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Marquette district: notes on Cascade Range. No. 155 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

✓ 155
Marquette District
J. Morgan Clement
893

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.

Not plotted or No not put down.

24180

Book
#1552

sch not plotted 2 4195, 2 4199

232.

36

37

38

51

53

58

72

87

Specimen 24178 - 24413

No. I

Notes

on

The Cascade Range

J. M. Clements.

1893

Compassman
Chas Perry.

Map I

E 500

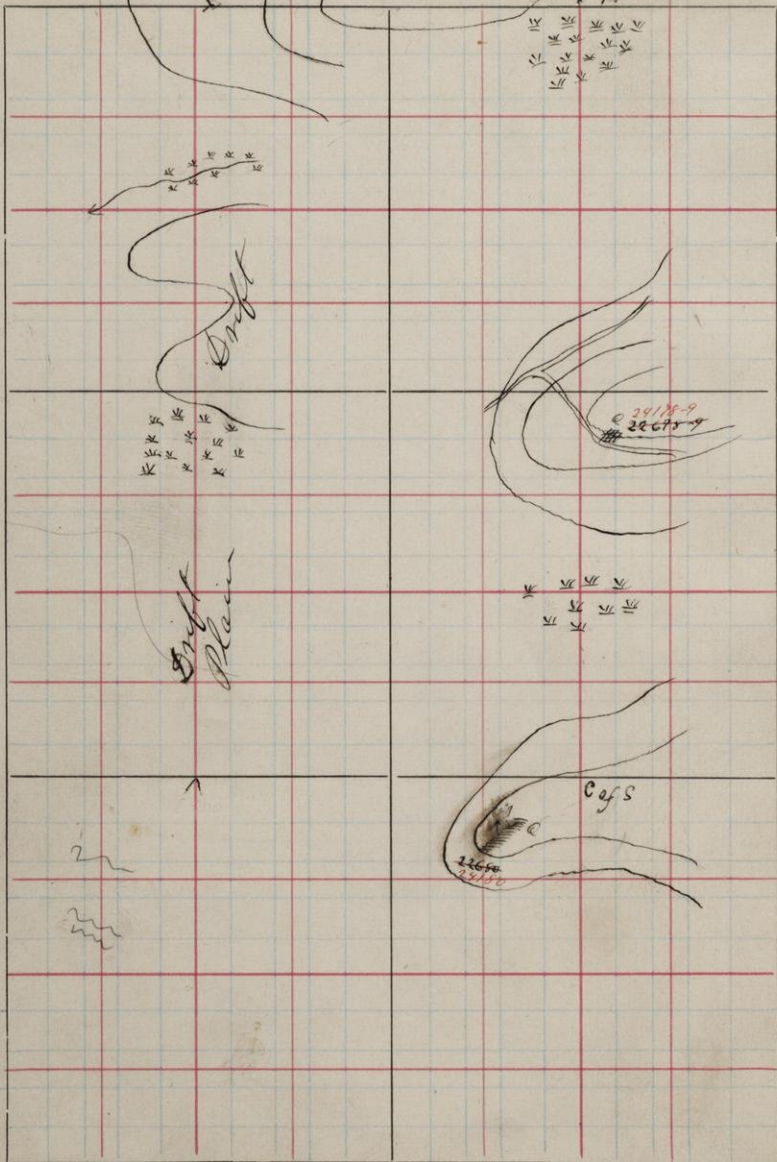
S. 29

T. 47

R. 20 1/4 Sec

W 1/4 Post

NE 1/4



Map I

July 7.

From N.W. Cor. S 28-47-26 ran S. & $\frac{1}{4}$ foot
then E 500 with St Bay ley. From this point,
in drift plain W. of Arcade, ran N over
drift plain and through narrow swamp
then over low drift hills to line.

E over same ^{kind of} drift hills to N $\frac{1}{4}$ foot and then
S. through swamps. At

S. 400 swamp ends and we begin to ascend
gentle slope - W end of a ridge - and at

24178
22678

S 55-5-E 35- get small ledge of quartzite
which in one place shows pebbles of quartz and
of a greenish rock in very small quantity.

24179
22679

This outcrop shows on N side of an old wood road.

Continuing S on $\frac{1}{4}$ line we ascend and
after crossing swamp ascend another ridge
and at top, at.

24180
22680

S 105-0 W 75- find outcrop of quartzite
dipping about 45° N(?) strike E 4° S(?).

Ledge extends for 60 paces, runs W 15° S.

