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Marquette Range: east of Eagle Mills. No. 152 1893

Bayley, William Shirley, 1861-1943

[s.l.]: [s.n.], 1893

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U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

9-891

Marquette Range
W. S. Bayley

LAKE SUPERIOR DIVISION.

INSTRUCTIONS.

1. Ordinarily at least two pages of this book will be devoted 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 number attached, showing the direction and amount of the dip. Denote a shaly or other very plainly bedded ledge by right parallel lines, and a ledge having a secondary structure by wavy parallel lines running in the direction of the strike, with dip arrow and number attached as before. The greatest care must be taken to avoid confusing slaty or schistose structure with bedding, and in all cases where there is the least doubt about the true bedding direction, indicate it by a query. 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 spaces between the blue lines as 100 paces, and twenty of these spaces to one mile, or 2,000 paces. Usually the southeast corner will be placed at the bottom of the page, or at the first black 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 the map may be turned around and the north placed at the left-hand side of the page. The ruling of the left-hand pages is also arranged so that, if desirable, a larger or a smaller scale can be used, eight inches, two inches, one inch, or one-half inch to the mile. With the two-inch scale, the squares outlined in black represent sections, and those in red, quarter sections and "forties," while the space between the blue lines is 200 paces.

2. On the right-hand page place the notes descriptive of the exposures. Begin in each case with the number of the specimen, placing the number on the left-hand side of the red line, after which give in order on the right of the same red line the position of the ledges as reckoned in paces from the southeast corner of the section and the dip and strike when observable, the latter always being expressed from the north; for instance 4025, 250 N., 300 W., *Strike, N. 78° E., Dip 50° S.* Then follow with a full description of the ledge. When topographical maps are used for locations this paragraph applies only in part.

3. Collect a specimen from every ledge, or wherever there is a change of rock on any one ledge, taking care to get fresh material, unless for a special purpose the weathered surface is desired. In case of trips made on foot or in canoes, for long distances, neighboring ledges, unquestionably of one kind of rock, need not be specimened. The position and extent of the ledges not specimened should be marked on the map, with notes that each is of a rock identical with specimen so-and-so. Under the same conditions small-sized specimens, trimmed to a uniform size of $2 \times 2\frac{1}{2} \times \frac{1}{4}$ inches will be allowed, but in all other cases *large-sized specimens*, trimmed to a size of $3 \times 4 \times 1$ inches, must be selected, in accordance with section 3, chapter IV, p. 44, Regulations of the U. S. Geological Survey. Specimens should not be placed together without protection in the collecting bag, as the fresh surfaces, important in determining the character of rocks, are thus destroyed. They should be damaged by no temporary mark, but the numbers should be at once marked in at least two places upon the inclosing paper or cloth bags. Specimens may be permanently marked in camp by painting the numbers upon them in white upon a black background, using Silver White and Ivory Black oil tubes for color, with turpentine as a diluent.

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, sketches, cross sections, etc.

5. Forward this note book as soon as filled as registered mail matter to C. R. Van Hise, U. S. Geologist, Madison, Wis.

Book #152

Bk 2

Marquett Range

E of Eagle Mills

July - Aug 1893

N. S. Bayley

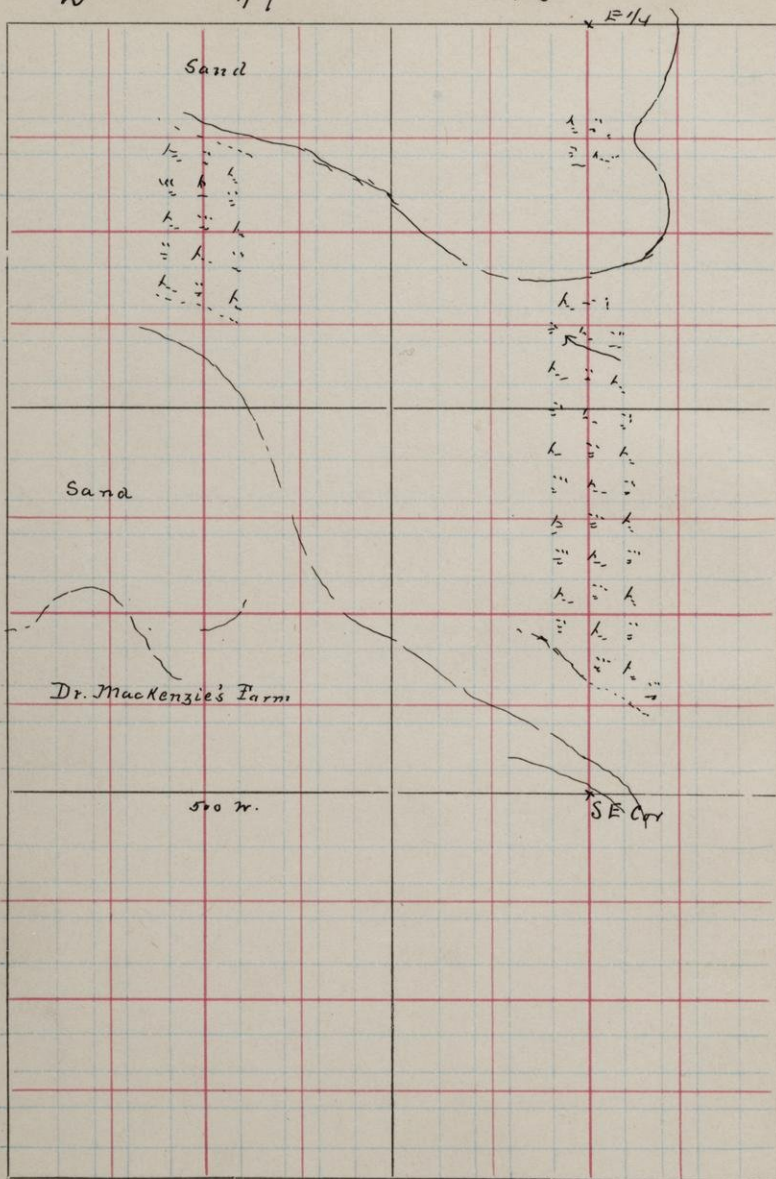
Chas Oley

G. W. Smith

S. 2

T. 47

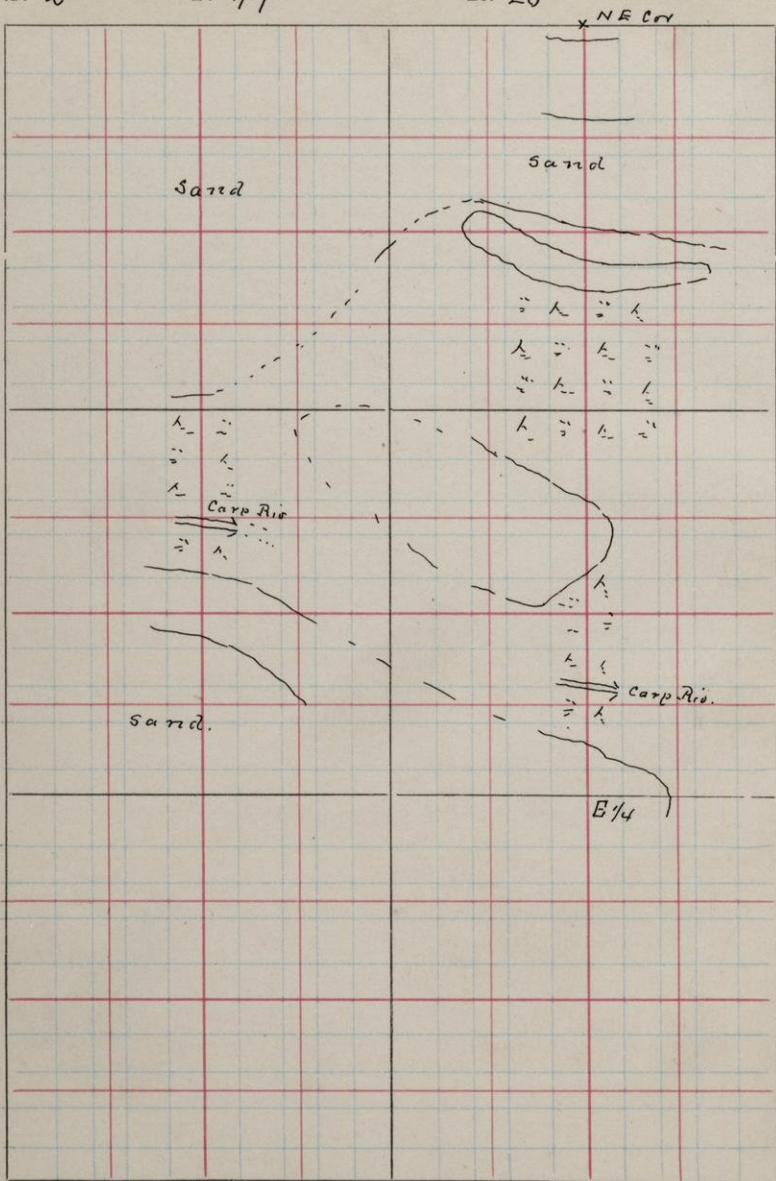
R. 26

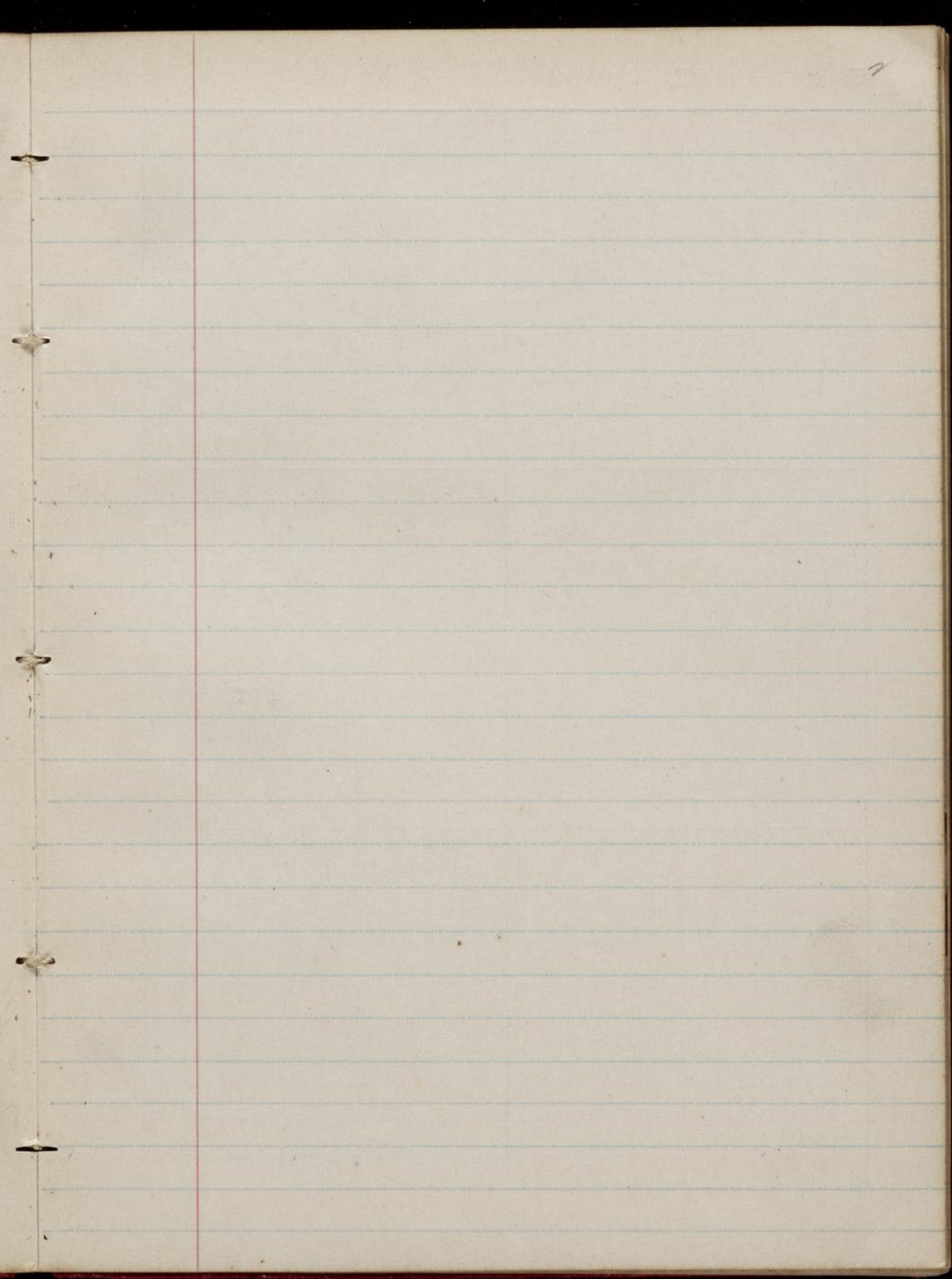


S. 2

T. 47

R. 26





S. 35

T. 48

R. 26

E 1/4

20-764
Slates
↓
60

Sand

Sand

Sand

Sand

Sand

Sand

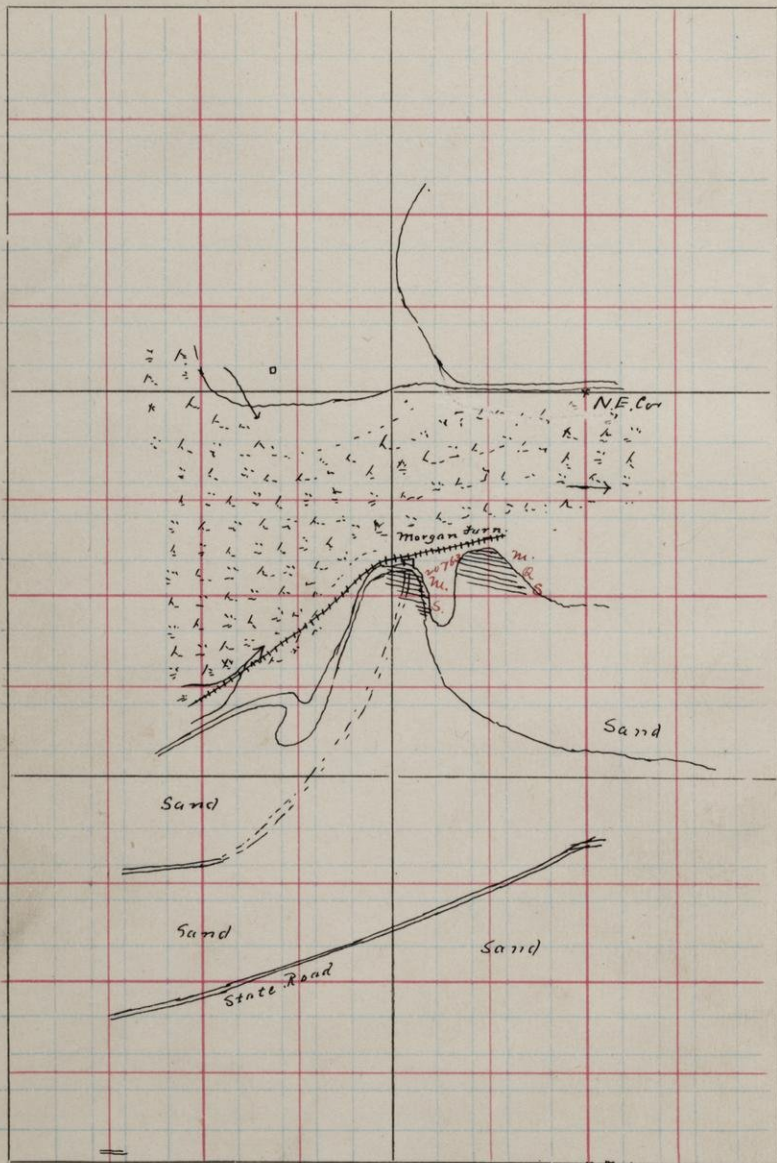
S.W.

S.E. Cor

S. 35

T. 48

R. 26



July 25/93

Ran north from S.E. Sec 2 to N.E. cor
Sec 35 in T 48 R 26, then west 500
paces and S.

The country is generally well covered
plains and glacial ridges. From under
these there occasionally peep a few
ledges

207636 see also 20764

207646 At 900 ft. 760-850 W of S.E. cor Sec 35.
48-26 is a small knob of slates of
a dark gray color, evenly banded
and schistose, with strike of schistosity
parallel to the bedding, which is
marked by narrow bands of limonite.
The strike is N. 15° W. and dip, 50° S.
while dip of schistosity is about 75-80° S.
N. 13. There is a duplication of number
20764. Please change one of them.

At 1725-50 N of S.E. cor Sec 35.
105 W. is an exposure of slates,
quartzite and marbles belonging
with the Goose Lake Marble Series.
The series strikes W. 15° N. and dips
nearly vertical, perhaps being inclined

5

slightly to the south. The slates are
to the south; these are then followed
to the north by a 2 ft. wide band of
quartzite, showing false bedding,
and this by pink marble. Exactly
like Goose Lake series.

