the trains at hand for reference, and never fails to have his watch going correctly. His baggage is always properly checked and his ticket safely stowed away in his inside pocket. Being certain that he is on the right train, with everything in order, his mind is serene, and a smile of benignant complacency illumines his countenance as he unfolds his evening paper or reviews the faces of his fellow-passengers.

The inexperienced traveler comes hurrying on the train at the last moment, all in a heat and flurry, and is scarcely seated on the last seat in the car, where he'll catch all the drafts from the opening door, when he discovers that he has lost his ticket or forgotten to check his baggage. Then ensues a storm of anxious inquires and querulous complainings, and before he has reached his destination he is voted a bore by all his fellow-passengers.

**Suggestions to Travelers.**

Consider what route you intend taking when you are contemplating a journey, and decide definitely upon it. Go to the ticket-office of the road and procure a time-table, where you will find the hour for leaving, together with names of stations on the road, etc.

When you intend taking a sleeping-berth, secure your ticket for same a day or two before you intend starting, so as to obtain a desirable location. A lower berth in the centre of the car is always the most comfortable, as you escape the jar of the wheels and drafts from the opening door.

Take as little baggage as possible, and see that your trunks are strong and securely fastened. A good, stout leather strap is a safeguard against bursting locks.
In checking your baggage, look to the checks yourself, to make sure the numbers correspond. Having once received your check, you need not concern yourself further about your baggage. The company is responsible for its safe delivery.

It is a wise precaution to have your name and address carefully written upon any small article of baggage, such as satchel, umbrella, duster, etc., so that in case you leave them in the car the railway employes may know where to send them.

An overcoat or package lying upon a seat is an indication that the seat is taken, and the owner has only left temporarily. It would, therefore, be rude in you to remove the articles and occupy the seat.

It is only courteous for a gentleman, seeing a lady looking for a seat, to offer the one beside him, as she scarcely likes to seat herself besides him without such invi-
tation, although she will, of course, if there are no entirely vacant seats, do so in preference to standing.

A courteous gentleman will also relinquish his place to two ladies, or a gentleman and lady who are together, and seek other accommodations. Such a sacrifice always receives its reward in grateful admiration of his character.

Ladies traveling alone, when addressed in a courteous manner by gentlemen, should reply politely to the remark; and in long journeys it is even allowable to enter into conversation without the formality of an introduction. But a true lady will always know how to keep the conversation from bordering on familiarity, and by a quiet dignity and sudden hauteur will effectually check any attempt at presumption on the part of her strange acquaintance.

Always consult the comfort of others when traveling. You should not open either door or window in a railway coach without first ascertaining if it will be agreeable to those near enough to be affected by it. Ladies, in particular, should remember that they have not chartered the whole coach, but only paid for a small fraction of it, and be careful not to monopolize the dressing-room for two or three hours at a stretch, while half a dozen or more are waiting outside to arrange their toilets.

Genteel travelers will always carry their own toilet articles, and not depend on the public brush and comb.

A lady will avoid over-dressing in traveling. Silks and velvets, laces and jewelry are terribly out of place on a railroad train. The appointment of the traveler may be as elegant as you please, but they should be distinguished by exceeding plainness and quietness of tone. Some ladies have an idea that any old thing is good enough to travel in, and so look exceedingly shabby on the train.

In America, the liberty of action accorded women is so much greater than that allowed in any other country in the world, that a special code of etiquette on some points is necessary in order to inform them how to act under all circumstances.
In England, the land of greatest liberty after ours, no lady of much gentility makes a journey without a male escort, or at least the company of her maid. Here it is quite common for ladies of the best families and greatest refinement to make journeys of length without the attendance of a male relative. Very young ladies are not allowed to travel, however, without the attendance of some older person, either male or female.

The directions for traveling having been given elsewhere, we will confine our directions to the manner in which an unattended lady shall behave at

**The Hotel.**

A lady should enter a hotel by way of the lady's entrance. A servant is always in attendance at the door to show her to the parlor, where she will be waited upon by the proprietor or clerk, to whom she should present her card and state how long she intends remaining.

A simple request to the waiter, particularly if it be backed by a slight remuneration, will insure his meeting her at the dining-room entrance and preceding her to her seat, thus obviating the slight awkwardness of crossing a full dining-room without an escort.

All conversation at a hotel table should be conducted in a low tone of voice so as not to attract attention, and especially should care be taken that no remarks of a personal nature are overheard by others. A lady will, of course, not enter into conversation with any but friends at a public table.

While waiting to be served it is permissible to read a paper at a hotel table. All orders should be given in a low but clear and distinct tone of voice. Never ask any one at the table to pass you anything. That is the duty of the waiter.
Never point to any article wanted; a glance at the dish, with a quiet request or a mere look at the waiter, is usually sufficient.

All loud and ostentatious dressing is out of place in a hotel dining-room. A quiet, unassuming dress of cloth or plain black silk is the most ladylike.

When a lady is without escort, it would be best for her not to take her supper in the dining-room late in the evening. She can have a meal sent to her room at a trifling extra cost.

A lady should never loiter in the halls, nor stand alone at a hotel window.

She should never hum to herself while going through the halls, nor play on the piano, nor sing in a hotel parlor unless invited to do so.

It is desirable when stopping at a hotel to secure a pleasant, comfortable room, with plenty of air and sunshine and a good outlook.

Be sure to lock your trunk and the door of your room whenever leaving it. If you have valuables, such as diamonds and much money, it is safer to leave them with the proprietor to be locked in the safe. They can easily be obtained whenever wanted by ringing for them.

It is never the act of a lady or gentleman to be scolding at servants. If their conduct gives you dissatisfaction, complain to the proprietor. Always tender your requests in a pleasant and courteous manner, and you will usually find them promptly attended to.

As a lady without escort is apt to require more service than one who has, it is only right to tender a little extra fee to the servant who has been especially attentive. A retaining fee, that is, a small sum given at the outset, is very apt to secure all the attention that can be desired.

A lady should always avoid all hurry and bustle in traveling by securing her ticket beforehand and having her trunk packed and ready to express in good time.
In order to secure herself positively against all impertinence and intrusion when unattended, a lady has need of a great deal of dignity and quiet reserve; if she be naturally of a lively and chatty disposition, she must beware how she indulge these innocent propensities, lest they be misunderstood. An intelligent and thoroughbred lady, however, can travel alone anywhere in America without experiencing the slightest lack of respect or courteous attention.

**Home Etiquette.**

CHILDREN should speak respectfully to parents and obey the slightest command immediately.

Parents should address a child in a mild, pleasant, but firm manner. Issue no orders but those of a just and reasonable nature, and then see that they are obeyed.

Govern with justice and kindness, and home will be indeed a little heaven on earth.

**The Lady’s Toilet.**

Cleanliness is the outward sign of inward purity. Cleanliness is health, and health is beauty.

The first business of the dressing-room is the bath, and this should be a complete bath, and not simply a hasty washing of the face. It is not to be supposed that a lady washes to become clean, but simply to remain clean. A bathing of the entire body at least once a day is essential to health. It is not necessary to have a bath tub for this purpose, but merely an ordinary basin of tepid water, with soap, sponge and clean towels.

The whole body may be quickly sponged off, or the
sponge may be dispensed with and the hands alone used to  
convey the water to the body, after which dry the body  
thoroughly with a soft towel, and then use a coarse Turkish  
towel vigorously until the skin is red from the friction. In  
ilieu of the coarse towel, a liberal use of the flesh-brush may  
be made, but either one or both must be regularly used, as  
nothing tends to keep the complexion in good condition so  
much as the daily use of the flesh-brush.  

Persons living in cities where Turkish baths are estab-  
lished will find a bath of this kind once a week very benefi-  
cial to their health. Oftener than this the baths would be  
apt to have an enervating effect. But an occasional Turkish  
bath is the most effectual cleanser in the world.  

Early rising contributes not only to the preservation of  
health, but the proper condition of the mental faculties. Too  
much sleep induces minor ailments, both of the body and  
mind. Fresh air, moderate exercise and good ventilation,  
together with the daily bath, are the greatest health-pre-  
servers.

**The Teeth.**

**Scrupulous** care is necessary to the preservation of the  
teeth. The teeth should be carefully brushed, not only  
every night and morning, but after every meal.

The best and only needful tooth powder is a simple  
preparation of chalk. The numerous dentifrices advertised  
are most of them worthless, and many of them positively  
injurious.

A good tooth-brush, not too stiff, is necessary. Very  
hot and very cold things and a great deal of sweets are  
injurious to the teeth.  

Upon the first indication of decay, a good dentist should  
be consulted; cheap dentistry is bad economy.
The Breath.

It goes without saying that a sweet breath is one of the essentials of happiness, and should therefore be carefully looked to. The principal causes of a bad breath are a disordered stomach, decaying teeth and catarrhal affections. In the latter case a good specialist should be consulted. When it arises from digestive difficulty, the diet should be changed to one better suited to the system. The eating of anything that will give an unpleasant odor to the breath is to be avoided.

The Nails.

Much care and attention is given to the nails by those who are particular in matters of the toilet. Of late years the care of the nails has been elevated to a profession, and persons calling themselves "manicures" make it their business to dress the nails of ladies of fashion.

It is sufficient, however, if you keep the nails carefully and evenly trimmed—great care, however, being required to preserve the correct, shape, and keep all superfluous skin entirely removed. Plenty of warm water, Windsor soap and a nail-brush are all that is required to keep the hands in good condition.

The Hair.

The hair should be regularly brushed, morning and evening, with a clean hair-brush. It is important that the brushing be frequent; it is also important that the brush be quite clean. The brush should be washed every day with hot water and soda, in order to preserve a glossy appearance to the hair. Occasionally the hair may be cleansed with a mixture
of glycerine and lime juice. Pomades and oil should be care-
fully avoided.

Never attempt to change the color of your hair by means
of dyes and fluids. Your own hair, as nature colored it, is apt
to be the only shade that will correspond with your eyes, eye-
brows and complexion. Practices of this kind are much to
be condemned. They indicate a senseless desire for fashion,
and an equally unladylike desire to attract attention. The
use of hair dyes, false hair, etc., is almost as much to be
condemned as painted cheeks and penciled brows.

The Complexion.

As to the art of obtaining a good complexion, all the
receipts in the world can have but little effect compared with
the excellence of early rising, regular habits, careful diet
and absolute cleanliness. The various lotions recommended
by Madame Rachel, and others of her ilk, the milk bath,
pearl powders and washes of every kind, would never be
needed if ladies were always careful to take plenty of exer-
cise in the open air, wear broad-brimmed hats in the sun and
veils in the wind.

The face should never be washed when heated from
exercise. Wipe the perspiration from the skin and wait
until it is sufficiently cool before you bathe even in warm
water. Rain-water is the best for bathing purposes. If an
eruption break out on the skin, consult a physician.

Dress.

In dress, as in other things, society has passed under
that wave of new impulse which has so much changed the
appearance of our houses, the arrangement of our interiors,
and even the texture and fashion of manufactures.

That which we wore placidly, and even with a little com-
plaisance and sense of superior good taste, twenty years ago,
would fill us with alarm and horror now. The change which has taken place is more than a change of fashion; it is a change of principle. The differences of shape and form, which vary from one three-months to another, are but fluctuations of the standard, but the alteration which we have recently arrived at is fundamental. It has affected, not only the cut, but the color, the fabric, the kind of our garments, and has relieved the severity of rule and left such a margin for individual fancy as was not dreamed of twenty years ago.

The change is chiefly visible in feminine apparel. Where are now the fine full tones of blue and of green, the bright pinks, the orange yellow, in which we once flaunted in happy ignorance, knowing no better and believing, with some show of reason, that we were imitating the tints of nature, the color of the flowers and of the birds? Where are now our apple-green gowns and our silk shawls “shot” with blue and yellow?

The world has paled since those favored days; even the vaporous tarlatan of the ball-room has sunk into softer tints, and in daylight no color effronts the eye of heaven that is not neutral.

The result of the new impulse is to make Art the guide in matters of dress; but with all due respect to that divine Priestess of the Beautiful, we cannot but believe that she would prove a dangerous guide in a matter that involves so many practical features and so many individual peculiarities.

Whatever painters may think, there are many costumes effective in a picture, which would not be at all beautiful upon a living woman, and indiscriminate following of the fancies of Art would not be much less fatal than the usual indiscriminate following of fashion.

No dress can be good which is not useful and into which the elements of individuality do not enter. The garments adapted for the slim and the tall and the graceful will never, however admirable in themselves, agree with the dowdy, the dumpy or the ordinary.
Fashion, indeed, throughout all its vagaries, has this one principle of humanity in it, that it is almost always designed to help those who want help, to cover deficiencies of nature, to conceal the evils wrought by time, and to make those look their best to whom no special charms have been given.

Beautiful persons are free of all such bonds. Whatever they wear becomes them—they confer grace, they do not receive it; therefore fashion is immaterial to them. The time has never been when they were not allowed to flout it at their will. What saying is more general than, "She can wear anything?" It is said in admiration, in enthusiasm, in envy, and in spite, but still it is said constantly of these favorites of Nature. And youth, even when not beautiful, has, to a certain extent, the same privilege.

As a matter of fact, dress is by no means an unimportant item in human well-being, and it may fairly claim to be considered in the light of a fine art.

To dress well requires something more than a full purse and a pretty figure. It requires taste, good sense and refinement.

A woman of taste and good sense will neither make dress her first nor her last object in life. She will remember that it is her duty to her husband and to society to always appear well dressed.

Dress, to be in perfect taste, need not be costly, and no woman of right feeling will adorn her person at the expense of her husband's comfort and her children's education.

The toilet of a well-dressed woman will be as well-chosen at the breakfast-table as at ball or reception.

If she loves bright colors and can wear them with impunity, she will combine them as harmoniously as an artist does his colors. If she is young, her dress will be beautiful: if she is old, she will not affect simplicity.
General Suggestions on Dress.

The golden rule in dress is to avoid extremes. Always follow rather than lead the prevailing fashion in dress.

Do not be so original in dress as to be peculiar, and do not effect fashions that are radically unbecoming to you. Ladies who are neither very young nor very striking should wear quiet colors.

It is not necessary to be rich in order to dress well. A little care in the choice and arrangement of materials is all that is necessary.

Be sure that your dressmaker is a woman of taste and perfectly mistress of her art. Do not trust to any ordinary sewing-woman who may know nothing about harmony of colors and grace of outlines.

A faultless morning toilet in summer should consist of the freshest of muslins, white or of delicate tints, with a tasteful arrangement of fresh, new ribbons, and plain linen collars spotlessly laundered. These, however, are better suited to young unmarried or married ladies.

Ladies of more advanced years may wear dark silks in the morning, but all jewelry, hair ornaments and fine laces should be eschewed for morning wear.

Street costumes should always be quiet in tone. Fine woolen materials, in some shade of brown, gray, olive, dark green or dark blue, make the most suitable and natty street costumes. Any lady of taste who has once seen herself in some such costume, well-made and fitting to perfection, with hat and gloves to correspond, will never sigh for anything richer or more expensive for street wear.

A lady of refinement will never wear a very expensive toilet of velvet or of silk or brocade of any light and conspicuous shade upon the street. Such costumes are exclusively for the carriage, for calling or for receptions.
Much jewelry is out of place in the daytime, whether on the street or for indoor wear. It is particularly out of place in church. A handsome brooch and small, unpretending ear-rings are the only jewelry permissible in the daytime. Heavy bracelets, necklaces, a profusion of diamonds and finger-rings should be reserved for evening wear.

English ladies are much more strict in this matter than American ladies. According to their code it is never allowable to wear diamonds, pearls and other precious stones in the daytime. Custom, however, supports the wearing of a pair of solitaires in the ears at any time and in any place in America.

Young ladies should not wear much jewelry at any time.

The dress of a gentleman should be perfectly unobtrusive, in entire harmony and becoming.

Above all things should he avoid the extremes of fashion, such as wearing his coat extremely or absurdly short. When fashion dictates tight pantaloons, let him not have his so tight that he cannot bend in them; nor, if broad ones be the mode, shall he have them so wide as to resemble his wife's gown.

Loud patterns in cloth and glittering trinkets on the watch-chain are indications rather of the gambler than the gentleman.

A gentleman will have his clothes made by a good tailor, easy of fit and excellent in quality, but subdued and quiet in tone, and neither too much in nor too far behind the prevailing style. Bulwer says, "A gentleman's coat should not fit too well," and he is right, as no self-respecting man wants to be taken for a tailor's dummy.

The regulation dress for evening wear — but it should never be worn before sundown, no matter how ceremonious the occasion — is black swallow-tail coat, black trowsers, black vest, cut low to show the shirt-front, thin patent-leather boots, a white cravat and light kid gloves.
A gentleman should wear no jewelry but such as has a use, except it may be handsome ring. His sleeve-buttons and collar-studs should be of plain gold, but genuine. False jewelry is vulgar, and elaborate ornamentation is foppish. It is more genteel even to dispense with a gold watch-chain and wear only a plain black guard.

If a ring is worn, good taste would suggest that it be a fine antique intaglio rather than an expensive diamond.

**Etiquette of Courtship and Matrimony.**

**First Steps in Courtship.**

It would be out of place in these pages to grapple with a subject so large as that of Love in its various phases; a theme that must be left to poets, novelists and moralists to dilate upon. It is sufficient for our purpose to recognize the existence of this, the most universal — the most powerful — of human passions, when venturing to offer our counsel and guidance to those of both sexes who, under its promptings, have resolved to become votaries of Hymen, but who, from imperfect knowledge of conventional usages, are naturally apprehensive that at every step they take they may render themselves liable to misconception, ridicule, or censure.

We will take it for granted, then, that a gentleman has in one way or other become fascinated by a fair lady — possibly a recent acquaintance — whom he is most anxious to know more particularly. His heart already feels "the inly touch of love," and his most ardent wish is to have that love returned.

At this point we venture to give him a word of serious advise. We urge him, before he ventures to take any step towards the pursuit of this object, to consider well his posi-
tion and prospects in life, and reflect whether they are such as to justify him in deliberately seeking to win the young lady's affections, with the view of making her his wife at no distant period. Should he, after such a review of his affairs, feel satisfied that he can proceed honorably, he may then use fair opportunities to ascertain the estimation in which the young lady, as well as her family, is held by friends. It is perhaps needless to add, that all possible delicacy and caution must be observed in making such inquiries, so as to avoid compromising the lady herself in the slightest degree. When he has satisfied himself on this head, and found no insurmountable impediment in his way, his next endeavor will be, through the mediation of a common friend, to procure an introduction to the lady's family. Those who undertake such an office incur no slight responsibility, and are, of course, expected to be scrupulously careful in performing it, and to
communicate all they happen to know affecting the character
and circumstances of the individual they introduce.

We will now reverse the picture, and see how matters
stand on the fair one's side.

First, let us hope that the inclination is mutual; at all
events that the lady views her admirer with preference; that
she deems him not unworthy of her favorable regard, and
that his attentions are agreeable to her. It is true her heart
may not yet be won: she has to be wooed; and what fair
daughter of Eve has not hailed with rapture that brightest
day in the springtide of her life? She has probably first met
the gentleman at a ball, or other festive occasion, where the
excitement of the scene has reflected on every object around
a roseate tint. We are to suppose, of course, that in looks,
manners, and address, her incipient admirer is not below her
ideal standard of gentlemanly attributes. His respectful
approaches to her—in soliciting her hand as a partner in the
dance, etc.—have first awakened on her part a slight feeling
of interest towards him. This mutual feeling of interest, once
established, soon "grows by what it feeds on." The exalta-
tion of the whole scene favors its development, and it can
hardly be wondered at if both parties leave judgment "out
in the cold" while enjoying each other's society, and possibly
already pleasantly occupied in building "castles in the air."
Whatever may eventually come of it, the fair one is conscious
for the nonce of being unusually happy. This emotion is
not likely to be diminished when she finds herself the object
of general attention—accompanied, it may be, by the display
of a little envy among rival beauties—owing to the assiduous
homage of her admirer. At length, prudence whispers that
he is to her, as yet, a comparative stranger; and with a
modest reserve she endeavors to retire from his observation,
so as not to seem to encourage his attentions. The gentle-
man's ardor, however, is not to be thus checked; he again
solicits her to be his partner in a dance. She finds it hard,
very hard, to refuse him; and both, yielding at last to the
alluring influences by which they are surrounded, discover at the moment of parting that a new and delightful sensation has been awakened in their hearts.

At a juncture so critical in the life of a young, inexperienced woman as that when she begins to form an attachment for one of the opposite sex—at a moment when she needs the very best advice, accompanied with a considerate regard for her overwrought feelings—the very best course she can take is to confide the secret of her heart to that truest and most loving of friends—her mother. Fortunate is the daughter who has not been deprived of that wisest and tenderest of counselors—whose experience of life, whose prudence and sagacity, whose anxious care and appreciation of her child's sentiments, and whose awakened recollections of her own trysting days, qualify and entitle her, above all other beings, to counsel and comfort her trusting child, and to claim her confidence. Let the timid girl then pour forth into her mother's ear the flood of her pent-up feelings. Let her endeavor to distrust her own judgment, and seek hope, guidance, and support from one who, she well knows, will not deceive or mislead her. The confidence thus established will be productive of the most beneficial results—by securing the daughter's obedience to her parent's advice, and her willing adoption of the observances prescribed by etiquette, which, as the courtship progresses, that parent will not fail to recommend as strictly essential in this phase of life. Where a young woman has had the misfortune to be deprived of her mother, she should at such a period endeavor to find her next best counselor in some female relative, or other trustworthy friend.

We are to suppose that favorable opportunities for meeting have occurred, until, by and by, both the lady and her admirer have come to regard each other with such warm feelings of inclination as to have a constant craving for each other's society. Other eyes have in the meantime not failed to notice the symptoms of a growing attachment; and some
"kind friends" have, no doubt, even set them down as already engaged.

The admirer of the fair one is, indeed, so much enamored as to be unable longer to retain his secret within his own breast; and not being without hope that his attachment is reciprocated, resolves on seeking an introduction to the lady's family preparatory to his making a formal declaration of love.

It is possible, however, that the lover's endeavors to procure the desired introduction may fail of success, although where no material difference of social position exists, this difficulty will be found to occur less frequently than might at first be supposed. He must then discreetly adopt measures to bring himself, in some degree, under the fair one's notice; such, for instance, as attending the place of worship which she frequents, meeting her, so often as to be manifestly for the purpose, in the course of her promenades, etc. He will thus soon be able to judge— even without speaking to the lady—whether his further attentions will be distasteful to her. The signs of this on the lady's part, though of the most trifling nature, and in no way compromising her, will be unmistakable; for, as the poet tells us in speaking of the sex:—

"He gave them but one tongue to say us 'Nay,"
And two found eyes to grant!"

Should her demeanor be decidedly discouraging, any perseverance on his part would be ungentlemanly and highly indecorous. But, on the other hand, should a timid blush intimate doubt, or a gentle smile lurking in the half-dropped eye give pleasing challenge to further parley, when possible, he may venture to write— not to the lady— that would be the opening of a clandestine correspondence; an unworthy course, when every act should be open and straightforward, as tending to manly and honorable ends— but to the father or guardian, through the agency of a common friend where feasible, or, in some instances, to the party
at whose residence the lady may be staying. In his letter, he ought first to state his position in life and prospects, as well as mention his family connections; and then request permission to visit the family, as a preliminary step to paying his addresses to the object of his admiration.

By this course, he in nowise compromises either himself or the lady, but leaves open to both, at any future period, an opportunity of retiring from the position of courtship taken up on the one side, and of receiving addresses on the other, without laying either party open to the accusation of fickleness or jilting.

**Etiquette of Courtship.**

In whatever way the attachment may have originated, whether resulting from old association or from a recent acquaintanceship between the lovers, we will assume that the courtship is so far in a favorable train that the lady's admirer has succeeded in obtaining an introduction to her family, and that he is about to be received in their domestic circle on the footing of a welcome visitor, if not yet in the light of a probationary suitor.

In the first place, matters will, in all probability, be found to amble on so calmly, that the enamored pair may seldom find it needful to consult the rules of etiquette; but in the latter, its rules must be attentively observed, or "the course of true love" will assuredly not run smooth.

Young people are naturally prone to seek the company of those they love; and, as their impulses are often at such times impatient of control, etiquette prescribes cautionary rules for the purpose of averting the mischief that unchecked intercourse and incautious familiarity might give rise to. For instance, a couple known to be attached to each other should never, unless when old acquaintances, be left alone for any length of time. nor be allowed to meet
in any other place than the lady's home—particularly at balls, concerts, and other public places—except in the presence of a third party. This, as a general rule, should be carefully observed, although exceptions may occasionally occur under special circumstances.

**What the Lady Should Observe During Courtship.**

A lady should be particular during the early days of courtship—while still retaining some clearness of mental vision—to observe the manner in which her suitor comports himself to other ladies. If he behave with ease and courtesy, without freedom or the slightest approach to license in manner or conversation; if he never speak slightly of the sex, and is ever ready to honor its virtues and defend its weakness; she may continue to incline towards him a willing ear. His habits and his conduct must awaken her vigilant attention before it be too late. Should he come to visit her at irregular hours; should he exhibit a vague or wandering attention—give proofs of a want of punctuality—show disrespect for age—sneer at things sacred, or absent himself from regular attendance at divine service—or evince an inclination to expensive pleasures beyond his means, or to low and vulgar amusements; should he be foppish, eccentric, or very slovenly in his dress; or display a frivolity of mind and an absence of well-directed energy in his worldly pursuits; let the young lady, we say, while there is yet time, eschew that gentleman's acquaintance, and allow it gently to drop. The effort, at whatever cost to her feelings, must be made, if she have any regard for her future happiness and self-respect. The proper course then to take is to intimate her distaste, and the causes that have given rise to it, to her parents or guardian, who will be pretty sure to sympathize with her, and to take measures for facilitating the retirement of the gentleman from his pretensions.
What the Gentleman Should Observe During Courtship.

It would be well also for the suitor, on his part, during the first few weeks of courtship, carefully to observe the conduct of the young lady in her own family, and the degree of estimation in which she is held by them, as well as among her intimate friends. If she be attentive to her duties; respectful and affectionate to her parents; kind and forbearing to her brothers and sisters; not easily ruffled in temper; if her mind be prone to cheerfulness and to hopeful aspiration, instead of the display of a morbid anxiety and dread of coming evil; if her pleasures and enjoyments be those which chiefly center in home; if her words be characterized by benevolence, good-will and charity; then we say, let him not hesitate, but hasten to enshrine so precious a gem in the casket of his affections. But if, on the other hand, he should find that he has been attracted by the tricksome affectation and heartless allurements of a flirt, ready to bestow smiles on all, but with a heart for none; if she who has succeeded for a time in fascinating him be of uneven temper, easily provoked, and slow to be appeased; fond of showy dress, and eager for admiration; estatic about trifles, frivolous in her tastes, and weak and wavering in performing her duties; if her religious observances are merely the formality of lip-service; if she be petulant to her friends, pert and disrespectful to her parents, overbearing to her inferiors; if pride, vanity and affectation be her characteristics; if she be inconstant in her friendships; gaudy and slovenly, rather than neat and scrupulously clean, in attire and personal habits; then we counsel the gentleman to retire as speedily, but as politely, as possible from the pursuit of an object unworthy of his admiration and love; nor dread that the lady's friends—who must know her better than he can do—will call him to account for withdrawing from the field.
But we will take it for granted that all goes on well; that the parties are, on sufficient acquaintance, pleased with each other, and that the gentleman is eager to prove the sincerity of his affectionate regard by giving some substantial token of his love and homage to the fair one. This brings us to the question of presents, a point on which certain observances of etiquette must not be disregarded. A lady, for instance, cannot with propriety accept presents from a gentleman previously to his having made proposals of marriage. She would by so doing incur an obligation at once embarrassing and unbecoming. Should, however, the gentleman insist on making her a present—as of some trifling object of jewelry, etc.—there must be no secret about it. Let the young lady take an early opportunity of saying to her admirer, in the presence of her father or mother, "I am much obliged to you for that ring (or other trinket, as the case may be) which you kindly offered me the other day, and which I shall be most happy to accept, if my parents do not object; and let her say this in a manner which, while it increases the obligation, will divest it altogether of impropriety, from having been conferred under the sanction of her parents.

We have now reached that stage in the progress of the Courtship, where budding affection, having developed into mature growth, encourages the lover to make

THE PROPOSAL.

When about to take this step, the suitor's first difficulty is how to get a favorable opportunity; and next, having got the chance, how to screw his courage up to give utterance to the "declaration." A declaration in writing should certainly be avoided where the lover can by any possibility get at the lady's ear. But there are cases where this is so difficult that an impatient lover cannot be restrained from adopting the agency of a billet-doux in declaring his passion.

The lady, before proposal, is generally prepared for it. It is seldom that such an avowal comes without some pre-
vious indications of look and manner on the part of the admirer, which can hardly fail of being understood. She may not, indeed, consider herself engaged; and although nearly certain of the conquest she has made, may yet have her misgivings. Some gentlemen dread to ask, lest they should be refused. Many pause just at the point, and refrain from anything like ardor in their professions of attachment until they feel confident that they may be spared the mortification and ridicule that is supposed to attach to being rejected, in addition to the pain of disappointed hope. This hesitation when the mind is made up is wrong; but it does often occur, and we suppose ever will do so, with persons of great timidity of character. By it both parties are kept needlessly on the fret, until the long-looked-for opportunity unexpectedly arrives, when the flood-gates of feeling are loosened, and the full tide of mutual affection gushes forth uncontrolled. It is, however, at this moment—the agony-point to the embarrassed lover, who "dotes yet doubts"—whose suppressed feelings rendered him morbidly sensitive—that a lady should be especially careful lest any show of either prudery or coquetry on her part should lose to her forever the object of her choice. True love is generally delicate and timid, and may easily be sacred by affected indifference, through feelings of wonderful pride. A lover needs very little to assure him of the reciprocation of his attachment; a glance, a single pressure of the hand, a whispered syllable, on the part of the loved one, will suffice to confirm his hopes.

REFUSAL BY THE YOUNG LADY.

When a lady rejects the proposal of a gentleman, her behavior should be characterized by the most delicately feeling towards one who, in offering her his hand, has proved his desire to confer upon her, by this implied preference for her above all other women, the greatest honor it is in his power to offer. Therefore, if she have no love for him, she ought at least to evince a tender regard for his feelings; and in the
event of her being previously engaged, should at once acquaint him with the fact. No right-minded man would desire to persist in a suit, when he well knew that the object of his admiration had already disposed of her heart.

When a gentleman makes an offer of his hand by letter, the letter must be answered, and certainly not returned, should the answer be a refusal; unless, indeed, when from a previous repulse, or some other particular and special circumstance, such an offer may be regarded by the lady or her relatives as presumptuous and intrusive. Under such circumstances, the letter may be placed by the lady in the hands of her parents or guardian, to be dealt with by them as they may deem most advisable.

No woman of proper feeling would regard her rejection of an offer of marriage from a worthy man as a matter of triumph; her feeling on such an occasion should be one of regretful sympathy with him for the pain she is unavoidably compelled to inflict. Nor should such a rejection be unaccompanied with some degree of self-examination on her part, to discern whether any lightness of demeanor or tendency to flirtation may have given rise to a false hope of the favoring his suit. At all events, no lady should ever treat the man who has so honored her with the slightest disrespect or frivolous disregard, nor ever unfeelingly parade a more favored suitor before one whom she has refused.

Conduct of the Gentleman when his Addresses are Rejected.

