Notes

Glass Mts

1965

Check: There may be cells marked 731z - if so, the fusulinids should be 730z.
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A survey of Puerto Rico the published maps is \( \frac{1}{50,000} \).

The features shown on top three groups—(1) water, in swamps, and other bodies mountains, hills, valleys, and (3) culture (works of man), roads, and boundaries. The features are shown and explained some earlier maps, and added some special maps.

All the water features are streams and canals by single by double lines. The large accentuated by blue water. Streams—those whose beds are shown by lines of blue depth.

Relief is shown by contour maps are supplemented by thrown from the northwest a purpose of giving the appearance of giving the interpretation of the concele mit or zero of altitude of the sea level. The 20-foot cont
April 1.
3.5
4.0 to 7246.
4.75 to Road bend
Right on end of outcrop N 30° W
3. Surveys of areas in which the problems are of minor importance, such as much of the mountain area.

4. Surveys of areas in which the problems are of major importance, such as much of the mountain area.
THE DIRECTOR,
United States

November 1937.

Effective on and after October 1, 1946, the price of quadrangle maps will be 20 cents each, with a discount amounting to $10 or more at the retail rate.
The aerial camera is now being used in mapping. From the information recorded on the photographs, planimetric maps which show only drainage and culture, have been made for some areas in the United States. By the use of stereoscopic plotting apparatus, aerial photographs are utilized also in the making of the regular topographic maps, which show relief as well as drainage and culture.

A topographic survey of Alaska has been in progress since 1898, and nearly 44 percent of its area has now been mapped. About 15 percent of the Territory has been covered by maps on a scale of $\frac{1}{500,000}$ (1 inch = nearly 8 miles). For most of the remainder of the area surveyed the maps published are on a scale of $\frac{1}{250,000}$ (1 inch = nearly 4 miles). For some areas of particular economic importance, covering about 4,300 square miles, the maps published are on a scale of $\frac{1}{62,500}$ (1 inch = nearly 1 mile or larger. In addition to the regular topographic maps of 20 to 250 feet. 

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March 28
Arrived Marathon - Noon on Mar. 28
15-20' of bioturbated beds C, M
fossils: Elphidiumella hassencensis
Spumellaria = 7300
x fossils 730p at base of heavy beds

730q - Elphidiumella beds on fault
Went on Hess Ranch to north side
low ridge N of Hess Ranch. Examinal
the eolianite justling N from top
hill with two levels 5830 and 5600.
The rock on these slopes is very
massive and suggests the bowl
Skinner Ranch to me. It is much
dolomitized and only fossils seen
were sections of snails and crinoid
stems. Massiveness of the rock
suggests Skinner Ranch. The rock
extends to the creek. Even noting
to indicate real Hess lithology.
I think the north slope of this
ridge from its west end to the
flat place in the hill 5600' is all
basal Skinner Ranch much
altered by dolomitization probably
from inclusions, one of which occurs
near the end of the long open
Want to see fault on NE. more of hill 5250 (contour). The fault is very conspicuous. A long section is exposed on the west face of this hill consisting of a considerable thickness of ribbon-banded, platy light gray-wearing limestone that breaks into plates which litter the slope. Some plates have an orange silicous sheen, and a small amount of silicous shale appears. This platy material is capped by clastic and biotabular limestone with Ribiporina, Eocostites, and Spirodiaphora. Thickness of limestone not determined. Above the Spirodiaphora bed which extends down the slope of the spur are CM type of beds which are followed by biotabular beds, thickness not yet determined which belong to my locality 708 = Cristitella beds. I think we have here a passage interval to The Hess. The platy beds representing middle Skinner Ranch passing into Hess lithology and then up Skinner Ranch with Spirodiaphora = to The Bell Neal Member.
March 29

Send Garcia pictures of Museum exhibits.
N65 E 20° N

730 r. — fusuline + Spisidiophora
A- flat banded ribbon banded bitum to
B- coarse calcarenite 20 to 28 ft
with R. fusuline + Spisidiophora
fusuline at base

C. Thin banded somewhat selenic
shaly to yellow weathering

B=73' D- Massive calcarenite —
biothermal with Spisidiophora

A=164' Sullivan Peak Equivalent

On top of A are steeply dipping
yellow weathering siltstone to 30 cm
Thin banded 1/8-1/2" Occasional
Thin lenses of calcarenite & shell
debris. One Thick band 2-3' below
yellow beds perhaps 10-15'!

Lowest beds of B are coarse calcarenite
with Sp. Iron rich gray zone
silicified bygreen "algae" material
Massive biothermal beds 3-4' thick.
A is on west side hill, lower part of Box top of hill, one silicious bed. Mud with shells and possible sponges.

A bed of yellow platy silicious limestone in the midst of B is followed by a thin succession of bioturbated and massive calcarcous facies of Spinydiplora near base. Extremely massive, showing no bedding. Facies in base of B is bedded = 730t. One bit heliozoa and large crinoid stem seen in 730p bed. Massive beds a pale brownish gray with varying degree of granularity.

E - Mostly blocky yellow brown crusty, breaking into angular blocks up to 8" thick, estimated at 20' and shown in a small draw, some thin bedded material - looks typical C.R.