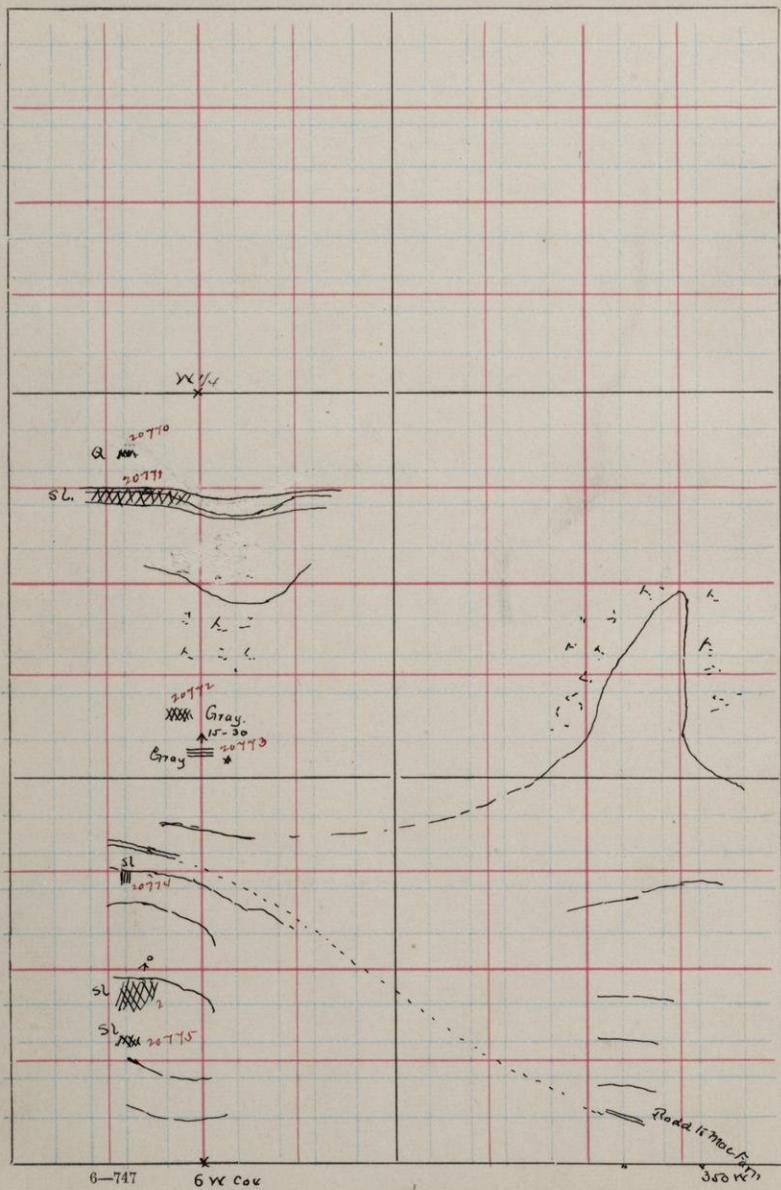
20763b Back of the Morgan Furnace the slates
and marbles are beautifully ex-
posed, but since Clements specimen-
ed the ~~west~~ side of the hill, only one
specimen of slate was taken from
the east side.

U. 13 Cf. this slate with 20764 b
see whether or not latter is a mem-
ber of the Marble series.

S. 2

T. 47

R. 26



July 26⁶

20765

20766

20767

20768

20769

See after 20775

Drove point 350 W. of S. $\frac{1}{4}$ post Sec 2. 48-26 ran north to north line of section, crossing only sand plains and swamps.

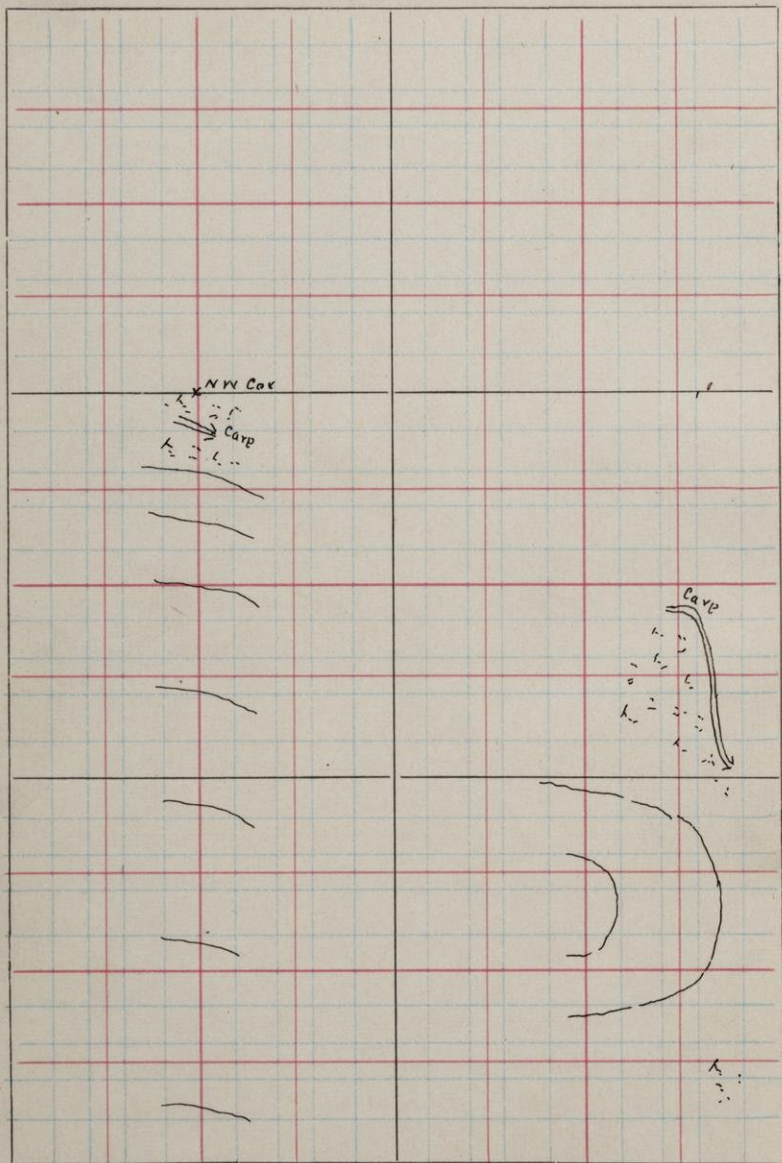
Continued run to greenstone north of N sec. line of Sec 35, finding swamps and sand plains continuing except for two ledges 20765 & 20766, until reach greenstone at 20769.

When reached north line Sec 35 ran west to NW cor S 35, then half a mile south to the W. $\frac{1}{4}$ post which is in a pond. Then west 450 paces and south to south line of section through swamps all the way south. Then went East on south line of Sec 34 to within 100 paces of East line of section and south in line 100

S. 2

T. 47

R. 26



6-747

NW

SE

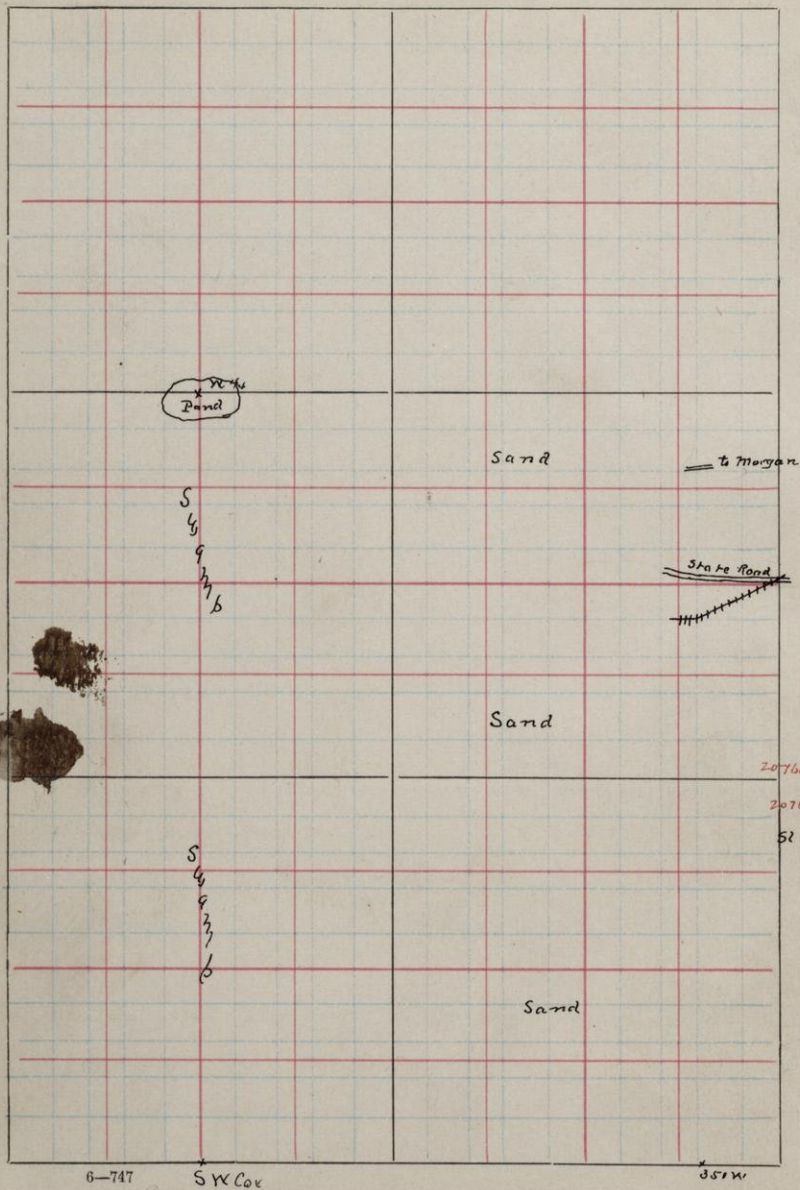
West of East line of Sec 3. to $\frac{1}{4}$ pt.,
then South on West line of Sec 2 to
S.W. Corner.

- 20770 At 75 S. 100 W. of $\frac{1}{4}$ p. Sec 2-48-26.
is a small ledge of quartzite from top
of the hill.
- 20771 At 150 S. 100 W. of same $\frac{1}{4}$ S. on the South
Trav of the hill which is so steep as to
be almost perpendicular, is a continuous
Exposure of slates in loose pieces. The
rock is undoubtedly in place, but
the strike and dip could not be de-
termined here.
- 20772 At 425 S. 20 W. of $\frac{1}{4}$ p. Sec 2, is a
little knob of gray wacke that is
quite massive.
- 20773 And at 465 S. on the line is a ledge
of conglomeratic-like gray wacke
whose dip is to the North at 15° - 30° .
- 20774 At 600 S. 100 W. of $\frac{1}{4}$ p. Sec 2, is a
small ledge of banded slate, that fur-
ther west has been ruined for ore.
The rock here strikes N. 85. but is evi-
dently contorted.

S. 35

T. 48

R. 26



52
20766-8
52
20765
52
28

4

Near the top of the hill it is flat lying and at

20775 850 ft. 100 W of the W. $\frac{1}{4}$ p. Sec 2 it is flat lying

20763f At 425 N. 225 W. of S. $\frac{1}{4}$ p. Sec 35 There is a small knoll of slate to the south and west of a larger hill. They strike W. 15° N and dip 28° S. Their schistosity = strikes with the bedding but dips 55° S.

N.B. Duplicate of 20765. Change one.

The west end of the hill East of the knoll above mentioned is at 540 ft. 150 W of S. $\frac{1}{4}$ p. of Sec 35.

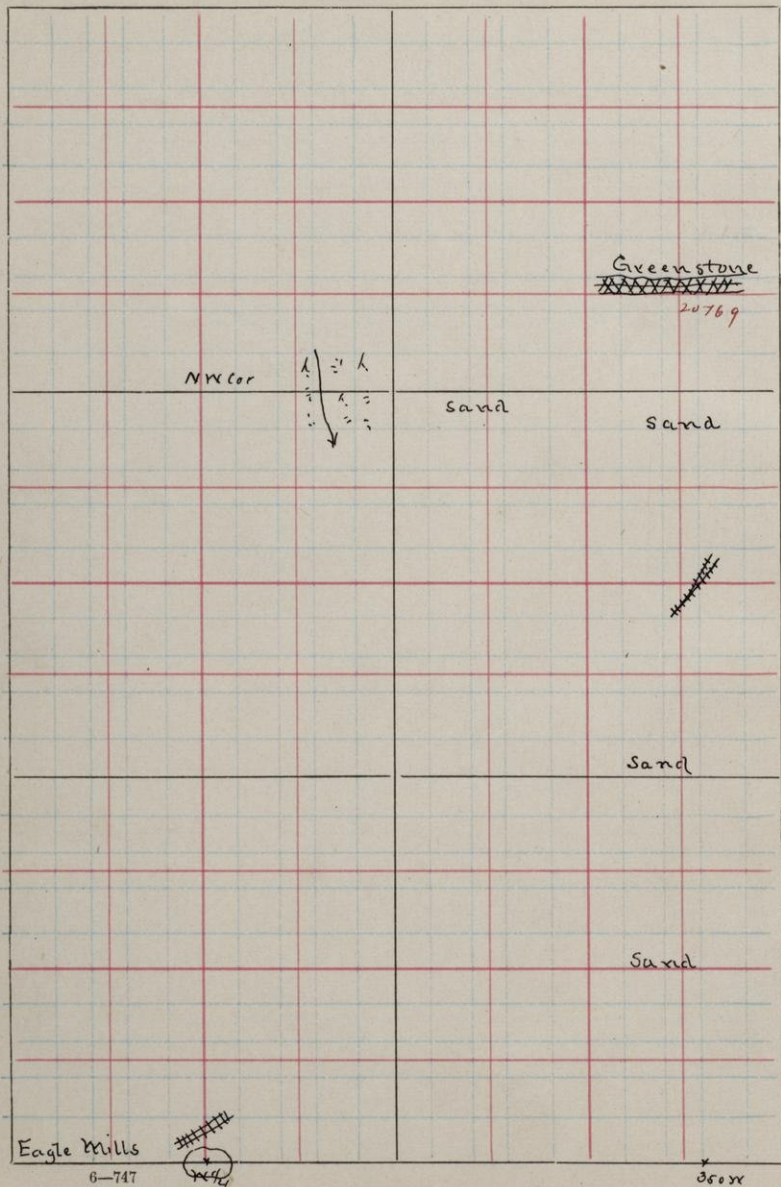
It consists here of the same slates, which change their strike and dip as though forming a plunging anticline. The strike of the schistosity is here, as before, 15° N of W. but the strike of the beds in places is 15° W of N. and their dip to the west. In other places the dip and strike is as before.

The anticline is a local one, with an axis plunging to the west (15° N of W) and dipping 15° in this direction.

S. 35

T. 48

R. 26



About the middle of the ledge is a 4-5 ft. band of breccia and conglomerate with same matrix as the slate containing pebbles of quartzite, quartz, slates and chert. It seems to be a band interbedded with the slates. It certainly does not mark a break in the slate series.

20766 Specimen of the weathered surface showing pebbles

20767 Pebble of jasper.

20768 Pebble of slate

20769 Greenstone schist from south side of bluff 350 W. 125 N. of U 1/4 p. Sec 35. Schistosity strikes about 20° W. of W. and dips nearly vertically.

S. 34

T. 48

Sand R. 26

SE
1/4

Eagle Mills.

State road.



S
6
9
3
P

Swamp

Carp

Swamp

SE
Gr

July 27

9

Ran north in Sec 3 - 47-26, beginning at point 250 W. of S.E. cor.

At north line of sec went 500 W and then south to south line.

At 230 N. 250 W. of S.E. cor Sec 3 on the north side of the top of a hill are broken fragments of the banded ferruginous scales, like those found further East.

At 225 N. 200 W. their strike was found to be E. 70 S. and dip 25° S.

20446 At 360 N. 230 W. is a small pit in what looks like gasper and actinolite scales. The rock seems to dip S.

20447 450 N. 250 W. is the top of a hill of scale that looks very much like the upper scales.

20448 At the base of the hill on its north side has been sunk a pit from which a little ore was taken.

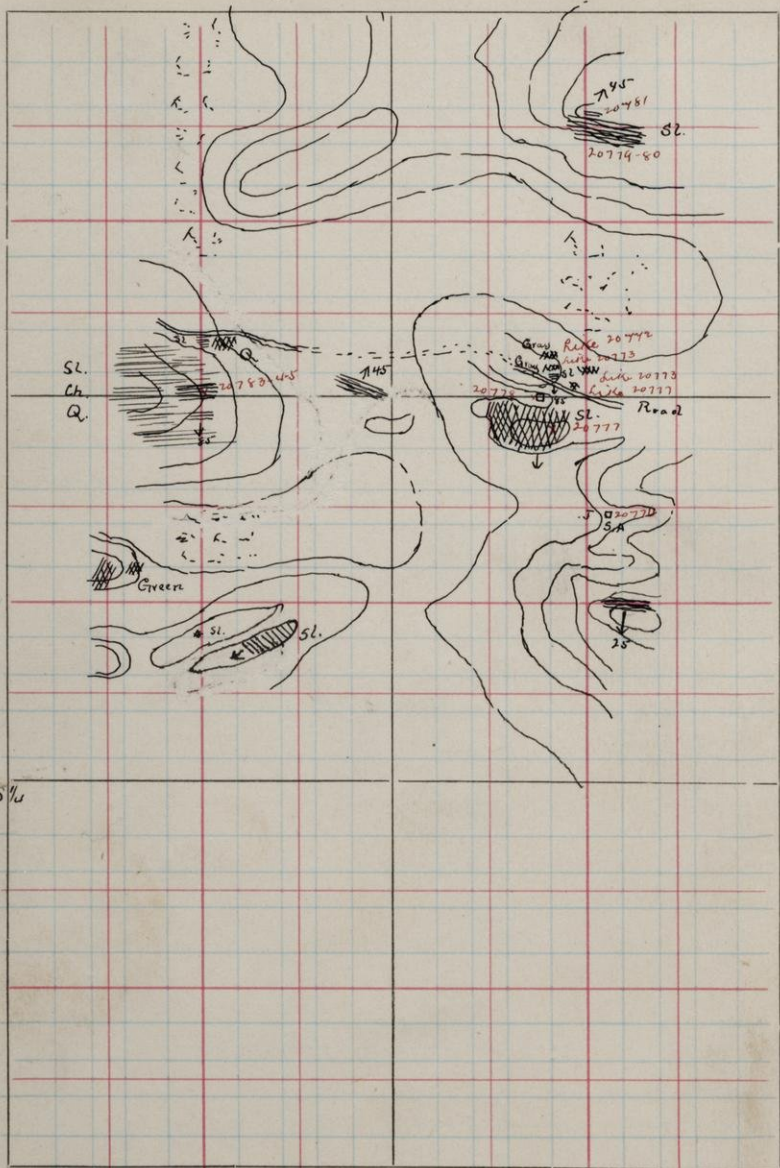
Just south of the pit, is a small drift.

