



## Notes for Mesabi Range, October, 1898. No. 354 October 1898

Grant, U.S. (Ulysses Sherman), 1867-1932

[s.l.]: [s.n.], October 1898

<https://digital.library.wisc.edu/1711.dl/M25Z6GMWTAY2R8A>

<http://rightsstatements.org/vocab/InC/1.0/>

For information on re-use see:

<http://digital.library.wisc.edu/1711.dl/Copyright>

The libraries provide public access to a wide range of material, including online exhibits, digitized collections, archival finding aids, our catalog, online articles, and a growing range of materials in many media.

When possible, we provide rights information in catalog records, finding aids, and other metadata that accompanies collections or items. However, it is always the user's obligation to evaluate copyright and rights issues in light of their own use.

U. S. GEOLOGICAL SURVEY  
FIELD SECTION BOOK

9-891

# 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.

Notebook No. 354.

Notes for Mesabi Range, October, 1898.

X = corner seen by some one of the party

⊗ = " " " US Grant.

• = test pit.

\* = outcrop.

■ = house.

== wagon-road.

==== railroad.

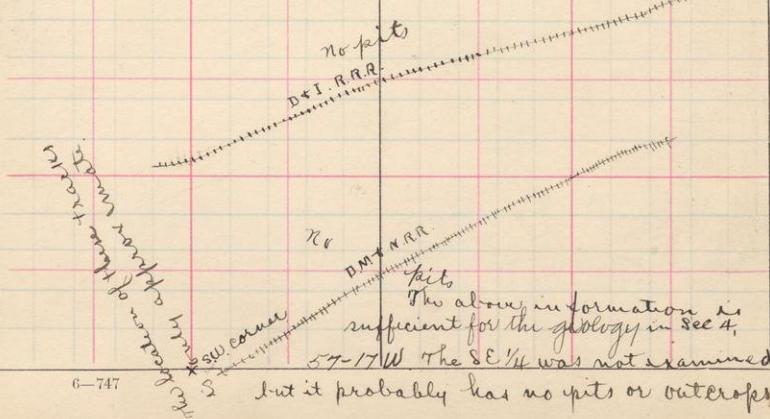
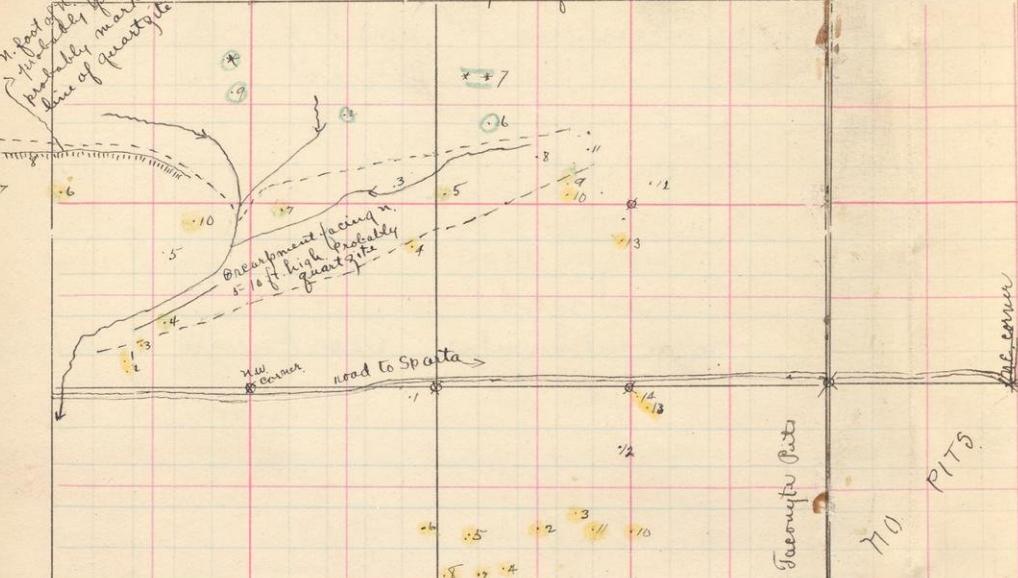
- before pit number = record given to Sebenius  
or Le Due.

2.

S. 7  
 $\frac{1}{2}$  foot of facing ridge  
 probably marble due to  
 line of quartzite along here.  
 T. 57

R. 17, W.  
 and parts of sec. 32 & 33 - 38-17.

S.



SE corner

6-747

6-747

The above information is  
 sufficient for the geology in sec 4,

57-17 W. The 8 1/4 was not examined

but it probably has no pits or outcrops

Oct. 11, 1898.

Run S. from N. line of sec. 4, 57-17, 400 paces E. of N.W. corner.

Pit.

-1. 425 paces E., 5 paces S. N.W. cor sec. 4, 57-17. Caved, medium depth, gravel, Taconyte.

(The following, nos 2-9, taken by LeDuc)

-2.	750 E. 345 S. N.W. cor sec 4, 57-17,	<u>Taconyte</u>
-3.	100 E. 310 S. " " " "	<u>Taconyte</u>
-4.	680 E. 455 S. " " " "	<u>Taconyte</u>
-5.	560 E. 375 S. " " " "	<u>Taconyte</u>
-6.	485 E. 345 S. " " " "	<u>Taconyte</u>
-7.	610 E. 470 S. " " " "	<u>Taconyte</u>
-8.	505 E. 490 S. " " " "	<u>Taconyte</u>
-9.	505 E. 715 S. " " " "	<u>Taconyte</u>

Run N. from S. line of sec 4, 57-17, 1000 paces E. of S.W. corner.

-10.	1000 E. 1885 N. S.W. corner sec 4, 57-17. Caved 25± ft.	<u>Taconyte</u>
-11.	900 E. 1900 N. " " " " 25± "	<u>Taconyte</u>
-12.	990 E. 2100 N. " " " " 15± "	<u>Taconyte</u> pieces but not clearly bedded.
-13.	1040 E. 2200 N. " " " " 12± "	<u>Taconyte</u>
-14.	1010 E. 2216 N. " " " " 10± "	<u>Taconyte</u>

See f. 9 for further note.

4

52

T.

R.

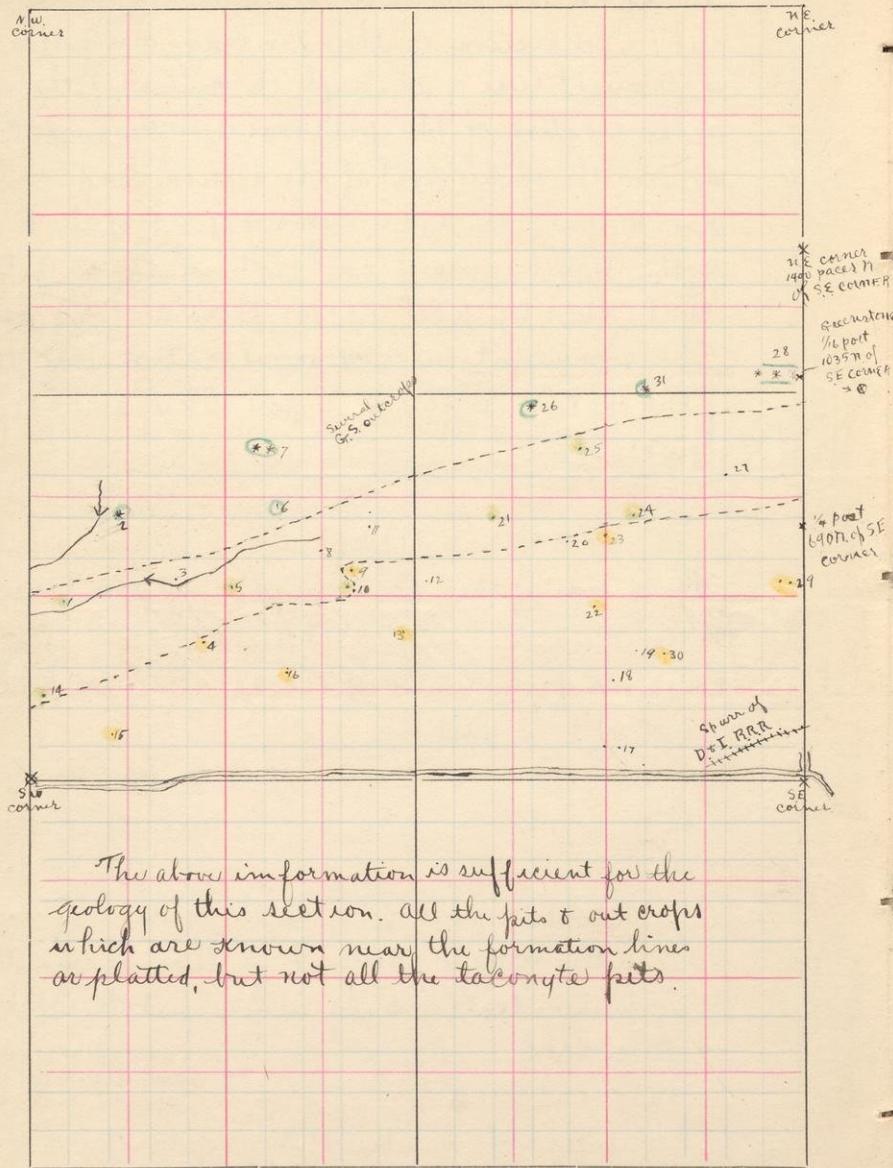
We find the N.  $\frac{1}{4}$  post to be 2240 paces N. of the S.W. corner. The section is thus too long. We follow a transit line N. through the center of the section so the location of the pits (Nos. 10-14) is right E+W. We saw the center post of the section and the  $\frac{1}{16}$  post N. of it; the latter is 740 paces S. of the N.  $\frac{1}{4}$  post. We assumed in locating these pits that this  $\frac{1}{16}$  post is 1500 paces N. of the S $\frac{1}{2}$  post. The above pits (10 to 14) are located on the plat (p. 2) from the N.  $\frac{1}{4}$  post. They are as follows:

$$\begin{array}{lll} -10 = 0^{\circ} \text{ E. } 355 \text{ S.} & -12 = 10^{\circ} \text{ W. } 140 \text{ S.} & -14 = 10^{\circ} \text{ E. } 245 \text{ S.} \\ -11 = 100^{\circ} \text{ W. } 340 \text{ S.} & -13 = 40^{\circ} \text{ E. } 40 \text{ S.} & \end{array}$$

The W. side of this section is about 2100 paces long.

now go N. from S. line of sec 32, 58-17, 700 paces east of S.  $\frac{1}{4}$  post

- 1. 75 N. 690 E. of S $\frac{1}{4}$  post sec 32, 58-17, Taconite within 2 ft of face
- 2. 65 N. 700 E. . . . . Taconite 1 "
- 3. 120 N. 735 E. . . . . 15 $\pm$  ft. of coarse granular quartzite, with evidently a little taconite above at. S. line of quartzite is evidently only a few feet N. of this pit
- 4. 180 N. 785 E. . . . . Quartzite greenish and fine grained.
- 5. 345 N. 665 E. . . . . Gravel and a considerable number of angular pieces of green stone. Silurian things, the pit is probably not ledged but I think it probably is, but the fact cannot be determined one way or the other.



- 6. Outcrop 518 N. 534 E. S 1/4 port sec 32, 58-17. quartzite,  
hard, gray, rather fine grained
  - 7. 534 N. 315 E. S 1/4 port sec 32, 58-17. "
  - 8. 608 N 444 E " " " " not clearly  
bedded but many greenstone fragments.
  - 9. Outcrop 775 N 25 W. of SE corner see 32, 58-17. Greenstone
  - 10. 445 N. 156 W. " " " " quartzite

The following species are found by me, see 33, 38-17

- 1. 475 N. 85 E SW. corner sec 33, 58-17. quartzite

-2. 715 N. 230 E. " " " " greenstone outcrop.

