June

1951

1 Year R p. 349

P. 20 NR

0331

Leonard Mtn.	2, 35
Decie Ranch	8
Not Head Ranch	10
Wildmill Hill	12, 39
Decie Ranch - Antinskia 707m	16
Buggout Mtn	20
Wolfcamp Hills	22
Hill W of Agon Mtn	57
Brooks Ranch	25
Gap tank	43
Clay slide	46
Sullivan Ranch Knob	48
Hess Ranch Horst	49


J73
J27
J27'
J27²
J27³
J29
J29'
J15
Bidermann
Windmill
Fox Canyon Knoll
Stone
Bell
5021
4920
4910
5000
4750
6237
6250
6150
6200
6300
6400
6500

0332


6237
5750
5250
4750
4910
5000
4920
4500
5021
5280
4500
4361
4250
B M
4627
Skinner Ranch
Iron Mtn
5420
5000
4750
J29'
J29
Slide
J15
P
J27'
J27²
J27
start
J43'
J43
J29³
Iron
small
knob
Beaded
Lepidodendron
SC

0333

...etween two
...at is partly
the valley is
...row gullies.
...gently slop-

NOTE:—Effecti...
quadra...
amount...

Power-transmission line

Wh...

...vation line

Land gra... line

...spect

Shaf...

(pr...

...ittent ...s and ...hes

Canals ... ditches

(1950) J18 = 2700' S 50

0333


G
6500
6000
6311
5760
5000
5470
5000
5250
Spring
5250
5500
Sullivan Ran
6000
B M
6125
5000
5935
5500
6000
CATHEDRAL MTN
5250
5241
5250
4750
4750
4750
4555
4750
4500
5300
J43
J43'
J17
J17'
J13'
Diohelm
J16'
J13
Martinska
J16
90
4902

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 par-
ticular 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).
In addition to the areas covered by [illegible]

0334

C4913

C4833

4750

4750

N

S

A

5075x

5000

4862

5131x

5000

49650

5072

5035

05285

5000

5233x

5135x

5000

5150

5000

BM △5473

5202

4500

4921

55270

5250

4750

4762

J20 cgt

J20

start southern

4445

4500

BOUNDARY LINE

C4752

J20⁴

4359

Gaptank J20²

J24¹

4815x

J24⁵

x4388

J24

4250

4265x

TO FORT STOCKTON

Dessie Ranch

De Spain Ranch

Kendrick Ranch

BM 4198

4166

4270

4165

BM 4217

Rowark Ranch

0335


5250
5461
5552
5575x
5318
5507
5500
Old Word Ranch
BM
5652
x5632
5950
5500
C5785
C5567
x5821
5767x
4750
5725x
Scorcahiella
4562
5751
5250
Wolf Camp Hills
5060
4750
4356x
4500
4395

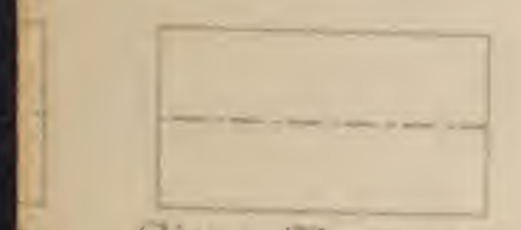
rves

Breakwater and jetties

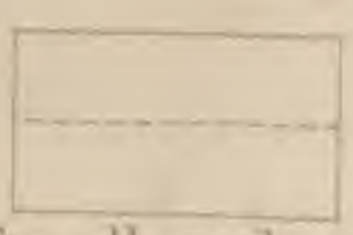
Bridge

Drawbridges

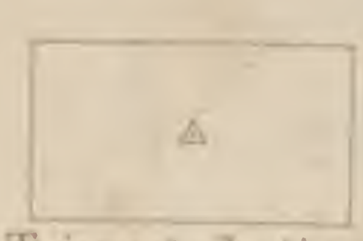
Ferry
(point upstream)



City, village, or borough line



Small park or cemetery line



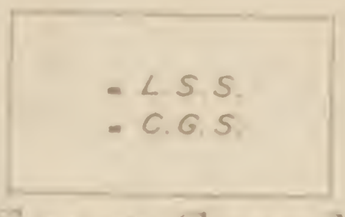
Triangulation point or transit-traverse station

U. S. mineral monument

Mine tunnel

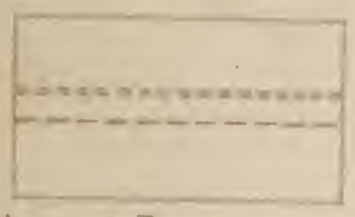
Mine tunnel
(showing direction)

Lighthouse or beacon

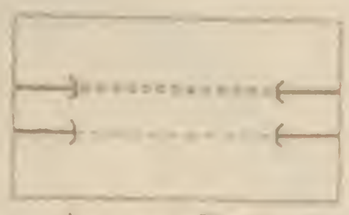


Coast Guard station

ATER
ted in blue)

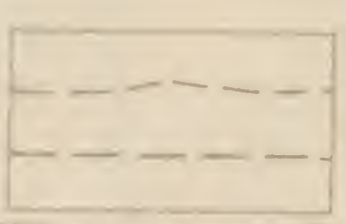


Aqueducts or waterpipes



Aqueduct tunnels

Lake or pond



Unsurveyed stream and abandoned canal

GALLAS

Willis Ranch

Canyon

Road Canyon

Hess

Hess Ranch

Leonard Mtn

Youngblood Place

TO MARATHON

5490x
5438x
5543x
5578
5611
5860
5803
5816
5305x
5453
5581
5726
5674
4751
4750
4673
4576
4514x
4520
4459x
4496
4437
4381
4361
4318x
4265
4426
4253
5000
5250
5500
4800
4500
4250
dike
Hidenites
& Chale
BM
5860
BM
4253
BM
4361

20
87
75
74
136
80
24
746
478
1214
380
146
234
4950
234
716
100
250
42
23
63
478
4600
248
848
4762
4825
4740
120
5
12
8
304
10
16
5
4450
380
570
4570
4762
248
1514

0338

Record of Pictures

1957

1 Hill 4815 and foothill
2 West side Hill 4815 + foothill
3 ¾ N west of knot T 24
4 East and W/S camp Hills in afternoon light
5 View from top of knob showing dip
6 East end Windmill hill
7 West end Windmill hill showing angle of ledge
8 " " " " " / bolsen
9 Looking Northeast Windmill hill & bolsen "
10 Clay slide
11 D 29 " front
12 Sullivan Peak