S 1315- R.R.

24181
22681

S 1375-E 50- ^{quartzite} in places conglomeratic with
gasper pebbles. overlying gasper, in
this old open pit; on same side of hill N-

24182
22682

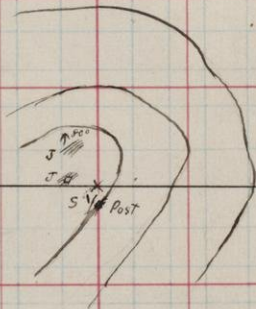
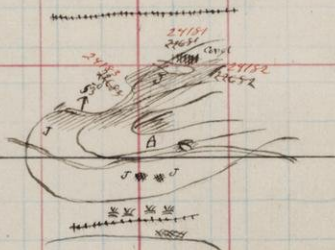
forth W. is another large pit in same
gasper bed at S 1425-W 30 The beds are
more or less contorted but general dip 53° N, strike E 20° N.

24183
22683

Map II

S S. 29 T. 99

R. 20



swy

SE 1/4

Same gasfer outcrops on top of ridge and is also exposed part of the way down southern descent. behind house in garden.

S1480 E 60 small pit in gasfer (located & specimen taken by Dr Bayley) S of wagon road.
S1500 Wagon road.

We continue to descend and pass small outcrops of gasfer at S1525 and S1525 E 25 and after crossing R.R. S1575 with gasfer outcrop in cut at S1585 E 25 we ascend hill no outcrops until S1950 W 25 small ledge of gasfer dip 80° N strike N.
S1985 W 40 test pit in gasfer. Several other pits within few feet of this.

Map III

From S $\frac{1}{4}$ first S 29-47-26 ran E.
E 365 N 60 gasfer outcrop.

E 375 N 60 same outcrop in R.R. cut, dip 22° N strike like N of E.

Map III

From E 400 ran S.

