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Marquette district: [specimens] 24780-24862. No. 159 1893

Clements, J. Morgan (Julius Morgan), 1869-
[s.l.]: [s.n.], 1893

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U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

9-891

159

Marquette District.

J. Morgan Clements.

1893.

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.

No. 24780 - 24862.

Notes
on
Basement Complex
of
Marquette Area.

(Region surveyed
extending from Michigamme River on W.
to sand plains (Approx C & N.W. RR) on E.
and from T 45 on S to sedimentary
areas on N.)

J. Morgan Clements
1893

Charles Perry,
Comptroller.

Scale, unless otherwise
noted, is 4" = 1 mile.

N.W. Cor.

S.

8

T.

47

R. 29

N.E. Cor.

S.W.
Cor.

S.E.
Cor.

1.

Began work from camp near
Fish Lake about 1 mile S of Champion

Ran S from N 2000 W 500-SE Cor. S 8-47-29.

24780-N 1700 W 375- SE. Cor. S 8-47-29

Rounded outcrop on hill near base of
pinkish rather coarse grained granite
with numerous veins of amethystine
quartz. With the granite occurs a
hornblende schist (24781). Outcrop is
small and can't be sure of relations, i.e.
whether schist is cut by granite or
included in it.

Like

24780-1 N 1600 W 500- S. E. Cor. Sec 8-47-29

Same granite with schist outcrops around
W. end of hill.

like 24780 N 420 W 690- SE Cor. Sec. 8-47-29

Granite like 24780 outcropping just S W of R.R.

24782-3-4 N 50 W 675- SE. Cor. Sec. 8-47-29.

Here in the R. R. cut we get
fresh exposure of granite 24782,
which is decidedly massive,
alternating with beds of a schist.

S. $\frac{5^-}{8}$

T. 47

R. 29

Cor.

Fish Lake.

5-

C.M. + S.T.P. + C. + N.W.

Cor.

8

S.W. Cor.

6-747

SE
Cor.



Legend

Approx. vert. & horiz. scale

hornblende rock 24783 in which the schistosity and bedding is vertical. Near the dark schist rock the granite frequently takes up a good deal of hornblende.

In the schist fragmentitic bands of amethystine quartz and greenish feldspar are not rare. That which I took for the banding in the schist is vertical but more or less wavy and in places quite irregular. In the granite, and almost vertical, are 3 narrow bands, about 3 ft wide on an average, of a dark rock 24784, apparently different from 24783, which I took for dykes cutting the granite.

As shown in accompanying sketch there is a triangular piece or wedge of granite between one of the dikes and the schist.

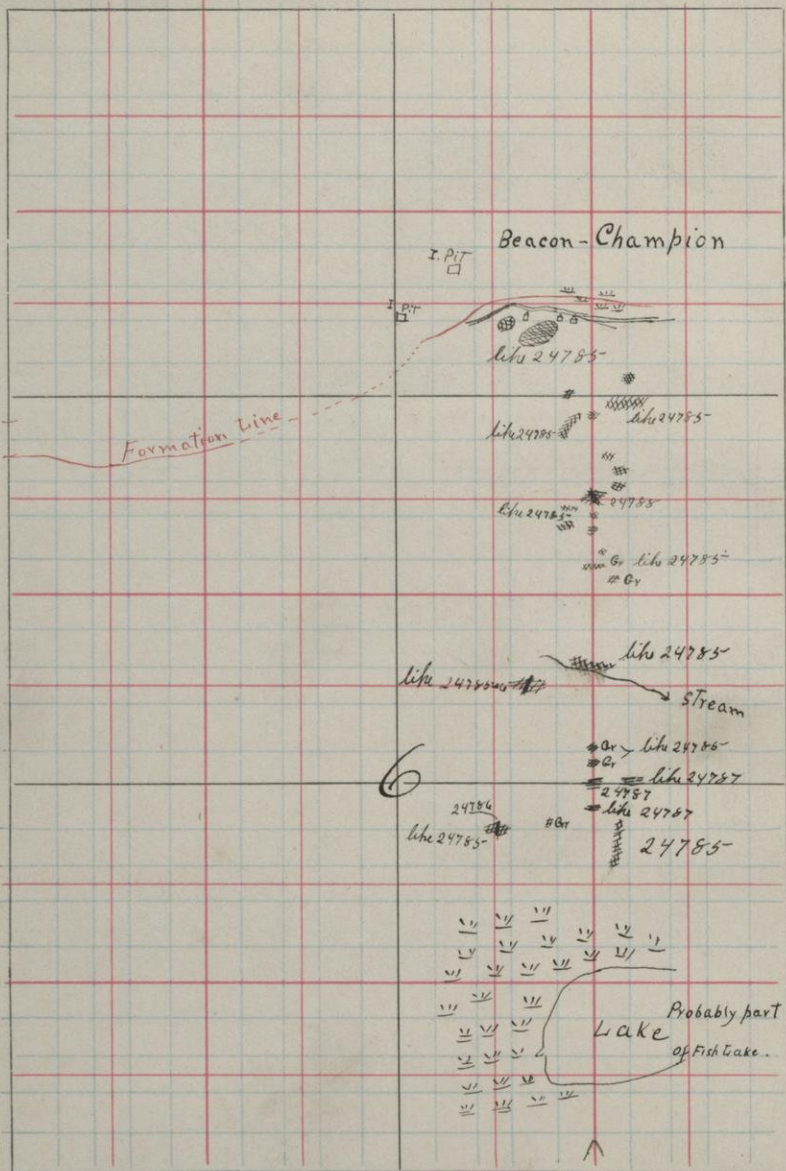
W on S line between Sec. $\frac{5}{8}$ - 47 - 29.

Ran W over rolling drift covered ground with no outcrops, but large boulders of granite here and there.

S.

T.

R.

N.W.
Cor.N.E.
Cor.S.W.
Cor.

6-747

S.E. Co.

Continued to W. along S. section line of S. 6-47-29 for 5.00 fathoms and then from N 0 W 500 - SE Cor. Sec. 6-47-29 ran N.

24785- N800W450-SE Cor. Sec. 6-47-29.

Ridge of grey medium grained granite

24786 N900W725-SE Cor. Sec. 6-47-29

Large outcrop of grey granite (lik. 24785) with bed (or dyke) of a dark rock 24786 in it which shows up again across the valley to the north.

24787 N1000W500-SE Cor. S. 6-47-29

Outcrop of a dark in places green schistose hornblende + mica rock.

N1300W500-SE Cor. S. 6-47-29 Granite like 24785-

24788 N1755-W500-SE Cor. S. 6-47-29

Granite like 24785 with dike of red granite 24788 in it.

N200W500-SE Cor. Sec. 31-48-29

Wagon road and beyond it is a narrow valley on N side of which are the pits in the iron ore. Granite bends around to SW. and the valley seems to follow the line of contact or at least approximately.

S. 7/8

T. 47

Cor.

R. 29

N¹/₄

N¹/₄

S¹/₄

S¹/₄

✓

G. lib 24785

✓ ✓ ✓

G. lib

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

✓ ✓ ✓

G. lib 24755

24785

lib 24790

lib 24790

Cor.

9
Ran S on section line 7/8-47-29.

like 24785- N145°W 1800 SE Cor. Sec 7-47-29.

Granite outcrop like 24785-

24789 N25°W 1800 SE Cor. Sec. 8-47-29

Outcrop of granite (like 24785) with
inclusions (dyke?) of schistose
hornblende rock (24789)

24790 N100°W 1850-SE Cor. Sec. 8-47-29

Knob of reddish granite or rather pinkish
granite varying from fine to coarse
grained. These knobs outcrop just
on SE border of a large swamp
extending to NW.

S. $\frac{8}{17}$

T. 47

R. 29

8

Cor.

24781 24792
Gr. Gr.
Gr. Gr. Gr. Gr.
Gr. Gr. Gr. Gr.

>

Cor.

17

SW.
Cor.

6-747

SE. Cor.

Ran E on line between $\frac{8}{17}$ - 47-29

24791 N25W1820 SE Cor. Sec 8-47-29

Large outcrop of medium grained
grey granite.

24792 N50W1650-SE Cor. Sec. 8-47-29.

Dark greenish hornblende schist
in same granite

S. $\frac{7}{18}$

T. 47

R. 29

C. of Sec.

7

Cor.

Q. 24793

24793

24793

24793

24793

24793

24793

24793

24793

24793

24793

24793

24793

24793

24793

24793

24793

Cor.