F - About 5' small pebble cgl. = 730u - lowest cgl. 27' above old road, goes up slope as a veneer to 65' above old road. This is only place where it was seen. Pebbles scattered, white, blocky and vary up to 1/2" but mostly 1/4" - 1/2"; Pebbles well rounded but irregularly shaped.
730g - Dusty beds at fault seem to be a sliver caught in because we could find no base or top to it.

Dick's first measure of S K R came to 130', but measuring across the hill rather than down the hill gave a measure of about 65'. In half the previous measure. The truth is somewhere between.

730v - Shimmer Ranch, side of knob near 730w.

March 30
Word 3 Junction Billabong & Road Cyn

A - massive gray sandy bed with silicious layers & caps. Wedgoceras common
B - covered
C - 6' same as A with Waagen
D - 5' covered
E - 24' of sandy lo in beds 1-3' thick with Alineovites, silicious nodules & silicious skins
F - covered slope with darker gray lo giving
G - somewhat tan colored sandy bunches few fossils to top of hill. Waagenoceras on very top.
Ammonites occur often in meta-silicious skins. The striking feature of this section is the almost complete lack of beaching pods and no particles of beaching pods were seen.

Noa a futile day because we could not rediscover the 723W locality. It was very foggy and cold; could not locate ourselves because we could not see the topography. Nevertheless it is absolutely clear that the beds on west side of Billilard Canyon are Word #3 and not Word #1. They are more sandy on the west side of the canyon than on the east but there is considerable sand on the east side. We saw few beaching pods on either side of the canyon. They are not as abundant as in the Word 3 further east, i.e. in Hess Canyon.

We visited 721W which is N 80°E of hill 4910. 7210 is N 70°E and 80 north of 721W. Fatter place about exhausted.
7260.
Biocenon 18' Thick

Going south of 702C, found clinostrata at 165 paces south +
Hess lithology at 212 paces.

At about 308 paces south came
an limestone egl. at 375 Composita
in fine grained gray la Composita
Dolbya. Massive clay limestome suggests level of
726m. At 479 paces gray granulose
with silicified crinoid detritus. 500
paces same with large crinoid. Very
Weathered yellowish. Changes abruptly
530 to informal Hess type. 70 paces.

Gasoline common in
Plat beds. Conglom in inside Amphitha
is small pebble quartz and ninth
large pieces of limestone

360 paces 520'E of 702C Biocenial
beds and conglomerate with many
fossils, Richthofenidae, Derbyidae. Also
much Congl. certainly the base
of the C.M.

M31 - Bill Neal Member 2 is 18
about 15 covered, bed with yellow
chert capped by 10 with crinoid
systems and large Spathic
Large Buciclae.

Chert Band
disappears in about 100 yards. Chest bed picked up against a little boulder. A mixed bed 4' thick in places. Escarpment common. Ledges of Euphrasia borealis, Argyrolaena, sponge bed with abundance of Eutrochelia. Fossil bed running along crest of ridge about 50' above 100'. Spence and some 57' in length. Aim to play out opposite Wend hill capped 5700' contour, opposite Wend hill 5700' contour.

Slight from 702 E

S 60 E of and hill of hogst
N 60 E S highest part of Leonard Mtn.
N 70 W of Wend hill 5060'
S 80 E Wend hill 5305'

702 E is 540 paces = 1350' west along ridge from divide = 1/4 mile. To get H1 locality follow fence line at gate 70 to its right section with Neal carbon fence.
April 1
7246 locality - Road Canyon

A - all but top 5' covered, top 5' with
Thick-bededd chalk strongly suggestive
of Leonard

B - Biothermal beds thought to be lower
Road Canyon

C - Very thin-beded, bituminous l.i.
with some interbedded chalk. Often
weathered yellow. Seems to me to
be good Road Canyon whereas
chalk under the bioherms looks
like Leonard.

Beds above Word 3 very fissile
Thin-beded yellow-silicious shale
Top bed of Word 3 has an inch or two
of brown, silicious material. Word 3
is light gray, very sandy. Occasional
Thin beds of chalk. Very uniform
 lithologically. Irregular sand layers
fossils, sand grains scattered, broken.
Occasional lenses with quartz pebbles
up to half an inch. Well scattered.
Layers about 65-70' thick.

W3 at SE end of outcrop: 11 levels at 13°
731m- large lens of limestone, sandy and silty, containing in fusulines and other fossils. West here yellow gr. pavement. About 3'-4' thick. At about same level as 7302 which came from the shale. The lens is 30-35' below Word #3 and seems almost identical to 723 W. The lithology is the same and the fossils similar. Phragmecites present.

Under the Word #3 is thin, yellow, fissile shale with occasional small liny lenses with fusulines and other fossils. One of these is 7302 taken from 30' below the Word #3. This shale seems lighter yellow than that of the Leonard and it has no chalk in it.

Location of 731m:
S 70 E at rigorous knot,
S 55 W on Sullivan Peak
S 30 W on hill 5300
S 60 E on hill (tree) on N side 5280.

Located just before Word 3 goes under the floor. Two patches of Word #3 west of main mass about 0.1 mi.

