Notes on section —
Calle chini etc —
Silver Peak Nevada
Sept. 1896

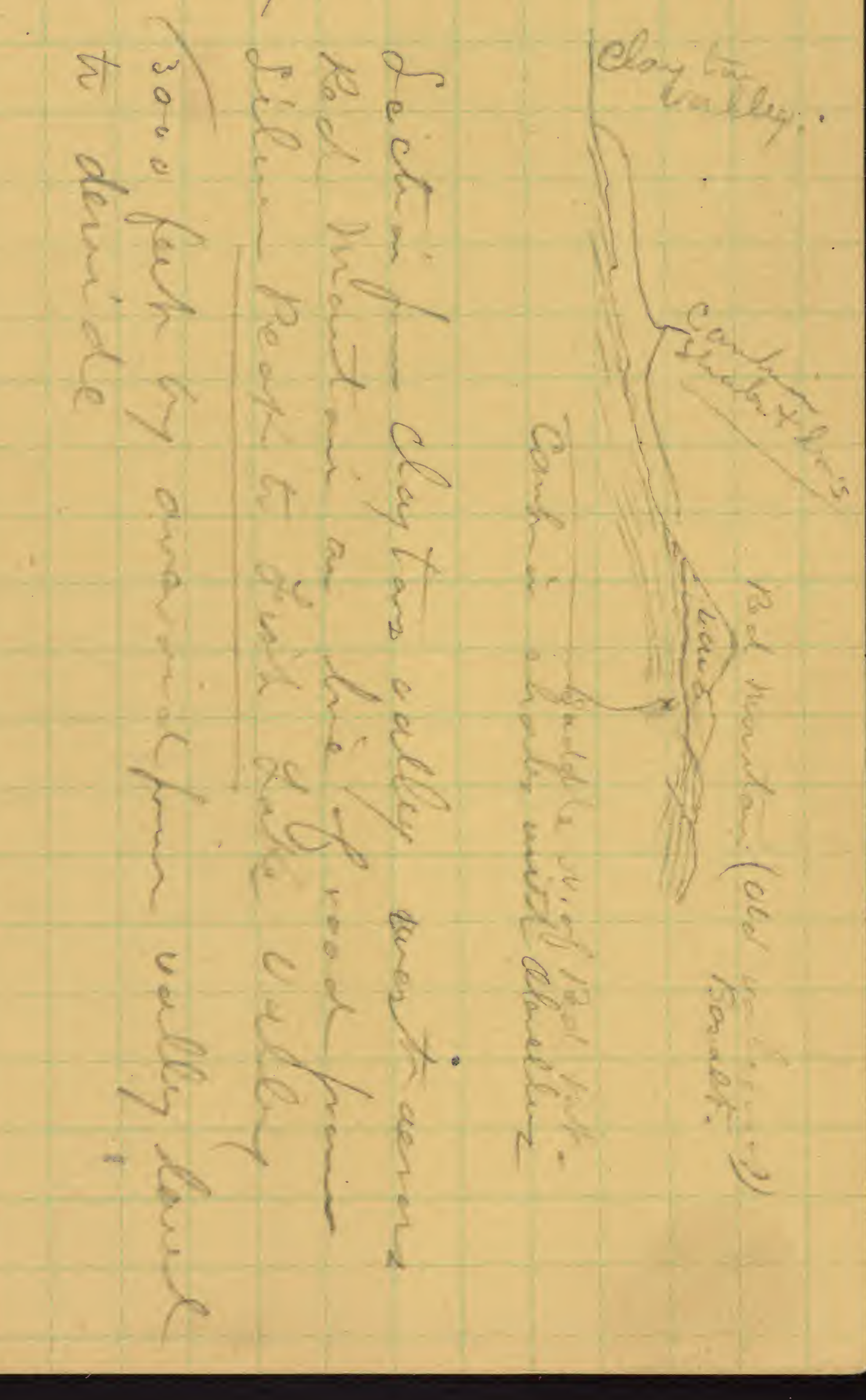
Gold mines

Cambrian rocks.

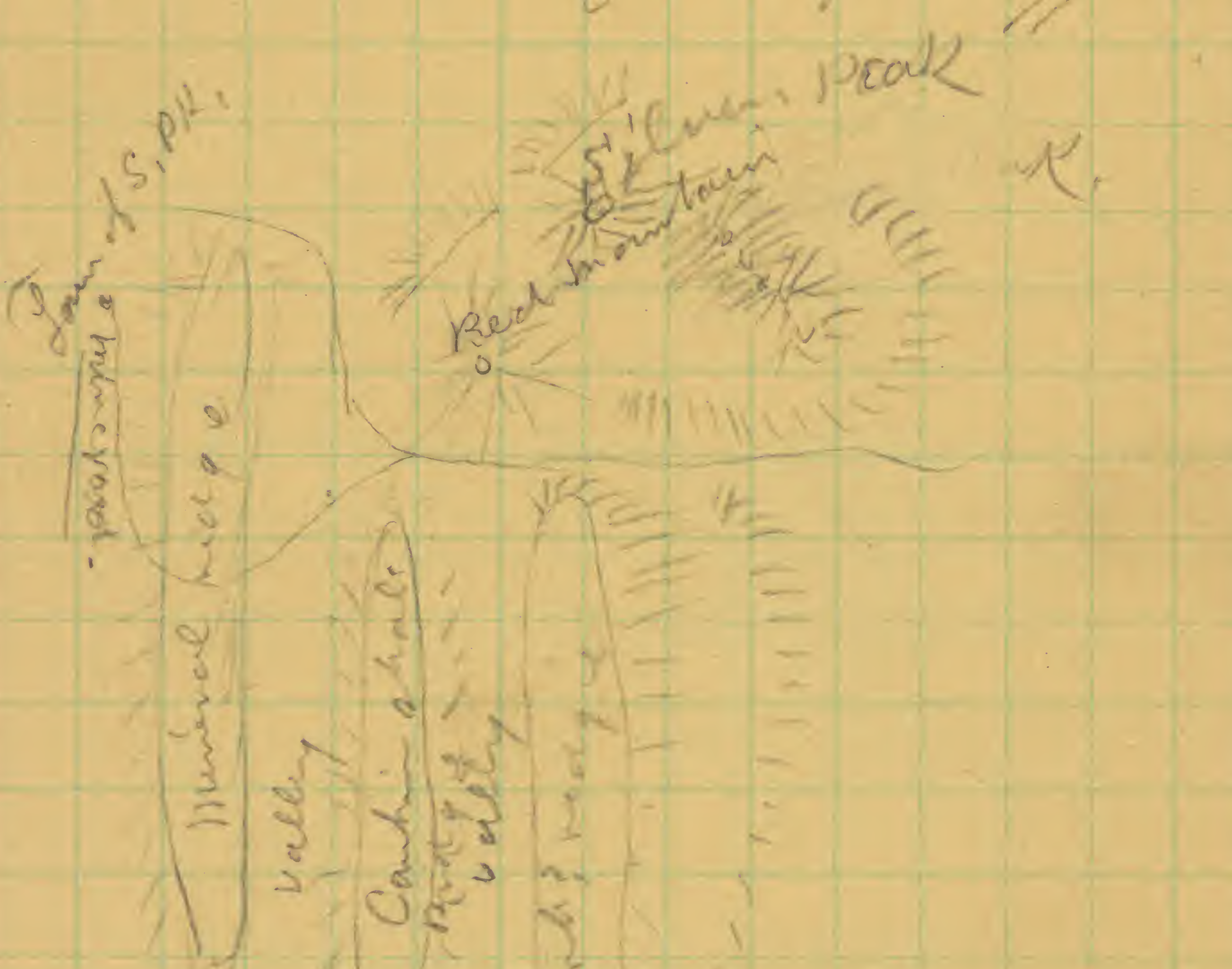
Arrived Left. 23d. 1896.

Camp. 7. a.m. 4200. 4200.