WC

Sandy sh. — covered 53

Sandy ls. 35

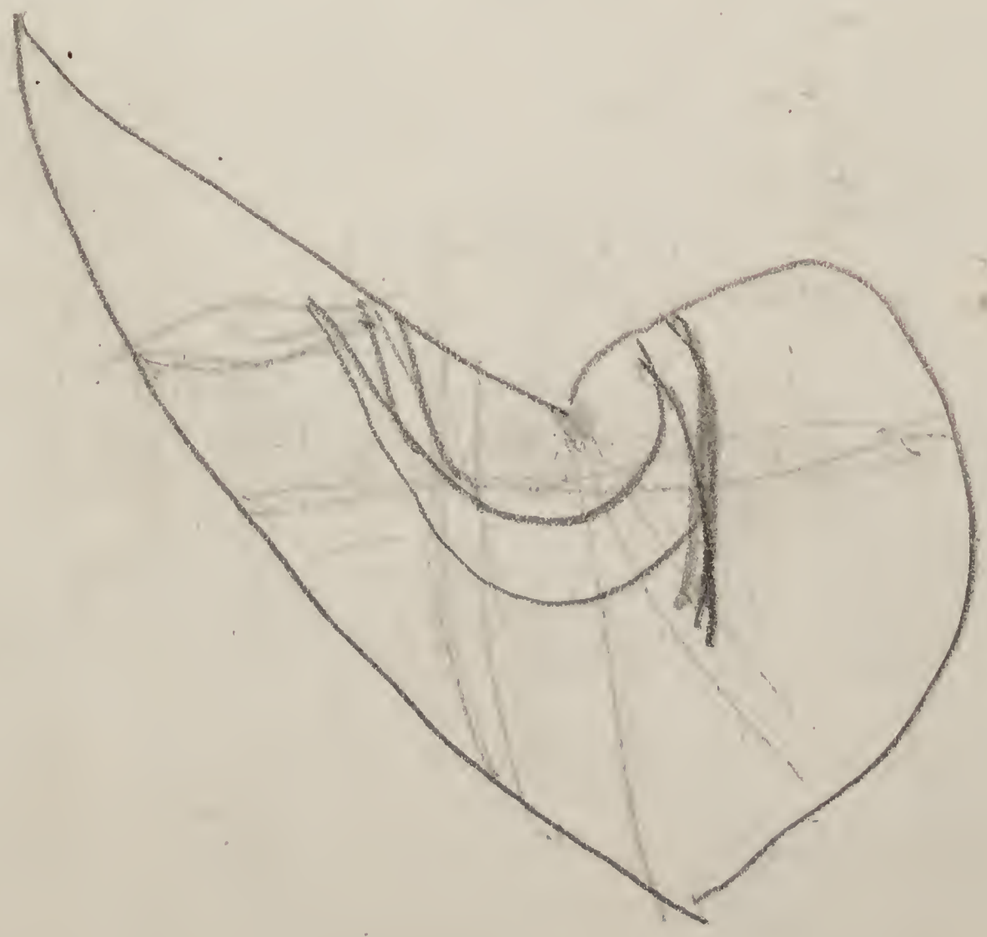
Brown sandy ls 39

Sandy ls. 43

Black gr. sh 35

Sandy ls. — 2

Covered — 5



0339

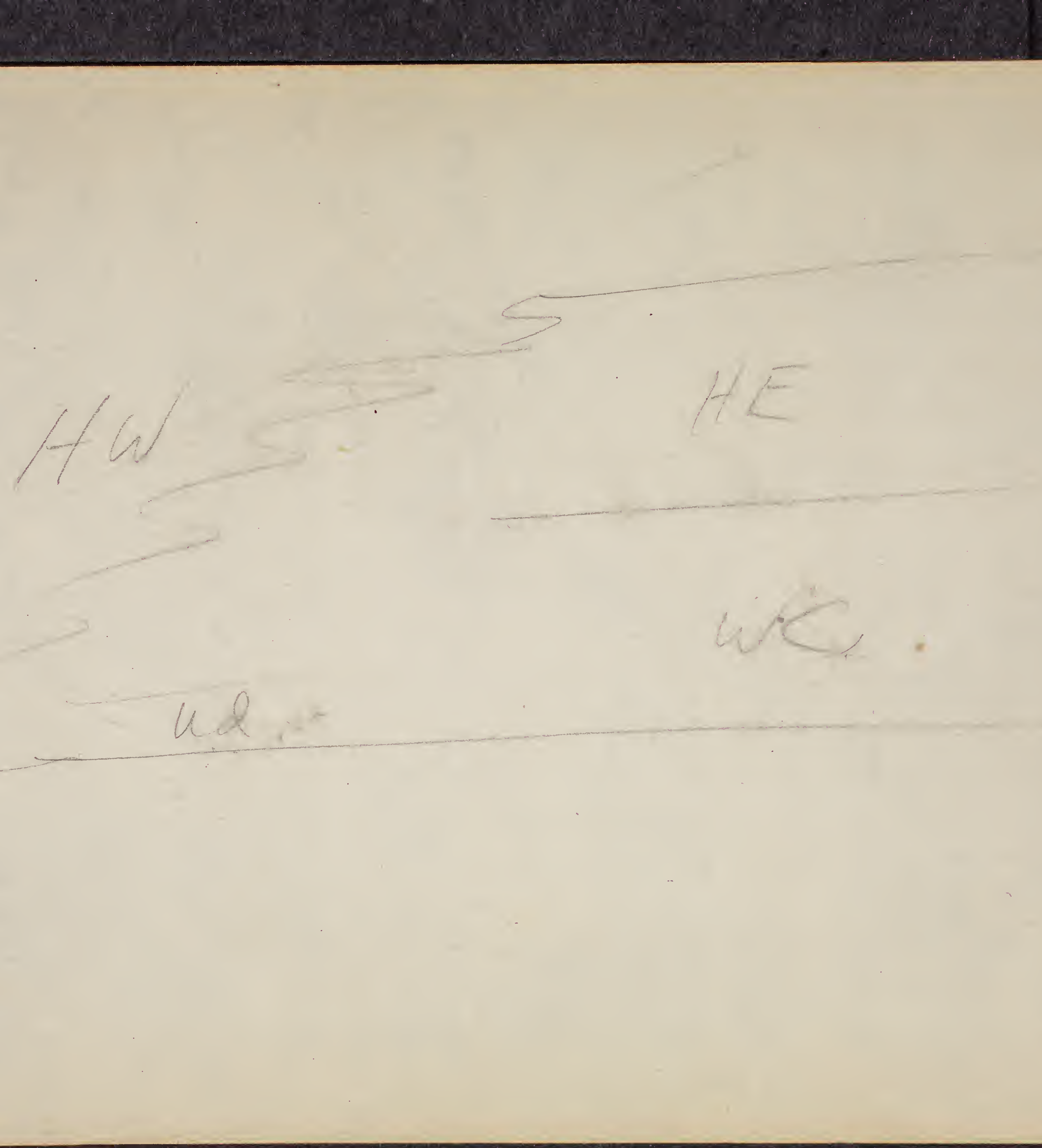
Record of pictures 1951

Pack I

1. Tesnus unconformity Leonard Mtn.
2 South face Leonard Mtn.
3 Looking N at Hess + Leonard #1 from Dev. Ck
4 " " " } saddle in wrinkle section
5 " " " } showing merging of Ls.
6 " NE " " " " "
7 Devil R looking N at sandstone sticking out of Permian
8 " " " W " Questa " " " "
9 J16 - top of Hess ledge
10 Bioherm J13' + J16'
11 " " " "
12 " " " "

Pack II

1 Wolfcamp shale N W of Devil R. J16'
2 Dugout Mtn.
3 Bioherm
4 Blank
5 East end W.C. Hills
6 " " " "
7 Wolfcamp silhouette at saddle
8 Blank
9 June 20 - Brooks R - hill 4762
10 Blank
11 Goniatite bed Hill 4752
12 Profile from Goniatite Hill Toward Wolfcamp Hills.



(1)

June 6 Ordovician on Freeman's Horn and Burnt Quadrangs.

Chert gl. in contact with Knox dolomite, About 5' above base in reddish calcarenite found Lost Cellula. Section above is marble or calcarenite for some 400 feet. About 300 feet above base is a shaly band in wood to house. This contains Dinorthis, Plectorthis, Parmorthis, Cyrtonotella and is Lincolnshire. Thin bedded limestones in the marbles contain Dalmanites. Part of the marble is Nunn Lincolnshire. The marble above the shaly Lincolnshire is the Rockdell of Cooper = Wardell in part. On top of the marble is Benbolt, followed by Lingula Wardell. An upper Wardell yellow and red Moccasin Knobs appear followed by a long sequence of Moccasin. The Witten is in a Moccasin lithology.

The remarkable part of this section is the long broad sequence of marble = Nunnaid part.

5060
4975
85

4975
4800
175
75

(2)

June 11 SE slope Leonard Mtn.
Section started above cgl at 4850
at 4975 comes first limestone
conglomerate.
at 5050' fossiliferous cgl.
" 5060 Leachinella. Fossil
brachial valve of Paraspirifer.
Beds above Leachinella not
markedly conglomeratic.
Above Leachinella beds rock
is a sugary calcarenite which
is dolomitized on top of Ree.
proof knob. The knob is
about 5100-5150 or more.
Barometer is 5150 on very top.
5245' on slope Fossiliferous sample
in calcarenite.
5290-5300' comes base of thick cgl.
Thus there are 240' of calcarenite
above the Leachinella beds.
5430-40 Leachinella bed. Base
of Ree.
5560 contact of granular ls
calcarenite with dolomite
Top of dolomite at 5750'
Just top of dolomite is a
bed 6" of flattish silicified
algae, Nerinella magnifica
Barometer at top of Mtn is 5860
checking BM altitude.
The rock on the top bench is
massive granular ls.

5300
5060
240

5560
5750
190

5750
5560
190

For section above dolomite
see 1950 notes.

Mesa E. facies

190' dolomite { on west fault this is about 25' higher than on east side

calcarenite 130'
beach at base

cgl. 140'

calcarenite 200'

beach.
cgl. 85'

calcarenite 50'

shale 60'

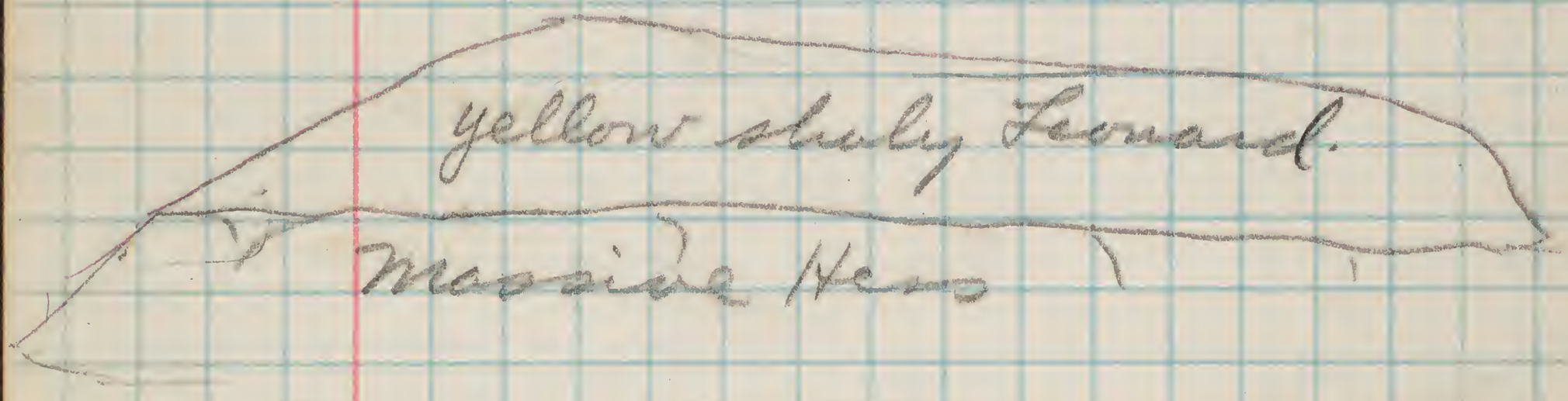
cgl. basal 15' to 100' or 200'

Zuñi

920

(3)

On the knob NW of BM can be seen platy shale capping knob of massive ferruginous dolomite



Going NW to base of knob NW of BM 5660 we follow along flat granular to beds capped by massive biohermal ledges. Flint rock seems to thicken as the dolomite thins to NW. At base of NW knob at 5760' comes a thin layer of yellow shale, probably 8-10' Biohermal beds follow for 120' followed by yellow shale for 8'. The next biohermal ledge is about 30' thick. This biohermal is followed by 45' siliceous shale platy to sandy yellow thin-bedded shale. This is the base of Kings old Leonard. This must not be confused with Unconformities which all leave on the N side of Leonard Mtn.