Follow fence to overcrop; where go through gate
Hill 5280

A1 - patch of small pebble conglomerate with Aglaea (common) and Drutilosa present.

Dark granular lo with Pennatules.

3'-4' bed dark detrital, with large Hurdadia, Chonostega, Hecosia, Aglæa.

These 3 layers chert together and enclosed in a matrix of blocky chert that breaks into rectangular lenses.

A double hood of lo. At about 4650' on slope. Other shells, dark color with brown silica skin.

<table>
<thead>
<tr>
<th>CM</th>
<th>Tony</th>
<th>1' A</th>
<th>50' B</th>
<th>SK-Tony</th>
<th>3' C</th>
<th>about 30' D</th>
<th>E</th>
<th>Covered to show</th>
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A1' - Detritals encased by chert above 1' below and contain Congerchus. About 50' below this edge chance

Thick limestone. There is a 3' bed with Congerchus. About 30' is another massive lo and in between is chert

This upper bed contains many corals thin and long.

E - Thick massive granular lo with scattered quartz pebbles up to 1' It is about 10' thick and contains small corals. Also has. Thick layers 4-6' of chert.

Below E is about 30' of SKR. The chart on it is more orange than that below.
Bed A', higher up a slope near top of hill had sandstone or something new.

A² - Divide between two main gullies has contact of SKR and CM. SKR has silurian skin and contains Tournaisian very uppermost bed is a clth with 1/2" pebbles. small corals common. lower quartz pebbles of 1/2 inch are scattered in the beds. Some layers of brown chert appear below. The top but all are thin. Large crinoid stems Helicosponge

Limestone appears in the lower 50' of the Cathedral Mts. but they do not seem typical of CM. Cornellia Penicillus and Chamaegetes but nothin distinct. upper bed 3' thick with a 3' silicous skin.

We walked the top bed of the SR from the Mt. top down till to our locality A' and the top is actually bed E which has at least 25' of chert under it. it is evident that the cherty beds thin into the mountain to the east. Possibly there is convergence of the \( \text{Tapanchus} \) beds toward Leonard Mts.
What we saw on hill 5280 suggests that some of the SKR chalks are pinched out to the east so that the mountain front presents a complete cliff face. Furthermore we found Foraminifera common at the top of the SKR and for some 50' or so below. It also occurs in 2 layers in the beds above it, in what is lithologically like Cathedral Mtn. I suspect that these limestones belong to the SKR rather than to the beds above. These may converge eastward to make the Foraminifera beds on Leonard Mtn.
April 2 -- King locality 104
Dolomite with scattered crinoid debris

On east side of King's 104 we saw evidence of faulting, lenticular rock, calcite rock, thick calcite veins, color change, dolomitic rock. All this added to a drastic dip change suggests fault. Furthermore, under the cap with brachiopods comes a massive coarse calcarenite. That I believe to be Shinnery Ranch. The situation seems to be nearly the same as that at 708.

Ness burst at East end A2' -- The Lemp Hills cap crosses the divide just east of the igneous body and the fault is on the S side of the divide. The fault must run along the South side of the igneous body and the east side of the divide. Thus the conical hill must be blocked on 3 sides by fault. The southermost fault taking in localities King 104 and 708. The fault along the south side of the igneous body must join the fault on the South side. The bulk of the conical hill must continue to be Shinnery Ranch (high).
A23. Near Ranch House
Fault runs stream on E side concave hill. 750 feet upstream from road.
Large bichinite at junction of road and main stream. Probable ostracods.
Under this a few feet from the road (50') in stream is pleko yellow 
whale, a large impeller clams 
like those from Split Rock area 
seen. The bichinite is almost certainly 
consoliddes.

Mouth of Road Canyon
131 p. very end of hill at E end 
Road Canyon like a knot of 
unfossiliferous Wood #3, Umbra.
The Wood #3 is a small hump 
almost completely composed of 
faunoloids. It also contains 
some trachiospores, Rich the faun 
producents + large Debris. This 
looks like the line 3b under 
Wood #3 on Thursday morning = 
731m. 7 of these lenses below the main 
leads.

A24 - Wood #3 consisting of blockey 
light gray sandly limestone with 
chert nodules and some yellowish 
chert slabs on the blocks. 20' thick 
forming crest of hill. All types of 
fossils are extremely rare. On 
slope rises to top of hill past 
umerous pieces of rock from lenses.
like those of 73/1. There are full of foraminifera.

Coming down the slope from 75 we were impressed by the fact that the flatter slopes of Word #3 are mainly confined to the upper slopes and no yellow shale shows. Where the slopes flatten the yellow shale appears but virtually no drift from Word #3 appears. It is unlikely that we picked up any contamination from above.

Contamination may come from line lenses just above Road Canyon but these have mostly Road Canyon types. At the end of the outcrop the upper Road Canyon is sparsely fossiliferous and is somewhat suggestive of higher Word.

