Note: Cattle in
Big Cattanwood Camp
Utah, 1885

C.H.
Big Cattarowd Canyon
2nd Mill Site in the Canyon (Mill B) Run by Mayfield.

Quartzite N. 50° West
Dip 35° N.

10 - 12 - 85.

Examined the strata between the limestone and quartzite just below.

Argillaceous shale rest on the quartzite and carry a characteristic Middle Cambrian fauna, Anerellus, Aneorides, etc. Also near the base of the limestone fauna Psychoparia stebeli.
not any characteristic upper cambrian fossils.

10-13-85.

from the Abbeville shale to the base of the limestone is about 300 feet. Thidway to 200 feet sh found fossils but mostly particularly different from those below. About 250 feet up in the limestone noticed Daphnia, Athyris, Shipto-sphyrena, crenatia.

In the l. just over the shale blende stems of a claddshana-lidene cnm.

In this section the Potasdan, film a derman are absent.
unless the first can...

Among the family collected at the Avenel

hamper is a large harp shield of manuscript?
Cambrian section of Big Cottonwood Canyon from to claim

1. *Argillaceous shales a little sandy in places* 300 ft.
   *Abelites, Potnia* etc.

2. *Gray contract quartzite sandstone* 3000 ft.

3. *Porphritic feldspar from quartzitic 20* 750 ft.
   *Granitic* 20


4. *Black sandy &
   *Meacocene shale* 75

5. *Light gray quartzite &
   *Quartzitic schist in lense*
   *Varying from 10 to 20 ft.*
5. The thin layers occurring as horizons between the more massive bands of layers, I notice places the quartzitic pebbles in grains and others they are less. Stains of gray, iron rust, reddish brown they occur.

6. Arenaceous shales with black, bluish-black, dark yellowish-green, a beautiful matrix for fossils but none observed. Excellent extensive affluence for finding fossils, excellent.

Like 5

200
8. Hard, dark black arenaceous shale with
specks of mica on surface.
10 cc.

9. Like 5. with bands of
purplish arenaceous shale near core.
7.00.

10. Thin-bedded sandstone,
purplish, with bands of
greenish-yellow argillaceous
near core.
7.00.

10.00.

12. Black arenaceous
shale.
Mud markings and cracks.
White marks.
9.00
12.050
Cottonwood Canyon
Oct 10th, 1885

On the north side of the mouth of Cottonwood Canyon a hill of quartzite occurs. Early bedded siltstone marked, going up the canyon, a dark argillite is seen resting against the quartzite. This being 70° to 80° S. E. Bands of green chloritized shale and sandstone occur. Ripple marks and ground crocots abound in many layers.
Section of shales east of Antelope (clayen) spring, home range Sept 8 03.

The shales (Antelope) rest on adjacent to a massive bedded bluish grey limestone.

1) Calcareous + interbedd limestone, coagulaceous, fissile shale. Bathypriornia wheeleri.

2) Bluish-grey brown with yellowish in full weathered frontings on the surface of the irregular shaly layers when the massive thick layers break down.

3) Calcareous fissile shale alternating...
2. With with thin layers (1/2" to 4") of dark, fine-grained limestone.

3. Fine lime, calcareous + argillaceous shales.

Fragments of *Asaphiceras* wheeleri + *Pty. kingii* occur here + there on the surface of the limestone + shales + a close search usually shows *Acrothoe subindica* and *Agnostus interstructus*.

a. Cartil.

At 65-70 feet a band of blue argillaceous limestones & Ag. *interstructus*.

And 900 feet + "Fusuline" or amelinated graptolites.

At 90 feet Pty. *kingii* + *Asaphiceras* wheelerianum.
with a back of contain- 
care. They celebrate a 
antelope. These tail-like 
game and extend thy about 125 ft. 
At 150 feet a bluff of shale 
weathered cal-shaly occurs. 
Acrathite subsidence 
abundant below - it. 

At 223 feet is a narrow 
band of yellow shale with 
the upper horizon of the 
abundant Bathynoeck- 
fam. 
Far 410 feet. Blended 
blue limestone more or 
less shaly appear. 
in a strong band. 

\[ d = 410 \]

E. Thin reddish blue-gray 
with buff streakings. 
Some faintly bl. (d). 

f. Calcicrema. Tongue-shale 
with one or two buff cr.
4. Yellow band 2 feet thick about midway

9. Blue, thin reddish, dark blue line, kinda to (E)

Bathyurisue fauna very abundant at 1600 feet. So it has been added Acrotera sh.? Lequidella

Same fauna in upper part of Sec. 244 - we see.

Total of Bathyurisue fauna 1010

h. Massive reddish dark blue line that breaks down into small angular fragments.

This sand forms a low cliff 2 miles on the southwest end of the amphitheater of Antelope Cliffs.
44

27
83
415
55
470

37
185
25
240

89
43
130
650
89
737

17
85
25

220

360
240
100
The limestone throughout marks the known upper limit of the Bathynusus wheels gone.

1. Thin bedded chalky grey & dark bluish-grey limestone
   Fossils
   In the chalk
   Limestone near the base
   Agnostus is very abundant and Ogygopsis occurs frequently.

   The lower 200 feet may be termed the Ogygopsis zone—see collections No. 2492.

   The Alexander zone
   extends in thickness fully 500 feet after
   skeletons the Meanius becoming large towards
6) the column

A detailed study of the collection is necessary to determine the
necessary area. A small wall near the cliff would be
necessary. The cliffs are narrow and not high.


A small collector's wife made 95 feet of

0 feet thick. She made all 95 feet a

by the cliff.

Arenaceous, dark grey and bluish grey, massive, bedded limestone forming gradually into cherty banded limestone.

The massive beds break down on weathered slopes into thin layers 1 to 4 thick.

None found on immediate side of section as limestone forms cliffs at a point on the strike 3 miles S.E. of Bluford. Gray limestone interbedded with gray limestone carry up thin laminations of gray chert. Fossil abundant in the cherty layers. This zone is about 253 feet above a fauna.
distincted by a large tribobite (see collection No 254)
It is probably a fern
Carnin forma

The Eureka slitch - Highland range
U.C.
formas to be studied in connection with 25 R.
House Range

Field notes 1908

Captured in drain and extending nearly 76 feet

7/15/08
29
30
150
20
170
Cambrian section
Horsz Range, Utah, Sept. 1905

The section begins at the top 285 feet below the summit of Suke Peak, the highest point on the range south of Mayum Pass.

The top of the peak is formed of 285 feet of Archeicamian limestone, a banded, thin bedded, bluish-grey and purplish limestone containing near the top a distinct fauna

*Trigula*

Orthoic (Plectarthus)
Raphistoma
etc. - J. D. Bunkley's No. 117.
Strike of upper beds N. 20°
East of E. 120° S.

The section extends down
the north-east slope of Suke
Peak and thence to a
high ridge east of the
area of eburnite granite
on the north-west slope of
Suke Peak; thence north
to Marion Pass. It is
then taken on the line
of the upper beds of the
Antelope Formation to
a point southeast of
Antelope Springs; thence
west on the north-
side of Dome Canyon
to the basal quartzitic
sandstone that passes
beneath the quaternary
of White Valley.
Order - can limestone - conformably resting on the Cambrian limestones.

Upper Cambrian -

No pot limestone.

Grey arenaceous limestone in thick and bands of thin layers - Irregular nodules + thin layers of dark grey chert - weathering black brown, occur at irregular intervals for 3 1/2 feet below the hummock. Chesty layers 1/8 to 1/2 also occur occasionally.

Fauna: a few fragments of trilobite, for industrial use identified were abomed.

Drift: boulder 2 1/2
the peak, similar in its lithological appearance to the grey arenaceous lime-
stone of this horizon, contains heads & banks of *Marennes*
sh. ?

B. Shaly, dark grey to
flint-grey arenaceous
limestone with small
dark concretions in
some layers.
No fossils observed.

C. Grey silicious limestone
in layers of varying
thickness, 4-2 feet, bonded with dark
cherty layers and
flinty arenaceous
limestone. The effect
takes the form of flattened
nodules & very thin
irregular layers.
No fossils observed.
Shaly and thin bedded bluish-grey arenaceous limestone.

