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Original Huronian, and Spurr, Michigammi, Champion, and Republic, Michigan: [specimens] 6576-6718. No. 6 Aug. 1883

Van Hise, Charles Richard, 1857-1918

[s.l.]: [s.n.], Aug. 1883

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U. S. GEOLOGICAL SURVEY

FIELD NOTE BOOK

No. 6.

Aug. 1883.

Original Huronian, and Spurr,
Michigan mt., Champion, and
Republics 6576-67

C. R. Vanhise.

Survey of the Pre-Cambrian Rocks of the N. W. States.

INSTRUCTIONS.

1. Devote at least two pages of this note book to one section. On the left hand page place a map of as much of the section as has *actually been seen*. Denote rivers, lakes, marshes, etc., by the usual topographical signs. Denote the ledges of rock, when no structure is made out, by cross-hatching, making the cross-hatching cover as nearly as possible the areas occupied by the exposures. If the rock is a massive one, but still more or less plainly bedded, use the same sign with a dip arrow and figure attached, showing the amount and inclination of the dip. Denote slaty or other very plainly bedded rocks by lines running in the direction of the strike, with figures and a dip arrow attached as before. To each exposure on the face of the map attach the number of the specimen representing it. In mapping the section count each of the smaller spaces as 100 paces, each of the spaces between the red lines as 500 paces, and four of these large spaces as one mile, or 2,000 paces. Usually the southeast corner will be placed at the first red line above the bottom of the page and at the right hand side. If, however, for any reason, it is desirable to show portions of an adjoining section, the southeast corner may be shifted up or down one space, or the map may be turned around and the north placed at the left hand side of the page.

2. On the right hand page place the notes descriptive of the exposures. Begin in each case with the number of the specimen, after which give in order the position of the ledges as reckoned in paces from the southeast corner of the section, and the dip and strike when observable, for instance: 4025; 250 N., 300 W.; *Strike*, N. 6° E.; *Dip*, 50° E. Then follow with as full a description of the exposure as possible. Very often the notes for one section will cover more than one page in which case pass to the next right hand page, *repeating the map on each left hand page* as long as the notes, with regard to one section, continue.

3. Collect a specimen from each separate ledge of rock, or whenever there is a change of rock on any one ledge. In case of trips made on foot or in canoes, for long distances, neighboring ledges, unquestionably of one kind of rock, need not be sampled, the position and extent of the ledge being marked on the map, with the note that it is of a rock identical with specimen so-and-so. Under the same conditions small sized samples will be allowed, but in all other cases *large sized trimmed specimens*, with chips for slicing, must be selected in accordance with § 3, chapter IV, p. 44, Regulations of the U. S. Geological Survey. All specimens are to have numbers painted on them, in white on a black background, in camp.

4. On the last twenty-five pages of the book give, as may seem desirable, a general account of the examination of the region mapped in the previous pages, correlation of observations, etc., etc.