Divide (Summit) on road
to Leidy's ranch. Dish
Creek valley. 9 20 a.m. 720.



d, Ridge across valley from c.
(Carboniferous ??)
x, Band of white quartzite which is brecciated + mineralized in the vicinity of the mines, + in the arch of the fold >a



Elevations on road Silver Peak to Drinkwater mine.

Monument 4900 — 400 —

Forks of road 575

Old ore dump (5975) 1500. (6300)

Drinkwater mine 6625. 2325

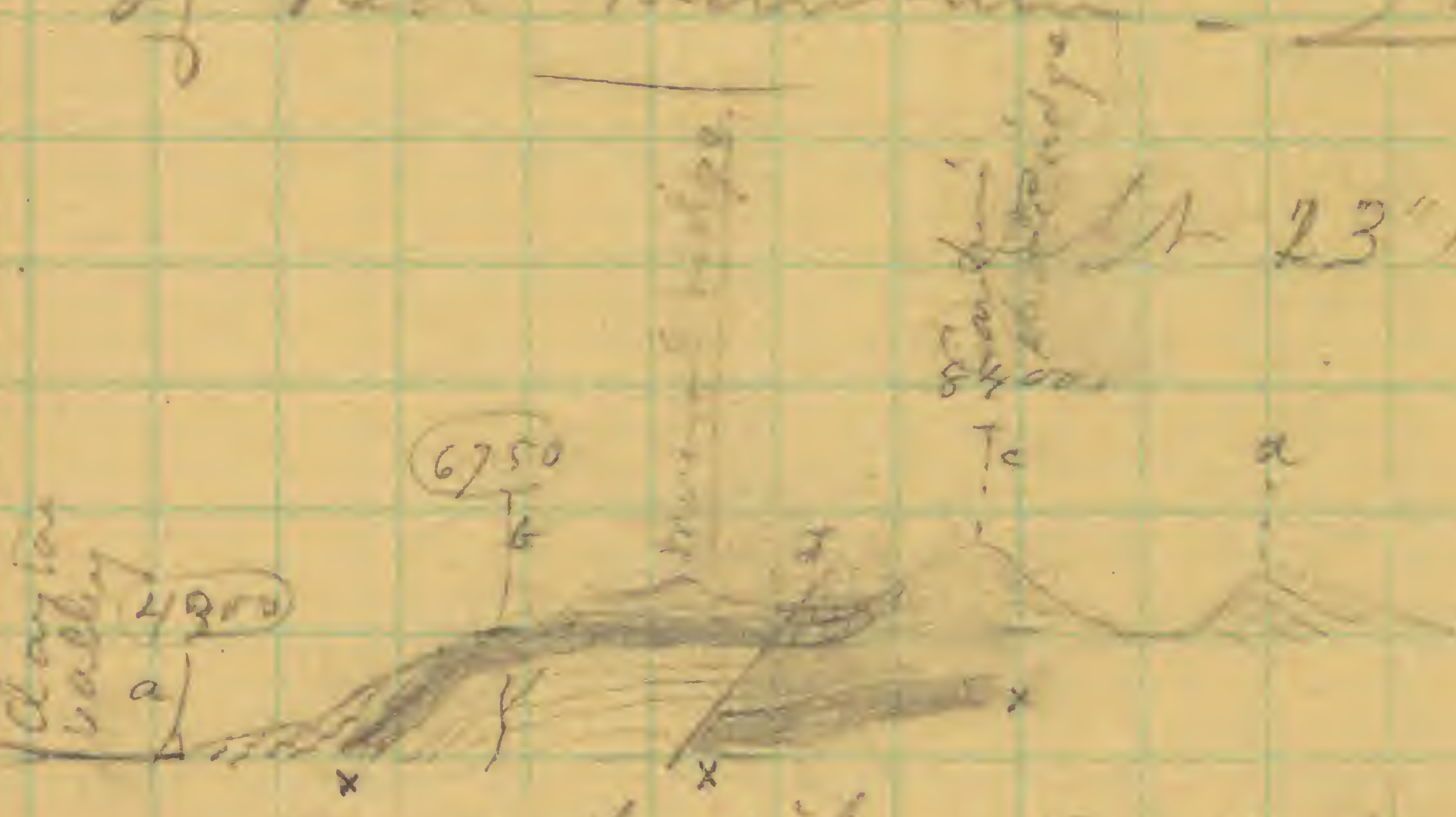
Mineral monument No 5 (6950) 2450.

6750 —

Town 4300 —

Summit of ridge west of mineral ridge & north of Red mountain 8400 / 4100

Sept 23rd 1896.



a. Level of Silver Peak (town) north.

b. Level of mineral monument No 5, near Drinkwater mine

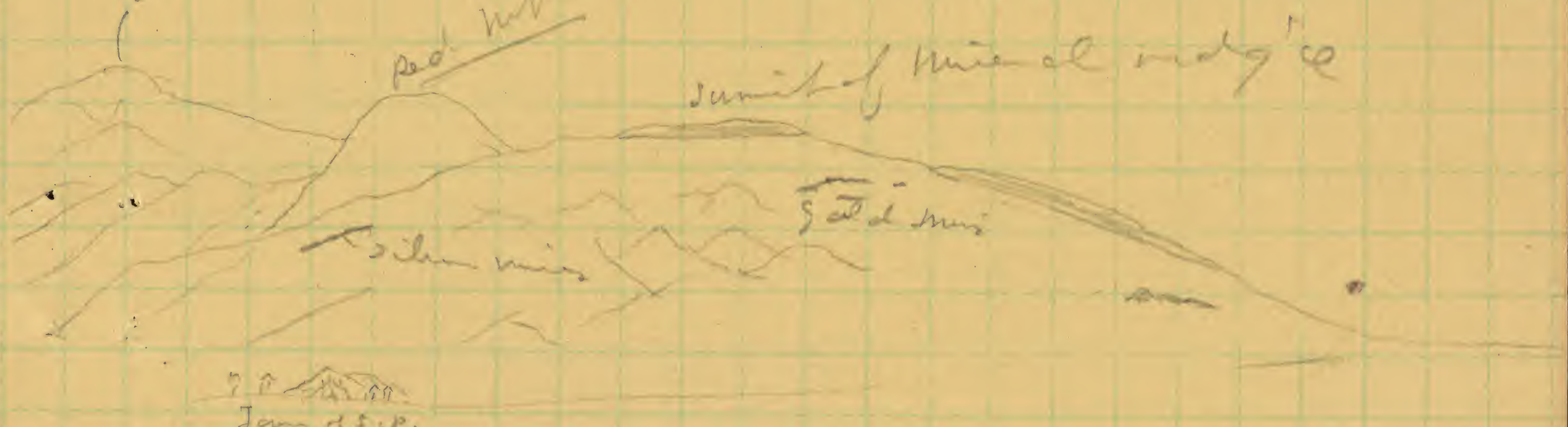
c. Ridge of Cambrian shale Olenellus horizon

Sept. 28/96.

Photographed Mineral ridge from hills, 1 mi N.E. of town of Silver Peak. Nev. 3. neg- 8 sec- each.

One neg- of fossil hill - 1 mi E. in salt flat.

View of Mineral ridge, Red Mt Range near Silver Bow
from hill in creek flats 1/4 N. E. of town of
S. P.