Grey calcareous limestone in layers 2-5 feet thick. In the lower part of this limestone where it is not meta-morphosed, it is olive colored and in layers 6-10 feet thick. There are occasional occurrences of grey shelly matter, as flattened nodules and thin layers that weather into dark brown.

Fauna. Near the top noted in the section two miles east, a megaclein of a trilobite that suggests *Dichelacme*.
a few faint green lines about 1 400 feet from the edge.
about 120 ft. 

150 feet from the base a small altered 
occurs in large numbers 

of P. tetragonis. Still 

fossiliferous loc. 262 E.

Notch Peak 

Total of Sukakakie, 1490.

Two miles east of the above, the section is unmeta-

marked and presents the following characters:

- Pale gray to gray compact limestone with 
  layers 1 in. to 2 in. thick.
  The weathering of the 
  thicker layers break 
  down into thin irregular 
  layers which form a bed of angular 
  fragments.

Fauna: Fragments of trilobites.
Sandy + silicious bluish + dyke calcareous shales with interbedded bands of dark bluish grey limestone 6+ to 2 feet thick.

Loc. 262d

Lead grey, jasperitic and annular calcareous limestone in layers 4+ to 2 feet thick, that are observed to be intrinsically layered by thin strips of light and dark grey color.

Fragments of trilobites.

Bluish-grey compact limestone, in layers 2+ to 4+ feet thick, that break down into irregular thin layers on weathering.

Fragments of trilobites.
black arenaceous shales until thin nodules of grey fusiform limestone are come into horizons also a few layers of thin grey limestone 4 to 8 = thick 235

Fauna a rich fauna in numbers of brachiopods fragments of trilobites free collecting 262 ft. from about 275 feet from base + 262 a from near the top.

This fauna also occurs in c -

A grey slightly arenaceous limestone in layers 2 to 6 feet thick weathering lead grey (cliff forming beds) 590.

Fauna, traces of trilobites
3b. Grey limestone and chalky clay in alternating layers. 1/2 to 2" thick. The irregular chalky layers weather in relief as dark brown bands. The limestone as light colored bands which gives a banded appearance to the cliff, which is very characteristic of this region.

3c. Grey arenaceous limestone in marine beds that usually break up on weathering into irregular layers 1/4" to 4" thick. The upper 20 feet form a more massive solid bed than the layers below.

Fauna: Traces of trilobites.
Upper Cambrian

1. Lm.
2a "
2b Shales - ananacea
2c Lm
2d "
2E Shales - ananacea
3a Lm
3b "
3c "

310$
375$
84$
92$
115$
235$
590$
170$
165$
Middle Carolina section.

Weeks formation as exposed in Weeks canyon, from south side of canyon beneath marine limestone to top of cliffs on north side of Marjum pass.

Average dip 12° at N. 20 East (magnetic).

Weeks formation:

Thin bedded limestones alternating with shaly limestones & a few bands of caliche & arenaceous limestone.

1a. thin bedded limestones in layers one to four inches thick. The limestone is mainly fine grained, dark grey, with weathering lead color except on bedding plane which usually silicene a more or less pinkish color. 2 x 5 ft.
Fauza, fragments of trilobites, + trilobic pods of the fauna in shaly limestone below.

Shaly limestone, usually dark grey with pinkish tinge in some layers on the surfaces. Sometimes buff yellow on weathering. The shales vary from 1/8 to 1 ft thick. This is a marked band in some sections + is arbitrarily separated from the shaly beds below.

Fauza. (263° of W.) 285°.

The fauna is much like that of 1°. Its most characteristic trilobite is Asaphicus minor N. oh.

1° Shaly bluish-grey to dark grey limestone in layers 1/8 to 1 ft thick.
with occasional layers 25-60 feet thick. Twenty feet from the top a band of layers of arenaceous, highly silicified limstone three feet thick occurs. A second similar band 38 feet below.

170.

Fauna.
Locality 263.

The fauna is rich in number of specimens and quite varied. The best specimens occur in the surface of the chalky layers.

1st. Reddish tinted more or less arenaceous chalky limstone.

Fauna, same as 1st. But much abundant.

30

1st. Shaly, through grey to dark grey limstone.

Similar to 1st.

Fauna same as 1st (263). 270.
17. Evenly bedded bluish grey to dark grey, fine grained limestone in layers 2" to 16" thick, with shaly limestone partings.

Fauna. A few traces of Agnostus and Phylloporia similar to those below.

19. Calcareous shales with thin layers of limestone.

Fauna. At base same as that of 17. Below.

(Total thickness 1380 Weeks.

(of marjoram formataii).
into thin irregular layers, and grey argillaceous limestone in layers 1 to 6 inches thick.

5. Grey argillaceous “ – 90.

249.

Fauna

Much fragment of
Phycharonia.

Dark grey thin bedded limestone more or less argillaceous.

Fauna. Near take a
Phycharonia like P. Kingii,
Near base ferrite of coal.

247 ft. This is the base
of Sec. 261 of 1905 + 249
of 1902.

1st. Grey, shaly limestone
hasing below into shale.
Maryium Formation. Exposed in cliffs on north side of Maryium Pass.

1. Grey, more or less thinly bedded limestone, that weathers to a dark lead grey color & breaks down into angular fragments ½ to 2 in. thick. Flat- and craggy nodules & thin, irregular chalky layers occur at intervals.

Fauna:
Agnostus & Lingulaella very abundant in upper 100 feet. See collection.
253 & Central portion
253 & 254 & lower 254.

2. Alternating bands of dark blue, grey, compact limestone in massive layers that break off
interbedded in the shaly limestone at 75 ft from top into dark colored argillaceous shales 100 ft.

Hanna,

some of loc. 248 a

of 1901.

18. Dark bluish gray limestone in thick beds that break up on weathering into thin irregular layers 1/2 to 2 in thick.

Hanna,

Loc. 247 a of 1901.

Total thickness of Marjum formation.

The Antelope formation is exposed at Marjum, but the type locality is taken in the exposure of the mouth of Antelope Springs.
Antelope formation

from ridge south of

Section earth, lower

Spring of Antelope Springs.

1. Alternating bands of

thin, shaly limestone and

shale with shale gradu-

ally predomninating to-

wards the lower horizon,

at 405 feet from base, a

band of blue gray, hard

in lower 1/5 1/2= thick

limestone occurs. At 473

feet another hard to

blow an occasional

thin layer.

Fauna, Agnostus bridgei

Arachnus wheeleri

Psychoporia Kingi' occur

in great numbers at 200-

350 feet from base. Many

hundred extinct towilites

packed by "Cone mill" cones

have been picked up.
on the surface of the clay resulting from the
disintegration of the
shales.
For list see loc. 244 (35)
244.4 (35) 247 a (34) 250 (18), if CSN.
Swager formation.

1a

Politic T. aranaeaceus limestone in massive layers near the top.
Below dark bluish-grey limestone is occasionally interbedded, and gradually it becomes the principal rock where it breaks up on weathering into irregular shaly layers 1/2 m to 3 m thick.

Lamia. Near base

(See. 25H occurs)

Near the top a few imperfect heads of a species of Ptychodraba were found, also heads of Zacanthoides about 20 feet from base.
1st. Reddish gray, argillaceous shale with interbedded thin layers of foraminiferous limestone.

2nd. Dark bluish gray lime-plume in massive layers that break up into irregular shaly layers 1/4 to 2 thick.

3rd. Calcareous and argillaceous shales with thin layers of gray limestone with fragments of trilobites.

Fauna - Same as in 1st - 10 2
Loc. 258 - 258a

4th. Bluish gray limestone with lens 4 to 10 cm thick with minor calcareous concretions from 1/8 to 1/2 in diameter in a few layers.
One limestone

1. Massive bedded
cliff forming, grey, siliceous
limestone with small
sheets of calcite.

One hundred feet from
the lake for 50 feet
below occasional
layers 15" to 2 feet
thick of brannish
yellow anevacous
limestone occur.

Fauna. No trace of

Fossils

House formation.