At first through small swamp then ascend hill and at

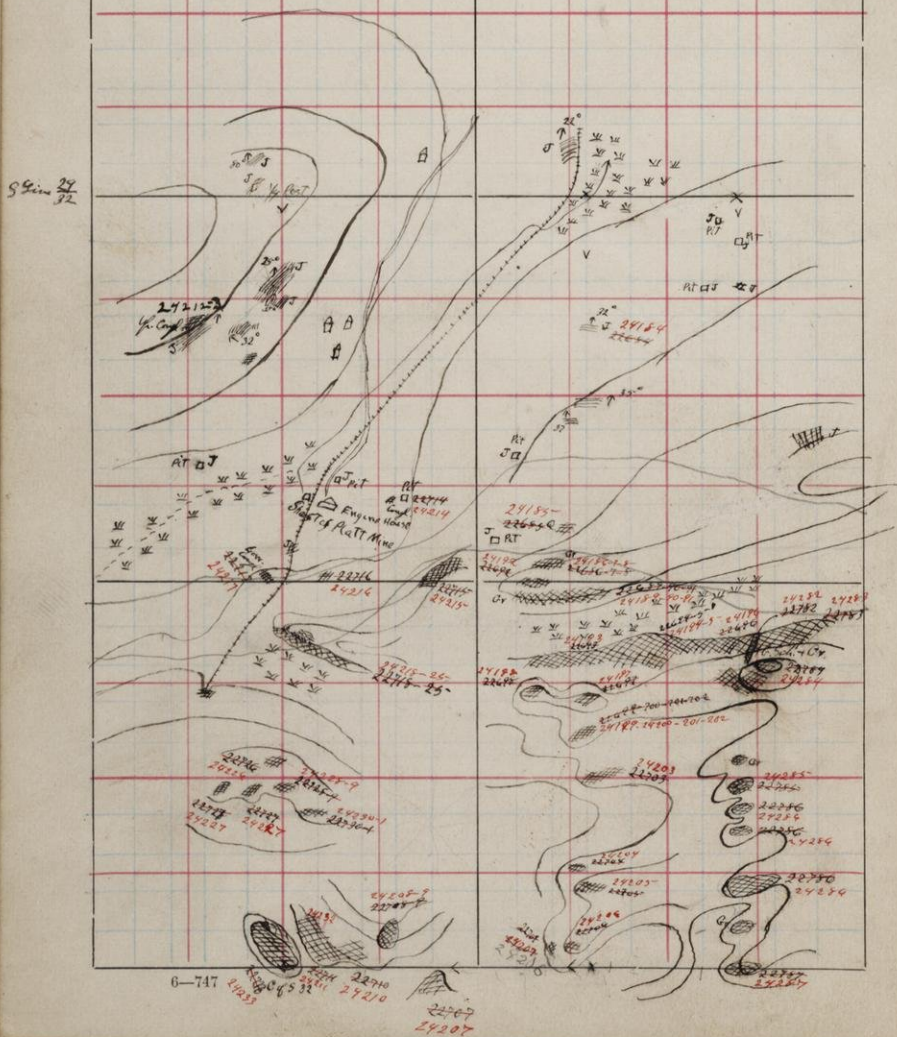
24184
22684

S160 get small gasfer ledge, dip 32° N, strike E.

S255 gasfer ledge, dip 35° N, strike E

S290 ^{W12} gasfer ledge, dip 37° N strike E

S340 W110 ^{test} pit, gasfer on dump.



24185
~~22685~~

S425 W 30 Granite with ^{small} lentils
on masses. Occurs in few large
angular blocks part on crest of ridge
after passing small meadow.

✓ 24186
~~22686~~
24187
~~22687~~
24188
~~22688~~

S475 W 30 Green schistose rock injected
with granite very much broken up.
Specimens represent apparently different
phases. ²⁴¹⁸⁶ ~~22686~~ is massive and unweathered, looks
like granite.

24192
~~22692~~

S450 W 120 Sdpt corner reached, gopher, & judge
from dump.

✓ 24189+91
~~22691+89~~
24190
~~22690~~

S485 W 75 Granite ledge.
S570 Ledge of rock, forms cliff at brow of hill,
similar to one at S475 W 30. Schistose ^{S4891} green
rock cut and broken by granite (²⁴¹⁹⁰ ~~22690~~).

(Pebbles were seen in Congl. near Platt mine,
on an excursion there with Prof. Van Hise and
Smith, which showed decomposed green
surface almost exactly like W. ²⁴¹⁸⁹ ~~22689~~.)

✓ 24193
~~22693~~

We cross small valley and ascend steep hillside
S575 of green schist cut by numerous
granite dikes.

✓ 24194
~~22694~~
24195
~~22695~~

Specimen from granite dike, taken at
S575-297, in the amphibole schist (²⁴¹⁹⁵ ~~22695~~)
Schistosity strikes NE and dip is 30° N.

24196
~~22696~~

S575 E 160 From same outcrop which continues E.

~~24197~~
~~22697~~

S645- Same green schist (amphibol schist)
cut by granite (²⁴¹⁹⁴~~22694~~)

~~24198~~
~~22698~~

S640 W75- Same green schist.

~~24199~~
~~22699~~

S670 Green schist (amphibol schist)

~~24200~~
~~22700~~

Strike of schistosity NE, dip 55° little W of N.
The schist is cut by granite dike, parallel to
schistosity and both cut by dike of
fine grained diabase(?).

~~24201~~
~~22701~~

S695 W 25- Dike in amphibol schist.

~~24202~~
~~22702~~

Separates easily, into flat pieces, parallel to
the sides of the dike.

~~24203~~
~~22703~~

S750 Green schist (amphibol schist)
cut by granite. Schist much contorted.

~~24204~~
~~22704~~

S860 W15 Small granite outcrop.

~~24205~~
~~22705~~

S890 Schist with small granite dikes.

~~24206~~
~~22706~~

S975 W20 Schist with granite dikes. Schistosity
tends about 30° S of

Map III

From 100 paces W of E 1/4 stake S22-47-26
ran W.

~~24206~~
~~22706~~

W 50 N15 Schist (cf ²⁴²⁰⁶~~22706~~)

~~24207~~
~~22707~~

W 200 S10 Schist

~~24208+9~~
~~22709+8~~

W 260 N10 Schist cut by granite

~~24210~~
~~22710~~

W 290 Rounded block of schist (amphibol) continuous

~~24211~~
~~22711~~

W 352 forms cliff 30 ft high.