18

C. of Sec.

S.W.
Cor.

6-747

S.E.
Cor.

Rare W on section line $\frac{7}{18}$ -47-29

24793 N. O W. 20-SE Cor. Sec. 7-47-29

Large outcrop of medium grained
Grey granite

S. 12/7

T. 47

Cor.

R. 30/29

24725-

~~24725~~

Gr. 24794

12
C. of Sec.7
C. of Sec.

Gr. 24794

24794

Gr.

24794 Gr.

Gr.

24794 Gr.

24793

Gr.

24793

Cor.

A

Run N on Range line 30/29. T. 47 starting
from S.E. Cor. Sec. 12-47-30.

24794 N230 W0-S.E. Cor. Sec. 12-47-30

Large outcrop of medium grained
slightly pinkish granite

24795 N1750 W150 S.E. Cor. Sec. 12-47-29

Large bare outcrop, on edge of clearing,
of medium grained grey granite.
Just to W. of trail from Champion
to Horse Shoe Lake where trail leaves
clearing and enters woods.

S. 1/6

T. 47

R. 30/29

Cor.

C of Sec.

1

C of Sec.

6

Formation Line

Gr.

24795

Gr.

24787

24796

Gr. 24795

Gr.

Cor.

Gr. 24795

Range Line

12

C of Sec.

6-747

C of Sec.

7

Continuing Non Range line

N 75° W 180° SE Cor. Sec. 1-47-30

Large outcrop of granite like 24795-
which is more or less continuous for
1500 feet to N where at

24796 N 725° W 175° it is cut by a dyke of
coarse grained diorite and at
N 750° W 150° is an inclusion of hornblende
rock like 24787.

N 2000 W 0° SE Cor. Sec. 2-47-29.

We are on N side of narrow valley and
there are here several pits all however
in drift. The valley seems to indicate
the line of contact between the
fundamental Complex and the
iron bearing rocks above it.

On this line the granite has not shown
any marked increase in schistosity
as we approach the edge nor
has there been a very noticeable
amount of dark schistose rocks
included in or cut by it.

S. $\frac{12}{13}$

T. 47

R. 30

C. of Sec.
12

24797

13
C. of Sec.

Range Line

Ran W. on section line $\frac{12}{13}$ 47-30

24797 N1850 W1925 SE Cor. Sec. 13-47-30

Large outcrop on top of hill of
medium grained grey granite.
Line ran for the most part through
swamp with now and then
rounded hills covered with heavy
growth of poplar with heavy
undergrowth.

S. 11/12

T. 47

Cor.

R. 30

Lib. 24797
Gr.

Lib. 24795

Lib. 24795

Lib. 24798

11
C. of Sec.

12
C. of Sec.

G. 24798

^

Cor.

Ran Non section line 10/12-47-30

24798 N 350 W 40-SE Cor. Sec. 11-47-30

Large outcrop on edge of swamp of
Medium grained grey granite.

Low granite hills with now and then
an outcrop alternate with swamps.
Outcrop either on top of hill or
just at edge of swamp, rarely
on the slope.

S. $\frac{35}{36}$

T. $\frac{48}{47}$

R. 30

c of Sec

35-

36

c of Sec.

Stream

Formation Line

To Champion

T. Line

6624800

Cor.

6624800

6624800

6624800

6624800

6624800

24800

6624799

6624799

6624799

6624798

6624797

Cor.

^

11

Continued to N on section line 2/1-47-30
framing here and there grey granite
outcrops in rounded boulders.

24799 N 52° W 0-SE Cor. Sec. 2-47-30
Outcrop of slightly pinkish
medium grained granite.

24800 N 96° W 30-SE Cor. Sec. 2-47-30
Large outcrop of medium grained
grey granite which continues
to outcrop here and there until
shortly after we pass the T. tree.
We then begin to descend over
drift to narrow valley where
I have drawn the N. boundary
of the granite.

34

R. 30

T. $\frac{48}{47}$

$$\begin{array}{r} 34 \\ 3 \overline{) 35} \\ \underline{32} \\ 3 \end{array}$$

3

C. of Sec

C of Sec.

35-

T. LINE

(Handwritten notes on lined paper)

litu 24502.34
litu 24502.34
litu 24502.34
litu 24502.34
litu 24502.34

Di. 24806

11. 24800

24504

前

二

十

一、

六

6224504

11

lib 248023 sc 24803
24804
lib 24802-3-4

Sc. H. 24800 Co. Loh 24801

24801

Cor.

→ To Champion

2

C. of rec.

6-747

Ran W. on T. line $\frac{35}{2} - \frac{34}{3} - \frac{48}{47} - 30$.

24801 N125W200 SE Cor. S. 35-48-30

Outcrop just S of wagon road of grey apparently very acid granite.

24802 N25W775 SE Cor. Sec. 35-48-30

Outcrop of hornblende schist to NW. of large outcrop of granite like 24801. Seems to include the schist.

24803 N10W1320 SE Cor. Sec. 35-48-30

Outcrop of schist more or less contorted

24804 N10W1470 SE Cor. Sec. 35-48-30

Outcrop of schist like 24802-3 and also with bands of 24804. Strike of schistosity and banding SW, dip about 40° NW. 24804 is the predominant phase of schist.

24805 N0W1750 SE Cor. Sec. 35-48-30.

Outcrop of what appears to be a bed of gneissoid ^{grey} granite among the schists.

N.0.W.150 SE Cor. Sec. 34-48-25-

Between this last location of schist and Lake Michiganum there are

no more outcrops. After crossing a narrow swamp we ascend hill apparently of drift and then descend over drift to lake.

24806 N 1755- W 175- SE Cor. Sec. 3-47-30

Outcrop of medium grained diabase. General strike of the schistose rocks which are located on map is, as is there indicated, in general SW and the dip about 40° NW.

S. $\frac{14}{23}$

T. 47

R. 30

C. of Sec.

14

Cor.

lik 24507 lik 24807 24807
P. Q. lik 24507 Gr. Gr. Cor. Gr.

23

C. of Sec.

Cor.

Cor.

Rare W. on Section line $\frac{14}{23}$ -47-30.

For granite at corner see Phillips notes.

24807 N40 W330 SE Cor. Sec. 14-47-30

Medium grained granite with
porphyritic pink feldspar.

The same granite continues to
outcrop, in rounded knobs and
batches, as indicated on map.

S. $\frac{15}{22}$

T. 47

R. 30

cf sec
15-

Cor.

2480, 24809 & line 24808
Se. H. Gr. 24808
24811

Cor.

@ line 24807

cf sec
22

S.W. Cor.

6-747

S.E.
Cor.

Continuing the new W section in $\frac{15}{22}$ 47-30

24808 N1280 W 950 SE Cor. S22-47-30

Large outcrop of medium grained grey granite.

Before reaching this outcrop we have been passing over moderately level or rolling ground covered with boulders of all kinds of granite.

24809 N.O W1280-SE Cor. S14-47-30

Fine grained grey granite in places slightly schistose.

24810-11 N.O W1450-SE Cor. Sec 14-47-30

Large outcrop of hornblende schist that portions to E quite fine grained (24810) as we continue we however find it overlaid to W by a coarse grained phase 24811.

Strike of schistosity and bedding N. 4° E
Dip W60°

S. $\frac{16}{21}$

T. 47

R. 30

Cof. Sec.

16

Co.

Michigamme

Co. 248R

Co.

Cof. Sec.

21

S.W. Co.

6-747

S.E. Co.

Continuing to W. on Section line $\frac{16}{21}$ 47-30

We pass over rolling country
for a part of the way well wooded
and in this portion we find
a number of shallow test pits
all in drift.

24812 N. O W. 750-S E Co. Sec. 16-47-30

Ledge of coarse grained diabase.

We now descend over cleared
country with thick growth
of small poplars to the
Michigan River. No outcrops.

W 1450

S. 24/19 T. 47

R. 30/29

Cor.

25/30

V

R 30

R 29

24

C. of Sec.

29

C. of sec

Gr.

G. 24813

G. 24814

Gr. like 24814

like 24814

Gr.

Gr.

like 24814

Cor.

like 24814

Gr.

like 24814

Lake

G. 24815

Gr. like 24815

like 24814

25

C. of Sec.

6-747

30

C. of S.

Ran S. on section line 24/18-47-30/29

24813 N1280 W.O -SE Cor. Sec. 24-47-30

Large outcrop of grey granite varying from fine to coarse grained.