-3. 580 N. 370 E. " " " " naturally bedded, rock is shaly, perhaps Keweenaw & perhaps quartzite, probably quartzite.

-4. 370 N. 433 E. " " " " quartzite, iron stained and probably a little taconite above the quartzite.

-5. 525 N. 550 E. " " " " quartzite.

-6. 715 N. 650 E. " " " " greenstone & possibly a little quartzite above, but not certain.

-7. 822 N. 610 E. " " " " greenstone outcrop.

-8. 620 N. 755 E. " " " " shaly quartzite, most probably bedded.

-9. 565 N. 840 E. " " " " taconite & possibly a little quartzite evidently near line between quartzite and taconite.

-10. 525 N. 840 E. " " " " quartzite.

52

T.

R.

-11. 660 N. 880 E. SW corner of sec. 33, 58-17, shaly quartzite,  
but not surely ledged.

-12. 560 N. 1045 E. " " " " " , probably not ledged

-13. 395 N. 28 W. 5 1/4 post of sec 33, 58-17, Taconyte

sec 33-14

nw 1/4

Run S. from N. line sec. 4, 57-17. 600 paces E. of N 1/4  
post. Go ½ mile south but see no pits. None are  
found in this section E. of my run, but 5 tacon-  
yte pits occur to the W. in in N.W. ¼ of N.E. ¼ sec. 4.

Oct. 12, 1898.

-14. 235 N. 50 E. of S.W. corner of sec. 33, 58-17. quartzite.

-15. 140 N. 230 E. " " " " " Taconyte.

-16. 290 N. 675 E. " " " " " Taconyte.

Run N. from S line sec. 33, 600 paces E. of 8 1/4 post.

-17. 90 N. 530 E. of S 1/4 post, sec 33, 58-17. Caved, 12<sup>±</sup> ft. clay(till)

-18. 285 N. 515 E. " " " standing, 30<sup>±</sup> ft.

Clay(till) & gravel  
caved 10<sup>±</sup> ft.

-19. 330 N. 395 E. " " " " " sand & gravel

-20. 640 N. 400 E. " " " " " Caved 20<sup>±</sup> ft. gra-

vel & taconyte, most probably ledged but  
near top of quartzite.

-21. 400 N. 200 E. " " " " " , caved 20<sup>±</sup> ft. fine  
grained, greenish gray quartzite.

-22. 470 N. 470 E. " " " " " Taconyte

-23. 650 N. 500 E. " " " " " , caved 20<sup>±</sup> ft.,  
reddish Taconyte and greenish Taconyte.

-24. 700 N. 560 E. " " " " " standing 30<sup>±</sup> ft.

S.

T.

R.

green, shaly rock with mica scales = probably quartzite.

- 25. 866 N. 440 E. of S<sup>W</sup> post sec 33, 58-17, quartzite.
- 26. 960 N. 177 E. " " " cut crop of greenstone, coarse, massive, diorite-like.
- 27. 800 N. 810 E. " " " gravel, & possibly, but not probably, greenstone.
- 28. 1035 N. 930 E. " " " greenstone outcrop, coarse massive diorite-like.
- 29. 525 N. 975 E. " " " taconite.
- 30. 340 N. 650 E. " " " taconite.
- 31. 1010 N. 620 E. " " " greenstone outcrop,

#### Section 34, 58-17. (plotted on p. 12)

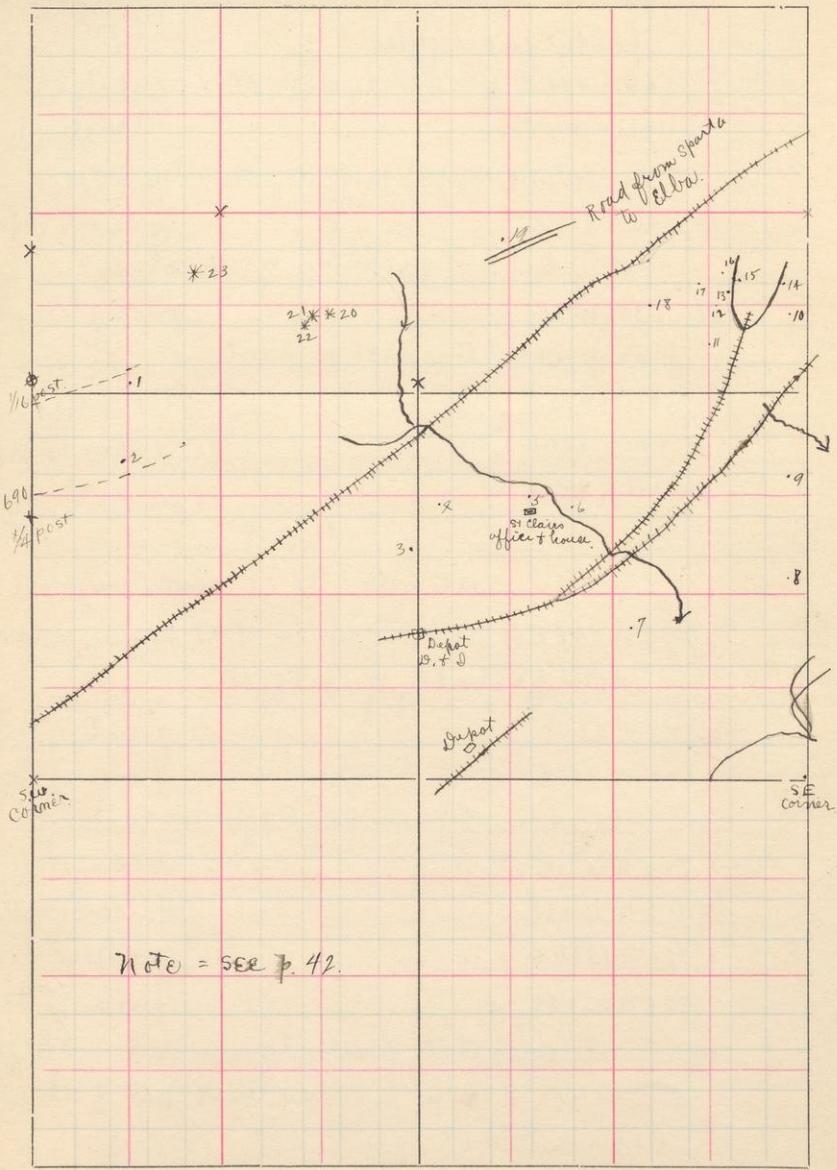
- 1. 1035 N. 260 E. of SW corner sec 34, 58-17, shaly, variegated rock, probably quartzite.
- 2. 835 N. 235 E. " " " , quartzite.
- 3. 620 N. 970 E. " " " standing 30<sup>±</sup> ft. clay & gravel probably bedded in taconite.
- 4. 735 N. 1060 E. " " " standing 25<sup>±</sup> ft. taconite.
- 5. 745 N. 1295 E. " " " standing 25<sup>±</sup> ft. taconite.
- 6. 725 N. 1380 E. " " " , caved 10 ft. gravel
- 7. 405 N. 1555 E. " " " , green to black siliceous slate, finely laminated, with some bands of iron. Probably lower part of slate formation.

12

S. 34.

T. 58.

R. 17.



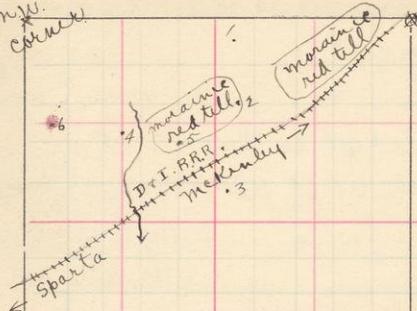
- 6. 550 N. 1960 E of S.W. corner sec 34, 58-17, standing 3 $\frac{1}{2}$  ft.  
sand and gravel.
- 9. 880 N. 1940 E. . . . . , gravel and  
very probably bedded in black slate.
- 10. 280 S. 40 W. of N.E. cor. sec. 34, 58-17, carved, 25± ft yellow  
taconite
- 11. 340 S. 250 W. . . . . , standing 15± ft. taconite
- 12. 255 S. 205 W. . . . . , standing 35± ft,  
taconite and lean ore.
- 13. 230 S. 180 W. . . . . , standing 40 ft.  
taconite and ore = edge of mine.
- 14. 200 S. 30 W. . . . . E side St. Clair mine.
- 15. 200 S. 175 W. . . . . W. . . . .
- 16. 180 S. 210 W. . . . . , standing 15± ft taconite
- 17. 210 S. 270 W. . . . . , standing 12± ft ta-  
conite, (pivy)
- 18. 255 S. 400 W. . . . . , shaly mica-  
ceous rock, most probably quartzite carved 25± ft  
clay and gravel.
- 19. 75 S. 760 W. . . . . shaly, mixed-  
ceous rock, most probably quartzite.
- 20. 270 S. 1230 W. . . . . greenstone  
outcrop, medium grained, massive, diorite like.
- 21. 265 S. 1260 W. . . . . greenstone out-  
crop, medium grained, massive, diorite like
- 22. 280 S. 1280 W. . . . . greenstone out-  
crop, medium grained, massive, diorite like
- 23. 170 S. 1570 W. . . . . greenstone out-  
crop, fine grained, less massive.

14

S. 25

T. 58

R. 17 W.

N.W.  
cornerN.E.  
cornerW  
1/4 partS.W.  
cornerS.E.  
corner

Oct. 13, 1898. Section 25, 58-17W.

- 1. 5S 555E. of n.w. corner sec. 25, 58-17W. Standing  $35 \pm$  ft.  
Clay (till) and gravel; drill (see note below)
- 2. 200S. 560E. " " " standing  $35 \pm$  ft.  
sand and gravel. Possibly but not probably  
ledged in taconite.
- 3. 420S. 535E. " " " , caved  $30 \pm$  ft. clay till
- 4. 270S. 250E. " " " , standing  $50 \pm$  ft,  
sand and gravel. Possibly but not probably ledged  
in taconite. (Observation taken at dusk)  
 $20 \pm$  ft.
- 5. 270S. 415. " " " , caved sand & gravel  
(Observation taken at dusk)
- 6. 155S. 658. " " " , gravel, drilled,  
over (Sebenius)

{Note. No. 1 was checked N. 2. of sec. 24. and found  
to be 55S. + 450W. of  $n\frac{1}{4}$  post sec. 25 and is  
so platted.

16

S. 24  
n.w.  
corner

T. 58

R. 17 W.

N.E.  
corner

steep N.W. slope to strong  
magnetic attraction  
undoubtedly talcuite

no pits.

low ridge with  
rock-like pit no. 12  
at the surface

.9

.10

.19

.21

.27

.26

.25 .23 .24

.22 .21 .20

.18

.16

.17

.15

.14

.7

NO PITS.

NO PITS.

NO  
PITS

w.  
1/4 part.

NEW  
ROAD  
SPARTA MCKINNEY

magnetic attraction  
here. Probably talcuite

S.W.  
corner

.2  
.3

DUTERR  
SPARTA

S.E.  
corner

Oct. 13, 1898. Section 24, 58-17 W.

- 1. 835 S. 550 E. of N.  $\frac{1}{4}$  post sec 24, 58-17 W. caved 25± ft.  
Sand & gravel. See note below.
- 2. 830 S. 595 E. " " " standing 60± ft.  
sand & gravel: drilled, Sebenius says the  
drill probably struck taconyte. See note below
- 3. 930 S. 545 E. " " " standing 60± ft.  
sand & gravel. See note below.