S. 3

T. 47

R. 26

E/W



S/W

SE/W

into the hill. In this are exposed the
slates and some chert beds - all striking
N. 30° S. and dipping 30° S.E.

At 528 U. 295 W. of S.E. cor. Sec 3
is another ledge of the same slates.
Their schistosity and slaty cleavage
are parallel. Strike EOW and dip
of beds 85° N. Locally the beds are
conglomeratic and brecciated.

U.B. are these the same beds that
are brecciated and conglomeratic
in Sec 35-48-26 [U.S. 20466-7-8]?

20449, At 859 U. 250 W of ^{the} S.E. cor. Sec 3. cross
20480 western Extension of the from which
took specimen 20441. The ledge of
slate here strikes N 10° W and dips
45° W.

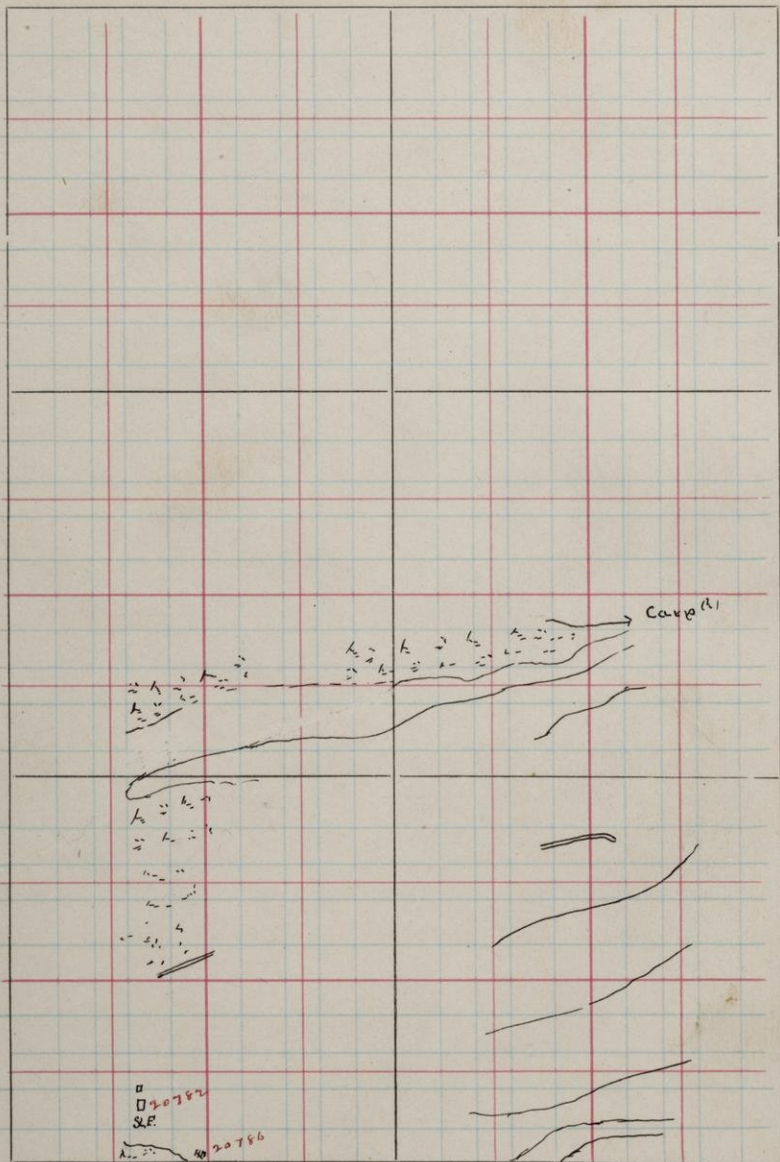
20781 At 859 U. 250 W of S.E. cor Sec 3 is
the top of the Escarpment. The same
slate is observed here but it is more
sandy than elsewhere.

20782 1100 U. 632 W of S.E. cor Sec 3.
Small pit in ferruginous slates.

S. 3

T. 47

R. 26

NE
(or)□ 20787
S.E.

20786

G-747

E/W.

July 29.

At 530 W. 520 N of S.E. cor. Sec 3
is an outcrop of slates on the South
slope of a hill. Their strike is N. 5° W.
and dip about 45° W. Just above it,
to the north is a thin bed of massive
quartzite.

At 750 W. 500 N of S.E. cor. Sec 3.
is the East end of a slate bluff
with rock striking 5° W of W and
dipping nearly vertically. The
predominant rock is a ferruginous
slate, with which is inter-
banded layers of white-quartzite
and chert.

20783 Chert

20785 Quartzite

On the South side of this hill the
Exposures are abundant. Their dip
here is high but is inclined slightly
to the South.

At 600 N. 700 W. of S.E. cor. Sec 3, on
N.E. side of the hill the white-weather-
ing quartzite or graywacke occurs

To the west a few paces is the conglomeratic shale, which in this place contains a large fragment of quartzite.

- 20786 At 1020 N. 750 W of S.E. cor. Sec 3. on the north side of the Swamp is a small ledge of schistose red rock, enclosing a large boulder-like mass of quartzite, which may be simply an unaltered piece of 20786.
- 20787
- 20788 1984 N. 1650 W. of S.E. cor. Sec 3. Knob of quartzite on north edge of Swamp.

Running south from 20788 find on the hill south great outcrops of greenstone.

- 20789 750 N. 1625 W. of S.E. cor. Sec 3. Greenstone from near top of hill.
- 20790 675 N. 1625 W of S.E. cor. Sec 3. Massive greenstone on S. slope of hill.

At 604 N 1625 W. well down on the south side of the hill the massive

S. 3

T. 47

R. 26

NW 1/4



porphyritic greenstone ends and
in its place are found many large
blocks of a finer greenstone, which
on its weathered surface shows
plain marks of flowage. They ap-
pear as fine parallel lines of
light and dark gray. By the lines
it would seem that the rock had
flowed around massive pieces
of the same substance.

In some places the lines seem to
be narrow bands of slate and
quartzite rather than of Diabase.
20791 Shows a fine and coarse band. It
is this variety that looks fragmen-
tal.

20792 is of the denser kind that ^{shows} flowage
lines on the weathered surface

at 230 N. 750 W of S. E. cor Sec 3
on top of a long narrow hill is a
ledge of blue slate. @

At 167 N. 750 W of S. E. cor. Sec 3
on the East end of another hill South
is a 50 ft. square ledge of slates. They
are the red and blue banded kind

14
Something like the marble slates,
They dip S.W. The strike of the schisto-
is is 30° S of E.

S. 12

T. 47

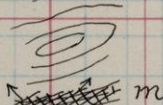
R. 26

NW Cox

NW Cox.



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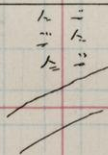


NW

6-747

20794 NW

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Q. 100

Q. 100

Q+SL

20601-2



SL

20800

SL

20799

SL

SL

SL

July 31

Starting from N.W. cor. Sec 12. T47
R. 26, Smith & Bayley ran south a mile
then East two paces and North.

Smith did geology, Bayley located.

20793 At 380 S. 20 E of N.W. cor Sec 12 is a
low ledge of massive quartzite on
top of the hill. It runs 100 paces S.
and is 50 or more paces wide.

20794 At 1000 S. of N.W. cor Sec 12 - 47 - 26.
is a large exposure of marble, form-
ing the South Escarpment of a steep
hill. Dip N.W.

20795 1400 S. of N.W. cor Sec 12.
On the west side of another hill are
several more exposures of marble
that evidently belong with the Loose
Lake Series.

20796 1780 S. of N.W. cor Sec 12.
Ledge of interbedded red slate and
marble. Strike E & W. Dip, 40° N.

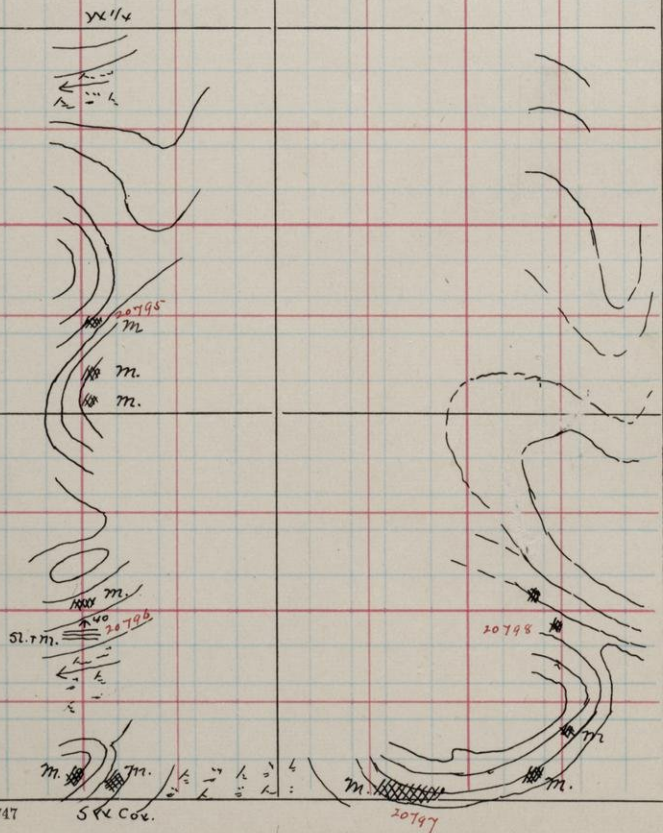
20797 1100 E. of S.W. cor. Sec. 12. Marble

S. 12

T. 47

R. 26

W 1/4



SW Cor 6-747

SE Cor.

20797

20798 240 U. 620 E of S.W. cor. Sec. 12.
Marble

20799 1233 U. 666 E. of S.W. cor. Sec. 12.

Ledge of slate in S. slope of hill.
Strike E, 30° - 40° S. Dip. 15° N. E

20800 1384 U. 600 E of S.W. cor Sec 12

Black slate, Dip and strike of
bedding not obtained. Dip of schis-
tosity 80° N.W.

20801 1552 N. 600 E of S.W. cor Sec 12.

Quartzite interbedded with slate.
Strike N 5° S. Dip 50° N. The quartzite
bed is at least 10 ft. in thickness

20801 Quartzite

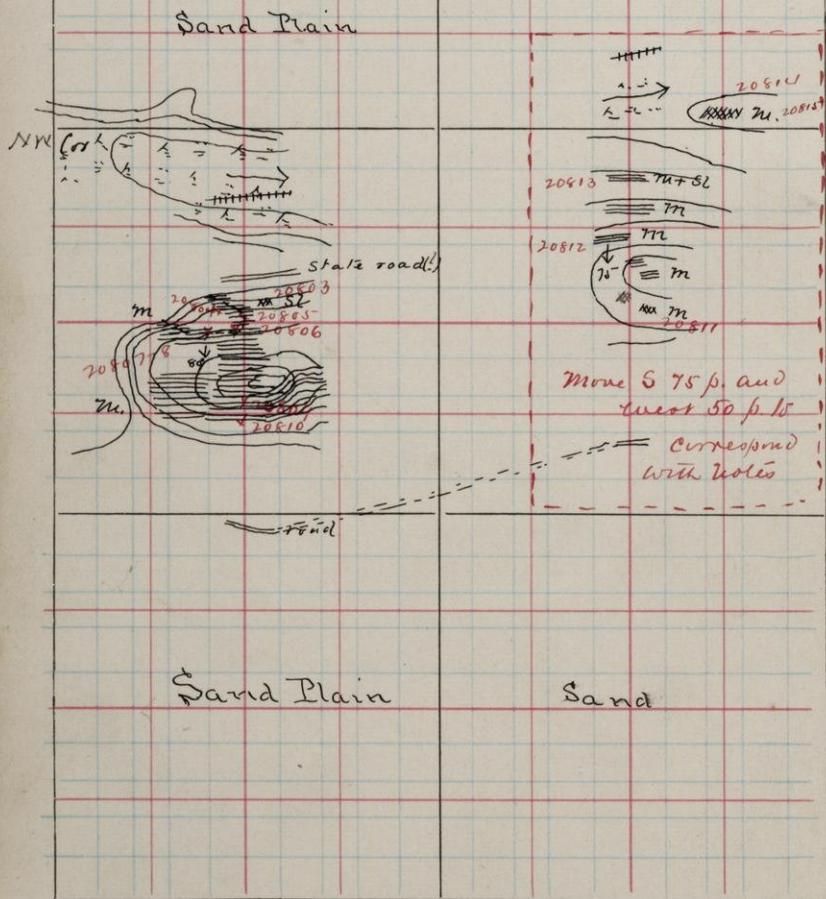
20802 Slate

1637 U. 600 E of S.W. cor 12.

Thin quartzite

1750 U. 600 E of S.W. cor 12

White quartzite?



Aug 2. 19

From N.W. Cor Sec 36 - T48 R26 ran
250 paces E and South in line 250
E of W. section line. [Smith & Bailey]

20803 At 213 S. 240 E of N.W. Cor Sec 36
is small ledge of slate at the bot-
tom of the hill south of swamp.

256 S. 250 E of N.W. Cor Sec 36.
is the N.E. corner of a quarry in
the Goose Lake marbles where the
relations of the various beds may be
well seen. At the north side and
along the south wall of the quarry
the rocks dip about 75° to the S and
strike E. 5° N. There are beds of

20804 fine grained marble of a red col-
or, that is interbedded with a

20805 marble that has which large red feld-
spars are disseminated. This ap-
pears as a narrow band not
more than six inches thick. It
is usually evenly bedded but oc-
casionaly is contorted

20806 Further south occur cryptocrystal-
line dove colored marbles

S. 36

T. 48

R. 26

N 1/2

Sand plain

Read's Road

Sand

Read's Road

Sand plain

Sand

Sand

Sand

On the East side of the quarry at one place the bands are contorted and bowed into folds that are sometimes Synclines and sometimes anticlines, often one above the other.

Do not think the series are overturned, but believe them to form a regular series in which a few beds are locally contorted.

- 20807 On the South side of the quarry the pink marble is again found, and along what seem to be slipping planes there has been developed a slaty phase of the same rock. Probably a shear slate.

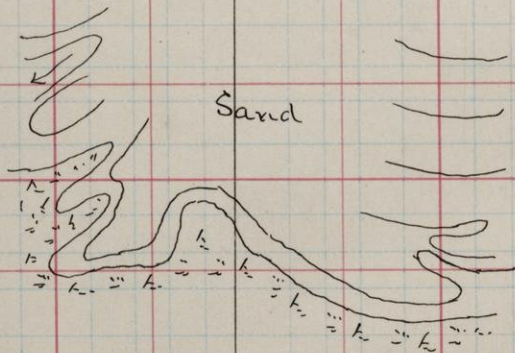
- 20809 358 S. 255 E of NW cor Sec 36
Low ledge of light pink massive limestone on top of hill.

- 20810 394 S. 254 E. of NW. cor. Sec 36.
On the South slope of the hill is a dark slaty phase of the marble striking E. 5° N. A little to the East the bed becomes bowed with the

S. / T. 47

R. 26

N. W. Cor



N. W. 1/4

6-747

19

East side of the bow striking further North. But since further East in the East side of the top of the hill the normal strike again obtains, the bowing is here also regarded as local. Here the marble is cut by quartz veins

[Smith &oley]

Aug 3.

20811

1780 N. 715 E. J.W. Cr Sec 36

Small ledge of pink marble out-cropping in top of the hill with a strike N. 5° S. It is considerably much folded and stands on end. At 60 paces N and 15 West of this point there has been slight faulting.

20812

1785 N. 650 E J.W. Cr Sec 36

is another ledge of marble which here strikes N. 5° S. and dips 75° S.

At 1825 N. 700 E of J.W. Cr. Sec 36 is more marble with same strike and dip as before.

At 1855 N. 700 E of J.W. Cr. Sec 36

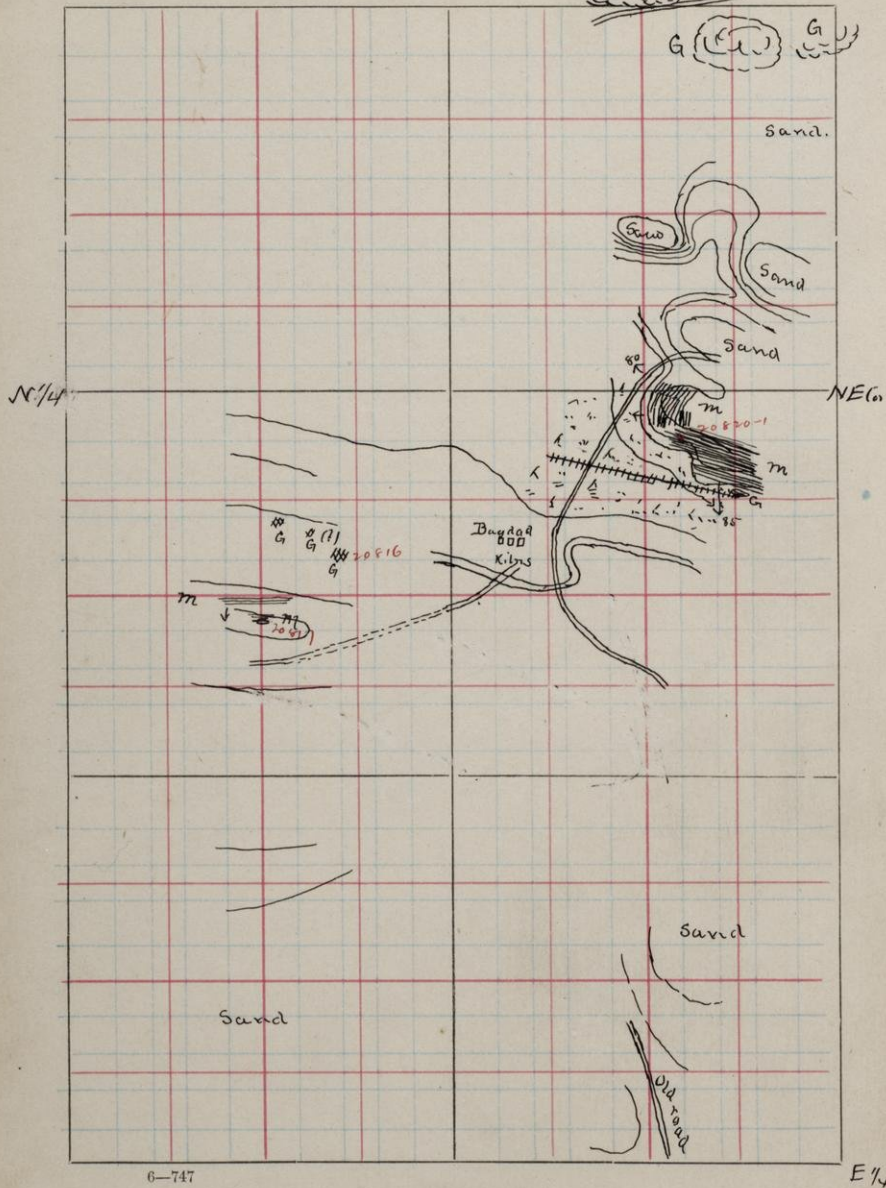
Marble and slate are interbedded

S. 36

T. 48

R. 26

R. 26 State Road



6—747

 $E \frac{1}{4}$

And the cleavage of the slate strikes
parallel with that of bedding.