Perminites is on the slope just west of 721/1. The lower slopes above the Road Canyon at and around 721/1 are covered wholly by shale. No float from the top appears. It seems improbable that any Word # has been picked up as Road Canyon.
April 2
Section on slope with Peninities just west of 72&j - in Road Canyon

Word

31
H
11'
G
26'
F
11'
E
27'
D
4'
C
16'
B
11'
A
95

A - Bioherms with large Peniculites and many fossils
B - Bioherms - scoured, poorly exposed
C - Fine granular limestone with fusulines and Peniculites
D - Partly covered slope but with beds a foot or less thick with siliceous skins, about the level of 72&j
E - Blocky thick bedded calcarenite with siliceous layers and stains
F - Thick biohem of light gray limestone with scattered fossils, corals common
G - Yellow siliceous shale
H - Bed of limestone with abundant fusulines and other fossils scattered through
I - Word shale
April 3.

A3 = 731g. A lens of detrital limestone with pebbles and shell debris. It contains Epevidiophora. This is at base of small knob of E. M. Huge crinoid stems.

731r = A3 - 10' above top of SKR (virtually). Comes a lens like that of 731g with pebbles of broken fossils and huge crinoid stems. It has the aspect of a small knob of Xestostrophia?

Section uphill at 731g.

A - 76 feet of yellow silicious shale and blocky chert. At top of A is a 9" layer of blocky chert.

B - fine calcarenite with silicious skins on rock surface (1/2"), fossils very fragmentary. - 1 foot Yalka?

C - covered.

D - Mostly shale and chert same bedded with a 6" limestone bed at top.

E - Fine grained calcarenite, dark gray in section and weathering occasionally. Ammonites, 1" silicious skin on top.

F - platy hard shale and chert, same but with flat-beded lls of Yalka.

G - same but with flat-beded lls of Yalka.

H - Usually silicious skins or shale beds.
Next Hill West

A - Chelsea yellow shale slope mostly covered
B - Bottom bed a fossil breccia but mostly chert with another one foot limestone band and a foot or two above the lowest one
C - 11' up in C a moderately large Rhyniophycusca. At top Thistle layers of chert
D - 11' chert blocky
E - Veneer of limestone, gray like that below. Occasional ammonites

731E - Crest of first and small knob above 731G is a section of siliceous yellow shale but on top of knob is a small bed formed with numerous fossils. Strother's among others. The north slope of the knob has a steeply dipping veneer of probable Lecanoid #3. This rock is the same lithologically as that on the big hill to the west. We found nothing diagnostic in 731T to place it in the section.
A—22' of yellow silicious shale
B—1' lens of detrital le. Skarn on
C—36' of shale and layers of blocky
D—covered
E—Blocky dolomite with calciferous
F—15' of angular greenish gray dolomite
G—Massive dolomite bed, 3' thick
H—alt., altered blocky chert
I—18' of massive tan dolomite
J—alt., badly altered.
Our wanderings of April 3 over the east end of Red Stone Hills did not produce any definite trace of the
Pustifera beds. The Spinidiplinae just above the SKR Shells belong
rather to the SKR than above. The beds at 731E have fossils suggestive
of Leonard # 2 but we saw nothing to clinch this.

April 4

Lennor Hills - South
714 W - N10W of Pincadle Hill with
Leonard 2. From Hill 5300 have
N60E. Locality with Pustifera
is about half way with 714 W.
This is probably locality 723 W. Check
One block numbered 713. This
must be checked in 1963 notes
and against collection.

Sullivan Peaks

April 4 the went up Sullivan Peak
The RC is all of 300' thick. I
think its contact with the Word
is at saddle at 731 W. This is at
about 5275' elevation on the
saddle. Down slope to east I
encountered The biotemas at The
base of The RC at about 5,000' elevat
These run along the side of The
hill for some distance and
look like The lower biotemas north
west of Hess Ranch.
A - platy yellow shale with pink bands
B - Bold mass in about 2 feet layer, many chert nodules, fluoresce. Calcite
Claystone, Neaphitic
C - Thin yellow shale
D - irregularly bedded massive limestone with interbeds of yellow clay and shale
E - yellow shale in long slope
F - Thin bedded limestone with some swollen parts. Evidently a lens
G - Yellow shale occasional lens of I, J, H - yellow dolomite
I - shale
J - dolomite yellow
K - shale
L - occurs just at base of slope at end of long spurs at about 5450'
Here are a series of lenses thru 56' feet vertical. Here limestone a variety of lithologies zone are dark lithic in nature, with some calcite and some are made up almost wholly of fossils. Some are patches (small) of fossiliferous debris. The top 16' of K has blue shale rather than yellow and many of the lenses are solid
about 5190 elevation like septaria with crumbles filled with black, tiny calcite. At top of I is a bed of bluish limestone
Top of line to top of limestone and bring line to keep upswing of slope into Bullion Plateau. Dips to low lying base of the hill at about 55 10'. Above the top of 4 the slope is mostly of black shale but has sculpted blocks with black joints. Small round concretions are also present.