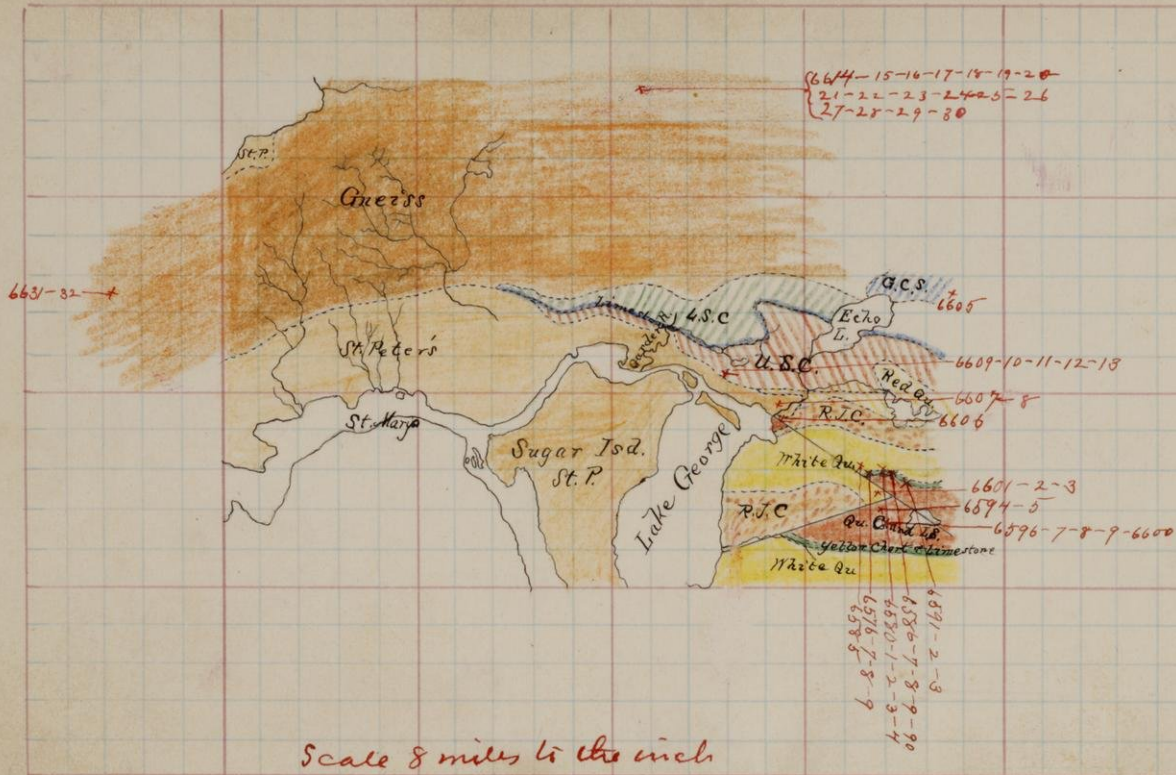
5. Forward this note book, as soon as filled, as registered mail matter, to R. D. IRVING, U. S. Geologist, Madison, Wisconsin.

#6

Sec.

T.

R.



1 2

Quartzites + Chert.
Yellow Chert and Limestone 3 k of Logan
Country back of Sault Ste Marie
Aug. 21 1888.

- 6576 Dark brown clayey and cherty quartzites.
6577 About 60 or 70 feet South West of the r
6578 N.E. corner of Sec. 25, Township Mac-
donald. Layers nearly horizontal.
The slight dip is approximately to
the Southward.
- 6579 Yellow clayey quartzite interstratified
with 6576-7-8.
As I remember the exposure is to the
15 or 20 feet in height. In the
upper half 6576-7-8 are predom-
inant and at the base several
feet thick is 6579.
- 6580 Dark brown cherty and clayey quartzite.
Eight or ten rods East of first
exposure, N.W. 1/4 N.W. 1/4 Sec.
30, Township Merrieth.
- 6581 Clayey quartzites interstratified
6582 with 6580.
- 6583 Pale yellow clayey and arenaceous
quartzite. Few feet lower than
6580-1-2, and into this place 7-8

Quartzite + Chert Con.

6581-2 gradually varies.

6584 Base of above exposure.

6585 White vitreous quartzite, from large bluff in S.E. $\frac{1}{4}$ S.E. $\frac{1}{4}$ Sec. 24, Township Macdonald, about 250 feet North West of 6576-7-8-9. This is plainly the quartzite Si of Logan. The manner of the of the two exposures previously described to this rock is taken as proof that they are the "Chert and Limestone 3k" rather than 3l which ought to be at a greater distance from 6585.

6586 Buff and brown clayey quartzites
6587 with chert and cherty quartzite.
6588 From about 80 rods South of East
6589 of N.W. corner of Sec. 80, Township
6590 Merri-deth. The specimens are numbered from the upper part of the exposure downward, and represent the different varieties of the outcrop rather than the number of layers. Each of the cherty layers 6587-8

Quartzites + Chert, Conn.

6589 are but a few inches in thickness but the number is quite large. However much the greater part of the outcrop is of 6586 and 6590. Bedding horizon 20 or nearly so.

- 6591 } Fresh colored clayey quartzites,
 6592 } South of middle of North line of
 Sec. 36, 500 feet. Township Merideth.
 Nearly horizontal with a slight
 dip to the South West. Interstrat-
 ified with and varying into
- 6593 } White vitriolic quartzite

Quartzites and Cherts
"Yellow Chert and Limestone 3' of Oregon"
Aug 21, 1883

6595 Clayey quartzite. From N.W. $\frac{1}{4}$ Sec. 31, Township Merrieth.

6594 Cherty phases of 6595, inter stratified with it in thin seams.

6596) Buff and brown clayey and cherty
6597) quartzite. From various places
6598) along the face of a high bluff
6599) situated near a saw mill on
6600) the outlet of a little lake in
the S.W. $\frac{1}{4}$ Sec. 31, Township
Merrieth. Bedding horizontal
or nearly so.