The conduct of the gentleman under such distressing circumstances should be characterized by extreme delicacy and a chivalrous resolve to avoid occasioning any possible annoyance or uneasiness to the fair author of his pain. If, however, he should have reason to suppose that his rejection has resulted from mere indifference to his suit, he need not altogether retire from the field, but may endeavor to kindle
a feeling of regard and sympathy for the patient endurance of his disappointment, and for his continued but respectful endeavors to please the lukewarm fair one. But in case of avowed or evident preference for another, it becomes imperative upon him, as a gentleman, to withdraw at once, and so relieve the lady of any obstacle, that his presence or pretensions may occasion, to the furtherance of her obvious wishes. A pertinacious continuance of his attentions, on the part of one who has been distinctly rejected, is an insult deserving of the severest reprobation. Although the weakness of her sex, which ought to be her protection, frequently prevents a woman from forcibly breaking off an acquaintance thus annoyingly forced upon her, she rarely fails to resent such impertinence by that sharpest of woman's weapons, a keen-edged but courteous ridicule, which few men can bear up against.

Refusal by the Lady's Parents or Guardians.

It may happen that both the lady and her suitor are willing, but that the parents or guardians of the former, on being referred to, deem the connection unfitness, and refuse their consent. In this state of matters, the first thing a man of sense, proper feeling, and candor should do, is to endeavor to learn the objections of the parents, to see whether they cannot be removed. If they are based on his present insufficiency of means, a lover of a preserving spirit may effect much in removing apprehension on that score, by cheerfully submitting to a reasonable time of probation, in the hope of amelioration in his worldly circumstances. Happiness delayed will be none the less precious when love has stood the test of constancy and the trial of time. Should the objection be founded on inequality of social position, the parties, if young, may wait until matured age shall ripen their judgment and place the future more at their own disposal. A clandestine marriage should be pre-
emptorily declined. In too many cases it is a fraud committed by an elder and more experienced party upon one whose ignorance of the world's ways, and whose confiding tenderness appeal to him for protection, even against himself. In nearly all the instances we have known of such marriages, the result proved the step to have been ill-judged, imprudent, and highly injurious to the reputation of one party, and in the long run detrimental to the happiness of both.

Conduct of the Engaged Couple.

The conduct of the bridegroom-elect should be marked by a gallant and affectionate assiduity towards his lady-love—a dénouement easily felt and understood, but not so easy to define. That of the lady towards him should manifest delicacy, tenderness, and confidence: while looking for his thorough devotion to herself, she should not captiously take offense and show airs at his showing the same kind of attention to other ladies as she, in her turn, would not hesitate to receive from the other sex.

In the behavior of a gentleman towards his betrothed in public, little difference should be perceptible from his demeanor to other ladies, except in those minute attentions which none but those who love can properly understand or appreciate.

In private the slightest approach to indecorous familiarity must be avoided; indeed it is pretty certain to be resented by every woman who deserves to be a bride. The lady's honor is now in her lover's hands, and he should never forget in his demeanor to and before her that that lady is to be his future wife.

It is the privilege of the betrothed lover, as it is also his duty, to give advice to the fair one who now implicitly confides in him. Should he detect a fault, should he observe failings which he would wish removed or amended, let him
avail himself of this season, so favorable for the frank inter-
change of thought between the betrothed pair, to urge
their correction. He will find a ready listener; and any
judicious counsel offered to her by him will now be grate-
fully received, and remembered in after-life. After mar-
riage it may be too late; for advice on trivial points of con-
duct may then not improbably be resented by the wife as
an unnecessary interference; now, the fair and loving crea-
ture is disposed, like pliant wax in his hands, to mold her-
self to his reasonable wishes in all things.

Conduct of the Lady During her Betrothal.

A lady is not expected to keep aloof from society on her
engagement, nor to debar herself from the customary atten-
tions and courtesies of her male acquaintances generally;
but she should, while accepting them cheerfully, maintain
such a prudent reserve, as to intimate that they are viewed
by her as mere acts of ordinary courtesy and friendship.
In all places of public amusement—at balls, the opera,
etc.—for a lady to be seen with any other cavalier than her
avowed lover, in close attendance upon her, would expose
her to the imputation of flirtation. She will naturally take
pains at such a period to observe the taste of her lover in
regard to her costume, and strive carefully to follow it, for
all men desire to have their taste and wishes on such
apparent trifles gratified. She should at the same time
observe much delicacy in regard to dress, and be careful to
avoid any unseemly display of her charms; lovers are
naturally jealous of observation under such circumstances.
It is a mistake not seldom made by women, to suppose their
suitors will be pleased by the glowing admiration expressed
by other men for the object of their passion. Most lovers,
on the contrary, we believe, would prefer to withdraw their
prize from general observation until the happy moment for
their union has arrived.
Conduct of the Gentleman Towards the Family of his Betrothed.

The lover, having now secured his position, should use discretion and tact in his intercourse with the lady's family, and take care that his visits be not deemed too frequent—so as to be really inconvenient to them. He should accommodate himself as much as possible to their habits and ways, and be ever ready and attentive to consult their wishes. Marked attention, and in most cases affectionate kindness, to the lady's mother ought to be shown; such respectful homage will secure for him many advantages in his present position. He must not, however, presume to take his stand yet as a member of the family, nor exhibit an obtrusive familiarity in manner and conversation. Should a disruption of the engagement from some unexpected cause ensue, it is obvious that any such premature assumption would lead to very embarrassing results. In short, his conduct should be such as to win for himself the esteem and affection of all the family, and dispose them ever to welcome and desire his presence, rather than regard him as an intruder.

Conduct of the Lady on Retiring from her Engagement.

Should this step unhappily be found necessary on the lady's part, the truth should be spoken, and the reasons frankly given; there must be no room left for the suspicion of its having originated in caprice or injustice. The case should be so put that the gentleman himself must see and acknowledge the justice of the painful decision arrived at. Incompatible habits, ungentlemanly actions, anything tending to diminish that respect for the lover which should be felt for the husband; inconstancy, ill-governed temper—all of which, not to mention other obvious objections—are
to be considered as sufficient reasons for terminating an engagement. The communication should be made as tenderly as possible; room may be left in mere venial cases for reformation; but all that is done must be so managed that not the slightest shadow of fickleness or want of faith may rest upon the character of the lady. It must be remembered, however, that the termination of an engagement by a lady has the privilege of passing unchallenged; a lady not being bound to declare any other reason than her will. Nevertheless she owes it to her own reputation that her decision should rest on a sufficient foundation, and be unmistakeably pronounced.

**Conduct of the Gentleman on Retiring from His Engagement.**

We hardly know how to approach this portion of our subject. The reasons must be strong indeed that can sufficiently justify a man, placed in the position of an accepted suitor, in severing the ties by which he has bound himself to a lady with the avowed intention of making her his wife. His reasons for breaking off his engagement must be such as will not merely satisfy his own conscience, but will justify him in the eyes of the world. If the fault be on the lady's side, great reserve and delicacy will be observed by any man of honor. If, on the other hand, the imperative force of circumstances, such as loss of fortune, or some other unexpected calamity to himself, may be the cause, then must the reason be clearly and fully explained, in such a manner as to soothe the painful feelings which such a result must necessarily occasion to the lady and her friends. It is scarcely necessary to point out the necessity for observing great caution in all that relates to the antecedents of an engagement that has been broken off; especially the return on either side of presents and of all letters that have passed.
Correspondence.

Letter-writing is one great test of ability and cultivation, as respects both sexes. The imperfections of education may be to some extent concealed or glossed over in conversation, but cannot fail to stand out conspicuously in a letter. An ill-written letter infallibly betrays the vulgarity and ignorance indicative of a mean social position.

But there is something more to be guarded against than even bad writing and worse spelling in a correspondence: saying too much—writing that kind of matter which will not bear to be read by other eyes than those for which it was originally intended. That this is too frequently done is amply proved by the love letters often read in a court of law, the most affecting passages from which occasion "roars of laughter" and the derisive comments of merry-making counsel. Occurrences of this kind prove how frequently letters are not returned or burned when an affair of the heart is broken off. Correspondence between lovers should at all events be tempered with discretion; and on the lady's part particularly, her affectionate expressions should not degenerate into a silly style of fondness.

It is as well to remark here, that in correspondence between a couple not actually engaged, the use of Christian names in addressing each other should be avoided.

Demeanor of the Suitor During Courtship.

The manners of a gentleman are ever characterized by urbanity and a becoming consideration for the feelings and wishes of others, and by a readiness to practice self-denial. But the very nature of courtship requires the fullest exercise of these excellent qualities on his part. The lover should carefully accommodate his tone and bearing, whether cheer-
ful or serious, to the mood for the time of his lady-love, whose slightest wish must be his law. In his assiduities to her he must allow of no stint; though hindered by time, distance, or fatigue, he must strive to make his professional and social duties bend to his homage at the shrine of love. All this can be done, moreover, by a man of excellent sense with perfect propriety. Indeed, the world will not only commend him for such devoted gallantry, but will be pretty sure to censure him for any short-coming in his performance of such devoirs.

It is, perhaps, needless to observe that at such a period a gentleman should be scrupulously neat, without appearing particular, in his attire. We shall not attempt to prescribe what he should wear, as that must, of course, depend on the times of the day when his visits are paid, and other circumstances, such as meeting a party of friends, going to the theater, etc., with the lady.

**Should a Courtship be Short or Long?**

The answer to this question must depend on the previous acquaintanceship, connection, or relationship of the parties, as well as on their present circumstances, and the position of their parents. In case of relationship or old acquaintance-ship subsisting between the families, when the courtship, declaration, and engagement have followed each other rapidly, a short wooing is preferable to a long one, should other circumstances not create an obstacle. Indeed, as a general rule, we are disposed strongly to recommend a short courtship. A man is never well settled in the saddle of his fortunes until he be married. He wants spring, purpose, and aim; and, above all, he wants a home as the center of his efforts. Some portion of inconvenience, therefore, may be risked to obtain this; in fact, it often occurs that by waiting too long the freshness of life is worn off, and that the gener-
ous glow of early feelings becomes tamed down to lukewarm-
ness by a too prudent delaying; while a slight sacrifice of
ambition or self-indulgence on the part of the gentleman, and
a little descent from pride of station on the lady's side, might
have insured years of satisfied love and happy wedded life.

On the other hand, we would recommend a long court-
ship as advisable when — the friends on both sides favoring
the match — it happens that the fortune of neither party
will prudently allow an immediate marriage. The gentle-
man, we will suppose, has his way to make in his profession
or business, and is desirous not to involve the object of his
affection in the distressing inconvenience, if not the misery,
of straitened means. He reflects that for a lady it is an
actual degradation, however love may ennoble the motive
of her submission, to descend from her former footing in
society. He feels, therefore, that this risk ought not to be
incurred. For, although the noble and loving spirit of a
wife might enable her to bear up cheerfully against mis-
fortune, and by her endearments sooth the broken spirit of
her husband; yet the lover who would willfully, at the
outset of wedded life, expose his devoted helpmate to the
ordeal of poverty, would be deservedly scouted as selfish
and unworthy. These, then, are among the circumstances
which warrant a lengthened engagement, and it should be
the endeavor of the lady's friends to approve such cautious
delay, and do all they can to assist the lover in his efforts
to abridge it. The lady's father should regard the lover in
the light of another son added to his family, and spare no
pains to promote his interests in life, while the lady's
mother should do everything in her power, by those small
attentions which a mother understands so well, to make the
protracted engagement agreeable to him, and as endurab
as possible to her daughter.
Preliminary Etiquette of a Wedding.

Whether the term of courtship may have been long or short—according to the requirements of the case—the time will at last arrive for

FIXING THE DAY.

While it is the gentleman's province to press for the earliest possible opportunity, it is the lady's privilege to name the happy day; not but that the bridegroom-elect must, after all, issue the fiat, for he has much to consider and prepare for beforehand: for instance, to settle where it will be most convenient to spend the honeymoon—a point which must depend on the season of the year, on his own vocation, and other circumstances. At this advanced state of affairs, we must not overlook the important question of

THE BRIDAL TROUSSEAU AND THE WEDDING PRESENTS.

Wedding presents must be sent always to the bride, never to the bridegroom, though they be given by friends of the latter. They should be sent during the week previous to the wedding day, as it is customary to display them before the ceremony.

Two cards folded in the invitation in the envelope are sent with the wedding invitation. The invitation is in the name of the bride's mother, or if she is not living, the relative or friend nearest the bride:

Mrs. Nicholas Ruth,
At Home,
Tuesday, November 18th,
From 11 till 2 o'clock.

No. 86 W. 47th Street.
The two cards, one large and one small, are folded in this invitation. Upon the large card is engraved:

Mr. and Mrs. W. F. Johnson,

On the smaller one:

Miss Rosie Ruth.

If the young people "receive" after their return from the bridal tour, and there is no wedding-day reception, the following card is sent out:

Mr. and Mrs. W. F. Johnsons
At Home,
Thursday, December 28th,
From 11 till 2 o'clock,
No. 50 E. 63d Street.

Or,

Mr. and Mrs. W. F. Johnson
At Home,
Thursdays in December.
From 11 till 2 o'clock.
No. 50 E. 63d Street.

The bridal calls are not expected to be returned until the last day of reception.

The bridegroom gives to the first groomsman the control of the ceremony, and money for the necessary expenses. The first groomsman presents the bouquet to the bride, leads the visitors up to the young couple for the words of congratulation, gives the clergyman his fee, engages the carriages, secures tickets, checks baggage, secures pleasant seats, if the happy pair start by rail for the "moon;" and, in short, makes all arrangements.

If the wedding takes place in church, the front seats in the body of the church are reserved for the relatives of the
young couple. The bride must not be kept waiting. The clergyman should be within the rails, the bridegroom and groomsmen should be in the vestry-room by the time the bride is due at the church. The bridesmaids should receive the bride in the vestibule.

The bridal party meet in the vestry-room. Then the bride, leaning on the arm of her father, leads the procession; the bridegroom, with the bride's mother upon his arm, follows; then groomsmen and bridesmaids in couples follow.

At the altar the bridegroom receives the bride, and the ceremony begins. The groomsmen stand behind the bridegroom, the bridesmaids behind the bride. In some churches, the bride and bridegroom remove the right hand glove; in others it is not considered essential. The bride stands on the left of the groom.

When the wedding takes place at the house of the bride, the bridal party is grouped behind folding doors or curtains ere their friends see them. If, however, this is not convenient, they enter in the same order as in church.

The first bridesmaid removes the bride's left hand glove for the ring.

After the ceremony the bride and groom go in the same carriage from the church to the house, or from the house to the railway depot or boat.

The bride does not change her dress until she assumes her traveling dress. Her wedding gown is worn at the breakfast.

Friends of the family should call upon the mother of the bride during the two weeks after the wedding.

Mourning must not be worn at a wedding. Even in the case of a widowed mother to either of the happy pair, it is customary to wear gray, or some neutral tint.

It is no longer the fashion at a wedding or a wedding reception to congratulate the bride; it is the bridegroom who receives congratulations; the bride wishes for her future happiness. The bride is spoken to first.
The day being fixed for the wedding, the bride's father now presents her with a sum of money for her trosseau, according to her rank in life. A few days previously to the wedding, presents are also made to the bride by relations and intimate friends, varying in amount and value according to their degrees of relationship and friendship—such as plate, furniture, jewelry, and articles of ornament, as well as of utility, to the newly-married lady in her future station. These, together with her wedding dresses, etc., it is customary to exhibit to the intimate friends of the bride a day or two before her marriage.

**DUTY OF A BRIDEGROOM-ELECT.**

The bridegroom-elect has, on the eve of matrimony, no little business to transact. His first care is to look after a house suitable for his future home, and then, assisted by the taste of his chosen helpmate, to take steps to furnish it in a becoming style. He must also, if engaged in business, make arrangements for a month's absence; in fact, bring together all matters into a focus, so as to be readily manageable when, after the honeymoon, he shall take the reins himself. He will do well to burn most of his bachelor letters, and to part with, it may be, some few of his bachelor connections; and he should communicate, in an easy, informal way, to his acquaintances generally, the close approach of so important a change in his condition. Not to do this might hereafter lead to inconvenience and cause no little annoyance.

We must now speak of

**BUYING THE RING.**

It is the gentleman's business to buy the ring; and let him take special care not to forget it; for such an awkward mistake has frequently happened. The ring should be, we need scarcely say, of the very purest gold, but substantial. There are three reasons for this: first, that it may not break—a source of great trouble to the young wife;
secondly, that it may not slip off the finger without being missed—few husbands being pleased to hear that their wives have lost their wedding rings; and thirdly, that it may last out the lifetime of the loving recipient, even should that life be protracted to the extreme extent. To get the right size required is not one of the least interesting of the delicate mysteries of love. A not unusual method is to get a sister of the fair one to lend one of the lady's rings to enable the jeweler to select the proper size. Care must be taken, however, that it is not too large. Some audacious suitors, rendered bold by their favored position, have been even known presumptuously to try the ring on the patient finger of the bride-elect; and it has rarely happened in such cases that the ring has been refused, or sent back to be changed.

WHO SHOULD BE ASKED TO THE WEDDING.

The wedding should take place at the house of the bride's parents or guardians. The parties who ought to be asked are the father and mother of the gentleman, the brothers and sisters (their wives and husbands also, if married), and indeed the immediate relations and favored friends of both parties. Old family friends on the bride's side should also receive invitations—the rationale or original intention of this wedding assemblage being to give publicity to the fact that the bride is leaving her paternal home with the consent and approbation of her parents.

On this occasion the bridegroom has the privilege of asking any friends he may choose to the wedding; but no friend has a right to feel affronted at not being invited, since, were all the friends on either side assembled, the wedding breakfast would be an inconveniently crowded reception rather than an impressive ceremonial. It is, however, considered a matter of friendly attention on the part of those who cannot be invited, to be present at the ceremony in the church.
ETIQUETTE OF COURTSHIP AND MATRIMONY.

WHO SHOULD BE BRIDESMAIDS.

The bridesmaids should include the unmarried sisters of the bride; but it is considered an anomaly for an elder sister to perform this function. The pleasing novelty for several years past of an addition to the number of bridesmaids, varying from two to eight, and sometimes more, has added greatly to the interest in weddings, the bride being thus enabled to diffuse a portion of her own happiness among the most intimate of her younger friends. One lady is always appointed principal bridesmaid, and has the bride in her charge; it is also her duty to take care that the other bridesmaids have the wedding favors in readiness. On the second bridesmaid devolves, with her principal, the duty of sending out the cards; and on the third bridesmaid, in conjunction with the remaining beauties of her choir, the onerous office of attending to certain ministrations and mysteries connected with the wedding cake.

OF THE BRIDEGROOMSMEN.

It behooves a bridegroom to be exceedingly particular in the selection of the friends who, as groomsmen, are to be his companions and assistants on the occasion of his wedding. Their number is limited to that of the bridesmaids; one for each. It is unnecessary to add that very much of the social pleasure of the day will depend on their proper mating. Young and unmarried they must be, handsome they should be, good-humored they cannot fail to be, well dressed they will of course take good care to be. Let the bridegroom diligently consider over his circle of friends, and select the comeliest and the pleasantest fellows for his own train. The principal bridegroomsman, styled his "best man," has, for the day, the special charge of the bridegroom; and the last warning we would give him is, to take care that, when the bridegroom puts on his wedding waistcoat, he does not omit to put the wedding ring into the corner of the left-hand pocket. The dress of a groomsman
should be light and elegant; a dress coat, formerly considered indispensable, is no longer adopted.

**ETIQUETTE OF A WEDDING.**

The parties being assembled on the wedding morning in the drawing-room of the residence of the bride's father (unless, as sometimes happens, the breakfast is spread in that room), the happy *cortege* should proceed to the church in the following order:

- In the first carriage, the bride's mother and the parents of the bridegroom.
- In the second and third carriages, bridesmaids.
- Other carriages with the bride's friends.
- In the last carriage, the bride and her father.

**COSTUME OF THE BRIDE.**

A bride's costume should be white, or some hue as close as possible to it.

**COSTUME OF THE BRIDEGROOM.**

Formerly it was not considered to be in good taste for a gentleman to be married in a black coat. More latitude is now allowed in the costume of a bridegroom, the style now adopted being what is termed morning dress; a frock coat; light trousers, white waistcoat, ornamental tie, and white or gray gloves.

**THE MARRIAGE CEREMONY.**

The bridegroom stands at the right hand of the bride. The father stands just behind her, so as to be in readiness to give her hand at the proper moment to the bridegroom. The principal bridesmaid stands on the left of the bride, ready to take off the bride's gloves, which she keeps as a perquisite and prize of her of her office.

**THE WORDS "I WILL."**

are to be pronounced distinctly and audibly by both parties, such being the all-important part of the ceremony as respects
themselves; the public delivery, before the priest, by the father of his daughter to the bridegroom, being an evidence of his assent; the silence which follows the inquiry for "cause or just impediment" testifying that of society in general; and the "I will" being the declaration of the bride and bridegroom that they are voluntary parties to their holy union in marriage.

AFTER THE CEREMONY

the clergyman usually shakes hands with the bride and bridegroom, and the bride's father and mother, and a general congratulation ensues.

THE RETURN HOME.

The bridegroom now leads the bride out of the church, and the happy pair return homeward in the first carriage. The father and mother follow in the next. The rest "stand not on the order of their going," but start off in such wise as they can best contrive.

THE WEDDING BREAKFAST.

The bride and bridegroom sit together at the center of the table, in front of the wedding cake, the clergyman who performed the ceremony taking his place opposite to them. The top and bottom of the table are occupied by the father and mother of the bride. The principal bridesmaid sits to the left of the bride, and the principal bridegroomsman on the left of the bridegroom. It may not be unnecessary to say that it is customary for the ladies to wear their bonnets just as they came from the church. The bridesmaids cut the cake into small pieces, which are not eaten until the health of the bride is proposed. This is usually done by the officiating clergyman, or by an old and cherished friend of the family of the bridegroom. The bridegroom returns thanks for the bride and for himself. The health of the bride's parents is then proposed, and is followed by those of the principal personages present, the toast of the bridesmaids being generally
one of the pleasantest features of the festal ceremony. After about two hours, the principal bridesmaid leads the bride out of the room as quietly as possible, so as not to disturb the party or attract attention. Shortly after—it may be about be about ten minutes—the absence of the bride being noticed, the rest of the ladies retire. Then it is that the bridegroom has a few melancholy moments to bid adieu to his bachelor friends, and he then generally receives some hints on the subject in a short address from one of them, to which he is of course expected to respond. He then withdraws for a few moments, and returns after having made a slight addition to his toilet, in readiness for traveling.

DEPARTURE FOR THE HONEYMOON.

The young bride, divested of her bridal attire, and quietly costumed for the journey, now bids farewell to her bridesmaids and lady friends. A few tears spring to her gentle eyes as she takes a last look at the home she is now leaving. The servants venture to crowd about her with their humble but hearfelt congratulations; finally, she falls weeping on her mother's bosom. A short cough is heard, as of some one summoning up resolution to hide emotion. It is her father. He dares not trust his voice; but holds out his hand, gives her an affectionate kiss, and then leads her, half turning back, down the stairs and through the hall, to the door, where he delivers her as a precious charge to her husband, who hands her quickly into the carriage, springs in after her, waves his hand to the party who appear crowding at the window, half smiles at the throng about the door, then, amidst a shower of old slippers—missiles of good-luck sent flying after the happy pair—gives the word, and they are off, and started on the long-hoped-for voyage.
Practical Advice to a Newly-Married Couple

Our advise to the husband will be brief. Let him have no concealments from his wife, but remember that their interests are mutual; that, as she must suffer the pains of every loss, as well as share the advantage of every success, in his career in life, she has therefore a right to know the risks she may be made to undergo. We do not say that it is necessary, or advisable, or even fair, to harass a wife's mind with the details of business; but where a change of circumstances—not for the better—is anticipated or risked, let her by all means be made acquainted with the fact in good time. Many a kind husband almost breaks his young wife's fond heart by an alteration in his manner, which she cannot but detect, but from ignorance of the cause very probably attributes to a wrong motive; while he, poor fellow, all the while out of pure tenderness, is endeavoring to conceal from her tidings—which must come out at last—of ruined hopes or failure in speculation; whereas, had she but known the danger beforehand, she would have alleviated his fears on her account, and by cheerful resignation have taken out half the sting of his disappointment. Let no man think lightly of the opinion of his wife in times of difficulty. Women have generally more acuteness of perception than men; and in moments of peril, or in circumstances that involve a crisis or turning-point in life, they have usually more resolution and greater instinctive judgment.

We recommend that every husband from the first should make his wife an allowance for ordinary household expenses—which he should pay weekly or monthly—and for the expenditure of which he should not, unless for some urgent reason, call her to account. A tolerably sure guide in estimating the amount of this item, which does not include rent, taxes, servants' wages, coals, or candles, etc., is to remember that in a small, middle-class family, not
exceeding four, the expense of each person for ordinary food amounts to fifteen shillings weekly; beyond that number to ten shillings weekly for each extra person, servant or otherwise. This estimate does not, of course, provide for wine or food of a luxurious kind. The largest establishment, indeed, may be safely calculated on the same scale.

A wife should also receive a stated allowance for dress, within which limit she ought always to restrict her expense. Any excess of expenditure under this head should be left to the considerate kindness of her husband to concede. Nothing is more contemptible than for a woman to have perpetually to ask her husband for small sums for housekeeping expenses—nothing more annoying and humiliating than to have to apply to him always for money for her own private use—nothing more disgusting than to see a man "molly-coddling" about marketing, and rummaging about for cheap articles of all kinds.

Let the husband beware, when things go wrong with him in business affairs, of venting his bitter feelings of disappointment and despair in the presence of his wife and family; feelings which, while abroad, he finds it practicable to restrain. It is as unjust as it is impolitic to indulge in such a habit.

A wife, having married the man she loves above all others, must be expected in her turn to pay some court to him. Before marriage she has, doubtless, been made his idol. Every moment he could spare, and perhaps many more than he could properly so appropriate, have been devoted to her. How anxiously has he not revolved in his mind his worldly chances of making her happy! How often has he not had to reflect, before he made the proposal of marriage, whether he should be acting dishonorably towards her by incurring the risk, for the selfish motive of his own gratification, of placing her in a worse position than the one she occupied at home! And still more than this, he must have had to consider with anxiety the probability of having
to provide for an increasing family, with all its concomitant expenses.

We say, then, that being married, and the honeymoon over, the husband must necessarily return to his usual occupations, which will, in all probability, engage the greater part of his thoughts, for he will now be desirous to have it in his power to procure various little indulgences for his wife's sake which he never would have dreamed of for his own. He comes to his home weary and fatigued; his young wife has had but her pleasures to gratify, or the quiet routine of her domestic duties to attend to, while he has been toiling through the day to enable her to gratify these pleasures and to fulfill these duties. Let, then, the dear, tired husband, at the close of his daily labors, be made welcome by the endearments of his loving spouse—let him be free from the care of having to satisfy the caprices of a petted wife. Let her now take her turn in paying those many little love-begotten attentions which married men look for to soothe them—let her reciprocate that devotion to herself, which, from the early hours of their love, he cherished for her, by her ever-ready endeavors to make him happy and his home attractive.

In the presence of other persons, however, married people should refrain from fulsome expressions of endearment to each other, the use of which, although a common practice, is really a mark of bad taste. It is desirable also to caution them against adopting the too prevalent vulgarism of calling each other, or indeed any person whatever, merely by the initial letter of their surname.

A married woman should always be very careful how she receives personal compliments. She should never court them, nor ever feel flattered by them, whether in her husband's presence or not. If in his presence, they can hardly fail to be distasteful to him; if in his absence, a lady, by a dignified demeanor, may always convince an assiduous admirer that his attentions are not well received, and at once and forever stop all familiar advances. In case of insult, a
wife should immediately make her husband acquainted therewith; as the only chance of safety to a villain lies in the concealment of such things by a lady, from dread of consequences to her husband. From that moment he has her at advantage, and may very likely work on deliberately to the undermining of her character. He is thus enabled to play upon her fears, and taunt her with their mutual secret and its concealment, until she may be involved, guilelessly, in a web of apparent guilt, from which she can never extricate herself without risking the happiness of her future life.

Not the least useful piece of advice — homely though it be — that we can offer to newly-married ladies, is to remind them that husbands are men, and that men must eat. We can tell them, moreover, that men attach no small importance to this very essential operation, and that a very effectual way to keep them in good humor, as well as good condition, is for wives to study their husbands' peculiar likes and dislikes in this matter. Let the wife try, therefore, if she have not already done so, to get up a little knowledge of the art of ordering dinner, to say the least of it. This task, if she be disposed to learn it, will in time be easy enough; moreover, if, in addition, she should acquire some practical knowledge of cookery, she will find ample reward in the gratification it will be the means of affording her husband.

Servants are difficult subjects for a young wife to handle; she generally either spoils them by indulgence, or ruins them by finding fault unfairly. At last they either get the better of her, or she is voted too bad for them. The art lies in steady command and management of yourself as well as them.

An observance of the few following rules will in all probability insure a life of domestic harmony, peace, and comfort:—

To hear as little as possible whatever is to the prejudice
of others; to believe nothing of the kind until you are compelled to admit the truth of it; never to take part in the circulation of evil report and idle gossip; always to moderate, as far as possible, harsh and unkind expressions reflecting upon others; always to believe that if the other side were heard, a very different account might be given of the matter.

In conclusion, we say emphatically to the newly-wedded wife, that attention to these practical hints will prolong her honeymoon throughout the whole period of wedded life, and cause her husband, as each year adds to the sum of his happiness, to bless the day when he first chose her as the nucleus round which he might consolidate the inestimable blessings of home.

"How fair is home, in fancy's pictured theme,
In wedded life, in love's romantic dream!
Thence springs each hope, there every spring returns,
Pure as the flame that upward, heavenward burns;
There sits the wife, whose radiant smile is given—
The daily sun of the domestic heaven;
And when calm evening sheds a secret power;
Her looks of love imparadise the hour;
While children round, a beauteous train, appear,
Attendant stars, revolving in her sphere."

—HOLLAND'S "Hopes of Matrimony."

Golden Rules of Etiquette.

TRUE politeness is merely the practical observance, in small matters, of the "golden rule:" Not to offend the tastes of another; not to annoy him; not to place self before our neighbor, are the basis of all etiquette.

2. State your opinions plainly and mildly. Never talk loudly, nor make broad sweeping assertions.
3. Never offer to back up an opinion with a bet. Of course no gentleman will be guilty of the rudeness of an oath.

4. Always show a deference to age.

5. Never contradict any one flatly; always beg leave, smilingly, not sarcastically, to differ with them.

6. Never anticipate a slight, nor be ever ready to take one.

7. Above all, never give way to abusive argument or a quarrel.

8. Loud laughter and slang phrases are the wit and humor of the jockey and the clown. No lady or gentleman can afford to use them.

**Things to Avoid.**

1. The most despicable figure in society is that of the coarse, purse-proud man or woman, who depends solely upon money for standing and consideration. Next to these, if not in the same rank, is the vulgar creature who knows everything.

2. Never volunteer an opinion, nor try to monopolize the conversation.

3. It is not necessary to be foppish in order to be neat. The fop is as far at one extreme as the slouch is at the other.