24814 N920 W O-SE Cor. Sec. 24-47-30

Outcrop of medium or rather coarse grained granite with large porphyritic crystals of flesh-colored feldspar. Same granite continues to outcrop for some distance to S.

24815 N1370 W.O-SE. Cor. Sec. 25-47-30.

Medium grained grey granite in large outcrop.

24816 N1010 W.O SE Cor. Sec. 25-47-30

Outcrop of coarse light-grey granite.

S. 25/30

T. 47

R. 30/29

C. of Sec.

C. of Sec.

25

30

24816 Gr.
24817 Gr. H.
Lk. 24816
Lk. 24816
Lk. 24816
Lk. 24816

Lake

Lk. 24816

R. 30

R. 29

Cor.
24818
Lk. 24816

stream

36

C. of Sec.

31

C. of Sec.

Gr. boulders, but no more outcrops!

24816-17 N 965 W 0 SE Co. Sec 25-47-30

Another outcrop of 24816 with band of 24817 (Held. Schist) in it.

The same granite continues to outcrop to S and almost surrounds the little lake in bare knobs.

24818 N. 1900 W. 20-SE. Co. Sec. 36-47-30

Here is an outcrop of a very fine grained light colored rock, (macroscopically very much like the "Chumney Granite"), showing no schistosity.

We now go over quite rough country apparently all drift covered. Plenty of granite boulders but no rock in situ.

R. 30 | R. 29.

C. of Sec.
31

C. of Sec.
32

S. 36

R. 29

Range Line

T. 47

Town Line

G. 24820

Wh 24819

Wh 24819

G. 24819

G. 24821

Wh 24819

Stream

To Republic

Wh 24819

47
T. 46

T. 46

Sec 1

31 32
S. 6 5

G. Wh 24819

6

C. of S

5

C. of Sec.

Michigan Riv.

6-747

24819 N. 1920 W. O SE Cor. Sec 1 - 46 - 30

Large outcrop of grey granite.
Feldspars are lath shaped and
extended in same direction
giving rock somewhat schistose
appearance. Long direction of feldspars
in general E-W.

Same granite, varying from finer
& coarse grained, outcrops on down to
Michigan River.

24820 N. 20 W 640 - SE Cor. Sec 31 - 47 - 29

Medium grained grey granite.

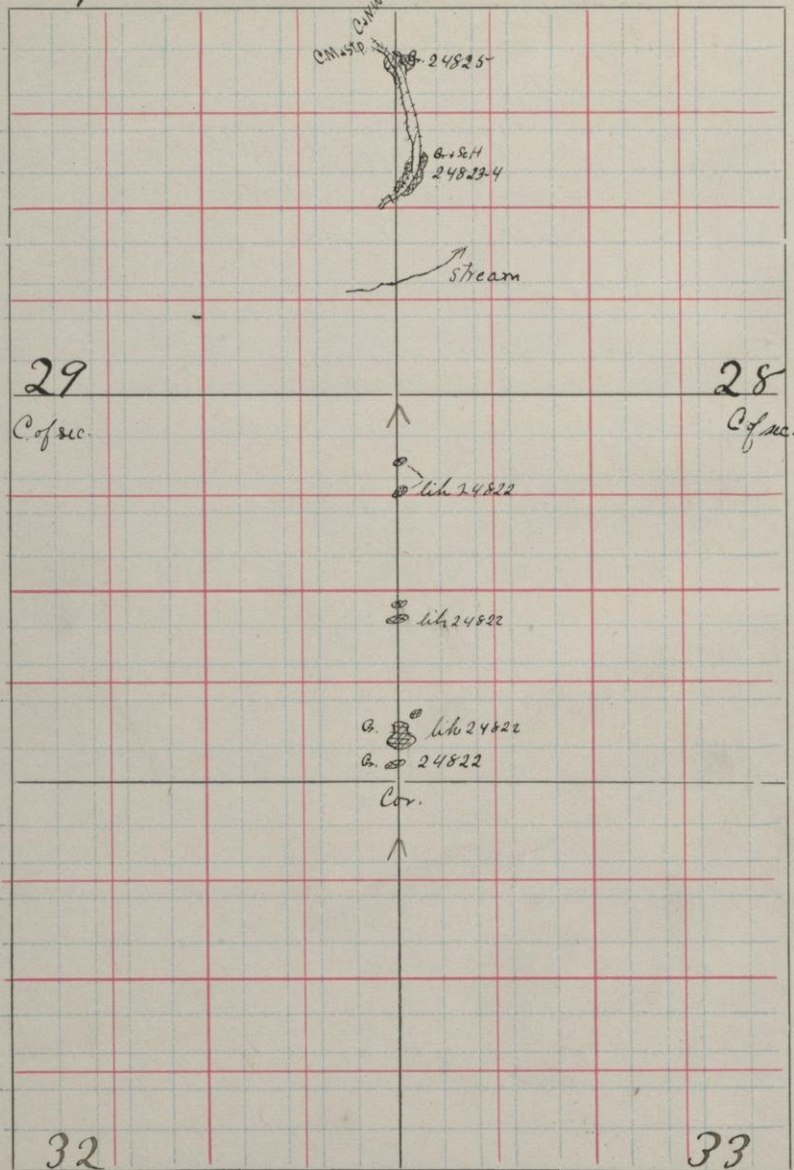
24821 N. O W 455 - SE Cor. Sec. 31 - 47 - 29

Grey granite

Continuing to E we pass over
granite like 24819 End run at R.R.

S. 29/28 T. 47

R. 29



C of sec.

6-747

C of sec.

24822 N45W0 SE Cor. Sec. 29-47-29

Coarse gray granite

24823-4 N1550 W1980 SE Cor. Sec. 28-47-29

In R.R. cut coarse red granite (24823) with some hornblende schist (?) (24834) in it. May be altered dyke cutting granite.

24825 N1850 W.0 SE Cor. Sec. 29-47-29

Here is exposure of same red granite (24823) and also a light gray granite 24825. (Fresh phases of 24823?) From exposure can't see their relations to each other.

S. $\frac{21}{28}$

T. 47

R. 29

C of Sec.

21

Cor



lik 24825

lik 24823

G.

G.

G.

lik 24822

CMSTA

CMVA

C of Sec.

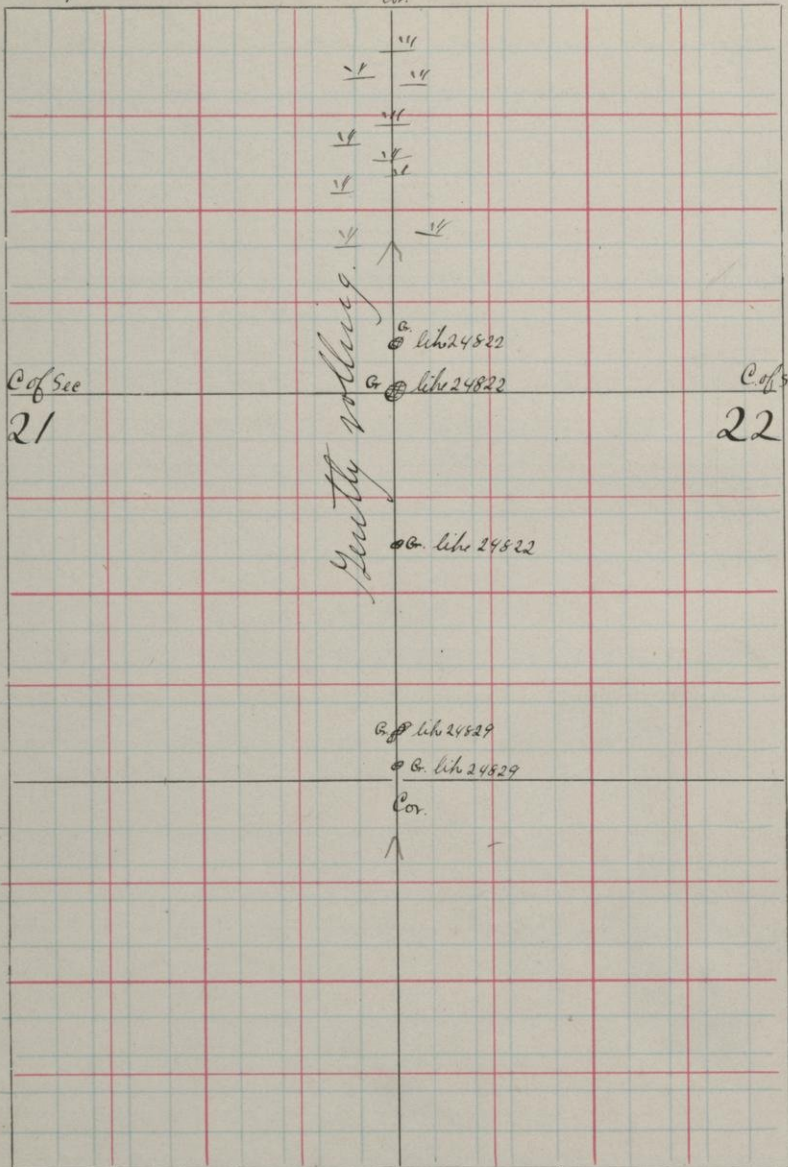
28

Granite like specimens already
taken and to which they are
referred.