6601) Buff and brown clayey and cherty
6602) quartzite. From almost verti-
6603) cal face of bluff near road in
the S.E. $\frac{1}{4}$ of N.E. $\frac{1}{4}$ Sec. 26
Township Macdonald. Bedding
horizontal and various phases
grading into each other.

MiscellaneousAug 21 1883

- 6604 White quartzite, Few rods South of Echo River about a half mile from its mouth near Bruce Mine road, small rounded and grooved exposure, "gn 3 i" of Logan.
- 6605 Slate, Given me by Alex Finlay, near Echo River at Bruce Mine road crossing. Said to have been taken from quarry three miles north East of Echo Lake which is in a bluff 100 ft. high.
- 6607 "Red Jasper Conglomerate" of Logan,
6608 About a half mile north of Echo River upon Bruce Mine road. Low glaciated knut. Exposure varies in coarseness from one to the other. The larger pebbles are commonly concentrated in layers.
- 6609 Slate, From high bluff upon
6610 Bruce Mine road about half
6611 way between Echo and Garden Rivers. This slate has easy cleavage in three directions

Miscellaneous Cont.
Aug 21 1883

as shown in 6609. As a result of this property large blocks are easily broken into fragments with light blows of the hammer.
 "State conglomerate 3f" of Logan.

- 6613 Drob colored clayey quartzite.
 Interstratified with 6609-10-11 in many alternate layers, each layer of both rocks commonly being a foot in thickness, though they are often thicker.
- 6612 Shows transition between 6609-10-11 and 6613.

Cascade and Victoria
Silver Lead Mines

Aug. 22, 1883

The Cascade and Victoria Silver Lead mines are situated about nine miles north of the mouth of Garden River in the Laurentian. The Cascade is a half mile north of the Victoria. The country rock is a medium grained dark colored mica and hornblende gneiss, much intersected with Granite or granitic veins. In every respect it resembles the Laurentian East of the Salmon River. This gneiss is also in the vicinity of the mines cut by greenstone dykes, four of which, one very large, were seen upon the road cut at the East end of a small lake situated about three quarters of a mile south of the Victoria Mine. Another outcrop of greenstone was observed a few rods north of the Victoria. The veins - as the Victoria two in number - have a trend nearly North and South and stand vertical or with a high dip to

Cascade and Victoria Mines, Con. 8

the westward, The rich portions are not above twelve inches in thickness at the widest parts, and perhaps averages in the parts worked something less than six inches. This rich portion is often, instead of being contracted in a single mass, split up into two or more parts by the intruding rock, and is always mingled with much gangue.

The silver bearing minerals observed are galena (said to contain 50% to the ton) chalcopryite, pyrite and blende. The gangue is chiefly quartz, feldspar and rock. The wall rock is a chloritic schist, varying gradually into chloritic gneiss and finally into the ordinary gneiss of the country rock. The distance from the veins at which the unaltered gneiss is reached varies from two to twenty feet or more.

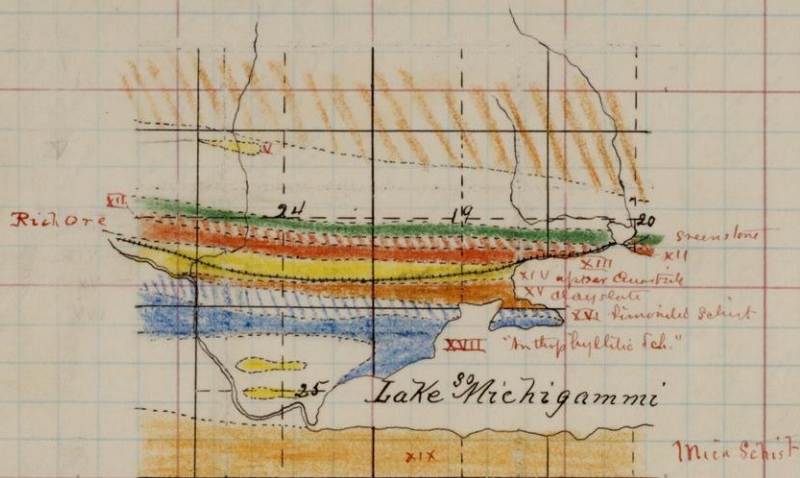
6614
6615
6616
6617
6618

Specimens of ore and gangue from dump pile.