20
450
165
130
140
240
85
100
60
15
1005
4850
5855
3008
7015
6525
5260
4800
260

(4)

For shale in canyon - sight on high ridge of WC hills N 70° E. Sight on ranch SE of WC hills is due E

My section is not in accord with King's. He divides the Hes & WC 150' below the 140' egl. This contact may be in the interval between top of lower & base of main mass of mountain. Plotting the section should straighten this out.

The Leachmilla bed high on the Mtn. at 5430-40' is about 20' thick and consists of a fossiliferous limy sandstone by age. The bed has very little lateral extent. A peculiar elongate orthoceid nature Mam Leachmilla is the most abundant shell. The Heliosparagia is also present.

(5)

June 12 Followed contact of Jeanne and conglomeratic ves & Jeanne Mbr. The cgl. evidently is laid on a very irregular surface because ligts occur in the Jeanne that extend more than 100'. Patches of shale were seen in several places above the cgl.

Up ravine nearly to head - Ravine cuts down east side of knob. The knob makes a bare rounded slope against the ravine. On the east side of the ravine a rounded mass of dolomite occurs with top at about 5000'. Near base of dolomite knob occurs layer with potato chip algae and oncolites. At 5075 occurs shale exposure with addenidus lithology under large cedar tree. Here abound Prod. Marcellensis and a few other fossils.

Wolfcamp type lithology can be seen in the slope climb to head of ravine at about 5250'. The Wolfcamp lithology is two higher than the knob shale exposure. The shale seems to occupy the sides of the knobs and probably filled in between them.

The flat at 4850 where we park, probably is a shale slope.

(6)

Here we found gonatites but the col. on the east side of the flat extends up 50' on the west side across the gully shale occurs on the lower part of the tongue. This would make the shale all of 350' thick between here.

The gonatites occur at about 5100'.

FJ12 - at 5100 feet under a ledge of hard limestone calue a shale slope having fossils. Some of the rocks is blue and nearly like the paste in some of the breccias, potato chip algae common, fusulinas abundant in lenticular masses.

on following the cgl-Jurassic contact it became apparent that considerable relief was etched on that surface. The cgl. thickens and thins. Usually some shale can be found above the contact throughout a range of 30'. The saddle on the Saccharoidal knoll is probably made by weathering away of this shale.

The area may be looked at as a great thick shale

(7)

containing biohermes. On the west side of our Leuchtenbourk 2 biohermes are visible. The lower one is separated from the upper by a shale & the beds of the upper one dip up to the west & seem to be truncated by the heavy limestones of the main mass of the Mtn. This may be King's unconformity but the dips look to be tied up with the biohermes.

(8)

June 13.- Exactly 25' above the Devonian novaculite occurs a continuous layer of cgl with rounded & rugged pebbles. This contains Artisbia and other goniatites. It is seen at the very base of the Wolfcamp sequence.

Location of Leptodus knob on
Devil R. —
Poplar Tank - S 60° E
Devil Ranch - S 12° E
Arnold Ranch - S 11° W
Crest of hill (Windmill) - N 60° E

J 13' When looking at Leonard h. #1 from below numerous bioherms ledges can be seen in the layers. Top of Hess at 4675'; Biohermal in Leonard #1 is S 53° E of Poplar Tank at 4815'.

Devil Ranch S 10° E. Top of lo. at 4952' where it makes a flat, above lower biohermal ledge, thin shale but upper half in coarse lo. cgl. Rectangular magnificate just above lower reef. Another biohermal appears above the lower one about 15' by 60' cgl on W side of lower reef. Cgl about 50' thick, small pebbles throughout but none

(9)

heavy bs. ~~but~~ build up 1½' in diameter at ~~base~~ 25' down
The lower 25' have much sand and are a real ss.
Next 20' down is in upper bohem. under bohem are megaly. cobbles. Remainder of section about 60' are in thin yellow shale and ls beds up to 1' thick. 20' under upper bohem comes the reticulate marginifera which is commonly on Lithostrotion skins on flat ls beds, about 10' above lower bohem. The measurements were taken from the base of the lower bohem. This is also included in the lower 60' under the upper bohem

The fauna of the bohem is rich in Waagenella which look just like those taken out of the Hess below. alt is possible some of the Hess blocks are float from above but I recall getting blocks with similar fossils in place. This particular bohem abounds in small productids suggesting Stroph. cosina.

The occurrence of Actinoconia at the base of the WC suggests that the WC changes age westward. King, p. 135 notes

1930

(D)

that the basal WC conglomerate of section 11 pass out by overlap to the east.

On the Antiskin locality for other fossils were found. The rock is fresh and fossils do not break out well. I was unable to find Scaechinella at this place.

June 14 Section one mile north of Hess Ranch.

Section started at point A. To top of cgl. by handlevel 110' going due north. Cgl. succeeded by dark grey granular l. 32'.
Granular massive l. forming reef hump 6'.
Dolomite 11' followed by 6' gravels and talus by 3' to top of hill. Formed in cgf. / dolomite. From base to top of hill is thus 162'. The fossils in small syncline are possibly a Centril.

110
32
6
11 dol
3
162

Strike on as N 50° E dip 12° NW

Starting section on as N for 141 paces in massive Granular, fine, dolomite.
N 28° E 74 paces same dolomite.
N 35° W 44 paces same dolomite.
N 12° W 89 " " .

(D) at this point I am on the hillside over the Leachinella locality (which is N 75°W of this point). The dolomite here is coarsely granular and has big crinoid stems.
N 5 I paces coarsely x'ln dolomite
N 25 E 89 paces same dolomite
N 35° W 12 paces coarse dolomite
N 35° W 13½ paces finely granular blue gray massive ls. at 29 paces fishes rich in fossils and Endotes in same fine gray Leonard type ls.
N 35° W 40 paces dolomite massive granular and dolomitic ls. Flint was a ls of. now dolomitized
N 48° W 73 paces granular massive ls and dolomitized ls. of same type. Barometer 4900'
N 22 W sight on Hess gate 260 paces in massive granular ls & dolomite.

After completing the section I examined the Leachinella beds. These have no regular dip and seem to lie on the mountain side, rather than being a part of the Mtn. I saw no trace of Leachinella in the dolomites. This section of Mtn is high Wolfcamp and Hess.

(12)

June 15.

Daniel Jamison has goniatites from Lisca and Wolfcamp he will send the Museum.

The eglogite N of the Hess house block like lower Wolfcamp egl., because they have rhombic brown sandy boulders and sandstone

Note - It must be recalled that Bill Allen found a goniatite in the shale at the base of the knob on Leonard Mtn.

Section at Windmill on Deer Kennel.

Basal egl is 20' thick at 4575 is top of biohermal bump forming a small flat. 25' above comes another onlap bump.

Barometer 4500

4600' N35E 14° NW on shaly bed near top of second bump. Top at 4600' has type of massive granular ls. with boulder pebbles & corals at top.

4640 found patches of shale. Probably most of covered slope is shale.

4710' under main saddle comes egl, sandy and with small dirt pebbles. I think all of the slope from top of biohem with

(13)

coral is shale.
4750 ± Top of cgl. The lower half of the cgl. is very sandy ± in places shaly. Upper half is solid sandy ls. packed with small chert pebbles.
4800 ± top of saddle. Thick bracchinella bed is conglomeratic with ls & chert pebbles in lower part. Otherwise it is granular and biothermal and very massive.
Barometer out by 100 feet which should be divided among the intervals. The saddle is actually at 4900'. The two knobs on each side of the saddle may be bryozoan lumps. There is a shale between the bracchinella and the lumps. The shale disappears to the east.
North end Windmill Hill
J15 - handleveling began at 4775.
Long dip slope of limestone has only Enteletes, Spirifer and Leptodus on the surface. The saddle just below the J15 is made up of biothermal limestone with some chert on the south side and in the topmost part. Small chert pebbles also present.
Handleveling to part N30°W Strike N52°E dip 18° NW Compass set at 18°.
22 HL steps in yellow shale and thin-bedded ls = about 120'

(14)

Covered 10'.
HL steps - at 20'-25' above covered interval Peninides abundant 25'-40' above covered interval bedded Nucla dolomite, 40-65' birhemmal lo with small pebbles 65'-100' massive fine grained unfossiliferous dolomite without fossils, 100'-138' platy sandstone sh. yellow Thin Bedded, 20 layers up to 2". 138-163' to top of knob all in massive fine-grained sugary dolomite. On the lower dip slope of the eastern lobe of this hill Peninides occurs. I think this is lo #34 of the Leonard.