S. 21/22 T. 47

R. 29

Cor.



Granite like specimens
already taken and to which
they are referred!

S. $\frac{15^-}{22}$

T. 47

R. 29

C of sec.

15-

Cor.

>

a
24526

24527 24528
a a 24528

Cor. a
24528 24529

C of sec.
22

24826

N. 0 W. 1190-SE. Cor. Sec. 15-47-29

Small outcrop of rather fine
grained reddish granite.

24827

N 50 W 860-SE. Cor. Sec. 15-47-29

Outcrop of fine grained grey granite.

24828

N 25 W 700-SE Cor. Sec. 15-47-29

Outcrop in R.R. cut of a very pretty
medium grained red granite.

S. $\frac{22}{27}$

T.

47

C. of Sec.

R. 29

22

Ch.

Republic

Humboldt

lib 24828

like 24829

Gr 24829

Cur

Col sec

27

24829 N. 20 W. 1890-SE Cor. Sec. 22-47-29

Rather coarse grained reddish granite

Continuing S E we pass over outcrops
here and there of granite like 24828-9.

S. $\frac{23}{26}$

T. 47

Cof sec

R. 29

23

Cor.



24830



24830

G.

24831



24831

24831

C.

Cof sec

26

24830

N. O W 1430 - SE. Co. Sec. 23-47-29

Large outcrop of a medium grained red granite.

We find the same kind again farther on and then it

24831

N 1965 - W 400 - SE. Co. - Sec. 26-47-29

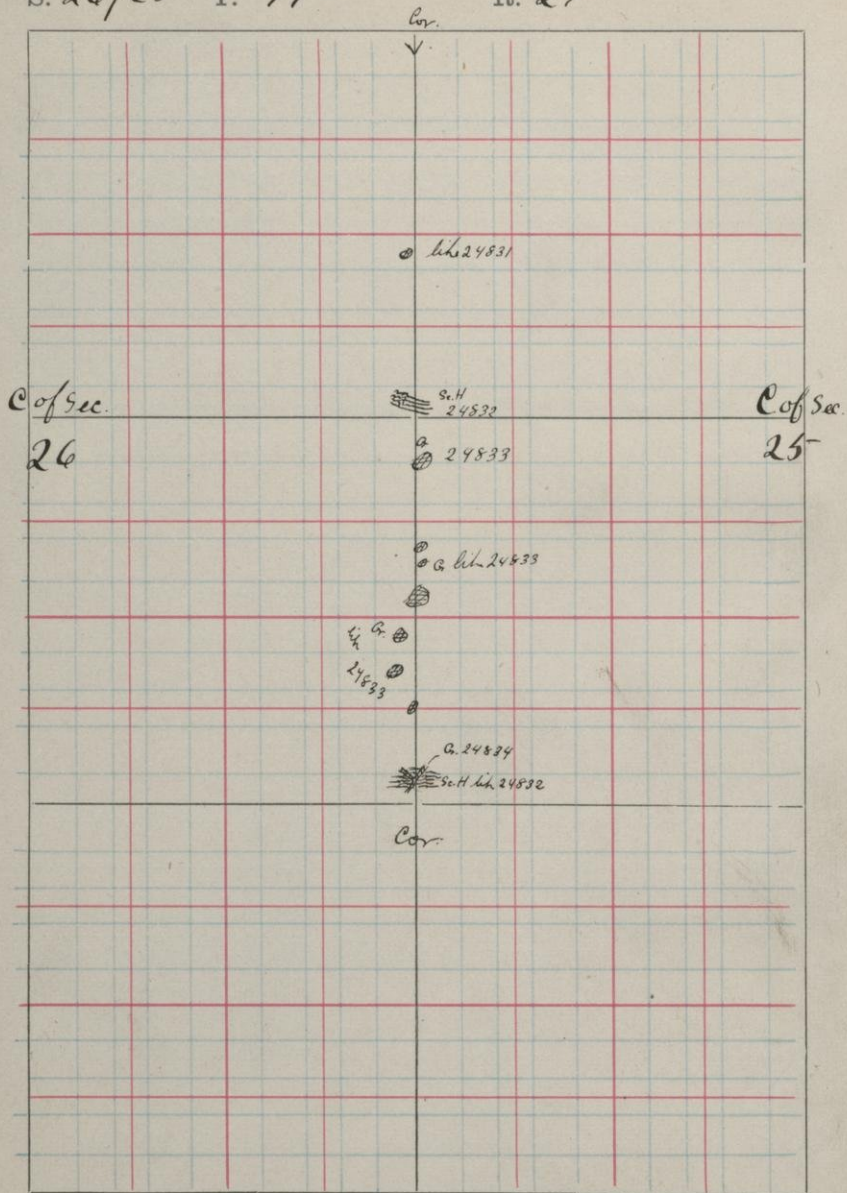
we come to another variety of granite.

N O W 270 - SE. Co. Sec. 23-47-29

Same kind of granite as 2483 with a little hornblende schist outcrops here.

S. 26/25 T. 47

R. 29



N1450 W10 SE Cor. Sec. 26-47-29

Outcrop of same kind of granite as 24831 again and with little hornblende schist in it.

24832

N1055 W.O- SE Cor. Sec. 26-47-29

Large outcrop of rather coarse slightly schistose hornblende rock.

24893

N.900 W.O- S.E. Cor. Sec. 26-47-29

Coarse grained grey granite.

The same kind outcrops for some distance farther on D S.

24832+4

N100 W O- S.E. Cor. Sec. 26-47-29.

Dark hornblende schist like 24832 cut by small dyke of quite acid granite 24834

C. of sec.

27

C. of s

26

R. 29

T. 47

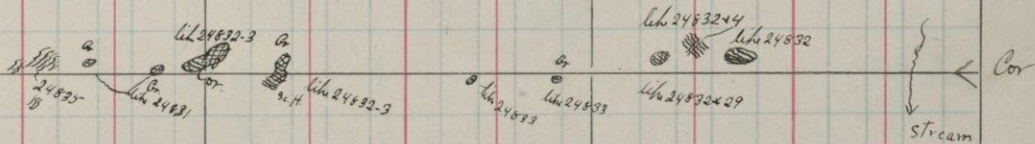
S. 27-26
34-35

34

C. of sec.

35

C. of sec



Running W. on Section line $\frac{26-47-29}{35}$ we pass at
 N30 W760 SE Co. Sec. 26-47-29 outcrop of schist
 like 24832 cut by dyke of granite like 24834.

N25-W850 SE Co. Sec. 26-47-29 outcrop of
 hornblende schist like 24832 and granite
 like 24829 but can't make out relations.

We continue to pass over outcrops of granite
 and hornblende schist for some distance to W.

24835 N15-W435-SE Co. Sec. 27-47-29

Here is a large outcrop of very gneissoid
 rock, banding caused by alternation of
 layers very rich and poorer in mica.
 Strik of bands in general NE but the
 banding is not ~~very~~ regular very straight.

28

C of Sec

27

R. 29

Cor

T. 47

$$\begin{array}{r} 28 \cdot 27 \\ \hline 5 \cdot 33 \cdot 34 \end{array}$$

6—747

33

C of sec

34

C of sec

M

24537
Se. H

lib 24836
C.



Gr. 24
Sett. 24893

(Handwritten notes on a map showing locations like "Stream", "C. Mospi", and "C. NW".)

lib 24836

Lib. 24836

Lib 24826

lib. 24836

24836

24836 N1965 W 1435 SE Cor. Sec 34-47-29

Large outcrop of rather coarse grained reddish granite.

The same kind continues to outcrop for $1\frac{1}{2}$ miles to W. In fact this coarser granite predominates just along here about 3 miles N. of Republic and would seem to indicate that this is near the central portion of the granite massive.