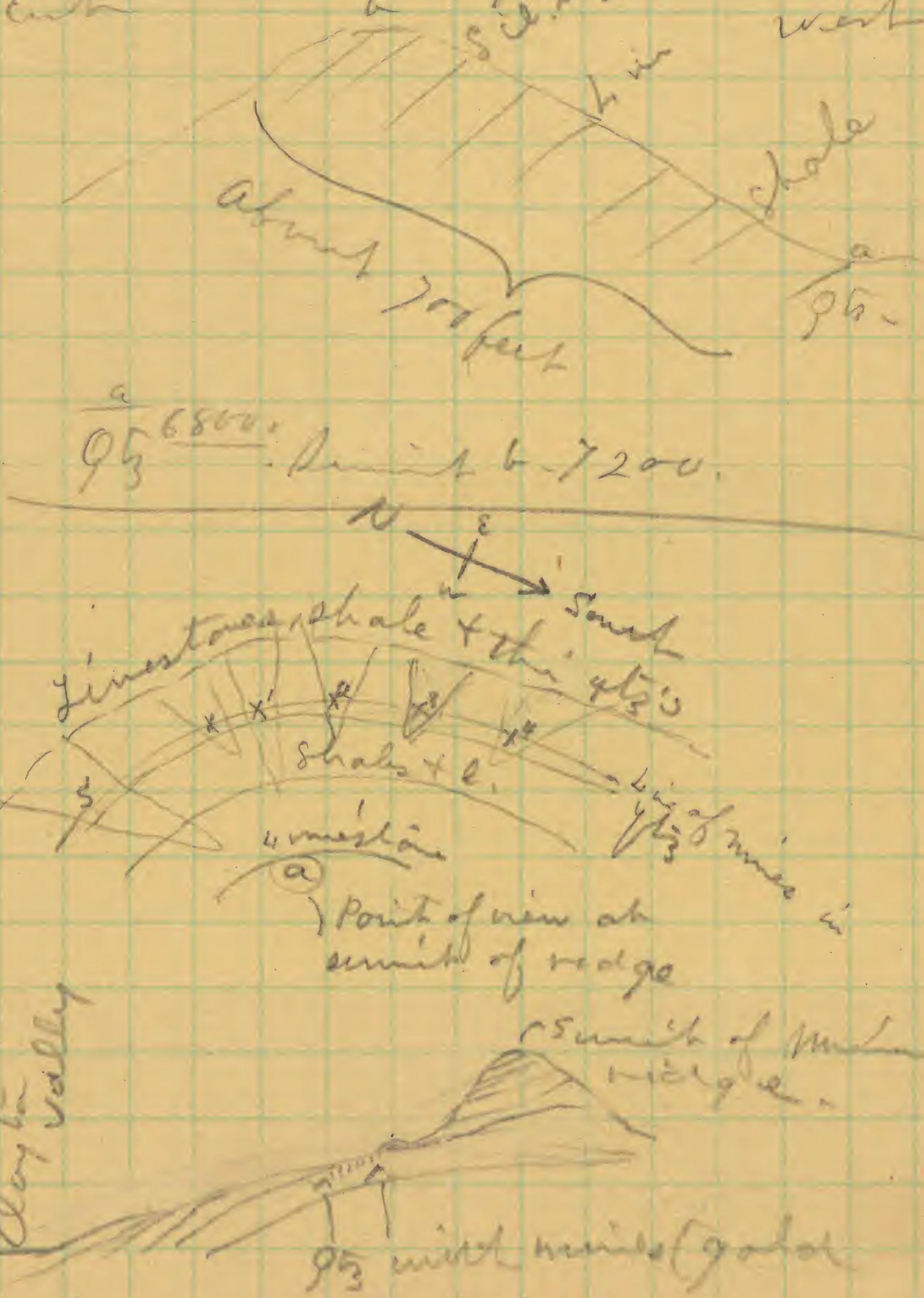


See photo Sept 28/96

Left 30th/96.

Silver Peak Quadrangle

(Mineral ridge)




Clayton Valley
Fish Lake Valley

Look a little look
at the gold mines &
consider them to be
of great value if
properly worked!

Lift 3 of 96

Notes on Lone Mountain.

Lone mountain appears to be a simple monoclinal uplift of about 4000 on 5000 feet of strata that strike to the west of north 5° to 25° and dip to the eastward at an average angle of 30°. Erosion has removed the higher portions until the higest eastern point is about 2000 feet above the surrounding plain and a little above the average hight of the ridge running N.W & S.E. ~~that across the line of slope of the strata~~ along the line of strike of the strata. This ridge is broken but ~~fairs~~ rather slight

depressions into four fromnit points and two lower ones, one on each end. From the central elevation chart, each spur juts out ~~to the~~ eastward the abrupt slopes of which cut across ~~the~~ strata dipping 30° in the same direction as the spur. Low down on the slope it becomes less abrupt and falls away more and more gradually until on the last half mile towards the plain it does not average over from 2° to 3°.

Westward the topography is marked by a rather abrupt slope for about 800 feet & then low ridges cut up by lateral cañons continue out to

the plain and on the northwest side a long spur, connecting with the main ridge by a rather high saddle passes out to the plain terminating abruptly without the long tolus slopes of the eastern & southern sides. As this ridge runs across the line of the strike a continuous section of the strata is exposed upto the main ridge and thence to the eastern base of the mountain.

An outline sketch of the mountain

gives (1)

and section along S.W. spur. (2)

Lectari from the S.W. end of the main
spur up to and over the main ridge.
Strata conformable. Rectari clear & exposed
along the entire distance.
The S.W. face of the spur is quite abrupt.
(1) at the base it is formed of a brecciated
quartzitic conglomerate, containing angular
fragments of quartz & pieces of silicious
limestone, that rests on a highly silicious
irregularly bedded limestone. that passes
beneath the plain. .75 ft.
2. Dark gray limestones in heavy layers, followed
by massive bedded shaly limestone
containing numerous fossils that

indicate the summit of the Ahbren
Cantrain formation (List of Cambrian
fossils of Lone Mtn) 300 feet.
Strike of limestone. N. 25° West. dip 28°.

3

White & pinkish colored quartzite.
Estimate 200.

4. Massive bedded siliceous limestone,
dirty brown & carrying silicified corals,
passing above into lighter colored beds
& again dark and light, continuing
for a long distance. Estimate 1800.
Strike midway N. 25° W, dip 30°

5. On the saddle leading to the main

ridge the beds are less siliceous & give away to a somewhat massive bedded gray to blueish gray limestone ~~with~~ that breaks up into shaly bands. This limestone carries numerous Devonian fossils. 200.

Lower Devonian of Lone Mtn.

6 Massive siliceous limestones, dark gray. continue on up to the crest of the ridge & out to the plain on the eastern side. About 500 feet up from the preceding band (5) a number of silicified corals etc are found in a massive stratum of siliceous limestone. (Upper div. of Devonian of Lone Mtn.) Estimate 1500.

~~Total 4075.~~

Cambrian 575.
Silurian 1800 2200w
Devonian 1700 1400w
} 4075. — 4675.


N. 30° to 35° W.
S
2
a
b
c

[0]

Cambrian section of the Highland Range on the west side Return half way between Bennets Spring & Stampede Gap. The base of the section begins at the quadernary and the western edge and the summit forms the crest of the range.

1. Dark reddish-brown quartzite; evenly bedded & ripples marked in some places. 350.
Strike N. 65° W. Dip 15° E.

2. Bluish-gray limestone 35

3. Buff argillaceous & arenaceous shales; ~~marked by~~ ~~banded~~ ~~bands~~, more or less solid

near the base &
laminated in the
upper portions. 60
Fossils. ~~Annelid trails;~~ fragments of Olenellus.
+ (Lecane tubes) lines)

4. Light colored gray
limestone & bluish black
l— " 16

5 Sandy, buff shale 40

6. Dark bluish black l- 46

7. Finely laminated, buff
argillaceous shale 85
(Two lines)

8. Gray to bluish black
compact l- 18

9 Buff arenaceo-argil-
laceous shale 64

10. Compact, Cherty l- 55

Compact shaly sand-
stone in massive
layers 40

12. Hard silicious gray limestone
almost quartzose at base 12

13. Yellow to buff sandy
shale 70

14. Bluish black l- 16

15 Sandy shales like 13. 40

16 Bluish-black ~~limestone~~
hard, compact l- 12

17 Shaly sandstone in
massive layers 52.

18 Gray, arenaceous
limestone 2

(4)

19. a Buff- sandy shale 40
b Gray arenaceous l- 30 73
c Sandy, calcareous
shale. 3

20. Massive bedded
bluish-gray limestone 200
20a Compact gray silicious
limestone almost
quartzite in places 400
20c Bluish black
evenly bedded limestone 6
Strike N. 30° W. 20°/10° E.