55 4' paces from base of is a layer of fusulinds = 731'
780 paces from base of 4 comes contact of shale & bs. Of Word & RC. Here more yellow shale occurs. This 1950' from base of 4, top of RC a great many fusulinds in nearly bedded bs. Overlying limestone cgl. = 731.5'

A4'. At about 5000' contour is a ledge of bioclines 10-15'. Thick with numerous sponges and corals that look like the basal bioclines of the Road Canyon. There are about 250' of slope here with RC = about 250-300'.
A - 8' of massive and coaly shale almost completely made up of fusulinacean. No fusulinacae in top 2'.
B - Shale, chest and thin s.s. beds, yellow and brown.
C - Massive is abounding in fusulinacean.
D - Slope of large scale indicating discontinuous beds of belemnitiferous shale in between yellow shales + chest. S. with fusulinacean.
E - Yellow chest + shale with 2' bed (belemnitiferous) of l.s. at base.
April 5
West end Road Canyon - walked over Word #3, Same sandy limestone but with few fossils. No general levels of fossils common. Bottom with ammonites - Waagenesis and Melbria and straight-shelled multilaid, common. The upper level mostly brachiopods all badly broken. In more frequent. This level also had a fair number of small quartz and other pebbles.

China Tank is exactly 0.6 mile west of middle divide in Hess Canyon.

7312 - dolomite limestone, clathy massive with linophyllum & spiriferella. Collecting poor.

732c - small isolated lave above 706 b and below Word #4.
April 6

Pregant Mountain

Ab, round knob with elevation 5000' is Leonard #3. Here about 60 feet thick and mostly cgl. at base, with some yellow chalk fossils badly macerated. Porous lamons, with large wing = 7000'

Ab, Leonard #2 is on slope just below 3 and is mainly massive & in.

The lower 1/2 and mostly massive dolomite in the upper half, all with small grn. pebbles and much fragmented fossils. D至此 it occupies 60' slope on side of mountain.

732d - Ab² N 20 E of hill 4811 = 3rd limestone

A - 3-4' conglomeratic massive, w/ small pebbles 1/2" and fragmented fossils
B - covered
C - Thinner bedded cgl. cgl.
D - covered
E - Fine calcarenite with broken fossil in lower 5' but top in course massive conglomerate to, w/ 2" siliccon shark.

Ominated Euphtostegy throughout
some of the beds have many sponges.

A6²  732E - 2nd Leonard
A- Massive fine-grained sandstone with some conglomerate patches
B- Conglomeratic dolomitic limestone rounded by weathering
C- Covered
D- Conglomeratic dolomite
E- covered
F- 2' conglomeratic
G- Chert with occasional 2' beds
H- Same as top of hill.

Skeletonia in G.
Color 33 is of Leonard #2 on Bugout Mt. Thick 35 to lower left.

Slope above 732E contains mainly quartzite

BW26 looks at small knob shows Leonard 3 on crest 4'2 below.
732f- Leonard #4 - a few feet 5-7' of gray granular limestone with most bryozoans on some of the surfaces. Ammonites present. Biphytes few and mostly a small Edinacrinus. Variety of fossils is in contrast to beds 72 and 73.

700p = A6f- Revisited Leonard #2 locality on east side of road and found cemented Omoana which is common in Leonard #2 and 3 on Leonard Mtn. We did not see it in Leonard #4. Considerable sandstone under cgl band. Leonard #2 has a great variety of Litholobus as seen at 732f. The sandstone at its base was not seen elsewhere but much sand exists in the section. Some of the blocky chert seems to be quartzite.

These limestones are clearly related to the Skinner Ranch and the discovery of Scolerania in both of these diminishes it.
April 7

NW of Dugout Mtn. near Old Dugout Ranch.

A7

A - Lower limestone, one of two
Dark gray, fine grained weathering with
a yellowish gray tint. Fusulinids
taken from 3' below top = 732g.

B - 18' of brownish yellow sandy rock
darkly like Leonard

C - 6' biotite but with few fossils
Some quartz pebbles. 732h, fusulinids

D - Cherty yellow rock

E - Gray beds '2'

F - Yellow chert

G - Calcarenite with many fusulinids

732K fossils from G. 732K is
from top, others from middle

732K - Small concentration patch with
Waggoneroceras. Under top hill with
poorly banded beds.

Blue

A7' - Clay shale with presence of a
Spinner. Shale suggests Hinton College
A72 - Low hill with "clay slide" structure, shaly bedded fine yellow sands and bluish sandstone in which we saw no fossils. This is overlain by thick beds of biohermal limestone which strongly suggests Redcliff Canyon. This limestone is about 20' thick. On its back slope is about 15' of yellow platy shale followed by about 20' of limestone, here not bioclastic, but the same beds from which we collected. The biohermal arrangement here is reversed with the bioherms at the base. Saw one mass of Cocinoporina which is good evidence for Redcliff Canyon.

A73 - High Knoll.

A - mostly thin bedded sandstone with some small pebble coke, near the bottom. Pebbles crowded and numerous, about 1'.

B - Yellow-orange to band about 1'. Thick containing Penninutes and Peniculina. Very like real clay slide. 732-1.

C - 50' of slope in gray to finish gray, cut mainly shale.
D-conglomerate, with limestone cobbles, very massive.

E-bottom half much more grain irregularly bedded, very fine grained, may have been litharenites originally.

F-series of broken with fine grained & fossiliferous limestone between one thick bed at very end. Coscinophora about 10' below top. 732-2 - ammonites at 4637 in A73 Knob.