(15)

The beds in the saddle of the Windmill section = the 50' foot Hess in the hills to the west.

South end Lower Hills

J16 - 92' above stream comes base of Hess ledge here very conglomeratic

Top of Hess at 4666'

@ 157' comes bunch of chill with flat beds of ls. N24°E dip 11° NW.

4666
42
4552
304
4856

@ 146' comes top of massive cgl. ledge mapped as Hess. Eleven feet higher comes flat bedded chert dip is measured.

157' - 166' comes top of low hill. Rock in this interval is thick beds of ls at bottom, cgl, and near top thin beds of dk gray ls. Some nodular beds of chert in ls & a little yellow shale. N53°E 11°NW

166 - 218' Bedded ls, beds up to 1' thick separated by shale. Beds often cgl. At top 1½ - 2' bed of yellow weathering ls.

4770

218 - 304' mostly covered in bottom half but mostly thin platy yellow shale in upper half.

4950
16
4934
380
215
162

4930'

304 - 380'

~~4950~~ to top of hill

Decie Ranch S 35°E
Poplar Top S 85°E
Sullivan Peak N 10E

4950
162
4788

Mostly biohermal limestone with numerous fossils some thick bedded ls with flat chert layers.

(16) I searched this bioherm carefully from top to bottom for Leachinella but found only a doubtful one it has Stephanograptus just like the Wolfcamp ones and those that occur in the upper Hess sponge beds. I suspect this bed correlates with the sponge bed and the fossil bed on the crest of the Mtn. It is possible that J #1 ties up with the fossil bed of King that overlooks the Wolfcamp Hill

J16² Picture 12 on pack one. Bioherm base at 4860'. This bioherm proved to be a great mass of huge cobbles. We are probably in the fringe of it. Pole tank 1 553° E, Decke Ridge S 11° E

The bioherm at J 13' measures 4860' by barometer.

In the bioherm of J16² one boulder measured more than 4 feet in its longest axis.

J16³ - At the place where I have collected most of my big Leachinella about 92' below the base of the Hess ledge is the base of a thick shale. 15' vertically from the base of the shale comes Composita and brachiopods

0356

(18)

The Wolfcamp seems divisible into 2 parts a egl. in the lower half or two-thirds and shale and ss in the upper half or one-third. The two should have no ∆ the front of the hills are in egl. but are overlain by thinly sandstone, soft, pink and yellow limestone. This can be seen in 2 ravines on the dip slope of the knobs. The shale contains layers of yellow sandstone, egl pebbled with small pebbles. The shale may or may not be overlain by egl. at loc 163. Same at loc 162 vertically below the Hess with artesia in the upper zone. The lower zone occurs 377' below the Hess Ledge. We followed the shale from the west side of the hills nearly to the east side the only good exposures are the ones noted. In places the ss is overlain by egl which is directly overlain by the Hess. If this egl. is interpreted as Hess unconformity is suggested.

Hess

Clay Sh with ss + cgl

fine ss

50±

Cobble lst cgl

(17) J 16'— about 116' of clay shale with some ss and ss beds in lower 20 or 30'. Contains snails and occasional goniatites. = 160'

See Section notes p. 244

June 17

Location of goniatite bed S 63° E on Poplar Fork. S 14° E on Dacie Road. Location is 50' below this point.

Lower Hills

J 17'— Good exposure of platy to shaly ss and cgl. with a few fossiliferous limy bands. Fossils include productids, Derbyia and a fragment of Spirifer. Just south of this exposure, platy ls. and bioherms (without fossils) appear interbedded with the cgl. Strike N 34° E dip 15° NW. The exposure is on a line S 54° E of Poplar Fork. Thin platy, yellow sandy shale strongly fissile. The Letna and above. Lower clayey and sandy beds resemble the Leonard.

See Section notes p. 245

J 17a— Good exposure of upper shale in ravine S 42° E of Poplar Fork. Alternating blue sh, yellow ss and cgl. Sand no good fossils. The beds are thin and numerous generally brown weathering.

92
15

97
15

62

(19)

The lower half of the cgl is also variable along and with front. Where Actinobid occurs it is a cobble cgl but with some clast at the Leptodus ledge limestone cobble cgl. can be traced laterally into quartzic cgl with little or no limestone.

On the west end of the ultra shale predominates between the cgl & the Hasp. Dlm lower 30' contains some sandy & cgl beds but the remainder is mostly clay shale.

I suspect that the shale in the windmill section is related to the upper shale but there is overlain by a thick cgl, I suspect that all these beds have an interbedding arrangement and are facies of one another.

(20)

Dugout Mtn.
June 18— Barometer reading at start.— 4420'. Gap tank seen on mountain front up to 4670'. Top of Wolfcamp cgl. at 4770' where slide is spread under crest of mountain. Saddle between Hess ridge and cgl mass to NE is occupied by yellow platy, siliceous shale of Leonard type & also contains some thick (1'-1½') ledges of ls. with silicious shin on top. They look like upper Hess at level of hills north of Decie Ranch. The saddle is at 4870'.

5095
4870
125

At 5020' comes a 3-4' ledge of sparsely cgl. limestone. Below this occurs mostly papery yellow shale. Another cgl ledge about 2' thick occurs about 5070' up in this interval.

At 5095 on NE edge of mtn comes base of main massive ledge which is limestone cobble cgl. in lower part but with some silicious pebbles.

The main high ledge contains granular limestone of Hess type with some bioherms, clubs not seen Leachinella but

0359

(21) The lithology in several places is likely for it.

Top of mtn at 5195.

Old account from 5095 to top of mtn. is all in very massive ls., some ls. cgl. and some flat, thick-bedded ls.

I walked northwest along the rim of the hill and along a long spur to 5110 feet which is the top of ls #1 from the crest of Red mtn.

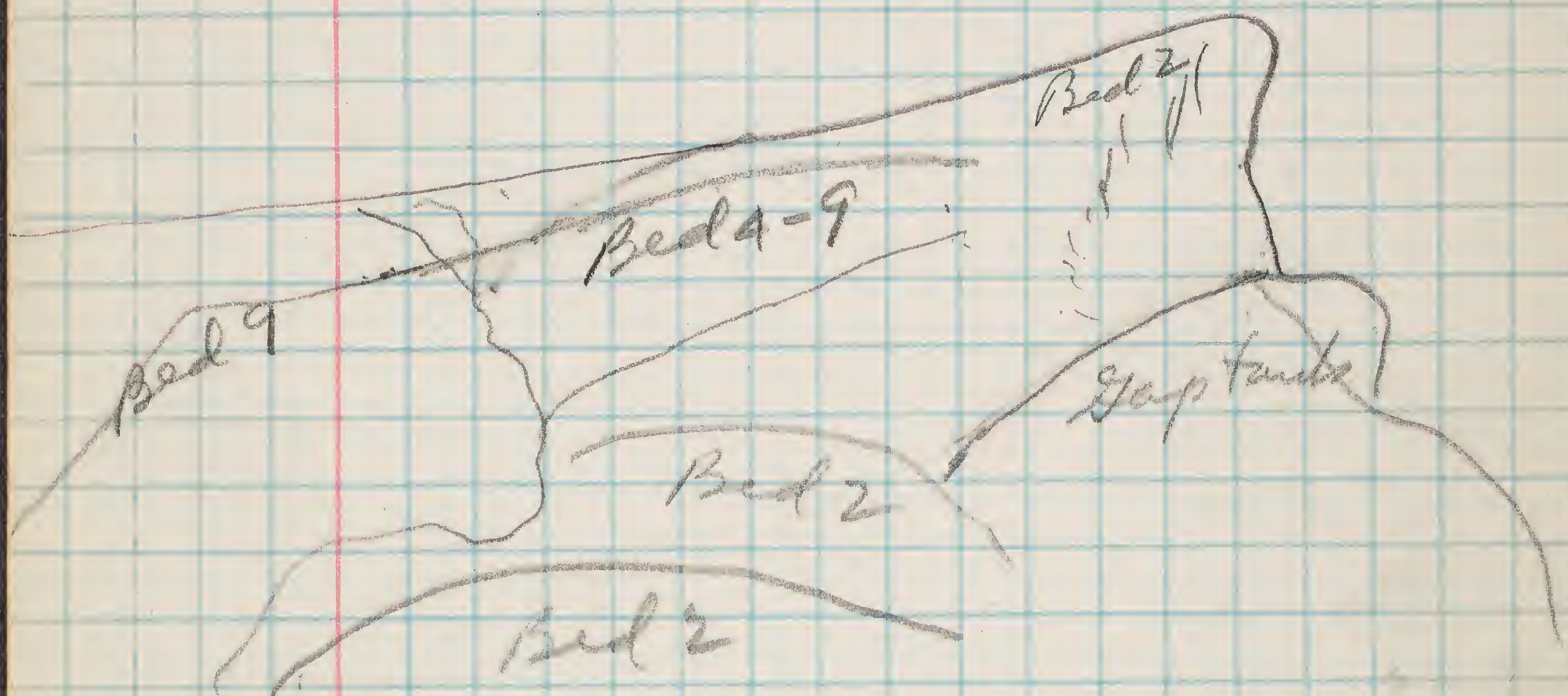
Here lumpy siliceous yellow brown rock appears to a low knoll made up of cgl. ls, mostly thin-bedded. Small biohermal lumps. Fossils are present. This is evidently ls #2.