1a. Blush black limestone
bedded limestone in
massive layers that
break up on weathering
into irregular thin
layers.
16. Grey, siliceous limestone
15. Black, grey limestone
14. Pinkish colored, argillaceous shale
13. Instead of Ptychoceras like P. biocamia
12. Grey siliceous limestone in layers 2 to 10 cm thick
11. Bluish-black limestone in massive layers breaking up into thin layers on weathering
Fauna (see loc. 260)
10. Grey siliceous limestone in thick beds
9. Pinkish - argillaceous shale
1st. Brown, buff weathering arenaceous limestone in thick layers. Almost sandstone in places.
Cambrian Lectrai
House range Utah
Dept. 1905.
Lectrai

Cahwell
Antelope Shales - lower section south from Antelope Spring from east base of ridge south of lower spring.

a) Fissile calcareous dolomite pinkish shale
b) Bauxite some argillaceous

ST. No. 5, Mag. 1/10 E1 120-150

Shale

Thin layers of dark bluish gray limestone 1/8 to 1/2 thick gradually appear in the shales at 97 feet these layers form a thin sand at 165 feet a band 2 feet thick occurs. Alternating beds of shale and thin banded limestone continue up to a sand of thin banded limestone.

Fossils

Aeoliscus wheeleri and
\[
\begin{align*}
44 & \div 5 \\
220 & \\
30 & \\
250 &
\end{align*}
\]
Middle Cambrian (Antetoke Shgs)

Swage formation.
Limestones forming Swage peak mountains above Antetoke formation.

1. Thin red fossil limestone

2. Dark grey, slightly arenaceous limestone in massive layers that break up into thin layers of shaly layers.

At 253 feet, a layer of interformational clay later 16 ft thick occurs.

Fossil: (Loc. 261 of 1795)

Ogygopsis Zone of 1902.
Loc (248°) quite a large fauna that extends nearly from top to bottom.

A hand of thick grey shaly limestone followed
\[
\begin{array}{c}
632 \\
315 \\
40 \\
355
\end{array}
\]
Agnostic

Ptychochinae, Kingia - occur in great numbers at 230 to 350 feet from the base. Many hundred entire trilobites have been picked up on the surface of the clay formed from the decomposing argillaceous calcaraceous rock. For lists of fossils look at localities 2441 (35), 2492a (35), 247a (31), 250 (18).

Thin reddish-brown, compact blue-gray limestone in thick beds that break down on weathering.

Horse Asaphius wheeleri & fragments of Ptychochina - 255, 255.

Total Asaphius wheeleri zone
1. Grey siliceous limestone
2. Thick beds forming a low cliff when slightly metamorphosed. 90 ft.
4. Grey siliceous limestone in bed 2 & 3 - 10 = thick - 70
5. Bunter argillaceous shale.
7. Greenish-blue, thick bed of dark grey argillaceous shale. 105
8. Grey siliceous limestone.
9. Blush-bluish limestone similar.
63.5
31.5
40
355
36
180.
by thin layers of thin layers of dark grey fine grained compact limestone on the surface of which large specimens of [illegible] occur at some localities.

Fossil. loc. 261.

Most abundant are

Ogygoporia, a great size

have

Lee fossils from loc

261. of 1905.
Cambrian section.

October 14, 1903.

Weeks Canyon.

Weeks Shale.

Base at summit of cliff above.

Margin runs on south side.

a) Calcereous shale, fine

passing into shaly bedded

blue-gray limestone separated

by shaly beds.

b) Shaly limestone 60 ft.

2) Bedded limestone in

layers 2-4 in. thick

with shaly limestone.

Hastings 320

Shaly bluish gray limestone 270

Rich from a doc. 263

4) Shaly reddish limestone 30

5) Shaly bluish gray limestone
18
95
12
230
25

36
55
275
37
312
2
27

150
250
35
285
7. Thin bedded limestones
1" to 4". Dark grey with
fine grained, pinkish,
surface to the
layers as weathering
edges lead grey.
Fama.

Summary of Weeks formation = 1

1  - 60
2  - 330
3  - 270
4  - 30
5  - 170
6  - 285
7  - 245

1390
Noise range section, 
Mount of Mervin iron, Sept. 12 " 05 

1) Gray, slightly arenaceous limestone in massive beds that break irregularly up into layers \( \frac{1}{4} \) to \( \frac{1}{2} \) inch thick. The upper 20 feet form \( 165 \) a more massive bed.

2) fossils (see collection.) The fossils in like strata of the underlying limestone below the base but above near forms of life.

3) Banded limestone + chert in alternating layers \( \frac{1}{4} \) to \( \frac{1}{2} \) inch thick. The cherty layers in relief on a dark brown wall. Calcite the limestone a lead gray, which gives a banded appearance to the cliffs.

Fossils, Loc. 262 a
\[ \frac{35}{5} - \frac{105}{21} \]

\[ \frac{4}{5} - \frac{210}{28} \]

\[ 238 \]
c) grey tine, slightly 
menaceous lime weathing

of lead grey,

The layers become thinner
so that above, 6-10 = 2 ft.

March

at base (262 -)
275th st. (262?)

1. Diver's brown + black

renaceous chalced with

layers of thick grey lime.
in 4-50 = thid interbedded

thin layers and nodules

with numerous fragment

e of trilobite & some

very good macrornode.

Near top (2626)

at top 2626

Jawite.

Lingulaella 2 or 3 sheets

Phidiana - of labradorica. idaho.

Ptychionida -

Chromidites -

1160
38 - 62
42 - 62
ii-

1. Blush grey, gypchaek

2. In thick layers, 2 to 4 feet that break up into irregular thin layers on weathering.

3. Lead grey, calcitic and arenaceous, in layers 4- to 2 feet, bedded by color, light to dark grey.

4. Fragments of butuhite.

5. Blush grey, with beds of arenaceous shale near base (263a) 87.

6. Similar, same fauna as in (d), in fault (loc. 262a)

Blush grey to grey, com-

pack layers 2 to 6 feet thick. The latter thick.
...dawn into irregular, thinned layers.
Fossil fragments of trilobite.

1. Grey, lead-calceditic, siltstone layers, very thin, thickness 6 to 24 ft.
2. Irregular, flattened nodules. Other layers of dark, chalky, matter occur at irregular intervals.
3. Cut off by erosion at...

\[
\begin{align*}
10 & \\
2a & -375 \quad \text{316} \\
2b & -84 \\
2c & -92 \\
2d & -115 \\
2e & -235 \\
3a & -590 \quad 901 \\
3b & -170 \\
3c & -165 \quad 925 \quad 2136 / 2136
\end{align*}
\]
Cambridge Section

From upper shales of section & left 12" = 1 ft

2. Grey siliceous limestone in layers of varying thickness & 2ft. Bonded with dark clay layers &iferous sandy limestone. The chert takes the form of flattened nodules & thin irregular layers. 38.5

At 39'60 feet up a band of shaly chloritic grey limestone 65' feet thick. 65'

Fragments of trilobites abundant in some of the layers.

Same as a shaly marl broken into thin layers.
5.5 feet above - about 100 feet thick - At 290 feet the modulus of
change of thin layers - the thin layers to 2 or 3 appear and continue
a intervals.

Ordovician - Banded blue +
\*\[Limestone to top of peak\]
\*\[Fama\]
\*\[Ordovici\]
\*\[L. angulara\]
\*\[Raphiotana\]
\*\[Etc\]
Cambric Section
Haze Range, Utah
Sept., 1905

The highest beds of the section are exposed in the high ridges 3½ miles south of Mornin' Pass. The strike is general east-northeast with a dip of 12°-20° east.

Descending section.

Upper Cambrian.

a. Dark colored limestone in layers 6 in. to 10 ft. with occasional occurrence of irregular flattened nodules & layers of dark green chestnut weather, dark rust brown.

Towards the limestone...
Upper Cambrian.
1. - 1490
2. - 925 - 925
3. - 925
\[ \text{Total: 2940} \]

Middle
1. = 1390 - Week
2. = 1092 - Marjum
3. = 825 - (Antelope - 3307 -
4. = 1355 - Belau) - 1355 -
\[ \text{Total: 6702} \]
Cambrian section, July 7th 06

Home range, Utah.