732 m - Knob - base of broken = RC

732 m - Middle Broken

232-0 - 10' above base of broken

732 P - very top of Knob

732 R - Coscinophora (10' below top)

732 G - lower massive member of deposit cut in plain in fault block. Dolomitic cream to whiteish limestone with few fossils. A good collection could be taken here with much work.
April 3
N 85° W 4861.
S 45° E on hill with thick over of R.C.

About 1 foot fusulinid limestone
capped by 1/2 - 1 1/2 of fine-grained
dark limestone both containing
Waagenoceras and Cotyspinicina
= 7825

A 81 - Thick sandstone probably
same as that capping hill 4806.

A 82 - Small knoll of biohermal limestone
with band of c.r. beneath, all is
seamer as top of hill 4861

732.5 = hill 4861, a knoll with
about 25 - 30 of biohermal Road Canyon.
Beneath is about 100 of slope
of shale and sandy sandstone like
that on other Road Canyon Hills to
southeast. Conchoara present
and peneconusis found in float.
The RC pitches steeply to the
south facing hill capped by sand-
stone. Faje dip/difficult to decipher.
New Edmontone in shale with
Conchoara. Above this is
more shale
732W is conglomerate on west side of hill about halfway up is full of fossils with belemnites and medallions, spinifer etc.

732V - Remnants from just above cal. on N side hill 1/2 way up.

732W - Brachiopods from near top of hill = Coscinophora

735Y = Same as above but up Cathedral Mtn.

732X - From base of RC limestone which is about halfway up hill. Limestone in two tiers, the lower one 20-30' thick variable with beehives at base, above beehives comes calcareous often just fusuline limestone. Bottom of hill below is a shale slope. Above calcareous the limestone is in form of concretions and lenses interbedded with yellow shale but hill is capped by 5' bed in 2 feet of fusuline. Sample 732Y from here.
732z - above the upper limestone
a patch of fine-grained black limestone
which is fragmented and containing
many ammonites.

733a - cornoplana from low
division on SE side of 732z, Y.

April 9

Big piece of 732z to Barnes
he's it shaved & polished

Roland Haddock
Texas Tech, Geoscience Dep.
Lubbock, Texas

April 10

Field trip - lead 43 cars about
150 people to Ojito Ranch
locality and to Ness Ranch.
April 11

Cliffs 732 s on lune map.

732 s - Waagenoceras and Populoceras
found by Furnish, et al.

732 z Ammonite Bed about 2' thick
crumbly smooth argillaceous s.s.
above it is much shattered
bituminous s. 3-4', some hard is
about 2' followed by yellow shale
capping small hill.
Under the 2' bed 3 ammonites 3'+
foot of yellow shale which
separates the ammonites from the
upper part of the Red Canyon.

733 b Fusulina s. 3' thick with
Megonsea.

G 733 d - Fusulina 16 s. and may
be upper part of
733 e north side hill tops with
platy silicous rock above the lo.

22' E 733 c-2' crumbly shale with ammonite
same as 732 z

4' bed above 733 f have loose
fusulines at top, lime lenses with
sponges and limey argillaceous
gray bituminous shale.
Above yellow shale is long slope to high knob - shale for 0.2 mile, then 20 in slope for about 30' vertical. This is followed by softer shale for perhaps 40', which contains occasional lenses with grey surface. This is followed by soft for 50' and then 22 (more massive) for 33'.

733b - Collected by E. Wilde - from bituminous coal seams.

Knots of coal lie between hill with 733b-g and hill 733-t-a. Some of the 7a contain Pennites.

In morning we visited 7325 locality and all agreed that it is welling in The Word. The small knots on the west side of hill 4861 are mostly in sandstone. In some of the sandstones Pennites were seen by furnisher and students. The low hill almost due west of 4861 contained two beds of 6-8 separated by soft shale and was definitely Upper Cathedral. The hill is capped by Road Canyon and this is corroborated.
In the presence of its marked slope of the same ammonite zone seen at 7322. Above
this was the same fusulind and concretionary beds as just above
7322. Above the ammonite beds we walked for about 0.2 mile in
yellow, platy shale to the base of
the big hill. Here the platy shale
gave way to soft gray shale with
small ball-like concretions
like those seen on Sullivan
Peak slope. It also had large
bituminous concretions, some with
black ammonites where fractured.
The higher up we went the more
sandstone we encountered in
very thick beds. No float with
fusulinds was seen on this very
steep hill. At 7323 (which Bank
had) some fusulinds were taken
in concretions. Some Ammonites
were present but nothing that could
be collected.

The Road Canyon on these hills
dish little biotermal material
and many of the limestone
are separated by shales or
clays suggesting that here
the Road Canyon may be fraying
out.
April 12

An low hill on east side Douglas mt.

Bluffs of base of cgl. of Davis Ranch is 60' high face of hill and thin base of cgl at above 445' on slope. Dick makes the thickness in the series at 3 levels (.92') and 11 more (.44') to top of hill.

The cgl is mostly a limestone cgl with limestone cobbles up to about a foot in diameter. In addition are chert, jasper and silicious rock fragments ranging from sand size to 1/4" in diameter. No cobbles or chert cobbles about 60-40. In cobbles often tightly nested & conformable in shape. Dick suggests they were soft when deposited.

Entire top of hill is cgl which must be at least 150 feet thick.