Another small lump (hill 4811) is capped by ls. but it does not appear to be strongly biohermal. As elsewhere the main ledge of ls #1 seems the end of the big biohems.

Dips and strike above Hero ledge — N 62° E 16° NW
N 18 E 10° NW.

The shale appears to be all of 100 feet thick at the west end of the exposure. The gradations occur in cgl. ls. in the midst of the shale

(22) June 19 - Wolfcamp Hills
Looking east on long slope
of Bed 2 shown Just back 9-4
Gap on to the sloping face of
Bed #2. a gully cuts down
on the shales in this wedge



about 50' of shale occurs between
the cgl and the last flat gelbur
ls. of the top of the Wolfcamp.
The Hess cgl. is almost wholly
a ls. cobble cgl. Likewise pebble
or any pebbles other than ls
ones are rare.

June 19 - small bioherm of
cream-colored massive ls
definitely ls. #2. Compact ls #2
appears on the dip slopes of
the thickened upper ls of the
Wolfcamp zone. This ls becomes

(23) to go under the big kept at 4962 but it is possible that the mass is a thickening knob of the Addenites zone, I favor the view that the knob is lo # 2 rather than Addenites.

J. 19 The upper Addenites lo is in very thick ghost west of hill 4952. The lo # 2 of the knob lies on a thin saddle between the knob and the upper Addenites lo. The orange-yellow bituminous beds can be traced across under the saddle without interruption. A small bitum at the extreme E end seems to overlie the lo # 2 on at least one or its flanks upper surface of upper Addenites, but just W of saddle and on slope down from saddle contains Leaflets.

703g J. 19 — Walked over lower 1/4 sec in foothills. Above cgl it is yellow fine-grained dolomite interbedded with fine-grained limestone, both abundantly in fractures small and large. In the dolomites the fractures are

(24) cavities. Large Onyalotheculus like those from the upper fossil bed were taken at a windmill. The cgl. at the base of the beds is a cobble cgl. with a little or no detrital material.

Bed 12 is very conglomeratic and the lithology is very suggestive of that of the Arikaree bed just above the Hess. This is true of most of the clasts lying on the slopes of Hagel's bus small pebbles and granules sand. The WC here is capped by about 50' of shale.

Permian bones were found in the crumbly granule beds of Bed 12 on the west side of the ravine in the center of the Wolfcamp Hills.

(25)

June 20

Section N 40° W up hill 4762
On Brooks Range.

Section begins on plain about 100-150 yards east of arroyo.

0-54' covered

54'-55'- brown, fine-grained ss.

55-68'- mostly covered, some shale visible

63'-66'- Brown massive ss.

66-77'- shale but mostly covered

77'-80'- ss. brown, fine-grained

80-124'- Shale in lower part, upper part in thin-bedded ss becoming heavy bedded at top. 28 forms upper 12'

124'-144'- white crumbly ss in lower 4' but massive and heavy-bedded above.

144-156' mostly shale but with some cobbly ls containing fossils.

144-199'- Smooth fracturing very massive detrital ls. biohermal in character and showing no bedding. The lower 10' or 15' are made up of cobble ls. This bed contrasts to the next overlying by weathering gray rather than brownish gray. The weathering color is very conspicuous from a distance.

massive white fractured ls	44'	
cover	5'	
Smooth fracturing detrital ls	43'	
Sh + ls	12'	
Massive ss white	20'	
	1' ss	
	44' sh	
	3' ss	
	8' sh	
	1' ss	
covered	54'	

199-204- covered.

204-248- Marble-like white-fracturing detrital ls. This is almost certainly the ls # 2 of the Wolfcamp.

(26)

By sighting from top of hill dip is 12° N 45° W.

June 20' small knob of gl. Studied section in small gleno N 20° W from knob.

J 20²

Section up hill 4752
Montgomery R — S 70° E
Hill 4762 — N 25° E
Ranch Hill — N 47° E

About 4500' appears bentonite in plain at foot of hill.
Section goes about N 50° W
4510' cuts a foot of brown ls. Kings bed #4.

4510'-4550' mostly covered. Shale with brown limestone algae
4550'-4561' - fine brown ss.
4561-4564 — Three foot ledge of limestone granules in a massive ledge. Contains gasteropod sections.

105'

4564-4575' dark gray granular ls in beds 6" - 1' thick
4575-4576 - hard yellow ls.
4576-4615 - Shale mostly covered
J 20⁴ — 4615 - One foot ledge of dark brown ls with globular structures. Some silicification
4615-4626 - brown ls. culminating in an orange yellow sandy bed.
4626-4660 - mostly covered shale terminating in an orange yellow algae band fine pebble bed

(27)

4660–4670?– covered slope
4670–4700–massive calcareous
fairly smooth fracture.
4700–4710–light gray limestone
suggesting Ls #2 of the W.
4710 & 4752 1 just above light
gray ls. comes a layer of ss. Slope
above this is mostly cobble covered
and poorly exposed. About 15' from
base and same distance from
top comes heavy bedded ls of
blue-gray texture and fossils;
it is probably Ls #2. Top 15' of
bluff is in D. cobble cgl.
On west side knob red marl
appears at 4700'
At 4615' in saddle comes
a cobbly ls bed with Dictyoclostus
and large Amplexus-like
Those also in lower 40'
About 9' below this bed at
4606' fossiliferous.
J 20[3] At 4626' dark fine-grained ls
at 4700' comes fine-grained flat-
bedded ss. Slope below this is
covered shale slope
From 4700' to top of hill is
in bedded fine-grained ls
suggestive of Ls #2 Nearest
fossils but the mass appears
to be one like Wolfcamp.

(28) June 21 - East side Leonard Mtn.
One line N26°E from Hess House and at about 4850' - 4900' the spurs are capped by ls. some agl. but some biohermal. Just south of Hess fence line about 100 yds. one spur has biohermal ls at base but a small knob has potato chip algal ls. dark brown in color.

Dike at N 30° E from Hess. South and approximately cutting 4910' contour. Below dike shale extends down for about 120' to about 4790' contour. Here were seen brown ls. with fenestrines and potato chip algae. Some snails and clams in shale just below dike 76' above dike comes a brown potato-chip reef.

The shale goes up 130' above the dike, making a total exposure of about 250 or more feet because the base was not seen.

J. N. Allebrandi.
Parkway Hotel, Marathon, Texas
The NE corner of Leonard Mtn proved very disappointing because we found so few fossils. The location of King's Permian locality 'Bonanza' is about 4 miles

0367

(29) down the Mtn like the small one el fanyet. The shale is certainly Wahweap zone because of the abundance of Striatopora corals,

7022 June 22 - Hill 4815 Brooks Land.

Outlying hill on West end has 100' elevation from Valley floor to thick biohermal ls / forming the crest of the hill. The shale obtains bright yellow brown ls ledges and dome shaped ls.

Std top of the big biohermal ledge lies 30'-40' thick occurs in the lower part of hill 4815' at 4600'. The biohermal ledge consists of 3 kinds of ls: biohermal gray ls dark gray ls like that of Kings Bld Ls at the general locality and potato chip algal beds all dark gray. Surface very irregular & pitted. Small holes rusting orange red. Looks very much like Wahweap.

4600-4610 shale mostly covered

4610-4625 - platy yellow sandstone

N 54° E 13° NW

(30)

4625-4657- gray shale
4657-4717'- platty sandstone in beds thickening to a cliff face of about 15'
4717-4740 Sandstone terminates
4740-4743- shale
4743-4746- thick ledge of fossiliferous ls. Has 4726 ft Barometer.
4746-4753- covered.
4753-4758- massive ss. at base of cliff at about 4760'
703r occur small fractures. Top of cliff about 4790. Ls. nodule like
Above the massive ls comes an 8' red bed mostly covered. To top of hill above red bed comes about 17' of cobbly ls.
Lying upon loose on surface probably from upper cliff.
Big dip corals in shale in top of lower broken ledge at 4800'
The lower bioherm forming the point hill is undoubtedly bed 9 of King. The bioherm capping the hill 4815 is probably not ls #2 of the WC but is the top of the Waldronites Zone. The whole section is Waldronites Zone. If any WC exists it is above the cgl. The fossiliferous

(31) in the base of the top ledge both like those of the upper Walcumites bed.