Dome canyon.

The lower portion of the west face of the range between Dome and Marjim canyons is formed of the characteristic dark brown, thinly bedded (0.5 to 10 feet) quartzitic sandstone on the south side of canyon.

D. lower Cambrian.

a. dark brown quartzitic sandstone in layers 1 to 10 feet thick. Estimate total of 1500.

b. Thinly bedded clayey, dark brown quartzitic sandstone with numerous ammonite trails.

Zone of Ammonites Gilberti in the Highland range of Nevada (see sect. 1903).

Middle Cambrian.

a. Buff weathering, grey, unmaeured limestone, Almaden sandstone in place.
Cainozoic

1. Ammonite trails.
2. Marine reddened arenaceous limestone. Flakes gray with irregular partings of buff-colored arenaceous limestone. The latter penetrate the layers of limestone in the most irregular manner and frequently surround small irregular masses of the flakey gray limestone. These often layers usually form a low cliff when slightly metamorphosed became massive and weather to a solid rough surface.

b. Porche shale
Porphyric. angellacous shale. 20.
Porche shale.
\[
\begin{align*}
18 - 35 &= -17 \\
40 - 12 &= 28 \\
102 &= 102 \\
60 - 210 &= -150 \\
182 &= 182 \\
28 &= 28 \\
4 \times \frac{13}{65} &= \frac{52}{65} \\
&= \frac{73}{73} \\
24 + 28 &= 52 \\
120 - 26 &= 94 \\
164 &= 164 \\
113 &= 113 \\
50 &= 50
\end{align*}
\]
K. Dome canyon limestone.
B. Massive, bedded cliff forming grey siliceous lime stone with small streaks of calcite.
In 205 feet for 50 feet occasional layer 15 to 20 ft thick of yellow brownish yellow amnonaceous limestone.

At traces of fault.

350.

2. Bluish-gray and pinkish colored shale.

At this point a north-south fault brings up K+T.
A second fault repeats K again. A greater north-south fault then brings up the tail of the limestone against K+T. The section is repeated. The measured section is taken for all the head of Dome Canyon.
ar l. (Pass shale which is marked by fossils & lithologic characters.

L. Blisth grey limestone with numerous cavities from 1/8 to 1" in diameter in some layers. 4" to 10" thick.

M. Caleocene & angillaceae shales with thin layers of grey limestone full of the heads of Ptychoparia. Also a few bivalve shells. 10".

N. Massive bedded dark bluish grey limestone in massive layer with break up into irregular shaly layers 1/2 to 2" thick.

0. Angillaceae shales, dark reddish shaly - same fauna as 4. 6.5.
The best locality we found for studying the front of the section for collecting fossils is on the hill between the two campas at the head of Davis Canyon, just below remnants of mass. Here the fossils of loc. 258, 258a, 258b were found. The shales M and Q are well exposed, but one note very fossiliferous excepting an elevation of 2.5 feet. Cretaceous shale is very abundant in thin interbedded limestones 1/2 to 2 feet thick.
p. 1203. Dark bluish grey limestone
with thin marine layers which
break up into irregular layers 1/4
of 3 cm thick. Occasional
calcite and arenaceous layers
occur near the base and
gradually they
replace the bluish grey limestone
and form thick layers.

152
1253.

The above unit appears
1/2 to be varved lithologically
but formally it is a
unit characterized by
Acanthodes? and Baculithodes.

Famile. Mr. Weeks found a
few small Ptychodonia near
the top of p. All from 2.5 cm
near the base on hill near head of
Slyone. Canyon below p.

The Antelope Shales
are adjacent to p.

Also found heads of Baculithodes
? Ptychodonia 35 to 40 feet above it.
The present of the section studied is broken by several E-W faults which reach the bed in question. Care in working out the section.

West side of Dome Canyon.
Blocks 1, 2, and 3 are slightly displaced. Block 4 is lifted 100 feet at the fault.

In addition to the faults, there are undulations of the strata which complicate the stratigraphy. Sometimes low domes occur or broad anticlines. An example of the latter is at the head of Dome canyon, where the south dip changes to S.W.
the first time I saw space aliens. I was 30 feet in front of them. They scared me to death. I would have run away if I could have. But there was no way to get away. I was trapped. I was in a nightmare. I was in a place I didn't want to be. I was in a place I didn't want to be.
The redded dark grey thin is redded fine line
may an less anacrency - 250
About 35 feet the
'finsal collected in 1902
loc. 247 occurr.
Near the late a
Ptychochorda like P.
King - Reck occur.
Some house

D. Alternating bands
of dark blue, conch, blue,
blue marine layers heathy
The arenite thin irregular
limestone in lumps 1 in

1. Blue grey 9"
2. Grey arenacea 90"
3. Blue grey 12"
4. Grey arenacea 95"
5. Blue grey 7"
6. Grey arenacea 35"

247

E. Blue grey 35 inch

Their redded usually
high with lighter layer
265
40
305
26/11/05

+ with a chart, layout
5/16 to 1/2 inch, + scattered, halved chart, bracket

family.

The lower portion of this series comes the fauna of (loc. 254. Q. E.D.), the upper the fauna of 253 5
Central portion (253 5).

January:
a - 19 5
b - 10 5
c - 25 0
d - 24 7
\[ \frac{e}{e} = 3 \text{ 0} \]

109 2.
Section 2 3/4 mile North of Brigham, Utah, west slope of Wasatch range—opposite ranch of A. C. Baker.

Gray quartzitic sandstone, weathering brown, with panthics of greenish arenaceous shale.

Middle Cambrian.
1. Bluish gray limestone, fragments of fossils—Bathyergusus—Ptychochisma—

2. Gray calcareous silicious shale, with thin-bedded bluish-black limestones.

Fauna—In shale—
Eocyclus* Tarida aculeus
Alalus (Lingulella)
Micrometra praemula

Billingsella
Aguas tile
Baconthoidea typicalis
Dryopinella
Phychoforma picheinhis
Neo-linus
Bathyurus hesvalli
Phychoforma a Small
b. lange

Aenuacens bramin
gray shale

Calcareous gray shale
hard
passing into thin bedsded
limestone

Silicious shale
massive layers
Sect. 3

2) This 'bedded' more or less nodular in—

Silicious shale like C 46

193

3. Massive bedded

thick gray limestone

passing above into

avenacer (gray limestone).
Cambrian section
S.S.E. of Malad
City, Idaho.

Studied and measured
by W.D.W. Oct., 1898.

The base of the section is
on the north side of two
mile canyon near its lower
western end. It was measured
up about 700 feet then
carried to the north west
to the west face of the ridge
then E. N. E. to the
summit of 31.

The
after portion of 31, all
of 38, one shewn on the
north south side of the
canyon for west slope
of the ridge. On the north side of the Canyon, a broken fault has disturbed the section adjacent to the canyon. This is readily determined by the stratigraphy at the canyon + by the succession of the subdivisions of the Middle Cambrian fauna on the first line of points north of the canyon.
Malad Rectri - Idaho.

Going up.

Base in north side of Canyon 2½ mi S.S.E. of Malad City, Idaho.

On road leading across range.

Brigham.

1. (Layers 2 to 5 feet thick)
   a. Massive reddish dark brown ½ ft. sandstone.
      27 W. S. 24½ N. 15 E.

2. Steel gray, buff, amorphous, shaly
   with layers of
   ½ ft. sandrock, black, reddish at intervals of 5 to 20 feet.

115.
c. Compact, hard - light gray - 1/5 sandrock similar to most of the 1/5 sandrocks of the Flathead area of Montana. In 210, the upper 8-10 ft. bands of greenish amethyst shale occur interbedded in the between the bands of 1/5 sandrock.