Oct. 14. 1898

- 4 — 155 W. of S  $\frac{1}{4}$  post sec 24, 58-17 W, gravel, drilled  
-5. 200 S. 285 W. " N.  $\frac{1}{4}$  post " " " , caved 15± ft. ~~tac~~  
-6. 128 32 W. " " " " " clay (till)  
-7. 1325 N. 20 E. " S  $\frac{1}{4}$  post " " " , taconyte (Sebenius)
- {Note: No 2. was again located from S.  $\frac{1}{4}$  post, &  
This correction is applied to Nos. 1, 2, & 3, &  
so platted. 2 = 120 N. 410 W - 3 = 20 N. 460 W - 1 = 115 N. 455 W.  
-8. 30 S. 254 E. of N.  $\frac{1}{4}$  post sec 24, 58-17 W, caved 10± ft.  
clay (till).

- 9. 285 S. 270 E. " " " " " , caved 25± ft.  
Clay & gravel. Many black slate drift pieces.
- 10. 168 S. 267 E. " " " " " , caved 20± ft.  
Black slate, rather now-silty, rich in iron  
and sometimes greenish. I think it is  
near the bottom of the black slate member.
- 11. 330 S. 225 E. " " " " " , caved 10± ft. { sand &  
-12. 575 S. 250 E. " " " " " , 4± ft. ledge  
within one foot of surface. Taconyte, very rich in

5.

T.

R.

- hematite and magnetite. A lean ore. Apparent dip of about  $12^{\circ}$  to S.E.
- 13. 590 S. 235 E. of N. 1/4 post sec 24. 58-17 W. Outcrop <sup>Same</sup> as No. 12.
  - 14. 700 S. 287 E. " " " Caved  $25^{\pm}$  ft. sand & gravel. Another pacing corrects this to 425 ft.
  - 15. 820 S. 140 E. " " " Caved  $20^{\pm}$  ft. gravel and hard magnetic ore.
  - 16. 25 N. 165 E. of center sec. 24. 58-17 W. Caved  $50^{\pm}$  ft. clay (till) & gravel.
  - 17. 15 N. 500 E. " " " Caved  $25^{\pm}$  ft. taconyte, but probably near black slate.
  - 18. 130 N. 672 E. " " " Standing  $50^{\pm}$  ft. gravel & taconyte.
  - 19. 325 N. 670 E. " " " {gravel Standing  $20^{\pm}$  ft.
  - 20. 355 N. 670 E. " " " Caved  $20^{\pm}$  ft. sand and gravel.
  - 21. 353 N. 625 E. " " " Caved  $20^{\pm}$  ft. greenish taconyte.
  - 22. 380 N. 615 E. " " " Standing  $20^{\pm}$  ft. greenish taconyte.
  - 23. 420 N. 590 E. " " " Caved  $20^{\pm}$  ft. hard magnetic taconyte.
  - 24. 430 N. 645 E. " " " {gravel Caved  $20^{\pm}$  ft.
  - 25. 435 N. 520 E. " " " Caved  $20^{\pm}$  ft. Clay & gravel probably ledges in taconyte
  - 26. 645 N. 560 E. " " " Caved  $20^{\pm}$  ft. taconyte.

८२.

T.

R.

- 27. 695 N. 370 E. of center sec. 14. 58-17 W., carved 20± ft  
hard magnetic.
- 28. 760 N. 381 E. " " " standing 10± ft  
hard magnetic taconyte; comes with  
in 4 ft of surface. Dip. 12-15° SE.
- 29. 75 S. 400 W. of N. E. corner sec. 24, 58-17 W., carved  
25± ft. taconyte.

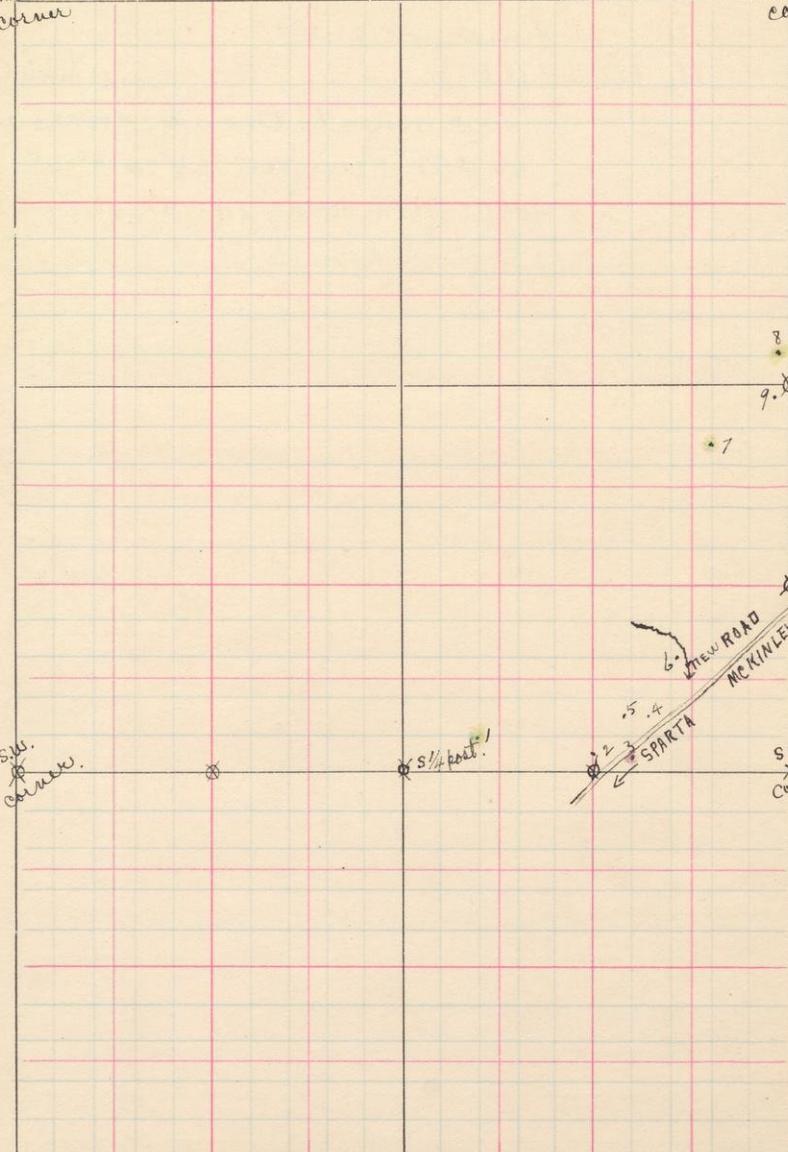
22.

S. 23

N.W.  
corner

T. 58

R. 17 W.

N.E.  
corner

Oct. 13, 1898. Section 23, 58-17 W.

- 1. 80 N. 195 E. of S  $\frac{1}{4}$  post sec 23, 58-17 W, standing  $50 \pm$  ft.  
Sand & gravel and a number of angular, freshly  
broken, non-glaciated pieces of fine grained,  
hard, sometimes laminated quartzite. I con-  
sider the pit ledged in quartzite.
- 2. 40 N. 500 E. " " " " " , standing  $50 \pm$  ft.,  
sand and gravel, possibly ledged in taconyte.
- 3. 40 N. 605 E. " " " " " , caved  $75 \pm$  ft. <sup>Taconyte</sup> ~~ft ore.~~
- 4. 155 N. 645 E. " " " " " , standing  $35 \pm$  ft. gravel.
- 5. 170 N. 595 E. " " " " " , standing  $40 \pm$  ft. gravel.
- 6. 305 N. 720 E. " " " " " , standing  $25 \pm$  ft <sup>clay till</sup> ~~t & gravel~~.
- 7. 145 S. 210 W. of E  $\frac{1}{4}$  post sec 23, 58-17 W. , caved  $15 \pm$  ft. greenish  
and reddish quartzite rather fine grained. Ab-  
solutely certain this is quartzite.
- 8. 85 N. 30 W. " " " " " , till. Lebenius  
was here when this pit was sunk and says  
it was ledged in quartzite.
- 9. 35 S. 40 W. " " " " " , gravel.

24

S. 27.  
N.W.  
corner

T. 58.

R. 17 W.

N.E.  
corner.

4.

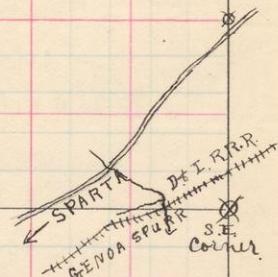
3.

2.

1.

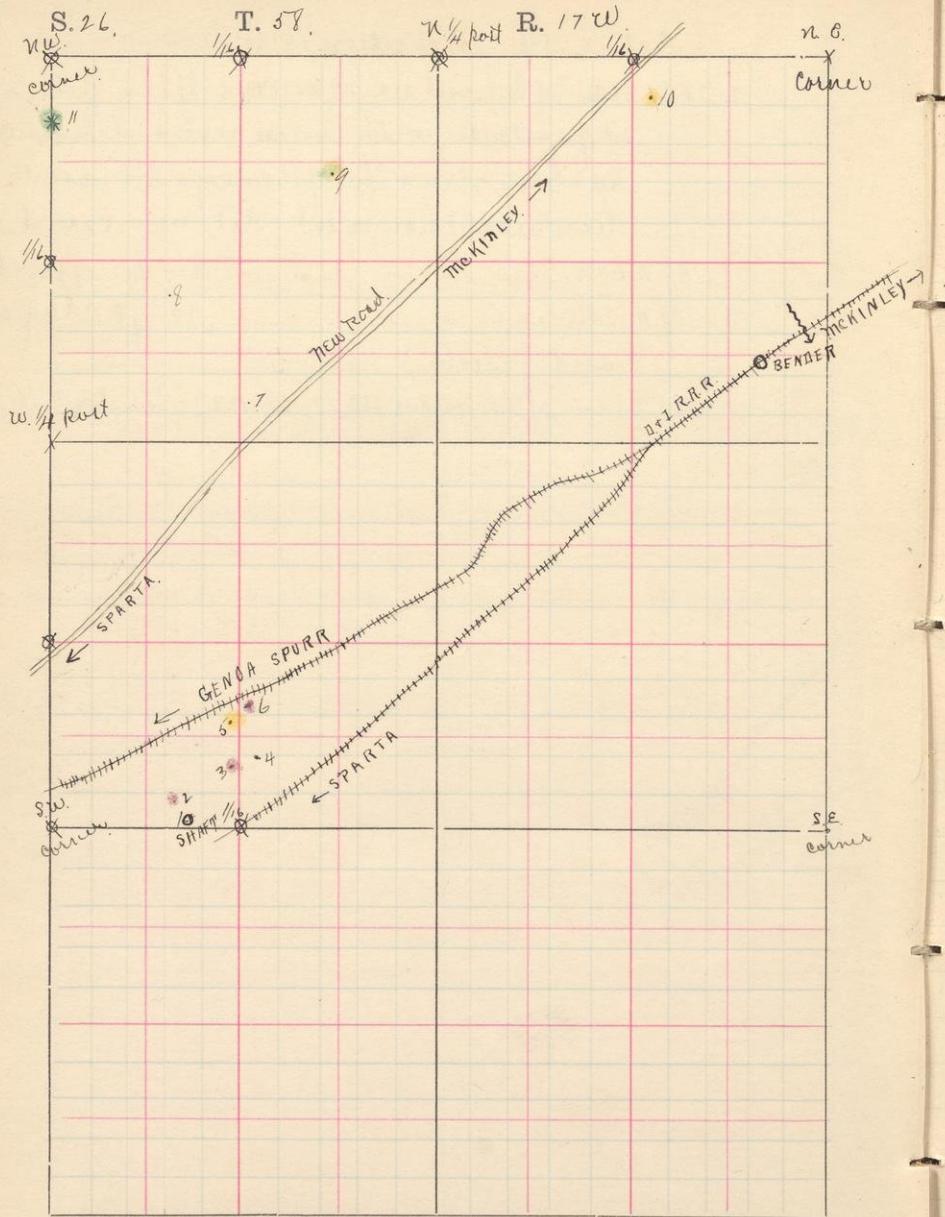
8 1/4 pax

S.W. corner



Oct. 13, 1898. Section 27, 58-17W.