NOW 860 SE Cor. Sec. 33-47-28

Large outcrop of 24836 with ^{inclusion} (dyke?) of hornblende rock like 24833

24837 N. O W 1900 SE Cor. Sec 33-47-29

Large outcrop of slightly schistose hornblende rock.

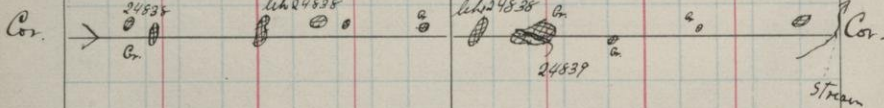
S. $\frac{34}{3}$

T. $\frac{47}{46}$

C. of Sec. R. 29

34

T 47



C. of Sec

3

T 46

24838 N.O. W. 790-SE. Cor. Sec. 34-47-29

Outcrop of coarse red granite

To E of location we pass over outcrops of a similar granite but finer grained, perhaps more like 24836.

24839 N.O. W. 745-SE. Cor. Sec. 34-47-29

(like 24838)
Granite cut by dyke of hornblende rock 24839

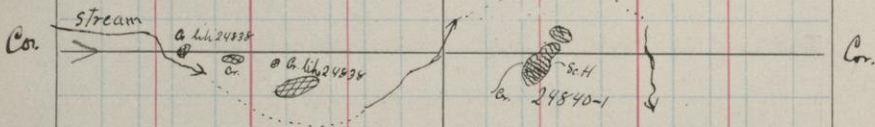
S. $\frac{35}{2}$

T. $\frac{47}{46}$

R. 29

C. of sec.

35 T 47



C. of sec.

2 T 46.

24840-1 N. 0 W 750 SE Cor. Sec. 35-47-29

Large outcrop of hornblende schist, 24840,
varying slightly in grain cut by dyke
of rather acid granite 24841.

S. 2/1 + 11/12 T. 46

R. 29

Gr.

③ lib 24838

W. Br. of Escanaba

lib. 24838

@ of sec. 2

C. of Sec.

Q₇.
Cn. ② lib 24838
~~Q₈~~ lib 24839

lib 24839

G. ④

248982





Gr.
lib. 24835

C of Suc

6—747

C. of sec.

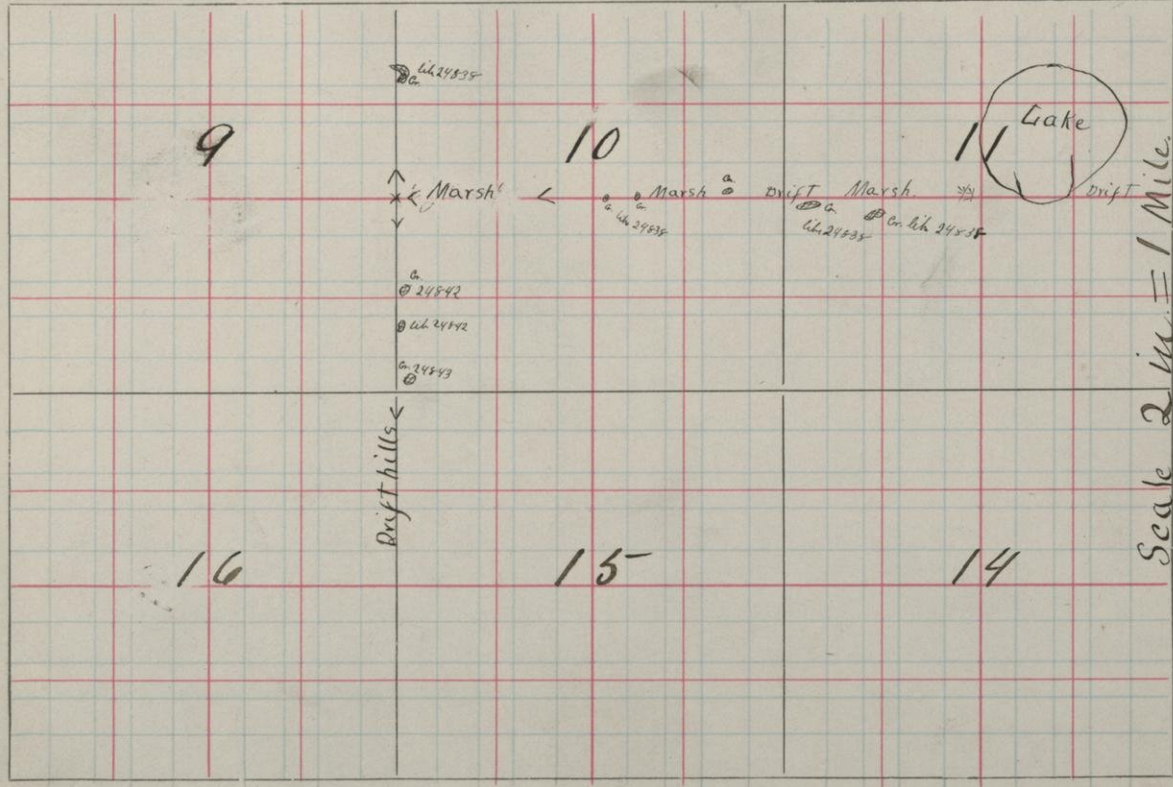
Running S. on Section line 2/1 + 11/12-46-29
we pass outcrops of granite
similar to 24838.

N. 735 W. 0 SE Cor. Sec. 2-46-29

Large outcrop of granite like 24838
cut by dyke of rock similar to 24839.

S. 10+11 T. 46

R. 29



Running W. on $\frac{1}{4}$ line Sec. 10-46-29
we pass only a few outcrops, and
these similar to 24838.

The country consists for most
part of drift ridges alternating
with marshes.

24842 N 54° W 1880 SE. Cor. Sec. 10-46-29

Outcrop of rather coarse slightly gneissoid
granite.

24843 N 90° W 1925 SE. Cor. Sec. 10-46-29

Outcrop of granite, gray, medium grained.

24844 N. 1000 W. 670 SE Cor. Sec. 15-46-29

Large outcrop

Same granite outcrops here in large
bare knobs for quite a distance to
E as shown on map.

S. 23-22 T. 46 R. 29

Sec. 15-

$\frac{1}{4}$ p Drift.

Cor.
Lk. 24844

Cor.
Lk. 24844

Lk. 24844

C. of sec.

22

Swamp

Cor.

Sec. 14

Cor. Lk. 24844
Lk. 24844

C. of sec.

23

NE Co.
S 23

Lk. 24844

Lk. 24844

G-747

SE.
23

Granite like 24844 predominates
in these sections. Outcrop shown on
map of runs.

22	23
27	26
34	35

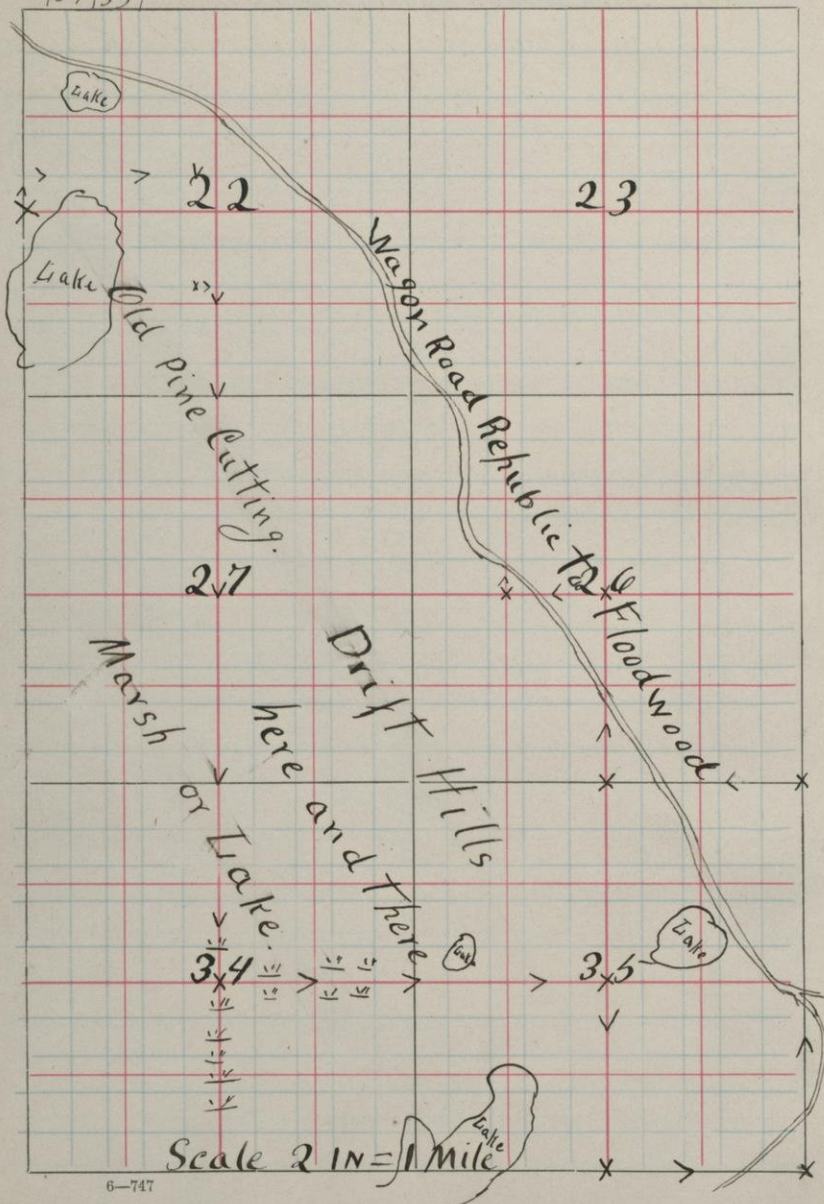
S.