20813 Specimen of slate?

20814 1935 N. 830 E of Twp cor Sec 36

is a large knob of black marble

20815 From same ledge 50 paces further
East.

At N. line Sec 36 went East to
1250 E of N.W. cor Sec, and then
South.

at 150 S. 1265 E of N.W. cor. Sec 36

and 190 S. 1350 E " "

are several masses of greenstone
that may be boulders. The largest
mass that at 190 S. was not rounded
and so Smith regarded it as a ledge.

20816 From this / Fine grained greenstone.

At 250 S. 1250 E of N.W. cor. Sec 36. on
North side of hill is a large exposure
of limestone, striking about E.W.
and dipping steep to South.

20817 300 S. 1250 E of N.W. cor Sec 36.

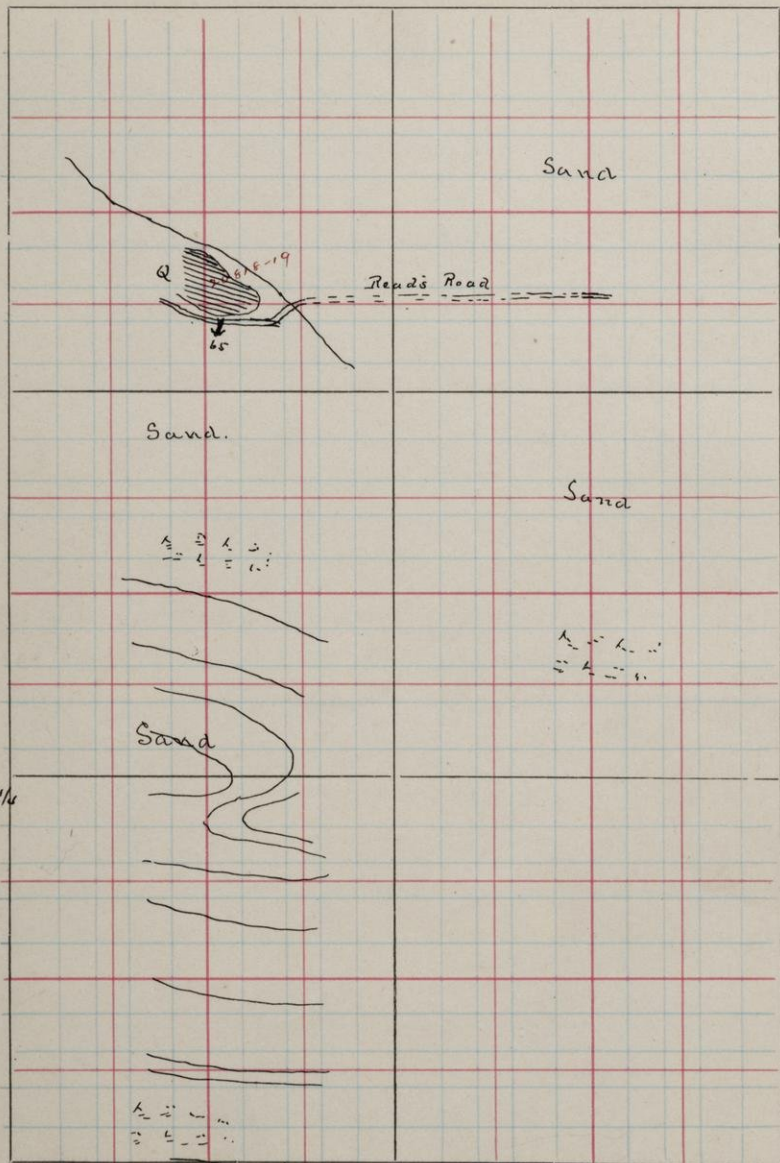
Pink marble from this ledge. A
little west of this point the rocks are

S. 36

T. 48

R. 26

E/W



0-747

Carp.

SE.
63°

Exposed in a 15-20 ft cliff in which the typical weathering of the Marble Series is shown clearly.

South of this point traverse Sand Plains to

20818

1310 S. 1250 E of N.W. cor. Sec 36.

Where there is a large exposure of brecciated quartzite, in the north

escarpment of a sand hill. The

quartz contains several bands of

20819

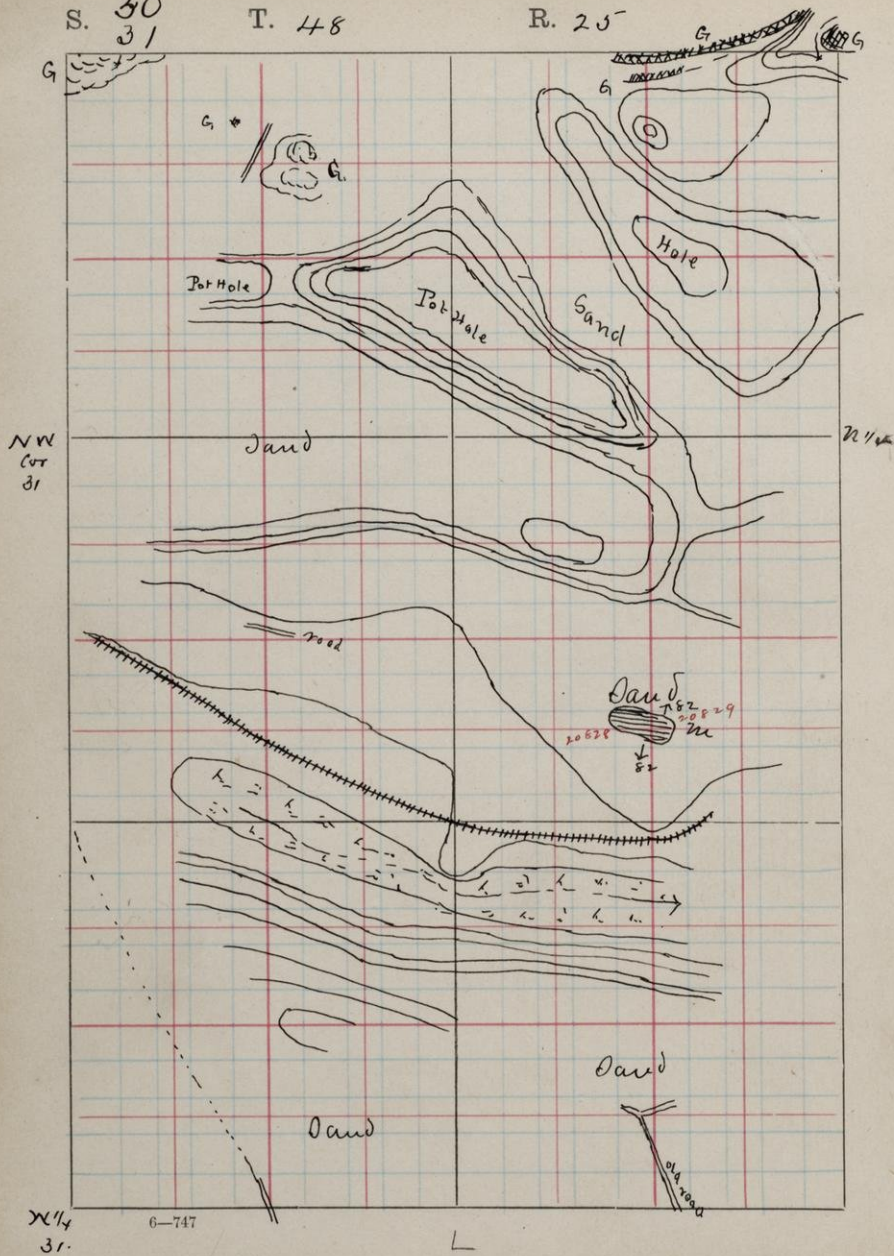
spotted rock, from which a strike of

N. 65° W and a dip of 65° S.W. is determined.

S. 30
31

T. 48

R. 25-



Aug 4/93.

Ran north on line 250 W of E. line
of sections 1 and 36 crossing the sand
plains without exposures until reach-
ed the north side Sec. 36. Here find
marbles in good exposures on line
with of stream.

At 1960 N. 200 W. of S.E. cor Sec 36.
is the west end of a series of marbles,
which to the east 100 paces or so, strike
N. 10° W. and dip nearly vertically.
At the west end of the hill where it
overlooks the Swamp is the end
of an anticline, with the strike of
the marbles surrounding its end
as follows 10 N of W, 40 S; and NE. on
its south side the rocks dip about
85° S. and on the N.W. side about
80° to the N.W. This would indicate
an anticline with a very steep
axis about E.W., with pitch about
80° W.

South of the Marble hill at its base
at about 1860 N. 125 W of S.E. cor Sec
36 is a very small ledge of schistose
gneiss with its schistosity about
parallel to the strike of the cleavage of

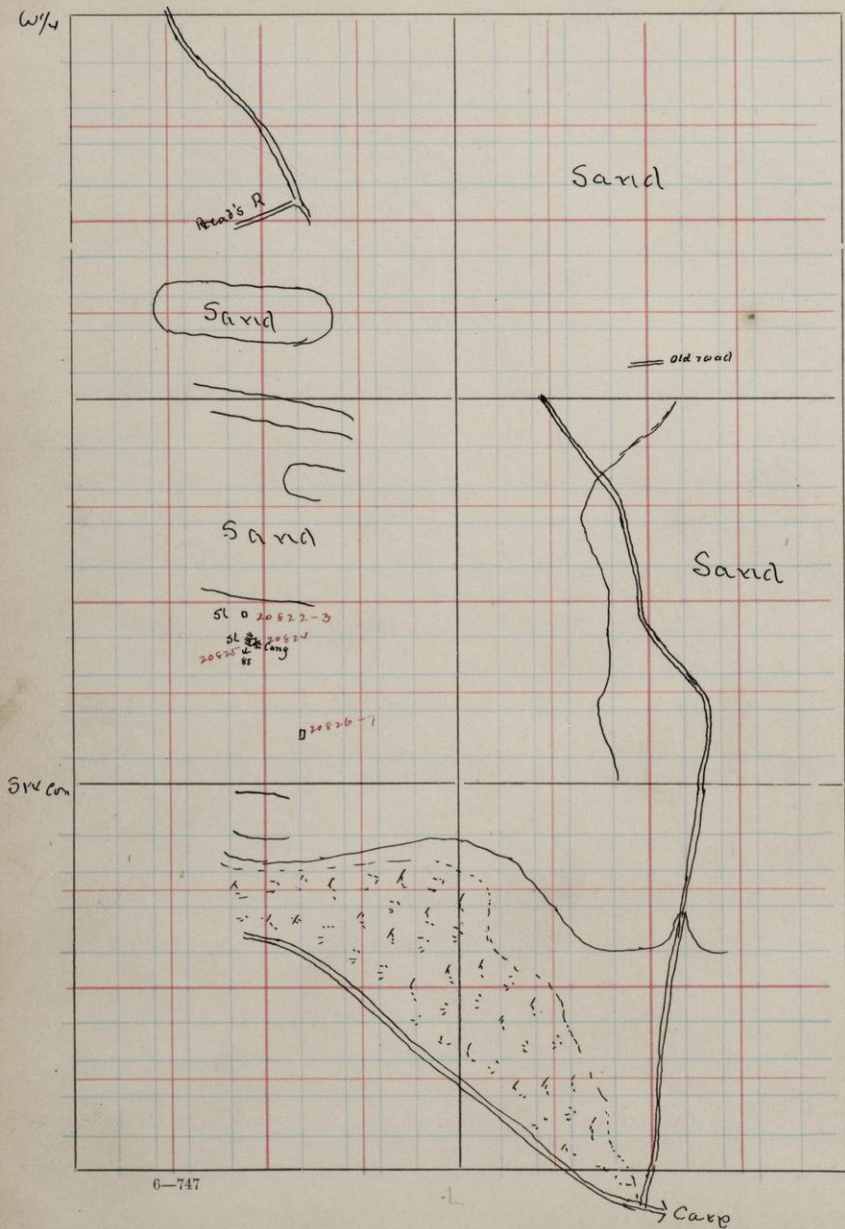
plat

S. 31

T. 48

R. 25-

W/4



The slates in the Marble Series. This greenstone is taken as a part of the basement in which the marbles lie.

20820 Marble

20821 Slate / interleaved at 1960 U. 190 W of S.E. cr Dec 36.

On the top of the hill, which is near the crown of the anticline the rock is brecciated forming a reibung's conglomerate?

Continued north to 500 U of S. line Dec. ²⁵ striking greenstone first at 500 U. 250 W. of S.E. cr. Dec 25. From this point run 500 E to 250 E. of W line of Dec 30. T 48 R 25 and south to Carp river.

Nothing but sand plains were seen until reached a couple of small pits at 230 U. 230 E of S.W. cr Dec 31.

20822 Here is a pit in black carbonaceous slates, with schistosity and bedding well developed. The beds are evenly bedded and are perhaps nearly flat in the pit. They may dip 10° to the W.

20823 Brown ore associated with the slates.

At 200 ft. 240 E of S.W. cor. Sec 31
 is a small trench with rocks exposed
 on both sides in small ledges. On the
 east side is an exposure of cherty breccia
 20824 or quartz conglomerate and on
 20825 the west side is a low ledge of slates
 striking 20° S of E. and dipping nearly
 vertically Nth S.

N.B. Probably place noted by Lawson
 as second evidence of unconformity,
 between Menard and upper series.

at 70 ft. 305 E of S.W. cor Sec 31
 is a deep pit with a large dump
 heap, in which are fragments of
 20826 ore and cherts, and
 cherts interbedded with a light
 20827 colored fragmental rock

The Jasper resembles the older ore
 Jasper.

Aug. 5.

Ran north from point in Corp mines
 750 E of W. line Rec 6 to 500 N of
 N. line Rec 30. over sand plains
 until reached a little hillcock at
 1630 N. 700-770 E of SW cor 31-48.25.

This is a small base knot of the
 marble series striking 5° N of W. and
 dipping on its South side 76° - 82°
 N. and on North side as much
 South. The predominant dip is to
 the north. The bedding is coarse and
 dips uniformly except at the west
 end of the hillcock where it strikes
 in all directions forming anticlines
 with axis dipping in all directions.

20828

is feldspathic marble from S.W. cor
 fledge

20829

White limestone from East end.
 Chert quartz is common as bands in
 the marble

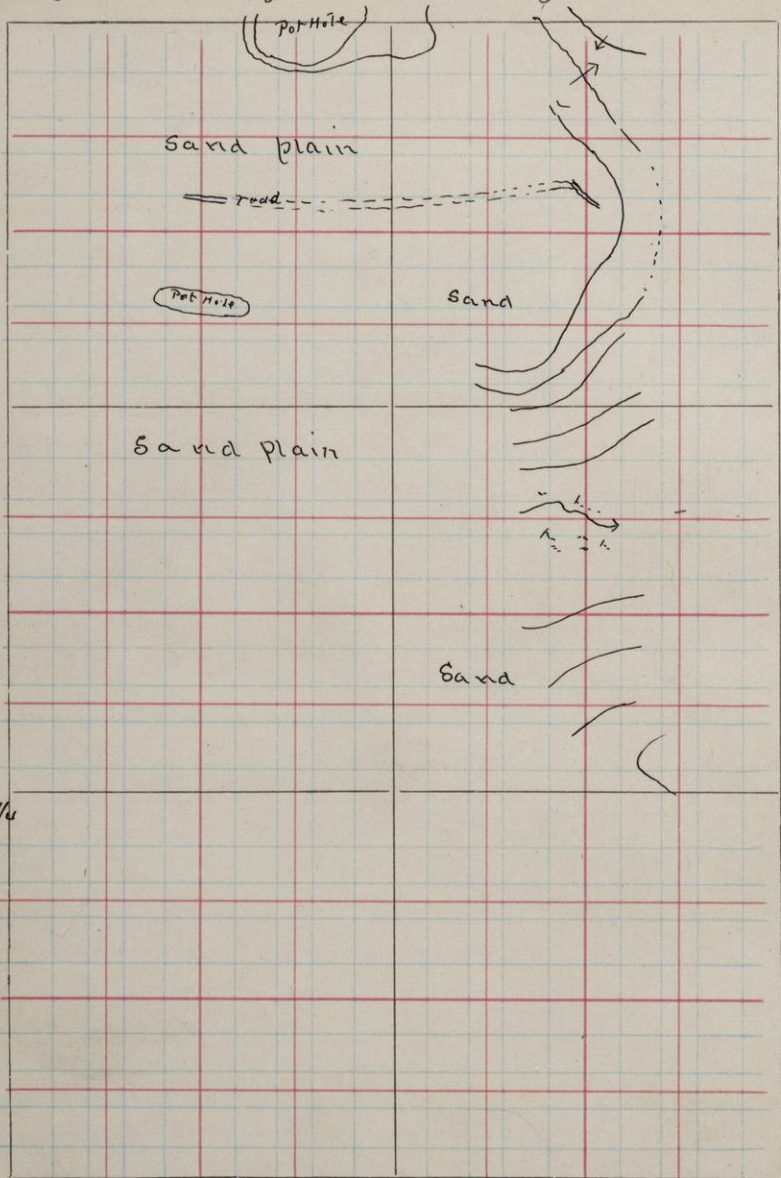
N.B. In notes hillcock is made an
 anticline while on map it is a syn-
 cline. Don't know which is correct.