Cascade and Victoria Mines Con.

- 6619 Chloritic Schist, Taken from dump pile and said to be wall rock.
- 6620 Schist taken from near rich part of vein worked upon on outcrop at South side of hill.
- 6621 Chloritic gneiss, different phases
6622 of, taken a few feet farther from vein than 6620
- 6623 Gneiss about 50 feet from vein.
- 6624 Chloritic Gneiss. The rock which composes the greater part of a large exposure at the East end of a small lake about three fourth of a mile from the Victoria Mine upon the Mine road South.
- 6625 Granite veins which everywhere cut 6624 in all directions. The width of these veins varies from the fraction of an inch to several feet.
- 6626 Contact specimen of Gneiss and Granite.

Brooks Map of Spurr and Michigammi



Sec.

T.

R.

Cascade and Victoria Mines Co.

- 6627 Contact specimen of gneiss 6624 and a greenstone dyke about six feet in width which cuts vertically with a strike approximately East and West above gneiss.
- 6628 Greenstone, center of dyke.
- 6629 Greenstone. Side of dyke many feet in thickness parallel to that first described and about 80 rods north of it.
- 6630 Greenstone. From dyke 6629 30 ft. from contact with gneiss

Gros Cap, Gneiss
Aug. 23, 1883

Attempted to visit iron mines in direction of Bonclair Bay. Could not find that any were being worked. Found man who owned property called iron mines toward Gros Cap. They were but prospect holes in Laurentian gneiss. As far as visited and as far as could learn, all properties in this direction were in same rock - no mining had been done. Could get no information as to location of any mines at head of Bonclair Bay.

6631)
 6632}

Gneiss, which represents above.

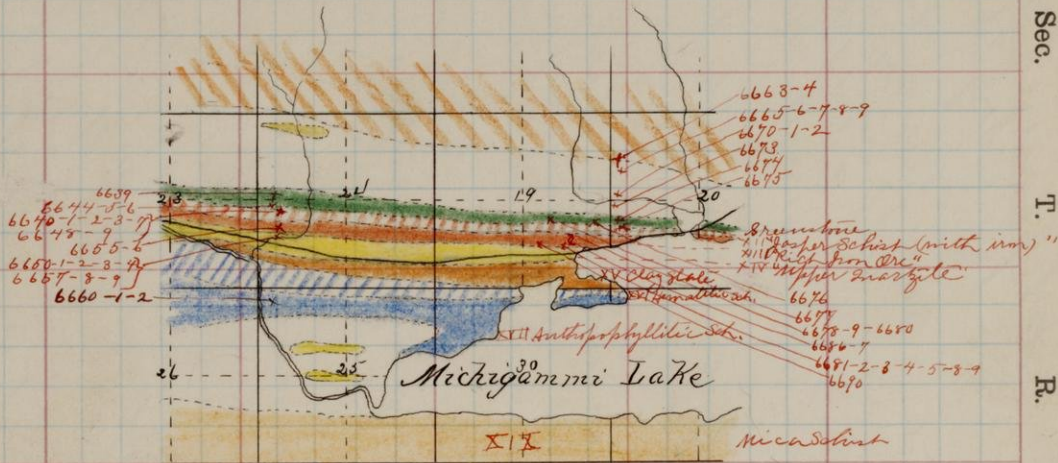
Isipeming, Mich.
Aug 26 1883

- 6633 Quartzite, Loose piece, but said by Mr. Howe to be from test pit in N.W. $\frac{1}{4}$, S.E. $\frac{1}{4}$ Sec. 9, T. 47 R. 27 - Near Lake Superior Mine.
- 6634 Sandstone, From test pit near 6633, Loose piece.
- 6635 Ferruginous quartz Schist, From test pit near Lake Superior Mine in S.E. $\frac{1}{4}$, S.W. $\frac{1}{4}$ Sec. 9, T. 47, R. 27.
- 6636 Quartzite, From low exposure about one mile from Lake Superior Mine, S.W. $\frac{1}{4}$, N.E. $\frac{1}{4}$ Sec. 16, T. 47 R. 27.
- 6637 Ferruginous quartz Schist, Rail road cut about one mile from Lake Superior Mine, S.W. $\frac{1}{4}$, N.E. $\frac{1}{4}$, Sec. 16, T. 47, R. 27. Not far from 6636. Dip quite flat to the Southward. From relative position of 6636 and 6637, the first one first, if there are no intervening folds or faults to underlie the second.
- 6638 Melaphyr, West of little lake near Barren Mine.