- 1. 75 S. 36 W. of E. 1/4 post sec. 27, 58-17W. Shaly fine grained quartzite with mica scales. Sebenius has been down this pit & says the rock lies nearly horizontal. Pit now caved.
- 2. 140 N. 60 W. " " " " " , 20 $\pm$  ft. gravel.
- 3. 290 N. 75 W. " " " " " , 35 $\pm$  ft. clay (till) and gravel.
- 4. 145 S. — of N.E. corner sec. 27, 58-17W., granetone outcrop.



Oct. 13, 1898. Dec. 26, 58-17W.

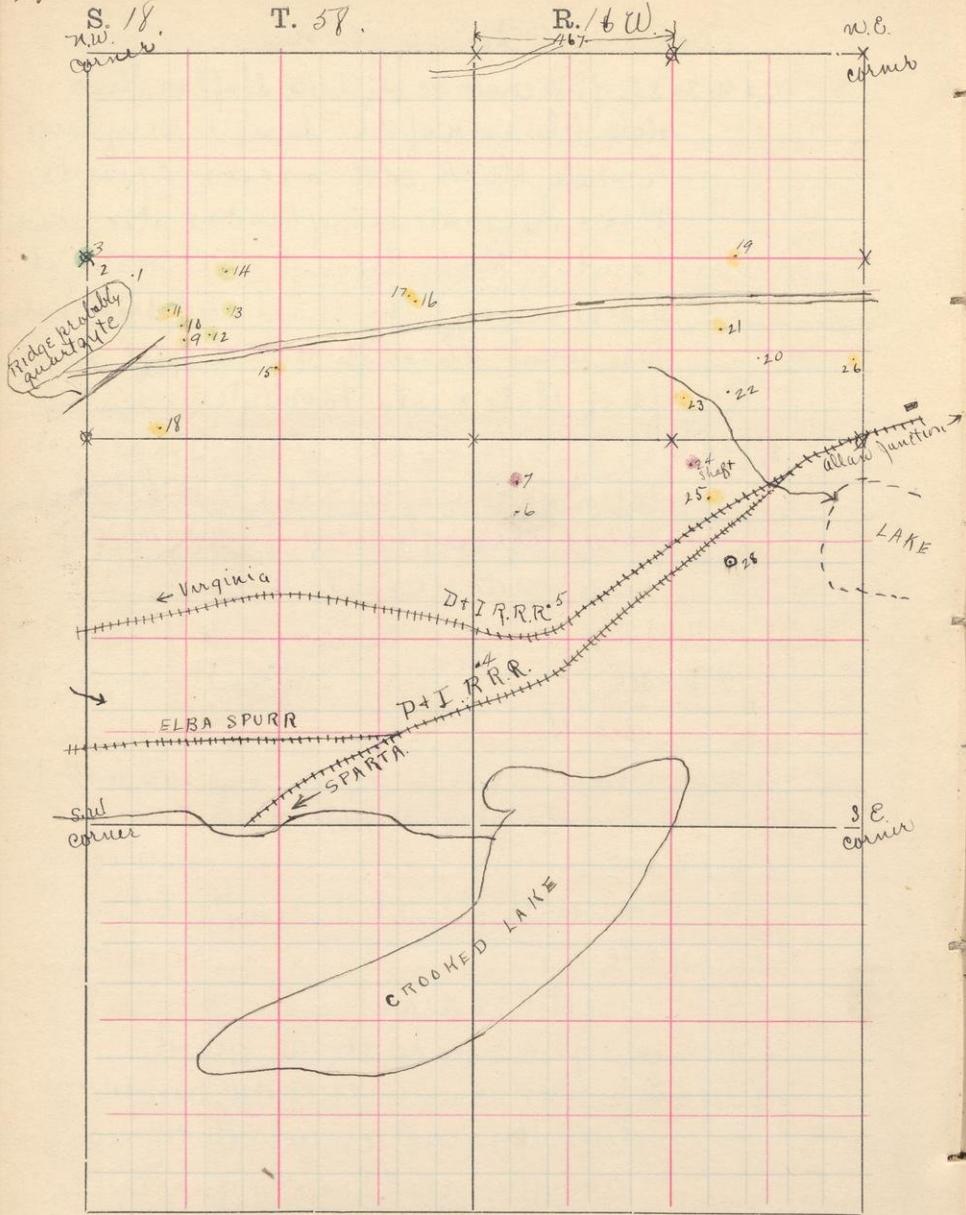
- 1. 8 N. 345 E. of S.W. corner sec. 26, 58-17W. Shaft in black slate. The rock of the dump is very largely slate, black, carbonaceous & fissile. There are some irony bands & also some bands of flinty taconite-like material. Sebenius says the shaft and drill hole here went through 50± ft. of drift, 100 ft. of slate & into taconite.
- 2. 53 N. 315 E. of S.W. corner sec. 26, 58-17W. Gravel & ore. Sebenius says this pit & drill hole here passed through 100± ft. of drift, 100 ft. of high grade ore & into taconite.
- 3. 165 N. 485 E. " " " " , 50± ft. gravel & ore.
- 4. 190 N. 530 E. " " " " , standing 20± ft. gravel.
- 5. 275 N. 475 E. " " " " , standing 40± ft. gravel & gray taconite.
- 6. 315 N. 500 E. " " " " , caved 40± ft. ore with a little taconite below.
- 7. 110 N. 510 E. " " " " , caved 10± ft. clay (till) & gravel.
- 8. 400 N. 310 E. of N.W. 1/4 sec. 26, 58-17W. gravel.
- 9. 270 S. 740 E. N.W. corner sec. 26, 58-17W. caved 40± ft. clay (till) & gravel & much silty, micaceous gray-green rock, probably quartzite. Pit most probably ledged, rock most probably quartzite.

28

S. 18.  
N.W.  
~~order~~

T. 58.

R. /  $\theta$  w



10. 92 S. 550 E. of N. 1/4 port rec 26, 58-17W, taconite, (Lebening)  
 -11. 145 S. — N.W. corner, sec 26, 58-17W, greenstone outcrop.

Oct 15, 1898 Section 18 58-16W.

- 1. 452 N. 100 E. of W. 1/4 port rec 18, 58-16W, clay + gravel.  
 -2. 478 N. 10 E. " " " " , clay + gravel.  
 -3. 500 N. — " " " " , greenstone outcrop.  
 -4. 438 N. 1003 E. SW. corner sec 18, 58-16W, clay + gravel,  
 shallow caved  
 -5. 580 N. 11908 " " " " , clay + gravel.  
 45± ft drilled.  
 -6. 832 N. 11058 " " " " , standing 40± ft.  
 sand + gravel.  
 -7. 905 N. 11178 " " " " , standing 70± ft.  
 sand + gravel. ore drilled.  
 -8. 1270 N. 245 E. " " " " , quartzite (Le Due)  
 -10. 1310 N. 230 E. " " " " , quartzite (Le Due)  
 -11. 1358 N. 205 E. " " " " , taconite, paint  
 rock + quartzite (Le Due)  
 -12. 1280 N. 310 E. " " " " , quartzite (Le Due)  
 -13. 1335 N. 365 E. " " " " , quartzite (Le Due)  
 -14. 1460 N. 345 E. " " " " , quartzite (Le Due)  
 -15. 1210 N. 490 E. " " " " , taconite (Le Due)  
 -16. 1385 N. 835 E. " " " " , taconite +  
 paint rock (Le Due)  
 -17. 1325 N. 845 E. " " " " , taconite +  
 paint rock (Le Due).

30.

S.

T.

R.



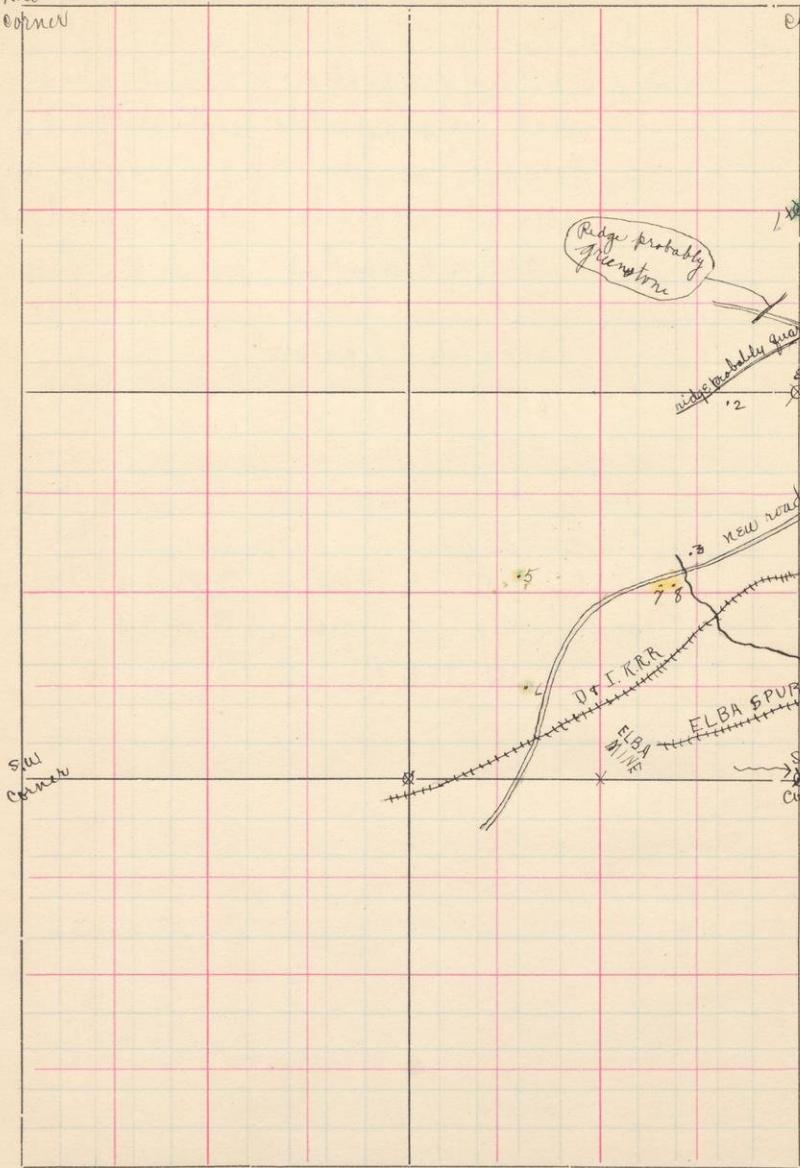
32.