S. 31

T. 48

R. 25

E 1/4



at 500 N. of N. line Sec 30 went
E. 500 paces to 1250 E of W. line
of sec. and South to Camp River.

On the run East passed under the
South face of a series of greenstone
ledges, and when left them struck
no more rock until reached a point
385 S. 795 W of N.E. cor. Sec. 31. where
is a small hill of the marble series
with the rock striking 5° S of E. and
dipping about 80° N. On the west end
of this knob the rock is contorted, but
could determine in this contortion
no regularity of structure. Anticlines
and synclines are common, but fur-
ther East the strike is uniform.

South of this knob rises the North
Escarpment of a higher hill, on
which the rocks are exposed for
300 paces or more. The rock is of the
marble series. It strikes uniformly
about 5° S of E and dips N. between
 75° & 85° .

20830 450 S. 700 W. of N.E. cor Sec 31

White marble

20831 Red slate interstratified with 20830.

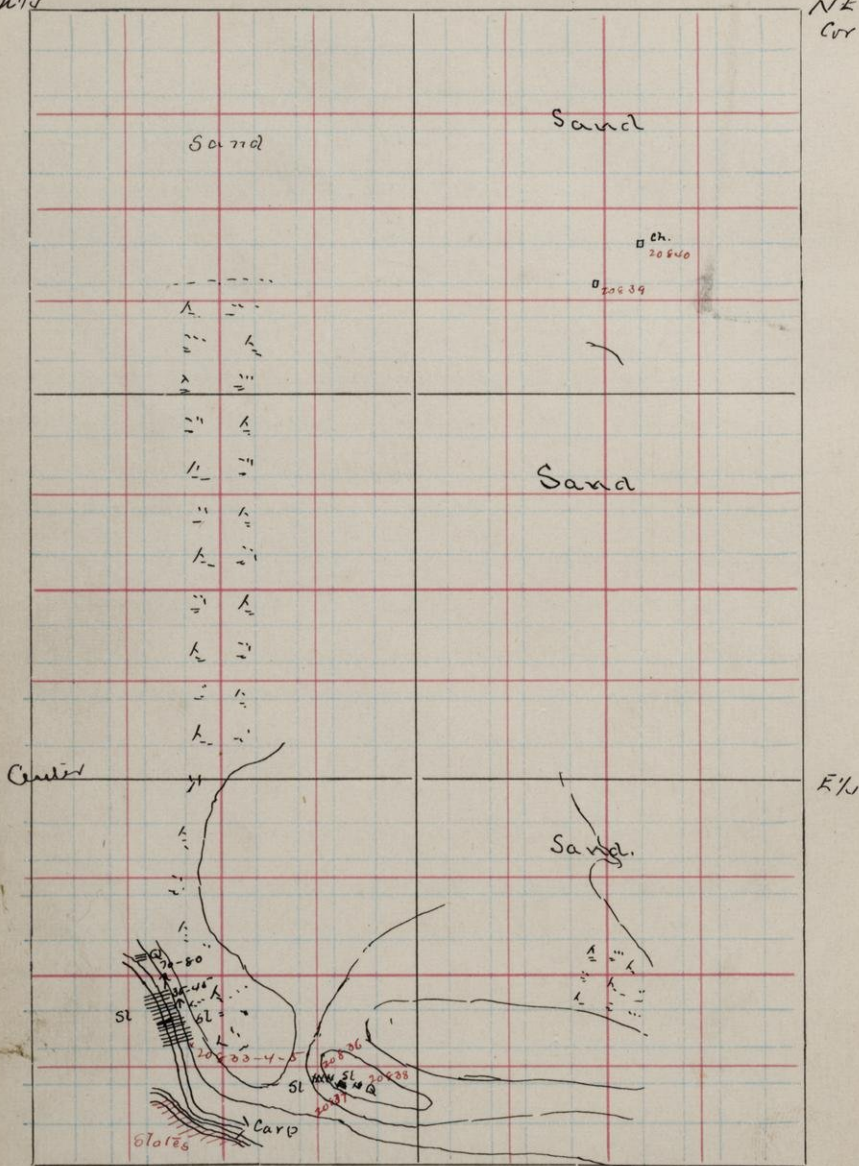
20832 Black slate, gashed with quartz veins.

S. 6
N 1/4

T. 47

R. 25

NE
Cvr



20 pages or so, South of 20831.

27

On the South side of the hill the
marbles and cherts are like the
Goose Lake series. They form an
escarpment overlooking the Sand
plains to the South.

There is the top of an overturned
anticline, with dip, in both sides
of the axis to the North. The beds
are crumpled badly so cannot
decide whether this anticline is
local or not.

No more rocks were seen in South-
ern course until reached the
Carp river at

1440 S. 750 W of N.E. cor Sec 6.

Where on the South side of the river
is a cliff of slates. Could not reach
this, but further west at

1340 S. 810 W of N.E. cor Sec 6.

where we find the stream falling
over a 5-6 ft. falls of the same
slates. These slates are very shaly
or oolitic. They are exposed for 100
paces giving splendid opportunities

for study.

At the East end of the Falls their schistosity appears to strike 2° N of E, and to dip vertically. At this place the bedding could not be detected, but at many other places both cleavage and bedding strike 15° N of E, with the former dipping nearly vertically and the latter from 35° to 45° N. Further up stream the dip of the bedding is steeper, reaching in some cases as high as 40° - 50° . At one place colored bands (which, however, do not require as bedding bands) are perfectly horizontal.

20833 The scales are black and blue.

20834 They are interstratified with gray bands, and occasionally with a

20835 layer of quartzite, which parts nearly at right angles to its bed.

The quartzite appears a little more abundant to the west, and its beds slightly thicker. At the upper part of the falls there is a lack of true slaty cleavage, while the bedding dips 55° N.

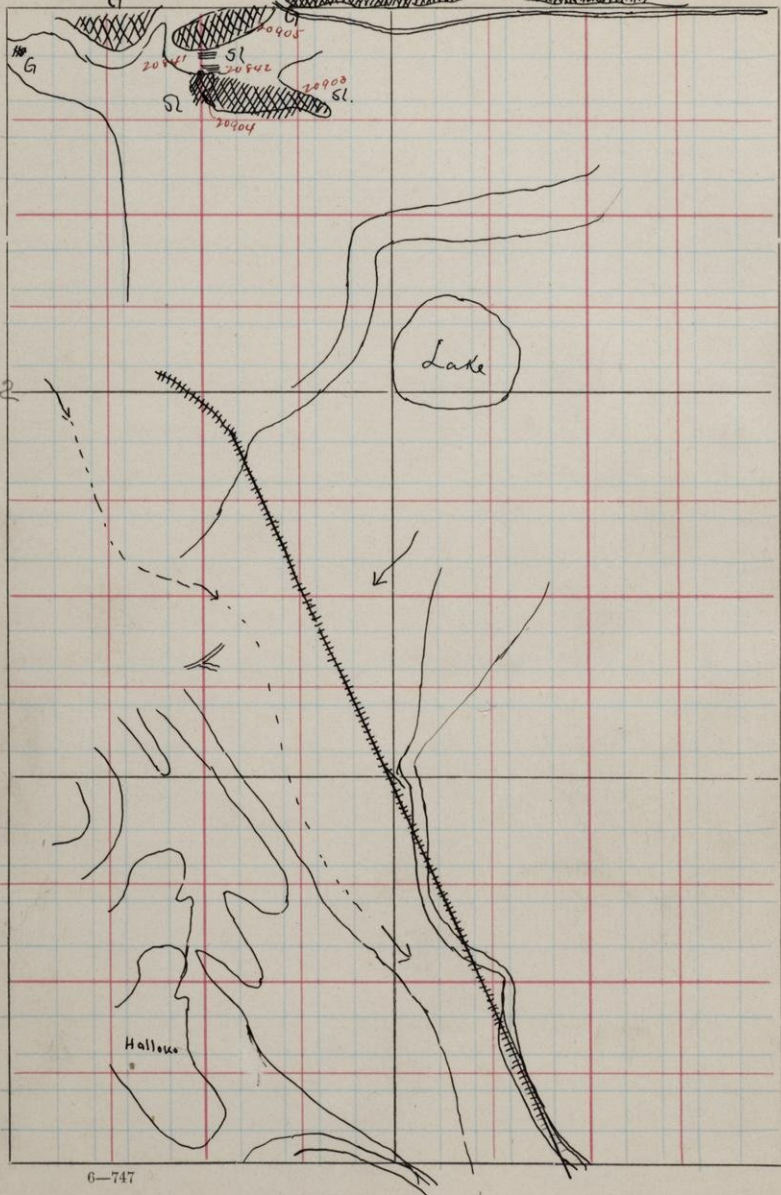
S. $\frac{29}{32}$ G

T. 48

G

R. 25 G

NE $\frac{1}{4}$ 32



Aug 7

29

[Smith Valley]

From Carp River, at a point 250
W. of E. line Sec 6 run north to
500 N. of S. line of Sec 30

Near the Carp, at 500-650 W.

1550-1600 N. of S.E. cor Sec 6 T47.

R. 25, is a small hill, from
which slates and quartzites like
those in the Carp, outcrop.

20836 At 625 W., 600 N. of S.E. cor. Sec 6
is an outcrop of dark gray slate on
the west slope of the hill. The strike
of the schistosity is $E 80^{\circ} S.$ and dip at
 $70^{\circ} S.$

20837 At 610 W., 590 N. of S.E. cor. Sec 6,
on the south slope of the same hill
the slate becomes reddened, and
it now contains small bands and
areas of quartzite. Ten feet East of
this outcrop a small one of gray
quartzite is found.

20838

S. 32

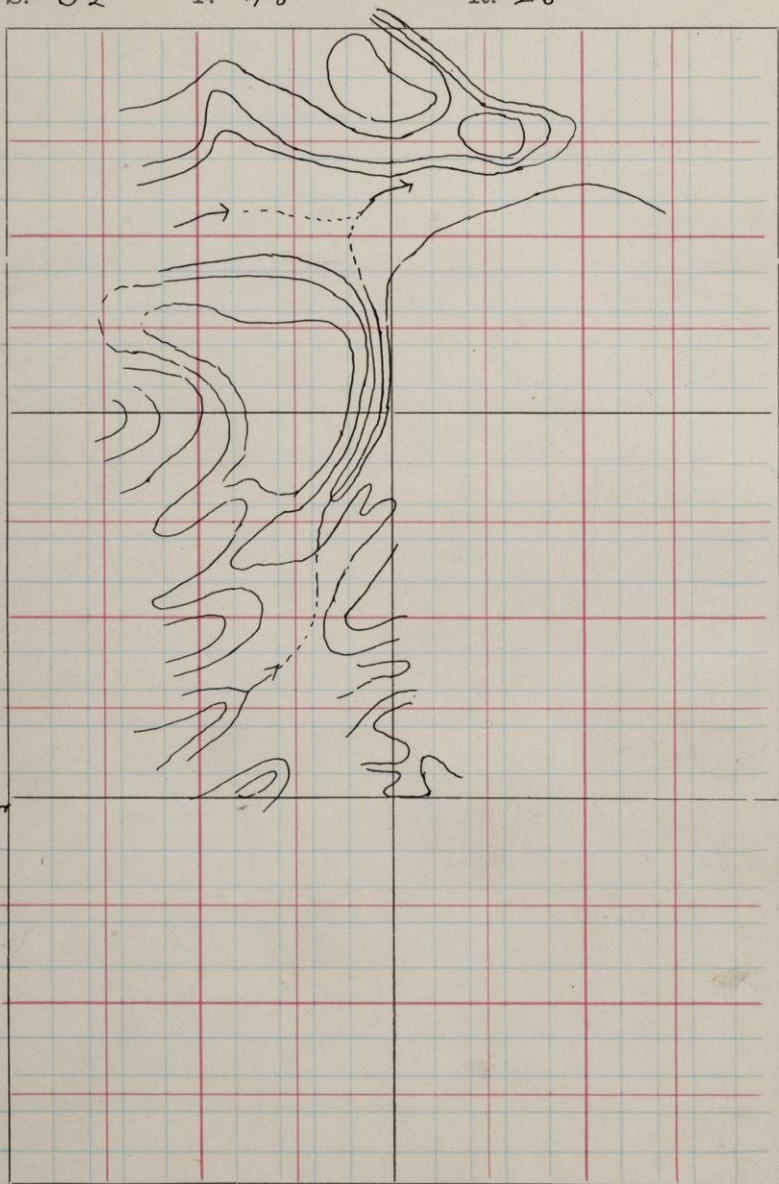
T. 48

R. 25

N.W.

S.W. Cor

S.E.



20839 At 260 W. 1650 U of S. E. cor Sec 6
is a small pit, from whose dump
heap, specimen was taken

20840 At 200 W. 1700 U of S. E. cor Sec 6
is another pit, in whose dump
heap are cherts and ore.

At 500 U of S. line Sec 30 run East
500 to 250 E of W. line Sec 29 and
South to Camp River.

The greenstones extend along the north
run all the way to turning point.

At turning point is a thrust of green-
stone schist that extends to 450 U. of line.

20841 } At 420 U. 250 E of S. W. cor Sec 29

20842 } just south of the greenstone, is the
north side of gray slate. Exposures. These
slates are sheared to such an extent
that it is difficult to detect their
bedding. The strike of the schistosity
is E. 5° S and dips very steep to the
south. Interspersed with the slates are
more quartzitic layers of more massive
material. Thin bands of the quartzite
have a strike, which seems the same

S. 5

T. 47

R. 25

NW Cor

NE 1/4

NE 1/4

to the north.

U.B. See Van Nise's notes on these ledges. Especially with reference to occurrence in them of pebbles which Smith overlooked, and which upon a visit to them with Smith on following day took the 'eyes' produced by shearing.

No other rocks were seen until reached Sec 5 - 47-25, where at 1550 N. 250 E of S.W. cor found small ledges of quartzite.

20843

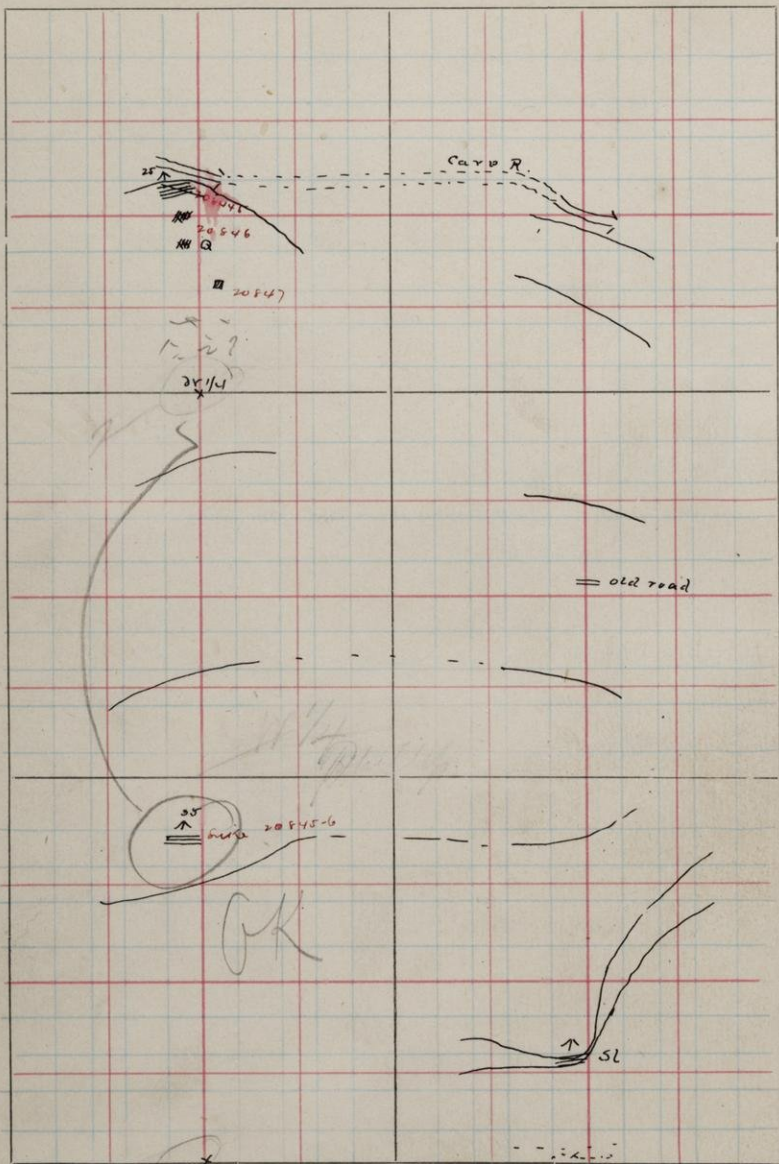
At 1500 N. 185 E of S.W. Cor. Sec 5 is a large ledge of red and spotted quartzite forming a knob. The ledge extends E 25° 60 paces and 60 paces.

Other ledges of same rock further S.