~~24211~~
~~22711~~

W 400 Centre of S. 32. Outcrop of hill of ²⁴²¹¹~~22711~~ schist

- From N $\frac{1}{4}$ front S 32-47-26 run S to C. of S.
- S100 On S. side of hill ledge of gasper.
 Dip 25° little W of N. Strike N.E.
- S130 Same gasper but lower strata outcrop.
 Dip 35° little W of N.
 The gasper ledges are banded ^{iron} ore and gasper
 and form terraces on hill side
- S160 W 65° Small ledge on same level as above.
 Dip 32° NW. Strike SW.
- S160 W 100° On crest of hill occurs the
 gasper overlaid unconformably by the
 upper conglomerate ^{consisting of} containing pebbles of
 quartz and gasper in quartzitic matrix.
 (Locality visited with Prof. Van Hise and Smith).
 Dip of gasper 37° little W of N. Strike SW.
- S200 W 45° small gasper ledge. Badly contorted.
- S350 W 100° Old pit in gasper.
- S360 E 45° R.R. S380 E 25° Shaft of Platt Mine.
- S380 E 165° Pit to ledge. (Specimen from dump)
- S370 E 75° Pit in gasper.
- S380 E 150° Small outcrop of congl., no relations.
- S380 E 120° Deep pit in gasper, on dump few pieces
 of quartzitic congl.
- S 500 R.R.
- S450 E 8° Small gasper outcrop in R.R. cut.
- S480 E 180° From quarry back of shaft. Sericitic schists
 or sheared granite (?). Visited with Prof. Van Hise. Cliff

24212
 22712
 24213
 22713

24214
 22714

24215
 22715

24216

~~22715~~

✓

24217

22717

✓

24218

~~22718~~

24219

~~22719~~

✓

24220

~~22720~~

✓

24221

~~22721~~

✓

24222

~~22722~~

24223

~~22723~~

24224

~~22724~~

✓

24225

~~22725~~

✓

of this rock 20 ft high here.

S 495- E 65- Outcrop (only small surface) of amphibole schist. Pointly not in str.

S 500 W 20 Small edge of low. congl.

Pebbles of quartz and schist and rock with bright green weathered surface, (cf specimens collected by Smith and myself for Prof. Van Hise)

S 560 We cross western end of hill which shows, where line crosses, what is

apparently basal congl. underlain by a light colored rock ^{gr.} faintly marked with red felspar (?). Farther to E same rock (²⁴²¹⁹~~22719~~) becomes orthite bearing.

In places there seems to be a regular orthite schist present

In one place a granite dike breaks through a gran rock (²⁴²²³~~22723~~) which seems to be ²⁴²¹⁹~~22719~~ altered by the dike. ²⁴²²⁴~~22724~~ is a kind of eruptive breccia from right side of dike.

There is a small mass of gneiss 30 paces long very much contorted which lies little to E of exposure of congl. ²⁴²¹⁸~~22718~~ and above it.

Relations of the rocks here are not clear to me. Exposure about 150 paces long at a place 35 ft high on ^{south-west} side of hill. The orthite rocks 22719-20 predominate.