21 Buff argillaceous shale
with fossils and a
few interbedded layers
of limestone 3" to 15"
thick.
Fossils. Linguleppis - - -
Obolella - - -
Ptychaspis - - - - - - - -
Olenoides - - - - - 124

22. Massive bedded siliceous limestone: weathering rough, broken into great bells 200 to 300 feet thick by bands of color, light gray, dark lead to bluish-black: on some of the cliff faces the weathered surface is reddish. 1570

23) Bluish-black limestone in massive ~~layers~~ beds that break up into shaly layers on exposure to the weather. The latter feature is less distinct 850 feet up and the limestone becomes more siliceous with occasional shaly beds 1430

Fossils. Near the summit

Ptychoparia
Bathyurus
Lower down quite
a Fauna occurs as
found farther south
than the line of the
section.

Summary of section.

1) Quartzite	350
2) Limestone & shales (argillaceous & arenaceous)	1466.
3) Massive limestones	3000
	4816

Faunas

In the lower portion of
2. the Olenellus fauna
predominates ~~through~~ about
300 feet of strata.
In the upper portion

f. 2. (21 of section)
Clenoides, etc.

The fauna of S. is meagre except near the upper contact where it is Potsdam in character and Dicellocephalus appears.

The succession of faunas is much the same as in the Eureka section.

Continuing north along the crest of the highland range & crossing Stapleside Gap the higher strata above 23 of the section begin to appear

dipping to the southeast the dip increasing towards the north and higher beds ~~afpear~~ coming in until at the Lair pass just north of Bristol the ~~Eureka~~ White Quartzite just below the Trenton horizon appears.

An estimate made while riding along the eastern base of the range gave 2500 feet as the thickness above the highest beds of the section & the quartzite. ~~Adding this to~~ I think this is under the actual thickness. Adding 2500 feet to the 4800 feet of the measured section

we have 7500 feet
of limestone. on Piche
on the Ely mountain
east of the line of the
rectan the ~~quartzite~~
lower quartzite gives
1200 feet. adding the
850 feet to the rectan
gives over 5500 feet
for the Cambrian and
2500 feet for the Silurian
The hiatus between the
two is probably considerable
as at White Pine or
miles north the Silurian
limestone below the quartzite
is over 5000 feet.

On the west side of
the Highland Range
west of the highest point
the ~~the~~ upper Quartzite -

9-16-85

35

Going west from Bennetts
Springs on the road to
Dry Lake a conical hill
rises a little north
of the road
The granite in the
same as that of Quartz
Peak in the Pah-ranagat
Range and the
limestone below carries
the same fauna as that
of the hill of Quartz Peak and
Fossil Butte. I collected
a number of excellent
specimens.

9-22-85

North of the main
Peak of the Highland
Range the strata
break over lands
Stampead Gap & then
extend in a long
high Ridge to the
pass a little north
of Bristal. Over
the pass the light
colored Eureka Quartzite
caps the ridge on the
south side & also the
hills on the N. W. side.
Estimating the
thickness of the strata
that is above the
head of the Highland
Peak Spectrail I think
2500 a conservative
amount.

our estimate is rather 3/
under than over the
true thickness as there
is some faulting to be
taken into consideration.

9- 23- 8/5

The Olenellus horizon
at Pioche is –
with numerous fossils
Ptychoparia etc. The
upper layer of the
quartzite are a little
calcareous in shale & these
carry numerous fossils

243
61
179
75
123

681

Sept. 7, 1888. 1

Beautiful illustration of
quaternary deposits (Lake)
at Panaca, Nev. Near
the limestone east of the
Town the calcareous
matter predominates. Silicious
layers, dark, cherty, cap
the buttes near the Town.
All around the valley the
reddish deposits occur in
smooth even layers resting
on & against the volcanic
& sedimentary rocks.
In going up "Condor Cañon
on the road from Panaca to
Rose valley the cañon
cuts thro' a massive belt
of limestone that dips 35°
E. Strike nearly N & S.
Layers more or less massive.
Lithologic character very
much like that of the

Photographs taken & specimens of fossils collected

Pogonip limestone above
the Hamburg shale.
Estimated thickness 1000 feet.
Cut off above thelow by
volcanic rock.
Sept. 2, 1885.

Ar Peche. Nev. the town
is built on a dark reddish
brown quartzite, much like
that of the Prospect mtn.
quartzite of the Eureka
district. This forms the
high central hill &
the shales & li- dip from
it on E + W.
The section is -

1, At the base rests on the
quartzite an argillaceo-grana-
ceous shale with thin
layers of dark bluish-gray
li- ccmy mmmmm

(3

finish. This is the Clarella horizon of the section. *

11. feet

2. Dark quartzite. 18 "

3. Sandy shale. Buff. Thin massive layers in places. Shows rain drops. Worm markings, annelid trails & crustacea - ch? 180 ft

389.

4. Massive bedded shaly - gray l- 24.

5. Yellow buff argillaceous shale. 45.

6. Same as No 4. 11.

7. Sandy shale. buff. Similar to 3. 63

Argillaceous yellowish

8. ~~Reddish quartzitic rock~~

shale 20 feet passing into a more arenaceous shale above at the places this belt carries a somewhat laminated argillaceous shale. Pinkish steel gray, drab, buff, that contains numerous fossils. Entire trilobites etc.

8. Reddish quartzitic rock passing into a dark massive bedded limestone & thin into a lighter colored more arenaceous shale about 1000 feet above Pioche 1000.

East of Pioche this belt is nearly 2000 feet—

this letter corresponds
to the Prospect No
1 – of the Creek a new
section.

Section of Highland Range from the westbase to the summit. 6

1) Dark brownish red quartzite ~~3~~50.
ST. N. 65° W. Dip. 15° E.

2. Bluish gray l- resting on 1. ~~3~~5.

3. Arenaceous shale in compact layers passing into laminated shale ~~[illegible]~~.
~~4~~, about 20 feet from base 60.

4. Light gray l- ~~[illegible]~~ ~~[illegible]~~.
Bluish l- 16.

~~5~~. 2r
5. Sandy shale- 40.

22 176

110

10

120

(7

6.) Dark flinty black l. 46.

7) Buff fine grained
org- shale- 85

8) Gray to flint black
l- 18.

9) Argillaceous shale
buff color 64.

10) Hard shaly l.
Bluish l- 55

11) Compact. shaly red- 40.

12) Compact siliceous l-
(gray) almost quartzite
adobe
Bluish l- 8
43 12

13.) Yellow sandy shale 70.

14. Bluish l- 168 8

15. Sandy shale 40.
154-168.

16) Blueish l- 12.
164-169

17) Shaly l- in massive
layers 169-180. 5'2

18) Arenaceous l- 2

20) Sandy shale
181-189. 40

21) Gray arenaceous l-
189- 30.
Sandy Calcareous
l- shale 3.
E Massive blueish-gray
l- 20'
233

22) Carbonaceous, hard
bituminous l- almost
quartzitic — 40

Section of Highland Range from west side.

Upper portion of Section

Br

1. Bluish-dark l- | 0
St N 30° W. D 10° E. | 6

2) Buff-arg.-shale with fossils + interbedded l-
2' like 1.
Lingulepis. Obolella, Ptychoparia, Olenoides typicalis. | 124.

3) Massive bedded silicious l. weathering rough and in great belts 200 to 300 ft
22 thick, dark bluish black, gray + in places on weathered surfaces reddish
1270 + dik 102

1270 + 3 or I | 1570

210

160.
1050
1210

4) Bluish l-dark in massive beds & breaking into thin shaly layers. At about 850 feet the l- becomes more silicious & the shaly beds less frequent. 1200 – 220 = 1430
1200 + dip of 10°.

Near the summit obtained Ptychoparia, & a form allied to the Bathyurus found in the Eureka section.