733h - Top of cgl but also wet cgl surrounding patches of limestone with Bevaculchella. Other patches not examined.

733i - 30' (guess above base of Sullivan Peak)

733j - Coccinitidae blocks

733k - Fossil wood 30' below Conway. Difficult to decide if lower SP or top Pop.
733-2 - Lens of limestone about 3' thick, smooth & detrital material with much broken up shells and other elastic debris. Sponges on surface. Answers to Leonard #4 and is in right plane.

Saw Tapidophora, Taphnena and numerous sponges on the surface.

April 13.

0.7 Ed. 701
1.7 John apple House #4 where we collected 733m.

Spent part of morning trying to find Knight's 174 but got Ed in The Cretaceous.

Afternoon collected for 2 1/2 hours at 726y. Took two blocks called 733m which I hope contain P. occidentalis. This species is common in the lower part of the cobbled and shaly beds just above the lower broken part of the Cathedral Mtn. Scattered boulders also occur in these shale.

Later in afternoon showed slowa boys The 706 b and 706e localities on Hays Ranch.
April 14

Apple Ranch is 0.4 mile NE of site of Old World Ranch.

WALKED ridge under upper part of Road Canyon. At 703 there are 40 ft of slope in plate bituminous l., and 30 feet of slope in dolomite. That has big b. boulders in base (all dolomite) and is bioclastic and very massive. 703 is nearer Old World Ranch Claim. From we have given it. It is 30 feet below the hilltop at this place, and occurs in the plate Road Canyon at the base of the dolomite mass. 

733m - Fusulines from about 20' below top of hill in about middle of plate Road Canyon. Also rare Liristella, Punctularia and Coccinophora. Excellent thick bioclastic, which fingers into the limestone.

733o - 17 feet (vertical) under bioclast on more of hill. Fusulinds in a 2' marl or clay. Fusulinds capped with siliceous shells just under bioclast (about 15' above 733o) = 733p

No bioclasts were seen at top of Road Canyon from ridge with Monistella cup & Apple place.
No brochums were seen at the base of the road cangon from the enonite locality to the west clear to the 2nd of the hill. The first Upper R.E. brochum is opposite Old Word Ranch near the end of the ridge making 703d. The brochum with goniatites at base is the first one of Old Word Ranch and is about 0.25 mile west.

7332 - same type of rock as H.R.

7335 - light massive l.2 with fusulike extends up hill on S side small divide. I think it must be the same bed as the white l.2 on the low hill on the NE side of Leonard Mtn.

Visited west end of hill 5305 at saddle soft layered contain blocks like H.R. Near base of hill a thick light-colored limestone can be traced over the saddle; old stream bed suggests the Schwatian crossed through the beds of Leonard Mountain.
April 15

At 584° E of King Ranch we are on the large Casingtonia bighorn of which I have a slide. Casing extends half way up in the bighorn and is then cut off.

A.- Casingtonia bighorn
B.- Light gray bighorn, spongy
C.- Covered
D.- Massive flat bed with silicious skins. T. Facilities = 733 V.
E.- 35' light gray Thin bedded limestone
F.- Darker gray Bedded limestone with 2" chert in top.
G.- Mostly covered but from flat thin bedded silicious shale and thin limestones
H.- Massive bed limestone = 733 V.
 clave with cherty and silicious mosses
I.- Cherty brown shale
J.- Massive bighorn limestone
K.- Yellow platy silicious shale
L.- 3'-4' ledge of light gray ls
with fossils + silicious masses
M.- 15' silicious shale capped by one foot band of limestone = N
Ames of 50 occasional in this red. This is an excellent place to collect Peracelates in bed N.
Dinicularis in lenses of M.
April 15

A15 - Spent morning on large bighorn with Coonkopha west of the huge one just N of Leonard Mtn. The Coonkopha are only in the bottom half of the hill and are then cut off. Saw few fossils above them.

Looked for ammonites between the upper and lower bighorns.

Bed E is mostly fine granular limestone, calcarenite, with numerous well preserved fossils. This bed has the same lithology as that seen at 726C where we found Parinites amelius about the same zone.

We did not get precisely to 721C but it seems unlikely that any fossils from this hill could be Cathedral Mountain. All slopes below The Road Canyon are well covered. I feel absolutely sure that 721C is wholly Road Canyon.

A15 is just west on the road and is separated from 733T, 47, by a gully.
Lasso Pictures

13 + W #1 - Views on faulted area just S of Herst. 20 views at 7260 and the N 230 views at Wood 63 at Billhead Canyon and of top of SKR on hill 5280. Total views from King loc. 184 looking at east end of Herst.


#3 - 1 - Dugout Knob with ammonites. To 18 - Dugout Mtn. east side one looking N West high Wood section. 19 - 20 - Apple Ranch April 13, 21 - 25 Apple Nasa Ranch, 7260 on 23. To end of road on Crown Mtn Ranch Carrying online beds.

Color #2 - Views on faulted area opposite north to 12 views at 7260 and Hess Ranch 13-23 views of end of outcrop of W3 in Bullion Canyon and of top of SKR on hill 5280 Up to 32 - views from King 194 looking into Horst. To and Decie Ranch.