Sec.

T.

R.



Spurr Mountain

Aug 27 1883

- 6639 Greenstone S.W. $\frac{1}{4}$, N.W. $\frac{1}{4}$, Sec. 24, T. 48, R. 31, North side of hill rising from swamp. (XI)
- 6640 Ferruginous quartz-schist, short distance South East of 6639. Mostly regularly banded, but in places assumed a brecciated character. (XI)
- 6641 Brecciated quartz schist into which 6640 at times varies. The change from 6640 to 6641 is sometimes abrupt. (XII)
- 6642 Ferruginous Jasper Schist, near line between S.W. $\frac{1}{4}$ N.W. $\frac{1}{4}$ and N.W. $\frac{1}{4}$, S.W. $\frac{1}{4}$, Sec. 24 T. 48, R. 31, short distance South East of 6640-41. (XII)
- 6643 Greenstone, short distance South of 6642-43 in N.W. $\frac{1}{4}$ S.W. $\frac{1}{4}$, Sec. 24 T. 48, R. 31. (XII)
- 6646 Greenstone. From above a short distance S.W. of 6644-45

Spurr Mountain Cont.

- 6647 Arenaceous schist, South East
of 6646
- 6648 Ferruginous Jasper Schist. From
XII about 20 feet North of foot wall
of mine a short distance South-
East of 6647. The two varieties of
rock were observed within a few
feet of each other
- 6649 Ferruginous quartz schist or quartz
XI ite. Typical North wall. As well
the strata have a high dip to the
Southward this becomes the
"foot wall".
- 6650 Garnetiferous Chlorite Schist.
XIV 6651) Typical South or Hanging wall.
- 6652 Garnet Chlorite Schist. About two
XIV feet from ore in South wall.
6650-51 vary into it.
- 6653 Conglomeratic chlorite schist. Into
XIV which 6652 varies gradually.
- 6654 Conglomeratic quartzite into
XIV which 6653 gradually varies. The
rock 6654 is not more than

Spurr Mountain Cont.

24 or eight feet south of 6650, all the intermediate numbers are between them. About 40 feet south of 6654 in a cut an exposure was seen which does not differ from it.

6655 Lean ore XII

6656 Rich ore, XIII

6657 Actinolitic Schist. From dump pile, said by mining captain XIV to be next to ore. This varies into

6658 Actinolite chlorite Schist, Also from dump pile, but supposed XIV like 6657 to be from hanging wall. This varies into

6659 Garnetiferous Chlorite rock full XIV of large rhombohedrons of chlorite, pseudomorphs after garnet.

South of the conglomerate 6654 is a floor which has no exposure. The rocks of the Spurr property, so far as they show

Spurr Mountain Cont.,

bedding, dip uniformly to the southward, this dip being at the walls of the mine about 45° .

The ore is magnetic as are also the ferruginous rocks. The present workings of the mine are exhausted, and the managers at the above date intended to stop mining in a few days.

Near Spurr Mountain.
Aug 28 1883

The ^{West} ~~Whitmore~~ or Farm Mine is situated in the N. W. 1/4, N. W. 1/4, Sec. 25, T. 48, R. 81. The workings consist of a single open pit, and are upon soft hematite. The surface of the country in its vicinity of the mine is everywhere covered with drift, a thickness of twenty feet being stripped from this deposit of ore. The mine or quarry has been opened but little more than a year. The ore and rock dips to the southward at an angle estimated 35° to 40°. Workings represented by following specimens:

6660 Rich ore. XVI

6661 Lean ore XVI

6662 Ferruginous rock upon south side of workings XVI

The Webster Mine - a single open pit - situated in N. 24 1/4 of N. E. 1/4 Sec. 26, T. 48 R 81 has the same general appearance

Near Spurr Mountain, Cont.
Aug 28 1883

and one of the same character
as the Farm.

The Beaufort Mine situated in
a short distance North of the mid-
dle of the South line of Sec. 22
T. 48, R. 31 is said to have
a great width of this some
rich soft hematite. Not visit-
ed.