June 23 - Collected Word #3 on Hess Ranch in morning within Wilson. Packed 27 boxes + 5 bags in afternoon

June 24 -
Sent pictures to Crosby Brooks, Marathon, Texas.
Two foothills stand out from hill 4815. These are limbs of King's bed 9 of the Formation.
Due N up west end hill 4815
Barometer at 4447' 0-76' up in shale slope having brown ls ledges + potato-chip bioherm. Am lower 25' limonite concretions abound.
76'-103' - Top of knoll at 4600' by barometer. This interval is in a bioherm which I believe represents King's bed 9 of his section on hill 4752. Fine fossils can be seen in the bioherm. Section up west of hill N 5° W. Top of bioherm in white sediments to. Bioherm overlain by shale about at section but overlapped by ~~west~~ brown ls. Shale quite thick on bioherm

(33) flank.
103-104 ± shale Thickness to east + west off flank of bioherm. This bioherm is same as one seen on section over hill 4815.
104-106 - Yellow brown ss with bioherm debris of yellow potato-chip algae.
106-198' - mostly covered but shale visible in places Thought it showed say all shale except for a thick dark brown ss lens at at 161'.
198-258' - platy and massive yellow fine grained sandstone alternating in a 3' bed of hard brown ss. with small chert pebbles. This seems to be the prominent bed of Kwig. This comes at about 4700' by barometer Barometer and handlevel are out only 5' at this place.
same as hill 4815
258-280 - mostly covered but some sandstone showing. Chert probably sh + ss.
280-300' ± base of cliff at about 4750'. White granular limestone extends to top of hill about 25' higher but did not climb cliff but think so may go up to 4800'. I suspect the D is about 50' thick going from about 4730' - 4780 or possibly a little higher.

(33) at 4755' is a layer of cobbly ls. The ls is white but is rather thin granular and detrital. I think the conglomerate overlying this ls on hill 4815 is probably the equivalent of Bed #2 of Wolfcamp. The conglomerate may be the cobbles off that hill.

Lower Permian cobbly ls bottom with cobbles separated by yellow sandy sh. These look like lowest bioherms of Admonite zone at Wolfcamp Hills.

702w Just 4' Edge of hill on N side ravine marked by white ls. about 40' thick. This is at 4650'. In lower part white ls, are two dolomitic ls ledges 1' thick.

4650'-4675' Slope with ls. cobbles but capped by a ledge of white ls like that below.

Section goes N 40° W from point on edge of canyon.

Cobble cap to 4675'.

4675'-4700' - mostly covered probably shale. Top in 3' of light yellow smooth fracturing dolomite.

4700-4725 - smooth fracturing yellow dolomite, with puffs of shale on the fracture. Top bed unrounded massive ls.

e 9th

(34)

suggesting a dolomitized bioherm,
4725-4755 - shale & dolomite
culminating in a thick bioherm
ledge all dolomitized
4755-4800 - alternating sh & dolomite
4800-4865 - some shale with
yellow dolomite beds up to 2' thick
J242 at 4865' formed fractures
Montgomery Ranch S 83° E, old
Mecho place S 22° E. Staffella at
4875'±
4875-4952 - Rock becomes mostly
limy in thin part and shale
becomes much less.
4930-5010 = mostly thick-bedded dolomite
Double ledge about 100' above
and here abandoned the section.

706l = 702y
J243 fractures at 5005'
J244 " " 4955'
703f Change from dolomite to ls.
at about 4890

J245 = 7015 Beside road and for 100 yds. to
the north occur brown bioherm
and thin beds of ls. yellow &
brown. Found 3 gonolites

Visited King's loc 113 in
saddle. Below red bed mem
cobbly & sandy ls. Some with
large bellerophonts. Above middle
are brown beds with large

(35) colonies of Syringopora. Thin is all in the upper bioherm.
Lo. The last of Kinderhook beds in the ravine below the place of noble off the side of bioherm. Here also large masses of potato-chip algae in very dark gray ls.
King records Parentelites from 201.

June 25
Collected all day at Wolfcamp Hills

June 26
Leonard Mtn.
1.09 Under knob at 4850' egl. in exposed. First ledge rock appears in place at 4900'; increased to 10% with no egl. First egl appears at 4960'. Egl. ends about 5025' and the fossil beds appear at about 5030'. Top of knob at 5100' even and section to top from fossil beds is all massive ls. except for top of knob which is dolomite for about 135'. Last above the summit of the knob the terrane is still knobby and bioherms are evident across the front. Evidence of slide over these knobs is also very clear. The massive egl going over these bioherms knobs may be kings unconformity. The

5425
136
5289

(36) Shale would thus go from a little below 4800' to at least 5235' feet. Most of the biohems are not of large size and eyl develop on their slopes and help fill the cavities between them. Furthermore biohems tend to form on lower biohems.

At 5190' at base of small biohem comes a small patch of fusulines. This is near the top of the biohems.

At 5235' comes the top of the biohems at this point. Ord is also the point where the mtn begins to steepen into a cliff face. This, or above the eyl. where Scacchinella again appears is the top of the W.C.

Base of WC Top of eyl at 5410' 5425' because surface very irregular. Two Scacchinella masses occur at this level and are overlain by at least 20' of shale but the shale laterally passes into ss and eyl. Just above the shale Ord rock is massive and dolomitic but the same interval in the gully is limy

At 5035 on west side of knob is a bench formed by a biohem under the main knot. The dips on the main knot all

(37)

seem very steep to the northeast at this place but they flatten out on the east side of the knob. On the west side of the knob is a deep ravine and in it appear brown limestones that crop out on the bottom. all these strata look like dips produced on the sides of mounds. On the east of one big knob the moss which it once flourished is no longer there but the rocks appear tilted.

D26'— Ina small ravine off the main one up the hill at 4960 feet comes an unusual occurrence On the N side of the ravine and for some 25 to 30' up the hill are cobbly, mealy and algal beds abounding in Aulosteges. These layers seem to be plastered on the side of the main knob. The aspen stage includes Aulosteges & Leachinella including Tegulifera and Parenfelsella. There appears that this bed belongs to the Uddenites zone. Whether it has any connection with the Leachinella bed at 5025 or not is hard to say.

Along with these beds Ina brown to that are verkeap and mun

(38)

along the ravine. I suggest that these were once nearly horizontal in the shale that covered the bioherm but that when the shale was washed out in weathering the so slumped down into their present position.

The west side of the knob near the top has corals fairly common. These bioherms are thus suggestive of the ones in the Wildmill section.

0376

(39)

June 27

Section up gully between two hills on East and Windmill hill. Section starts on small knob at base of hill at abv ▽ 4460'

The top of this knob is 4490 and the whole knob is composed of massive biohermal ls.

Saccharoidal occurs on the west side of the saddle between this small knob and the next larger one. Saccharoidal seen on front small hill

Between the small knob and the next larger one, in the saddle between the two pinple is exposed for 20' or 30' horizontal

At base of high knob cgl shows over the dimple exposure. 4710' comes top of knob and base of hill. Knob mostly covered above lower 50'; bed of brown ss at base of hill.

0377

(40)

June 27'

West side knob, east end hill

A. = Cgl. b. with large pebbles in upper part and enormous cleaved stems all without real bedding. Up B 20' capping knob. This is undoubtedly Pwl based Keno sandstone in cliff on upper part Mtn.

B. - 17' thickly covered but with dark blue bedding b. showing blocks up to 10" covered on upper surface by brown siliceous shale. Blocks possibly interbedded with shale

C - Thick bedded sandy b. with thin layer of cgl at top.

D - 2' cgl.

E - 12' shale with thin bands of cgl. mean middle, contains chert pebbles & cuneiform stems.

F - 2' cgl. chert pebbles up to 2" and a few b. pebbles.

Strike N 70 E dip 16° NW.

Dimple form saddle between this knob and main part hill

J 272 small fractures at 4600' on large knob

A cgl 6'

B 17'

C 7'

D 2'

E 12'

F 2'

Dimple

(4)

On the ravine which bisects the knob limestone occurs at about 4530'; above this about 15-20' of cgl. appears at 4575'. This cgl. fads up the hill on both sides. It is evidently the cgl that can be seen in the pebble on the front side of the knob. A little higher in the ravine and then 2-3' beyond cgl appears. This is composed of large pebbles. At

June 27 about 4600' limestone, massive appears which contains tiny fusulines like those on the small knob where Leachinella occurs.

As shown by the knob on the west plateau the Dimple has enormous relief in this hill, at least 300' at the "West" knob. It is possible that the bioherms grew on Dimple humps.

On the saddle between the knob at the windmill and the main hill Dimple flat may be seen. This suggests that the Leachinella bioherm may occupy a hump on the Dimple. The dipper dot Dimple really may be only a shale + no ls. The Wolfcamp overlying the bioherm.

(42) at 4710' just above bioherm of base of hill comes dark brown ss.

Under the cgl at the windmill are shale and ss which might belong to the WC but at first it is more likely to be Dimple material.

Sedulked hunted on the slope for shale fossils but were unable to find any. At this the knots were exhumed by weathering of shale off them, in the big ravine under the west saddle the fans contain many fine pebbles. These are probably from soft shaly cgl that may make up a large part of the section between the knots.

0380

(43) June 28 - Section at Baptank just west about 0.2 mile west of road intersection. Section starts on limestone 3 of Baptank Section goes due N.

To 3 looks like a brittaun like those common in W.C. 80 paces to another brittaun ls. which is about 6' above the other.

80 - 225 paces - covered. At this point we come to a brown brittaun ls. at the base of the hill 12' above the starting point. Brittaun ls 31 thick

6' vertical covered

6 - 8-9 brown ls. with patches of algae

9 - 73' mostly covered slope

73 - 96' dark gray granular limestone in rather massive ledges. Dips N 20 W at 15°. This is probably ls #5 of the Baptank section.