4. Dress quietly, but let the material be rich; never dress loudly, and avoid much jewelry.

5. Never wear plated ornaments nor imitation gems.

6. Never whisper in company, nor attempt to monopolize the attention of a person.

7. Abstruse subjects, professional topics, religion and politics should be avoided. “The shop,” as the English designate business affairs, should never enter into social conversation.
8. Indulge but seldom in quotation; never in innuendo, insinuation or punning.
9. Avoid all satire and sneering—the devil is painted always with a sneer upon his lips.
10. Never flatter, nor volunteer advice.
11. Never talk scandal.
12. Never laugh at you own jokes
13. Never correct an error, misquotation nor other mistake of any one.
14. Never interrupt a conversation without good cause, and always apologize for so doing
15. To inveigh against religion, or the nationality or sentiments of any one, is the very worst of taste.
16. Sit or stand at your ease; avoid lolling, h.tching about, playing with your chain or other part of your clothing.
17. Be cool, quiet and collected; avoid haste and worry.
18. The drawing-room comedian is the silliest of the silly. Buffoonery should be left to professional clowns.
20. Never attempt to “show off.”
21. Never bring in such sentences as “When I was in Rome,” or “One day in Paris,” etc.
22. Never make yourself the hero of the adventures you relate. It is homely but wise advise never to “blow your own bugle.”
23. If your opinion is asked on some subject with which you are familiar, give it modestly, not as though it were infallible.
24. The practical joke is both low and cruel; no gentleman or lady would think of indulging in one.
25. Never use any foreign language, not understood by the company, unless there should be some one of that nation present who does not understand English.
26. Never, as it is termed, “take the word out of any one’s mouth.” Be patient, and in due time, no doubt, he
who is speaking will find the word or phase for which he is seeking.

27. Never utter a remark that you think may offend any other of the company.

28. Avoid all profanity and coarse language.

29. Avoid appealing to others to prove your assertions.

**Special Rules of Etiquette.**

1. Be cool, quiet and self-possessed in all situations.

2. When you enter a room, bow to all therein. You can afterwards more particularly salute your friends.

3. Never go into company with soiled clothing; use no musk, and remove all offensive odors from clothes and person.

4. "Cleanliness is next to godliness," and is one of the cardinal points of good breeding.

5. Be courteous to all ladies, whatever may be their rank.

6. Gentlemen never cast slurs upon the softer sex, and he is churlish, as well as ill-bred, who maligns woman in general.

7. Shakspeare gives many excellent general rules for social government, amongst them: "Be thou familiar, but by no means vulgar," showing that even among friends, intimacy should not degenerate into vulgar disregard of all conventionalities.


9. Your dress should be of as rich materials as you can afford, but not flashy. In cut and color it should be quiet and modest.

10. Be prompt in keeping engagements and punctual in meeting all obligations.

11. Avoid borrowing or lending. No man can be independent and but few honest when in debt.
12. In speaking of friends and acquaintances to others, no matter how intimate, give them the prefix of Mr., Miss or Mrs., as the case demands.

13. Avoid sneering and sarcasm.

14. Be not witty at the expense of another; no humor is permissible but that which is perfectly innocent.

15. Punning is a weak apology for wit, and should be eschewed.


17. Never search through a card basket or an album unless invited.

18. Do not be ashamed to tender an apology, if in the wrong. Always accept one with gentle courtesy.

19. If a secret is entrusted to you, never reveal it; it is neither honorable nor honest to give away that which is not yours.

20. Exaggeration is foolish. If you must speak, speak the truth.

21. Never display any form of curiosity; it is a despicable trait of character to be curious about things that do not concern you.

22. Never flatter. A delicate compliment may be innocently offered and well received, but flattery is odious.

23. Do not whisper in society, and avoid signaling to friends in company.

24. Avoid the use of languages unknown to the generality of the company.

25. Never be dogmatic, nor make dictatorial assertions.

26. In entering a house, even your own, always remove your hat, and do not be boisterous or restless.

27. It is better to have no associations than to have evil ones. Good books or good thoughts are better than evil companions.

28. Avoid all profanity, loud talking and boisterous merriment.
29. Never back your opinions with an oath or a bet.
30. At the breakfast table, politely salute all assembled, if it be the first time of meeting for that day. A cheerful “good morning” should be passed between the members of the home circle.
31. Of course, no gentleman will chew tobacco in a church, parlor, or in the presence of ladies.
32. Be natural. Avoid eccentricity and affection.
33. Do not ape any one.
34. Your room is the place for making your toilet. Do not arrange your clothing in company.
35. In company avoid paring or cleaning your nails, picking your teeth, scratching your head, etc.
36. Be not egotistical nor pompous. These faults would cloud the most brilliant genius; how much more so mere ordinary mortals.
37. Volunteer your aid to any lady in distress, or to an invalid or aged person.
38. You cannot afford to let one beneath you in station exceed you in politeness. Be courteous to every one.
39. Boast of nothing; especially not of your wealth, since that is the least qualification of a gentleman.
40. A wife or husband should speak respectfully of each other, and should be mentioned as Mr. ——, or Mrs. ——.
41. Ostentation is silly and vulgar.
42. Never make your ailments or your troubles a topic of conversation, but treat sympathetically those that do.
43. Never contradict in a rude manner. Always point out a mistake with gentle courtesy.
44. Never soil or mark a book that has been lent to you. Return it in good order; and, if unavoidably injured, return it, and a fresh copy also.
45. Never correct a person in grammar, deportment, or in a mistake that does not implicate you in a wrong.
46. Never remark upon the personal deformity or mental peculiarities of acquaintances.
47. Upon the street, the lady must first recognize the gentleman.
48. In dancing, gloves should always be worn.
49. You have no right to forget an engagement. To do so without a prompt and ample apology is equivalent to an insult.
50. A promise made must be carried out, if possible at any cost.
51. No lady ever sneers at, or comments upon, the dress of another in the streets.
52. Avoid all slang and florid adjectives. The conversation, like the manners and morals, should be quiet, chaste, and simple.
53. Learn to say "No," to all evil invitations and promptings; the true gentleman should be courageous as well as kind.
54. No amount of learning, wit and genius can atone for coarseness and ill-breeding.
55. Depend neither on wit, wealth, nor raiment for your status in society.

George Washington's One Hundred Rules of Life
Government.

But few men display, as did the "Father of his Country," the varied talents of the soldier, the statesman, the farmer, and the man of business, and if the code of self-government which he is said to have prescribed to himself at the early age of thirteen, had anything to do with his success—and no doubt it did—it is certainly worthy of the deep consideration of all.

1. Every action in company ought to be some sign of respect to those present.
2. In the presence of others sing not to yourself with a humming noise, nor drum with your fingers or feet.
3. Speak not when others speak, sit not when others stand, and walk not when others stop.

4. Turn not your back to others, especially in speaking.

5. Be no flatterer; neither trifle with any one that does not delight in such familiarities.

6. Read no letters, books or papers, in company except when necessary; then ask to be excused.

7. Come not near the books or writing of any one so as to read them unasked.

8. Let your countenance be pleasant; but in serious matters somewhat grave.

9. Show not yourself glad at the misfortunes of another, though he were your enemy.

10. They that are in dignity or office have in all places precedency; but whilst they are young they ought to respect those that are their equals in birth or other qualities, though they have no public charge.

11. It is good manners to prefer those to whom we speak before ourselves, especially if they be above us—with whom in no sort should we take the lead.

12. Let your discourse with men of business be short and comprehensive.

13. In writing or speaking give to every one his due title, according to his degree and the custom of the place.

14. Strive not with your superiors in argument, but always submit your judgment to others with modesty.

15. When a man does all he can, though it succeeds not well, blame not him that did it.

16. It being necessary to advise or reprehend any one, consider whether it ought to be done in public or in private, presently or at some other time, also in what terms to do it.

17. In reproving any one, do it with no sign of choler, but with sweetness and mildness.

18. Mock not, nor jest at anything of importance.
19. Break no jests that are sharp and biting.
20. Laugh not at your own wit.
21. Wherein you reprove another be unblamable yourself, for example is more impressive than precept.
22. Use no vituperative language against any one.
23. Avoid all blasphemy.
24. Be not hasty to believe disparaging reports against any one.
25. Avoid all gossip and scandal.
26. In your dress be modest. Affect nothing singular or unusual.
27. Go to no extreme of fashion; be well, but not gaudily dressed.
28. Play not the peacock, looking about on every side to see if you be well decked.
29. Never play with your dress in company, nor look at yourself to see if your clothes fit, or if they be awry.
30. Associate yourself with men of good quality, if you esteem your own reputation.
31. It is better to be alone than in evil company.
32. Let your conversation be without malice or envy.
33. When angry, beware of haste; give reason time to resume her sway.
34. Do not urge any one to discover to you his secrets.
35. To reveal the secrets of another is base and dishonest.
36. Do not tell extravagant or marvelous stories.
37. Utter not base and frivolous things amongst grown or learned men.
38. Do not discourse on learned subjects to the ignorant; neither use obscure words or language in conversation with them.
39. Speak not of doleful things in time of mirth, nor at the table. Never speak of melancholy things at inappro-
priate times; of death and wounds; and if others mention them, change, if you can, the discourse.

40. If you must tell your dreams, do so only to intimate friends.

41. Break not a jest when none take pleasure in mirth.

42. Laugh not loudly, nor at all without occasion.

43. Do not talk loudly, nor exhibit a boisterous demeanor.

44. Deride no man's misfortunes, though there seems to be cause to do so; neither laugh at the calamity of any one.

45. Speak not injurious words, neither in jest nor in earnest; scoff at none, even though they give occasion.

46. Be not forward, but friendly and courteous.

47. Salute all who pay you that courtesy; hear and answer politely.

48. During a conversation, affect not sad and pensive airs or abstraction.

49. Neither detract from others, nor be excessive in commending.

50. Go not where you are doubtful of a welcome.

51. Give no advice without being asked; then let it be brief.

52. When two are contending, take not the part of either.

53. In indifferent matters, go with the majority.

54. Do not presume to correct the mistakes of others; that is the privilege of parents, masters and superiors.

55. Gaze not rudely on any one; neither note their deformities or peculiarities.

56. Do not use any foreign tongue in company, except to one ignorant of English.

57. Let your conversation be modest, and your language that of good society.

58. Speak plainly; do not drawl out your words, nor speak through your nose.
59. Treat solemn and sacred things with reverence.
60. Let your conversation indicate thought; silence is better than idle talk.
61. When another is speaking, be attentive. Should he hesitate for words, do not supply them. Never interrupt another while talking.
62. Select the proper time to talk upon any kind of business.
63. Never whisper in the company of others.
64. Make no odious comparisons.
65. Should you hear any one commended for any act, commend not another for the same or a greater action.
66. Be not curious to learn the affairs of others.
67. Never intrude yourself upon others that speak in private.
68. Undertake not what you cannot perform; make no promises you cannot fulfill.
69. Never attempt in an argument to bully others; give to every one perfect liberty in expressing himself, and always be willing to submit to the majority.
70. Be not tedious in discourse; make not many digressions, nor repeat the same tales.
71. Speak not ill of the absent; it is both cowardly and unjust.
72. Let all your pleasures be pure and manly.
73. Neither speak nor laugh when your superiors are talking; listen respectfully and without impatience. Never be angry at the table; if annoyed, conceal your vexation, lest others, too, be made unhappy.
74. Jog not the table or desk at which another is reading or writing.
75. Lean not on any one, nor slap fiends and acquaintances on the back or shoulder.
76. Affect not singularity in dress, manner or conversation.
77. Avoid many and extravagant adjectives.
78. Never look on when another is reading or writing.
79. Avoid sudden friendships.
80. Distrust those that protest vehemently.
81. Make no friendships with silly or evil persons.
82. Never seem to indorse any one that is disreputable.
83. Is best to avoid association with those who show any disrespect for old age.
84. Observe the customs of those older and wiser than yourself.
85. Avoid becoming a borrower or lender of money.
86. Never do any action of which you have not well studied the consequences.
87. Be neither prodigal nor miserly; avoid both extremes.
88. A good listener is more esteemed by all than a good talker.
89. Avoid all vulgar ostentation; do nothing for show.
90. Be upright in all dealings.
91. Never be outdone in courtesy or politeness.
92. Live temperately, but be not ascetic.
93. Avoid hypocrisy; never seem to be what you are not.
94. Avoid fanaticism and be not dictatorial nor too positive.
95. Never oppress nor deride those weaker, poorer or more ignorant than yourself.
96. Avoid all games of chance, especially with those who make a proposition of cards or dice.
97. Never attempt to make good an assertion with a wager.
98. Live not only honestly, but honorably; be chaste, moral and correct in all things.
99. Obey your parents in all things.
100. Revile not religion; when you speak of God, His works or attributes, do so reverently, and in church let your conduct be serious and solemn.
A PUBLIC meeting is the assemblage of a portion of the people, for the expression of opinion upon matters of local or general concern. The proceedings are but few and simple; yet, to preserve order during its session, and to give effect to its action, the meeting has to be guided by defined rules from the time of its projection to the moment of its close.

A Democratic Meeting!

The citizens of Blank, in favor of the policy of the Democratic party, are requested to meet on Saturday evening, September 9th, at the house of Jasper Glyde, Bridge street, at 7 o'clock, to take such measures as are deemed advisable to promote the success of the party in the coming election.

The notice is also published in the county newspaper, should there be one.

Meanwhile, the proposers of the affair, either after a caucus or individually, obtain the consent of some speaker, say a Mr. Joseph Becker, to be present and give his views on public topics. In that case, the advertisement closes with an announcement like this:

"A. B., Esq., has accepted an invitation to address the meeting."

The projectors meanwhile meet in caucus, and agree upon officers. They select for chairman Mr. Charles Kendrick, an old resident and a man of standing, and Mr. John Travers, to act as secretary, and these gentlemen consent to take the positions assigned them.
When the evening comes, and the meeting has assembled, no business is begun until half an hour after the hour named. This interval is called "thirty minutes' grace," and is always allowed, through custom, for the difference in watches.

At 7½ o'clock, Mr. William Irwin steps forward and says:

"The meeting will please come to order."

Every one hereupon suspends conversation, and, as soon as all is quiet, Mr. Irwin continues:

"I move that Mr. Charles Kendrick act as President of this meeting."

Mr. Parke Neville says:

"I second the motion."

Then Mr. Irwin puts the question thus:

"It has been moved and seconded that Mr. Charles Kendrick act as President of this meeting. So many as are in favor of the motion will signify their assent by saying 'aye!'"

As soon as those in the affirmative have voted, he will say:

"Those who are opposed, will say 'no!'"

If there are more ayes than noes, as there will be, unless Mr. Kendrick be very unpopular indeed, he will say:

"The ayes have it. The motion is carried. Mr. Kendrick will take the chair."

If, on the country, the noes prevail, he will say:

"The noes have it. The motion is lost."

Thereupon he will nominate some other, or put the question upon other nominations.

As soon as a chairman is chosen, he will take his place Mr. Thomas Turbot then says:

"I move that Mr. John Travers act as secretary of this meeting."

This motion is seconded, and the chairman puts the question and declares the result.
The form of putting the question to the chairman may be simplified thus:

"Mr. Charles Kendrick has been nominated as president of this meeting. Those in favor, will say 'aye!'—Contrary opinion, 'no!'"

The meeting is now organized. The chairman will direct the secretary to read the call. When that has been done, he will say:

"You have heard the call under which we have assembled; what is your further pleasure?"

Hereupon, Mr. John Smith says:

"I move that a committee of three be appointed to draft resolutions expressive of the sense of this meeting."

This is seconded.

The chairman then says:

"Gentlemen, you have heard the motion; are you ready for the question?"

If any one desires to speak against the resolution, he arises and says:

"Mr. Chairman!"

The chairman turns toward the speaker, and listens to him, and so to each in succession. When they are all done, or in case no one responds to the call, he puts the question in the customary form previously given, and declares the result.

The resolution being adopted, the chairman says:

"How shall that committee be appointed?"

If there be no reply, or a reply of "chair," the chairman names the mover of the resolution and two others as a committee. The committee withdraws to prepare the resolutions, or to examine those previously prepared for the purpose.

During the absence of the committee is the proper time for the speaker or speakers to address the meeting. When the speeches are over, the chairman of the committee comes forward and says:
"Mr. Chairman, the committee begs leave to report the following resolutions:"

He then reads the resolutions, and hands them to the secretary.

The chairman now says:
"You have heard the report of the committee; what order do you take on it?"

Some one now moves that the report be accepted, and the resolutions be adopted. To save time, the chairman will put the question solely on the adoption of the resolutions. If no objection is made, and no amendment offered, he will put the question, and declare the result.

As a general thing, a committee may be avoided, as a useless formality, and the resolutions be offered by one of the projectors of the meeting.

So soon as the resolutions are adopted, and the speeches are over, the chairman should ask:
"What is the further pleasure of this meeting?"

If there be no further business, some one moves an adjournment. The chairman does not ask if the meeting be ready for the question, since an adjournment is not debatable, but puts the question direct. If carried, he says:
"This meeting stands adjourned without day."

If the meeting thinks proper to adjourn to meet at another time, the time is fixed by a previous resolution, and then, when it adjourns, the chairman declares it adjourned to the time fixed upon.

It will be seen that the foregoing form, by varying the call, and changing the business to suit, will answer for any other political party, or for any other purpose.

When a public meeting is called by any executive or other committee, the name of the chairman of that committee should be appended to call, and the committee itself should prepare business for the action of the meeting, as much as possible.

The duty of the secretary of a public meeting is merely nominal, unless it is desired to publish an account of its pro-
ceedings. In the latter case, the record of the foregoing meeting, which is a form for any other meeting, varied under the circumstances of the case, would read thus:

"At a meeting of the Democratic citizens of Blank, held pursuant to public notice, on Saturday evening, September 9th, at 7 o'clock, at the house of Jasper Glyde, Mr. Charles Kendrick was called to the chair, and Mr. John Travers appointed secretary.

"On motion of Mr. John Smith, a committee of three, consisting of Messrs. John Smith, Henry Magraw, and Casper Evans, was appointed to draft resolutions expressive of the sense of the meeting.

"During the absence of the committee, the meeting was effectively addressed by Joseph Becker, Esq.

"The committee, through its chairman, reported the following resolutions, which were unanimously adopted:

[Here the secretary inserts the resolutions.]

"On motion the meeting adjourned."

Organizing Associations.

When it is advisable to form a society, club, or other association, for any specific purpose, those who agree in regard to its formation may meet upon private notice or public call. The mode of organizing the meeting is similar to that of any other.

As soon as the meeting has been organized, and the chairman announces that it is ready to proceed to business, some one of the originators, previously agreed upon, should rise, and advocate the formation of the club or society required for the purpose set forth in the call, and end by moving the appointment of a committee to draft a constitution and by-laws. This committee should be instructed to report at the next meeting. A convenient time of adjournment is fixed on, and if there be no further business, the meeting adjourns.
When the time for the second meeting arrives, the same officers continue, without any new motion. If either be absent, his place is supplied, on motion, by some other. The Committee on the Constitution and By-laws reports. If the constitution is not acceptable, those present suggest amendments. As soon as it has taken the required shape, it is adopted, and signed by those present. The by-laws are treated in the same way.

The society is now formed, but not fully organized. The officers provided for by the constitution have now to be elected. This may be done at that meeting, or the society may be adjourned over for that purpose. So soon as it has been done, the chairman of the meeting gives way to the newly-elected president, or, in his absence, to a vice-president; the secretary of the meeting vacates his seat, which is taken by the newly elected secretary or secretaries, and thus the organization of the new body is complete.

Public Celebrations.

Public celebrations may be made by some public society, or by the citizens at large. If by the latter, a meeting is generally called, subject to the customary rules, and a committee of arrangements appointed, who take charge of the business. A society appoints a like committee.

The committee of arrangements meet, and appoint a chairman and secretary. As soon as this is done, the mode of celebration is determined upon. In the case of the Fourth of July, some fit person is generally invited to deliver an oration, and another to read the Declaration of Independence. A sub-committee is appointed to secure a proper room, unless the celebration takes place in the open air, when the committee has in charge the erection of a stand.
The proper sub-committees are:

1. On correspondence. The duty of this committee is to invite such distinguished guests as are desirable.

2. An orator. This committee invites the orator selected.

3. On place. This committee attends to hiring a room and fitting it up, or, if it be an out-of-door celebration, see to the erection of a stand for the officers and speaker, and seats for the auditors.

4. On printing. This committee attends to the necessary advertising and printing.

All these report their action to the main committee as it adjourns from time to time.

The day having arrived, at the hour named, the officers and speakers being ready, and the audience assembled, the chairman of the committee of arrangements calls the meeting to order, nominates the president of the day, and puts the question on his acceptance. The latter now takes his seat, and the other officers are appointed. So soon as this is done, a clergyman, if there be one named for the purpose, delivers a short prayer. The chairman of the day next announces by name the reader of the Declaration, and says:

"Mr. [naming him] will read the Declaration of Independence."

The Declaration being read, the chairman says:

"Mr. [naming him], the orator of the day."

The orator now comes forward, and delivers his oration, at the close of which the exercises are determined, and after a benediction, if a clergyman be present, the meeting adjourns without any formal motion.

If a band of music can be had, it is always engaged on such an occasion, and plays national and patriotic airs previous to the taking the chair, at the close of the proceedings, and at the various intervals.

The public celebration of their own anniversaries by public societies, if done by orations, follows the same form.
Conventions.

A convention is a number of delegates assembled for the purpose of carrying out the views of constituents, and is gifted with powers over that of an ordinary meeting. It is the legislature of a party; and, consequently, is governed by the same rules of action, or very nearly, as any other legislative body.

A convention may be called, either by some committee gifted with the power, or by invitation of the leading friends of a particular cause or measure. The call should contain some general directions as to the mode of electing delegates.

The night before the meeting, it is usual for the friends of particular men or measures, among its delegates, to hold a caucus, in order to devise the plan of action necessary to secure the success of the man or measures they prefer. Here they discuss acts and views with a freedom which cannot be permitted in open convention, and agree upon their common ground on the following day. Part of their proceedings will leak out in spite of all precaution; but care should be taken to admit none but those who are friendly, in order that as much secrecy as possible may be attained.

There are two sets of officers in a convention — temporary and permanent. The first is merely for the purpose of conducting the business preparatory to organization. The possession of the permanent president is often a matter of great importance when there are two parties in a convention. If the temporary president appoints the committee which is to nominate permanent officers, it may be important to gain him. In that case there is a struggle who shall nominate first, and sometimes there are several nominations for temporary chairman. To avoid this indecent competition, it is usual to give the delegation from each county, district, or township, the right to name one member of the committee on permanent organization. Until the permanent officers
have been chosen, and have taken their seats, none but pre-
liminary business is to be transacted.

The whole machinery of a convention resembles that of
one of the houses of legislature. But a convention for a
political or social purpose, never formally goes into committee
of the whole. When there is an interval, and the main body
is waiting for the report of a committee, or after the business
is done, and previous to adjournment, it is customary to call
on various prominent men to address the convention, which
thus goes into quasi-committee, without the formality of a
motion.

Frequently, the permanent chairman of a convention is
chosen on account of his wealth or position; but the cus-
tom is a bad one. A convention is essentially a business
convocation; the time of its members is more or less valu-
able; and no chairman should be installed unless he is
familiar with the duties of his position, and capable of con-
ducting affairs with promptness, dignity, and force.

It is a custom to give the thanks of the convention to its
officers, just previous to adjournment. In that case, the
member who makes the motion puts, himself, the question
upon its adoption, and declares the result.

**Forms of Constitutions.**

A constitution is the formal written agreement making
the fundamental law which binds the parties who associate.
In preparation of this, useless words should be avoided.

The constitution, after having been adopted, should be
engrossed in a blank book, and signed by the members.
Amendments or alterations should be entered in the same
book, with the date of their adoption, in the shape of a copy
from the minutes; and a side-note inserted in the margin of
the constitution, opposite the article amended, showing on
what page the amendment may be found.
Lyceums or Institutes.

Preamble.—Whereas, experience has shown that knowledge can be more readily acquired by combination of effort than singly, we, whose names are hereunto annexed, have agreed to form an association to be known as [here insert title], and for its better government, do hereby establish the following constitution:

Article I.—The name, style, and title of this association shall be [here insert name], and its objects shall be the increase and the diffusion of knowledge among its members.

Article II. 1. The officers of this association shall consist of a president, two vice-presidents, a corresponding secretary, a recording secretary, a treasurer, a librarian, and a curator, who shall be elected annually on [here insert time of election and mode, whether by open voice or by ballot].

2. The said officers shall hold their offices until their successors shall have been elected; and their powers and duties shall be similar to those of like officers in like associations.

Article III.—There shall be appointed by the president, immediately after his election, by and with the consent of the association, the following standing committees, to consist of five members each, namely: on finance, library, museum, lectures, and printing, who shall perform such duties and take charge of such business as may be assigned to them by vote of the association.

Article IV. 1. Any person residing within [here state limits], who is above the age of twenty-one years, may become a resident member of this association, by consent of a majority of the members present at any stated meeting succeeding the one at which his name shall have been proposed; any person residing without the limits aforesaid may be chosen, in like manner, a corresponding member;
and any person who is eminent in science or literature, may be elected an honorary member.

2. Each and every resident member, upon his election, shall sign this constitution, and pay over to the recording secretary the sum of [here insert the sum], and shall pay the like sum annually in advance; but no dues or contributions shall be demanded of corresponding or honorary members.

Article V.—1. This association shall be divided in the following sections, namely: 1. Natural Science; 2. Arts; 3. History; 4. Agriculture and Horticulture; 5. Mental and Moral Philosophy; 6. General Literature; to each of which sections shall be referred all papers or business appropriate to its department; and to one or more of these sections each member, immediately after his election, shall attach himself.

2. Each section shall report, from time to time, upon the business intrusted to it, as this association shall direct.

Article VI.—This association shall meet monthly [here insert time], and at such other times as it may be called upon by the president, upon the written request of six members; of each of which meetings due notice shall be given, and at each and all of these meetings six members shall constitute a quorum for the transaction of business.

Article VII.—The rules of order embraced in "The Rules of Debate and Chairman's Assistant," shall govern the deliberations of this association so far as the same may apply; and the order of business therein laid down shall be followed, unless suspended or transposed by a two-thirds vote.

Article VIII.—Any member who shall be guilty of any public, felonious offense against the law, or who shall persevere in a course of conduct degrading of itself or calculated to bring this association into odium, may be expelled by a two-thirds vote of the members present at any stated meeting; and any member who shall neglect or refuse to
pay his dues for more than one year, shall thereby cease to be a member of this association; but no member shall be expelled until due notice shall have been given him of the charges brought against him, and until he shall have had the opportunity of being confronted with his accusers, and of being heard in his own defense.

Article IX.—This constitution may be altered, amended, or abrogated, at any stated meeting, by a vote of two-thirds of the members present; provided, that written notice of said alteration, amendment, or abrogation, shall have been given at a previous stated meeting.

Duties of Officers—The Presiding Officer.

The chairman should have made himself fully acquainted with the rules of order and the usages of deliberative bodies. He should be prompt, dignified, and impartial. He should be quick of eye to note any member who rises, and quick of speech to declare him in possession of the floor. He should suffer no member to violate order, without instant rebuke. His voice should be steady, distinct and clear, so that all may hear readily. When he puts the question, states a point of order, or otherwise addresses the body, he should rise; and when he has finished, resume his seat. His constant attention is necessary, and his eye should never wander from the speaker before him; nor should he, in any way, show a neglect of the business. No matter what disturbance may arise, his coolness and temper must be preserved. If his decision be appealed from, she should show no resentment—an appeal being a matter of privilege—but should put the appeal in the same indifferent manner as though it were an ordinary question. He should always remember that he has been placed there to guide and control the machinery of the moment, and not to give his own views, or display his own abilities in an organized associa-
tion. He will sign all orders for the payment of money, ordered by the body.

The Recording Officer.

The secretary or clerk, at the commencement of proceedings, will seat himself at his table; and, at the order of the chairman, will read the minutes of the previous meeting. He must note down the proceedings, and write them down in full, previous to another meeting. He must file all resolutions and other papers before the body, and allow none to go from his custody without due authority. He must read all resolutions and papers, when requested to do so by the chair. He must turn over his records and papers in good order to his successor on leaving his office. He must countersign all orders on the treasurer, which have been signed by the president, as this counter-signature is the evidence that the society has approved the order.

The Treasurer.

The treasurer must enter, in a book to be provided for the purpose, all money received, and all payments made, on account of the body. He must pay out no money, except on an order, signed by the president, and countersigned by the secretary. He must retain these orders, as his vouchers. He must turn over his books, in good order, to his successor on leaving his office. He must give bonds in such needful sum as it deems best, if the body require.

The Librarian.

The librarian will take upon him the charge of the books and manuscript not pertaining to the duties of other officers. Of these he must keep a catalogue. He must
keep a record of all books borrowed, by whom and when returned; and must only loan them under such regulations as the body see fit to adopt. He must turn over his catalogue and records to his successor on leaving his office.

The Curators.

The curators will take charge of all specimens of nature or art, or otherwise, and all property of the body, not in charge of other officers. This they will have catalogued, and will keep it under such restrictions as may be imposed on them by the main body. They must turn over their catalogue papers and property to their successors on leaving their office.

The Committee on Correspondence.

The committee will take charge of all correspondence ordered by the body, and if there be no corresponding secretary, will conduct it with all parties, at direction of the body, through its chairman. It will report, from time to time, as directed, and will keep copies of letters sent, and a file of those received, which it will turn over to its successors, on its discharge. If there be a corresponding secretary, he will perform the duties assigned above to the committee of correspondence.

The Committee on Finance.

The committee on finance will devise the ways and means to obtain the necessary funds for the body, and report thereon from time to time; and will attend to such other duties as may be assigned to them.
Other Committees.

Other committees will attend to such business as may be assigned to them by the main body, reporting thereon as may be required.

By-Laws.

The old custom of appending a distinct set of By-Laws has fallen into disuse. The main points will be found embodied in the Constitution in the forms given. Any others, or any modifications of the rules necessary, may be provided for in the Constitution, or enacted by a majority vote. But, if it be thought necessary, that portion of the Constitution that contains provisions that were formerly so placed, can be made distinct.

Official Forms—The President.

On taking his seat, says:

"The meeting [or society, or club, or association, as the case may be] will come to order."

If there have been a meeting previous:

"The secretary will please to read the minutes."

After the minutes have been read:

"You have heard the minutes of the previous meeting read. What order do you take on them!"

When a motion has been made and seconded:

"It has been moved and seconded that [here state the motion]. Are you ready for the question?"

If a member arises to speak, recognize him by naming him by his place, or in any way which will identify him without using his name, if possible.

In putting the question:

"It has been moved and seconded that [here state the
motion. So many as are in favor of the motion will signify their assent by saying 'Aye!'

When the ayes have voted, say:
"Those to the contrary opinion, 'No!'

Or, have the resolution read, and say:
"It has been moved and seconded that the resolution just read be passed. So many as are in favor," etc.

On a call for the previous question:
"Shall the main question be now put? Those in the affirmative will," etc.

On an appeal, state the decision, and, if you think proper, the reasons therefor, and that it has been appealed from, and then:
"Shall the decision of the chair stand? Those in the affirmative," etc.

Should it be sustained, say:
"The ayes have it. The decision of the chair stands as the judgment of this meeting" [or society, etc., as the case may be].

Should it not be sustained, say:
"The noes have it. The decision of the chair is reversed."

In announcing the result of a question, if it be carried, say:
"The ayes appear to have it—the ayes have it—the motion [or amendment, as the case may be] is carried.