S. 6

T. 47

R. 25



G-747

SW Cor

Aug 8

32

[Smith & Oley]

Ran S. from Camp river starting at point 725 p. S of N.W. Cor.
Sec 6 - 47 - 25

Near the river is a moderately steep slope in which several exposures are to be seen

20844 725 S. ^{35° N} of N.W. Cor Sec 6
N

20845 10 Steps E of 20844 in the same ledge is a banded red and gray slate, which strikes (if the bands be taken as bedding) ^{20°} N 10° E and dips 25° N.

20846 Interbedded with the slate is a quartzite? and this rock appears to predominate in the southern ledges.

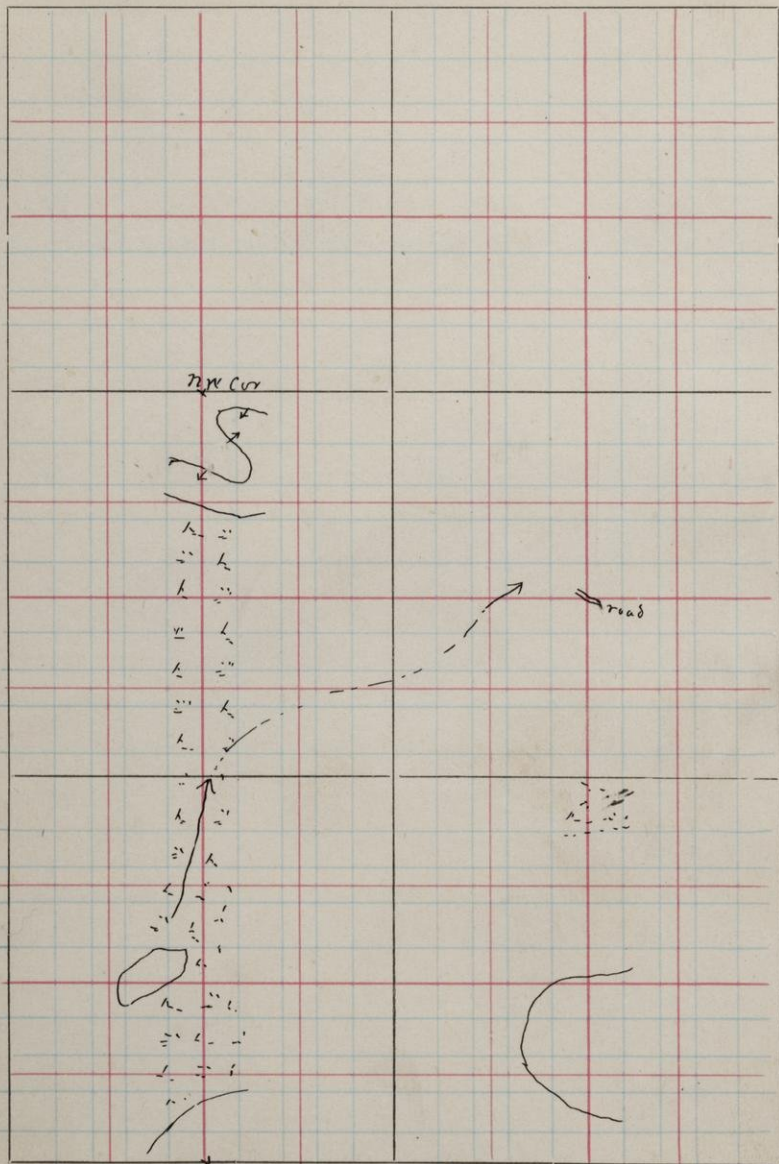
The strike of the schistosity of the slate is N of W and the dip steep to the north

20847 840 S. 20° E of N.W. Cor Sec 6 is a pit with red slate in dump.

S. 7

T. 47

R. 25-



1555 S. of U.W. Cr Sec 6 is an outcrop
of interbedded slate and quartzite
striking $N 5^{\circ} E$ and dipping $35^{\circ} N$.
Though this is general strike and
dip the beds are contorted to a slight
extent in places.

Continued S. along west line Sec
of S.W. Cr. ^{Sec 8} Then East 500 paces and
north.

No rocks were seen in Sec 7
until reached S. 1400, where mar-
bles begin.

20848 1400 S. of U.W. Cr Sec 7 -

Much weathered white marble

20849 1445 S. 15 W. of U.W. Cr Sec 7

Pink marble. Strike about $E 10^{\circ} W$,
dip about $30^{\circ} - 40^{\circ} S$.

20850 1510 S. $5^{\circ} E$ of U.W. Cr Sec 7.

Little precipitous ledge of dense,
hard, dark brown marble, striking
 $E. 35^{\circ} S$. Dip very low to N . In some
places $11^{\circ} N$.

20851 1575 S. 50 E of N.W. cor Sec 7
Pink marble

20852 1600 S. 75 E of N.W. cor Sec 7.

Interstratified marbles, one of which is like 20850 and the other a pink one. On the vertical faces exposed the pink marble seems to include fragments of the brown. [These are probably secondary chert nodules etc. W.S.B.]

5 Steps E of 20852 the same redations are observed between the two marbles, and, in addition, there is above the marble a fine grained shale, in which cleavage is now very marked.

20853

1790 S. of N.W. cor Sec 7

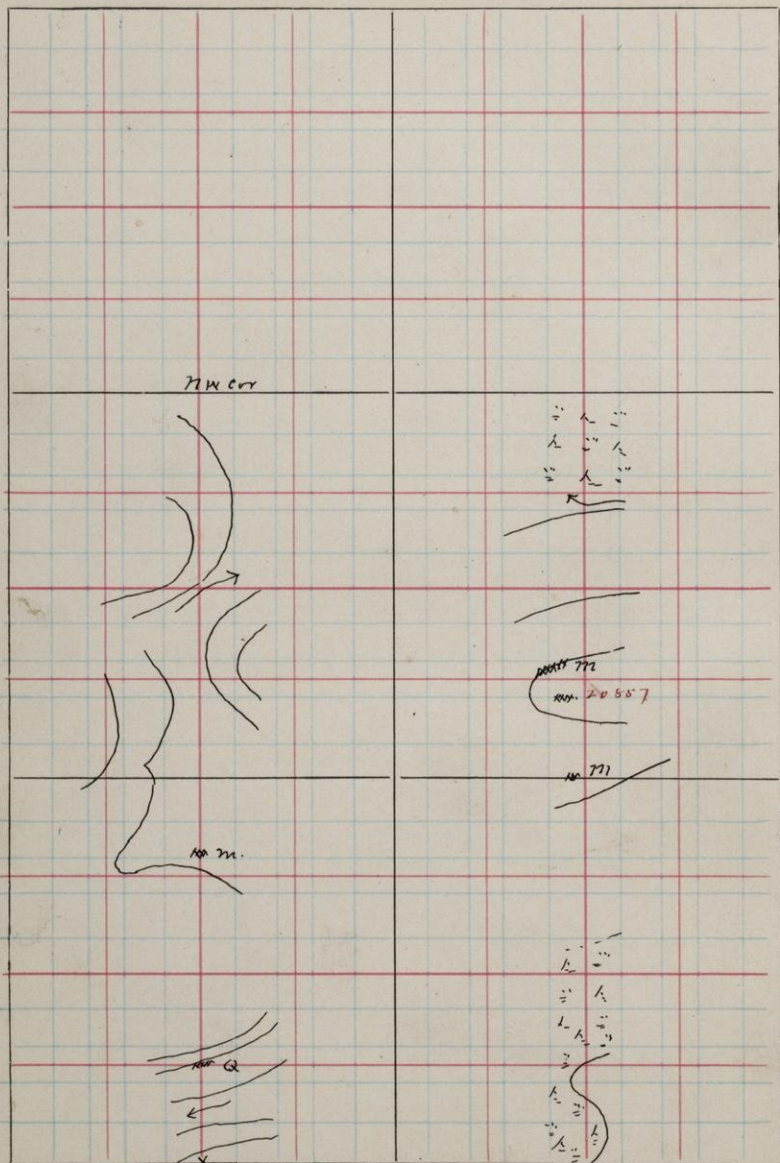
1820 S. " " " " "

Marble occurring in large blocks that have become loosened from hill side.

S. 18

T. 47

R. 25-



1850 S. of NW cor Sec 4 on South
Slope of hill, is a high ledge of
marble striking N 10° W and dip-
ping N. Slate also occurs inter-
bedded with the marbles. Its schisto-
20854 ily dip more steeply to the north than
does its bedding.

20855 At 315 N. 500 E of S.W. cor Sec 18
just north of sand plain is a high
cliff of massive red quartzite? ex-
tending several hundred paces
E & W. In places it is spotted and
has a conglomeratic appearance.
The specimen shows the spotting.

At 450 N. 500 E of S.W. cor. Sec 18.
Ledge of red quartzite with strike
E 25° S, dip, 35° S.

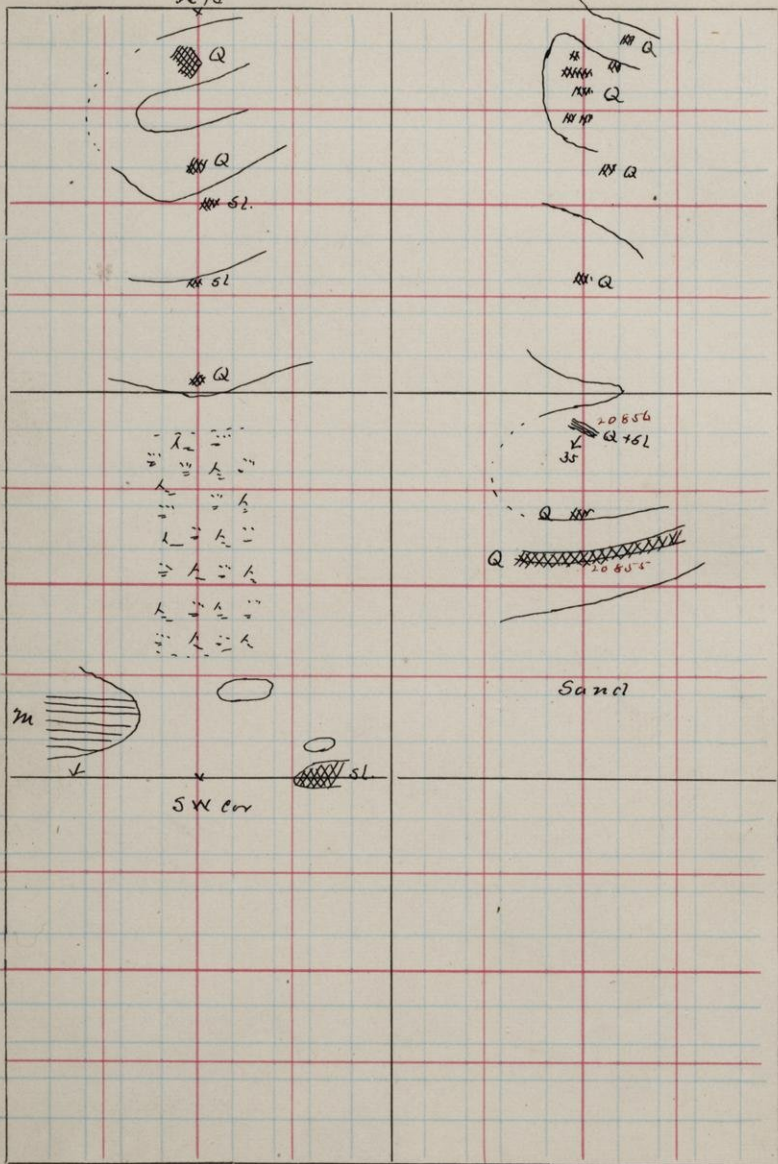
20856 Black slate occurs interbedded with
the quartzite, especially at the base
of the ledge.

N.B. Compare this black slate with
that at the base of the cliff showing
contact between the sand and

S. 18

T. 47

R. 25



upper quartzite, in Carp River.

At 660 N. 505 E of SW cor Sec 18.

Ledge of pink, massive quartzite.

800 N. 520 E of SW cor Sec 18

Red and spotted quartzite

20857 1640 N. 485 E of SW cor Sec 18

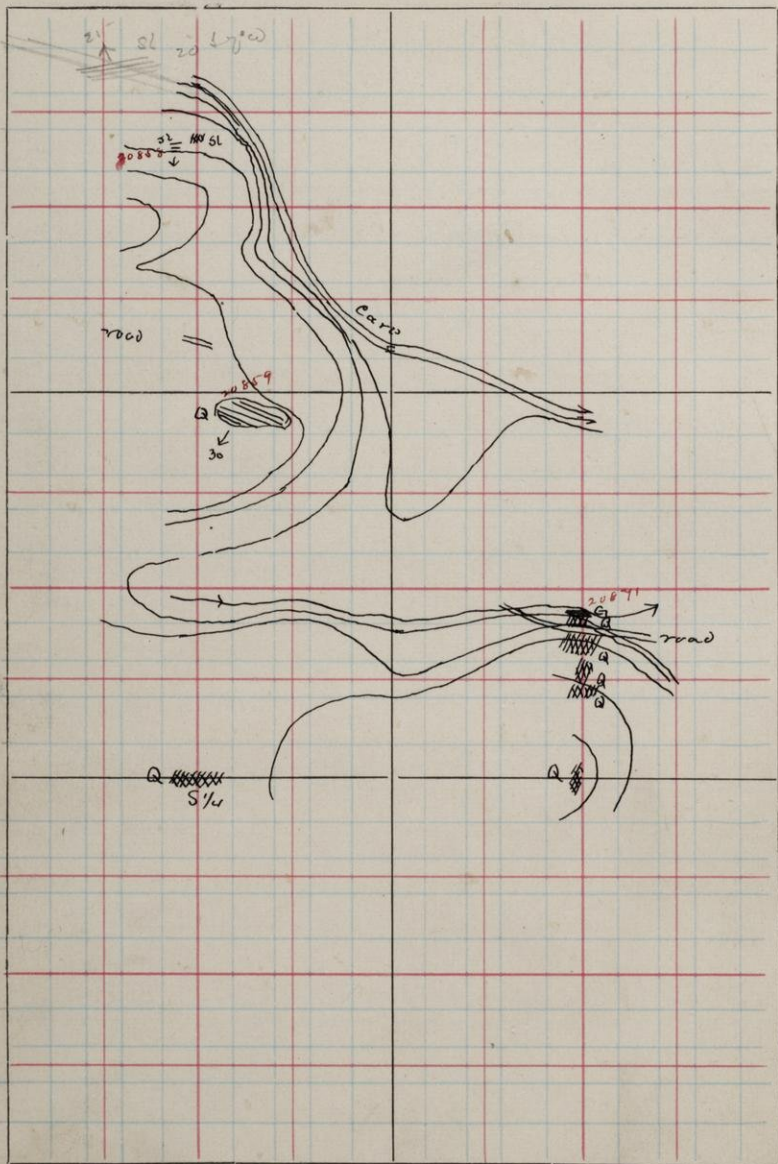
Small ledge of bedded rock on
O. side of same hill.

U.B Unfortunately, I fear, there
are not enough specimens taken
in this run to enable me to de-
cide whether the quartzite is the
upper quartzite, or that which is
interbedded with the pebbles.

S. 6

T. 47

R. 25



Aug 9.

From Camp river ran South on $\frac{1}{4}$ line of Sec 6 to S. $\frac{1}{4}$ p. Sec 18, then East 500 p. and north to Camp.

At 1165 S of $\frac{1}{4}$ p. Sec 6 - 47-25, on north side of the south of river, is a low ledge of red slates, which extends in a broken outcrop some distance E & W.

20858 At 1175 S of $\frac{1}{4}$ p. Sec 6 and 40 W. The slates are fairly well exposed. Their dip is probably south, but this could not be determined positively.

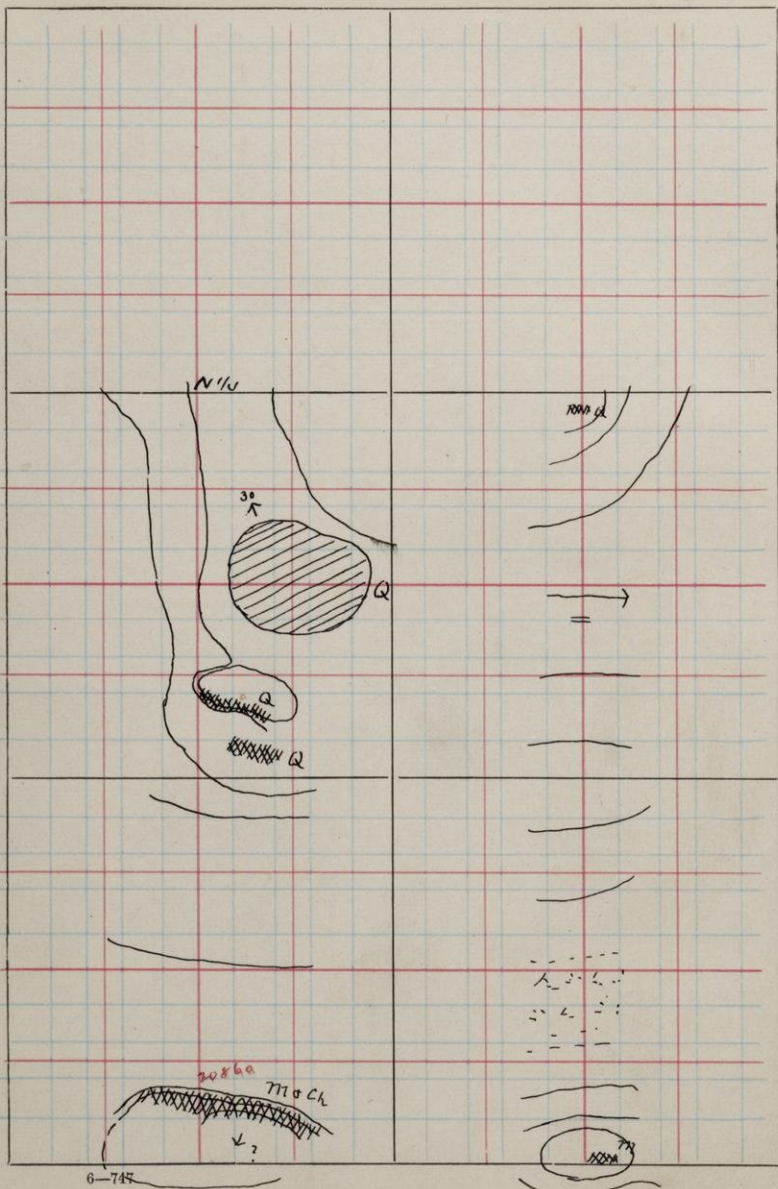
20859 1525 S. 20 E of $\frac{1}{4}$ p. Sec 6, is the west end of a little quartzite hill, that runs some 100 paces or more west. As is usually the case the rock is very massive, though it is thought that the dip of the layers is about 30° to the S.W.