T.

46

R.

29



Sections 22, 26, 27, 34 + 35 - 46-29
are duply drift covered and
show no outcrops on runs made
through them as shown on map.

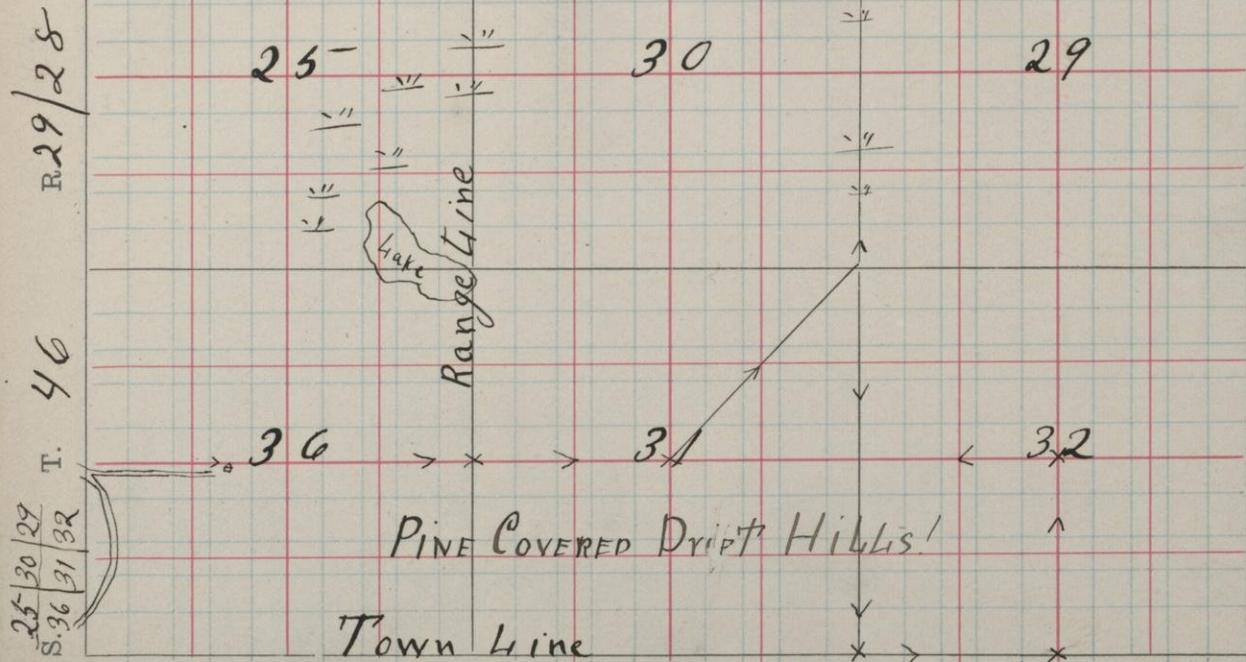
R. 29

Sec. 24

Sec. 19

R. 28

Sec 20



Run made as indicated on map.
 No outcrops. Country heavily drift
 covered and the rolling hills
 are usually pretty heavily timbered,
 large pine near T. lake but
 farther N. Jack pine.

Crossing wide swamp we come at
 24845- N. 18 85° W. O.-SE Cor. Sec. 30-46-28
 to large outcrop of rather coarse light
 grey granite very much like 24844.

Sec 17

Sec 16

Sec 15-

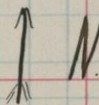
Drift Swamp.

64 24846-

64

64 24845-

Jack Pine



20

21

22

R. 28

Drift + Swamp.

64 24845-



Sand Plain Jack Pine

Jack Pine

29

28
Jack Pine

27

Scale 2 in. = 1 Mile

S. 20/21/22
29/28/27
T. 46

Ran line indicated on map through swamp and over drift hills then across rolling plains covered with Jack pine.

N. O. W. 600 - S. E. Cor. Sec. 17-46-28

Small outcrop of granite lib 24845-

N. O. W. 1870 - S. E. Cor. Sec. 17-46-28

Another small outcrop of grey granite lib 24845-

R. 28-
T. 46
S. 9/10/15-
8/17/16/15-



24846-7 N 320 W 0-SE Cor. Sec. 17-46-28

Outcrop of coarse light gray granite 24846
very much like 24844+5 cut by a
1 1/2 ft dyke of dark granitic rock 24847.

Same granite continues to outcrop to E for
over a mile along Section line $\frac{8}{17}$ -46-28.

24848 N 250 W 1500-SE Cor. Sec. 9-46-28

Outcrop of a granite very much like
the granites we have been having
for some distance 24844-5+6.

N 250 W 1340-SE Cor. Sec. 9-46-28

Same granite 24848 cut by dyke of
basic rock like 24847.

From SE Cor. Sec. 9-46-28 as far as I
can run to S. & E extend ^{rolling} sand plains
with jack pines & in places low ^{low} fescue.

Running N on section line 9/10-46-28 we get
no outcrops until we come to mouth with
outcrops on both sides of it. Granite
like 24846

Running W. on Section line 4-46-28
we pass outcrops of granite like
24846

NOW 505-SE Cor. Sec. 4-46-28

Outcrop of granite like 24844 + cut by
dyke of 24847.

24849 NOW 775-SE Cor. Sec. 4-46-26

Small outcrop of hornblende rock 24849
and again the same at
NOW 860-SE Cor. Sec. 4-46-26

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

T.

46

C. of Sec.

R.

R. 28

5-

A hand-drawn map on lined paper showing two locations along a horizontal axis. On the left, a cluster of small circles is labeled "Lib. 24846". On the right, a single circle is labeled "Lib. 24849". An arrow points from the right towards the left. Below the axis, the word "Cor." is written at both ends.

C. of Sec.

S

Pair number of outcrops of granite
like 24846 on run W along section
line $\frac{5}{9}$ - 46-28.

S. $\frac{32}{5}$

T. $\frac{47}{46}$

C. of sec. R. 28

32 T'47.

Cor.



24850
Gr.

Cor.

24851-2-3.
24850
24852
Gr.

C. of sec.

5- T'46.

24850 N. 1920 W. 1900 S.E. Cor. Sec. 5-46-28

Large outcrop of light colored coarse
gray granite very much like 24844-5-6.

Same outcrops in several places
as indicated along line to E.

24851-2-3 N. 0 W. 420 S.E. Cor. Sec. 32-47-28

Large outcrop of hornblende rock
24851 contorted and cut by acid
granite 24852 which has in places
pt followed schistosity of hornblende
schist; and both 24851 & 22 cut
by dykes of diorite, 24853.

Hornblende rock is almost massive when
fresh & has in places cf. specimen porphyritic
crystals of hornblende lying in it. Weathering
brings out schistosity.

The schist and granite continue to
outcrop along line to E.

S. $\frac{33}{4}$

T. $\frac{47}{46}$

C. of Sec. R. 28

33

T 47

Cor.

>

gl 24852

24852

24854

24853
G. 24

24853
24853

G. 24853

Cor.

C. of Sec.

4

T 46

42

The acid granite 24852 outcrops in
several large knobs along line.