If it be lost:
"The noes appear to have it—the noes have it—the motion is lost."

If a division be called for:
"A division is called for. Those in favor of the motion will rise."

Count them. When counted, announce the number, and say:
"Those opposed will rise."

Count them, report the number, and declare the result.
If the yeas and nays be called for, and no objections be made, he states the question, if needed, and says:

"As the roll is called, members will vote in the affirmative or negative. The secretary will call the roll."

After the ayes and nays have been determined, the chairman states the number and declares the result.

If no quorum be present at the hour of meeting, after waiting a reasonable time, he says:

"The hour for which this meeting was called having arrived and past, and no quorum being present, what order is to be taken?"

Or, he may simply announce the fact, and wait for a member to move an adjournment.

If during a meeting some member calls for a count, he counts, and announces if a quorum be present or not. If not, he says:

"This meeting is in want of a quorum. What order is to be taken?"

Or he may state the fact only, and wait for a motion to adjourn. But while there is no quorum present, business must be suspended.

After the minutes have been adopted, he says:

"The next business in order is the reports of standing committees."

If none, or after they have reported, he says:

"The reports of special committees are next in order."

And so he announces each business in its proper succession.

When the hour for the orders of the day arrives, on call of a member, he says:

"Shall the orders of the day be taken up? So many as are in favor," etc.

In case of disorder in committee of the whole, which its chairman cannot repress, the presiding officer may say:

"The committee of the whole is dissolved. The society [or club, or association, as the case may be] will come to order. Members will take their seats."
He will then take the chair, instead of the chairmain of the committee of the whole.

In taking the question on amendment, he says:

"The question will be on the amendment offered by the member from [naming his place, or otherwise indicating him]," and then puts the question.

If on an amendment to an amendment, then:

"The question will be on the amendment to the amendment," and the rest as before.

If either the amendment or the amendment to the amendment be carried, he will say:

"The question now recurs on the resolution as amended. Are you ready for the question?"

And if no member rises to speak, he will put the question.

On the motion to amend by striking out words from a resolution, he says:

"It is moved to amend by striking out the words [naming them]. Shall those words stand?" And then he put the question.

Objection being made to the reading of a paper, he will say:

"Shall the paper [naming it] be read?" and then put the question.

And on an objection being made to the reception of a report, he will say:

"Shall the report of the committee be received?" and after the demand he puts the question.

When in doubt as to which member was up first, he says:

"The chair is in doubt as to which member is entitled to the floor. The society [or club, or association, as the case may be] will decide. Was the gentleman from — — [indicating any one] first up?" And puts the question. If the body decide against that member, he puts the question on the next, and so through, until the society decides that
some one of them has the floor. If but two contend, how-
ever, and the society decide against the first named, the
decision virtually entitles the other to the floor without
further vote.

If a member is out of order, he will say:

The member [indicating him] is out of order." He will
make him take his seat, and then state wherein the mem-
ber is out of order.

If the point of order is raised by a member he will say:

"The member [indicating him] will state his point of
order." When this has been done, he decides the point.

On a question of the time of adjournment, he says:

"It has been moved and seconded that when this meet-
[or club, etc., as the case may be] adjourns, it adjourn to
[naming time and place]. Are you ready for the question?" And if no one rises to speak, puts the question.

On a question of adjournment, he says:

"It has been moved and seconded that this meeting [or
club, etc.] do now adjourn;" and puts the question.

When adjournment is carried, he says:

"This society [or club, etc.] stands adjourned to" [nam-
ing time and place]; or if without any time, he says:

"This society [or club, etc.] stands adjourned without
day"

The Recording Secretary.

The secretary commences his minutes thus:

"At a stated [or special, or adjourned stated, or ad-
journed special, as the case may be] meeting of [here insert
the name of the body], held on [here insert the time and
place of meeting], Mr. [insert chairman’s name] in the
chair, and [here insert secretary-s name] acting as sec-
retary—

"The minutes of the preceding meeting were read and
approved."
If the reading of the minutes was dispensed with, say so, instead of the preceding line.

Then give a statement of what was done, without comments, as succinctly as possible, down to the adjournment.

In countersigning an order for money, or in giving a certified copy of the minutes, or an extract from them, always sign the name on the left-hand corner of each sheet except the last. On the last, the signature on the same corner should be preceded—if an order for money—by the word testes or attest; and if it be a copy of minutes, by the words, "A true copy of the minutes."

In case of an adjournment for want of a quorum, say:
"At a stated [or special, etc.] meeting called at [name place and time], no quorum being present, the meeting adjourned."

In recording the yeas and nays, prepare a list of the members, or have it on hand, and after the name of each have two columns ruled.

Where a member votes "aye," write it in the first column, or head one column "aye," and the other "no," and make a mark in the proper column, opposite the name. Where he votes "no," write it on the second. Add up, and enter the number at the foot of each column. Indorse the resolution or motion voted upon the back of the list.

Where a report is made, it is not necessary in the minutes to do more than give an abstract of its contents, or a sentence or two indicating its nature. The report should, however, be indorsed with its title, and the date of its report, and filed.

A list of the orders of the day should always be made out previous to every meeting, for the convenience of the presiding officer.

**Corresponding Secretary.**

In addressing a letter for the body, write the words "Corresponding Secretary," as concluding part of the sig-
nature, and retain a copy of the letter sent, with a record of the time it was dispatched, stating whether by mail or private hand.

**The Treasurer.**

The form of account of the treasurer is very simple. But where the accounts are complicated, a regular set of books should be opened, and kept by double entry.

**The Committees.**

The chairman of the committee of the whole, when the committee has risen, will say to the president of the main body, if it have concluded its business:

"Mr. President: The committee of the whole has, according to order, gone through the business assigned to it, and asks leave to report."

Leave being granted, he reports what has been done.

Or, not having concluded—

"The committee of the whole has, according to order, considered the business assigned to it, and made progress therein, but not having time to conclude the same, asks leave to sit again."

Or, if rising from the want of a quorum—

"The committee of the whole has, according to order, considered [proceed to consider] the business assigned to it, but has risen for want of a quorum."

In putting the question for rising—

"It has been moved and seconded that this committee do now rise and report [or report progress]. So many as are in favor," etc.

All written reports are headed after a similar form. If from a standing committee, thus:

"The committee on [insert name of committee] respectfully report ——." And then let the report follow.
If a special committee —

The committee to which was referred [here state the special matter of reference], have considered the same, and respectfully report," etc.

And all reports conclude with:
"All of which is respectfully submitted."

A minority report is headed:
"The undersigned, the minority of a committee to which was referred," etc.

And concludes as in a majority report.

Rules of Order—Quorum.

1. A quorum is a sufficient number to legally transact business. A majority of the members of any association constitutes a natural quorum; but a smaller number is usually made a quorum by a provision to that effect in the constitution or by-laws, through motives of convenience.

2. If there be a quorum present at the hour named for the meeting, or within thirty minutes thereafter, the presiding officer takes the chair, and calls the association to order; if not, he waits a reasonable time, and from the chair announces that no quorum is present. Thereupon no further business is in order, except to adjourn for want of a quorum, but it will be in order to call the roll of members and to make endeavor to obtain the presence of enough to form a quorum.

3. During the transaction of business, should it be observed that no quorum is present, the chair may announce the fact, or any member may call for a count. If, on counting, it be found that there is no quorum, business is suspended until a quorum be found. If not to be had, the meeting must be adjourned.

4. If, on calling the ayes and noes, or on division, a quorum be not found, the vote is null, and at the next meet-
ing the unfinished business is in the exact state it was when the absence of a quorum was discovered.

Call.

1. On a call of the body, each member rises as he is called, and answers to his name, and the absentees are noted. In a small body it is not necessary to rise.

Minutes.

1. The presiding officer having taken the chair, and a quorum being present, the minutes are read. If there be any mistakes in the record, these are amended, and then the minutes are adopted. If, under any circumstances requiring haste, or in the absence of the journal, the reading of the minutes be suspended, they may be either read and adopted at another stage of the proceedings, or at the next succeeding meeting. Nevertheless, the minutes being a record of facts, any error subsequently discovered may be amended at any time. This may be done by unanimous consent; or, if objections be made, then any member who voted in the affirmative on their adoption, can move a reconsideration of the motion to adopt. This last motion prevailing, the minutes are open to amendment; and after being amended, the motion on their adoption as amended is put.

2. The rule of record in ordinary associations is somewhat different from that in legislative bodies. The minutes of the former stand in lieu of the journals of the latter. The former never contain a question which is interrupted by a vote to adjourn, or to proceed to the order of the day: the latter always do. Even propositions withdrawn, or ruled out of order, may be entered, as so treated. The
minutes are to be full and explicit, and a true record of all that was done, but not of all that was said, unless the latter be necessary to a clear understanding of the business.

3. Proceedings in committee of the whole are, of course, not entered on the minutes—the entry merely that the committee rose and reported thus and so, and what was done thereon by the association.

**Presiding Officer.**

In the absence of the president, or in case he declines, the vice-president takes the chair. If there be more than one vice-president, then they take it in their numerical order, unless the association, by vote, designate a particular one. If neither president nor vice-president be present, some member is called to act temporarily as chairman, on motion put by the mover thereof.

**Recording Officer:**

In the absence of the secretary, or, if more than one, in the absence of all, a temporary secretary must be appointed on motion.

**Arrangement of Business.**

This, in associations, is usually provided for in the by-laws. If not otherwise provided for, it is as follows: 1. Reading the minutes. 2. Reports of standing committees. 3. Reports of special committees. 4. Special orders. 5. Unfinished business. 6. New business. The election of new members, unless otherwise ordered, is always in order; and the election of officers ranks as a special order; but an election of members is not in order while other business is pending, or while a member has the floor.
Orders.

There is only one case where a member has a right to insist on anything, and that is where he calls for the execution of an existing order. No debate nor delay can be had on it; but where it is for an order of the day, fixing some particular business to be taken up, then the president, on call of a member, puts the question whether the association will proceed to the order of the day. If it is decided in the negative, that is, in effect, a reversal of the former order, and the association decides to proceed to other business.

Committees.

1. Standing committees are appointed under the constitution or by-laws of the association, or by resolution, and sit permanently, while special committees are usually appointed by resolution to attend to some particular business, which being done, they are usually discharged.

2. The first-named person acts as chairman of any committee. It is true that the committee possesses the inherent power to choose its own chairman; but custom prevents this power from being used. Should a committee select some other than the first-named as chairman, it would be considered a wanton insult.

3. It is always proper to place the mover of a successful motion on any committee arising through his resolution, and to name him first; but if the committee is upon an inquiry into his conduct, or where its deliberation concerns himself personally, or his manifest interest, the rule is not followed.

4. As near as they will apply, the rules of order of the main body govern the deliberations of committees.

5. A committee to whom a resolution or affirmative proposition is committed should always have a majority of mem-
bers, if they can be had, favorable to such resolution or proposition.

6. Unless otherwise ordered, the chair appoints all committees.

7. When there is a standing committee on any subject, anything referring to such subject should be referred to that committee alone; but it may be given to a special committee, if the association think proper.

8. Standing committees require no order to report. They are always in session, and should report at every meeting, if only to report progress,

9. A committee cannot sit while the main body is in session, unless so ordered to do.

10. A majority of a committee must concur in a report; but the minority are never refused leave to bring in a counter report.

11. Sometimes a majority cannot be found, when the committee should report the fact of their disagreement, and ask leave to be discharged; they are then to be discharged, and either a new committee raised, or the subject brought before a committee of the whole, or before the main body.

12. Persons appointed upon a committee should join that committee so soon as they are notified of their appointment, unless they are excused; as it is the duty of the first named member of the committee to call his fellows together as soon as possible.

Committee of the Whole.

1. If it be necessary to go into committee of the whole society, either for a general or specific purpose, it is done by motion, when the chairman vacates the chair, and calls some member to it to act as chairman; though the committee of the whole, if it chooses, can select another chairman, like any other committee. This it never does.

The quorum of the committee is the same as that of the
main body. If a quorum be found wanting, the committee has to rise, the regular chairman takes his seat, and the chairman of the committee informs him that the committee rises for want of a quorum. Then the usual course is taken in regard to the absence of a quorum.

2. If any communication be made to the main body while in committee of the whole, the committee cannot receive it. If its reception be necessary, the committee have to rise.

3. If there be confusion and disturbance in committee of the whole, the president may take the chair, declare the committee dissolved, and reduce the body to order. In that case it requires another motion for that committee to sit again.

4. A committee of the whole cannot adjourn, but it must rise. It cannot take the previous question, nor take the ayes and noes.

5. If the business before the committee of the whole be unfinished, it rises on motion, the regular presiding officer takes the chair, and the chairman of the committee reports that the committee of the whole have, according to order, considered the business assigned to them, and have made progress therein, but, not having time to conclude the same, ask leave to sit again. Leave is then granted on motion. If the motion be a special one, and it is concluded, the motion is that the committee rise and report proceedings; then, when the president takes the chair, the chairman of the committee reports that the committee have gone through the business referred to them, and ask leave to report. Leave is then given to report then, or at some other time, either by motion, or, should there be no objection, on the call of some member.

6. In committee, members may speak oftener than once on the same subject, and are not confined strictly to the subject-matter. With these and the foregoing exceptions, the same rules of order govern a committee of the whole as govern the main body.

7. A motion to rise and report progress is in order at
any stage of the business, and is to be decided without debate. When they have reported, they may be discharged on motion, which brings the matter laid before them directly before the association itself.

Committment.

1. If it be desired to refer a resolution, address or other matter, to a committee, it is done on motion. If to a special committee, the chair names the committee. Any member present may suggest one member on that committee, and if the main body do not object, the chair will name him, since the silence of members in that case is equivalent to a direct appointment of that person by the association. But such a course is unusual, and generally improper.

2. Though the majority on a committee should be favorable to a measure, the minority may be of those who are opposed to it in some particulars. But those totally opposed to it should never be appointed; and if any one of that view be named, he should rise and state the fact, when the main body will excuse him from serving.

3. If it be a written matter which is referred, the secretary delivers it to the first named of the committee.

4. A committee meets when and where it pleases, unless the time and place is fixed for it. But it cannot act unless its members assemble together.

5. The committee cannot change the title or subject of the matter before it, but otherwise have full power over it.

6. If it be a written matter before it, if it originate with the committee, the writing must be considered paragraph by paragraph, and the question put on each. After each paragraph is approved or amended, it is then considered as a whole. If it has been referred, the committee only report the amendments they recommend separately; as they have no right to amend a paper belonging to the main body.
7. When the committee is through, some member moves that it rise and report the matter to the main body, with or without amendments, as the case may be.

**Reports of Committees.**

The chairman of the committee, standing in his place, informs the association that the committee to which was entrusted such a matter, naming it, have directed him to report thereon, and moves that the report be received. The cry of "Receive!" or "Report!" or "Read it!" from any one, generally dispenses with the formality of a question. He then reads the report, whatever it may be, and delivers the written report to the secretary. Then it lies on the table until called up by a motion. The committee is dissolved, and can act no more unless reconstituted for the purpose by a vote.

**Motions.**

1. A motion is a proposition by two members; consequently, if not seconded, it is not to be entertained. This is different, however, in the case of an appeal, where the question may be put on the demand of one member.

2. A motion must be put in writing, if any member desires it, and read, when required for information. But if the demand for the reading be repeated, so as to show itself a mere pretext for delay, the association may order it to be read no more.

3. A motion for adjournment cannot be made while one member is speaking; because it is a breach of order for one to speak when another has the floor, except to a point of order; consequently, even a privileged motion cannot be entertained. And even on a call to order, decided against him, he must still be allowed to go on, provided he does not persist in the same violation of order in his remarks.
Amendments.

1. An amendment takes the place of the question it is proposed to amend, and must be decided first. So an amendment to an amendment must be decided before the first amendment.

2. But the amendments cannot be piled one on the other; that is, while you can amend an amendment, you cannot amend the second amendment.

3. For example: it is moved to give the thanks of the association for his kind gift of fifty volumes to the society. It is moved to amend by striking out the word "kind" and inserting "generous." This is an amendment. It is then moved to strike out the word "generous" and insert that of "liberal." This is an amendment to the amendment. It is then proposed to strike out the word "liberal," and insert that of "munificent." This third amendment is out of order.

4. Nor can amendments be made to certain privileged questions. Thus, an amendment to a motion to adjourn, for the previous question, a call of the house, or to lay on the table.

5. But an amendment, though inconsistent with one previously adopted, is still in order. It is for the association alone to decide whether, by the passage of the second amendment, it will recede from the former action.

6. On an amendment being moved, a member who has spoken to the main question, may speak to the amendment.

7. If it be proposed to amend by leaving out certain words, it may be moved to amend the amendment by leaving out a part of the words of the amendment, which is equivalent to letting those words remain.

8. For example: the original words being "Resolved that we have heard with feeling of lively satisfaction that the authorities of our town propose to tax dogs, and approve
their action, ” it is moved to amend by striking out the words "with feelings of lively satisfaction." If it be moved to amend the amendment, by striking out the words "with feelings of satisfaction," the question would be: Shall those words stand as part of the resolution? If carried, the word "lively" is struck out, and the rest remains. The question then recurs on the resolution as amended.

9. When it is proposed to amend by inserting a paragraph, or part of one, the friends of this should make it perfect by amendments; because if it be inserted it cannot be amended, since it has been agreed to in that form. So if proposed to amend by striking out a paragraph, the friends of the paragraph should also make it as perfect, by amendments, as possible; for if the striking out be negatived, that is equivalent to agreeing to it in that form, and amendments are not admissible.

10. When it is moved to amend by striking out certain words and inserting others the manner of stating the question is, first to read the whole passage to be amended, as it stands at present, then the words proposed to be struck out; next those to be inserted; and, lastly, the whole passage as it will be when amended. And the question, if desired, is then to be divided, and put first on striking out. If carried, it is next on inserting the words proposed. If that be lost, it may be moved to insert others.

11. A motion is made to amend by striking out certain words and inserting others in their place, which is negatived. Then it is moved to strike out the same words, and to insert others of a tenor entirely different from those first proposed, which is negatived. Then it is moved to strike out the same words and insert nothing, which is agreed to. All this is in order; because to strike out A and insert B, is one proposition. To strike out A and insert C is another proposition. To strike out A and insert nothing is another proposition. The rejection of either proposition does not preclude the offering of a new one.
But a motion to strike out alone being voted down, is equivalent to voting that the words should stand, and amendments are not in order. Jefferson thinks that even if the question be divided, and taken first on the striking out, and that fails, amendments are in order, because the proposition is only half put. There is force in this, and it seems to be the practice.

12. After the paragraph is amended, it nevertheless may be further amended by striking it entirely out.

Privileged Questions.

1. "When a question is under debate, no motion shall be received but to adjourn, to lay on the table, to postpone indefinitely, to postpone to a day certain, to commit, or to amend; which several motions shall have precedence in the order they stand arranged; and the motion to adjourn shall be always in order, and shall be decided without debate."

2. These privileged questions shall not only be entertained while the main question is pending, but will be put before it.

3. A motion to adjourn takes precedence of all others, because otherwise the body might be kept sitting against its will, and indefinitely. Yet even this question cannot be entertained after another question is actually put, and while members are voting upon it.

4. An order of the day—that is, a question which has previously been set down to be argued or determined on that day—takes place of all questions except adjournment. If, for instance, a matter be set down for 7 o'clock, then at that hour, although another question may be before the body, a motion to proceed to take up the order of the day must be received by the chair.

5. These privileged questions sometimes conflict with each other, but are reconciled under known rules.
6. If the previous question be first moved, it is first put. This cuts off all the others. The society, having decided to take the question, must vote on it as it stands—postponement, commitment, and amendment being out of order.

7. If postponement be carried, of course the question cannot be either committed, amended, nor the previous question be carried, for the subject is not before the body.

8. If committed, the same rules and reasons follow.

9. If amendment is first moved, the question on that must be determined before the previous question.

10. If amendment and postponement are proposed, the latter is put first. The reason is, that the amendment is not suppressed, but comes up again in its order whenever the main question is again considered.

11. If a motion for amendment be followed by one for commitment, the latter shall be put first.

12. The previous question cannot be put on the motion to postpone, commit, or amend the main question.

13. The motion for the previous question, or for commitment or amendment, cannot be postponed.

14. A motion made for reading papers relative to the question discussed must be put before the main question.

15. A motion made and seconded cannot be withdrawn without leave, though, if no member object, it is not necessary to put the question.

16. When different sums or dates are used in filling blanks, the question shall first be put on the largest sum and the longest time.

17. In commitment, the motions to commit are privileged in the following order: 1. Committee of the Whole; 2. Standing Committee; 3. Special Committee.

18. A motion to lay on the table must be put before either postponement, commitment, or amendment, although neither of these last can be laid on the table.

19. A postponement can be amended as to time, and an
amendment can be amended; but if it be proposed to amend by inserting anything, a motion to amend or perfect the matter proposed to be inserted must be put to a vote before the question to insert. The same rule follows in regard to striking out.

20. A question of privilege, such as a quarrel between members, or affecting the character of members, or the main body, must be disposed of before the original question be disposed of.

21. Questions on leave to withdraw motions, or appeals from the decisions of the chair, have a precedence over the main question.

Previous Question.

1. Where any question is before the association, any member may move that the main question be put; and this is termed moving the previous question. If the motion pass in the affirmative, the main question is put immediately, and no further debate is allowed upon the matter at issue.

2. This is frequently styled "the gag law," because its adoption cuts off all debate. When a subject, in the judgment of the majority, has been exhausted, or when personalities have been introduced, and disorders are threatened, it is a very proper and wise thing; but it should not generally be brought to bear so long as members who desire to speak are unheard.

Division of the Question.

1. A question which contains more parts than one may be divided, on the demand of a member, provided the main body concur. If the question contain parts which are evidently incompatible, the presiding officer may divide them of his own will, unless the body deny him the power.
2. When a question is divided, after the question has been taken on the first member of it, the second member of it is still open to amendment and debate, unless the previous question be taken upon it.

Co-existing Questions.

1. Occasionally there are two questions up at the same time—one primarily, and the other secondarily. Are both subject to debate?

2. When it has been moved to commit a question, the main question is debatable under that motion; but no amendment can be entertained, because the question of commitment will be first put.

Equivalent Questions.

Where questions are equivalent, so that the rejection of one is the affirming the other, that necessarily determines the latter. Thus, a vote against striking out is virtually the same as a vote to agree; a vote to reject is equivalent to a vote to adopt; but, on a motion to strike out A and insert B being decided in the negative, this does not preclude the motion to strike out A and insert C, these being separate questions.

The Question.

1. The question is first to be put on the affirmative, and then on the negative side.

2. After the question has been put, debate upon it is out of order; but after the presiding officer has put the affirmative, any member who has not spoken before on the question may speak before the negative be put, for it is not a full question until the negative be put.
3. But on trifling matters, such as leave to bring in reports of committees, withdrawing motions, reading papers, and such like, the consent of the main body will be supposed without the formality of a question, unless some one should object, for the absence of an objection in such cases testifies to unanimous consent.

Division.

1. The affirmative and negative voices having been heard upon a question, the presiding officer declares by the sound what is the result. If he have doubts as to the relative strength of the yeas and nays, or if any member demands it, before other business has been gone into, then a division is ordered.

2. The mode of dividing is for those in the affirmative to rise, when the presiding officer counts those up, and announces the number. These sit, and those in the negative arise, to be counted in like manner.

3. One-fifth of the members present may call for the yeas and nays, each member's name being called, and his answer entered by the secretary.

In case of any disorder during a division or calling of the yeas and nays, the presiding officer decides the question of order; and the decision is not the subject of appeal at this time, although it may be revised after the division or call is over.

Reconsideration.

1. A question which has been decided either in the affirmative or in the negative, may be reconsidered upon the motion of a member who has voted with the majority. But this motion for reconsideration will not be in order, unless made during the meeting whereat the question was decided.
2. The effect of the adoption of a motion to reconsider is to place the question in a position it occupied before the vote on its adoption or rejection was taken; consequently it is as open to amendment, postponement, commitment, or laying on the table, as it was at that time.

Appeals.

1. An appeal from the decision of the chair is a matter of right, and brings under review and opens to debate the grounds of such decision.

2. The presiding officer, by usage and courtesy, has the right to assign his reasons for his decision before the question is put on the appeal.

3. The question on an appeal is, whether the decision of the presiding officer shall stand as the judgment of the body itself. If a majority vote in the affirmative, the decision stands; if not, it is reversed.

4. An appeal cannot be put on an appeal; that is, a second appeal cannot be entertained while the first remains undisposed of.

5. A mere opinion of the chair, drawn out by an interrogation on points of order, is not subject to an appeal. To be appealed from, it must be an actual decision on a question coming up legitimately in the progress of business.

Papers.

1. When papers have been laid before the main body, or referred to a committee, every member has a right to hear them once read at the secretary's table, before he can be compelled to vote on them.

2. But he has not a right, therefore, to have papers read independently of the will of a majority of his colleagues. If the reading be demanded purely for information, and not
for delay, and no one objects, the chairman will direct it to be done, without putting it to the question. But should any one object, the question must be put.

3. Nor can any member have a right, without a question first put, to have any thing read, which is not before the body.

4. Nor can a member have a right to read a paper, in his place, not even his own speech, if it be objected to, without the leave of the body. But this rule is not usually enforced, unless there be a gross or intentional abuse of the time and patience of the body.

Communications.

When a communication addressed to the main body is presented, the question is to be put whether it shall be received. But a general cry of "Receive!" or, even if there be no objection, the silence of the body is sufficient to dispense with the formality of the question. In that case, or in case the vote on its reception be in the affirmative, it is to be read, unless otherwise disposed of.

Things on the Table.

1. Matters which have been laid on the table can only be called up when the class of business to which they belong is in order.

2. If laid on the table by a motion, they can only be lifted from it by a motion. If laid there under rules, as a matter of course, they can be called up by any member as a matter of right, when the business to which they belong is reached in its regular order.

3. But it is deemed discourteous when the matter lies on the table, to call it up in the absence of the mover, or against his wishes, if present, provided it refers to a matter
of local or private concern, in the mover's special charge; and provided, further, that it is not designed or calculated to delay final action on any measure or proposition before the body, or impede the progress of business.

**Resolutions.**

All resolutions must be committed to writing if demanded, and the name of the mover should be signed thereto.

**Rights of Members.**

1. It is the right of a member to have the question put on his motion, and a refusal to do this is a breach of order on the part of the chair.

2. It is the right of a member to insist on the execution of a standing order of the body.

3. And it is the right of a member, if he observe that a quorum is not present during the transaction of business, to call for a count.

**Order and Decorum.**

1. When the presiding officer takes the chair, every member is to be seated.

2. When any member means to speak, he is to stand up, uncovered, and to address himself—not to those around, or to any particular member—but to the presiding officer, who calls him by his name; or, better still, indicates him by his position, or otherwise, that the body may take notice who it is that speaks. But a member who is indisposed may be indulged to speak sitting.

3. When a member stands up to speak, no question is to be put; but he is to be heard, unless the body overrules him.
4. If two or more rise to speak nearly together, the chairman decides who was first up, and calls him by name or location; whereupon he proceeds, unless he voluntarily sits down, and gives way to the other. But if the chairman is not clear in his mind, or the body does not acquiesce in his decision, the question is to be put as to which was first up.

5. No man can speak more than once to the same question, not even though he change his opinion in the meanwhile, unless by unanimous consent.

6. But if he be the mover, proposer, or introducer of the question pending, he may close the debate; but only after every one desiring to speak on it shall have been heard.

7. Or he may be permitted to speak again, to clear a matter of fact; or merely to explain himself in some material part of his speech; or to the matter and words of the question keeping himself to that only, and not traveling into the merits of it; or to the orders of the body, if they be transgressed, keeping within that line.

8. If the chairman rise to state a point of order, give information, or otherwise speak within his privilege, the member standing up must resume his seat, that the chairman may be first heard.

9. No one is to speak impertinently or beside the question, superfluously or tediously.

10. No person is to use indecent language against the proceedings of the body; and no prior determination of which is to be reflected on by any member, unless he means to conclude with a motion to rescind it. While a proposition is under consideration, however, though it has been even reported by a committee, reflections upon it are not reflections upon the body itself.

11. No person, in speaking, is to mention a member then present by his name; but to describe him by his seat, or as one who spoke last; or on the other side of the question; or in some other indirect way to identify him.

12. Nor is he to digress from the matter to fall upon the
person; nor to use even unmanly words against a member; nor to arraign the motives of those who propose or advocate it. All such violations of order it is the duty of the chair to immediately suppress.

13. When a member shall be called to order by a member or the chair, he shall sit down until the point of order is decided. The member who makes the call shall state his point of order, and the question shall be decided by the chair, without debate; subject, of course to an appeal.

14. While the chair is putting a question, or addressing the body, none shall walk out of or across the room; nor, in such case, while a member is speaking, shall entertain private discourse; nor, while a member is speaking, shall pass between him and the chair. Every member shall remain uncovered while the body is in session. No member, or other person, shall visit or remain near the secretary's table while the ayes and noes are being called, or the ballots counted.

15. No one is to disturb another in his speech by hissing, coughing, spitting, or rude exclamations; nor stand up to interrupt him; nor pass between the chair and the speaking member, nor go across the house while he is speaking; nor walk up and down the floor; nor take books or papers from the table, or write there. Nevertheless, if no attention is paid to what the member says, it is a piece of prudence for him to sit down, as the ill-manners of his colleagues are *prima facie* evidence that he is saying nothing worth the hearing.

16. If repeated calls do not produce order, the chair may call any member by name who obstinately persists in irregularity, whereupon the main body may require the member to sit down. He must be heard in exculpation, if it is intended to proceed further, and then withdraw to await the further action of his colleagues, who may pass a vote of censure upon him; or, if he persists, may act in his case in the manner prescribed in the by-laws of the body.
17. Disorderly words are not to be noted until the member finishes his speech, unless they are manifestly personal, indecent, blasphemous, or reflecting upon the house. The offensive words are to be taken down by the member who objects, or by the secretary, at his request. If the chair thinks they are not disorderly, he directs them not to be taken down by the secretary, unless there be a general cry to the contrary. They are to be read, when taken down, to the member, who may deny them; in which case the body shall decide by vote whether they are his or not. If they are voted to be his, or if he acknowledges them, he must justify them satisfactorily, explain the use of them, or apologize. If the offended member still persists, and is not satisfied, the sense of the body may be taken, during which both members must withdraw. But when business has intervened, or any member spoken after the offensive words, they cannot be taken down.

18. Disorderly words spoken in committee must be written down, as in the main body; but the committee can only report them to the latter for its action.

19. Blasphemous or seditious words, or words reflecting on the religious belief of members, or on religion generally, are not in order.

20. No member can be present when anything which concerns himself is debating, much less vote upon it; nor is any member to speak to the merit of it until he withdraws. Nevertheless, he may be heard upon it, before he withdraws.

21. No member is to come into the place of meeting, or remain there, with his head covered, nor put on his hat while there.

22. A question of order may be adjourned for a time, to look into precedents.

23. When a member is called to order, he shall sit down at once, unless permitted to explain. If the body be appealed to, it shall decide the question without debate; if there be no appeal, the decision of the chair shall be sub-
mitted to. If the decision be in favor of the member, he
shall be allowed to proceed; if against him, he shall not
proceed without the leave of the body; and the body may,
if it think proper, proceed to censure him.
24. All decisions of the presiding officer are liable to be
reversed, altered, or amended by the body.

Adjournments and Recesses.