Amelid tracks occur on the surface of the shale, 8-10 ft. of 1/5 sandrock. Reddish-brown 1/5 sandrock of the same type as.
Malad 5

but deeply colored

4.4

granite-colored anacener shale with layers of y(5), dark brown sandstone, one of which at top fine felt thick cape
the series of anacener beds

45

6.94+

Daugton (Middle Cambrian)

2. A dark gray lime with many fossils:

Iphidea,

Acroreta

Abaluz

Orthocera

Olenicide etc
Work Angillaceras
shale passing ab
above 30 ft in
tblue-black calcareous
shale + thin redded l
in
NG
large echinula
fragments of tribolites
Corrected 55

Desperately a massive redded
compact, hard
grey limestone +
usuallly forming a
high cliff

Silicous fm that
places possesses
hard sandstone 55
3a Thin bedded (3.5 to 8 in) contact hard but with considerable amnaceous matter in some of the layers. Small fragment of fossils.

3b Reddish brown sandy shale with a few layers of hard red and a little green sandy shale near the top.

3c Thick bedded amnaceous flinty gray line with trilobites in bedded line.

3d Greenish sandy shale.
3.5 Altering bands of limestone and sandy shale.

3.6 Thick bedded gray limestone with thin beds.

3.7 Fresh green, fine-grained shale.

3.8 Bluish-gray limestone in thin and thick layers. At 180 feet, fossils of marine species abundant.

3.9 Blacksmith.

Total time: 797.

3.50 Strong menace on W. Overland grade colored.

180.
31. Light gray sandy
line of wormi
layers alternat
ing with thin
gray sand
layer. Many small
shells and concretions in
thin, gray layers
4 ft 5

32. Alternating beds of
thin-bedded clay
and sandy
5 ft

3.60 & 5.5 ft
large Oblatis?
more with shal
170 = 530
feet, assume the
same species

From this point the section
is taken on the south
side of the canyon and carried
to the limit of the ridge
to the south east,
malad $10

Massive redded
gray hand gray
ink passing off into thinner redded
blue gray line, 405

50 ft. Light gray massive
redded silicous line.
Handed in places, 445.

Thin redded
Flint gray sandy
line, with fragments of Trilobites
Onty chunhami
DB etc. 58

Hing gray silicous
Massive redded
line, with a few
shaly sandy beds. Total 1088

180
51  27
255  34
35  
290

108

82  27
41 0.
5 5
465

32  180
16  465
180 475
58
58
105
8

2708
Malac.

Same as 4 E.

Alternating bands of thin bedded limestone -
calcareaous shales-
passing into greenish
calcareous shales near
the summit of the series -
Fossiliferous numerous in
many of the layers of
...

A real list of material collected.

as 132 feet. Orthoceras abundant.
\[
\frac{350}{405} - \frac{129}{20} = \frac{70}{59}
\]

\[
\frac{435}{24} = \frac{238}{58} = \frac{180}{0}
\]
malade (Y) J12

- Thin, bedded +
- Shaly siliceous +
- Gray linn, passingapatitic to gray + thin
- Gray linn, carrying
- Many fossils
- See 2.14.21%
- At 290 feet shale begins to appear as irregular flattened nodules in the linn

At 465 feet the
- Shale colored
- Menaced line
- In massive layers
- With occasional bands of shaly
- Menaces linn. /

180 -

Total 655
Malade
5.5

Bremer ad
that layer

5 Light gray 9.5, 3.5

Brown 2.00
Fossil Ptychoparia

Gray with
fragments of white

As seen in the cliffs
about one mile south
of Cherry Creek, the
Carnelian termite done
Malad 2/14

on a plane of erosion

Ampaquequm lim. - Denton lim.

Gt. 3. south

Arroyo = Carbine lim.

At the obverse section the
bran sandstone 5' one
remained.

In the foot the silicious
lime 4' is altered to
form a weathered quartz
rock in which the calcareous
matter is nearly all
alumined. (See Kodok
photo.)
Malad Sectrni
Idaho

SUMMARY

Ord -

Cambrian (1)

1. Brown sandstone

2. Light gray quartzitic sand.


2 1/2 foot colored arenaceous limestone in massive layers with occasional bands of shaly arenaceous limestone 180

2 thin bedded + calcareous +
arenaceous limestone
Malai.

Having abruptly into gray and bluish gray line with a few dark bands,
175 feet from other flatterd cherry nodules just occur.

465a

Alternating bands of thin redded lime calcareous shales with greenish argill shales near the summit.

Fauna -
Malod)
D. Light gray silicious marine, bedded limestone with a few shaly arenaceous beds 180.

E. Thin bedded flinty gray arenaceous limestone with fragments of brachiopoda 38

f. Similar to d 445

g. Massive bedded, compact, hard gray limestone with thin bedded flinty gray limestone near summit 405

3) Alternating beds of thin bedded limestone, arenaceous and shale (on back)

b. Light gray arenaceous limestone in massive layers
Famia in 3 a

In the lower part small

Abolute 00

Pty chophoria 1 2 hr.

In upper part

High eyed trilobite
Malad.
alternating with bluish-gray amenaecum in.
Arthritis in beaten beds.
Notes of 1885

Southern Ute
9-27-50

In riding from Panaca to St. George via Nebran, Mantanqeadar & Diame

and valley. The road

shakes the s. lawn hills

beds until the vicinity

of mantan headare &
dome where beds of sand-

stone appear in small

cutards. From here on

the evidence of the Junq

*Sier rocks of the plateau

increases & soon the great

masses of the Pine valley

Mts are ahene. Basalt

coves much of the

country toward St George.
Bosal cliff, Virgin River Canyon below Hurricane ledge.
Section of Pweeney 5. of Virginia Utah near Walker Shale.

Reddish brown sandy & arg. shale, gypsum, between Carbon and Penns. 155.

2. Dark clays untouchable 206.


4. Dark sandy arg. shale 40.


Reddish-brown and gray gypsum shale. 360

9) Alternating gray, dark, and reddish brown shale. 175

10) Light brown, shaly, l.-
with fossils (specim) 30.

11) Similar to 9. 230

12) Reddish-brown, chocolate
shaggy, wavy, in
alternating shaly and
massive layers. 340

13) Sandstone, conglomerate. Coarse, gray and
few pebbles. Many impressions of seed like steme. Est. 175

5 220
April 9th, 19__

The farm is only

The barn and the

There seems to be

The trees and

The farm country
10-2-85

Rock Canyon 1/2 mi S.
Washman M. Watering place on road leading from St. George to Kanab
on Washman M. to Kanab.

The upper surface of the Carboniferous l. is irregular.

On this rests uneven
lenticular masses of soft
sandstone. Beds of Conglomerate joining of gritty
pebbles. Blocks of cherty
rock. Pebbles of reddish
sandstone like the Red
Wall sandstone.

Photograph No. 1. of Rock
Canyon shows the Cambi
li with the conglomerate
in the Cot. I.—which is here well filled with
shaly conglomerate.

Photographs No. 2. show the irregular character
of the lumpy beds of
the Carboniferous.

Up towards the entrance
to the Canyon collected
fossils from the Car-
glomerate pebbles and blocks
of shale also from the
freshly overlying stratum
both one of Pennsian
age & belong to the
series above the true
Carboniferous. In 1883
I think the conglomerate
might be formed of
the debris gathered
along the line of the Hurricane fault at the close of the Paleozoic but there is not sufficient proof of this. A study of the fossils collected in 1883 may lead to such a conclusion but from my faith in it is nil.
The return of the Hurricane ledge north & east of Layfournville has thrown the Pennine cliff & superimposed strata back to the eastward as shown by Photograph No 2, of this date. "Hurricane fault." East of Layfournville.

Pattern of the Pennine below the limestone band still extends into the westward face of the slope of Carboniferous Lias. Tertiary faults reach to the summit on the north end of the valley formed by the erosion of the Pennine etc.

See Photo.
The Permian about

Virgin City and northward

is better developed than

at any point between

it and the crossing of the

Colorado River at Lee's

Ferry.

The limestone at the

base with conglomerate

is well shown at Rock

Canyon, 12 miles East of Workman's

Ranch.

Between the latter place

and Virgin City there is

Jayneville, beautiful

sections are shown

of the limestone along

of the 180 feet

of the formation. The

limestone is hard and varies

in thickness from 20 to

25 feet, it was
deposited on an uneven surface as in the Kanab section.