What appear to be traces of fucoids mottle ~~the~~ great portion of 4 & annelid trails are not infrequent. The curious aspect given to the inosculating bands of color 1/8 to 1/4 to 1/2 inch broad = mosaic work is seen

in many of the layers,
Recalls the Winooski
marble of the Vermont
section
At the base of 3.
the Middle Cambrian
fauna prevails in the
shale (No 2). 28 or
feet above the fauna
is still Cambrian.
The l- of 3 & 4 appears
to equal the Prospect
Mt & Hamburgh l- of
~~the~~ Eureka section
The shaly beds also
resemble those of the
Eureka section.

"Lentiles"
In the lower portion
of the section taken
by J. E. Whitfield
lenticular masses

of limestone occur in the shaly bed & below both shale (arg) & quartzitic sd - occur in the form of "lentils."

The ~~shata~~ of the Highland Range ~~south~~ north of Bennets Spg. appear to be of Cambrian age.

19
~~82~~ 90.

9-8-85. (14)

Hyko, Nev. Devonai

Directly east of the upper ranch at Hyko. Shaly l- capped by massive beds of dark arenaceous l- carry Devonian fossils. Collected a number in the morning.

The ridge of Devonian l- extends on the east side of the Pah-ran-a-gat valley for several miles. Owing to the faulted & broken condition of the strata no continuous section could be made but from the best examination I can make without great & prolonged investigation there is not over

I can see for
instance, many
similarities that may be
referred to the Darwinian.
The color is dark dusky
brown & drab gray as in
the Eureka Denmanii.
It is not impossible but
that a portion of the
mass may be referred
to the Upham Pilsbryi
but there is no evidence
of it & the fauna on
Hyko is more Uphamian
than Lauren Denmanian
in character.

9-14-85 (30

Fossil butte N. of Wy Bu 8 miles is a portion of the uplift that raised the Pahran-a-gat Range. The southern end is formed of the Quartzite that caps Quartz Peak & the Silurian l-comes out from beneath it & gives the characteristic fauna.

Receptaculites mammilaris.
Orthis tricenaria
" sp.
Strophomena sp.
Maclurea — 2. sp.
Proetus. —
Asaphus —

The beds above the quartzite that carry the Trenton l-fauna are carried down by a fault line here the Niagara horizon with

the large Pentamerus & a thick-shelled Orthoceras shows a little more of the quartzite.

The strata are then broken for some distance until the light gray siliceous & of the lower portion of the eastern foothills of Quartz Mt is reached.

Fossils were collected but the section being so imperfect was not measured.

From Hy Ko the position of the Devonian on the east side of Pah-rah-gat range is clearly shown by the great alternating belts of light gray, dark gray & dirty brownish siliceous limestones. The extend south of

the deride at Logan 32
+ are made as lenses broken
& mixed with volcanic
rocks.

In the section taken
on the 13" we have
to add about 1,000 feet
of the light gray silicous
L- There is then a
hiatus between the
toh of the section at
Crab Peak & the base
of the Devono-Silurian
section to the East of it.
Nor finding any
Laven Devonian fossils
we cannot place the
base of the Devonian but
from the fact that
the Stansbury & Flanders
canals extend down
nearly to the great light
gray silicious L- it is

appears best to draw
the division line between
the Upper Silurian & Devonian
at about that point. This
will leave not far
from 1500 feet in the
Up. Sil.

The Trenton horizon
is, as at Eureka, compar-
atively thin. yet 3 or 400
may be referred to it.
The limestone below the
Quartzite at Quartz peak,
750 feet is the upper part
of the Pogonip group of the
Eureka & White Pine sections

9-15-85. 34

The Hyko Range is famed of Devanian- marked a little by volcanic rock on the east. The siliceous- ous rocks skirting around the mouth to reach to Pahroc Spring. East of this volcanic rock masks them but along the road occasional outcrops show that they are the prevailing underlying rock to the dry lake crossed on the road from Pah-roc to Bennetts Springs.

9-10-85 (C7)

Summit of Quartz Peak
above Silver Cañon
Pah-ran-a-gat Ranges
Nev.

Section going down.

1. Massive bedded
gray siliceous l. with
occasional layers of
quartzite & chert.
535
170 + 365 feet.

Str. at summit N. 30° E.
Dip. 20° N.

2) About ~~the base of this~~ is
~~divided by~~ a belt of
bluish l. that contains
numerous Trenton fauna
fossils.

Stroph. alternata, L. sericea
Orthis testudinaria, ~~Streptelasma~~ Stictopora
[illegible] (white).

[illegible]

32.

184

62

6

310

40

135

285

535

410

1430.

(18

Asaphus. (ribs + portions of head) Ceraurus (tail) Calymene senaria (Head) Illaenus (tail) (Maclurea) Rhy-cophory. Streptelasma –

~~3) the half of (1)~~ (2)

B. Massive bedded dark siliceous l- In places the layers are thin & more calcareous. At about 150 feet from the base a belt of the l- 30 ~~..~~ feet thick is almost filled with Pentameri. The same shell also occurs just above the Lenten fossils of 2. in a dark l-.

485.

at 150 feet down in
the dark silence of
the great pentamerous
bed ends.

	34
	3
52	102
270	305
35	
305	

C9

4) Hard intrusion, white quartzite a little reddish below. 410-

On the spur which I was following down a mass of broken dark silicious rock appears below the quartzite, & further down the ridge a belt of quartzite underlaid (dip. 45°. W. 90°) by bluish l-hold Lower Carboniferous comes in. An oblique fault line parallel to the trend of the range cuts off this quartzite. This quartzite = Eureka quartzite of the " dist. Survey.

9 — 11 — 85 (20

5) ~~Same at dark bluish~~
gray l- with fossils
but not in good condition.
Layer 18 in to 3 feet thick
150.

6) Thinner bedded bluish
gray l- sometimes
shaly. Fossils numerous.
Same as below Quartzite
at Eureka Dist. 400.

7. More massive beds
than 6 & with fewer
fossils 200.
about 150 from base
Receptaculites observed.
Orthis, Orthoceras &
Murchisonia observed
to base.

Section of Pogonip Mts

Massive bedded, hard
(T) brittle drab to gray l.

Fossils at base Orthis-
Bathyurus.

> 5 feet, etc. noticed
Orthoceras & Maclurea
in sections in massive
blocks of l.