An adjournment is the closing of a session for the day to
be resumed on another day; on which day the regular
routine of business is commenced anew, except when super-
seded by a special order.

A recess is a suspension of business from one hour of a
day to another hour of the same day; at which business is
taken up at the point where it was left, unless a special
order takes its place.

A motion to adjourn cannot be amended, by adding the
day and hour. It must be put simply that this body do
now adjourn; and, if carried in the affirmative, it is adjourned
to the next sitting day, or without day, as the case may be.
But any special time of adjournment may be fixed by a pre-
vious resolution.

If a question be put for adjournment, it is no adjournment
till so pronounced by the chair. And it is a breach of cour-
tesy for a member to leave his place until the chair has pro-
nounced on the question of adjournment.

Suspension of Rules.

By unanimous consent any rule or order may be sus-
pended in part or whole; but the object of suspending the
rule must be stated in the motion, and when that object has
failed or been attained, the rule regains its former force.
Force of Words.

Throughout these rules, whenever the word "body" or "main body" has been used, it means the society, club, association, or other organized body to which the rules are made to apply.

Tie Vote.

Where a presiding officer is not chosen out of the body itself, as in the case of the Vice-President of the United States, the Lieutenant Governor of a State, or the Mayor of a city or town, who may preside over the Common Council, he has naturally no vote. The Constitution in the case of the two first, and the charter in case of the last, give them the privilege of deciding in case of a tie, and they do not vote otherwise.

But in the case of the Speaker of Congress, or of a House of Assembly, or a State Senate choosing its own presiding officer, the Speaker or President votes like any other member, only it is customery for the clerk, in calling the roll, to call him by his title, and not by his name. Hence, in ordinary societies the presiding officer votes on all questions, and must vote if it be pressed, or be guilty of contempt of the main body, as in the case of any other member. The effect of a tie vote then is merely that the question before the body, not having a majority of votes, is lost.

Of Resolutions.

A written resolution is the formal record of opinion upon one or more subjects, expressed by a body of men. As in almost every species of written composition, the language should be simple, terse and forcible.
A resolution may or may not be prefaced by a preamble. If it be so constructed, the preamble should set forth briefly the cause of the resolution which is to follow. This preamble is usually commenced with the word "Whereas."

After this comes the resolution or resolutions — which commence with the word "Resolved."

A good resolution — one that is pithy and forcible — requires some care in its composition. Unless the writer be a very experienced one, he had better avoid all figures of rhetoric, and confine himself to a plain statement of the opinion he wishes to convey.

As example is always useful, we will take a subject, and show the preferable form of a preamble and resolution upon it.

We will suppose that a party majority in the legislature passes a registry law, which is not approved by the opposite party, and a public meeting of the members of the latter desire to condemn it. The following preamble and resolutions may be suggested:

"Whereas, It is proper for the people, in their public assemblages, to express their views of the conduct of those in office, and to award to the latter their approval or censure; and

"Whereas, The late legislature of this State have passed on oppressive registry bill, odious in its principles, and burdensome in its details; therefore,

"Resolved, That the act referred to meets our unqualified disapproval and decided condemnation; that we will spare no efforts to promote its abrogation; and that we will vote for no candidate for senate or assembly who is not pledged to its speedy repeal."

Now, the above is not more wordy than such resolutions usually are, yet it can be easily simplified.

It is unnecessary to aver that it is proper for the people to express their views on official conduct, "in their public assemblages," since it is their right to do that also in
other places. The rest of the first paragraph is a mere repetition. And, finally, the whole is a matter generally admitted, and, therefore, not the subject of affirmation. The preamble had better begin with the second paragraph. But that contains useless words also. Anything which is oppressive is apt to be odious in its principles and burdensome in its details, and vice versa.

The resolution itself contains superfluous matter in its phrases—"decided condemnation" or "unqualified disapprobation" should be stricken out, and the remainder of the paragraph condensed.

Again: the statements of the preamble may be as fully expressed in the body of the resolution itself, and may be properly omitted.

Following these hints, the resolution would read as follows:

"Resolved, That we are opposed to the present oppressive registry law, and that we will vote for no candidate for either house of the legislature who is not pledged to its speedy repeal."

With these remarks upon composition, we proceed to lay before the reader a series of resolutions upon various ordinary subjects, which may possibly afford him hints, or serve for the nucleus of others.

**Resolutions of Condolence on the Death of a Member of a Fire Company.**

**WHEREAS,** It has seemed good to the Almighty Disposer of events to remove from our midst our late worthy and esteemed fellow-member, Phillip Flint; and

**WHEREAS,** The intimate relations long held by the deceased with the members of this company render it proper that we should place upon record our appreciation of his services as a fireman, and his merits as a man: therefore,
Resolved, That we deplore the loss of Philip Flint with deep feelings of regret, softened only by the confident hope that his spirit is with those who, having fought the good fight here, are enjoying perfect happiness in a better world.

Resolved, That we tender to his afflicted relatives our sincere condolence, and our earnest sympathy in their affliction at the loss of one who was a good citizen, a devoted fireman, and an upright man.

Resolved, That the members of this company will attend our deceased member to the grave in a body; that the engine-house be hung with the emblems of mourning until after the funeral ceremony shall have been performed, and that the hall of meeting be draped with black for thirty days.

Resolved, That a copy of the foregoing resolution, signed by the president, and certified by the secretary, be transmitted to the relatives of the deceased.

Resolutions of Instruction to Members of the Legislature.

Whereas, From the situation of this county [or "town," or "village,"] the general road law of the State is partly inapplicable to us, and highly inefficient, and the circumstances of the case require a specific law; therefore

Be it resolved, by the people of [insert name here], in town meeting assembled, That the Senate and Representatives of this district in the legislature be, and hereby are, instructed to procure the passage of a law exempting this county [or "village," or "town," as the case may be] from the action of the general road law, and placing the working and repair of the roads entirely under the control of the local authorities.

Resolutions of Thanks to the Officers of a Convention.

Resolved, That the thanks of this convention are hereby given to the president for the able, dignified, and impartial
manner in which he has presided over its deliberations, and to the other officers for the satisfactory manner in which they have fulfilled the duties assigned to them.

[On a resolution of this kind the question is always to be put by the member who makes the motion—it being personal to the presiding officer.]

**Resolutions at a Meeting of Stockholders in Favor of a Certain Route.**

**Resolved,** That the proposed horse railroad should be located on the summit of the Palisades, and not on the shore below, for these reasons:

1. The shore route is narrow, and being limited by the river on one side and the steep Palisades on the other, is incapable of the expanded population which may be expected on the space above, and is not likely to furnish those profits in the future which shall reimburse stockholders for the present outlay.

2. There is now a road being constructed from Hoboken to Union Hill, on the upper route. This will probably be extended to Bull's Ferry, and thus connecting with this line an unbroken communication will be secured between the upper terminus of our road and the ferry at Hoboken.

3. The slightly increased cost of grading in the upper route is more than made up by the fact that the right of way in the lower route will cost a vast deal more.

**Resolved,** That, for the foregoing and other reasons, the directors be instructed to select the upper, and not the lower route for the line of the proposed road.

**Of Reports,**

A report is the written statement of a person having a particular matter in charge, of the acts officially performed,
or of a committee concerning the results of an investigation or matter confided to their care. The matter of the report is regulated by the same rules as regards its style and nature, as govern resolutions.

Recapitulation of Certain Points.

In order to impress certain points more strongly on the mind, we present in a condensed form the rules in regard to matters likely to confuse the reader.

I. Motions in Order during Debate.

These in their order of precedence are:
1. To adjourn.
2. To lay on the table.
3. To postpone indefinitely.
4. To postpone to a day certain.
5. To commit.
6. To amend.

II. Motions in the Order of Their Precedence.

1. To fix time [and place, if desired] of adjournment.
2. To adjourn.
3. For the order of the day.
4. To lay on the table.
5. For the previous question.
6. To postpone indefinitely.
7. To postpone to a time certain.
8. To commit.
9. To amend.
III. Motions in Order When a Member Has the Floor.

1. Call to order.
2. Appeal from decision of the Chair.
3. Objection to considering a question.
[Not in order if debate have already begun on the subject.]
4. That the question be discussed.
5. For the order of the day.

IV. Motions Opening Main Questions to Debate.

1. To strike out enacting clause of bill, or ordinance, [of course not applicable in private societies, and used in State or municipal Legislatures when it is desirable to force the flight on the measure at the second reading.]
2. To commit the question.
3. To refer.
4. To postpone indefinitely.
5. To reconsider a debatable question.

V. Successful Motions that Cannot be Reconsidered.

1. Adjournment.
2. To take from the table.
3. To reconsider.
4. That the committee rise.
5. To suspend the rules.

VI. Matters Not Subject to Amendment.

1. Motion to adjourn.
2. Amendment to an amendment.
3. An appeal from the decision of the Chair.
4. A call to order.
5. Motion for leave to continue speaking after having been pronounced out of order.
6. Motion to lay on the table.
7. Objections to the consideration of a question.
8. Motion for the order of the day.
9. Motion to indefinitely postpone.
10. Call for the previous question.
11. Motion to reconsider.
12. Motion that the committee rise.
13. Motion that a question be discussed.
14. Motion to suspend the rules.
15. Motion to take from the table.
16. Motion to take up a question out of the proper order.
17. Motion for leave to withdraw a motion.

VII. Non-Debatable Matters:

1. A motion to adjourn. But a motion to fix the time to which the Society shall adjourn, when it does adjourn, is debatable.
2. An appeal from the decision of the Chair, when a question of decorum is in debate, or to the priority of business. And no appeal can be made the subject of debate while the previous question is pending.
3. A call to order is not debatable.
4. Motion to extend the limit of debate.
5. Motion to have leave to continue speaking after having been pronounced out of order.
6. Motion to lay on the table.
7. Motion to limit debate.
8. Objection to the consideration of a question propose.
9. Motion for the order of the day.
10. Motion for the previous question.
11. Questions in regard to priority of business.
12. Call for the reading of papers.
13. To reconsider an undebatable question.
14. Motion that the committee rise.
15. Motion to allow the question to be discussed.
16. Motion to suspend the rules.
17. Motion to take from the table
18. Motion to take up a question out of proper order.
18. Leave to withdraw a motion.

VIII. Forms of Putting Certain Questions.

In putting the question of an appeal, the Chair does not ask if the decision of the chair be overruled, but—"Shall the decision of the Chair be sustained?" or "Shall the decision of the Chair stand?" If there be a tie vote, the decision of the Chair is overruled, because of the lack of a majority.

In putting the question on striking out certain words, it is put—"Shall these words [naming them] stand as part of the resolution?" If there be a tie vote, they are struck out, because a majority have not pronounced in their favor.

On a demand for the order of the day, the question is put—"Will the Society [council, club, whatever it is] now proceed to the order [or orders] of the day?"

On a demand for the previous question, the form is—"Shall the main question be now put?"

On an objection to the consideration of a question, if made at the time of the introduction of the subject, the form is—"Shall the question be considered?"

On putting the yeas and nays—"As many as are in favor of the motion [or resolutions] will when their names are called, answer, Aye. Those of the contrary opinion, No. Mr. Secretary, call the roll."

On a call for the yeas and nays—"As many as are in
favor of calling the yeas and nays, will, when their names are called, say, Aye. Mr. Secretary, call the roll.” When the requisite number have answered the Secretary suspends calling, reports result to Chair, who says—[naming the number,] “In the affirmative. The yeas and nays are ordered.” Or, if there be no objection, he may say—“Those in favor of calling the yeas and nays will rise and remain standing till counted.” He then counts them audibly, and announces the number and result. But if any member cries “vote!” or otherwise dissents, the roll must be called for the ayes only.

IX. Two-Thirds Vote.

There is no such thing naturally as the necessity of a two-thirds vote. By the rules of order, a majority suffices to order the previous question, to limit the time of speeches, to limit the debate—which last is virtually ordering the previous question at a fixed hour—or to consider a question when objected to; while to suspend the rules, or amend them, or to make a special order, or to move for the discussion of a nondebatable question, or to take up a question out of its order—the three last amounting to a suspension of the rules—requires unanimous consent.

But while this is the practice in legislative bodies, in ordinary organizations, where celerity in the dispatch of business is not of great importance, where the previous question is looked upon as a device to prevent the minority from expressing an opinion, and where a suspension of the rules is more frequently necessary, the following special rule is sometimes adopted:

It shall require a two-thirds vote of the members present at any meeting to call the previous question, to limit debate, to fix a specified hour for closing debate, to consider a question when objected to on its introduction, to
make a special order, to suspend, or to amend the rules, to order the discussion of a subject non-debatable under the rules, or to take up a question out of its order.

This may be placed in the constitution or by-laws of the society, when it will become paramount law, to which the rules of order opposed to it must yield.

The safest mode, however, will be found to adhere to the parliamentary rules.

X. Matter-of-Course Question.

To expedite business, that to which no one objects, when stated by the chair, is considered ordered. Thus, the reception of a report, calling for division, reception of communication, withdrawal of a motion before the house, leave to continue speech in order after being pronounced out of order, etc., are permitted without a vote, if no objection be made. So in seeking a motion, which strictly (when not a question of order, an objection to the consideration of a question or a call for the order of the day) requires to be seconded, it is always taken for granted that it has been, unless some one should violate courtesy so far as to inquire. In that case, it must be seconded, or it falls to the ground.

It is considered unfair to insist upon the seconding of a motion, because it violates the natural right of a member to get a proposition in good faith before the house; but, if his motion be made for dilatory purposes, or to annoy and weary out the majority, or be in effect, though not in shape, offensive to the house, it is eminently proper that he should have at least one member to back him in his attempt; and it is no discourtesy to cut off his discourtesy by demanding the seconder.
Questions for Debate.

1. Ought the largest city of a State to be the capital of that state?
2. Will the coal supply of the United States hold out?
3. Must the Chinese go?
4. Has the abolition of slavery improved the condition of the blacks?
5. Is universal suffrage a success?
6. Has the attendance at churches changed the character?
7. Was the Tichborne claimant the true heir?
8. Is the drama immortal?
9. Will the planting of forests increase the rainfall?
10. Should woman have the right of suffrage?
11. Is cremation preferable to burial?
12. Ought Governments to own railroads and telegraphs?
13. Should the President of the United States be elected directly by the people?
14. Does Prohibition prohibit?
15. Should the public museums and parks be opened on Sunday?
16. Should foreign languages be taught in the Public Schools?
17. Should the right to vote depend on a property qualification?
18. Are early marriages advisable economically?
19. Have we an aristocracy?
20. Could the Government of the United States do as well without the Senate?
21. Will the colored race become amalgated with the whites?
22. Are competitive examinations a fair test for the fitness of applicants for office?
23. Should gold be the standard of value?
24. Should there be more Arctic expeditions sent out?
25. Was Washington a military genius?
26. Is the assessment of office-holders for political purposes immoral.
27. Is the communion a mistake?
28. Has the visit of Oscar Wilde had any effect on the public taste?
29. Is the co-education of the sexes advisable?
30. Has the Government been too liberal in land grants to railroads?
31. Are inventors sufficiently protected by the patent laws?
32. Should married women be retained as teachers in the Public Schools?
33. Should convict labor be allowed to compete with honest labor?
34. Is the present system of trial by jury the best?
35. Should voting by ballot be introduced into all elective and legislative proceedings?
READY • RECKONER, • INSURANCE

• AND • INTEREST • TABLES.
### READY RECKONER

*For Computing the Price of Cattle, Hogs, Cotton, or any Commodity Sold by the Hundred or Part of the Hundred.*

If the desired amount or quantity is not in the table, add two numbers together.

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### An Instantaneous Method of Computing Interest

To compute interest at five per cent, divide the given number of days by four. To compute interest at eight per cent, divide the given number of days by three, and multiply the result by three. To compute interest at three per cent, divide the figures in the given column by three.

#### Table of Interest at Four Per Cent.

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Explanation.—To ascertain the number of feet multiply the number of feet in length by the number of inches in width, and divide the product by 12; the result will be the number in feet and inches. Thus, multiply 9 inches wide by 26 feet long, and the result will be 234. Divide this by 12 and we have the product 19 feet and 6 inches.
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**TABLES**

**HOURS OF TEN HOURS' LABOR PER DAY**

*Quick Method of Computing Wages*
Cotton Cicker's Calculator.

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Short Insurance Rates.

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# How Interest Accumulates.

If one dollar be invested, and the interest added to the principal, annually, at the rates named, we shall have the following result as the accumulation of one hundred years:

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<th>Ten Years</th>
<th>Fifty Years</th>
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| 2
| $10.00 | $13.00 | $2,900 |
| 1
| 20.00 | 260.00 | 5,800 |
| 1
| 30.00 | 390.00 | 8,700 |
| 1
| 40.00 | 520.00 | 11,600 |
| 1
| 50.00 | 650.00 | 14,500 |
| 1
| 100.00 | 1,300.00 | 29,000 |
| 0.10
| 200.00 | 2,600.00 | 58,000 |
| 0.37
| 400.00 | 5,200.00 | 116,000 |
| 1.74
| 1,000.00 | 13,000.00 | 290,000 |

## Compound Interest Tables.

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<td>1.23957</td>
<td>1.31593</td>
<td>1.38657</td>
<td>1.44439</td>
<td>1.52078</td>
</tr>
<tr>
<td>8</td>
<td>1.28599</td>
<td>1.36857</td>
<td>1.44495</td>
<td>1.50410</td>
<td>1.59015</td>
</tr>
<tr>
<td>9</td>
<td>1.33340</td>
<td>1.42331</td>
<td>1.50433</td>
<td>1.56578</td>
<td>1.66159</td>
</tr>
<tr>
<td>10</td>
<td>1.38182</td>
<td>1.48024</td>
<td>1.56513</td>
<td>1.62943</td>
<td>1.73524</td>
</tr>
<tr>
<td>11</td>
<td>1.43143</td>
<td>1.53945</td>
<td>1.62728</td>
<td>1.69529</td>
<td>1.81115</td>
</tr>
<tr>
<td>12</td>
<td>1.48276</td>
<td>1.60070</td>
<td>1.69065</td>
<td>1.76310</td>
<td>1.88924</td>
</tr>
<tr>
<td>13</td>
<td>1.53519</td>
<td>1.66308</td>
<td>1.75535</td>
<td>1.83310</td>
<td>1.97043</td>
</tr>
<tr>
<td>14</td>
<td>1.58953</td>
<td>1.72768</td>
<td>1.82130</td>
<td>1.90543</td>
<td>2.05403</td>
</tr>
<tr>
<td>15</td>
<td>1.64571</td>
<td>1.79408</td>
<td>1.88853</td>
<td>1.98000</td>
<td>2.14064</td>
</tr>
<tr>
<td>16</td>
<td>1.70385</td>
<td>1.86138</td>
<td>1.95626</td>
<td>2.05678</td>
<td>2.22959</td>
</tr>
<tr>
<td>17</td>
<td>1.76391</td>
<td>1.93090</td>
<td>2.02565</td>
<td>2.13543</td>
<td>2.32184</td>
</tr>
<tr>
<td>18</td>
<td>1.82685</td>
<td>2.00252</td>
<td>2.10685</td>
<td>2.21550</td>
<td>2.41652</td>
</tr>
<tr>
<td>19</td>
<td>1.89161</td>
<td>2.07612</td>
<td>2.19112</td>
<td>2.30713</td>
<td>2.51364</td>
</tr>
<tr>
<td>20</td>
<td>1.95820</td>
<td>2.15182</td>
<td>2.27768</td>
<td>2.40090</td>
<td>2.61364</td>
</tr>
</tbody>
</table>

Example. — At 5 per cent. compound interest, what will $1,000 amount to in seven years? The table shows that $1 in seven years at 5 per cent. compound interest amounts to $1,407.10, which amount, multiplied by 1,000, equals $1,407.10.

## Short Interest Rule.

To find the interest on a given sum for any number of days, at any rate of interest, multiply the principal by the number of days, and divide as follows:

At 5 per cent., by .................................. 72  At 10 per cent., by ................................ 36
At 6 per cent., by .................................. 60  At 12 per cent., by ................................ 30
At 7 per cent., by .................................. 52  At 15 per cent., by ................................ 24
At 8 per cent., by .................................. 52  At 20 per cent., by ................................ 18
At 9 per cent., by .................................. 49

1034 THE PRACTICAL HOME FARMER.
### Time in Which Money Doubles.

<table>
<thead>
<tr>
<th>Per Cent</th>
<th>Simple Int.</th>
<th>Compound Int.</th>
<th>Per Cent</th>
<th>Simple Int.</th>
<th>Compound Int.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>50 years.</td>
<td>35 years.</td>
<td>5</td>
<td>20 years.</td>
<td>14 years, 75 days.</td>
</tr>
<tr>
<td>2 1/2</td>
<td>40 years.</td>
<td>28 years, 26 days.</td>
<td>6</td>
<td>16 years, 8 mos.</td>
<td>11 years, 327 days.</td>
</tr>
<tr>
<td>3</td>
<td>33 years, 4 mos.</td>
<td>23 years, 104 days.</td>
<td>7</td>
<td>14 years, 104 days.</td>
<td>10 years, 80 days.</td>
</tr>
<tr>
<td>3 1/2</td>
<td>28 years, 208 days.</td>
<td>20 years, 54 days.</td>
<td>8</td>
<td>12 1/2 years.</td>
<td>9 years, 2 days.</td>
</tr>
<tr>
<td>4</td>
<td>25 years.</td>
<td>17 years, 216 days.</td>
<td>9</td>
<td>11 years, 40 days.</td>
<td>8 years, 16 days.</td>
</tr>
<tr>
<td>4 1/2</td>
<td>22 years, 81 days.</td>
<td>15 years, 273 days.</td>
<td>10</td>
<td>10 years.</td>
<td>7 years, 100 days.</td>
</tr>
</tbody>
</table>

### Practical Calculations.

#### To Measure Wells or Cisterns.

Square the diameter in inches, multiply by the decimal .7854, and the product by the depth of the well or cistern in inches. The result will be the full capacity of the well in cubic inches. If the actual quantity of water be sought, multiply by the depth of water in inches, and in either case divide by 231 for the number of gallons.

### Circular Cisterns, One Foot in Depth, Computed.

<table>
<thead>
<tr>
<th>Diameter in Inches</th>
<th>Contents in Gallons</th>
<th>Diameter in Inches</th>
<th>Contents in Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>- - - - - 5.875</td>
<td>18</td>
<td>- - - - 13.218</td>
</tr>
<tr>
<td>15</td>
<td>- - - - 9.18</td>
<td>20</td>
<td>- - - - 16.32</td>
</tr>
<tr>
<td>16</td>
<td>- - - - 10.44</td>
<td>21</td>
<td>- - - - 18.</td>
</tr>
</tbody>
</table>

For any greater depth than one foot, multiply by the number of feet and fractions of a foot. As the areas of circles, and consequently the capacities of circular cisterns of equal depth, vary as the squares of their diameters, it is unnecessary to multiply calculations. For instance, should it be required to find the contents of a circular cistern of
two feet diameter, say as the square of one 1: to the square of 2: 5.875, that is, as 1: 4: : 5.875 and 5.875x=23.5= the contents of such cistern. This formula will apply to any diameter; for three feet, multiply by 9; for four feet, multiply by 16, etc.; for 5, by 25.

The Amount of Rainfall on a Building.

In this calculation the amount of annual rainfall is assumed to be thirty-six inches, which is about the average for the Northern States. Find the area covered by the building, in square inches. Multiply it by 36, the depth of rainfall; divide the product by 231, the cubic inches in a gallon, and the quotient will be the number of gallons of water shed by the roof in one year.

The Diameter of a Circular Cistern that will Contain the Rainfall on a Building.

The side of a square is to the diameter of a circle of equal area as 1: 1.128. The square root of the area of the building, multiplied by 1.128, will be the required diameter, assuming depth of cistern and rainfall to be equal. Allowance must, of course, be made for greater or less depth of cistern than three feet, as well as for daily or occasional use of rainwater.

The Per Cent. of Profit or Loss.

Add two ciphers to the difference between the cost and selling price, divide by the cost, and the quotient will be the gain or loss per cent.

Weights of Hay by Measurement.

Four hundred cubic feet of dry meadow hay are estimated at one ton weight. The actual measurement to make a ton will be modified by the density of the volume
of hay, the pressure it has been subjected to as in a large or long-standing stack, and the like. In barns the volume is variously estimated from 400 to 550, according to coarseness and the length of time it has been piled up. Find the cubic contents by measuring the three dimensions of the pile in feet, and divide by 400, 450, 500 or 550 (according to circumstances, as explained), and the quotient will be the number of tons, approximately.

**Weights of Cattle by Measurement.**

To find the approximate weight, measure as follows:  
1. The girth behind the shoulders.  
2. The length from the fore part of the shoulder-blade along the back to the bone at the tail, in a vertical line with the buttocks. Then multiply the square of the girth, in feet, by 5 times the length, in feet. Divide the product by 1.5 for average cattle (if cattle be very fat, by 1.425; if very lean, by 1.575); and the quotient will be the dressed weight of the quarters. Thus: The girth of a steer is 6.5 feet, and the length from the shoulder-blade to the tail-bone is 5.25. The square of 6.5 is 42.25, and 5 times 5.25 is 26.25. Multiplying these together gives 1109.0625, which, when divided by 1.5, produces 739.379 pounds, the approximate net weight of the steer after being dressed.

**The Number of Shingles Required for a Roof.**

Multiply the length of the ridge-pole by twice the length of the rafter, and the product by 8 if the shingle is to be exposed 4½ inches to the weather, and by 7 1-5 if exposed 5 inches.
The Number of Square Yards in a Floor or Wall.

Multiply the length and width of the floor, or height and width of the wall, in feet and fractions of a foot, divide by 9, and the quotient is the number of square yards.

The Number of Bricks Required for a Building.

The average brick is 8 inches long, 4 inches wide, and 2 inches thick, or 64 (8x4x2) cubic inches; 1728 cubic inches make 1 cubic foot, and 27 bricks make 1728 (64x27) cubic inches. In laying bricks, 1.6 is allowed for mortar, or 4½ out of every 27, leaving 22½ actual bricks for each cubic foot. Therefore, multiply the dimensions—length, height and thickness—in feet and fractions of a foot, of the several brick walls, and the product by 22½, and the result will be the number of bricks required. Multiply by 20, instead of 22½, if the bricks are larger than the average above given. Allowance should be made for chimneys, projections for mantels, and the like, on the same basis.

The Number of Perches of Stone Required for a Wall or Cellar.

The perch of stone is now computed at a perch, or 16.5 feet in length, by 1.5 feet in width, and 1 foot in height, or 24.75 (16.5x1.5x1) cubic feet. Of this amount 1-9, 2.75 cubic feet, is allowed for mortar and filling. Multiply the three dimensions of the wall or walls in feet—width, height and thickness—and divide by 22 (24.75—2.75), if the needed quality of stone is the subject of inquiry, or by 24.75 if it be sought to ascertain the amount of masonry in the wall or cellar.
The Number of Feet, Board Measure, in a Lot of Boards, Planks, Flooring, Scantling, Joists, Sills or Beams.

The foot of board measure is a superficial or square foot, 1 inch thick. Multiply the product of the width and thickness of each board, plank or other article, in inches, by the length in feet and fractions of a foot, divide by 12, and the quotient will be the number of feet of board-measure. In flooring, allowance must be made for rabbeting, the proportion varying with the depth of the groove and the width of the boards.

The Cubic Feet in Squared Timber or Beams.

Multiply as in board-measure, but divide by 144 instead of 12, or multiply the three dimensions in feet and fractions of a foot.

The Number of Cubic Feet in a Round Log of Uniform Diameter.

Square the diameter in inches, multiply by .7854, and multiply this product by the length in feet, divide by 144, and the quotient is the number of cubic feet.

Estimate of the Number of Cubic Feet in the Trunk of a Standing Tree.

Find the circumference in inches, divide by 3.1416, square the quotient, multiply by the length in feet, divide by 144, deduct about one-tenth for thickness of bark, and the result will be, approximately, the number of cubic feet.
The Number of Feet, Board Measure, in a Log of Unequal Diameters.

Square the smallest diameter in inches, multiply by .7854, and the product by the length of the log in feet, divide by 12, and the quotient will be the number of feet of board measure, approximately.

The Area of a Circle.

Of all plane figures, the circle is the most capricious, or has the greatest area within the same limits. It is geometrically demonstrable that it has the same area as a right-angled triangle with a base equal to its circumference, and a perpendicular equal to its radius, that is, half the product of the radius and circumference. It is obviously larger than any figure, of however many sides, inscribed within its perimeter, and smaller than any circumscribed polygon. As a result of laborious calculations on this basis (pushed in one instance to 600 places of decimals without reaching the end), it has been ascertained that the ratio of the diameter to the circumference of any circle (sufficiently exact for all practical purposes), is as 1:3.1416 (3.141592653x), or in whole numbers, approximately, as 7:22, or more nearly as 113:355. Hence, to find the circumference or diameter, the other quantity being known, multiply or divide by 3.1416; and to find the area, multiply half the diameter by half the circumference, or the square of the diameter by .7854 (3.1416x4).

Capacity or Contents of a Granary, Bin, Crib or Wagon.

Multiply the three dimensions—the length, width and depth—in feet (the inches, if any, being reduced to fractions of a foot), multiply the product by the decimal .803564—or deduct one-fifth, which is sufficiently exact for ordinary
purposes—and the result is the number of bushels. Where the wagon or crib flares considerably in length or width, it will be necessary to obtain a mean dimension. This is done by taking the longest and shortest measures, with one or more intermediate ones, and dividing the sum of all by the number taken. The quotient will be the mean dimension sought. The greater the flare the larger the number of intermediate dimensions that should be taken to insure accuracy. Corn in the ear, when first cribbed, is estimated at twice the bulk of shelled corn.

**To Measure Corn or Similar Commodity on a Floor.**

Pile up the commodity in the form of a cone; find the diameter in feet; multiply the square of the diameter by .7854, and the product by one-third the height of the cone in feet; from this last product deduct one-fifth of itself, or multiply it by .803564, and the result will be the number of bushels.

**To Measure Casks or Barrels.**

Find mean diameter by adding to head diameter two-thirds (if staves are but slightly curved, three-fifths) of difference between head and bung diameters, and dividing by two. Multiply square of mean diameter in inches by .7854, and the product by the height of the cask in inches. The result will be the number of cubic inches. Divide by 231 for standard or wine gallons, and by 282 for beer gallons.

**The Number of Cords in a Pile of Wood.**

A cord of wood is four feet wide, four feet high and eight feet long, or 128 (4x4x8) cubic feet. Multiply the three dimensions—length, height and width—of the pile in
feet, divide by 128, and the quotient will be the number of cords. The odd inches in any or all of the three dimensions must be reduced to decimals or common fractions of a foot, before beginning to multiply.