#3 - O-3 Decie Ranch, 4-9 Sullivan Park 10 - 18 - Road Canyon #4 on Hess Ranch 19 - end Dugout Mtn.

#4 - 0-7 Dugout Mtn. (mostly flowers) 8-19 - NW of Dugout Mtn. (mostly flowers) 26-25 Field trip of April 10. To and Dugout knob with ammonites.

#5 - 1 - Dugout knob with ammonites To 23 - Dugout Mtn. east side - To finish Hess and Apple Ranches April 13th.

#6 - 1+3 Hess Ranch, 4-6 Apple and Hess Ranches 7260 on 6. To 23 on Dawn Mt. Ranch mostly Road Canyon and Croscim-phl.
Big Bend Area of Texas
Texas Geog. Soc. Vol 1 No 1
Dallas, 1937.

April 16.
Packed all blocks, bundled all bags and packages to total 48. They weighed 5090 pounds.

April 17.
Shipped fossils by 10 A.M. Then went down to Big Bend Park. We were unable to get lodging. There so went on to Presidio. Trip up the Rio Grande was spectacular.

April 18.
From Presidio went down Rio Grande to Texas 118 to Alpine. Some fine volcanic scenery along this route. Arrived in Mc-Allen about 3:00 P.M. Saw Russell White in evening but were denied permission to visit his place because of hunting season. We visit Mrs. Johnson for permission to go to Ogo Pomito.
April 19

Mr. Rachel White, 700 West 4th

Marfa, Texas

Mrs. Lorraine Love Johnson

4th and Plateau, Marfa, Texas

In morning called on Mrs. Johnson for permission to visit Area NW of Eljo Points. After considerable discussion she lead us to the place and we found the locality with ease. Here a cuesta faces southeast with a bold face. In front of this are dark pillow of the alfa formation. That form the flat in front of the cuesta. These pass up into a thick series of sandstone. The sandstones break up nearly the entire face of the cuesta except for the top. On the crest of the hill and on the NW slope for about 1/3 the distance down. The slope are greatly altered, weathered limestone which suggests breccia like those seen in Alton creek forming the bluff along the creek. Further down the hill
Comes thin bedded limestone and thin bedded dolomite that
upward considerable plate Thin black shale appears. This
rock which is suggestive of
the beds above The biotends
at Cibolo creek extends to
base of hill where it is in
contact with yellow brown
sediments. Thin bedded rock
strongly suggestive of The
word. The black thin-bedded
top above The "biohams" contains
thin layers of
limestone and some connate
both often with numerous
fusuloids but no other good
fossils were seen.

The uppermost yellow beds
also contain large black
limestone concretions but
they are without fossils.
These beds are in The
south part of The W. E. Love
Ranch which is called The
Dyep Ranch.
April 20
Northwest of Ojo Bonito
Section along line N 70° W - dip = N 10° E 38° N
Went back to Permian NW of Ojo Bonito. Walked long section near west end and on north side of road. This section started at road which ran on the contact of the "biohermal beds" and the lower cherts and went on through the latter into the Word type and beyond this into dark thin shale capped by a conglomerate which we think is Cretaceous.

A - Thin platy, black shale, sandy, with some black b.s. concentrations.
Occupied an interval of 166 paces = 415 feet = about 200' vertical.

B - ½ foot limestone band with large fusulinace and a few brachiopods = 733 z.

C - An interval of 474 paces of yellow brown shale and bioturbated shale with occasional gray biologic lenses, one about 40' long.
The base is of spinulidae = 234 z.
This equals a vertical thickness of about 5 95'.
D. - Black, thick-bedded chert passing upward into thin-bedded, black, sandy shale; covering an interval of 136
paces = about 170 feet vertical
Fusulinids 40' below top = 734D
Estimate. The so-called bihemid
zone at about 120' thick on the
larger hill. In the upper
part here on the south side
of the road we found
Ammorita; pool but common,
in limestone masses. = 734C.
Fusulinids 734D taken about
50' below base of Wordtype
rock about ½ mile east of preceding section.

733Y. - Chert, fusulinids taken
on southwesternmost hill
and one east side creek at
west end of section.
April 21
7348 - About 75' above the Hueso on east hill of Bay Long, 25 miles
W of Van Horn, = same loc. as 7258

April 22
0.55 mile north of Hueso Same Products. Part of afternoon spent at Texas Western College.

April 23
Charles L. Thomas had Apple Ranch in 1945.

April 24


741 c A24 2 From "bighorn" near Alcon Peak

741 d A 24 3 across gulley, S. of "bighorn", small slab w/ Kozlowski
741e  A244 - Willacolla beds below Grant reef.

741f  A245 - Nw side Cerro Alto where lower Hueco & intrusive mkt.

741g  A254  Crest of Northernmost hill, on N. side of road, in Upper Hueco (course calcarenite w/ crin. cols.) ca. 0.2 mi. W of line intersectin Jim Tank + Daily Tank

Carlos Perez  Manager
171 Maryland
El Paso

Bob Anderson
General Manager

Joe Mims
P.O. Box 1000
Roswell N. Mex
741 mh A 26 - South side gully with Brant Reef Bough of Alcanan 77 mt. Ledge Block Reef level.