96' - 134' - Mostly covered but lower 9' in dark brown ss. This is overlain by 6 or 7' of ss. This is evidently the Addams zone, ss to light gray potato-chip algae.

134 - 156 - Massive gray ls. the #2 of the W.C.

Dip slope of about 40 paces

(44)

From top of mountain ledge
handlebed at 15°
0-7Hb - mostly covered, but shale
and thin beds suggesting
low Uddenites.
7-8 Hb angary ss.
8-19 Hb - pebbly cgl in sand matrix
19-24 Hb - Cross bedded ss and
conglomerate forming a low
cliff.
24-27 - Same but mostly angary ss.
27-31 - Light gray fine-grained lss.
Cretaceous - Section from here N 30° E and in
paced.
↓ 67 paces and 11' higher still in
lss but it looks biohermal +
cgl. 132 paces to same level on
next hill
Uphill slope ∠ 21°; 16' vertical
Same lss. some brown chert.
Slope ∠ on next hill 12°. 63'
vertical. a variety of ls. and
sandy limestone and considerable
dolomite.
I think the ledge purported to be
lss #2 of the WC is in reality
another ls. probably the one
in the lower part of the section.
The white ls above the ss is
the top Uddenites ledge and
the real ls #2 is lost. The
ss and cgl. I think is
probably the thick ss under

0382

(45) The top undevides ledge that we have followed on the Brooks ranch.

All of the beds in this section above the cgl is Cretaceous.

Just above the so-called ls #2 of W.C. is a shale and about 30' up in it is a layer of orange weathering ls, with fossil ics.

About 100 yds S 45° E of Gaptank occurs dip slope of ls #2. A small valley is made on the slope. 150 paces can be paced across the valley the upper 40 paces in shale with brown ls layers. Fossils abundant in upper 46 paces.

N 50 E of Gaptank about 150 yds is another hill about 25' high face of hill with pebbles and rimbed (2" - 3') of brown & yellow ls. Hill capped by cgl & cross-bedded ss.

0383

(46)

June 29

Up with just east of Clay Slide

4690 ft of wash exposing 30-46
of shale & thin ls. This wash is
about west of the clay slide
collections were made.

4690-4710 - platy yellow sh.
4710-4825 - gray sandy shale
4825-4829 Cut ledge of sandy
limestone rotten in lower part
and containing small Lingulas
Lingulas. ✓
4829-4850 - gray sandy shale
4850-4851 - sandy yellow sh.
4851-4875 - gray sandy shale
4875-4885 - yellow clayey sh.
4885-5000' - Up the edge of the
mountain occurs slightly platy
dark gray clayey to weathering
ash gray. Fault breccia. Zone
west Rock here is fairly coarse
granular massive and shows
no bedding. They are Tuna
Siliceous. The platy beds are
typical Wood #1 and they
have massive equivalents
which cap the ledges of the
arroyo along clay Slide Valley.
The Tuna of Lobo and to
Wood facies change evidently
does not take place.

(47) The ledge at 4825 is formally
suggestive of the 702c bench.
The clay & slide starts about 4930'
in notch of hill just under top.

J 29' — Went up long slope to knob
at 5000'. This is a great bolsonad
mass truncated to the SE. & the
north and west the surfaces
are rounded. In the saddle
at about 4875 flat platy limestone
with chert the typical Wood #1
lithology appears. This mass is
thus distributed by to #1 of the
Wood as mapped but its structural
expression is found. The rock
is a fairly coarse calcarenite
with cobbles in the upper part
some of them with Silicified
sins are common. Small
mammillary lumps of brown
silica are common.

The commones J fossil is a
headed Zaphrentis. This belongs
here and is associated with
large fusulinids - Parafusulina.

Hill east of Sullivan Flume

0385

48

Knob next to Sullivan Ranch road.

Scaddy seen at 4600', at 4650 cgl: heavy sandy c. and and a shale (yellow and kennad-like appears). Base of Hess ledge in knob comes at 4710. Hess ledge 40' thick. This ledge is quite cgl in places.

J 29[2]. fossiles in Hess on top knob.

707n J 29[3] — fossiles at 4610'.

Lowest beds at 4575' about 1/4 mile W of road in small gully. Lowest beds under front knob at 4600'.

0386

(49)

July 1

Keyes Ranch Herat
Ravine under Hill 5816

5150' 5150' lowest shale exposure.
5150-5190 - Dark gray indurated sh.
5190-5191 - hard limy layer with
crinoid stems.
5191-5200 - Thin bedded sandy
shale in flat fish layers.
5200-5210 - same flat fish sandy rock.
5210-5230 - covered
5230-5235 - crumbly dark blue gray
shale.
5235-5255 - covered
5255-5265 - crumbly shale capped
by yellow ash band of 9".
5265-5270 - crumbly shale with 9" ls
band on top. Is hard splintery
but shelled not fossils.
5270-5275 - gray crumbly shale with
three thin (2") limy fish bands
about 1½" apart at top. Dip
here 6°
5275-5280 - crumbly shale with 5
sandy + cal bands 6" thick.
5280-5285 - same with 2 6"-10" inch
fish at base separated by 6"
shale.
5285-5290 - same crumbly
shale.
=5320' 5290-5300 - Top 10' of shale
becomes cobbly, but fine rock

(50)

is soft. at 5300' comes solid
land cgl. lo.

5320-5400 5300'-5370' — lower part with
fairly coarse cobbles but upper
part in dark gray irregularly
bedded, but heavily bedded sandy
and pebbly ls. Sand & pebbles
fairly angular. Cobbles below
mostly rounded and fairly
coarse. Poor fossils found at
5370-5376- bioherm of lump.
5376-5400 — Top of a conspicuous
ledge. The interval included in
fine and coarse cgl. & sandy ls.
Ledge is 5400' on west side gully.
Section starts again on east
side gully on same level as
5400 on west side
5400-5430 - sandy brown to dark
gray ss.
5430-5470 - alternating thin
bands evidently shale covered
by a one-foot bed of hard
dk ls.
5470-5481 — Silt or shale
5481-5482 - sandy ls.
5482-6600' - to top of bold
bluff of cgl. This interval
is a dark cgl interbedded
with irregularly bedded ss
and sandy ls. Cobbles up to
a foot, in base mostly ls
but above mostly chert &

5492' base of sill

5669' to top of cgl

5100

5740

(57) other siliceous types.
5600-5630 ± flat-bedded dark to
weathering ochre-yellow, thin
beds of ad and dark to with
angular dark chert fragments.
This rock suggests the last Hew
facies.
5630-5655 - brown dolomite in
layers ½-1' thick. Hew facies.
5750' 5655-5715 - granular massive
and platy ls of the west Hew
facies.
5715-5737 - dark gray dolomite + ls
probably Hew west facies.
Barnacles range to 5740' and is
thrown out by 76' (low). We went
5816' top of section up the hill N 10° W in the depression
that goes up just east of knob 5816

The northeast end of this hill
also about ± 5816' is composed
of granular dolomite. This is
Lilly's loc. 210. We saw nothing
but large Omphalotrochus at abt.
5750'. This ls has like Hew west
facies altered to dolomite.

Down west face of hill 5816
to saddle at ± 5535' saw same
section of dolomite +
chert with dipping to so near
bottom.
704k Dy 1°-at 5525' fractures in

0389

(52)

7040

egl. above (51) main ledge of egl. Dip 12° - Fractures just below 5540 main ledge of egl. Saddle at 5540' and Fischer egl. ledge of about 5520'. A should dry a deal further along. Takes place above Main bearing ledge. The rocks are thinner-bedded, as and the egl have small pebbles. Right in the saddle appear steeply dipping egl which seem to have left by the flat as and below the Fischer ledge. My two fractures dip 11° & Dip 12° are both above the slip and run N48E 139°. Dip upon upper beds on the east face of the hill west of 5816 the dipping beds are well shown. The dipping beds are not parallel to each other under the unconf. and thus suggest forests off a reef.

Looking at west face of hill 5816 the dip on the Hess beds is 11°, that on the Wolfcamp 19°. Where studied on west side of hill east of 5816 the unconf was at 5550.

Section above unconf.

(53)

5550 – 5600 – covered.
5600 – 5603 granular massive gray ls. looks like Wolfcamp.
5603 – 5810 – covered
5810 – 5700' Jy 13 704m Fossiliferous at base thick ls with small pebble cgl. 5' above are platy ls, with fossilines. Whole interval is thick bedded, irregularly bedded sandy ls, ss, and fine pebble cgl with dark pebbles.
5700 – 5775 Lighter gray ls with light or white chert pebbles & quartz pebbles. Thin cgl. only in bottom part. Top of this unit is fine grained & coarse grained light gray ls weathering light blue gray. Barometer at 100' (high).
Dip more to east barometer reset cgl & sandstone at about 5650
5775 – 5550 Jy 15 704t Correct fosslines on nose east of hill 5675'. Come back to saddle at 5525' which is correct.
Came down hill from saddle at 5525'.
5425 – base of big cgl.
5425 – 5325 – shale & ss with cgl.
5325 – 5208 lowest exposure of cgl.

0391

(54) July 16 — 5'100' in gully blue gray shale with band of ls.