**Contents of Fields and Lots.**

The following table will assist farmers in making an accurate estimate of the amount of land in different fields under cultivation:

<table>
<thead>
<tr>
<th>10 rods</th>
<th>×</th>
<th>16 rods</th>
<th>=</th>
<th>A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>&quot;</td>
<td>20</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>&quot;</td>
<td>32</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>&quot;</td>
<td>40</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>5 yards</td>
<td>&quot;</td>
<td>968</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>&quot;</td>
<td>484 yards</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>&quot;</td>
<td>242</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>&quot;</td>
<td>121</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>80</td>
<td>&quot;</td>
<td>60 1/2</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>70</td>
<td>&quot;</td>
<td>69 1/2</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>220 feet</td>
<td>&quot;</td>
<td>198 feet</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>440</td>
<td>&quot;</td>
<td>99</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>110</td>
<td>&quot;</td>
<td>369</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>60</td>
<td>&quot;</td>
<td>726</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>120</td>
<td>&quot;</td>
<td>363</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>240</td>
<td>&quot;</td>
<td>181 1/2</td>
<td>&quot;</td>
<td>1</td>
</tr>
<tr>
<td>200</td>
<td>&quot;</td>
<td>108 1/9</td>
<td>&quot;</td>
<td>1/2</td>
</tr>
<tr>
<td>100</td>
<td>&quot;</td>
<td>145 2/9</td>
<td>&quot;</td>
<td>1/2</td>
</tr>
<tr>
<td>100</td>
<td>&quot;</td>
<td>108 1/9</td>
<td>&quot;</td>
<td>1/4</td>
</tr>
<tr>
<td>25</td>
<td>&quot;</td>
<td>100</td>
<td>&quot;</td>
<td>.0574</td>
</tr>
<tr>
<td>25</td>
<td>&quot;</td>
<td>110</td>
<td>&quot;</td>
<td>.0631</td>
</tr>
<tr>
<td>25</td>
<td>&quot;</td>
<td>120</td>
<td>&quot;</td>
<td>.0688</td>
</tr>
<tr>
<td>25</td>
<td>&quot;</td>
<td>125</td>
<td>&quot;</td>
<td>.0717</td>
</tr>
<tr>
<td>25</td>
<td>&quot;</td>
<td>150</td>
<td>&quot;</td>
<td>.109</td>
</tr>
<tr>
<td>2178 square feet</td>
<td>&quot;</td>
<td>.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4356</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>.10</td>
</tr>
<tr>
<td>6534</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>.15</td>
</tr>
<tr>
<td>8712</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>.20</td>
</tr>
</tbody>
</table>
Boxes of Different Measure.

A box 24 inches long by 16 inches wide, and 28 inches deep, will contain a barrel (3 bushels).

A box 24 inches long by 16 inches wide, and 14 inches deep, will contain half a barrel.

A box 16 inches square and 8 2-5 inches deep will contain one bushel.

A box 16 inches by 8 2-5 inches wide, and 8 inches deep, will contain half a bushel.

A box 8 inches by 8 2-5 inches square, and 8 inches deep, will contain one peck.

A box 8 inches by 8 inches square, and 4 1-5 inches deep, will contain one gallon.

A box 7 inches by 4 inches square, and 4 4-5 inches deep, will contain half a gallon.

A box 4 inches by 4 inches square, and 4 1-5 inches deep, will contain one quart.

In purchasing anthracite coal, 20 bushels are generally allowed for a ton.
Pension Laws.

Any person who has been, since the 4th of March, 1861, disabled in the military or naval service of the United States, or in its marine corps, shall, upon making due proof of the fact, be placed on the list of invalid pensioners of the United States. No claim for pension on the part of a State militiaman, or non-enlisted person, on account of disability from wounds received in battle, shall be valid unless prosecuted to a successful issue prior to July 4, 1874.

Rates of Pension Per Month.

<table>
<thead>
<tr>
<th>DISABILITIES</th>
<th>Rate from July 4, 1861</th>
<th>Rate from March 3, 1866</th>
<th>Rate from June 6, 1872</th>
<th>Rate from June 4, 1874</th>
<th>Act of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of both hands - - -</td>
<td>$25 00</td>
<td>- -</td>
<td>- -</td>
<td>$31 25</td>
<td>$72 00</td>
</tr>
<tr>
<td>Total disability in both hands,</td>
<td>- - -</td>
<td>- - -</td>
<td>- -</td>
<td>31 25</td>
<td>72 00</td>
</tr>
<tr>
<td>Loss of both feet - - -</td>
<td>20 00</td>
<td>20 00</td>
<td>31 25</td>
<td>72 00</td>
<td></td>
</tr>
<tr>
<td>Total disability in both feet,</td>
<td>- -</td>
<td>- -</td>
<td>20 00</td>
<td>31 25</td>
<td></td>
</tr>
<tr>
<td>Loss of sight of both eyes - - -</td>
<td>25 00</td>
<td>- -</td>
<td>31 25</td>
<td>72 00</td>
<td></td>
</tr>
<tr>
<td>Loss of sight of one eye, the sight of the other having been previously lost - - -</td>
<td>- -</td>
<td>25 00</td>
<td>31 25</td>
<td>72 00</td>
<td></td>
</tr>
<tr>
<td>Loss of one hand and one foot</td>
<td>- -</td>
<td>20 00</td>
<td>- -</td>
<td>24 00</td>
<td>30 00</td>
</tr>
<tr>
<td>Total disability in one hand and one foot</td>
<td>- -</td>
<td>20 00</td>
<td>24 00</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Any disability equivalent to the loss of a hand or foot</td>
<td>- -</td>
<td>15 00</td>
<td>18 00</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Any disability incapacitating for the performance of any manual labor</td>
<td>- -</td>
<td>20 00</td>
<td>24 00</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Any disability resulting in a condition requiring the regular aid and attendance of another person</td>
<td>- -</td>
<td>25 00</td>
<td>31 25</td>
<td>50 00</td>
<td></td>
</tr>
<tr>
<td>Total deafness</td>
<td>- -</td>
<td>- -</td>
<td>13 00</td>
<td>- -</td>
<td></td>
</tr>
</tbody>
</table>

* Rate from June, 1880, in case the disability is permanent and requires the regular aid and attendance of another person. An applicant for increase of pension from $31.25 to $72 per month must furnish the testimony of his physician, or of two credible witnesses, to prove the extent to which he requires the aid and attendance of another person.
The same provision of law which entitles to $31.25 per month entitles to $72 per month, provided that in the latter case the disability is permanent. The loss of a leg above the knee, or an arm at or above the elbow, entitles the person so disabled to a pension of $24 per month after June 4, 1874.

The rates of $10, $12, $14 and $16 per month will be allowed in cases in which the disability bears the same proportion to that produced by the loss of a hand or foot that those rates bear to the rate of $18 per month.

The phrase "total disability" is construed to refer to a total disability for the performance of manual labor requiring severe and continuous exertion. The phrase "any manual labor" includes the lighter kinds of labor which require education and skill.

The first step to be taken by an applicant for pension is to file a declaration before a court of record, or before some officer thereof having custody of its seal, setting forth the ground upon which he claims a pension. Blank forms of declaration are furnished upon request at Commissioner of Pension's office. The identity of the applicant must be shown by the testimony of two creditable witnesses, who must appear with him before the officer by whom the declaration may be taken. A pensioner who may deem himself entitled to an increase of pension should file a declaration on a blank form furnished for the purpose, setting forth the ground upon which he claims such increase. A declaration for increase of pension may be taken before any officer duly authorized to administer oaths.

All invalid pensions granted under the general law will terminate at re-enlistment, or when the disabilities for which they were allowed shall have ceased.

A widow's pension will end at her remarriage, and not be renewable should she again become a widow.

Pensions allowed to dependent mothers and sisters end at remarriage, or when dependence ceases. Pensions allowed to dependent fathers end when the dependence ceases.
The name of any pensioner shall be stricken from the roll upon his or her failure to claim a pension for three years after the same shall have become due.

To entitle a widow or children to pension, the death of the husband or father must have been the result of injury received or disease contracted under such circumstances as would have entitled him to an invalid pension had he been disabled.

A widow is entitled to a pension of the same rate as that to which the husband would have been entitled had he been totally disabled. In addition to this rate, she will be allowed $2 per month for each child of the officer or soldier under the age of sixteen years.

In the applications of widows and children for pensions, they will be required to prove that the death of husband resulted from the injury or disease on account of which his pension; and, if the husband had not established his claim for an invalid pension, the widow shall prove origin and cause of the fatal disease. Widows will be required to prove their marriage to the person on account of whose service and death the claim is made; also proof of dates of births of children by copy of church record.

A mother claiming a pension must prove the cause and date of the death of her son; her relationship; that he left no widow or minor child or children surviving; and her dependence upon him for support.

A father claiming pension on account of the death of his son, upon whom he was dependent for support, must prove facts similar to those required of a mother.

The claim on behalf of minor brothers and sisters should be made by a guardian duly appointed.

In administration of the pension laws, no distinction is made between brothers and sisters of the half blood and those of the whole blood. Evidence in a claim for pension cannot be verified before an officer who is engaged in the prosecution of such claim.
In claims for increase of pension, a fee of $10 will be allowed. All letters of enquiry relative to claims pending in Pension Office should give the number of the claim.

No sum of money due, or to become due, to any pensioner, shall be liable to attachment, levy or seizure, under any legal or equitable process.

Agents for paying pensions shall receive two per centum on all disbursements made by them to pensioners.

No agent, or attorney, or other person, shall demand or receive any other compensation for his services in prosecuting a claim for pension or bounty-land than such as the Commissioner of Pensions shall direct to be paid to him, not exceeding $10.

Every officer, or enlisted or hired man, who has lost a limb, or the use of a limb, in the military or naval service of the United States, is entitled to receive, once every five years, an artificial limb or apparatus, or commutation therefor. The period of five years is reckoned from the filing of the first application after June 17, 1870. The commutation allowed in case of the amputation of a leg is $75; in all other cases, $50. Applications for artificial limbs should be transmitted through the proper pension agent to the surgeon-general of the army.
Air-Balloons invented by Gusmac, a Jesuit, in 1729. Revived in France by M. Montgolfier, 1783.

Air-Guns invented by Guhr, of Nuremberg, in 1656.

Air-Pumps invented in 1650.

Algebra known in Europe in 1300; in general use in 1590.

Almanacs first published in 1470, by Martin Hkus, at Buda. The first almanac in England was printed at Oxford, in 1673.

Alien AND Sedition Acts passed by Congress in 1798; expired by limitation, Jan. 26, 1801.

Alphabet. The Ionic alphabet was introduced 399 years before Christ. Before this time the Greek letters were but sixteen in number.

Anaesthesia discovered in 1844.

Anchors invented in 587.


Argand Lamps invented by Aime' Argand, of Geneva, about the year 1782.

Arquebus introduced about 1520, and remained in use until after 1567, when the matchlock supplanted it. In 1630 the flint lock was invented, and the musket was introduced.

Banking. The first bank in Europe was the Bank of Venice, 1171. The Bank of England was established in 1694, the Bank of North America, 1781.

Barometers invented in 1626; wheel barometers in 1668, phosphoric in 1675, pendant in 1695, and marine in 1700.

Battering-Ram invented 441 years before Christ.

Bayonets invented at Bayonne in 1670. First used in England in 1693. At first these had wooden handles fit-
ting into the guns, but in 1699 the socket bayonet was introduced.

Bellows.—Strabo informs us that the invention of bellows is due to the Scythian philosopher, Anacharsis, who lived in the time of Solon.

Bells invented by Paulinus, bishop of Nola, in Campania, in or about the year 400. They were first used in France in 550, in Greece in 864, and in the churches of Europe in 900. In Switzerland they first appeared in 1020.

Blankets first made in England in 1340.

Blood, circulation of, discovered in 1619.

Blue (Prussian) first made in Berlin, in 1704.

Bombs invented at Venlo, in 1588, and used first in the service of France in 1634.

Books, in their present form, were invented by Attalus, king of Pergamus, in 887.

Boots invented 907 years before Christ.

Boston Fire Nov. 9, 1872. Loss $73,600,000.

Bread first made with yeast by the English about 1650.

Bricks first used in England by the Romans. In 1625 their regular size was fixed by Charles I.

Bridges. The first bridge of stone in England was that built at Bow, near Stratford, in 1087.

Buckles invented about 1680.

Bullets of stone used in 1514. Iron bullets first mentioned in 1550.

Bullion (Assaying of) introduced in 1354.

Butter.—The first mention of butter is that of Herodotus, who, in describing the Scythians, says: "These people pour the milk of their mares into wooden vessels, cause it to be violently stirred or shaken by their blind slaves, and separate the part that arises to the surface, as they consider it more valuable than that which is collected below it." Soon after the death of Hippocrates, we read that the Greeks thought the butter which the Thracian ate a wonderful kind of food. The ancient Ethiopians appear
to have used butter as food. The ancient Germans were butter-makers.

**Calico-Printing** and the Dutch-loom engine first used in 1670.

**Camera Obscura** invented by Baptista Porta, in 1515.

**Canal.**—The first English navigable canal was finished in 1134.

**Candles** of tallow took the place of prepared splinters of wood in 1290.

**Cannon** invented in 1330. First used by the English in 1346; used first in England in 1445; in Denmark in 1354; by the Spaniards in 1406. The first iron cannon were made in England in 1547.

**Caps** first worn in 1449.

**Cards** invented for the amusement of Charles VI. in 1380.

**Carriages** introduced in England in 1580; in Vienna in 1515.

**Chain Shot** invented by De Wit, Dutch Admiral, in 1666.

**Chess** invented 608 years before Christ.

**Chicago Fire**, Oct. 8-11, 1871. Loss, $290,000,000; about 250 persons perished, and 98,500 rendered destitute; 25,000 buildings destroyed.

**Chimes** on Bells invented at Alvest in 1847.

**Chimneys** first introduced in England in 1200, but at first only in the kitchen or large hall.

**China** made at Dresden, in Saxony, in 1706; at Chelsea (England) in 1752; by Mr. Wedgewood in 1762.

**Civil Rights Bill** passed by Congress 1866.

**Civil Service Reform** Bill introduced in Congress Jan. 20, 1867. Act for rules to be prescribed by the President for civil service examinations passed March 3, 1871, and commissioners for that purpose appointed June 28, with G. W. Curtis as chairman.

**Clay's Compromise**, tariff, 1833; slavery, 1850.
Clocks, called water-clocks, were first used in Rome 158 years before Christ. Clocks and dials were first put up in churches in 913. In 801 clocks were made to strike the hour by the Arabsians, and by the Italians in 1300. A striking-clock was used at Westminster in 1368. The first portable striking-clock was made in 1530. Richard Harris, of London, invented clocks with pendulums about 1641. To distinguish these from dials, they were first called sun, "nocturnal, or night-dials." Repeating clocks and watches were invented by a maker named Barlow in 1676.

Coaches.—Covered carriages appear to have been used by the old Romans. In the year 1588, Duke Julius of Brunswick published an act against riding in coaches. Philip II, of Pomerania-Stettin, published a similar document in 1608. Coaches appear to have been used in France very early. An ordinance of Philip the Fair, issued in 1294, for suppressing luxury, forbids citizens' wives to ride in coaches. Coaches were first used in England in 1565, the first being that made for the Earl of Rutland. In 1601 an act was passed to prevent men riding in coaches, on the score of its effeminacy. Coaches began to be common in 1605, and were petitioned against by the saddlers and others. Hackney coaches introduced in 1634. In 1661, a stage coach was two days going from London to Oxford, and the "Flying Coach" was thirteen hours, even in summer weather, when the roads were at their best.

Coal first dug for fuel in 1234.

Coin.—Silver was first coined by Phidon, King of Argos, 869 B. C. In Rome, silver money was first coined 269 B. C. Gold and silver coins first used in the East. Coin first used in Britain 25 B. C., and in Scotland not until 248 years later. In 1101, round coins were first used in England. Silver halfpence and farthings were coined in the reign of John, and pence were the largest current coins. Gold was first coined in England in 1087; in Bohemia in 1301. In 1531, groats and
half-groats were the largest silver coin in England. Gold was first coined in Venice in 1346. Shillings were first coined in England in 1068. Crowns and half-crowns were first coined in 1551. Henry III introduced copper money into France in 1580. Copper money introduced into England by James I in 1620. The process of milling coin introduced in 1662. The mint of the United States of America was established in 1793.

Coining with a die first invented in 1617, and first used in England in 1620.

Compass (Mariner's) invented in China 1120 B.C.; used in Venice 1260; improved at Naples in 1302. Its variations observed in 1500; its dipping in 1576.

Copyright.—The copyright law was first passed by Congress in 1791, the term being made fourteen years; amended, and term extended to 28 years, with renewal for 14 more, in 1831.

Cotton.—The first raised in the United States was in 1621, in Virginia; first exported from U.S. in 1747.

Cotton Gin invented in 1839, by Eli Whitney.

Culverins first made in England in 1534.

Daguerreotypes first made in France, 1839.

Declaration of American Independence, 1776; recognition, 1782.

Delf (or Delft) earthenware invented at Firenze in 1450.

Diamonds first cut and polished at Bruges in 1489.

Dice invented 1500 B.C.

Dipping Needle invented by Robert Norman, 1580.

Distilling first practiced in 1150.

Diving-Bell.—This machine appears to have been known in 1509, and repeated mention of its use occurs in historical chronicles from that date.

In the United States, the Sawyer-Man light appeared in 1878, and Edison began his experiments in electric lighting in the same year.

**Emancipation Proclamation.**—January 1, 1863.

**Engraving on metal** invented in 1423; on copper in 1511. Improved process introduced by Prince Rupert of Palatine in 1648. Engraving process for tints invented by Barable, a Frenchman, in 1761. Engraving on wood invented at Flanders in 1423, and revived in 1511 by Albert Durer. Engraving on glass invented at Paris in 1799, by Bondier.

Envelopes for letters were first used in 1839.

**Etching on copper** with aqua fortis was introduced in 1512.

Ether was first used in surgical operations in 1844.

**Express.**—The first American express was operated between New York and Boston, in 1821, by W. F. Harnden.

False Hair introduced by the courtesans in Italy, and first brought into England from France in 1572.

**Fenian Raids** into Canada, May 31, 1866; resumed February 3, 1870.

Filibustering raids of Wm. Walker, 1853-60.

Fire Engines, to force water, existed in very ancient times. The first of the kind now in use, but of a vastly inferior character, was invented by two Dutchmen, each named Jan van der Heide, at Amsterdam, in 1518. In 1657 an improved engine was introduced at Nuremberg by John Hantsch. Fire-engines were first known at Paris in 1699. The first volunteer fire company in America was the Union of Philadelphia, about 1736.

Flag.—The American flag was first used by Washington at Cambridge, January 1, 1776.

Fortification.—The present mode introduced about 1500.

Forks are, comparatively speaking, quite a modern invention. They were first known in Italy toward the end of
the 15th century. They began to be known in France by the end of the 16th century. Introduced in England in 1608.

Free Soil Party.—The first national convention was held at Buffalo, August 9, 1848.

Fugitive Slave Law passed by Congress, September 12, 1850.

Gamut in music invented by Guy L'Aretin in 1025.

Gas was first evolved from coal by Dr. Clayton in 1739. Its first application, as an illuminating medium, was made by Mr. Murdoch, in Cornwall, England, in 1792. Sir H. Davy, before a committee of the House of Commons, declared it was not practicable to light London with gas. The first display of gaslight was in Birmingham, on the occasion of the peace rejoicings of 1802. It was introduced for lighting the shops and streets of London, generally in 1814. In the United States it was introduced in 1822, in Boston.

Gilding, with gold leaf, invented in 1273.


Grist Mills invented in Ireland in 214.

Gunpowder was invented by the monk Schwarts in 1330, although used by the Chinese A. D. 80. The Byzantines used Greek fire A. D. 668.

Guns invented in 1330; used by the Moors at the siege of Algeciras, in Spain, in 1344: at the battle of Crecy in 1346, and at the siege of Calais in the year following. Adopted by Denmark in 1354; used by the Venetians, at sea, against the Genoese, in 1377. First used by the Spanish in 1406. The early English guns were first made of brass in 1635: in 1547 they were made of iron. Bombs and mortars were invented in 1543.

Hartford Convention (anti-war), December 15, 1814.

Handkerchiefs were first manufactured at Paisley, in Scotland, in 1743.
Heraldry originated in the year 1100.

Homeopathy was introduced into the United States in 1825.

Horseshoes.—Although the ancients protected the hoois of their horses with some covering, horseshoes, of the kind now known, were not in general use until the ninth century.

Hour-Glasses invented in Alexandria 240.

Hydrometer.—The oldest mention of this instrument belongs to the 5th century, but its invention has been attributed to Archimedes.

Infallibility.—The dogma of Papal Infallibility promulgated in 1870.

Inoculation for small-pox, first tried on criminals in 1721. Vaccine discovered by Dr. Jenner in 1796.

Insurance.—The first fire insurance office in America was in Boston, 1724. The first for life insurance in London, 1772; the first American, in Philadelphia, in 1812. Marine insurance dates back to 1598 in England, and to 1721 in America.

Interior Department established March 3, 1849.

Jesuits.—The order was founded by Ignatius Loyola in 1541.

Judiciary Act passed by Congress February 13, 1801.

Knitting Stockings invented in Spain about 1550.

Knives were first used in England about 1550.


Lace.—The knitting of lace is a German invention, first known about the middle of the 16th century.

Lamp (Sir Humphrey Davy's safety) for preventing explosions by fire damp in coal mines, 1815.

Lanterns invented by Alfred the Great 890.

Leyden Jar invented in 1745.

Liberty Party, national convention at Buffalo, August 30, 1843.
Library.—The oldest American library is that of Harvard College, Cambridge, 1638. The first subscription library was established at Philadelphia in 1731.

Lightning-rods were first used by Benjamin Franklin about 1752.

Life-Boats invented by Greathead, who received a premium from Parliament in May, 1802.

Linen when first made in England was regarded as a great luxury, and was very costly. A company of linen-weavers from the Netherlands was established in London in 1386.

Lithographic Printing first brought into England in 1801.

Magic Lanterns invented in 1282.

Magna Charta signed 1215.

Magnifying-Glasses first made in England by Roger Bacon 1260.

Maps and Globes invented by Anaximander 600 B. C.

Marble Paper.—A German invention belonging to the 17th century.

Matches—Friction matches first used in 1829.

Mecklenburg county, N. C., Declaration of Independence issued May 31, 1776.

Medicinal Simples first brought into Europe, from the East, in 1200.

Microscopes first used in Germany in 1621. Improved by Torricelli in 1624.

Military Academy, West Point, founded by Congress March 16, 1802.

Missouri Compromise passed March 3, 1820, and repealed May 24, 1854. It restricted slavery to south of 36° 30'.

Mirrors (Silvering) invented by Praxiteles 228 year B. C.

Monroe Doctrine declared in the message of President Monroe, Dec. 2, 1823.
Mormons arrived at Salt Lake Valley, Utah, July 24, 1847.

Musical Notes invented in 1070; improved 1330; printed 1502.

Nantes, edict of, tolerating Protestants, issued April 12, 1598; revocation, Oct. 22, 1685.

Needles first made in England by a native of India in 1545; re-invented by Christopher Greening in 1560.

Netherlands, revolt of, 1565 to 1580.

New Orleans, battle of, Jan. 8, 1815, Jackson defeating the British. Captured by Farragut April 26, 1862.

Newspaper.—The first authentic newspaper was printed in 1494; first daily, Frankfort Gazette, 1615. The first English was the Weekly News, 1622; the first in France, Gazette de France, 1631. The first advertisement appeared in 1648. The first American newspaper was printed in Boston, Sept. 25, 1690, and was called Publick Occurrences, Foreign and Domestic. The first continuously printed in America was the Boston News Letter, 1702; first daily, The Pennsylvania Packet, 1784.

Nullification Ordinance passed by South Carolina Nov. 19, 1832. The proclamation of President Jackson denouncing the same was issued Dec. 10, 1832.

Omnibuses were first used in New York in 1830.

Organs were invented in 750.

Ostend Manifesto issued Oct. 21, 1854.

Paper Hangings.—The invention of hangings of paper to take the place of other more costly hangings, has been attributed to a manufacturer of paper hangings, named Breitkopf, of Leipsic. That kind known as velvet-paper is said to have been invented by Jerome Lanyer, an Englishman, who received a patent for it in 1634, although the invention has also been claimed for Francois, a Frenchman, who is asserted to have introduced it at Rouen in 1620.

Paper made of cotton, in use in 1000. Made of linen
Rags in 1319. First introduced in England in 1588. White paper first made there in 1690. Paper was made from straw in 1800.

Paper Money first used in America in 1740, and revived in 1788.

Parchment invented by King Attalus, of Pergamus, 887 B.C.

Patent Right Law first enacted in U.S., April 15, 1790.

Paving with Stones first introduced at Paris in 1180.

Philadelphia was founded by William Penn in 1682, Riots, native American and Irish, May 6 to 8, 1844.

Penny Post introduced for London and its suburbs by an upholsterer named Murray in 1681. Adopted by the government in 1711. First set up in 1774 in Dublin. Carried out on an enlarged scale in 1794, and made a two-penny post in 1801.

Pens.—The style, or point or bone and metal, which was used for writing on tables coated with wax, gave place to the reed, pointed and split, and used as a pen with some colored liquids. These were gradually abandoned in favor of quills. The first known record of quills being used for pens is that of Isidore, who died in 636, but supposed to have been introduced at an earlier date. The substitution of steel for quill pens took place early in the present century, yet, strange to say, nothing is known with certainty of the person who first invented the metallic pen.

Phonograph invented in 1877 by T.A. Edison.

Phosphorus first made in 1677.

Photographs were first produced in England in 1802; perfected in 1841.

Pianoforte invented about 1710 in Italy.

Pilgrims landed at Plymouth, Mass., Dec. 21, 1620, although the date is commonly given as Dec. 22.

Pins were brought from France, and first used in England by Catharine Howard, Queen of Henry VII. Before
that time both sexes used ribbons, loop-holes, laces with points and tags, hooks and eyes, and small skewers made of gold, silver, and brass. Pins were first made by machinery in America in 1832.

**Pipes of Lead**, for water, first cast in 1539.

**Pistols** first used by the cavalry in 1544.

**Pitch** and tar first made from pit coal at Bristol in 1779.

**Plaster of Paris.**—Casting with it from the face inventen in 1470.

**Porcelain of Saxony** greatly improved in 1767.

**Port-Holes** introduced for ships of war in 1545.

**Post-Office** first established between Vienna and Brussels in 1516. Posts established regularly between London and all the principal towns throughout England in 1635. Postage stamps were introduced in England in 1840; in the United States in 1847.

**Pottery** improved greatly by Wedgwood in 1763.

**Printing.**—The Assyrians and Babylonians used clay tablets, and wooden blocks were used by the Chinese as early as 952. Printing from movable types was invented by Faust in 1441, and made public by Gutenberg in 1454, although the invention is also claimed for L. Koster, of Haarlem, as early as 1423. The first Bible was printed by Faust and Schoffer in 1456, and they also printed the first book with date, a Latin Psalter, in 1457. Wooden type first introduced into England, by William Caxton, a London merchant, in 1477. The first English press was set up in Westminster Abbey, where it remained until 1494. The first American book, "Escala Espiritual," was printed by Juan Hablas, Mexico, about 1535. The first press in the United States was that of Stephen Daye, at Cambridge, Mass., 1639. Printing in colors was first introduced in 1626.

**Pyramids** first erected about 2170 B.C.
Quicksilver is first used for refining silver ore in 1540.

Railroad.—The first passenger railroad was opened in England, Sept. 27, 1825; the first in America, Baltimore and Ohio, 1828, although freight was moved by rail at the granite quarries of Quincy, Mass., as early as 1826. The first steam railroad was opened in the United States in 1830, from Albany to Schenectady—sixteen miles.

Reformation in Germany, 1517; in England, 1532.

Republican Party.—The first convention was held at Pittsburgh, Feb. 22, 1856.

Resumption of Specie Payments in the United States—Act approved 1875; took effect Jan. 1, 1879.

Ribbon Looms.—It has been asserted that these looms were first known to the Swiss, but others claim their invention for a German in the town of Dantzic in sixteenth century.

Ruling-Machines invented by a Dutchman in London in 1792.

Saddles.—Pliny informs us that one, Pelethronius, was the first to introduce a piece of leather fastened to the back of a horse for the accommodation of its rider. For a long time these cloths and pieces of leather were regarded as unmanly, and were, therefore, regarded by soldiers with great scorn. The old German races despised the Roman cavalry for riding on such effeminate contrivances. Saddles of the kind now used appear to have been in use in 385. Side-saddles first used in 1380. Previous to their introduction women always rode astride.

Sailcloth first made in England in 1590.

Salt Herring after the Dutch method first used in 1416.

Saltpeter first manufactured in England, in 1625.

Saws.—The inventor of the saw is said, by the old Greek writers, to be Talus or Perdox, Pliny ascribes the invention to Dædalus, but Hardouin affirms that the pas-
sage in which he does so refers to Talus, and not to Dædalus. Talus was the son of a sister of Dædalus, and the invention is said to be due to his using the jawbone of a snake to cut through a piece of wood. His master grew jealous of the honor Talus won by this invention, and caused him to be privately put to death.

Sedan Chair introduced into England in 1734.

Sewing-Machine first patented in England, in 1755. The first complete machine was constructed by an American, Elias Howe, in 1846.

Sextant invented by Tycho Brahe, at Augsburg, in 1550.

Shay's Rebellion, in Massachusetts, 1786–87.

Sleeping-Cars were first used in 1858. Pullman's patent dates from 1864.

Soap first made in London and Bristol in 1524. The first express mention of soap appears in Pliny and Galen. The former speaks of it as an invention of the Gauls.

Speaking-Trumpets invented by Kircher, a Jesuit, in 1652.

Spinning-Wheel invented at Brunswick, 1530.

Spectacles invented by Spina, a monk, of Pisa, in 1299.

Stamp Act enacted March 22, 1765; repealed March 19, 1766.

Statutes of the United States first revised and codified in 1873.

Steam.—The steam engine boiler was discovered by the Marquis of Worcester, in 1663. Newcommen's engine was patented in 1705, and the invention was perfected by James Watt, in 1773. The high pressure engine was invented by an American, Oliver Evans, in 1779. The first steam vessel of which there is any record was that of Papin (France), in 1707. Then follow those of Jonathan Hulls (England), 1736; William Henry (Conestoga river, Pa.), 1703; James Rumsey (Md.), 1786; John Fitch (Dela-
ware river), same year. In 1806 Robert Fulton constructed the Clermont, which plied regularly between New York and Albany, at a speed of five miles per hour. The first steamer crossing the Atlantic made the voyage from Savannah to Liverpool in twenty-five days, A. D. 1819.

Steel.—The invention of steel is of very great antiquity, as the process of hardening iron is described in the Old Testament (Isaiah xliv, 12). The helmet of Hercules, described in Hesiod, appears to have been of steel. Homer refers to the process of hardening steel by immersing it, while red hot, in cold water.

Stereotype Printing invented by William Gid, a goldsmith, of Edinburgh, in 1735.

Stirups, according to a statement made by the Emperor Mauritus, were first used in the 6th century. Hippocrates and Galen speak of a disease which, in their time, was occasioned by long and frequent riding, because the legs hung down without any support.

Sugar is first mentioned in 625 by Paul Eginetta, a physician. It came originally from China and the East; was produced in Sicily in 1148, in Madeira in 1419, in the Canary Islands in 1503, and in the West Indies by the Portuguese and Spaniards in 1510. In 1641 it was cultivated in Barbadoes. Sugar-refining was first carried out by a Venetian in 1503, and this process was adopted in England in 1569. Sugar cane was first cultivated in the United States in 1751, near New Orleans, the first sugar mill being constructed in 1758.

Sunday Schools were first established by Robert Raikes, Gloucester, England, in 1781.

Sun-dials invented 558 B. C. The first in Rome, 308 B. C., was that erected by Papirius Cursor, when time was divided into hours.

Tanning Leather.—A new and more expeditious method than that previously in use was invented in 1795.