The upper horizon has not been seen in the section east of the vicinity of Workings No.

The Shinumo conglomerate contains feldspar pebbles more friable than that of Kanab. It varies in thickness from 75 to 150 feet. The lower surface rests on the eroded surface of the Permian sandstone.

The cream colored, resting on the Cap, varies very much in thickness and character. It usually overlies cream to buff in color, finely bedded 4 to 2 feet, and very hard,reaking with a chiselled texture.
Vinta Mtz

Aotez Wehen

since Aug. 1903.

[Signature]
No. 2. is formed of reddish brown & purplish marl or less massive bedded & cross. often cross-bedded sandstones. Very fine conglomerates occur in bands & small white or yellow pebbles. 1/8 - 1/4 in. diameter are scattered through the sandstones at many horizons. Narrow ribbon-like banding is common in the purplish beds.

No. 3. At a point about 2 miles from the side canyon is about 300 feet in thickness.

Above No. 3, a coarse gray sandstone about 60 feet thick overlies the shales. A bed of fine conglomerate occurs near
the topic of it. The dip + strike of the shale +\nare the same. This may be as in the Belt Mesa. I now\nconsider the shale 3 to be fine Cambrian corresponding\nto the Belt ferrane of Montana. Geologically they are of the same\ntype. The conglomerate is the base of the Paleozoic.

Above the conglomerate slightly calcareous buff\nmaterial sandstone over that early traces of large\nin this. Fine clasts.

25 feet, Campaniformes fossils.
The Cambrian at the sections E & W of Holiday Park on the Weber river appears to be from 500 to 1000 feet thick consists of alternating bands of lim shale sandstone. It is overlain by reddish sandstones in which the valley of the Weber has been eroded to the Kansas promie above. The beds above the Cambrian are mainly reddish sandstone with a few bands of limestone. In the limestone a fauna occurs much like that of the Permian of the Grand Canyon section of southern Utah. mostly conchoidal forms.
Blackfoot Fork Section of Cambrian System.

Wasatch Mountains between Ute and Logan peaks, 12 to 16 miles east of Hyrum, in Northern Utah.

August, 1906.

Ordovician.

Dark flesh-black and gray limestone. In the basal bed immediately above the Cambrian a fine fauna occurs.

Plectothiaz —

Systrophia —

Orthoceras —

Endoceras —

Fragments of trilobites.

See collection.

Upper Cambrian.

Dark bluish-gray and
The limestone is of the same type as that of the Upper Cambrian for 190 feet below. To explain the change in the fauna there is no break in the section. One of the characters common to the Cambrian and the superjacent Ordovician is the presence in most layers of flattened concretionary nodules; stronger from a minute size up to 3 or 4 cm. or more. All the larger cases rarely exceed 10 mm. in thickness.
gray limestones in layers
varying from 1\(\frac{1}{4}\) to 20
inches in thickness.

Fauna:
25 feet below top:
- Abolute (Lingulaella) 00.
- Plectorthis
- Syntrophina
- Dicellocephalus.

At 10\(\frac{1}{2}\) to 12\(\frac{1}{2}\) feet below the top a considerable
fauna occurs:
- Plectorthis 00.
- Syntrophina
- Anamoeon

From 20\(\frac{1}{2}\) to 30 feet above base:
- Plectorthis

Fragments of fossils occur
throughout:
- Miliolus
- Solenopleura
Many of the layers are almost made of small flattened concretions varying from a minute size to 6 cm.
4.annelid forings. Shales occur as flattered strugies on the bedding and in the layers. 3.5

3.2 feet from the bone

two species of A. lobata (Pygella)
occur.

1/4)

3.1. Massive bedded, arenaceous
limestone forming broken
cliffs. A few cherty
nodules occur near the
left and the lower 50 feet
has many irregular, oval
cherty nodules & stringers
of chert coincident with
the bedding.

Total of 3.

Bedded bluish gray
limestone and fossils.
4) Bedded, light gray, shaly, hard sandstone, fossiliferous below by thin, brown sandstone. Slightly the base shaly. Then, bedded sandstone. (St. N. 20° E (mag), with 250 w.)

Fauna.
The upper 20 feet: family:

Franz:

Alabes (Lingulella) ? D.O.

Acropleura

Billingsella calaradoensis.

Near the base
Resume:  
1 = 190
2 = 795 Arenaceous
3 = 84
4 = \[ \frac{166}{1225} \]

MC. 1. = 1041 Arenaceous
Middle Cambrian.

1. 

a. Light gray arenaceous limestone 12 ft.

b. Lead colored arenaceous limestone 80

c. Light gray arenaceous limestone 85

d. Dark lead gray arenaceous limestone 87

2. Shaly and thinly bedded arenaceous limestone with intercalated reddish-brown sandy layers 15

f. Light gray arenaceous limestone 18

Similar to d (written out) 185
h. Light gray arenaceous lim.

j. Dark lead gray arenaceous lim - with numerous arenaceous concretions filled with light gray arenaceous lim.

1. Massive bedded arenaceous cherty lim -

2. Bluish gray, massive limestone cherty more or less arenaceous limestone in thick bands that break up into thin layers on weathering.

Fauna. A few traces of fossils occur in the fluvial 20 feet and larger arenaceous concretions.
occur in many of the arenaceous limestones. If in a dark rock the filling of the irregular borings are filled with lighter colored rock, it is the light gray rock by darker rock.

3. a) Thin bedded, bluish gray, compact limestone with interbedded thin layers of gray limestone. 22, Fauna.

b) Lingulaella

(Nummulites tetonensis)

(b) Greenish argilaceous sh. 12.

c) Gray coarse grained limestone. ST. N. 20° E. Sth. 20° a. 13. Loc. 55M
Fauna
Hyalithes

1a. Greenish argillaceous + sandy shale
Hyalithes
Agnostus
Agraulas

(6a)

Gray coarse grained limonite

(6b)
Fauna
Hyalithes (abundant)
Ptychophera (2. ch.)

1b. Greenish argillaceous + sandy shale

Total of 2.
220

3/2

Bluish gray limonite with small concretions + small nodules of calcite scattered through the
the layers which range from an inch to 6 in. inches or more in thickness near.

Fauna: (fragments of fossils) loc. 31j

b. Massively bedded gray limestone that forms a low cliff and breaks down readily on gentle slopes. Fauna (fragments) loc. 85.9 132

c. Limestone similar to (b) 290. Fauna (fragments) loc. 31k

d. Greenish argillaceous shale. 39. Fauna. Abalrus loc. 54k

e. A thin, white, gray, thinly bedded limestone
f. Arenaceous steel gray limestone

g. Blush gray limestone with small concentrations of small rounded nodules of calcite scattered irregularly through the layers. Fossil: Micrometa incrustatilis.

a. Dark lead gray arenaceous limestone (a)
f. Arenaceous, steel gray cliff forming limestone in the corner, passing gradually into...
a dense gray, compact limestone that weathers to a light gray color. The layers vary in thickness from 4 inches to 2.5 feet.

Total of 4

Fauna: Each layer contains irregular annelid borings in some of the coarser limestone, no fossils were observed.

5

Bluish gray, compact, thin-bedded limestone with large irregular annelid borings. The upper part filled with steel gray arenaceous limestone similar to the beds above. (On back. 290

Fungi

In amber part

Micronecta

Alemorides?
Below the limestone is a more uniform group of strata that tend to form low cliffs on the steeper slopes.
130 feet below the top of a large trilobite, this indicated by a lead tail. and 20 feet lower.

Gray arenaceous limestone in thin layers with occasional bands of layers 4 to 10 in thick, often calcitic and with intercalated conical concretions. Fama. In the other 5 feet. loc. 549 (3).

Scenella

A. cancellis quadriceps

Ptychoparia subcomata, Microstrea

In layers 70 to 80 feet below the top of b.