S. 13

nw corner

T. 58.

R. 17W.

N.E.  
corner

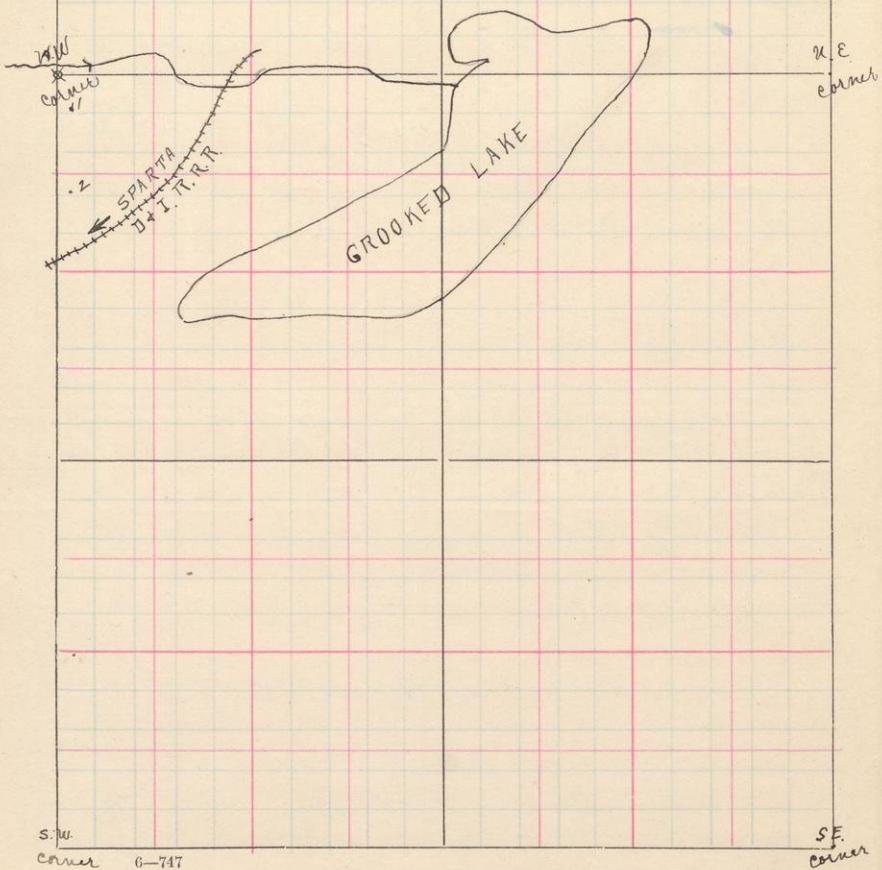
- Oct. 15, 1898. Section 13, 58-17 W.
- 1. 480 N. 15 W. of S. 1/4 post sec 13, 58-17 W., greenstone outcrop
  - 2. 25 S. 185 W. " " " " " standing 10+ ft.  
perhaps bedded in jaspary taconyte
  - 3. 405 S. 265 W. " " " " " clay (till)
  - 4. 500 N — " " " " " greenstone outcrop
  - 5. 445 S. 596 W. " " " " " quartzite <sup>(Scherinian)</sup>
  - 6. 760 S. 685 W. " " " " " green rock ap-  
parently made of quartz grains in a green  
cement. It looks like greenstone, but I feel  
sure it is quartzite. (See note below)
  - 7. 478 S. 355 W. " " " " " taconyte, paint-  
rock & ore
  - 8. 470 S. 290 W. " " " " " taconyte & lean ore
- {Note: Specimens of rock from Pit #6 = No. 1.

34

S. 19.

T. 58

R. 16 W.



S.W.

corner

6-747

S.E.

corner

Oct 15, 1898. Section 19, 58-16 W.

- 1. 98 S. 31 E. of N.W. corner sec 19, 58-16 W. clay (till), drilled.  
-2. 290 S. 32 E. " " " " " clay (till), carded

36

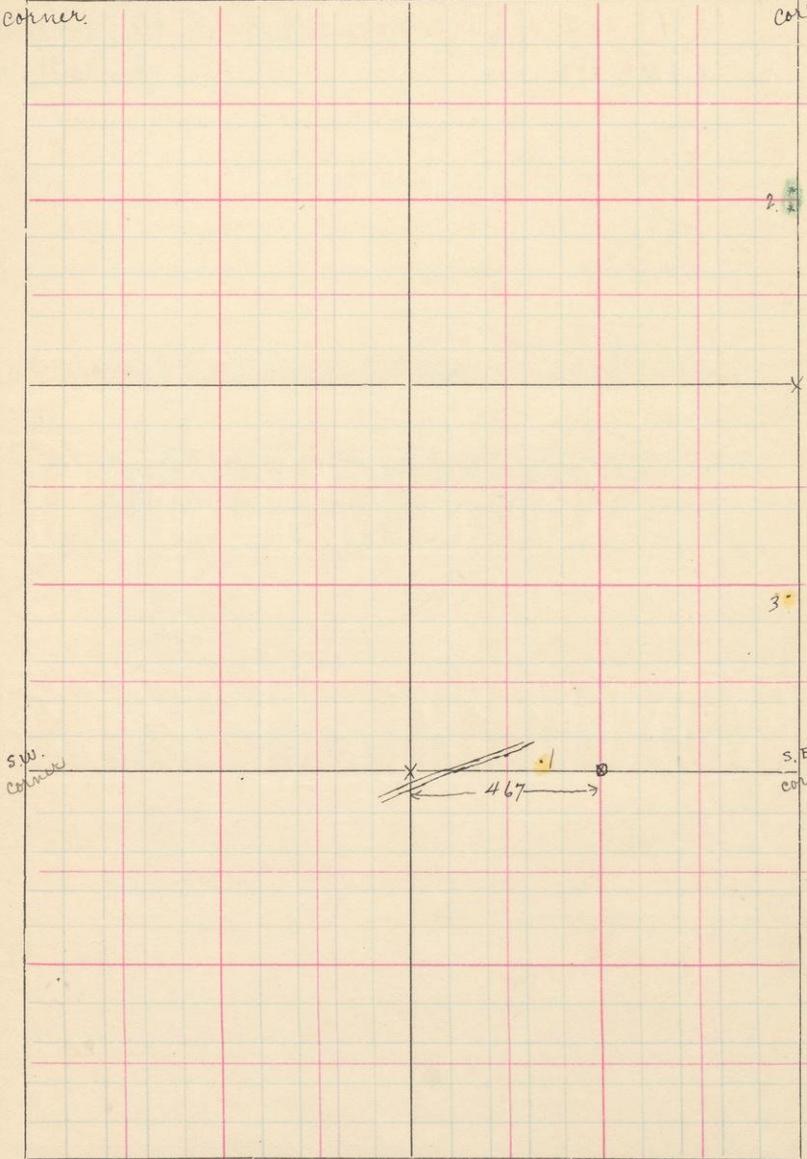
S. 7  
N.W.

T. 58

R. 16 W.

corner.

N.E.  
corner.

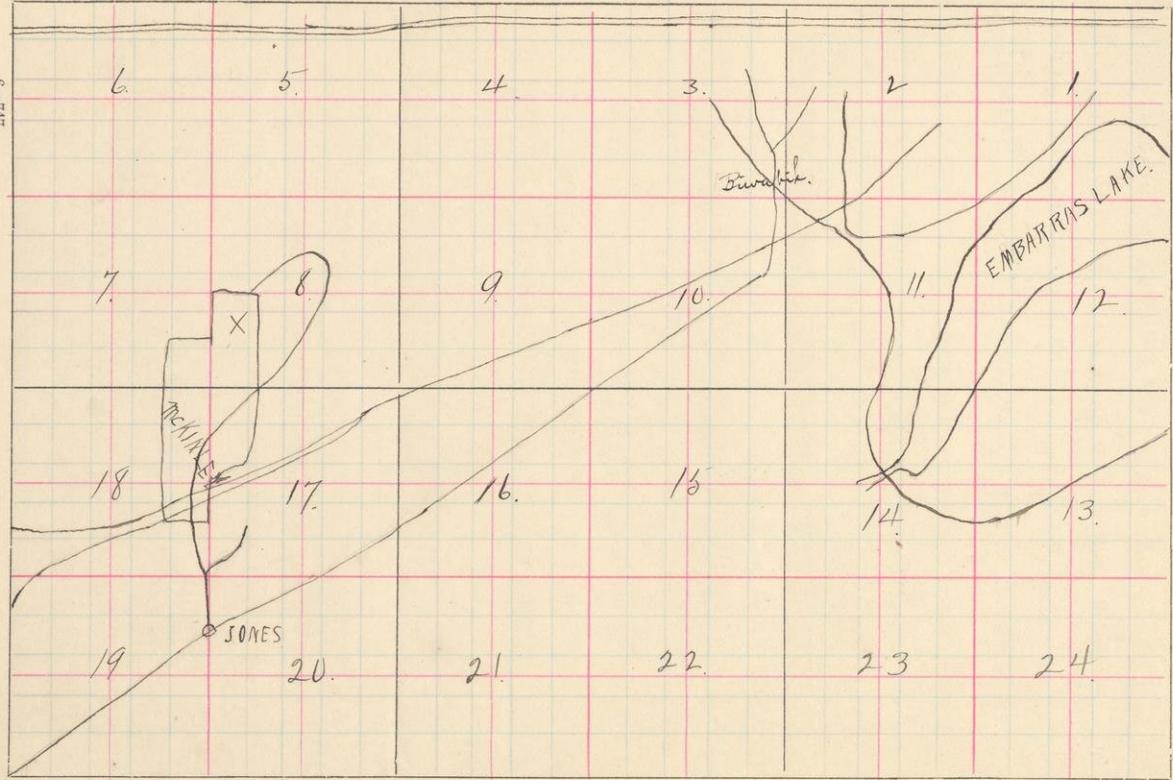


OCT. 15, 1898.

Section 7, 58-16 W.

- 1. 20 N. 330 E. of S  $\frac{1}{4}$  post sec. 7, 58-16 W., taconite & haematite
- 2. 480 N. 5 W. ... E  $\frac{1}{4}$  post sec. 7, 58-16 W., greenstone outcrop, runs 50± paces northward
- 3. 465 N. 30 W. of SE corner sec. 7, 58-16 W., taconite (Le Due)

6-747



S.

T. 58

R. 16 W.

36



40

S. 35.

T. 58.

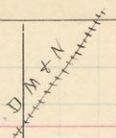
R. 17 W.

NW  
corner.

20

X

X

SW  
cornerNE  
cornerSE  
corner

## Section 35, 38-17 W.

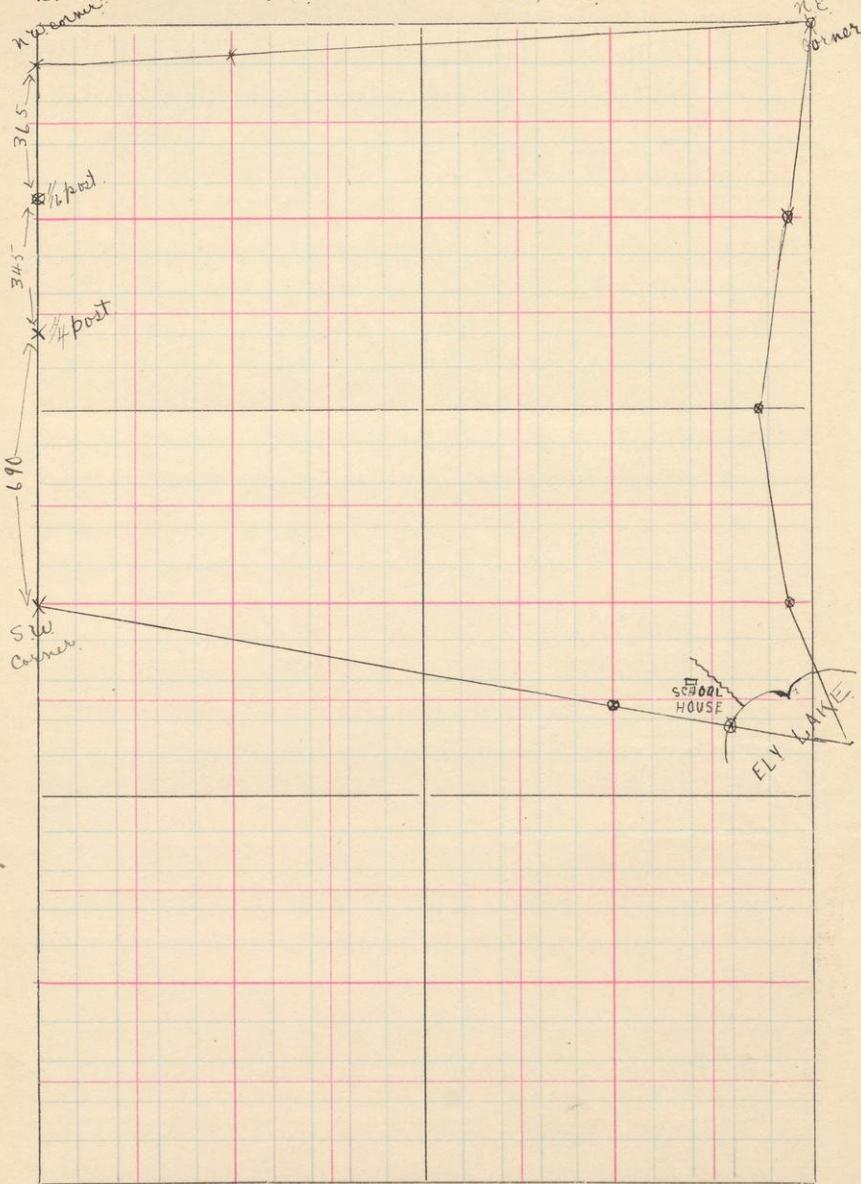
- 1. 383 N. 125 E. of W. 1/4 post rec. 35, 38-17 W., black slate. (LeDuc)
- 2. 95 S. 195 E. " N.W. corner sec. 35, 38-17 W., black slate. (LeDuc)