Michigamme
Aug. 28, 1883

- 6663 Typical gneiss from high ridge about half mile north and little East of center of workings of Michigamme Mine; near center of West line of T. W. 1/4, Sec. 20, T. 48, R. 30.
- 6664 Greenstone dyke cutting above gneiss
- 6665 Massive quartzite. About 400 feet South of gneiss range in S. W. 1/4 T. W. 1/4, Sec. 20, T. 48, R. 30. A few feet farther South this ledge varies into
- 6666 } Hornblende quartz schist which
 6667 } dips at angle of 60° to the Southward, and still farther to the Southward the exposure varies into
- 6668 } Biotitic quartz schist, which is
 6669 } a fine grained uniformly banded rock. The distance from 6665 to 6669 is 30 feet.

Michigan Cont

6670 Biotitic Schist, About 700 feet South of 6665 etc. in extreme S.W. $\frac{1}{4}$, T. W. $\frac{1}{4}$, Sec. 20, T. 48, R. 30, It has a dip of 30° to the Northward. It is cut by

6671 Massive Greenstone in the most irregular manner, the intruding masses varying in width from a few inches to several feet. At times 6671 runs approximately parallel to the bedding of 6670 and again cuts directly across it.

6672 Contact of 6670 and 6671.

The dip of the lower part of the above exposure becomes higher and higher as one goes toward the South until at its extreme end the layers are almost vertical. While this is true the top layers of the exposure dip much less than those below, and in one place actually becomes horizontal, or even dips slightly to the Southward, as if we were near an abrupt anticlinal.

Michigan Cont.

- 6673 Same rock as 6670, about 100 feet South of it upon the opposite bank of a little brook, Extreme N.W. $\frac{1}{4}$, S.W. $\frac{1}{4}$ Sec. 20, T. 48, R. 30. Contorted by many minor folds but dipping at an angle of 70° or 80° to the Southward.
- 6674 Massive Greenstone (Melaphyr?) Bluff about 100 ft high rising abruptly upon the South side of the narrow valley of the brook spoken of above, N.W. $\frac{1}{4}$, S.W. $\frac{1}{4}$, Sec. 20, T. 48, R. 30.
- 6675 Greenstone from same bluff as 6674 about 300 or 400 ft South of it
- 6676 Greenstone from exposure West of 6674 and 6675 in N.E. $\frac{1}{4}$, S.E. $\frac{1}{4}$, Sec. 19, T. 48 R. 30.
- 6677 Greenstone, West of 6676, N.W. $\frac{1}{4}$, S.E. $\frac{1}{4}$ Sec. 19, T. 48, R. 30. These greenstones (6674-6677) form a high ridge which extends East and West as far as explored - a half mile -

Michigamme Cont.

there being only two narrow breaks in this distance.

- 6678 Ferruginous quartzite, ten feet north of foot wall of Michigamme Mine.
- 6679 Ferruginous quartzite or quartz schist. Typical foot wall.
- 6680 Massive ferruginous quartzite, from west end of a pit where it abruptly cuts out the ore.
- 6681 Chloritic schist or Chlorite Rock. Typical hanging wall, varying into
- 6682 Chlorite quartz schist, situated two feet from 6681, varying into
- 6683 Quartzite, few feet south of 6682 and farther from ore.
- 6684 Actinolitic? ferruginous quartzite. From dump pile. Said to lie immediately above the ore upon the hanging wall, varying