at 140. Receptaculites mam-
illaris, R. elongata abundantly

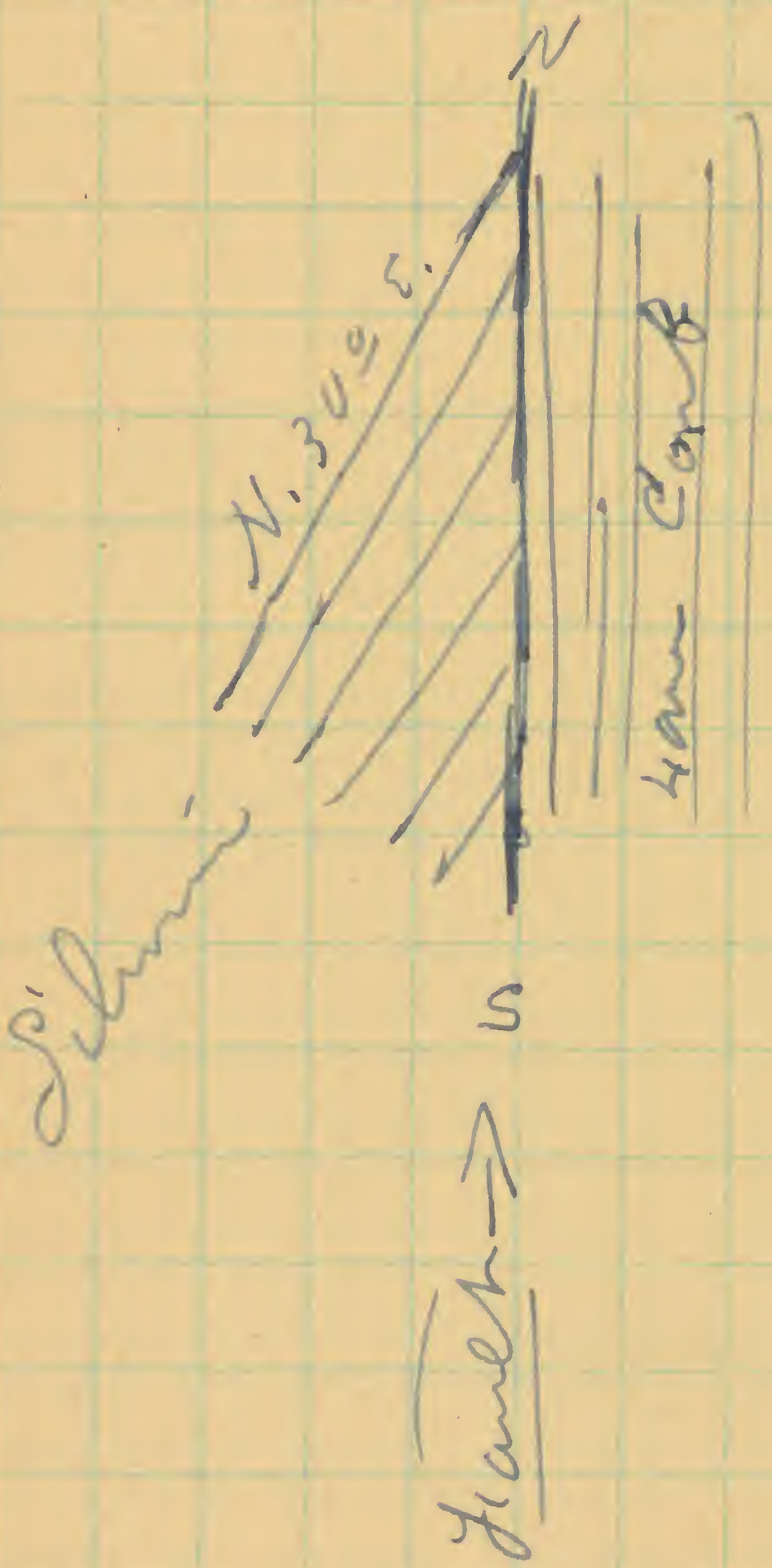
Between 150-200- feet
Recep- Illaenus Orthis
pogonipensis, etc.

(10)

...e. ~~t~~ is ~~up~~ shown in a hill north of the road leading from Bennets Springs to Sykes Fossils are very abundant. No strata overlying the upper quartzite were observed ~~on~~ in the Highland Range between Bennets Spring & 2 miles north of Bristol *

9-11-85

The trend of the Santa Ana Mts. part of the Palm Canyon Range is nearly N-S. (mag.)



Strata east of the
Quartz Mt Fault Line.

1.) Silicious l- much broken up + altered. about 350.

2) Dark ferruginous quartzite 100.

St N+S.
Dip. 40° W.

3 Silicious l- passing down into evenly beded bluish black + gray l- carrying numerous fossils of a Lower Carboniferous and Upper Devonian type. (See collection) Est- 600.

D. 20° to 90° Near fault line

4. This is underlaid by a massive band of gray - silicious. × 100

Section to be con- a return trip

9-12-85 23

Section of Devonian l-
facing up into Dawson
Canal.

Taken going up. Lower
portion yet to be taken.

a) Gray & blueish black
medded l-.
St. N. 10° E. Dip 15° to 20°
70 feet
Fossils Atrypa reticularis.
" Pleurotomaria -
Bryozoa.
Strophodata perplana.

b) Gray siliceous l- with
shaly partings & blueish
black l- The two
grading into each
other. At 150 feet
up the l- carries
Stromatopora & numerous

small stems of what appear to have been a coral (Cladopora or an allied branching form) crowds the darker layers.

240 feet – sight angle of 20°

c Buff colored sandstone 25 ft

d. Almost a repetition of (b).
Stromatopora disappears about 100 feet up. The mottled rock (Coralline) appears now & then.
At 215 feet numerous fossils occur in a bluish black l–
A. reticularis
Cyrtina. Orthis resupinata = (O. Iulliensis) Rhyn- pugnus.
L- contains up to

362 – sight. 20°

$$
\begin{array}{r}
3\ 3 \\
16\overline{5} \\
2\ 0 \\
\hline
\end{array}
$$

E. Sandy l- followed by arenaceous l- & thin bluish-gray l- (25

185 - s.a- of 20.

f) ^contact^ Hard sandstone in thin layers. 25

g) Bluish-black l- followed by shaly l- & layer of b-b-l- These l- layer carry numerous fossils much like those of (d) At 60 feet the shaly buff-l- predominates & a smoother harder l- comes in in the shaly l- in thin layers. Fossils few & badly preserved. At 250 feet crinoid stems begin to appear & ~~at 295 feet~~ Athyris pa. reticularis was seen for the last time.

$$
\begin{array}{r}
73 \\
\hline
365 \\
50 \\
\hline
415.
\end{array}
$$

At 275. Spirifer liniata & Spiriferina cristata - (Octoplicata) appears (Or a form very much like it.)
The limestone in layers gradually predominates & the shaly l- disappears.

415 - S.a.-of 20°

g! The fauna has gradually changed & presents a mixed Devonian & Lower Carb character (see collections).

g!. Massive bedded gray l- Hard & compact passing into granular, dark gray l- & then more ~~th~~ thinly bedded bluish-black l-
Of this I measured 425 to which is to be added that ~~taken~~ by Mr Whitfield

63
315
42
357

35

107 Sights at 150

535
35
570 beat at S.a of 15c
355
925.
70
995

112
55
167
835
115
950.
55
1025.
995
2020

Sept. 11th on the divide 27
above the Raymond Mill.

Throughout 9th section of
crinoid stems abound.

9-13-85.

W/of h. 23. continue
down about 200 feet
as a cliff of gray
l- & then thin layer
of gray & bluish-black
l- continue down
150 feet & here into a dark
siliceous l- & that into
a light gray sil-l-
that as almost sandstone
in places. (St. N. 20° E.
This completes (a) Dip 15° N.
all of (a) 995' - Sight
angle of 15° on +1025 feet

below (a) 9 ft dam

1) Gray quartzitic sandstone
in massive layers.
115 ft - S. a. of 15°

2) Gray silicious l-
115 ft - S. a. of 15°.

3) Quartzite more ferruginous
than 1.
90 feet - S. a - of 15°

4) Light gray & dirty
brown silicious l- in
alternating bands of
various degrees of hard-
ness & combination of
calcareous & arenaceous
matter. Jar cracks the
lower hard, massy
layers are almost
made up of Chroma-
tohara & stems of a

slender canal 1/8 ~ 1/2 2ε
1/4 in diameter.
Average dip 20°
afternoon (3).
Traced to meander

210 ft.

Stopped at a reddish
siliceous dolomite
a quartzite.
Fossils not observed
so as the identified
except Stromatopora.

Section of Silurian in the Pah-ran-agat Range. Nev. Quartz Peak.

(From base up)

1. Massive bedded gray limestone in layers from one to four feet in thickness (Orthis, Murchisonia & 200. Orthoceras seen in the lower layers & Receptaculites mammillaris & R. elongata 150 feet up.)

2. Thinner bedded bluish-gray limestone that is shaly in places 400
Fossils numerous

3) Evenly bedded layers of dark, bluish-gray to bluish-black limestone, thin layers, making massive beds, that break up on exposure to the influence of the weather.

Fossils numerous (see list of fossils at this horizon). 150

4. Hard, intrusive white quartzite becoming tinged with a reddish color towards the base. 410

5. Massive bedded dark gray siliceous limestone, ~~with a massive bed of this bed~~

150.

6. Bluish-gray to bluish-black thin bedded limestone with numerous fossils of Lower Limestone age, as Strophomena alternata Leptaena sericea, Orthis testudinaria, Leptodiscus bina? Calymene senaria, Ceraurus, Asaphus, Rhynchonella cohaesa, Macluria, 30, Stictopora, Streptelasma.