At 225 S. 75 E of $\frac{1}{4}$ p. Sec 4 is the north side of another quartzite bluff. Here it was thought the dip was 30°

S. 7

T. 47

R. 25



in a direction 15° N of W.

20860 At 935 S. of $\frac{1}{4}$ Sec 7.

North side of large marble ledge, in which this rock is interbedded with chert. The whole mass is contorted, but the main dip seems to be south.

20861 1610 S. 130 W. of $\frac{1}{4}$ Sec 7.

Large knob of brecciated marble in which no dip, but strike could be determined.

20862 1650 S. of $\frac{1}{4}$ Sec 7.

Another ledge of marble is seen, in which are green bands striking 10° W of S. and dipping 25° E.

20863 210 S. 20° E of $\frac{1}{4}$ Sec 18, is a small north facing precipice of marble, with a southerly dip.

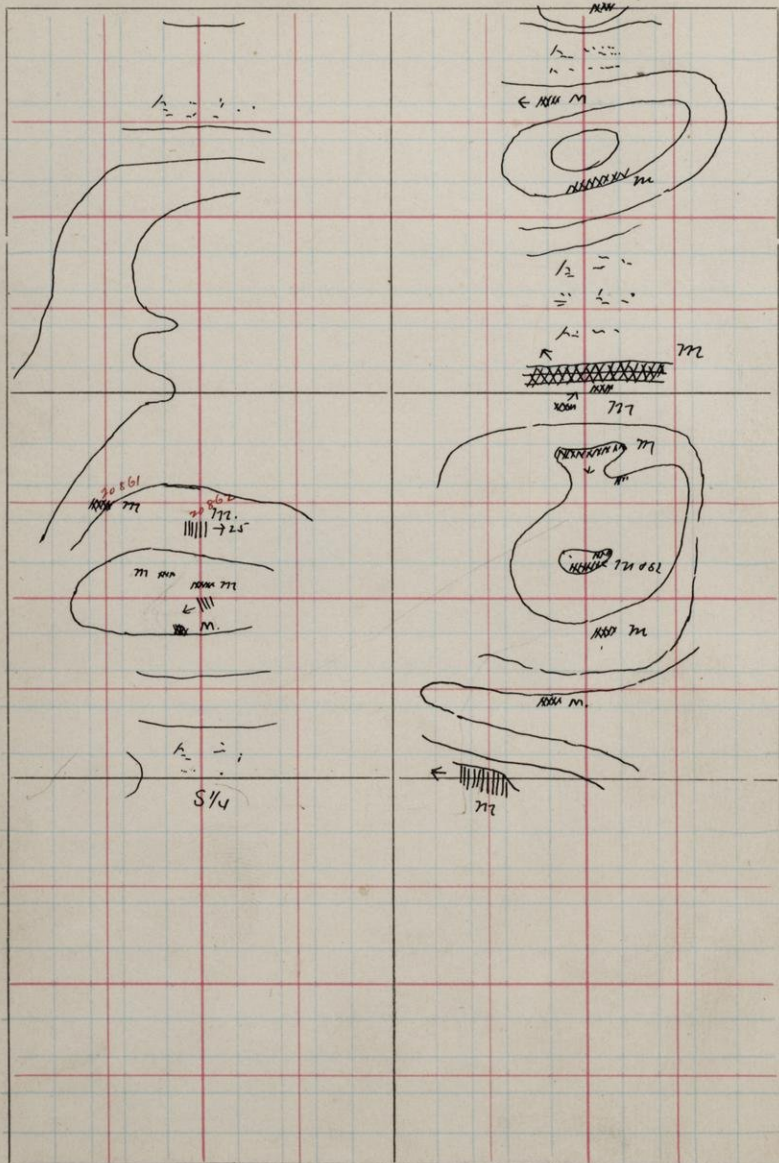
20864 Interbedded with the marble is a black shale.

See note { Run about 860 to 950 S of $\frac{1}{4}$ Sec 18 are continuous ledge of marble, in

S. 7

T. 47

R. 25-



20865 which the rocks are more or less
 entorted, but in which the predomi-
 nant dip when determinable is to
 the NW at an angle of about 30° . On
 top of the ledge there is an abundance
 of a gray, slaty rock resembling
 graywacke, but am not sure that
 it is in place in the vicinity?

Note - Evidently something wrong here.
 unless, as may be possible the descrip-
 tion has gotten into notes in the wrong
 place. If it followed description of
 20866 it would be all right.

20866 260 S 75° E of $2\frac{1}{4}$ p. Sec 18. Ledge of
 fine, red, cherty marble of which there
 are several ledges in the neighborhood.

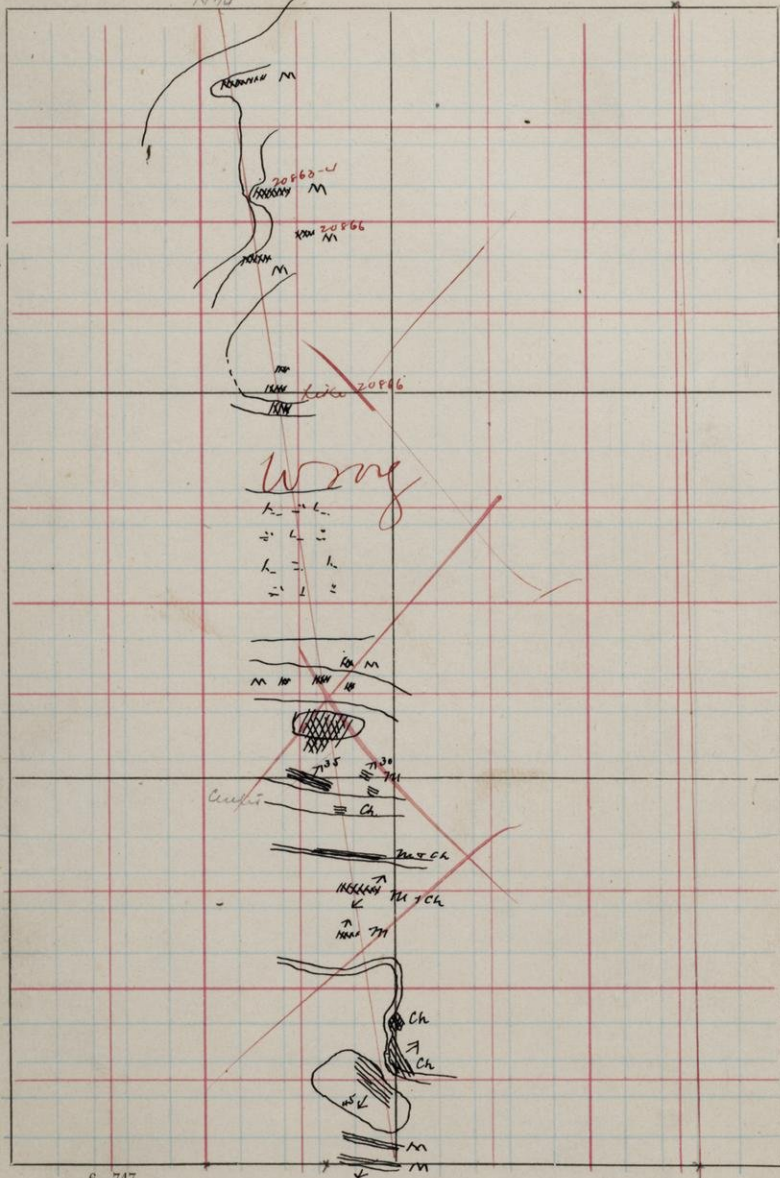
on South side of the Swamp, at
 840 S of $2\frac{1}{4}$ p. Sec 18 the marbles
 again appear, but in massive
 layers until the S. side of the hill is
 reached where interbanded marbles
 and cherts occur. The marbles are
 well bedded and dip $30^\circ - 35^\circ$ N, while
 the cherts dip in the same direction

20867

S. 18

T. 47

R. 25-

 $N/2$ 

20868

The cheets and quartzites - from the South Side of the hill are of a darker color than those north.

At 1130 S. they show as synclinal with its axis dipping low to the S.E.

20869

South are again great cheet hills with rock well exposed. This dips N.E. at 45° and strikes 30° N. of W.

South of the cheets we again find marbles dipping to the South or lying very flat. The Southernmost hill before reaching the plain to the S. is composed of pink, banded marbles, dipping 33° S. E. and striking 30° S. of W.

20870

1130 S. of N. 1/4 p. Sec 18.

Pink and gray banded marble from S. side of hill overlooking sand plain.

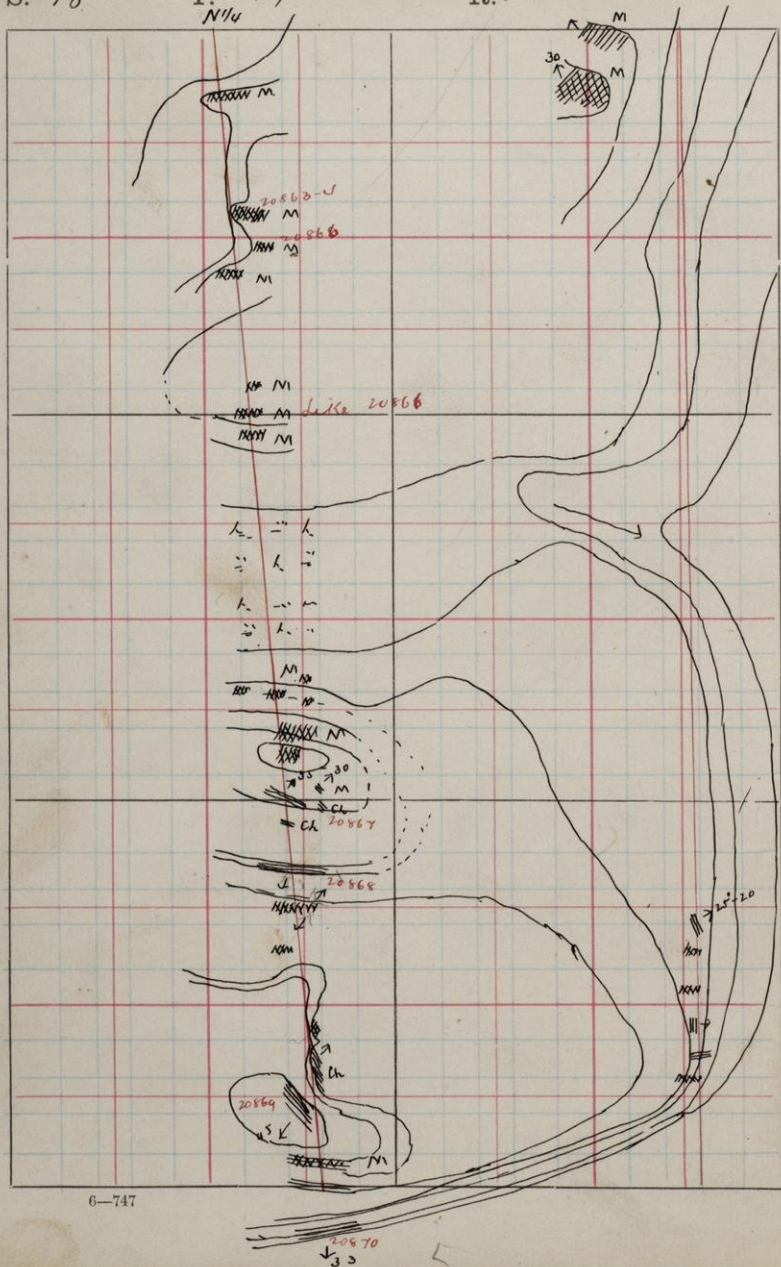
N.B.

It is plain that we have here a series of folds of marble and Horse Lake cheets, and that the width of the two by no means represents

S. 18

T. 47

R. 25



the thickness of the layers

Feb. No 2. Locations are wrong
C.T.W. When reached turning
point at 1500 S. of N.W. Sec 18
found ourselves W of corner (S.E.)
only 840 paces. On map locations
are corrected as well as ones be
done.

plat 9
At 1800 S. 650 E of N.W. cor Sec 18
are ledges of slate on the South side
of the hill. They strike 10° N of E and
dip northerly.

The rocks from this point to the
South line of section 6 are all
marble, but when we reach this
section we find again the quartz-
ite as far as 270 N, 500 E of S.W.
Sec 6.

20871

Here they are cut by a greenstone
that is more or less altered at this
place, but is fresh enough to show
the Diabasic structure further East

Aug 10

Across the stream from the greenstone just mentioned is a bluff of very massive quartzite, in which are indications of a bedding with a S.W. dip.

20872 is from the face of the cliff.

On the north side of the hill, just over the top, are found red slates, like those in the Marble series. They strike about NW and dip 40° - 50° S.W.

The north side of the cliff is precipitous over the Camp river. At its eastern end it consists of evenly bedded black slates, that appear to be carbonaceous, and red slates overlying these.

20873 400 N. 500 E of S. $1\frac{1}{2}$ p. Sec 6.

Reddish slate from top of cliff.

20874 425 N. 475 E of S. $1\frac{1}{2}$ p. Sec 6.

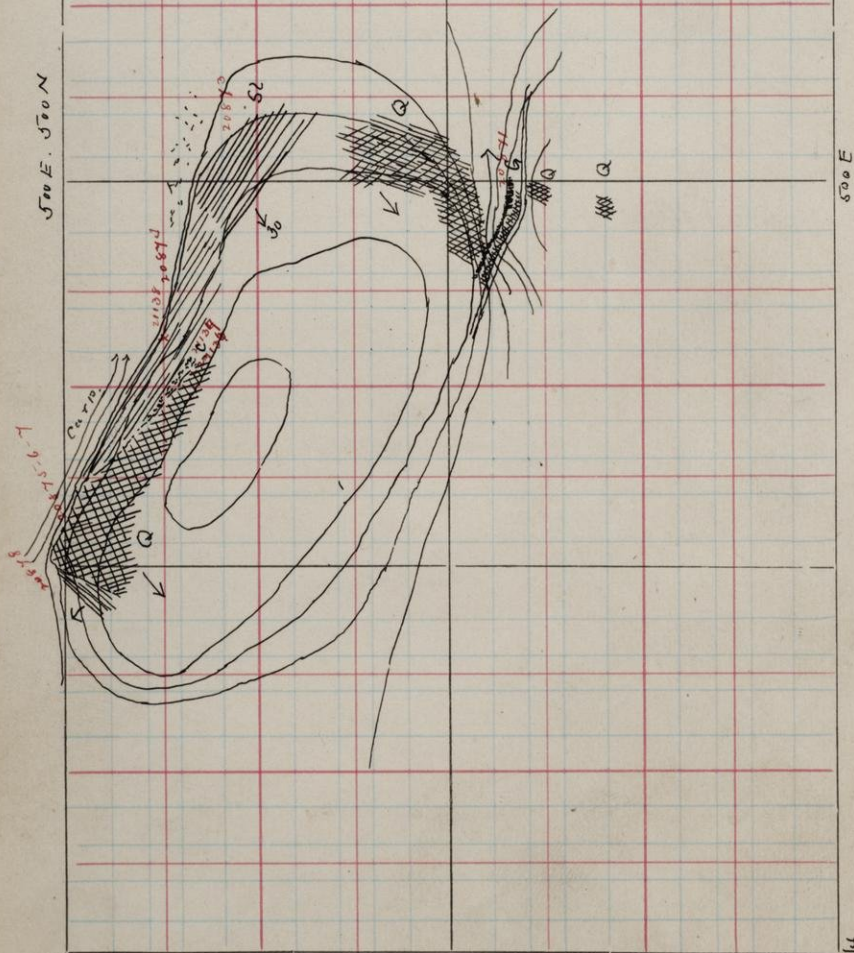
Black slates from base of bluff where rocks strike 30° N of W and dip 31° S.W.

At 350 E. the quartzite may be seen capping the cliff, overlying

S.

T. 47

R. 25-



the slate, with a thin layer of conglomerate between the two. This conglomerate has pebbles of the underlying slate, of granite, feldspar etc., and is regarded by Seaman as the base of the quartzite-series.

The quartzite beds become more and more thin bedded toward the bottom and resemble closely a graywacke.

20875 massive quartzite

20876 Slaty phase near bottom

20877 Slaty phase, above 20876.

Further west the quartzite gradually comes to occupy the entire cliff side, as it would naturally do from its S.W. dip.

Where the quartzite and slate are in contact near the level of the river, on the west end of bluff there appears to be a slight unconformity between them.

The underlying slates are regarded by Seaman as Mesozoic, and of the underlying quartzite he wishes to construct a new series, of which this quartzite would be the lower

H4

member, under the name of the
'upper quartzite'.