Michigan Cont,

into

6685 Chloritic actinolite rock. Also
from dump pile.

6686 Rich ore.

6687

6688 Quartzite. From north and
6689 south out across strike of rock
leading into ore bed.

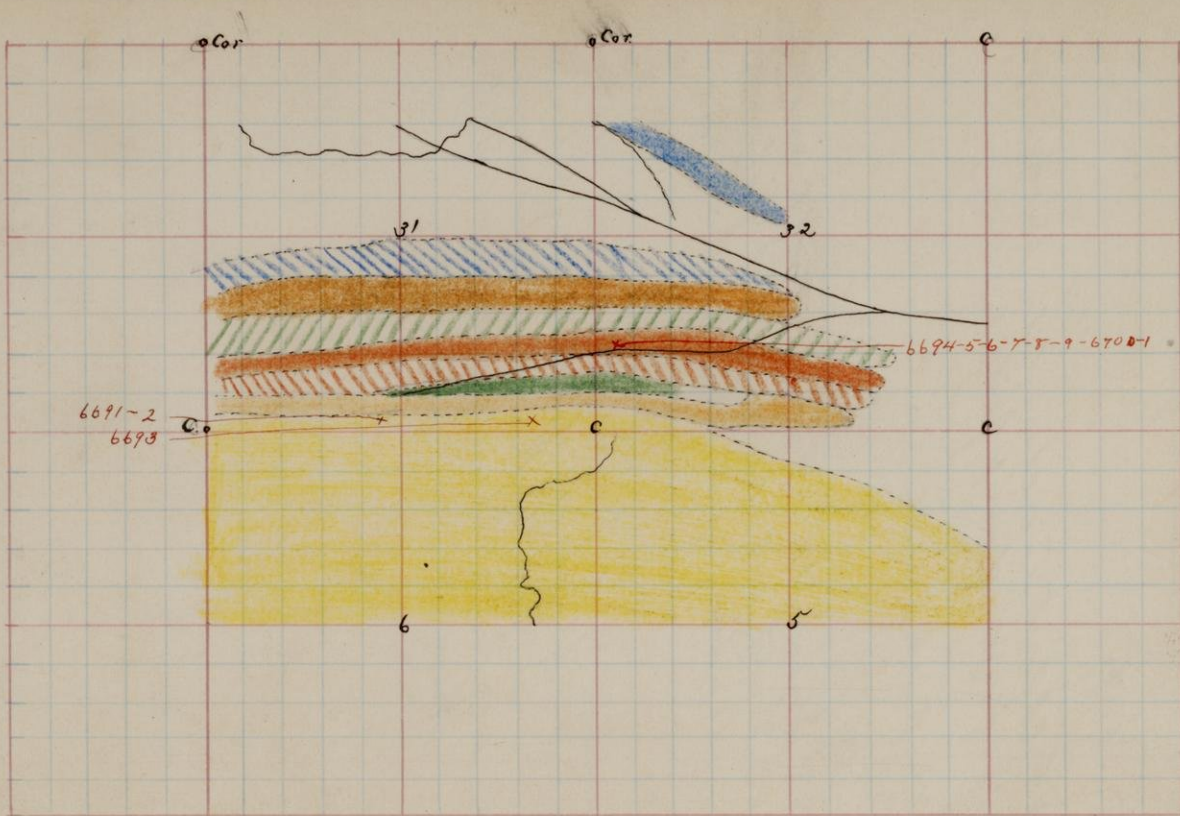
6690

From exposure a short distance
South-west of 6688-89, S.E. $\frac{1}{4}$
Sec. 19, T. 48 R. 31, Bandings
across strike much contorted,
thus -

Sec.

T.

R.



Champion

Aug. 29. 1883.

- 6691 Gneiss, from one of numerous low rounded glaciated knobs which are plentiful for a long distance both North and South and East and West in the South $\frac{1}{2}$ of Sec. 31, T. 48, R. 29.
- 6692 Gneiss - finer grained than 6691 and alternating with it in same exposure, S. E. $\frac{1}{4}$, S. W. $\frac{1}{4}$, Sec. 31, T. 48, R. 29.
- 6693 Granite. From a different knob from above situated in S. E. $\frac{1}{4}$, S. E. $\frac{1}{4}$, Sec. 31, T. 48, R. 29.
- 6694 Ferruginous quartz schist. From South (foot) wall of open pit of Champion Mine. Strata almost vertical, the high dip being toward the North.
- 6695 Lean ore near North Wall, varies into