A. fulva

B. Billingsella
Hyalithae
Aclenoides quadricus
Ptychoparia subcornuta

Gray limestone with numerous cavities 1/4 to 1/2" in diameter - a few thin layers of interformational conglomerate & some shaly limestone total of 5 1/2"

Fine-grained gray, calcareous + organic lacking shaly beds 3 1/2"

13
Aforus
Ptychoparia preferential longonta
Bluish gray to blue-black
fine grained, thinly bedded limestone

Fama

Ptychothora

fragments of Ablonus

occur sporadically.

c.
greenish argillaceous shale

14

d. Gray argillite limestone

in layers 5-14 thick 24

Fama

Micrometra stuarti

Ptychothora 2. 6

15

E. Greenish argillaceous sandstone shale

Fama

16

Ablonus (Eingubella) mecorelli

Loc. 54 P.
Bluish gray thinly bedded limestone.  
Loc. 5472

N. 30'E. 12' W.  
Fauja near bone.  

*Micrometra stantiscaperda*  
*Ptychoparia*
  

Greenish org. illacite + 
Shale. sandy shale.  

Fauna:  

*Micrometra hannula*  
*Westonia ella*  
*Hyolithes*  

Orthotheca?  
*Ptychoparia*  
*Asaphidens brunelli*

---

Massive bedded bluish gray limestone passing.  

Hardenward into gray arenaceous limestone.  

Fauja.  

(Doc. 5548)
8. Massive bedded dark arenaceous limestone. Passing at about 130 feet into a calcareous sandstone, then a gray sandstone.

Layer Cambrian.
Lower Cambrian

1a) Quatztic sandstone, gray, greenish gray, bronzish, dirty gray, reddish, dirty brown, in layers 3 to 5 feet thick.

1b) Greenish, brown, sandy shale

Fossilized trails

Same as (a). Est. 1200.
<table>
<thead>
<tr>
<th>Layer</th>
<th>Measurement</th>
<th>Unit</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upper Cambrian</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Arenacea</td>
<td>180</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>2. Arenacea</td>
<td>775</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>3. Arenacea</td>
<td>94</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>4. Shaly &amp; thin bedded sand</td>
<td>166</td>
<td>ft</td>
<td>1225</td>
</tr>
<tr>
<td><strong>Middle Cambrian</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Arenacea</td>
<td>1041</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>2. Shale</td>
<td>220</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>3. Thin bedded</td>
<td>1100</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>4. Arenacea</td>
<td>520</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>5. Thin bedded</td>
<td>453</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>6. Shale</td>
<td>276</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>7. Marine</td>
<td>107</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>8. Arenacea</td>
<td>390</td>
<td>ft</td>
<td>4187</td>
</tr>
<tr>
<td><strong>Lower Cambrian</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Est. 125,000*
Aug. 23rd 06.

Blacksmith Fork Section.
Gang up from massive Mm.
Measured.

massive Mm. B.

1) Greenish argil, + sandy sh.
Tranva (a) of Aug 14th.

30 ft.

Micrometra hannula.
O(Westonia) ella.

Hyolithes

Orthotheca

Ptychochoria?

Asaphiscus havelli.

2) Bluish gray thinly bedded
Mm. Sh N. 30° (mag.) 9.12 Eng. 23.

Tranva.

Micrometra superba Weller.

Ptychochoria

3) Shale similar to (1).

O. f. Mcconnelli.

O. f. Mcconnelli.
B.F. (2) 8-23-06

4. Gray lim, mostly in layers 3 to 1/4" thick, and finally calcitic.
Micrognetra stuarti W.
Petty chohonta 2.2 h.

5. Greenish avg. 2h.

6. Blush gray to blue fine grained tan, hedded lim. V1 36
Fragments of Ptychodaria -
Shaly beds.

7. Gray fine grained avg.

Feb 11
Abel
Ptychodaria.

8. Gray tan with concave
trans. X - 1/2" also a few thin interformal
\[ \frac{27}{14} - \frac{41}{5} + \frac{75}{23} - \frac{184}{185} = \frac{130}{185} \]
conglomerate, clayey, shale, limestone

(8) Alamosaurus fm., thin layers with traces of plant fragments and thin layers 4-10 m thick, often caliche with unformational conglomerate flattened caconolites (1:35) at foot of Alamosa quadriceps, N.W., recur.

Hyolithes

Psychochoria subcoronata

Billingsella

Obeliscus

At 130-185° south?

Clavellia "?"

Alamosaurus quadriceps, subcoronata

Microperus

c. The last becomes more pure + uniformly gray
with average thicker layers + tendency to form ledges on the slope.
At 155 feet up found large tank + head at 280 feet up the bluish gray line becomes chafed with steel gray annular gray line evidently the filling of large annulid borings.
At 290 the bluish gray line stops.

B. F. 8-23-06

f = 0.58 4/3
b = 1.25
4 = 2.90

f = 3.0
2 = 2.2
3 = 1.8
4 = 2.4
5 = 2.8
6 = 1.36
7 = 3.8
8 = 48
8
259
\[
\begin{array}{ccc}
35 & 66 & 46 \\
5 & 5 & 30 \\
172 & 33 & 260 \\
34 & 44 & 78 \\
199 & 325 & 182 \\
\end{array}
\]
P. F. (8-23-06)

Arenaceous steel gray, cliff forming limestone, passing gradually to a dense gray, compact limestone, weathering light gray, layers 41/2 to 2 feet thick. 37.5 ft.

Lead gray arenaceous limestone.

195 ft.

570 ft.

F.

1a) Bluish gray lime, with small concretions and small rounded nodules of calcite. Microclimatic sculpturability. 55 ft.

Arenaceous steel gray limestone.

28 ft.

Bluish gray thin-bedded limestone.

182 ft.

Greenshish argillaceous shale.

39 ft.
BF. (8-23-96) 6

5. With gray line.
   similar to 1.  290V

6. Massive red forming
   clay cliff.  13 2V

7. Simonite 5 1+ 5.  38 0V


9. Lead expanded clay.
   Aug. 24° 06. C nuova section.

8a. Greenish argilhyd.  22°.

8b. Gray coarse clay.
   Hyolithes 2 abundant.
   Ptychoceras (2. a. 2.)

9a. Greenish argilhyd
   at base Aegrositus

9b. Agranulocr.
   Hyolithes 147.

9c. Gray clay similar
   Hyolithes 13.
B.F. (6-24-06)

1. Greenwich argillite 12
- Shaly, buff-gray with interbedded thin layers of gray lime-like

Faulun -
- Xiphactinus tetramerus E.8. = 220.
- Lingulrella "Maryjum" jamatana - very abundant.

\[
E = \begin{array}{c}
1 = 55 \\
2 = 23 \\
3 = 142 \\
4 = 39 \\
5 = 290 \\
6 = 132 \\
7 = 380 \\
8 = 220 \\
\hline
1321
\end{array}
\]

2. Cherty lime. 1.13 b.l.n. gray, massive cherts of cherty, more or less and ocean lime.
- Thin, sandy lime bedded on weathered.
- Massive bedded. 28\%.

- Massive bedded. 25\%.
at 10 o'clock the still gray weather light gray.

\[
\begin{align*}
97 & \quad \frac{3}{5} & \quad 75 & = 198 \\
17.5 & \quad 2.4 & \quad 85 & = 493 \\
\hline
51 & \quad 35 & \quad 186 & = 506 \\
30 & \quad 32 & \quad 198 & = 701
\end{align*}
\]
8 F. 18-24-06.

2) Dark lead, gray, calcareaeous lam. (Amelid forings) 56.5

3) Light gray arenaceous lam. 49.4

3) Dark lead, calcareaeous arenaceous lam. 198.5

4) Light gray arenaceous lam. 18.0

Total is 782.0

9) Shaly arenaceous thin

10) Bedded with reddish brown

2) Sandy shaly layer 15.5

4) Dark lead, gray, calcareaeous lam. 87.5

5) Light gray arenaceous lam. 85.1

4) Lead calcareaeous arenaceous lam. 20.5

3) Light gray arenaceous lam. 19.5

18 x 1
Upper Cambrian.

1. Shaly, hard red, followed by reddened, dirty brown, then light gray sand.

Lamina - ST. N. 2637, 247.5 N., 0.25 E.

Lingulifera in shaly beds near base.