24854 N1975-W1455-SE Cor. Sec. 4-46-28

Outcrop overlooking stream of a
fine schist which in places is
very ferruginous. Test pits have
been sunk around here.

24855 N75-W1140-SE Cor. Sec. 33-47-28

Large outcrop of a rather fine grained
grey granite cut by dyke of rock like 24853

S. 32/33 T. 47

R. 28

C. of Sec.

32

C. of Sec.

33

Cr.
Gr. Lib. 24845

Lib. 24846

Lib. 24851

Gr. Lib. 24848

Lib. 24845

Gr. H. Lib. 24851

Gr. H. Lib. 24851

Gr. Lib. 24852

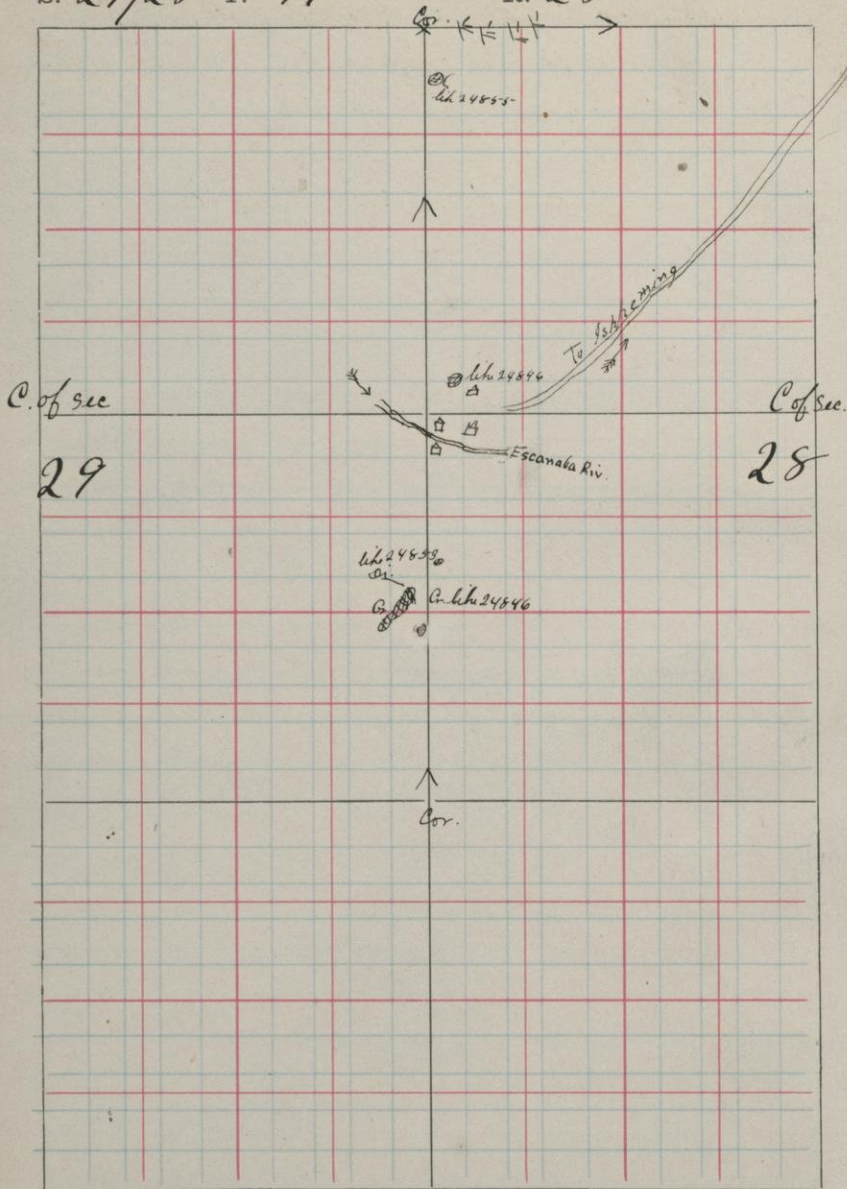
Gr. Lib.

^

Running N on section line 32/33-47-28
we pass over numerous outcrops of
hornblende schist like 24851 and
granites for the most part coarse
grained like 24846 & 48.

S. 29/28 T. 47

R. 28



Ran N on Section line 29/28-47-28
forming coarse granite for unit flat
similar to 2484688.

N. 975-W. 0 S.E. Cor. Sec. 29-47-28

Come to Escanaba Riv. Small settlement.
Wagon road from here to Greenwood and
onto Ishpeming.

S. 28/27 T. 47

R. 28

Tolohemip
Greenwood

Cor.

24856

C. of Sec.

28

Escanaba Riv

C. of Sec.

27

Cor.

The N. section line of S. 28-47-28 had been run on previous survey so that I took no specimens and made no locations. Outcrops are of granite similar to 24856.

24856 N 19 10 W O SE Co. S. 28-47-28.

Medium grained grey granite.

The same continues to outcrop to Escanaba and on along run made as indicated on map.

S. 33/34

T. 47

R. 28

Cor

24857

② like 24837

Plains

C of Sec

33

Col Sec.

34

lib. 24837

Di lib 24853

Escanaba.

Sc. H. lib 24851

Q. lib 2433-2

Co

24857 N1800 W1975- SE Cor. Sec. 34-47-28

Fine grained grey granite very
much like 24855.

N.400 W.0 SE Cor. Sec. 33-47-28.

Greenish hornblende schist like 24851
cut by granite like 24852

S. 34/35- T. 47 R. 28-

C of Sec.

34

Cor

↑

Co. 24857

Plains

Cor
↑

C of Sec.

35-

NE Cor.

↓

Co. 24856

Plains

↓

Sec. 36

Plains

TLT-0

SE Cor.

S. 27/26 T. 47

R. 28

@ of sec.
27

Cor.
X

@ L.H. 24856

@ L.H. 24856

@ L.H. 24859

@ 23859

@ L.H. 23859

@ L.H. 24858

@ 24858

@ L.H. 24858

Cor

C. of Sec.
26

N.E. Cor.

Rolling, drift, gravel.

Sec.
25

G.

Gr. L.H. 24856

L.H. 24856

G.

S.E. Cor.

24858

N300 W35 SE Cor. S. 27-47-28

Outcrop of a rather coarse grained
diabase. Again in 2 small outcrops
farther on to N.

24859

N570 W25 SE Cor. Sec. 27-47-28

Outcrop of medium grained grey granite.

N. Section line of Sec. 26-47-28 had been
run by a previous survey so I made no
locations and took no specimens.
Granite generally medium grained
like 24856.

S.

T. 46

R. 27

Lk 24550
Gr

Lk 24553

Rolling country, drift covered

6

5-

7

8

Drift hills + plains, no outcrops

To Polhemus

Lk 24546

Drift plain

Lk 24550

Gr like 24546 out by
Lk 24547

Camp A

Lk 24546

Gr Excavated

18

17

Drift plains

Drift plains

Lk 24546

Running S. on Section line 1/6-46-28 p₇
we pass at

N 1725 W 80-SE Cor. Sec. 1-46-28

outcrop of aca. granite like 24856 cut
by dyke of diabase (?) like 24853

Same granite outcrops little farther
on to S. on side of and in small valley.

We continue on to S over rolling drift covered
country to Escanaba River on which
there is an outcrop of granite. G. Wap.