42

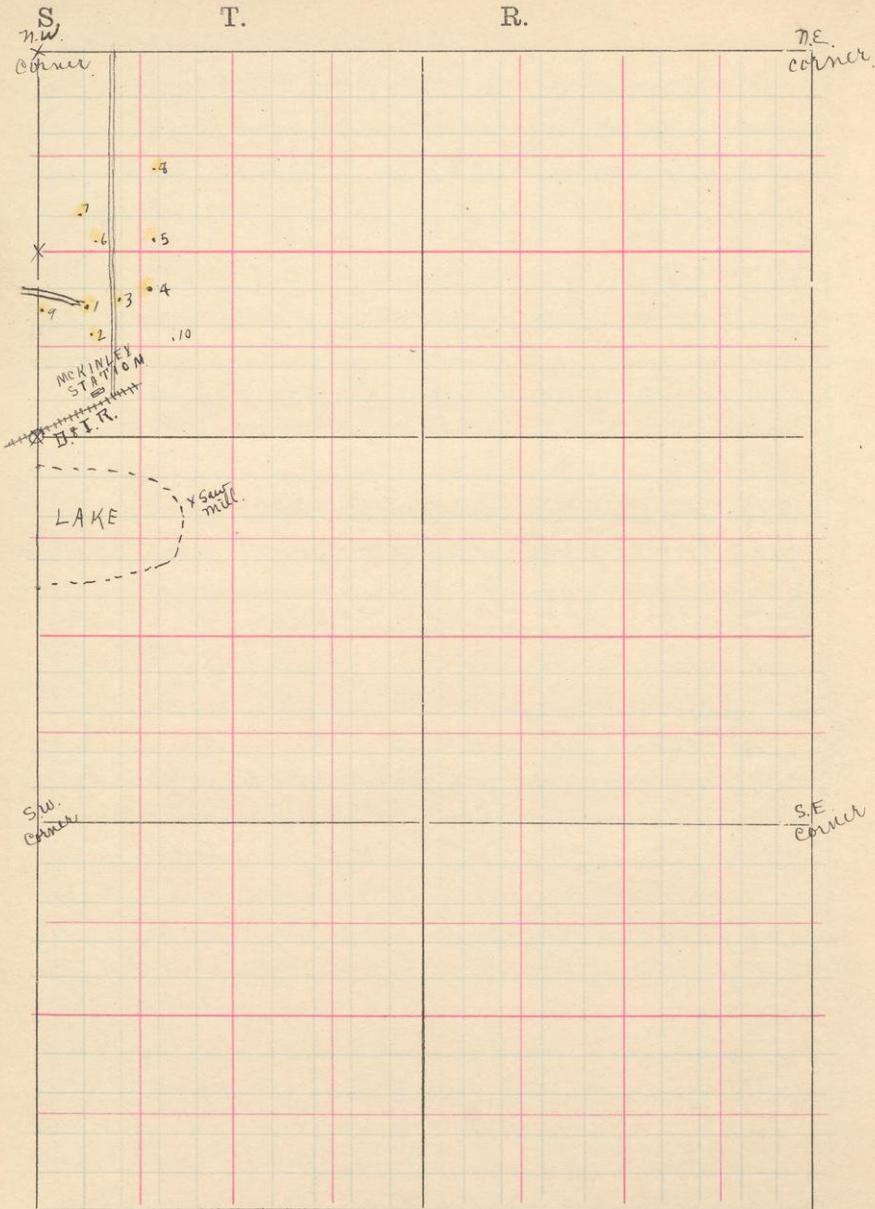
S. 34.

T. 58

R. 17 w







Oct. 17, 1898. Section 17. 58-16W.

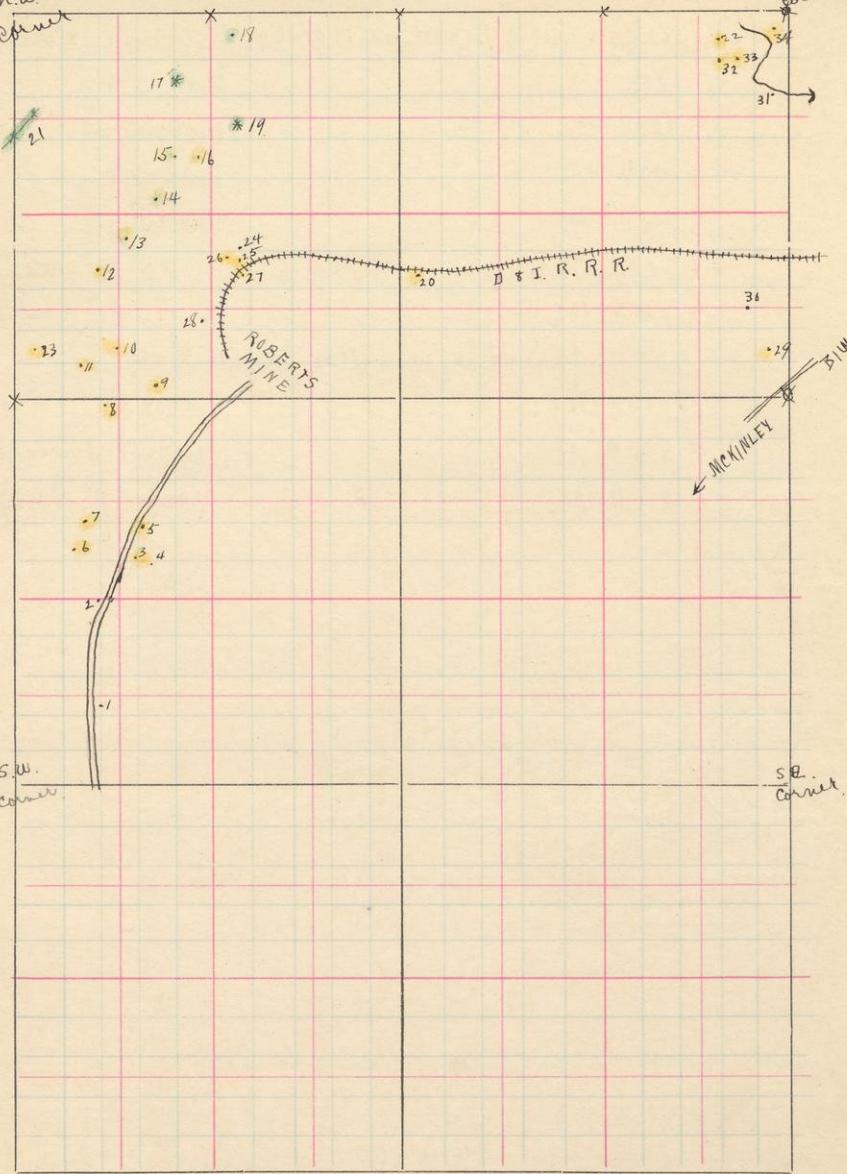
- 1. 368N 116E of W 1/4 post sec 17, 58-16W, taconyte + ore  
-2. 283N 120E " " " " " " " " taconyte  
-3. 383N 190E " " " " " " " " taconyte  
-4. 390N 265E " " " " " " " " taconyte  
-5. 528N 280E " " " " " " " " taconyte  
-6. 528N 150E " " " " " " " " taconyte  
-7. 600N 110E " " " " " " " " taconyte and ap-  
parently a little black slate  
-8. 715N 280E " " " " " " " " taconyte  
-9. 315N 5E " " " " " " " " brecciated taconyte + ore  
-10. 265N 335E " " " " " " " " caved 10+ft. clay + gravel

46

S. 8  
N.W.

T. 58.

R. 16 W.



Oct. 17, 1898. Section 8, 58-16W.

-1. 225 N. 190 E. of SW corner sec 8, 58-16W. Perhaps black slate or taconyte.

- 2. 490 N. 200 E. " " " sand & gravel, caved 10 ft
- 3. 605 N. 295 E. " " " taconyte, standing 70± ft
- 4. 590 N. 335 E. " " " gravel, standing 8± ft
- 5. 680 N. 300 E. " " " Taconyte, caved 8± ft
- 6. 615 N. 127 E. " " " Taconyte
- 7. 700 N. 155 E. " " " Taconyte
- 8. 55 120 E. of W 1/4 post sec 8, 58-16W, Taconyte standing 25± ft.
- 9. 47 N. 350 E. " " " Taconyte & lean ore
- 10. 130 N. 245 E. " " " Taconyte, caved 35± ft.
- 11. 83 N. 140 E. " " " Taconyte & lean ore <sup>(red)</sup>
- 12. 340 N. 295 E. " " " " " Taconyte & lean ore, standing 50± ft.
- 13. 425 N. 275 E. " " " " " Standing 30± ft,

some quartzite & much fine grained, massive, green rock which looks like greenstone but is probably quartzite. Also some conglomerate containing quartz pebbles up to  $\frac{1}{2}$  inch in diameter, also a few greenish pebbles. The conglomerate seems to be the last rock thrown out and is assumed to be the base of the Animas. (See note.)

- 14. 540 N. 345 E. of W 1/4 post sec 8, 58-16W, Standing 20± ft., quartzite & much conglomerate.
- 15. 560 N. 405 E. " " " " " gray to greenish quartzite & conglomerate.

2

T.

R.

- 16. 657 N. 465 E. of W 1/4 post sec. 8, 58-16 W., shaly, fine-grained, micaceous rock, probably quartzite.
- 17. 830 N. 400 E. " " " " " , greenish to grayish, slaty, thin gray wacke like rock, fine grained. Out crop.
- 18. 66 S. 553 E. of N.W. corner sec. 8, 58-16 W., Keewatin outcrop.
- 19. 275 S. 560 E. " " " " " , Keewatin outcrop, graywacke + slate. Strike N.E. dip N.W. 75°.
- 20. 670 S. 1050 E. " " " " " , Caved 75± ft. Taconyte.
- 21. 685 N. 0 E. of W 1/4 post sec. 8, 58-16 W., greenstone outcrop, continuing 100 paces in a northeasterly direction. (See Due)
- 22. 75 S. 800 E. of N 1/4 post sec. 8, 58-16 W., Taconyte (See Due)
- 23. 140 N. 53 E. of W 1/4 post sec. 8, 58-16 W., Taconyte (See Due)
- 24. 400 N. 560 E. " " " " " , quartzite.
- 25. 366 N. 576 E. " " " " " , Taconyte + paint rock.
- 26. 355 N. 550 E. " " " " " , Taconyte.
- 27. 340 N. 570 E. " " " " " , Taconyte.
- 28. 207 N. 478 E. " " " " " , lead ore. (Sebenius). 36 paces N. of this in R.R. cut there is an outcrop of Taconyte for 80 paces.