7. Massive bedded dark siliceous limestone with a ~~bed~~ stratum thirty feet thick almost made up of a species of Pentamerus like P. galeatus. These occur not far above the Lower part of 6.

8/ Massive bedded gray silicious limestone with occasional layers of quartzite sandstone & chert. 535

Strike N. 30° East, dip 20° north.

2210.

Summit Peak.

Mr Whitfield's section at ~~the~~ Raymond Mill Lemidle, Quartz Peak section going up

1) Bluish black l- with corals etc.

Dip. 30° to 40° to 55° to 90° West. St N. 30° E. ~~600~~ ft. 860

2- Shaly limestone in massive layers 55 ~~700~~

3. Cherty l- 2~~5~~0

4. Silicious l- & sandstone running into quartzite- Near fault line- all broken up.

To be added to Devonian & Sub-Carb section.

Eastern slope of Pah-
tan-a-yan Range north
of the line of Logan.

Base of.

1) Light gray siliceous
limestone 1000.

2 Light gray & dusty
brown siliceous limestone
in alternating bands
of color & of varying
degrees of hardness. The
silicious & calcareous
matter varies considerably in the different layers.
Jaundes the lamination
many layers are almost
made up of a species of
Stromatopora & blendes
stems of a blendes
branching canal 1/8" to 1/4"
in diameter.
Average dip 20°. 2100

3) Quartzitic sandstone

~~90 ft. S. A. of 15~~ 85

4. Gray siliceous limestone

~~115 ft. S. A. of 15~~ 105

5. Gray quartzitic sandstone in massive layers.

~~115 ft. S. A. of 15~~ 105

~~6. Gray bluish-black evenly bedded lime-stone~~

6. Light gray siliceous limestone, almost a sandstone in places, passing upinto a dark siliceous limestone and then into thinner bedded bluish bluish-black limestone

~~99 feet S. A. of 15 and 102 to be added.~~ 1920

The upper layers contain
Strophomena (perplana)
Atrypa reticularis
Leptaena.
Pleurotomaria.

7. Gray silicious limestone with shaly limestone partings and bands of bluish-black lime-stone; the ~~three~~ grading into each other in places. 150 from the base Stromatopora + a small slender coralline stem around the darker silicious layers.
~~240 ft S.a. 2/0~~ 225

8 Hard, ~~Buff~~ colored sandstone.
25

9. Almost a repetition of 7.

about 100 feet to the
Shumatoff and Carolina
markings disappear &
then reappear about
for 100 feet. an
2/5 feet a band of
blush-black thinly
bedded limestone / cannot
numerous fossils. of
Upper Devonian Age.

See collection for list.

~~362 ft. S. A, 20°~~ 340

10.) Calcareous sandstone
overlaid by arenaceous
limestone and about
than blush-gray thin-
bedded limestone

~~185 ft S.A, of 20°~~ 175

11.
Hard compact bellamah
sandstone in thin layers 25

12.

Bluish-black limestone in thin layers overlaid by shaly limestone with intercalated beds of bluish-black limestone. The latter carry numerous fossils very much like those of 9. at 60 feet from the base buff shaly limestone fine-dommicks and a more evenly grained, smoother harder limestone begins to appear as thin layers in the shaly limestones. Fossils few in number & badly preserved.

At 250 feet from the base numerous fragments of cyrinoids Crinoidal Columns begin to appear & Atrypa reticularis was seen for the last time.

At 275 feet Spirifera

biserata & Spirifernina cristata were absent.

- The limestone in layer gradually replaces the shaly limestone until the latter disappears in the section.

~~415 ft. S. A. of 20°~~, 390

12.

The fauna has gradually changed & presents a mixture of Devonian & Lower Carboniferous ~~forms~~ forms.
(See Collection).

13.

Massive bedded, gray limestone, Hard & compact it passes into granular, dark gray limestone & then into more thinly bedded flinty black limestone

~~425 ft @ S. A. of 20° + Add~~

~~+ 860 ft +~~ 1260

14. Shaly limestone in
massive layers. 55

15. Chonty siliceous
limestone 250.

16. Silicious limestone,
sandstone & quartzite.
(about) 500.

8660

Lower

SECTION OF SILURIAN (Ordovician)

In the Pah-ran-a-gat Range, Nevada. Quartz Peak.

L. Massive bedded gray limestone in layers from one to four feet in thickness	200. feet
Orthis, Murchisonia and Orthoceras are seen in the lower layers, and Receptaculites mamillaris and R. elongata, 150 feet up.	
2. Thinner bedded bluish-gray limestone, that is shaly in places.	400.
Fossils numerous.	
3. Evenly-bedded layers of a dark, bluish-black limestone, thin layers making more massive beds that break up on exposure to the influence of the weather.	150.
Fossils numerous. ?	
4. Hard, vitrous white quartzite, becoming tinged with a reddish color towards the base.	410.
5. Massive bedded dark iron-gray silicious limestone.	150

6. Bluish-gray and bluish-black thin bedded limestone, with numerous fossils of Trenton limestone age.- Stictopora, Streptelasma, Strophomena alternata, Rhynchonella capax, Leptaena sericea, Orthis testudinaria, Leperditia bivia?, Calymene senaria, Ceraurus, Asaphus and Miclurea. 30.

7. Massive-bedded, dark, silicious limestone with a stratum thirty feet thick, almost made up of a species of Pentamerus like P. galeatus. These occur not far above the Trenton limestone of 6. 335.

8. Massive-bedded, gray, silicious limestone, with occasional layers of quartzite sandstone and chert. 535.

Strike N.30° East, Dip 20° North.

2210.

Summit of Peak.

490 4

SECTION OF LOWER SILURIAN.

In the Pahranagat Range, Nevada. Quartz Peak.

1.	Massive bedded gray limestone in layers from one to four feet in thickness. Orthis, Murchisonia and Orthoceras are seen in the lower layers, and Receptaculites mammillaris and R.elonga ta 150 feet up.	200 ft
2.	Thinner bedded bluish-gray limestone that is shaly in places. Fossils numerous. (See list under No.3)	400 "
3.	Evenly bedded layers of a dark bluish-black and bluish-gray limestone, thin layers making more massive beds that break up on exposure to the influence of the weather. Receptaculites mammillaris, Orthis Pogonipensis, Orthis tricenaria, Porambonites obscurus, Bellerophon sp? (same species in 204), Hyolithes, sp.undet., Endoceras multitubulatum, Leperditia bivia, Illaenus crassicauda.	150 "
4.	Hard vitrous white quartzite becoming tinged with a reddish color towards the base.	410 "
5.	Massive bedded dark iron-gray siliceous limestone.	150 "
6.	Bluish-gray and bluish-black thin bedded limestone with numerous fossils of Trenton limestone age. Zaphrentis sp?, Bryozoa 3 sp., Streptorhynchus filitexta Orthis testudinaria.	30 "
7.	Massive bedded dark siliceous limestone with a stratum thirty feet thick almost made up of a species of Pentamerus like P.galeatus. These occur not far above the Trenton limestone of No.6.	335 "
	Massive bedded gray siliceous limestone with occasional layers of quartzitic sandstone and chert. Strike N.30° East - Dip 20° North. Summit of Peak.	535 " 2210 "

In this section some of the common species of the Pogonip fauna of the Eureka District were found in No.3, but none of the characteristic Trenton fossils. The latter occur in No.6, nearly 160 feet above the quartzite.

This section is unbroken, extending from the south base of Quartz Peak to its summit, and is one of the best that I met with in southern Nevada. The position of the Trenton fossils above the quartzite is unmistakable.

Note on the Quartz Peak Section.