At 176 feet D (Lingulifera)

Billinguella coloradoensis - Acrosteola

+ continue up to top of sandstone.

A2 - Bedded, blue, gray, thin, in layers from 1/2 in. to 15 in. thick. Very fossiliferous.

A3 - Massive, reddened argillaceous sand, gray, gray cliff, cherty, nodular, and A
and as flattened stringers occur in the lower fraction for about 5 feet. Similar stringy material occurs begins again at 397 ft.

30

Gray siliceous and occurs here in thin layers 1/2 to 6 in thick. The layers occur in thick bands and break up into layers upon weathering. Chert fills larger and small arachnoid borings and also occurs as flattened stringers. Fossil, at 34 ft. from base.

(1)${}^{1/2}$ in. scale
185
180
184
25

38 3/4
16 5/3
24

195
185
39??
B.F. 8.25/06
Ar 25.2
feet up small
concentrals 2.5 4 mm. in
diameter almost make
up layers of the rock
12.5 to 22.5 thick and contin-
ue up about 15 feet.
Massive bedded group
arenaceous bed with
occasional chert.
3rd layer, continue up 5 feet
after the thin bedded
layer below.

3rd. Thin bedded arenaceous layer
followed at 55 wli by
massive bed doesn't lead
colored arenaceous lm 1195.

Total 3 = 775
\[
\begin{align*}
15 \times 140 &= 2100 \\
\div 5 &= 420 \\
\div 7 &= 60 \\
29 \times 5 &= 145 \\
\div 20 &= 7.25 \\
\div 165 &= 0.49 \\
34 \times 110 &= 3740 \\
\div 23 &= 163.043 \\
\div 193 &= 19.346
\end{align*}
\]
B.F. (8-25-06) [12]
A. y. u. e

4a. Shaly + thin bedded silicious lm. hanging up a h
20 feet up into limest h
Ogray bedded lm

at 60.5': Upper Cambrian fm
occur. XX. of A. y. u.
at 70 to 80 ft a rich
fauna occurs. XXX of A. y. u.
Plectanthus.

S. trilobites:
Anamocora
Pty.
Acrotrita.

At 193 ft, A. y. u.
Plectanthus, etc.

C. X. A. y. u.
Orthoceras (Annulated)
Endoceras.

At 165 we found
(A. H. aculeata) 00.
Plectorthiz
Syntrophina
Hiliccephalus

Base of Ordovician.
190 feet.

\[ 4 \times 190 = 190. \]

\[ \begin{align*}
A. 1 &= 166. \\
2 &= 92. \\
3 &= 7751775. \\
4 &= 190. \\
\text{Total} &= 1223. \\
\end{align*} \]
Liberty Canyon Section
East 2.2 miles
5.5 miles west of Liberty, Bear Lake County, Idaho.

Ordovician limestones
beneath white quartzite

", "(logan quartzite)

500 feet

Camman (Upper)

1) Bedded, light-gray limestone with Ashilite for.
in Blacksmith fork section.

Sheet-like layers of steel-gray arenaceous limestone.

500 feet down

The following fossil occur:

Menocaphalus
Psychophoria
Aranocara
\[
\begin{align*}
145 & \\
215 & \\
580 & \\
290 & \\
346 & 
\end{align*}
\]
2. Brownish shale sandy
375 P. ft. 10 x 60

3. Thin bedded flint
Green limestone will
Shelly matter +
Some interbedded
Thin layer of brownish
sandstone Gently

337

The total of upper Cambrian

Near these the following fossils occur:
A) Abalites
B) Billingsella coloradoensis
C) Acrotheca

Zona upper Cambrian 1197
47. Massive reddened arenaceous limestone passing into thin gray rough limestone 450

30. Gray quartzitic pelite 92

6. Dirty gray arenaceous limestone 272

2. Thin, gray, arenaceous limestone, alternating massive and thin beds 385

5. Greenish arenaceous shale of thin reddened limestone 575

59k Fragment of Aholus 785

Bloomington
12. Greenish anacacea green shale

13. Thin bedded gray limestone

15. Limestones (a) Loc. 597 25.
(a) fossils removed in the hand.

16. Chalk (Bacanthoides shale) 40.

17. Limestones from Upper Jurassic

40. Quatztite and

Total Middle Camb. 2000.

Lower Cenomanian quartzites.
Fauna of lower Middle Cambrian Terrane

Locality: 10 miles west of Paris, Idaho - and about 6.5 miles west of Liberty, Bear Lake County, Idaho.

Formation: Dark, fresh, black, and greenish argillaceous slate that is superjacent to the quartzitic sandstone of the Beaver Canyon. The sandstone is nearly 40 feet thick, dip 40° west, strike N. 10° east.

To the north, three miles, a bed of limestone 30 feet thick occurs between the quartzitic sandstone and the shale of Blacksmith Fork.
canyon there is 390 feet of calcaceous limestone and 107 feet of bluish gray limestone between the shale and the quartzitic sandstone. These conditions indicate that the Middle Cankian was deposited upon an uneven surface of Lower Cankian sediments and that a stratigraphic break is present?

Shale

Quartzitic sandstones of Lower Cankian

The precise canyon to the shale in the Blacksmith Tank section and the Graceline gulch section are:

Eocystites

Micromintra praecocis

Hyalithes

Orthotheca

Ptychoparia
Abs.: uricus howelli
Pathy: howelli

L. amana
1. Eocystites
2. Protophargia
3. Adolis (Lingulella) 00
4. Micromitra kaumpula
5. " " a
6. " " b
7. Plectorthis a
8. " " b
9. Hyolithes
10. " " a
11. Orthotheca
12. Acrotheca
13. Berichiana
14. Agnostus a
15. " b
16. " " c
17. Microdias
18. Ptychoheria leschenii
19. " " a
20. " " b
21. " " c
22. " " d
23. Oxyto cephalus
24. Odontophora typica
25. " " a
26. " " b
27. Alenoidea nevadensis - week
28. Bathy oceana fremblyi
wrisis howelli
Aug. 14th 1866

Blacksmith's Fork

Shaly blue line
+ 44
Shaly blue line

54th shaly blue line
Marine blue line
Gray blue

at 0ft. well, Hyalite, American, as alkaline wheel, Psycholita?
Micrometra pajamula with London Hyalite

b. Micrometra

c. Superba W (b)

d. 0.44. McCamelli, Hyalite?

@. @. McCamelli. Micrometra. P. Psycholita

@. @. McCamelli. Micrometra. P. Psycholita
Camp Section
Aug. 17-20
06

Massive Lm
Lm (o)
Shaly Bedded
Lm (c)
Greenish fossil Shell (b)
Lm (n)
Shale (x)
At camp a low antiform brings up the lowest beds exposed in the canyon. Edgewater and lo. pebble conglomerate id. to 1.7 beds above the entire Garden City formation.

Actinolite occurs at the bend of the road about 5' above it. It varies for the shaly layers which alternate with the pebble beds.

The shaly layers are particularly abundant in a dark crystalline rock which again alternates with shaly layers with quartzite.

Above these layers there is a thin formation consisting of quartzite alternating with white shaly beds. This is quickly to bedded and unbedded as usual with options. It is correlated with the Ochain Peak.

In this vicinity is the unusual Carboniferous style.
2-3 mi S.
Rügling, Montana

10 August 1927
Mr. R.S. Barlow

The low hills along the White Sulphur Springs road are Cambrian.

The red Belt Spotted shale outcrops directly beneath the Upper Cambrian limestone, containing Orthoceras. This limestone is the friend of botanic, geologic, and fossil hunters, and contains fossils of many varieties.
A short distance from the horizon.

Continuation of section
of red bed. Aug. 28th 1879.

The red bed is succeeded by a
succession of deposits of
fine grained red sand, usually
streaked with white from the
cliffs above. The upper surface
of this stratum presents the
following aspect when exposed
in a freshly broken surface.

White red on higher buff

Buff red.

The two beds were closely welded
without showing that the white
sand had passed the red with-
out an interval of time.

The buff bed is succeeded
by a mass of beautifully colored
red sand & buff sands. Consists
largely of red bed, streaked with
red dirt & yellowish buff sands.