Oct. 18, 1898.

- 29. 120 N. 67 W. of E 1/4 post sec. 8, 58-16 W., standing 36± ft. green shaly rock, Taconyte-like. Probably near top of Taconyte horizon.

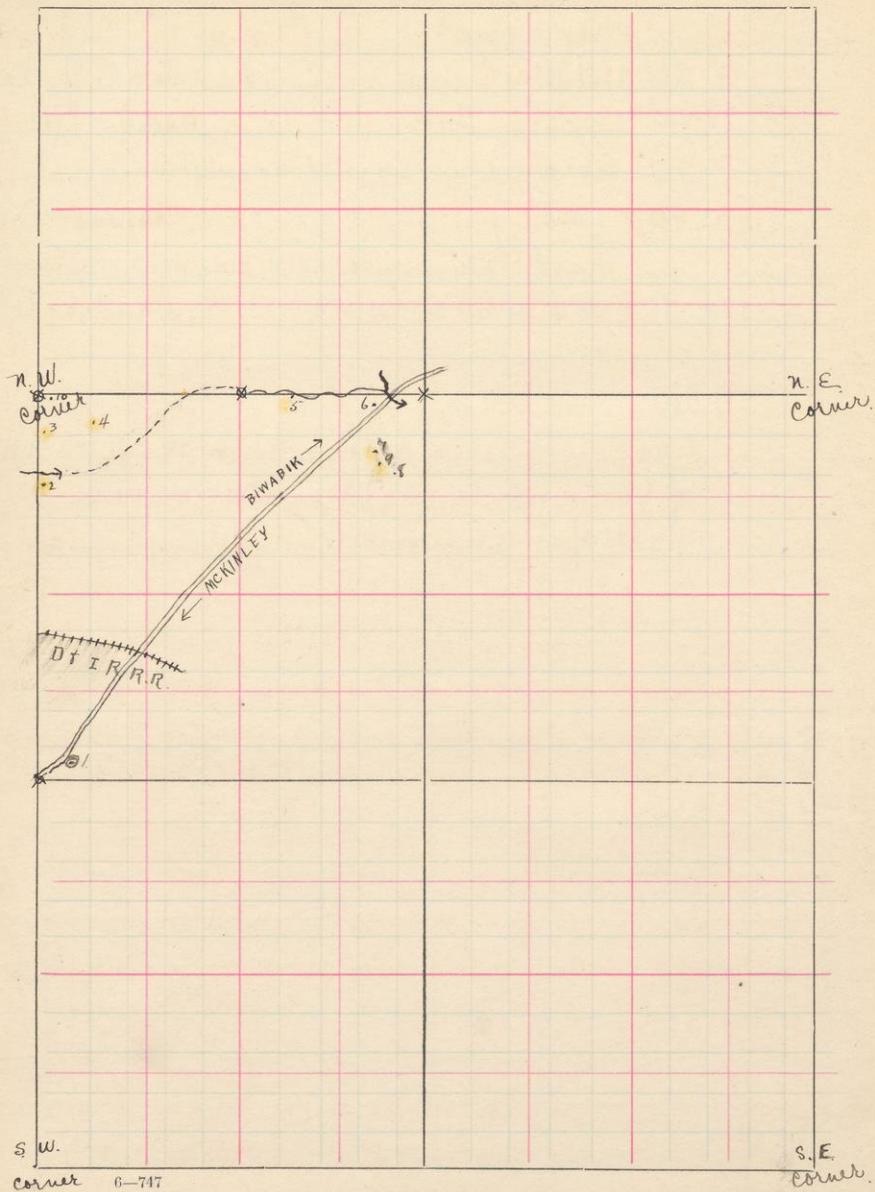
52

T.

R.

- 30. 250 N. 125 W. of S. 1/4 post sec 8, 58-16 W., caved  $15 \pm$  ft.  
clay + gravel.
- 31. 800 N. 50 W. " " " " " , caved  $8 \pm$  ft. clay.
- 32. 840 N. 190 W. " " " " " , caved  $35 \pm$  ft.,  
hard green magnetic taconite.
- 33. 895 N. 130 W. " " " " " standing  $30 \pm$  ft.  
hard, slaty gray to green magnetic taconite.
- 34. 50 S. 50 W. of N.E. corner sec 8, 58-16 W., standing  $50 \pm$  ft.  
taconite.

{ Note. In Pit #3, rock No. 2 = the conglomerate  
& No. 3 = the green rock which may be part  
of the underlying Keeatin or may be  
part of the Chinakies.



Oct 18, 1898. Section 9, 58-16 W.

- 1. 60 N. 85 E. of W. 1/4 post sec 9, 58-16 W., caved 15± ft., black silty rock with much magnetite and some greenish taconyte-like material. Probably black slate near taconyte boundary.
- 2. 784 N. 15 E. of W. 1/4 post sec 9, 58-16 W., caved 25± ft., hard magnetic taconyte.
- 3. 90 S. 20 E. "W. corner sec 9, 58-16 W., standing 40± ft. <sup>Taconyte</sup>
- 4. 85 S. 115 E. " " " " standing 35± ft. magnetic taconyte.
- 5. 5 S. 620 E. " " " " , taconyte
- 6. 30 S. 860 E. " " " " , caved, material taken away for road, nothing but clay left.
- 7. 150 S. 830 E. " " " " , caved 25± ft. <sup>Taconyte</sup>
- 8. 200 S. 100 W. of N. 1/4 post sec 9, 58-16 W., caved 40± ft. clay
- 9. 185 S. 140 W. " " " " , caved 15± ft. taconyte.
- Oct 19, 1898.
- 10. 20 S. 10 E. of N. W. corner sec 9, 58-16 W., taconyte.

54

S. 5  
n.w.

corner

T. 58

R. 16 W.

N.E.  
corner

S.W.  
corner

\* \* \*

→ no road corner  
S.E. corner

Oct 18, 1898.

Section 5, 58-16 W.

-1 65 N. 130 W. of S.E. corner sec. 5, 58-16 W., quartzite & conglomerate. (Selby)

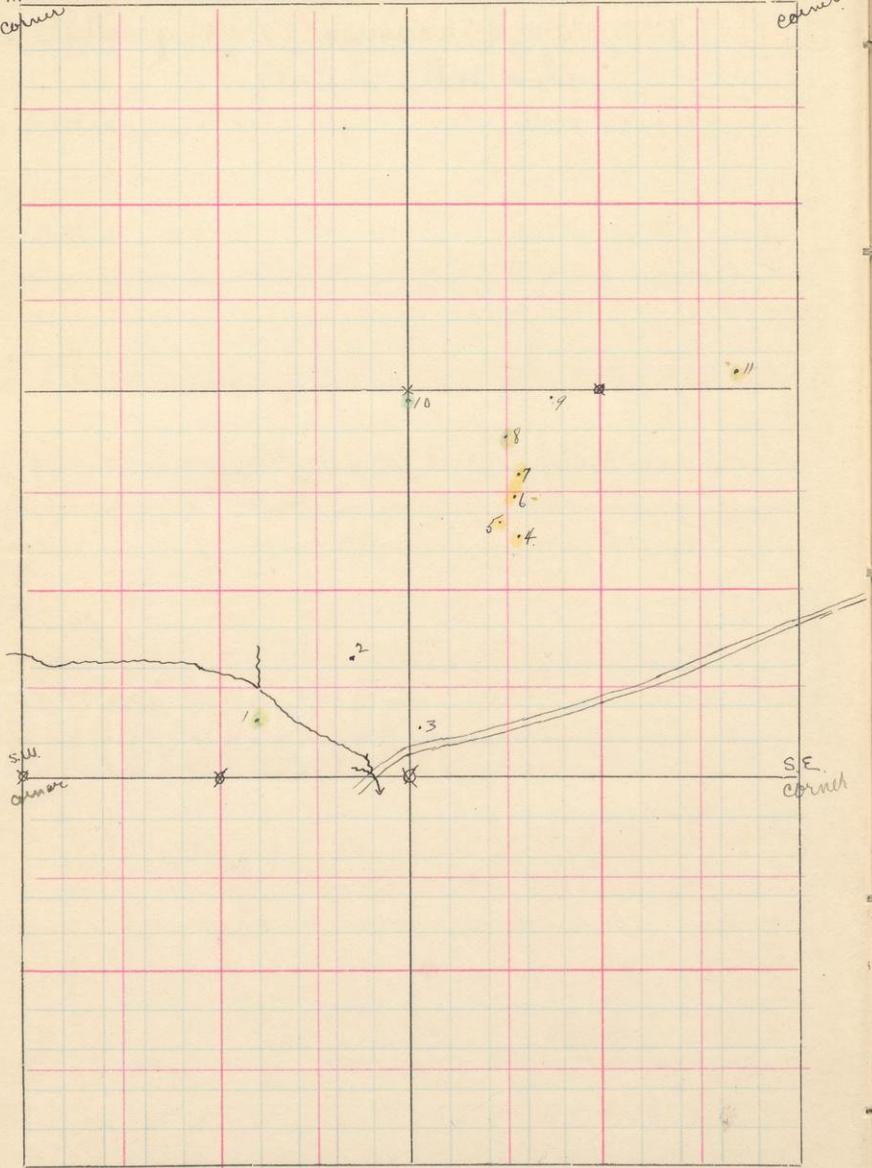
-2 265 N. 130 W. " " " " " , quartzite.

56.

S.4.  
n.w.  
corner

T.58.

R. 16W.

n.w.  
corner

OCT. 19, 1898. Section 4, 58-16 W.

- 1. 165 N. 600 E. of S.W. corner sec. 4, 58-16 W., quartzite.
- 2. 310 N. 825 E. " " " " , caved 20± ft. clay (till).
- 3. 120 N. 20 E. "  $\frac{1}{4}$  post sec 4, 58-16 W., caved 30± ft. clay (till)
- 4. 630 N. 280 E. " " " " , caved 35± ft. taconite.
- 5. 680 N. 240 E. " " " " , caved 25± ft. green,  
magnetic taconite.
- 6. 730 N. 260 E. " " " " , caved 50± ft. green  
magnetic taconite, lean ore + a little brown  
taconite.
- 7. 763 N. 265 E. " " " " , caved 25± ft. tacon-  
yte + lean ore. Also some quartzite blocks  
which perhaps come out below the taconite.
- 8. 870 N. 250 E. " " " " , caved 25± ft. shaly  
+ micaceous; also gray to greenish fine  
grained quartzite.
- 9. 990 N. 33 1/2 E. " " " " , not surely bedded,  
rock uncertain.
- 10. 975 N. 0 E. " " " " , probably green-  
stone but not absolutely certain.
- 11. 1060 N. 860 E. " " " " , quartzite sure.