Champion Con't

6696}

6697}

Of which there is an layer about
two feet thick, and then
comes

6698

Quartzite, and two feet farther
North is found a layer of

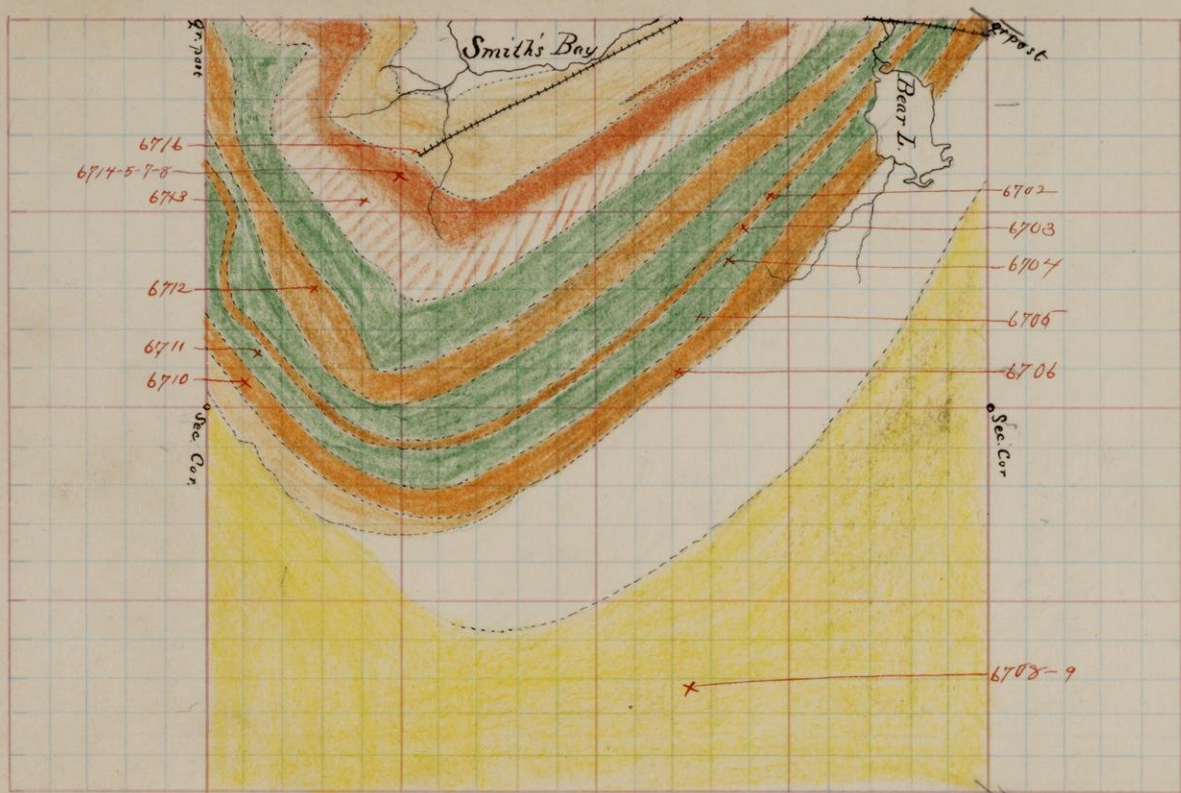
6699}

6700}

and beyond this layer of
six inches is

6701

Quartzite again. The layers
of 6699-6700 and 6701 then continue
alternately, such changes
being seen in a distance of
ten feet across the strike.



Republic
Aug 30, 1883.

- 6702 Ferruginous Jasper Schist, S.W. $\frac{1}{4}$ N.E. $\frac{1}{4}$ Sec. 7, T. 46, R. 29. A short distance to the South-east walking across the strike we find
- 6703 Ferruginous quartz schist, S.E. $\frac{1}{4}$ N.E. $\frac{1}{4}$ Sec. 7, and beyond this in the same direction
- 6704 Greenstone in mesh, which continues for some distance, A short way beyond the greenstone there is no exposure, but the next rock seen is
- 6705 Greenstone, again. Continuing to walk, we find
- 6706 Ferruginous quartz Schist in the extreme S.E. $\frac{1}{4}$, N.E. $\frac{1}{4}$ Sec. 7.
- 6708 Gneiss, from low exposure in
 6709 S.E. $\frac{1}{4}$, N.W. $\frac{1}{4}$, Sec. 8, T. 46, R. 29, Specimens were taken from a single exposure, but a range of such knobs extends from the above place in a North West direction

Republic. Cont.

- 6710 Ferruginous quartz schist,
S.E. $\frac{1}{4}$, S.E. $\frac{1}{4}$ Sec. 7, T. 46, R. 29.
North-west of here is found
- 6711 Greenstone, and still farther
to the North-west
- 6712 Ferruginous quartz schist
- 6713 Ferruginous jasper schist.
S.W. $\frac{1}{4}$, S.E. $\frac{1}{4}$, Sec. 7.
- 6714 Ferruginous jasper schist.
Foot wall of one of the open
pits of Republic Mine.
- 6715 Ferruginous jaspery quartz schist.
Hanging wall of above pit next
to ore.
- 6716 Quartzite, Hanging wall of
same pit a few feet back
from ore.
- 6717 } Rich ore from stock pile,
6718 }