Other specimens taken from the
contact upon a later visit are

24136

graywacke above conglomerate

24137

conglomerate

24138

slate under conglomerate

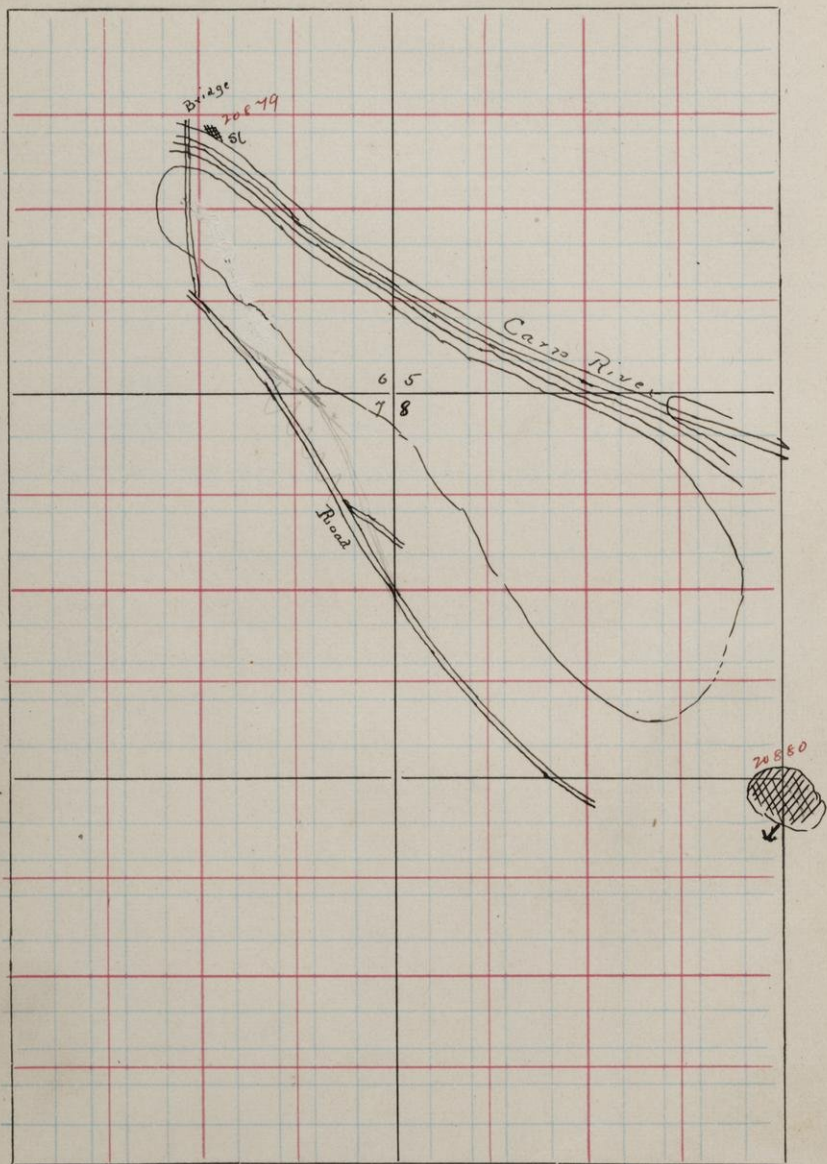
20878

At 510 N. 250 E of S 1/4 Sec 6 The
quartzite abuts against a mass
of slates that seem to be a little
different from the underlying
slates. The slates here strike about
10° E of N. and dip west at a tolera-
bly high angle. The contact is evi-
dently a fault contact, the downthrown
side of which is probably the quartzite.

S. $\frac{6}{7} \frac{5}{8}$

T. 47

R. 25



Examined country between the Camp
Pines and Read's road and between
the points 250 W. of the line between
60.5 and 70.8 and 500 E of this
line.

The country is largely covered with
hardwood and there are but few
Exposures.

20879 On the north side of the camp, near
the water ledge are slates
1750 E. 350 N of SW cor Sec 6.

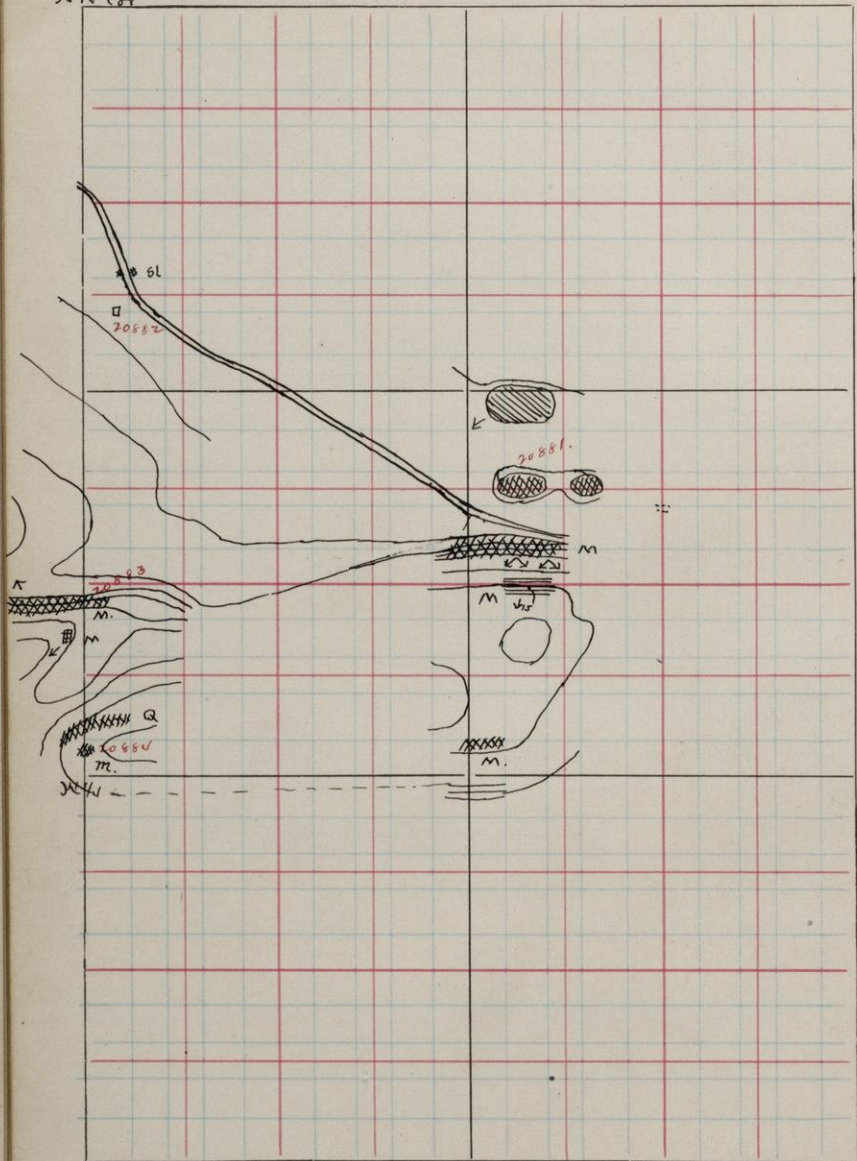
20880 At 500 S. 550 E of NW cor Sec 8 is a
small knob in which the slates
seem to dip SW at a low angle and
to strike N.W.

20881 S.E. of this knob is another composed
of greenstone. Its west end is
at 610 S. 550 E of N.W. cor Sec 8

S. 8
NW Cor

T. 47

R. 25



Aug 11

46

From N.W. Cor Sec 8 run S. to 1500
S. of S. line Sec 17. Then East 500
paces and turn to Road's road.

20882

At 400 S. 30 E of N.W. Cor Sec 8 - 47-25
is a little pit near the side of the
road. No ledge is in sight, but the
fragments in the side show that ledge
was struck. The rock is red slate.

At 680 S. of N.W. Cor Sec 8 is the foot
of a steep marble bluff, covered large-
ly with snow. The dip of the rock seems
to be toward the N.W. (30° W of N) and
at an angle of 30° .

20883

Marble from near the top of the bluff.
690 S. 15 W of N.W. Cor Sec 8.

20884

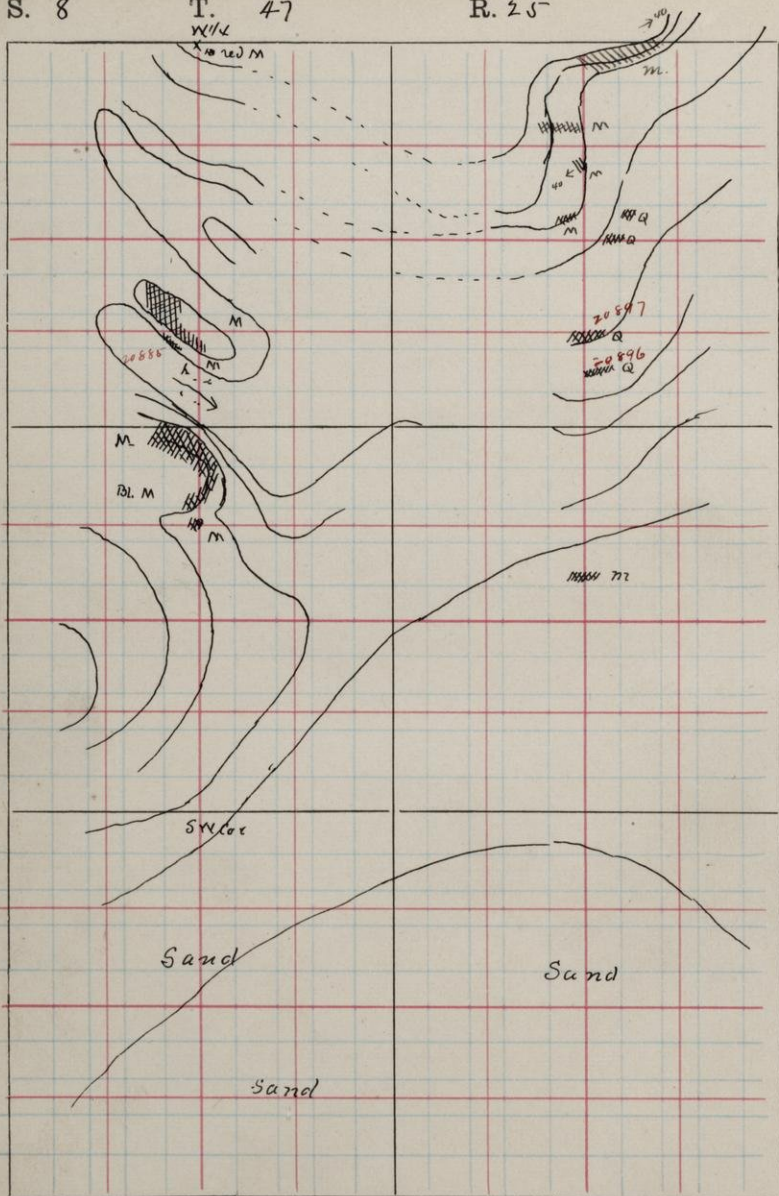
Quartzite marble from 909 S. N.W. Cor
Sec 8. on North Side Small hill
This is unquestionably a bed in
the marble series, for the marbles
again appear on top of hill.

Marbles continue in separated out-
crops all the way to the N.W. Cor of Sec.

S. 8

T. 47

R. 25-



They are principally the dense red and the black varieties, so massive that dips and strikes could not be determined.

20885 1400 S. 30-40 W of N.W. cor Sec 8.

Pink marble in small precipitous ledge facing south.

The N. ~~to~~ Sec 17 runs are in sand plains, but at 500 S. begins a small y marble whose structure is beautifully shown as that of a dish or basin, the rocks everywhere dipping into the hill.

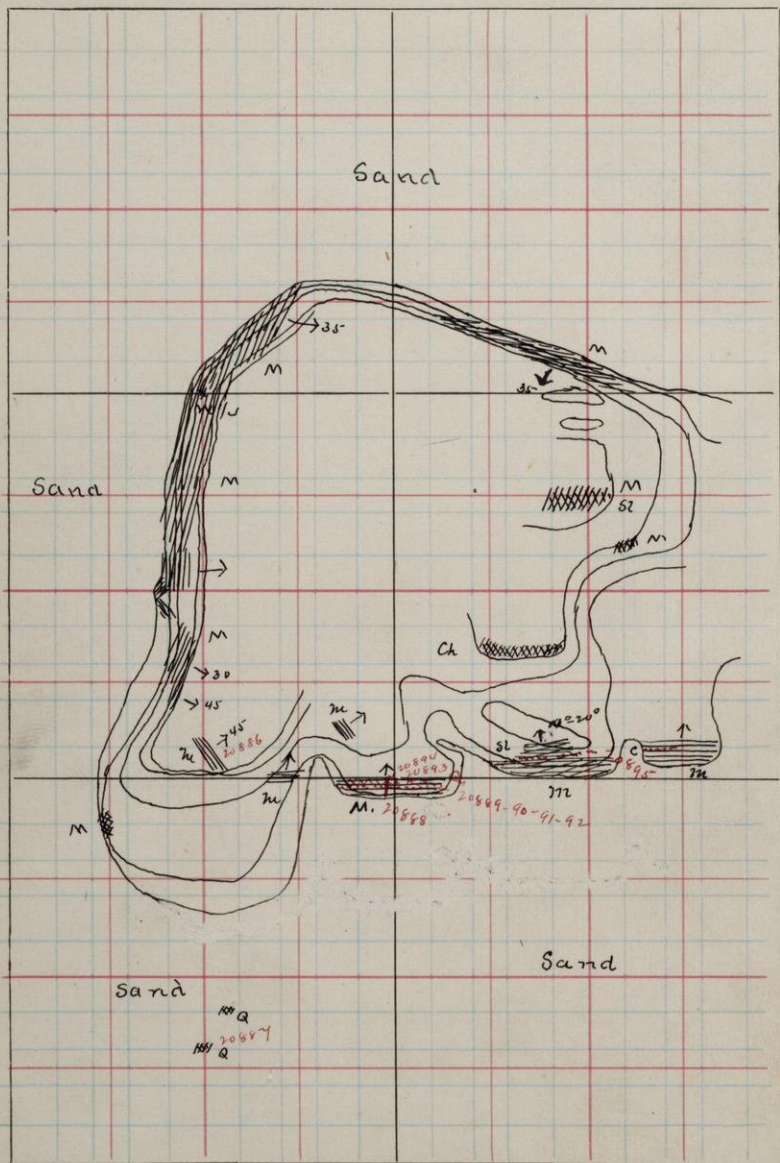
on the N.W. edge of hill the rocks strike 30° E of N and dip 30-35° S.E. The north and west sides of the hill are cliffs rising above the plain as precipices from 30-50 ft. high. On the west side the marbles are well exposed, showing the layers of different colors dipping, usually, gradually to the south, and at other places horizontal.

The dip at the N.W. end of hill is, as has been said, to the S.E. This

S. 17

T. 47

R. 25-



6-747

SK Cor

continues to remain the dip of the rocks forming the west side of here throughout most of its extent. Here and there, however, are minor crumples in the strata and near the S.W. cor. of the hill the strike is nearly N.S. and dip, E.

20886 in specimen from S.W. cor. of hill.

The southernmost exposures of the marble are at 1675 S. on section line, and beyond this in the plain are two small exposures of true quartzite.

20887 175 N of S.W. cor Sec. 17

Quartzite

200 N 25 E of S.W. cor Sec 17

Quartzite.

At 1500 S. of N.W. cor Sec 17 ran east in sand plains at foot of cliffs and steep slope forming S. side of hill and then north.

20888 At 220-330 E, 450-470 N of S.W. cor Sec 17 the marbles at the foot of hill are the pink, fine grained varieties.

20889 Above this is a very peculiar quartzite conglomerate, which in its weath-

20890 ered surface shows the fragments-
very plainly

20891 The bed contains rounded pebbles

20892 of quartzite, and sharp fragments
of slate, gneiss etc.

The rock may be a breccia, though
if so, the great variety in the nature
of fragments needs explanation.
Since the bed dips with the underly-
ing series, the thrust that would
have broken so many different
kinds of rocks as are represented
in the fragments must have
been of regional extent. There is no
evidence that this is the case, hence
am inclined to believe that the rock
is a true conglomerate. It is un-
conformable upon the underlying
marble, in the sense that its con-
tact is a disjunctive one, sometimes
existing entirely across the beds of the
limestone. This is believed to be due
to the fact that at the time the
conglomerate was laid down the
marble had been cracked etc, and
that the conglomeratic material settled
down into these cracks. Would regard

this bed as the product of a single storm, which deposited coarse fragmental material upon the sun cracked (shallow water layers) marbles.

East the conglomerate seems to disappear and a quartzite takes its place. At any rate above the marble with east is quartzite, that

20892

is more or less slaty or schistose on the top of the ledge is a little angle

20894

of the rock, cutting through the quartzites and marbles at right angles to their strike.

The dip of the series here is 34° N and strike about ESW.

At 330 W. 470 N of S.W. cor Sec 17 is a good exposure of the feldspathic marble. Great bands of red feldspar are arranged along the bedding planes of the marble, which is followed to the north as elsewhere by quartzite.

20895

500 E. 550 N of S.W. cor Sec 17. Above the feldspathic limestone at this place and under a 5 ft. bed of

51

Slates, all dipping 10° - 20° ^N and striking 20° N of E. is a thin layer of the conglomerate?

In the slates the slaty cleavage dips about 60° ^N and strikes with the bedding.

The little knob at 600 E. 500 N of D.W. cor Sec 17 is of marble dipping as before. However, at the west side of the hill is another exposure of the conglomerate, which again appears with the same kind of contact with respect to the underlying marble as has already been noted further west.

850 N. 500 E. is a large flat ledge of pink marble, which is nearly flat lying. It perhaps dips at a very low angle to the East.

On north side of the hill at 990 N. 500 E of D.W. cor Sec 17 is an Escarpment, as in its west side. The rocks comprising it are again marbles dipping about 35° SE?

and striking 20° N of W.

With this exposure cross sand plains, and so meet with no rocks until we reach Sec 8. Here are marbles and interbedded quartzites

20896 565 N. 500 E of S.W. cor Sec 8.
Marble

20897 630 N. 500 E. of S.W. cor Sec 8
Calcareous quartzite

For locations of other ledges see map.