The Trenton horizon is, as at Eureka, comparatively thin, yet 300 feet may be referred to it. The limestone below the quartzite at Quartz Peak is the upper part of the Pogonip group of the Eureka and White Pine sections. Other outcrops of the Eureka quartzite were observed, most notable of which is that on the road to Hyko going west from Bennett's Springs, just before the road passes out of the hills on the slopes leading down to Dry Lake. At this point a conical hill formed of this bedded limestone is capped by the typical Eureka quartzite. The limestone below gave the characteristic Upper Pogonip fauna. Another locality where the Pogonip limestone occurs in beds is Condor Cañon on the road from Panaca to Rose Valley, Nevada. The cañon cuts through a massive belt of limestone which dips 35° East with a nearly north and south

492 4c

strike. The lithological characteristics are very much like those of the Pogonip above the Hamburg shale. The estimated thickness is 1000 feet. No well determined fossils were observed.

In Bulletin XXX mention is made of the occurrence of the Eureka quartzite just north of Bristol; Par.68, p.36.

DEVONIAN.

Devonian at Hyko, Nevada.---Directly east of the upper range at Hyko, there is an exposure of shaly limestone overlaid by massive beds of dark arenaceous limestone carrying a Devonian fauna The specimens are poorly preserved, but the following species are recognized:

(570) Stromotopora sp.?.
Spirifera sp.?.
Atrypa reticularis, Linn.
Pentamerus lotus, Walcott. (var)
Mediomorpha sp.
Holopea sp.?.
Euomphalus (P) laxus, Hall.

The ridge of Devonian limestone extends up the east side of the Pahranagat Valley for several miles. Owing to the faulty and broken condition of the strata no continuous section was measured, But from the examination I made of it in the two days at my disposal, I estimated that there was not far from 3000 feet of the limestone, most of which was of a dark, siliceous variety. It is like the dark dirty brown and drab gray arenaceous limestone of the Eureka District. It is not improbable that a portion of the lower part may be referred to the siliceous beds of the Upper Silurian, though there is no positive proof of this, but the fauna at Hyko is more nearly related to that of the Upper rather than the Lower

Devonian.

To the north of Hyko about ten miles, the section is cut off by a fault and a low ridge (Fossil Butte) formed of the Pogonip limestone capped by the Eureka quartzite, followed by the siliceous beds of the Silurian.

In the Pahranagat Range next west of the Hyko Range , the section is more complete than at the latter, and embraces a great thickness of siliceous beds most of which may be referred to the Devonian above No. 1 of the section.

Owing to the siliceous character of the beds no good fossils were obtained until No.9 of the section was reached. Here the fauna indicates the Upper portion of the Devonian. The section is continuous and unbroken up to No.12 in which there is a transition from a Devonian to the Lower Carboniferous fauna. This section is of special interest owing to the thickness of the limestone from the Silurian to the Carboniferous which is unmarked by the presence of any sandstone or argillaceous shale, as in the Eureka section.

This section was measured by Lock's level, spacing, and here practicable, cliffs were measured with the tape-line.

SECTION.

Eastern Slope of Pahranagat Range, North of the line of Logan.

1. Light-gray siliceous limestone. 1000 ft

2. Light-gray and dirty brown siliceous limestone in alternating bands of color of varying degrees of hardness. The siliceous and calcareous matter varies considerably in the different layers. Towards the lower portion many layers are almost made up of a species of Stromotopora and slender stems of a branching coral one-eighth to one-fourth of an inch in diameter. 2100 "

Average dip 20 .

3. Quartzitic ferruginous sandstone. 85 "

4. Gray siliceous limestone. 105 "

5. Gray quartzitic sandstone in massive layers. 105 "

6. Light-gray siliceous limestone almost a sandstone in places passing up into a dark siliceous limestone and then into thinner bedded bluish-black and bluish limestone. 1920 "

The upper layers contain Strophomena perplana, Atrypa reticularis, Cyrtina sp.?, Pleurotomaria.

7. Gray siliceous limestone with shaly limestone partings and bands of bluish-black limestone; the three grading into each other in places. 150 feet up from the base, Stromatopora and a small slender coraline stem crowds the darker siliceous layers. 225 "

8. Hard buff-colored sandstone. 25 "

9. Almost a repetition of No.7. 340 "

About 100 feet up the Stromatopora and coraline markings disappear and then reappear above for 100 feet At 215 feet a band of bluish-black thinly bedded limestone carries numerous fossils of the Upper

Devonian age, vix:
Lingula (like L.ligea), Hall.
Orthis impressa, Hall.
Productus Shumardianus, Hall.
Productus (like P.lachrymosa)
Strophodonta sp.?.
Spirifera sp.?.
Nucleospira concinna, Hall.
Cyrtina Hamiltonensis, Hall.
Ambocoelia (like young of A.umbonata)
Rhynchonella duplicata, Hall.
Rhynchonella sinuata, Hall.
Athyris ? sp.?.
Pentamerus lotus, Walcott. (var)
Modiomorpha ? sp.?.
Euomphalus sp.?.
Platyostoma lineata ?, Conrad.
Orthoceras sp:?.
Orthoceras sp.?. (slender species)
Leperditia sp.?.

10. Calcareous sandstone overlaid by arenaceous limestone and above that bluish-gray thin bedded limestone. 175 ft

11. Hard compact yellowish sandstone in thin layers. 25 "

12. Bluish-black limestone in thin layers overlaid by shaly limestone with intercalated beds of bluish-black limestone. The latter carry numerous fossils very much like those of No.9. 390 "

At 60 feet from the base buff shaly limestone predominates and a more evenly grained smoother harder [illegible] shaly limestones. Fossils few in number and badly preserved.

At 250 feet from the base numerous fragments of crinoids crinoidal colums begin to appear and Atrypa reticularis was seen for the last time.

At 275 feet Spirifera lineata and Spiriferina cristata were observed.

The limestone in layers gradually replace the shaly limestone until the latter disappears from the section.

The fauna has changed and Lower Carboniferous species were alone collected, viz:

Amplexus sp.?.
Syringopora sp.?.
Acervularia pentagona, Goldfuss.
Fenestella sp.?.
Chonetes sp.?.
Chonetes granulifera, Owen.
Chonetes sp.?. (No.2 of 648)
Productus Nebrascensis, Owen.
Productus punctatus, Martin.
Productus tenuicostatus, Hall?
Productus semireticulatus, Martin.
Productus (No.1 of 648)
Productus (No.2 of 648)
Orthis resupinata, Martin.
Streptorhynchus crenistria, Phillips.
Syringothyris cuspidatus, Martin.
Spirifera pinguis, Sowerby.
Spirifera pulchra, Meek.
Spirifera striata, Martin.
Spirifera (M) lineata, Martin.
Cyrtina sp.?.
Athyris subquadrata, Hall.
Rhynchonella
Terebratula sp.?.
Platyceras sp.?.
Bellerophon sp.?. (No.1 of 648)
Euomphalus sp.?. (No.1 of 648)
Euomphalus laxus, White.
Euomphalus (Straparollus) Ophineasis, H.& W.
Holopea sp.?.
Loxonema (No.1 of 648)
Loxonema (No.2 of 648)
Pleurotomaria sp.?.
Pleurotomaria sp.?.
Edmondia 2 sp.?.
Leperditia sp.?.
Proetus peroccidens, H.& W.

13.	Massive bedded gray limestone. Hard and compact, it passes into granular dark-gray limestone and then into more thinly bedded bluish-black limestone.	1260 ft
14.	Shaly limestone in massive layers.	55 "
15.	Cherty siliceous limestone.	250 "
16.	Siliceous limestone, sandstone, and quartzite, about	500 "
		8560 ft

Note on the relation of the Quartz Peak section to the Preceding.

To the Quartz Peak section we have to add about 1000 feet of the light-gray siliceous limestone as observed on the northeastern slope of the Peak that is found between the top of the Quartz Peak section and the base of the Siluro-Devonian section to the east of it. Not finding any Lower Devonian fossils in the latter section we again supposed the beds were Devonian and from the fact that Stromotopora and other slender corals extend down to the great light-gray siliceous limestone No.1 it appears best to draw the

point. This will leave not far from 1000 to 1500 feet in the Upper Silurian.