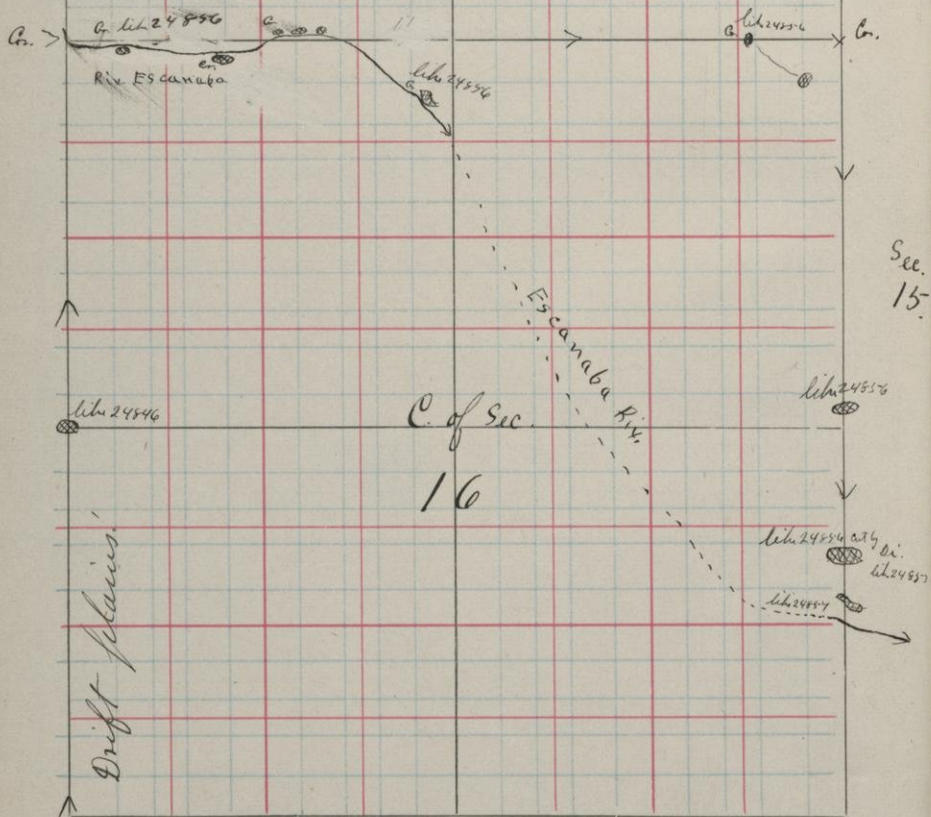
N 1900 W. S. SE Cor. Sec. 18-46-27

Large outcrop of coarse granite ^{like 24846} cut by dyke
of diabase like 24847. River cuts through
the granite and forms a fall of a few feet.

S. $\frac{9}{16}$ + 16/15 T. 46

R. 27
Cop. Sec.

9



Granite like 24856 predominates
along river - where outcrops show for
miles, rest of country quite level and
heavily covered with drift.

See
15.

24856

S. $\frac{20}{29} \frac{21}{28}$
 $\frac{32}{33}$

T. 46

R. 27

Sec.
19

20

21

Sec.
30

Drift plains!

29

No. Antelope!

Drift plains!

28

Sec.
31

32

33

Drift hills!

6-747

Town Line

The run was made as indicated
on map. No outcrops. Country
quite level and drift covered
but near T line becomes rougher
and is there in places covered
with timber. Rest of area has
been burned over and either
has poor growth of small
poplars on it or here and
there jack pine.

Sec. 4

Sec. 3

NE Co.

✓ Sec 10.

S. 9/10 T. 46 R. 27

C. of Sec.

9

C. of Sec
10

Sec. 16.

Co.

Co.

Co.

Lib 24556

Co.

Lib 24557.
24560

Lib 24557
Co.
Lib 24557

Co.

Co.
Lib 24556
Sec. 15

Co.
Lib 24557

Co.
Lib 24557

Lib 24557

Lib 24557

Lib 24557

Co. Sec.
11
Lib 24557

Drift hills

6-747

SE Co.
S/O

Ran N. on section line 9/16-46-27

N 500 W 50-SE. Cor. Sec. 9-46-27

Outcrop of granite like 2485 showing a somewhat gneissoid or flow structure in mass but not in hand specimen.

24860

N. 1050 W. 0-SE. Cor. Sec. 9-46-27

Granite like 24857 including blocks of a finer dark hornblende schist 24860.

Continue of our numerous outcrops of granite similar to specimens already taken

S. 4/3 T. 46 R. 27

Sec. 33

Co.

T. LINE

Sec. 34

C of Sec.
4

No outcrop

C of Sec.
3

Sec. 9

Co.
1

Sec. 10

NE Co.
Sec. 3

Lib. 248556

Lib. 248556

E. Br. of Escanaba

Lib. 248556

Sec. 2

Lib. 248556

Lib. 248556

Lib. 248556

Lib. 248556

SE Co.
Sec. 3

Lib. 248552

Outcrops along section line 4/3-46-27
are similar to granites already
specimened. Not as coarse grained
as we find farther S in complex.

N1540 W 0-SE Cor. Sec. 3-46-27

Granite similar to 24856 cut by
dyke of coarse grained diabase like
Phillips' 23602.

N1180 W 0 SE Cor. Sec. 3-46-27

Granite like 24856 cut by granite like
24857.

N685 W 0 SE Cor. Sec. 3-46-27.

Diabase ledge like Phillips' 23602.

N500 W 0-SE Cor. Sec. 3-46-27.

Granite like 24856 cut by fine
grained diabase like Phillips' 23599

S. 33/34 T. 47 R. 27

Sec. 28

Sec. 27

NE Cor.

Sec. 34

Sec. 35

C. of sec.

33

C. of sec.

34

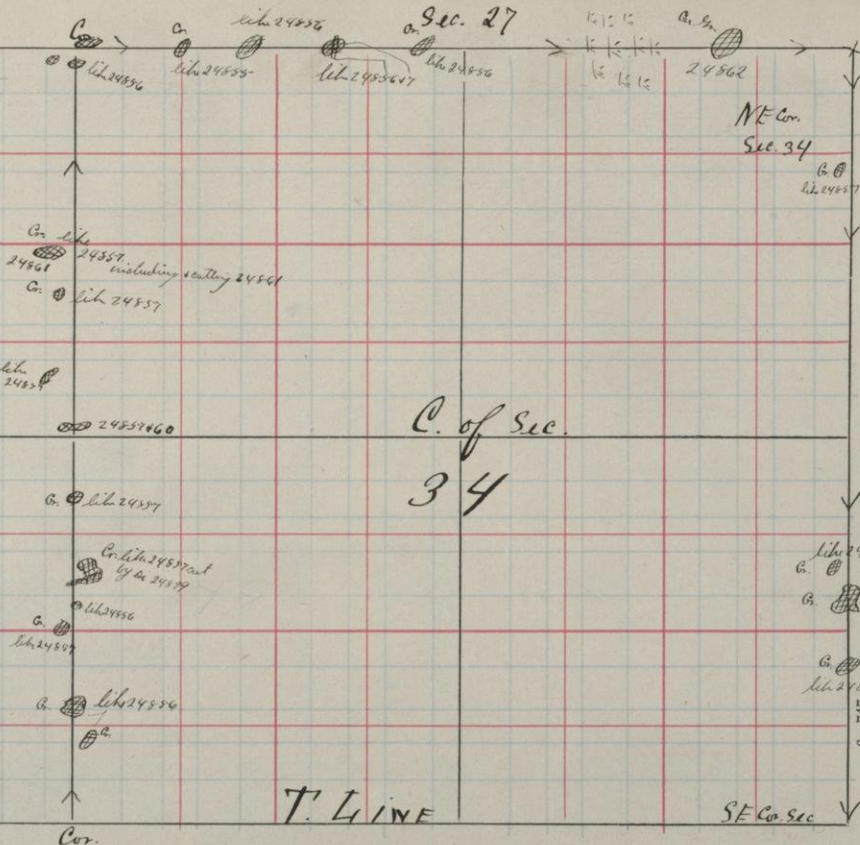
Sec. 4

Sec. 3

Cor.

T. 47 N.

SE Cor. Sec.



N.300 W.0 SE Cor. Sec. 33-47-27

Outcrop of granite like 24856 including blocks of hornblende schist and cut by a rock (Di.?) like 23599 of Phillips.

N.660 W.0-SE Cor. Sec. 33-47-27

Large dyke of coarse grained diorite? like Phillips' 23599 cutting granite like 24857.

N.1020 W.0 SE Cor. Sec. 33-47-27.

Granite like 24857 enclosing blocks of a schist like 24860

24861 N.1480 W.100 SE Cor. Sec. 33-47-27

Large mass of dark schist 24861 cut by and included in granite like 24857

To N. of Sec. 34 is a ridge of bare granite about 300 paces N. and then beyond that the rocks seem to be granitstone.

N.2000 W.1600 SE Cor. Sec. 34-47-27.

Granite like 24856 enclosing blocks of 24861

N.2000 W.1350-SE Cor. Sec. 34-47-27

Granite like 24857 cut by granite like 24856.

24862 N.2000 W.350-SE Cor. Sec. 34-47-27

Large mass of gneiss 24862 cut by and apparently included in granite like 24857

N.600 W.0-SE Cor. Sec. 34-47-27

Granite, acid, like 24852 enclosing masses of hornblende schist like 24857

The nearer we come to northern boundary of the basement complex the more schist we run to find associated with the granite and the granite is decidedly finer grained and more liable to be cut by dykes of granite than farther from the border.

Shattered