Tax.—The first tax levied on the people was by Solon, 540, B. C.
Tea first known in Europe in 1610, being brought from India by the Dutch.

*Telegraphia* (mechanical) invented in 1687. First used by the French in 1794, and by the English in 1796. The first electric telegraph was operated from Paddington to Drayton, England in 1835, the same year in which Morse's telegraph was invented. The first telegraph line in operation in America was between Baltimore and Washington, in 1844. The first submarine cable was laid in 1851, between Dover and Calais, and the first Atlantic cable was operated in 1858.

**Telephone.**—A. Graham Bell first presented a speaking telephone at the Centennial Exposition, Philadelphia, in 1876.

**Telescopes.**—The first reflecting telescope made on the principle discovered by Sir Isaac Newton in 1692.

**Thread** first made at Paisley in 1722.

**Thermometers** first invented by Drebcl, a Dutchman, in 1620; improved by Reaumur in 1730; and by Fahrenheit in 1749.

**Tobacco** was first introduced into England, from Virginia, in 1583.

**Union of England and Scotland,** 1707; **Great Britain and Ireland,** 1801.

**Vaccination.**—See *Inoculation.*

**Ventilators** first introduced by the Rev. Dr. Hales in 1746.

**Violins** of the modern kind invented about 1477. Introduced into England by Charles II.

**Wall-papers** first used in Spain and Holland in 1555. Flock or velvet wall-papers were first used in 1620.

**War Ships.**—In 1814 Sir Robert Seppings introduced various and most important improvements for the construction of war ships. The lower parts of the frames of ships of war were then, for the first time, filled in, a system of diagonal trussing was introduced, the stern was altered in
form, so that it no longer remained open to the fire of an enemy, and the upper decks were enlarged. Sir W. Symonds altered them so as to decrease the quantity of ballast required in 1832. In the International Exhibition of 1851, various improvements in this direction were shown but great iron-cased ships were not then thought of. In July, 1854, the first of a new class of crew, gun vessels was launched for use during the Russian war. To operate with these, vessels of iron were constructed to bombard the fortresses in the Baltic. The first French iron-cased ship, was a frigate called the "Gloire," and this was quickly followed by the first English ship of that kind, the "Warrior." Since then vessels of this kind have been subject to a variety of alterations and experiments, tending to improve both their strength and their sailing qualities. The first battle between iron ships of war occurred in the war for the Union, the Merrimac and the Monitor being the contestants.

Watches were invented at Nuremberg in 1477, and were first introduced into England from Germany in 1577. Water Mills for grinding corn are said to have been invented by Belisarius when Rome was besieged by the Goths in 555. Pliny, however, mentions wheels turned by water.

Weather-Cocks.—The earliest mention of a weathercock is that made by Vitruvius, concerning that on the tower built at Athens by Adronicus Cyrrhestes.

Wild-Fire invented by a Greek in 663.

Wilmot Proviso, to restrict slavery, offered in the House of Representatives, Aug. 8, 1846, by David Wilmot, of Pa.

Wire invented at Nuremberg in 1351.

Wire-Drawing.—The first record we have of this art is probably that contained in Holy Writ, where we are told that gold was beaten and cut to threads, so that it could be interwoven into cloth. The present mode of forming
metallic threads, that known as wire-drawing, was first known in the 14th century.

Woolen Cloth.—Although the making of woolen cloth is one of the most ancient arts, its manufacture was not known in France until 1646, when it was made at Sedan. It was first made in England in 1331, but was not dyed or dressed until 1667.

Yellowstone National Park established by Act of Congress, Feb. 28, 1871.
Household Economy.
Household Economy.

Economy in the Kitchen—Washing Dishes.

An English lady says: There are so many modes of washing dishes, that some will take it as quite unnecessary that they should be told how to do it. The proper way is perfectly simple. Have a pan of hot water in which a little soap has been dissolved, and then use a mop made of an old linen towel, or candle wicking fastened to the end of a stick, and then transfer them to a pan of still hotter water, and drain a moment, and wipe dry. This gives them an elegant polish. They should be wiped as soon as they have been through the last water, else they have a streaked effect, which can be felt, if not seen. It is the custom in England to drain them in racks, but we think our own mode the best—at least with the white ware so fashionable in this country, and which is so little known there.

The glassware should be washed first, then the silver, then the cups and saucers, etc., and the greasy dishes last. Never wash nor wipe more than one article at a time. When china is rough to the touch, it is simply because it is not cleansed. Hot water, and plenty of it, dry, clean towels, and rapid wiping make the dishes shine like mirrors. You can wash glasses in quite hot water, by rolling them round in the water, filling them as soon as they touch it, thus making all portions of the glass equally hot. They will never crack if treated in this way. Dish-washing forms a large proportion of the daily life of the housekeeper, and anything which expedites it, and leaves time for other things, ought to be welcomed.
The Damper in the Stove.

The following, on the use of the damper, although written for stoves in which wood is burned, contains information of equal value for those burning coal, whether hard or soft. The use of the instrument, must, however, be studied, since different fuels require different treatment. Concerning the damper, our contributor says: A damper in the stove is of great importance in a house—both as a matter of economy, and of comfort. It makes the hot air remain in the stove, and does not take in the outside heated air, which is done through the crevices and proper drafts. If the damper is shut, you instantly feel the heat on your face, showing that it is thus kept in the room. The circulation is thus stopped in the room, and a soft, pleasant atmosphere is the result.

Economy in Fuel.

The main item is, however, economy in fuel. Not more than half the quantity of wood is used, and yet an equal amount of heat is obtained. This is of some consequence to the purchaser, or to the person who has the wood to chop, and of course, has an extra amount to furnish when it goes roaring up the chimney. Then to the housekeeper, the fact that she gains more ashes by the use of a damper, is an inducement to use one, as they are not lost in the air.
Wood Fuel.

Dry hard wood is positively necessary, where a damper is used. Dry hickory makes the best coals. Maple and birch come next, though the flame is not so hot and bright. The beech blazes well, but it is too much like soft wood. When the blaze is gone there is not much left of it. With a damper you can use soft maple. It is often the case that when there is not a damper, the fire is continually "going down," the heat is unequal, and the temperature of the room is being continually rendered cool—first dry, then damp, making it disagreeable and dangerous. This matter is of the utmost importance to the housekeeper, and should be attended to.

Regulating Coal Fires.

Never fill a stove more than half or two-thirds full of coal, even in the coldest weather. When the fire is low, never shake the grate or disturb the ashes, but add from ten to fifteen lumps of coal, and set the draft on. When these are heated through and somewhat ignited, add the amount necessary for a new fire, but do not disturb the ashes yet. Let the draft be open half an hour. Then shake out the ashes. The coal has thoroughly ignited, and will keep the stove at a high heat from six to twelve hours, according to the coldness of the weather. In very cold weather, after the fire is made, add coal every hour.

Use of Coal in Sick Rooms.

You know what a racket is caused, even by the most careful hand, in supplying coal to a grate or stove, and how when the performance is undertaken by Biddy, it becomes almost distracting. If you don't remember, take notice the
first time you are ill, or have a dear patient in your care, or the baby is in a quiet slumber. Let some one bring in the coal scuttle or shovel, and revive your recollection. Well, the remedy we suggest is to put the coal in little paper bags, each holding about a shovelful. These can be laid quietly on the fire, and, as the paper ignites, the coals will softly settle in place.

You may fill a coal scuttle or box with such parcels, ready for use. For a sick-room, a nursery at night, or even for the library, the plan is admirable. Just try it. Besides, it is so cleanly. If you don’t choose to provide yourself with paper bags, you can wrap the coals in pieces of newspapers at your leisure, and have them ready for use when occasion requires. Perhaps the “help” will kindly do it for you; or better still, the children, if the house is so sunshined, will attend to the wrapping, and think it fine fun.

Economy in Coal.

In any fire-place not excessively small, a plate of iron set upon the grate will halve the consumption of coal, reduce the smoke and leave a cheerful, free-burning fire. Quite sufficient air enters through the bars, no poking is necessary, and the fire never goes out until the coals are consumed. There is no ash and no dust, every particle being consumed. Any householder can try this experiment and reduce his coal bill, say thirty per cent., at the cost of a shilling.

Care of Stoves.

Blackening and polishing stoves is hard work. Indeed, one of the best known lady writers on economy and household art, has said that a blackened stove may be a nuisance. It may be so in more ways than one. Few housekeepers, says our authority, have time to blacken
their stoves every day, or even every week. Many wash them in either clean water or dish-water. This keeps them clean, but but they look very brown. After a stove has been blackened, it can be kept looking very well for a long time by rubbing it with paper every morning. If I occasionally find a drop of gravy or fruit juice that the paper will not take off, I rub it with a wet cloth, but do not put on water enough to take off the blacking.

The Uses of Waste Paper.

Comparatively few housekeepers are aware of the many uses to which waste paper may be put. After a stove has been blackened, it can be kept looking very well for a long time by rubbing with paper every morning. Rubbing with paper is a much nicer way of keeping the outside of a tea-kettle, coffee-pot and tea-pot bright and clean, than the old way of washing them in suds. Rubbing with paper is also the best way of polishing knives and tinware, after scouring. This saves wetting the knife handles. If a little flour be held on the paper in rubbing tinware and spoons, they shine like new silver. For polishing mirrors, windows, lamp-chimneys, etc., paper is better than dry cloth. After it has been so used it is none the worse for kindling fires. Preserves and pickles keep much better, if brown paper, instead of cloth, is tied over the jar. Canned fruit is not so apt to mold if a piece of writing paper, cut to fit the can, is laid directly on the fruit. Paper is much better to put under a carpet than straw. It is warmer, thinner, and makes less noise when one walks over it. Two thicknesses of paper placed between other coverings on a bed, are as warm as a quilt. If it is necessary to step upon a chair, always lay a paper on it and thus save the paint or woodwork from damage. A fair carpet can be made for a room not in constant use, by pasting several thicknesses of newspaper on the
floor, over them a coat of wall-paper, and giving them a coat of varnish.

**Cleaning Soiled Marble.**

Much annoyance is frequently experienced from soiling marble table-tops, kitchen slabs or other marble objects. It is said that if slacked lime is mixed with a strong solution of soap into a pasty mass and spread over the spot, and allowed to remain for twenty-four or thirty hours, then carefully washed off with soap and water, and finally with pure water, the stain will be almost entirely removed, especially if the application be repeated once or twice.

**Ox-Gall and Lye.**

Another preparation consists in mixing an ox-gall with a quarter of a pound of soap-boiler's lye, and an eighth of a pound of oil turpentine, and adding enough pipe-clay earth to form a paste, which is then to be placed upon the marble for a time, and afterward scraped off, the application to be repeated until the marble is perfectly clean. It is quite possible that with all our endeavors a faint trace of the stains may be left; but it is said that this will be almost inappreciable. Should the spots be produced by oil, these are to be first treated with petroleum for the purpose of softening the hardened oil, and the above-mentioned applications may be made subsequently.

**Ink Spots on Marble.**

Ink spots may be removed by first washing with pure water, and then with a weak solution of oxalic acid. Subsequent polishing, however, will be necessary, as the lustre
of the stone may become dimmed. This can be best produced by very finely powdered soft white marble, applied with a linen cloth first dipped in water and then into the powder. If the place be subsequently rubbed with a dry cloth, the lustre will be restored.

Grease Spots on Wood.

If one is so unfortunate as to get any sort of grease on floor, or table, apply directly potter’s clay, just wet with water so as to form a stiff paste. Spread it pretty thick upon the grease spot, and lay a thin paper over to keep it from being rubbed off. After twenty-four hours scrape it off and spread on fresh clay. It will gradually absorb the grease, and leave the floor or table clean; but it may need to be renewed several times. When the clay looks clean, wash off with soap and water. The clay is also good to take grease from clothing, applied in the same way.

To Clean Tin Covers.

Mix a little of the finest powdered whiting with the least drop of sweet oil, rub the covers well with it, and wipe them clean; then dust over them some dry whiting in a muslin bag, and rub bright with dry leather. This last is to prevent rust, which the cook must guard against by wiping them dry and putting them by the fire when they come from the dining-room, for if hung up once damp, the inside will rust.

Verminous Insects, Cock-Roaches and Bed-Bugs.

Cockroaches are the plague of many housekeepers, and yet a little Paris green is death to them. Keep it in a common flour-dredging box, label it poison, and apply it
weekly to their haunts! Bed-bugs or chinch-bugs can also be dispersed and utterly routed with this remedy; and both cockroaches and bed-bugs will flee from powdered borax. Travelers should always carry a paper of borax in their bags, and sprinkle it under and over their pillows, if they fear they shall become food for the last-named wretches.

**Ants and Flies.**

Sprigs of worm-wood will drive away large black ants; and none of them, whether black, brown or red, relish wintergreen, tansy, Paris green, cayenne or kerosene; so if they invade our pantries, we can, by a judicious application of some one of these articles, make the premises too unpleasant for them. Fly-paper should be kept around the house as early as the middle of May. Put it in every open window, and thus destroy every intruder. It must constantly be borne in mind, that the cobalt with which some fly-paper is saturated, and also Paris green, are two most deadly poisons. Keep them safely out of the way of children.

**Expelling Flies From Rooms.**

It is stated that if two and a half pounds of powdered laurel leaves are macerated or boiled in two gallons of water, until their poisonous quality is extracted, and with the solution a whitewash is made, by adding as much quick-lime as can be slacked in it, and if a room be whitewashed with this preparation, flies will not settle on the walls for six months. If a paste, made by stirring together one pint of the powdered laurel leaves with a quarter pint of glycerine, be applied to windows and door casings, a room so prepared will soon be emptied of flies. Two applications
of this paste are enough to keep even a kitchen clear of insects for a fortnight.

There is nothing disagreeable or deleterious to human beings in the odor of the wash or paste, though laurel leaves, or laurel water, taken into the human stomach, acts as a violent poison.

You may also drive flies out with a brush, but, unless something is done to render the place uninviting to them, they will return immediately. There are many weeds or plants emitting an empyreumatic odor which answer well for the purpose. None are more effectual than the wild chamomile (Mayweed). The odor of this plant is not at all disagreeable, and branches of the weed when in flower, or some of the dried flowers, scattered about a room, will soon rid it of all flies.

Another way is to throw some powdered black pepper on a hot shovel and carry it about the room. The generation of empyreumatic vapors in the same way from other spices will also, it is said, answer the purpose. A few drops of carbolic acid or creosote, on a cloth hung up in a sick-room or used in the dressings, would probably be effectual, but the odor is not usually so acceptable to one's olfactories.

The best thing of all is to keep them out. The author has never found any means of doing this so cheap, effectual and pleasant, as wire screens to all doors and windows. This will keep them out, with a little driving occasionally, if the doors all open outward. For mosquitoes and gnats, when it is impracticable to keep them out, as in the case of tents, used while camping out, a little brown sugar burned on coals we have found effective in some instances in driving them away, but of course a good mosquito-bar is the best.

**Cloth and Fur Moths.**

The small moths so destructive to cabinets, tapestry, clothes, carpets, furs, grains, etc., are called tineans, and
belong to the natural order lepidoptera. They have four membranous wings covered with imbricated scales, like fine powder— as the butterflies and moths. Among these are the carpet moth, the clothes moth, the fur moth, and the hair moth. These moths are nocturnal in their habits, flying in the evening. They do not lay their eggs in material in constant use, and therefore wardrobes, drawers, chests, etc., should be frequently examined, and the contents aired, and beaten to dislodge the eggs or larvae.

In old houses subject to their depredations, the cracks in closets, and other exposed places, may be brushed over with turpentine or other odorous substances. Sheets of paper sprinkled with spirits of turpentine, powdered camphor, shavings of Russia leather or tobacco, are also preventives. Chests and boxes of camphor-wood, red cedar and Spanish cedar, are obnoxious to these insects, and are useful for preserving costly articles.

The cloth linings of carriages, etc., may be preserved from their repredations by being sponged on both sides with a solution of corrosive sublimate in alcohol, just strong enough so that it will not bleach a black feather white. The insects may also be killed by fumigating with tobacco smoke, or the fumes of sulphur. It is also said that if hemp, in flower. cut and dried, be placed in a cushion, it will prevent the ravages of moths for years.

**Book-Destroying Insects.**

Books, large or small, made up of dry paper, are nesting-places for a variety of insects, hardly large enough to be recognized as living things. Besides making themselves homes between the leaves, they feast on the paste, binding, twine on the backs and the green mold that gathers on them if neglected. One species takes up residence in the binding, devouring as it goes. Another feeds upon the paste. Still
another book pests that is sure to appear in a library, not overhauled and dusted occasionally, eats through a volume.

Bookcases should not be made light with glass doors. Wire-netting is far preferable, because the books are kept drier; fresh air is all-important. An upper story is superior to a basement, being less liable to gather mold, which is a forest of minute vines in which bookworms ramble for exercise. Twice is each summer the books should be exposed to a bright sunlight while dusting them, also exposing the open leaves to a fresh current of air.

**Furs.**

A good receipt for preserving furs from moths is: One ounce gum camphor and one of powdered shell of red pepper. Macerate in eight ounces of alcohol for several days, then strain. Sprinkle furs, etc., with this tincture, roll up in a clean cloth and lay away.

**Kerosene.**

Kerosene is volatile, and its vapor is explosive. Only the best oils—from 150 degrees fire test up to 175 degrees—should be used. The oil does not explode. An oil may even extinguish a burning match when thrown into it, and yet be highly dangerous to be used as a burning fluid. It is the vapor of these oils mixed with air that is dangerous, as far as explosion is concerned. While a partly filled lamp has the portion above the oil filled with a mixture of vapor and air, it may explode. When a lamp is filled while lighted, the mixture of air and vapor in the can or filler explodes upon coming in contact with the flame; the oil itself does not explode, though it does serious injury when scattered by the explosion.
Test for Kerosene.

Dr. Nichols, the well-known chemist and writer on chemical science, advises the following test for kerosene: Fill a pint bowl two-thirds full of boiling water, and into it put a common metallic thermometer. The temperature will run up to over 200 degrees. By gradually adding cold water, bring down the temperature of the water to 100 degrees, and then pour into the bowl a spoonful of the kerosene, and apply a lighted match. If it takes fire, the article should be rejected as dangerous; if not, it may be used with a confident feeling of its safety.

The Laundry—Some Helps in Washing.

The Germans, and especially the Belgians and Hollanders, are noted for their fine washing. Their method, which does away with the use of soda, is as follows: Dissolve two pounds of soap in about three gallons of water as hot as the hand can bear, and add to this one tablespoonful of turpentine and three of liquid ammonia; the mixture must then be well stirred, and the linen steeped in it for two or three hours, taking care to cover up the vessel containing them as nearly hermetically as possible. The clothes are afterwards washed out and rinsed in the usual way. The soap and water may be re-heated, and used a second time, but in that case, half a tablespoonful of turpentine and a tablespoonful of ammonia must be added. The process will cause a great economy of time, labor and fuel. The linen scarcely suffers at all, as there is little necessity for rubbing, and its cleanliness and color are perfect. The ammonia and turpentine, although their detersive action is great, have no injurious effect upon the linen; and while the former evaporates immediately, the smell of the latter will disappear entirely in drying the clothes.
Washing Summer Suits, Etc.

Summer suits are nearly all made of white or buff linen, pique, cambric or muslin. Whatever the material, common washerwomen spoil everything with soda, and nothing is more frequent than to see the delicate tints of linens and percals turned into dark blotches and muddy streaks by the ignorance and vandalism of a laundress. It is worth while for ladies to pay attention to this, and insist upon having their summer dresses washed according to the directions which they should be prepared to give their laundresses themselves. In the first place the water should be tepid, the soap should not be allowed to touch the fabric; it should be washed and rinsed quickly, turned upon the wrong side, and hung in the shade to dry, and when starched (in thin boiled but not boiling starch) should be folded in sheets or towels, and ironed upon the wrong side as soon as possible. But lined should be washed in water in which hay or a quart bag of bran has been boiled. This last will be found to answer for starch as well, and is excellent for print dresses of all kinds; but a handful of salt is very useful to set the color of light cambrics and dotted lawns; and a little ox gall will not only set but brighten yellow and purple tints, and has a good effect upon green.

To Cleanse Blankets.

Put two large tablespoonfuls of borax and a pint bowl of soft soap in a tub of cold water. When dissolved, put in a pair of blankets and let them remain over night. Next day rub them out, rinse thoroughly in two waters, and hang them to dry. Do not wring them.

To Wash Flannels.

I wonder if housekeepers know that flannel should never have soap smeared upon it, or be rubbed upon a
A hot suds should be made, and the flannel should be squeezed through it, rubbing the dirtiest portions in the hands as lightly as possible. When the stains are softened, another warm water should be ready, into which dip the flannels, and squeeze them dry as possible out of it. Shake them well, and hang them out where the wind will not strike them hard; never hang them in the sun.

Washing Fluid.

Three tablespoonfuls of soda, the same quantity of dissolved camphor [the same as kept for family use], to a quart of soft water; bottle it up, and shake well before using. For a large washing take four tablespoonfuls of fluid to a pint of soap, make warm suds and soak the clothes half an hour; then make another suds, using the same quantity of soap and fluid, and boil them just fifteen minutes, then rinse in two waters.

To Remove Acid Stains and Restore Color.

When color on a fabric has been destroyed by acid, ammonia is applied to neutralize the same, after which an application of chloroform will, in almost all cases, restore the original color. The application of ammonia is common; but that of chloroform is but little known. Chloroform will remove paint from a garment or elsewhere, when benzole or bisulphide of carbon fails.

To Preserve Clothes-Pins.

They should be boiled a few moments and quickly dried, once or twice a month, when they become more flexible and durable. Clothes-lines will last longer and keep in better order for wash-day service, if occasionally treated in the same way.
To Remove Grease from Worsted.

Take one-quarter pound of Castile soap, one-quarter pound ammonia, very strong, one ounce sulphuric ether, one ounce spirits of wine, one ounce glycerine. To mix this, cut the soap fine and dissolve in one quart of soft water, and then add four more quarts of water and all ingredients.

Two or three daily applications of benzine will also remove the grease spots. Apply with a brush or woolen cloth. Do not make the application in a warm room, as the article is highly inflammable.

Starching and Ironing.

Starch and iron shirt bosoms as usual, and when the articles are thoroughly dry, place one at a time on a narrow, hard and very smooth board, which has one thickness of cotton cloth over it, sewed tightly; have the polishing iron heated so that it will not scorch, and rub it quick and hard over the surface, up and down the bosom, using only the rounded part on the front of the iron. A still higher polish may be obtained by passing a damp cloth lightly over the smooth surface, and then rubbing hard and quickly with the hot iron. It needs a good deal of patient practice to do this admirably, but when once learned, it is as easy as other ironing. A polishing iron is small and highly polished, with a rounded part, which allows all the friction to come on a small part at one time, which develops the gloss that may be in both linen and starch. Collars and cuffs look nicely done in this way.

For Lawns.

Take two ounces of fine white gum Arabic powder, put it into a pitcher, and pour on a pint or more of water, and
then, having covered it, let it stand all night. In the morning, pour it carefully from the dregs into a clean bottle, cork it and keep it for use. A teaspoonful of gum water stirred into a pint of starch made in the usual manner, will give to lawns, either white or printed, a look of newness, when nothing else can restore them, after they have been washed.

Gloss for Shirt Fronts, Collars and Cuffs.

To a pail of starch, a whole sperm candle is used. When the linen is dry, it is dipped in the cold starch and ironed in the ordinary way; then it is dampened with a wet cloth, and the polishing iron pressed over it. To this last manipulation the linen is indebted for the peculiar laundry gloss which all admire so much, but which many housekeepers have vainly striven to leave upon the wristbands and bosoms of their husbands' shirts.

Bleaching Linens, Etc.

The best method of bleaching or restoring whiteness to discolored linen is to let it lie on the grass, day and night, so long as it is necessary, exposed to the dews and winds. There may occur cases, however, when this will be difficult, and when a quicker process may be desirable. In these cases, the linen must be first steeped for twelve hours in a lye formed of one pound of soda to a gallon of soft boiling water; it must then be boiled for half an hour in the same liquid. A mixture must then be made of chloride of lime with eight times its quantity of water, which must be well shaken in a stone jar for three days, then allowed to settle, and being drawn off clear, the linen must be steeped in it for thirty-six hours, and then washed out in the ordinary manner. To expedite the whitening of the
linen in ordinary cases, a little of the same solution of chloride of lime may be put into the water in which the clothes are steeped; but in the employment of this powerful agent, great care must be exercised, otherwise the linen will be injured.

**Bleaching Cotton Goods.**

A very good way, says Mrs. M. T. M., Auburn, Ill., to bleach cotton cloth is to soak it in buttermilk for a few days. Another way is to make a good suds, put from one to two tablespoonsfuls of turpentine into it, before putting the clothes in. Wash as usual, wringing the clothes from the boil, and drying without rinsing. By using one tablespoonful of turpentine in the first suds on washing days, it will save half the labor of rubbing, and the clothes will never become yellow, but will remain a pure white. It is simple, and I never wash without it.

**To Clean Merino.**

Grate two or three large potatoes; add to them a pint of cold water; let them stand for a short time and pour off the liquor clear, when it will be fit for use. Lay the merino on a flat surface and apply the liquid with a clean sponge until the dirt is completely extracted. Dip each piece in a pailful of clean water and hang up to dry without wringing. Iron while damp on the wrong side. It will then appear almost equal to new.

**Removing Iron Rust.**

Wash the stains in ripe tomatoes. Then hang in the sun to dry. After thoroughly drying, wash in clear water.
Home-Made Soap and Candles.—Soft-Soap.

In making soft-soap, use a pine barrel, for a hard-wood barrel will warp and leak. A well-cleansed fish barrel is commonly taken for the purpose. Put in ten to twelve pounds of potash, and throw upon it two pailfuls of boiling water. Let it digest awhile and then put in two pounds of grease to each pound of potash. Have the grease hot. Let that digest awhile, then add a third pailful of hot water. Stir and digest awhile, then add another pailful of hot water. Keep doing this until the barrel is within six inches of being full. Stir occasionally until the whole is well mixed. It should stand three months before use. Stir occasionally during the first week. The longer it stands after making, the better the soap.

Another Way.

For one barrel of soap, take thirty pounds of grease, free from salt, rinds, or bits of lean meat, and the lye from two barrels of good ashes. Put one quart of lime in the bottom of each barrel of ashes. Put boiling water on to leach with; have ready the soap barrel where it is to stand. When the lye begins to run, melt the grease in a little lye, and pour it in the barrel. Heat the lye, and fill it full, stirring frequently until cold. I always use the stove kettle, as that is free from rust, which makes white cloth yellow. Soap made in this way will be very light-colored and thick, and requires but little labor in making. If the lye is not strong enough to eat the grease, boil it awhile.

Cold-Made Soap.

Have lye strong enough to bear up an egg. Then stir in any soap-grease until the lye is pretty well filled, and in a week or ten days the soap will be fit for use. In the meantime, stir occasionally.
Hard Soap.

Five pounds soda ash, two and a half pounds white lime, one-half pound resin, ten pounds grease, eight gallons soft water. Boil five hours. Take the soda ash and lime, put them in your kettle, pour the water over, and boil one-half hour. Then let it settle, and turn off the lye. Lift out the lime and soda ash, turn over it more water, as it is yet quite strong, return the lye to the kettle, add the grease and resin, and boil five hours. This makes excellent soap.

Second Recipe for Hard Soap.

Pour four gallons of boiling water over six pounds of sal soda and three pounds of unslacked lime. Stir the mixture well, and let it stand over night. Then drain it off. Put six pounds of tallow, or any kind of clear grease with it, and boil it two hours, stirring most of the time.

Lard Candles.

Take twelve pounds of lard, one pound of saltpeter, one pound alum. Pulverize and mix the saltpeter and alum; dissolve the compound in a gill of boiling water; pour the compound into the lard before it is quite melted. Stir the whole until it boils, and skim off what rises. Let it simmer until the water is all boiled out, or until it ceases to throw off steam. Pour off the lard as soon as it is done, and clean the boiler while it is hot. If the candles are to be run in a mold you may commence at once, but if to be dippod, let the lard cool first and cake. Then treat as you would tallow.
Hardening Tallow.

Take the common prickly pear and boil or fry it in the tallow, without water, for half an hour, then strain and mold. I use about six average-sized leaves to the pint of tallow (by weight one pound of leaves to four of tallow), splitting them up fine. They make the tallow as hard as stearine, and do not injure its burning qualities in the least.

To Clean Silver.

A lady correspondent in Southern California sends the following: Silver is most susceptible of spotting and discoloration by sea air, the human perspiration, the presence of sulphurated hydrogen (as seen in an egg spoon left uncleaned), the excreta of cockroaches and other strong-smelling insects, and lastly, by the contact of mice; the latter cause has irretrievably injured new plated-ware, never used, but left on a sideboard accessible to these little vermin. It is the practice of the East-Indian jewelers never to touch silver and gold with any abrasive substance. The most delicate filigree work and wire constructions of silver are rendered snowy white by their simple manipulation. They cut some juicy lemons in slices; with these they rub any large silver or plated article briskly, and leave it hidden by the slices in a pan for a few hours. For delicate jewelry, they cut a large lime nearly in half and insert the ornament; then they close up the halves tightly and put it away for a few hours. The articles are then to be removed, rinsed in two or three waters, and consigned to a saucepan of nearly boiling soapsuds, well stirred about, taken out, again brushed, rinsed, and finally dried on a metal plate over hot water, finishing the process by a little rub of wash leather (if smooth work).
For very old, neglected or corroded silver, the article may be dipped, with a slow stirring motion, in rather a weak solution of cyanide of potassa, but this process requires care and practice, as it is by dissolving off the dirty silver you obtain the effect. Green tamarind pods or oxalate of potash are greater detergents of gold and silver articles than lemons, and are much more employed by the artisan for removal of oxides and fire-marks.

A strong solution of hyposulphite of soda, as used by photographers, is perhaps the safest wash, as it will in no way attack the metallic silver, but only the films of chloride, etc., on its surface.

**To Paper Walls.**

Mrs. Annie R. White, for many years literary and household editor of the *Western Rural*, discourses as follows about the way to paper rooms: Don't try to paper with a carpet down. Make paste, cut bordering and the paper the day before. If the wall has been whitewashed, it must be washed in vinegar to neutralise the alkali in the lime. If papered before, and you wish the paper removed, sop with water and it will peel off. If convenient, provide a long board, wide as the paper, though a table or two will do. The paper must be measured, placed right side down on the board; then with a brush proceed to lay on the paste, not too thickly, but over every part, and be careful that the edges receive their share. When completed, double within three inches of the top, the paste sides being together; carry to the wall, mount your chair, and stick your three inches of pasted paper on the wall at the top. That holds it; now strip down the other end, and see that it fits just right; if not, peel down, make right, then press to the wall from the center right and left. Leave no air under, or when warm it will expand, bursting the paper.
Of course the paper must be matched; it will not do to measure by lines unless the walls are perfectly plumb. Small figures make less waste, and make small room look larger. Stripes make a room look higher, and if there are no figures between, or in the stripe to match, there is no waste, and no trouble in putting on. If a narrow border is the style, let it be bright, if the paper be neutral; but if that be bright, the border had better be dark neutral. If the paste be made too thick, the paper will be apt to crack and peel off; if too thin, it will saturate the paper too quickly, and make it tender in putting it on. A counter-duster is nice to brush the paper to the wall. White clean cloths will do, but will not do to rub the paper with this; being damp, the paint or color rubs off the paper. The tables must be dried each time after pasting, for the same reason. Paste under paper must not freeze, nor be dried too quickly. If whitewashing is done after papering, tack double strips of newspaper wider than the border all around the room, to prevent its soiling the paper.