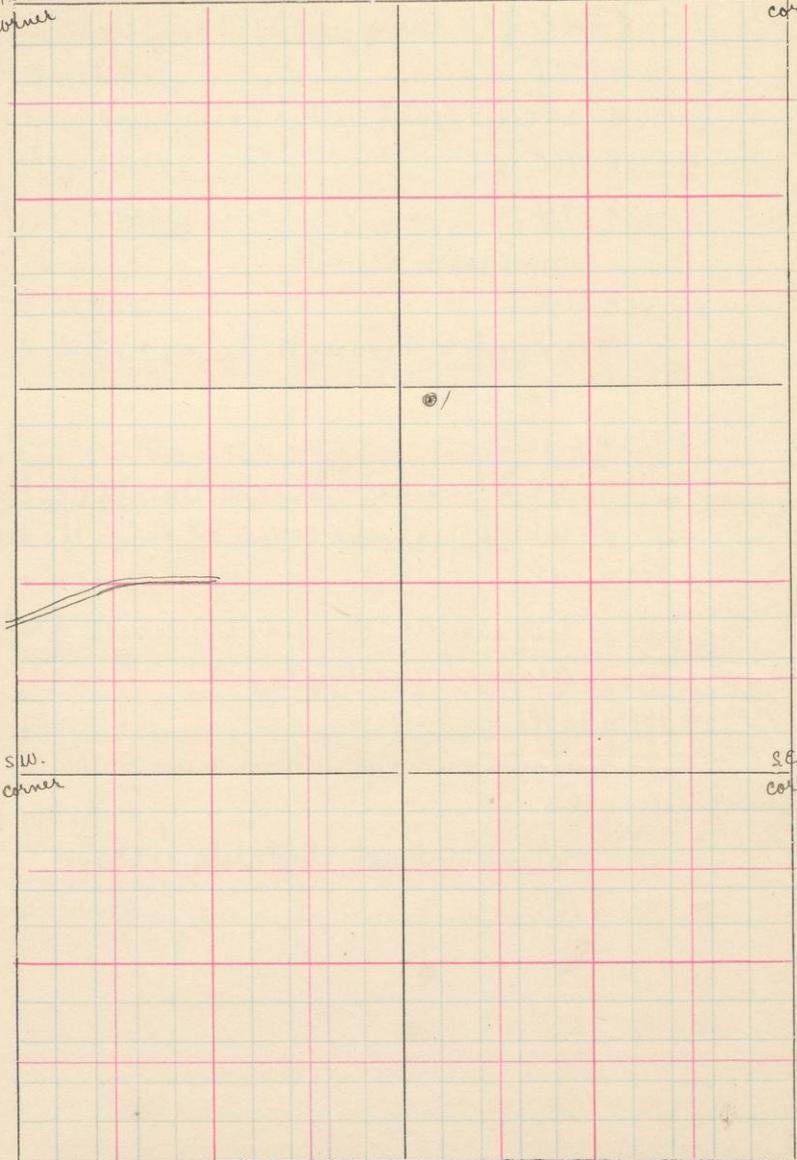
58

S. 3  
N.W.  
corner

T. 58

R. 16 W.

N.E.  
corner



Oct. 19, 1898. Section 3, 58-16W.

-1. 53 S. 108 1/4 post sec 3, 58-16W, black slate,  
Sebenius.

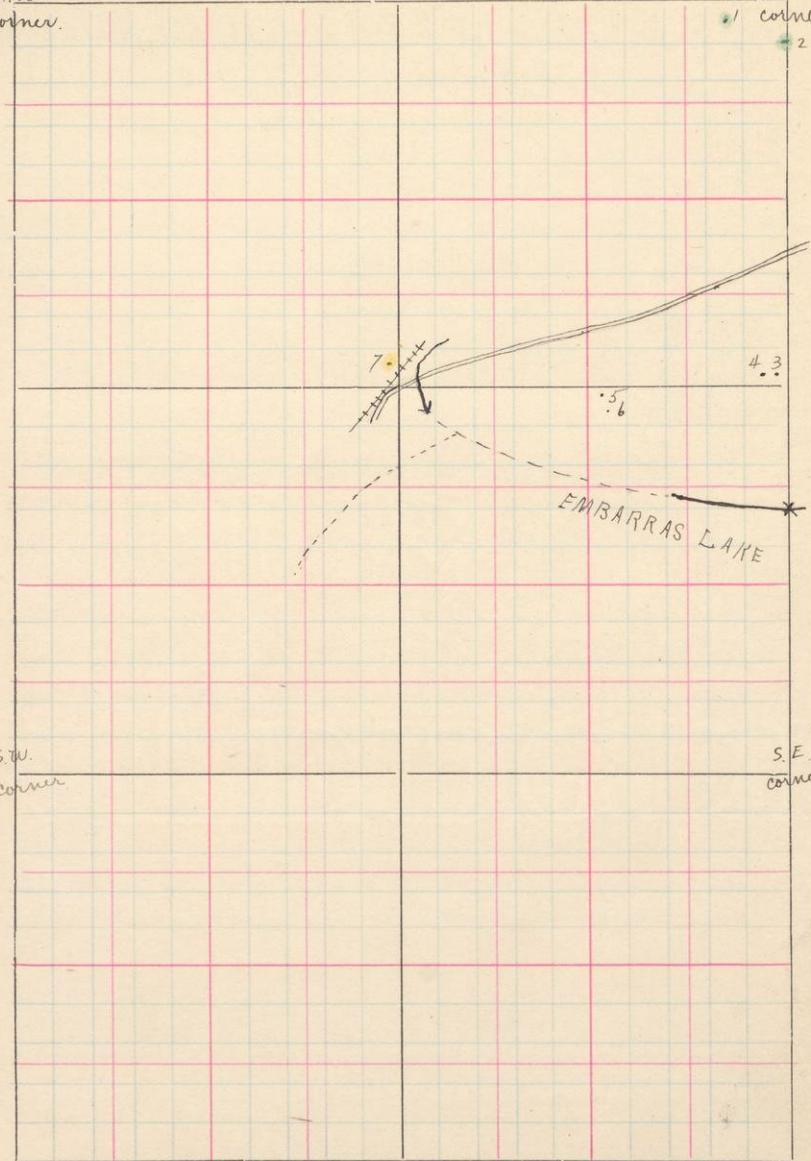
60

S. /  
N.W.  
corner.

T. 58

R. 16 W.

N.E.  
corner.  
2



Oct 19, 1898.

Section 158-16W.

- 1. 50 S 150 W. of N.E. corner sec 1, 58-16W, greenstone out crop. Fine grained, somewhat schistose, the schistosity running about E. & W. & standing vertical.

- 2. 100 S. " " " " " , greenstone  
out crop. (Calcium)?

- 3. 960 S. 26 W. " " " " " , sand.

- 4. 960 S. 55 W. " " " " " , sand & gravel

- 5. 1015 S. 450 W. " " " " " , sand & gravel

- 6. 1075 S. 440 W. " " " " " , sand & gravel

- 7. 940 S. 1020 W. " " " " " , taconyte

{Note. The foot of the greenstone ridge at N.E. corner of the section is about 250 paces S of the N.E. corner & this probably marks the S. line of the greenstone. Then comes a swamp for perhaps 100 paces and then higher ground of sand & gravel which extends to the lake, descending at the shore abruptly 75± ft.

# Blank Even Pages

62-72

## Skipped

Oct. 20, 1898.

Section 6, 58-15 W.

7.35 A.M. Bar 2 = 2448. Embarras lake = 1371 X.

Start from N. shore of Embarras lake at W. side of section 6, 58-15 W. and run north. Larding abruptly from the lake for 70 paces to 62 ft. above the lake. The plateau is nearly level sloping very slightly to the north to the W. 1/4 post. This plateau is of sand and some gravel. The plateau continues N. to nearly 700 paces from the 1/4 post, where a steep rise begins. This rise is between 700 & 900 paces from the 1/4 post. The hill is evidently of greenstone and I judge the greenstone boundary should go at least as far south as 700 paces N. from the 1/4 post.

-1. 100 S. of N.W. corner sec 6, 58-15 W., greenstone outcrop.

-2. Very fine grained green schist. Schistosity strikes nearly E. & W. and stands about vertical.

Now go east along N. side of sec 6, 58-15 W. from the N.W. corner. Steep descent to 375 paces from corner where swamp begins and continues to 660 paces E. from N. W. corner of sec 6. Beyond the swamp the plateau of sand & gravel begins & continues nearly 300 paces E. of the N. 1/4 post. The greenstone outcrops (see outcrops) at the N.W. corner of the plateau.

On going S. from the N.  $\frac{1}{4}$  post, the plateau continues almost to Embarras lake. A few depressions (Kettles) occur in its surface. On this plateau of sand and gravel, the modified drift must average  $50 \pm$  ft in thickness. Kettles are from 5-20 ft. below general surface.

- 2. 20 S. 200 E. of N.W. corner sec 6, 58-15 W., greenstone out crop similar to No. 1, but harder & more massive.
- 3. 0 S. 600 E. " " " " , greenstone out crop, fine grained shistose, in places massive and harder where massive. Schistosity strikes E. + W. (not mag.) and stands about vertical.
- 4. 0 S. 633 E. " " " " , greenstone out crop same as No. 3.
- 5. 0 S. 700 E. " " " " , greenstone out crop. Greenish silaceous appearing finely conglomeratic.
- 6. 5 S. 112 E. of N.  $\frac{1}{4}$  post sec 6, 58-15 W., pit, sand & gravel ledged in greenstone, some of which is a greenish feldspar porphyry.
- 7. 35 S. 115 E. " " " " pit, sand & gravel, probably ledged in greenstone.
- 8. 110 S. 125 E. " " " " pit, sand & gravel, perhaps ledged in greenstone

- 9. 165 S. 150 E. of N. 1/4 post sec 6, 58-15W, pit sand & gravel  
 $50 \pm$  ft.
- 10. 30 S 453° E. " " " " " pit, sand (Reduc.)
- 11. 45 S 480° E. " " " " " pit, sand & gravel  
(Le Due)
- 12. 240 N. 405° W. of S. 1/4 post sec 6, 58-15W, drill hole in  
black slate. (Le Due) (Long year's drill)

Oct. 20, 1898

Section 31, 59-15 W.

1. 1100 ft 540 W. of S.E. corner sec. 31, 59-15 W., greenstone outcrop.  
 Massive, decayed, medium grained diorite.  
 -2. 500 ft 160 W. " " " " " , greenstone outcrop.  
 (Reduc.)

On going N. from S. line sec 31, 500 paces W. of E. side  
 of the section we pass over undulating land  
 composed of modified drift except for some  
 greenstone outcrops. Toward the N. boulders are  
 abundant.

Oct. 21, 1898.

3. 1140 N. of  $\frac{5}{4}$  post sec 31, 59-15 W., greenstone outcrop  
 outcrop. Fine grained, green, schistose. Isch-  
 tosity strikes N.E., dip N.W. 80°.
- 4. 1700 N. 156 E. " " " " " , greenstone outcrop,  
 fine grained, massive pit 15± ft, caved gravel.
- 5. 980 S. of N.W. corner sec. 31, 59-15 W., greenstone, out crop.  
 fine grained, massive.
- 6. 1240 S. " " " " " , greenstone out crop.
- 7. 1350 S. " " " " " , greenstone out crop.  
 fine grained conglomerate. Pebbles of  
 greenish & grayish flint rock & quartz  
 Pebbles not & not more than 2 in. across  
 numerous (?)
- 8. 630 N. 150 W. of  $\frac{5}{4}$  post sec 31, 59-15 W., greenstone outcrop

$$1520 = 2600.$$

$$1525 = 2600.$$

$$1550 = 2625$$

$$1520 = 2600$$

$$1575 = 2650$$

$$1525 = 2605$$

$$1600 = 2675$$

$$175 = \underline{175}$$

$$1625 = 2700$$

$$1700 = 2780$$

$$1650 = 2725$$

$$1675 = 2730$$

$$1700 = 2775$$

$$1225 = 2800$$

-1. 1700' N. of S.W. corner sec. 30, 59-15 W., granite outcrop &  
granite along line & just to the west  
of it for about 200 paces N. of this.

K 26x

1970 R-31-59-17 2 — h 200  
89° ~~5~~ 5x