702L =
704V

at the windmill Art says a shale comes between Dimple and cgl of WC. There is a possibility of this also at the windmill but the lithology looked like Dimple to me.

I recall seeing potsh chips algae in the lower shaly part of the section on the Mtn. side of Iron Mtn. These would be good evidence of Holbrook Zone.

July 3

Revisited section at windmill the shale along the base of the hill proven to be Dimple. This is true of gl which I had previously placed in the WC can be clearly imbedded with the Dimple shale. Of the cgl are followed W & N to a small arroyo they can be seen interbedded with shale. Two small knobs N of the windmill show Dimple underneath but north a veneer of rubble on top. On the NW side of our big knoll Dimple can be seen forming nearly all of the

(55)

slope. On the saddle between the big knoll and the main hill Dimple can be seen as flat at the base of the hill and in place. This was previously interpreted as WC in place but it is definitely Dimple. This is true also of the knoll to the east.

The WC here is thus a veneer over a Dimple high or a sand-bank laid into a swale against a Dimple high.

The top of the knoll at the windmill is a ash with small subrounded pebbles, broken sponges, corals and brachiopods. Fragments of Leptodus are common which indicate the rocks to be Permian in age. This material from its bathed fossils and pebble suggests wave-bumped debris against a Dimple high.

The sides of the knoll are definitely in place. Thin layers are parallel but the dips are generally steep into the hill. The whole dimple surface is quite irregular and this knoll + the east one are probably

(56) Said against highs.

Jy3' Shale under cgl. at about 4575' elevation opposite ravine in main hill about ½ mile E of Sullivan Ranch road. Left on Poplar Tank S27°E Shale obtained by cgl. sight on windmill E of Sullivan R road N72°E.

Jy3³ - Small knob with cgl dipping to hill and with shale slope on S side of about 40' Elevation 4600'. cgl thins to pebbles + silt and pebble. At the base of the knot a long ridge flows Gaptank float. Cgl ca 20' thick. The shale is probably same as Jy2.

A coarse cgl. appears in a gully on East side of knot Jy3³ and seems to underlie the shale.

Just east of the knot about 150 yds. is a low hill of chert cgl and trends to Probably Gaptank or Dimple This is underlain by yellow ss.

(57)

at 4600' above shale & egl of
by 3' cross 25'-30' of slope in
small ravine of yellow co.
At west end Dewie Hill open
at King's fauld at 4530' are
blue gray granular ls. like Ites.
This may be a fault or there
may be separate buchems at
different levels. The blue ls is
overlain by small pebble cg.
At the supposed fault one
mass is brecciated and
is elongated toward the
mountain. The only way
this can be explained is
by igneous type buchems and
not faults. Could see
no breaks in the limestones
that follow the 4550' contour.
Thus all seem to me to be
Wolfcamp limestones.

BM
5860

Deonard Mtn

5h.

4960-5000 Scoachinella

4750

4800

5760
4850
210
75
135

(57)

July 4

Hill W of Iron Mtn

West from saddle on small knob. Knob at base of hill 40' feet high all in Dinple to base of hill. at base of hill Base of Dimple at about 4735 in a Gap saddle. Here comes a cover of granular lo. blocks like those at the base of the section in the Windmill Canyon Went up 110' more in Rio Loco blocks material to 4845' which forms about the level of the fan deposit. Gr recess and bare spots evidence of shale clear to this level beddings apparent in base, well preserved crinoid fragments. The base of the main wall of the Hess is about 55' higher or at about 4935-4950.

Barometer base at 4860

July 4' at 4850-4870 comes a shale beds showing blue gray shale crumbly brown iron stained and flat, thin bedded which is no. We again no fossils, not even crinoid stems. Bowden coll. = 7080

July 42 - Below 4850' contour in center of hill and below 4750' contour on west and

(58)

near ravine the slope is composed of shale. The shale slope is about feet high. Near the top under the cliff are thin ss interbedded with shale and have in a thin lime band (yellow) clear fossils (but they were rare. At 4850 under main part hill clear a small lump with potato-chip algae and pure Conglomerate.

Jg 43 - At 4600' on south slope hill concentration of blocks of brown cgl & lime with oolitic & fossiliferous. Blocks approximately in place. 50 yds W is a dropped block of Hess material which overlies the cgl. The cgl is in place in the shale under the main ledge just N of the dropped block. At 4705' is the base of a 20' bed of gray magnesite ls with some 1 inch areas. Core of brown with potato chip algae in rounded pieces. Just below these are large cup coral sections. Above this area on the Brooks place. The brown ls beds W. contain 20' of lime ton at base of hill

(59) Base of hill came at 4650'
On this hill are at least
100 feet of shale. I think all
of the shale belongs to the W.C.
I saw no definite Unconformities
zone affinities. except for the
potash lip algae."
At the north end of this
hill I saw no big agl.
underneath the Hdo.
Same as occurs at the south
end. and as recorded by
King
On the Davis Range the
big agl. at the west end
pinches out. Toward the
east. We evidently saw the
thinned wedge of it on Jy 3
just west of King's faulted
area.
The Hdo is at the north end
of the hill W of Clavon Mtn.
Consists of flat dark limestone
in layers 9" - 1' thick often
with talent layers on top.
The stuff looks a great deal
like the Leonard in the
Davis place.

Notes on King

King notes WC basal cgls thicken westward from 10± miles E of Chaos Mtn to 458' near Limey. Cgls are followed by ch. & sandy shale. The upper shales are variable because of erosion at top. 160' one mile W of Chaos Mtn. SW of Limey upper beds removed by pre-Hess erosion for 1½ miles of outcrop so that Hess cgl rests on WC cgl.

Note Keyte section for Mtn front north of Meeks Ranch p. 57.

Base of Hess along its entire length from Gaylands to Del Norte Mtns. marked by cgl. Angular divergence up to 10° between Hess & WC? Variable up. WC indicates Pre-Hess erosion.

Hess

Up division between siliceous sh. above & massive ls. below. Meeks Ranch no basal cgl in Hess as they pass into a massive gray ls. without fragmental material resting on the WC. are all rocks from windmill section to Dragon Mtn. probably Hess, rather than WC?

Hear cgls. Among grasses in hills
N of Hen Ranch.

Try to see Gaptank from
Thi E of Gaptank. Probably at
Gole -nday = WC or Udelwike

0400

Skeo Mtn. fusulinids
Wolfcamp fm.

Ozawainella huecoensis D.+S. WC (upper) Leonard Mtn. (loc. 18)
Schubertella kingi D.+S. W.C. (loc. 7, + 17)
S. melonica D.+S. Leonard (Perminites campensis zone)
Triticites uddeni D.+S. WC. bed 9 at W.C. (also loc. 7)
T. ~~roundtreeae~~ subventricosus D.+S. Hoover W.C. in beds 4, 9. (Locs. 5, 7, 8).
T. pinguis D.+S. L.W.C. WC Hills
~~Schwagerina~~ franklinensis D.+S. WC. bed 14 (W.C. Hills)
~~S. beedeanis D.+S. Beede~~
S. gracilitatis D.+S. WC just below Skeo cyn. NW of Baptanka.
S. linearis D.+S. WC. 1½ mi N35°E of Skeo R. Highest W.C.
S. compacta (White) Bed 9, 4 mi. WNW of W.C.
S. diversiformis D.+S. Mid Wup. W.C. Baptank
Pseudoschwagerina uddeni (B.+K.) Bed 12 WC Hills
P. texana ultima D.+S. W.C. bed. 14.
Paraschwagerina gigantea (White) Mid W.C. at UC
P. kansasensis (B.+K.) WC beds 4-7 WC Hills.

3401

Leonard Fm.

Staffella laevinoda D. & S. — 450' above base, 2 or 3 mi. NW of Gaptank.

Schwagerina hessensis D. & S. Base of Leonard on Dugout Mtn

S. hawkinsi D. & S. Base of Leonard on Dugout Mtn.

Sr. guembeli D. & S. 1½ mi. W. of Gaptank.

S. cf. pseudoregularis D. & S. 450 above base, 1½ mi W of Gaptank.

S. crassitectoria D. & S. 400-500' above base N of WG

Parafusulina bakeri D. & S. Lower Leonard W and Dugout Mtns, S. tip hill W of clear Mtn

0402

Willis, Robin - Correlation of Texas and New Mexico Permian. A.A.P.G. Bull 13, 1929, p. 1017

"The uplift which accompanied the folding of the Marathon region, prior to the deposition of the upper Cretaceous formation established a land mass southeast of the Glass Mts. which must have persisted until the end of Word time at least and reappeared during Bissett time, if it did not remain throughout the Permian. The numerous conglomerates in the Hess indicate its proximity. The shales and sands of the Leonard and Word were derived from it, and from its westward extension. The successive overlap of the formations from the Carboniferous to the Word is additional evidence of the proximity of this land mass. Southwestward along the southeastern front of the Glass Mts., each succeeding formation overlaps the ones below it and rests directly on the folded Pennsylvanian beds".

Top WC at 5714 in half 5816
Top of WC on hill 5700' at about 5800'

1162 feet mile
5.5
5810
5810
6390
5075
5715

5.5
90
4950

5075
495
5570

27

2.2 5280
22
10560
5544
11616.0