**Papering Whitewashed Walls.**

If the walls are covered with thick, scaly whitewash, the result of years of additions, they must be scraped with a thin steel scraper—a hoe will do if carefully used. This will smooth them. Then wash them in weak lye and sweep off thoroughly when dry. Size the walls with glue water, one pound of glue to a pail of water, and the paper will stick and not peel off. The paste should be smooth rye flour paste, rather thin, but perfectly smooth. Starch paste is the next best.

**Sweeping.**

If brooms are wet in boiling suds once a week they will become very tough, will not cut the carpet, will last much
longer, and always sweep as clean "as a new broom," if kept hanging up when not when not in use. A most admirable way of sweeping a dusty carpet is to have a pail of clean cold water stand by the door, into which the broom can be dipped, taking care to shake all the drops out of it, by knocking it hard against the side of the pail. Then sweep a couple of yards or so, wet the broom, and sweep as before. When carefully done, and the drops are all shaken out, it will clean a very dirty carpet nicely, and you will be surprised at the amount of dirt removed. Sometimes you will need to change the water two or three times. In winter, snow can be sprinkled over the carpet and swept off, before it has time to dissolve. Some throw down tea-grounds, and sweep them off briskly. Fresh grass is an excellent cleanser of a carpet, strewn thickly about and swept hard. Moistened Indian meal has proved of good effect.

**Kalsomining.**

There are as many ways to kalsomine as there are to whitewash. The simplest mode we know of is to take ten pounds of Paris white, and soak it in cold water—just enough to dissolve it well. Take one-eighth of a pound best white glue, soaked in cold water enough to cover. Let it soak three to four hours; or till well swelled. If there is much liquid by the time the glue is well swollen, take the glue out and put it in a saucepan over the fire, with a little water to keep it from burning. Mix the dissolved whitening thoroughly with the hand. Then add the melted glue, mixing well. This mixing needs to be done in a large vessel. Then pour into these ingredients a quarter of a pint of linseed oil, and on top of oil pour sufficient muriatic acid (perhaps ten cents' worth) to cut the oil, stirring it the while. After this is done, add cold water enough to the whole to thin it down to about a pailful of the liquid. Then
mix a little ultramarine in a cup of cold water, and add to the whole, so as to remove the yellow tinge, and make it a bluish white. Apply with a clean whitewash brush, one or two coats.

**Painting—Best Time for Outside Work.**

Paint houses late in the autumn or during the winter. Paint then will endure twice as long as when applied in early summer, or in hot weather. In the cold season it dries slowly and becomes hard, like a glazed surface, not easily affected afterward by the weather, or worn off by storms. But in very hot weather the oil in the paint soaks into the wood at once, as into a sponge, leaving the lead nearly dry, and ready to crumble off. This last difficulty might be guarded against, though at an increased expense, by first going over the surface with raw oil. By painting in cold weather, one annoyance might certainly be escaped—the collection of small flies in the fresh paint.

**Recipe for Inside Paint.**

A cheap inside paint, and by no means a bad one, especially where the smell of oil or turpentine would be objectionable, or in any case where lead paint is not desirable, may be made by taking eight ounces of freshly slacked lime, and mixing it in an earthen vessel, with three quarts of skimmed sweet milk. In another vessel mix three and a half pounds of Paris white with three pints of skimmed milk. When these mixtures are well stirred up, put them together, and add six ounces of linseed oil. Mix these well and it will be ready for use. This preparation is equal to oil paint, and is excellent for walls and ceilings. Any shade may be made by the addition of dry pigments.
To Soften Putty.

To remove old putty from broken windows, dip a small brush in nitric or muriatic acid (obtainable at any druggist's), and with it paint over the dry putty that adheres to the broken glass and frames of your windows; after an hour's interval, the putty will become so soft that it can be removed easily.

Spring House-Cleaning.

Now is the time that tries women's souls, and no sound is heard o'er the house save the scrub-brush, the mop and the broom. The spring cleaning is at hand.

Blankets and Furs.

And first, there are all the woolens, blankets, etc., to be washed, and all that can be spared (for we dare not put them all out of sight, lest we provoke another snow-storm), are to be packed away in deep chests, and plenty of cedar boughs strewn over them, or else powdered camphor gum. The possessor of a cedar-wood trunk need have no apprehensions, but without that, the moth-millers will make sad havoc among your furs, woolens, etc., unless you regard them carefully.

The Carpets.

All carpets do not need to be taken up; those which do not can be loosened at the edges, the dust-brush pushed under a piece, and a clean sweep of all the dust can be made. Then, wash the floor thus swept, with strong soap-suds, and spirits of turpentine after. Then, tack the carpet
down. The odor is soon gone, if you open your windows, and you can feel safe for this summer, at least. Upholstered furniture can be treated to the same bath, if applied with a soft, clean cloth, and the colors will receive no injury. But before using it, brush the cushions with a stiff hand-brush and a damp cloth, so as to take away all the dust.

A good way to clean straw matting after it is laid, is to sprinkle corn-meal over it, or damp sand, and sweep it thoroughly out.

**Windows Washed.**

Windows are hard to wash, so as to leave them clear and polished. First, take a wooden knife, sharp-pointed and narrow-bladed, and pick out all the dirt that adheres to the sash; dry whiting makes the glass shine nicely. I have read somewhere, that weak black tea and alcohol is a splendid preparation for cleaning the window-glass, and an economical way to use it would be to save the tea-grounds for a few days, and then boil them over in two quarts of water and add a little alcohol when cold. Apply with a newspaper, and rub well off with another paper, and the glass will look far nicer than when cloth is used.

**Furniture Doctored.**

To take out bruises from furniture, wet the part with warm water; double a piece of brown paper five or six times, soak it, and lay it on the place; apply on that a hot iron till the moisture is evaporated; two or three applications will raise the dent or bruise level with the surface. If the bruise be small, merely soak it with warm water, and apply a red-hot iron very near the surface; keep it continually wet, and in a few minutes the bruise will disappear. To remove stains, wash the surface with stale beer or vinegar; the stains will
be removed by rubbing them with a rag dipped in spirits of salt. Re-polish as you would new work. If the work be not stained, wash with clean spirits of turpentine and re-polish with furniture oil.

**Household Hints — Seventeen Facts.**

1. Simple salt and water cleans and preserves matting more effectually than any other method.
2. Tepid tea cleans grained wood.
3. Oil-cloth should be brightened, after washing with soap and water, with skimmed milk.
4. Salt and water washing preserves bedsteads from being infected by vermin; also, mattresses.
5. Kerosene oil is the best furniture oil; it cleanses, adds a polish, and preserves from the ravages of insects.
6. Green should be the prevailing color for bed hangings and window drapery.
7. Sal-soda will bleach; one spoonful is sufficient for a kettle of clothes.
8. Save your suds for the garden and plants, or to harden yards when sandy.
9. A hot shovel held over varnished furniture will take out spots.
10. A bit of glue dissolved in skimmed milk and water will restore old rusty crape.
11. Ribbons of any kind should be washed in cold suds and not rinsed.
12. If flat-irons are rough, rub them well with salt, and it will make them smooth.
13. If you are buying a carpet for durability, you must choose small figures.
14. A bit of soap rubbed on the hinges of doors will prevent them from creaking.
15. Scotch snuff, if put in the holes where crickets come out, will destroy them.
16. To get rid of moths and roaches from closets and bureau drawers, sprinkle powdered borax over and around the shelves, and cover with clean paper.

17. To remove grease-spots apply a stiff paste to the wrong side of the material or garment; hang it up and leave it some time; the grease will have been entirely absorbed by the paste, which can then be rubbed off.

**To Clean Looking-Glasses.**

Wash a piece of soft sponge, remove all gritty particles from it; dip it lightly into water, squeeze it out again, and then dip it into spirits of wine; rub it over the glass, dust it with powdered blue or whiting sifted through muslin; remove it lightly and quickly with a clean cloth, and finish with a silk handkerchief. If the glass be a large one, clean one-half at a time, otherwise the spirits of wine will dry before it can be removed. If the frames are gilt, the greatest care must be taken to prevent the spirits of wine from touching them. To clean such frames, rub them well with a little dry cotton wool; this will remove all dust and dirt, without injury to the gilding. If the frames are varnished, they may be rubbed with the spirits of wine, which will take out all the spots and give the varnish a good polish.

**Fastening Window Sashes.**

A convenient way to prevent loose window sashes from rattling unpleasantly when the wind blows, is to make four one-sided buttons of wood, and screw them to the stops, which are nailed to the face-casings of the window, making each button of proper length to press the side of the sash outward when the end of the button is turned horizontally. The buttons operate like a cam. By having them of the
correct length to crowd the sills of the sash outward against the outer stop of the window frame, the sash will not only be held so firmly that it cannot rattle, but the crack which admitted dust and a current of cold air will be closed so tightly that no window strips will be required. The buttons should be placed about half-way from the upper to the lower end of each stile of the sashes.

French Polish.

To one pint of spirits of wine add half an ounce of gum saellac, half an ounce of gum lac, and half an ounce of gum sandarac; place the whole over a gentle heat, frequently stirring till the gums are dissolved. Then make a roller of list, put a portion of the mixture upon it, and cover that with a soft linen rag, which must be slightly touched with cold-drawn linseed oil. Rub them into the wood in a circular direction, covering only a small space at a time, till the pores of the wood are filled up. Finish in the same manner with spirits of wine with a small portion of the polish added to it. If the article to be polished has been previously waxed, it must be cleaned off with the finest sand-paper.

Restoring Furniture.

An old cabinet-maker writes that the best preparation for cleaning picture-frames and restoring furniture, especially that somewhat marred or scratched, is a mixture of three parts of linseed oil and one part spirits of turpentine. It not only covers the disfigured surface, but restores the wood to its original color, and leaves a luster upon the surface. Put on with a flannel, and when dry, rub with a clean soft wooden cloth.
The Beds.

When mattresses and feather-beds become soiled; make a paste of soft-soap and starch, and cover the spots. As soon as it dries, scrape off the paste and wash with a damp sponge. If the spots have not disappeared, try the paste again.

Rough on Grease.

The following will be found a most excellent preparation for taking grease-spots from carpets and other fabrics: Four ounces white Castile soap, four ounces alcohol, two ounces ether, three ounces ammonia, one ounce glycerine. Cut the soap fine; dissolve in one quart soft water over the fire; then add four quarts more soft water, after which add the spirits, and bottle. Cork tight. Apply with a stiff brush, and rinse.

To Brighten Carpets.

Dissolve a handful of alum in a pail of water, dip your broom in, shaking it well, and sweep a small space. Then re-dip the broom, and sweep as before, until you have gone over the whole carpet. You cannot imagine how it will renew the colors in the carpet, especially green.

Laying Down Oil-Cloths.

Oil-cloths always come in rolls. The nearer we buy, says a correspondent, towards the last end of the piece the more they will shrink after laying them down. To prevent this, unroll them, place them smoothly on the floor wrong side up, and use them so for a week, or even two. Then
turn them, and tack them to the floor. This method prevents their pulling up and cracking, as we often see new oil-cloth do.

**Cleaning Gold Chains.**

Put the chain in a small glass bottle, with warm water, a little tooth-powder and some soap. Cork the bottle, and shake it for a minute violently. The friction against the glass polishes the gold, and the soap and chalk extract every particle of grease and dirt from the interstices of a chain of the most intricate pattern; rinse it in clear, cold water, and wipe with a towel.

**To Whiten Ivory.**

Boil alum in water; into this immerse your ivory, and let it remain one hour; then rub the ivory with a cloth, wipe it clean with a wet linen rag, and lay it in a moistened cloth to prevent its drying too quickly, which causes it to crack.

**Toilet Receipts.**

**To Remove Freckles.**

Take one ounce Venice soap, one-half ounce lemon-juice, one-quarter ounce bitter almonds, one-quarter ounce deliquated oil of tartar, three drops oil of rhodium. Dissolve the soap in lemon-juice, and add the two oils. Place in the sun until it becomes an ointment. Then add the rhodium. Anoint at night with this ointment, then wash in the morning with pure water, or mixture of elder-blows and rosewater.
Face Wash.

Take a small piece of gum benzion, boil in spirits of wine until it is a rich tincture. Use fifteen drops in a glass of water, three or four times a day. Let it remain on to dry. It is very efficacious in removing spots, eruptions, etc.

Curling False Hair.

Wind the hair on smooth round sticks about as large as a curling iron, fasten the ends firmly to the stick, then wind over the hair a strip of cloth, which must also be fastened at the ends, put in a dish of warm water sufficient to cover, and let it boil two hours. Remove from the water and place in a moderately heated oven to remain until nearly dry, when they should be placed in the sun or near the stove until they are perfectly dry, when they may be unwound from the sticks and brushed over the finger. If too dry or not sufficiently glossy, put a little oil on the brush. Care should be taken while the hair is in the oven that it does not become too warm.

Cleansing the Hair.

Use a tablespoonful or two of common spirits of harts-horn, in a basin of water; then thoroughly wash the scalp and the hair until they are clean; then wash with clean water, wipe dry, and apply a little light oil or promade, if needed, to prevent from taking cold.

Another good hair-wash is: Beat the whites of four eggs to a froth, rub well into the roots of the hair. Leave it to dry. Wash the head clean with equal parts rum and rosewater.
Dandruff can be removed by washing the head with buttermilk and thoroughly cleansing with pure soft water afterward.

**Stimulant for the Hair.**

One of the best stimulants to promote the growth of the hair, when there is danger of baldness, and to hasten growth, is as follows: One pint alcohol, castor oil enough to take up the alcohol, two ounces spirits ammonia, one-quarter ounce oil origanum, one-quarter ounce tincture cantharides. Shake all well together before using. Apply about four times a week.

**Glycerine Ointment.**

A glycerine ointment for chaps and excoriations is made as follows: One-half ounce spermaceti melted together with a drachm of white wax and two fluid ounces of oil of almonds by a moderate heat; the mixture is poured into a mortar, when a fluid ounce of glycerine is added to it and rubbed till the ingredients are thoroughly mixed and cold.

**Court Plaster.**

Soak isinglass in a little warm water for twenty-four hours; then evaporate nearly all the water by a gentle heat, dissolve the residue in a little proof spirits of wine, and strain the whole through a piece of open linen. The strained mass should be a stiff jelly when cool. Now, extend a piece of silk on a wooden frame and fix it tight with tacks and thread. Melt the jelly, and apply it to the silk thinly and evenly with a hairbrush. A second coating must be applied when the first has dried. When both are dry,
cover the whole surface with two or three coatings of balsam of Peru, applied in the same way.

Unfermented Wine.

Take the pure juice of well-ripened grapes, put in a porcelain kettle with about one pound of best white sugar to each gallon of juice, and let it boil gently, skimming carefully. Let it simmer slowly till it is reduced about one-fifth. Then bottle or can while hot, and you have a rich, refreshing drink.

Elderberry Wine.

To every quart of the berries put a quart of water, and boil for half an hour. Bruise from the skin and strain, and to every gallon of juice add three pounds of double-refined sugar and one-quarter ounce of cream of tartar, and boil for half an hour. Take a clean cask, and put in it one pound of raisins to every three gallons of wine, and a slice of toasted bread covered with good yeast. When the wine has become quite cool, put it into a cask, and place in a room of even temperature to ferment. When this has fully ceased, put the bung in tight. No brandy or alcohol should be added.

Home Made Inks.

A good black ink may be made as follows: One gallon of soft water, one-quarter of a pound extract of logwood, twenty grains bichromate potash, fifteen grains prussiate potash. Heat the logwood and water to a boiling point, and skim well. Dissolve the potash in one-half a pint of hot water, and put all together, stirring well. Boil
three minutes; strain, and it is fit for use. A few cloves put in each bottle will prevent it from molding.

**Ink Not Injured by Freezing.**

Take about one handful of maple bark — the inside bark, the outside bark having been scraped off. Put it in three pints of water, and boil until the strength is all out of the bark; then strain the bark out of the ooze. Put in the ooze half a tablespoonful of copperas, and boil five or ten minutes, until the copperas is all dissolved. Keep stirring. This will make near one gill of good ink that will not be injured by freezing.

**Indelible Ink.**

Four drachms nitrate of silver, four ounces rain-water, six drops solution of nut-galls, and one-half a drachm gum Arabic. This will make an ink that will not fade, and costs very little.

**Indelible Inks for Brusnes.**

For using with a marking-brusn, an ink may be made by diluting coal-tar with benzine to a proper consistency, or equal parts of vermilion and copperas may be rubbed up with oil varnish. Either of these holds well on linen or cotton fabrics.

**Ink for Zinc Labels.**

An ink for zinc only, that will endure for years, cuts slightly into metal, has a black color, and is as legible after a dozen years as when newly written, is made as follows:
One part verdigris, one part sal ammonia, half part lamp-black, and ten parts of water; mix well and keep in a bottle with a glass stopper; shake the ink before using it. It will keep any length of time. Write it on the label with a steel pen, not too fine pointed. It dries in a minute or two.

Recipes for Glue—Isinglass and Spirits.

A strong and fine glue may be prepared with isinglass and spirits of wine, thus: Steep the isinglass for twenty-four hours in spirits of wine and common brandy; when opened and mollified, all must be gently boiled together and kept well stirred until they appear well mixed, and a drop thereof, suffered to cool, presently turns to a strong jelly. Strain it while hot through a clean linen cloth, into a vessel, to be kept close stopped. A gentle heat suffices to dissolve the glue into an almost colorless fluid, but very strong, so that pieces of wood glued together with it will sooner separate elsewhere than in the points joined.

A Strong Cement.

Mix a handful of quicklime with four ounces of linseed oil; boil them to a good thickness, and then spread it on tin plates in the shade, and it will become exceedingly hard, but may be easily dissolved over a fire, as glue, and will join wood perfectly. This glue will resist fire and water.

Cheap Water-Proof Glue,

A glue that will resist water to a considerable degree is made by dissolving common glue in skimmed milk. Fine levigated chalk added to the common solution of glue in
water makes an addition which strengthens it, and renders suitable for sign-boards and things which must stand the weather.

**Paste That Will Keep.**

Dissolve a teaspoonful of allum in a quart of water. When cold, stir in as much flour as will give it the consistency of thick cream, being particular to beat up all the lumps; stir in as much powdered resin as will lie on a dime, and throw in a half dozen cloves to give it a pleasant odor. Have on the fire a teacupful of boiling water, pour the flour mixture into it, stirring well at the time. In a very few minutes it will be of the consistency of mush. Pour it into an earthen or china vessel; let it cool; lay a cover on, and put in a cool place. When needed for use, take out a portion and soften it with warm water. Paste thus made will last. It is better than gum, as it does not gloss the paper, and can be written on.

**The Dyer's Art.**

The time is long since past when spinning and weaving constitute an important part of rural economy. It will no longer pay even to dye old fabrics at home, except in those sections far removed from dyer's establishments. It will not pay at all, except for the most common fabrics. Rag carpets, however, have not gone out of fashion, and they never should. If tastefully made, they are pretty, and for kitchen and general family wear, certainly lasting. The recipes given by contributors fairly include all the regular colors, and will show that this department of rural art is still extensively practiced, for many still keep up the knowledge of the art as much because it amuses them as for any other reason.
Coloring Dress and Other Fabrics.

As to the stability of dyes imparted to silks, damasks and fabrics, used in furnishing, an eminent French chemist has found that the blue colors produced by indigo are stable; Prussian blue resists moderately the action of air and light, but not soap; scarlet and carmines, produced by cochineal and lac-dye, are last; the most stable colors on silk are produced by weld.

Mordants.

In colorings it is sometimes necessary to employ mordants, or substances to "fix" color; they may even change a color; so, by mixing mordants, different shades are produced. But it will not be necessary to enter into this subject here. Where mordants are necessary, they will be given in the simple recipes. In relation to fixing colors generally, and this applies to washing, the following will be useful:

Take a large double handful of bran, put it in a saucepan and set it over the fire, allowing it to boil thoroughly in a quart of water. When thoroughly boiled, strain the bran, and throw the water into that in which you are about washing your lawn or chintz dress. Let the dress soak for an hour or so in it before washing. Instead of starch use a weak solution of glue-water, and iron on the wrong side.

Coloring—Yellow, Blue and Green—Yellow.

Dissolve one-half pound sugar of lead in hot water; dissolve one-fourth pound bichromate of potash in a vessel of wood, in cold water. Dip the goods first in the lead water, then in the potash, then alternate until the color suits. This quantity answers for five pounds of goods.
Blue.

Dissolve one-fourth pound copperas in soft water, sufficient to color five pounds of goods; put in the goods and let them remain fifteen minutes; then take them out. Take clean soft water and dissolve two ounces of prussiate of potash. Put in the goods when it is milk-warm. Let them remain in this fifteen minutes; then take out the goods, and add one ounce of oil of vitrol to the potash dye when it is only milk warm; put in your good again; boils or deep blue, and take out before boiling for lighter shades.

Green.

Take the yellow dyed by the above receipt, and dye by the recipe given for dying blue, and you will have a beautiful green.

Coloring Cotton.

To four pounds of rags take one and one half ounces oxalic acid, two ounces of Prussian blue; let each soak over night in one quart of rain-water, then put together in as much warm rain-water as you want to color with. Put in the rags and let them be in twenty minutes. Wring out and dip in the following yellow dye:

Take six ounces of sugar of lead, four and a half ounces of bichromate of potash; dissolve in a pint of hot rain-water. Take as much hot rain-water as you want to color with. Dip first in the lead, then in the potash several times. Rinse in cold rain-water. Use tin or copper — no simmering is needed. The first makes a blue, the last a beautiful yellow, and both a durable green.
A Good Yellow.

Take bichromate of potash, one pound to a pailful of water: for blue two boxes of bluing. Color yellow first, then dip the goods, either cotton or woolen, into the blue dye, and you have a deep durable green. Scald thoroughly.

Coloring Cotton Red.

Take two pounds of Nicaragua, or red wood, four ounces solution of tin. Boil the wood for an hour or more, turn off the dye into a tub or pail. Then add the tin, and put in your cotton. Let it stand five minutes, and you will have a nice red.

Or this.—For four pounds of goods, take one pound of redwood. Steep in cold water over night, then let it come to a boil. Skim out the chips; wring out the goods in the dye, then add sufficient muriate of tin to set the color; return the goods to the dye, let them remain until colored deep enough. Color in brass or tin.

Coloring Cotton Green.

Dissolve six ounces of sugar of lead in hot water, four ounces bichromate pottassæ in warm water; dip the cloth in the sugar of lead, wring out, then dip in the pottasa. Dip three or four times, till a bright yellow is obtained. When the cloth is dry, dissolve four ounces Prussian blue, four ounces oxalic acid. Dissolve separately in warm water; then turn together, and dip your cloth in the blue dye, and you will have a splendid green.

Prussian blue and oxalic acid make a beautiful blue for cotton. Dip three or four times for a deep shade. Rinse in salt-water.
Or this.—For five pounds of goods dissolve nine ounces sugar of lead in four gallons rain-water. Dissolve in another vessel six ounces bichromate potash in four gallons of rain-water. First dye your goods blue (if you wish a dark green, you must have a dark blue—if light green, a light blue). Dip the goods first in the lead-water, then in the potash-water, and then again into the lead; wring out dry, and afterwards rinse in cold water.

**Scarlet and Pink—Scarlet for Woolen Goods.**

To each pound of goods take one ounce of pulverized cochineal, one-half ounce of cream-of-tartar, two ounces of muriate of tin. Use soft water. Color in tin or copper. Let the water get a little warm before putting the dye-stuff in. Stir well, so that all is dissolved, then put in the goods and let them come to a boiling heat and simmer until the right shade is obtained. A beautiful rose color can be made by taking out when at that shade. It will not fade by washing or wearing, but grow darker as all the other scarlets do. This will not do for cotton or silk.

**Pink.**

Take three parts of cream-of-tartar and one of cochineal, nicely rubbed together; tie a teaspoonful in a mustard bag. Put this with a quart of boiling water; dip in the articles to be colored, previously cleaned and dipped in alum water; if wished stiff, put in a little gum arabic.

**Coloring—Black, Brown and Slate—Black.**

Take one pound of extract of logwood. Put it in a kettle and fill it half full of water. Dissolve it the day before it is wanted, and pour half of it in a kettle of water. Put in your
yarn and boil half an hour. Have ready a quarter of a pound of copperas dissolved in another kettle and take out your yarn and pour in half your copperas water again. Put in your yarn. Let it remain five minutes. You will then have a nice black. When this is done, you can put in all of the rest of your dye and throw in all your old black and gray rags and color them over. You will thus have your rags in shape to take to the weaver's, and have a nice carpet.

Brown.

For nine pounds of goods take one-half pound japonica, two ounces blue vitrol, one ounce bichromate of potash. Dissolve the japonica in enough soft water to cover the goods, and let them stay in all night. In the morning make a solution of the vitrol and potash; wring the goods out of the other dye and let them stand in this half an hour. The goods should simmer in both dyes. For light brown use a brass, and for a dark, a copper kettle, to make the dyes in. This is a good recipe for coloring dress goods, as well as carpet rags.

Brown With Catechu.

Take one pound of catechu extract and one-half ounce of vitrol; dissolve in rain water; the catechu put in water enough to wet your goods. Color in an iron kettle. Then put in your vitrol. Wet your goods in soapsuds before putting in the dye. This is a fast color.

Slate Color.

Boil yellow oak bark in an iron kettle until the strength is extracted. Take out the bark, then add a very little copperas, and you have a pretty color.
Walnut Coloring—Black Walnut, with Walnut Barks

Walnut bark will color any shade from a light tan to coal-black. Color the wool before carding as follows: Peel the bark from the body of the tree—the bark of the root is the best. Put it into a barrel, a layer of the bark and wool alternately, till you fill the barrel; then fill up the barrel with rainwater. Lay on the top heavy weights. Let it stand in the sun or some warm place till you get the shade required.

With Butternut Bark.

Another way to color yarn, cloth or carpet rags, is to boil a large iron kettleful of butternut bark for four hours; take out the bark, put in a spoonful of copperas. If you wish a black put in more copperas or a little blue vitriol—too much vitriol rots the goods. Then while the dye is boiling, put in the goods and keep stirring and once every few minutes lift the goods with a stick into the air, then put them under. And so on keep watching and moving them till you get the shade required. If left folded or packed too tight they will spot.

Nearly Black.

Put the bark in an iron kettle, and boil until the strength is all out; then skim out, and add about one teaspoonful of copperas to set the color, airing the goods while boiling. If you wish to color woolens, omit the copperas.

Butternut and Black Walnut.

Peal the bark when the sap is up; put in a kettle, cover with water and let stand until it sours; then boil an hour, throw out the bark and put in the yarn (woolen wet in soap-
suds), cover it over with the bark and weigh it down in the dye. Let stand for a day, then wring it and hang it out in the air for half a day. If it is not dark enough re-heat the dye, put back the yarn and let it stand as long again. It will be a nice brown that won't fade with washing. Black walnut colors the darkest. I believe it would color black by having the dye very strong and and airing it often.

**Hickory-Bark Color.**

Hickory bark will color a beautiful bright yellow, that will not fade by use. It will color cotton and wool. Have the bark shaved off or hewed off, and chopped in small pieces, and put in a brass kettle or tin boiler, with soft water enough to cover the bark, and boil until the strength is out; then skim out the chips and put in alum. Have it pounded pretty fine. For a pailful of dye I should put in two good handfuls, and wet the goods in warm water so there will be no dry spots on them; wring them as dry as you can, shake them out and put them into the dye. Have a stick at hand to push them down and stir them immediately, so they can have a chance all over alike. If the color is not deep and bright enough, raise the goods out of the dye, lay them across a stick over the kettle, and put in another handful of alum. Stir it well and dip again. It will want to be kept in the dye and over the fire to a scalding heat about an hour, but keep stirring and airing, so they will not spot.

**Coloring Carpet Rags.—Drab, Green, Etc.**

To color drab: Save your cold tea and put a little copperas in it. Boil it up and skim it, and then put in your goods and let them remain a short time.

To color cotton green: First color blue, and then put them in a yellow dye.
To color blue: For four pounds of one ounce prussiate potash, one ounce copperas, one ounce of alum. Dissolve the alum and copperas in water enough to wet the goods. Then put them in the potash, and let them remain ten minutes; then put in the copperas and alum. Let the dye be hot.

To color yellow: Take eight ounces sugar of lead, four ounces bichromate potash. Dissolve the sugar of lead in hot water, in a jar. Dip the goods in the sugar of lead first, and then in the potash, alternately, till you have the color desired. This will color six pounds.

Yellow and Blue.

For each pound of cotton rags, take one ounce of sugar of lead, dissolve in warm water, put in a brass or copper kettle. Heat it to a scalding heat and put in the rags. Let them remain in half an hour; then dissolve one ounce of bichromate potash in warm water in a wooden dish. Take the rags out, dip in the potash, wring out and air. Repeat until you use the dye up. You will have a beautiful yellow. Be sure and use soft water.

To color blue: to five pounds of cotton rags take five ounces prussiate of potash, five ounces copperas and two ounces oil vitriol. Take the copperas and potash, put in a copper or brass vessel, heat it till well dissolved. Put in the rags, and scald from eleven to thirty minutes. Take out and cool. Add oil vitriol, then dip and take out. Hang in the shade. You can take more white rags and make a pale blue by dipping in after this. Put your yellow rags in this same blue dye, and you will have a nice green. Hold some in your hand and put in the dye in places, and it will be clouded yellow and green. This must be in soft water, also. Then hang in the shade, and when dry, rinse in warm water.
Green.

For five pounds of white cotton rags reeled in skeins, I take one pail of the inner bark of yellow oak, cut in fine chips, and boil it two hours in three pails of soft water, in either tin, brass or copper. Then skim out the bark and add one-fourth of an ounce of alum. While the dye is boiling, take three ounces of Prussian blue, tie it up in a strong cotton rag, and rub it in enough soft water to thoroughly wet the rags; squeeze and turn them in the bluing nearly half an hour. Wring them out and take as many as you can handle at one time and put them in the hot dye, stir them around a few seconds and take them out; then put in more until you have them all green. Do not leave them in the dye a minute for it will soak out the blue. The rags may need to be dipped more than once. This color will not fade. If light green is desired, use less blue.

Green and Red.

To color carpet-rags green: to five pounds of cotton cloth, take one pound of fustic and four ounces of chip logwood; soak in a brass kettle over night; heat the dye, then add two ounces of blue vitriol; wet the cloth in suds. When the dye is boiling hot put in the cloth.

For coloring red, for five pounds of goods, take one pound of redwood, steep in cold water over night, then let it come to a boil, skim out the chips; wring out the goods in the dye, then add sufficient muriate of tin to set the color; return the goods to the dye, let them remain until nearly colored deep enough; color in brass or tin.

Blue and Yellow.

I first color blue, then yellow. Take one ounce prussiate of potash, one tablespoonful of copperas, one ounce oil
of vitriol. Bring to a boil. Then put in the goods for twenty minutes, skimming often. This is sufficient for five pounds.

To color yellow, dissolve one and a half pounds sugar of lead in hot water, one and a half ounces bichromate of potash, dissolved in a vessel of wood in cold water. Dip first in lead water, then in the potash, and alternate until the color suits.