IV

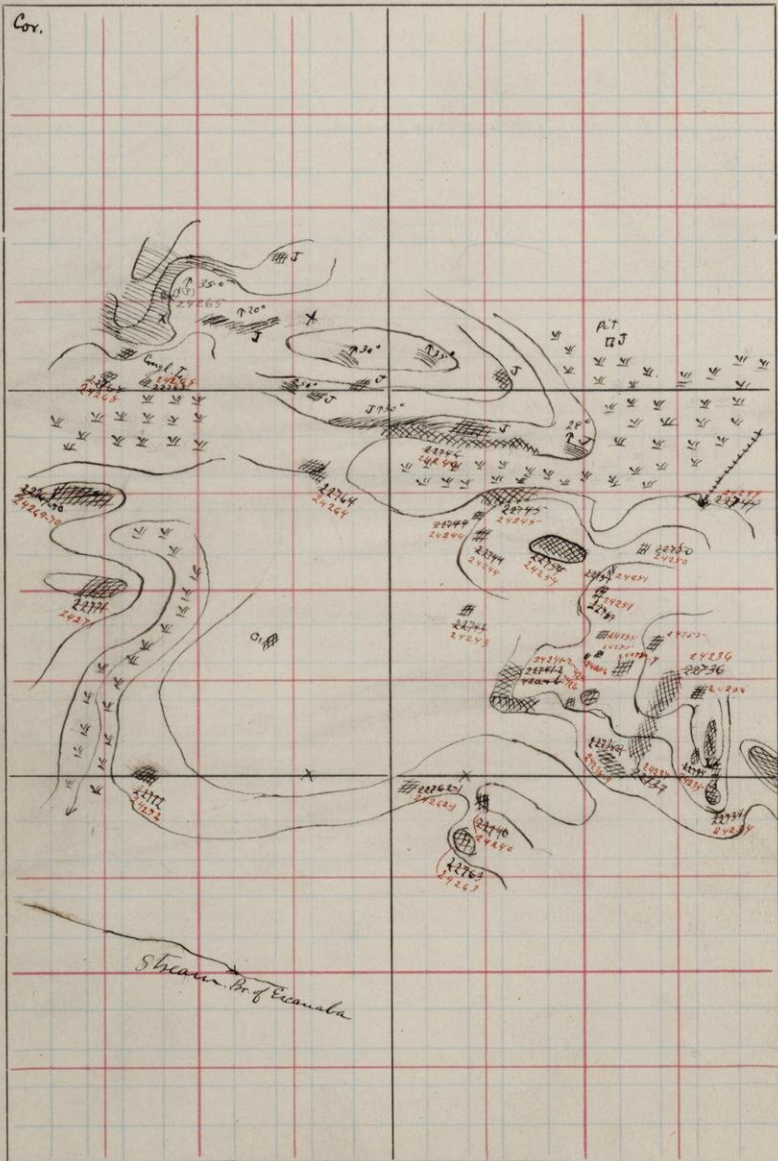
S. 32

T. 47

R. 26

NW $\frac{1}{4}$

Cor.

 $\frac{1}{4}$ 

Crossing narrow valley we ascended hill and at

24226

22720 ✓

24227

22727 ✓

24227

22727 ✓

24228-9

22728-9 ✓

24230

22730 ✓

24231

22731 ✓

24232

22732

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

24233

22733 ✓

S720 find small rounded knoll of Amph. schist

S762 W40 Same rock as preceding

S762 W70 Smaller exposed face on side of knoll.

S762 Schist cut by granite dikes (24229)

S800 E30 Amph. schist, extends E-W as most of the

schist exposures do just here, cut by dike of

diabase and several small granite dikes.

S940 W25 Amph. schist, forms steep hill knob,

cut by granite dikes. Schistosity is nearly vertical

and strikes N.

S1000 C. of S. 32-47-26. On top of knob of amph.

schist.

From C. of S 32-47-26 ran W 400 then N.

W 80 S10 Amph. schist. Outcrops every few paces,

entire hill is schist. Schistosity N and vertical.

W105 N35 Amph. schist.

W150 N100 Amph. schist. Schistosity 5° W of N, dip 70° NE.

W160 N25 Amph. schist. Continuation on lower level

of same rock as 22736. Schistosity strikes N, dips 75° E.

W192 Amph. schist. Schistosity strikes N, dip 25° E.

Underlain conformably to schistosity by another

kind of schist (?) or else with a dike in it which is now

schist.

W380 S30 Sledge, no relations.

Map IV

From 400 W of C. of S. 32-47-26 ran N. 500.

24241
~~22741~~
 24242
~~22742~~

N 85 E 35 Cliff of greenish schistose rock cut by red granite. Specimens ^{24242a + b} ~~22742a + b~~ were taken little farther around hill to S.E. from

24242a
~~22742a~~

continuous outcrop. ^{24242a} ~~22742a~~ is from just

24242b
~~22742b~~

above granite dike and ^{24242b} ~~22742b~~ from below it.

24243
~~22743~~

N 215 Small outcrop of greenish schistose rock

24244
~~22744~~

N 318 E 5 Greenish schistose rock broken up by red granite.

24244
~~22744~~

N 350 E 10 Outcrop higher up hill of same rock as ²⁴²⁴⁴ ~~22744~~

24244
~~22744~~

N 380 E 20 Same schistose rock as ²⁴²⁴⁴ ~~22744~~

24245
~~22745~~

N 380 E 55 Same rock again forms steep hill side.

24246
~~22746~~

We now cross narrow marshy valley and at N 440 begin to ascent opposite hill. Here outcrops the lower conglomerate. Pebbles of quartz, greenish schist and in places a rock which weathers a vivid gran. Shows also very prettily a concentric weathering. Matrix of Congl. is ^{locally very ferruginous} quartzitic. In the Congl. occurs in places a gneiss interlaminated with thin beds of graywacke. ^{this locality, for Prof. Van Hise, (see them)} had previously collected specimens from. The gneiss is for most part in upper part of Congl.

24247
~~22747~~

N 455 Ascending hill cong. disappears and

24248
~~22748~~

gneiss become more abundant.

Map IV

From N 500 of ~~sec.~~ W 400 of C. of S. 32-47-26 ran E 200 and then S.

E 50 Gneiss outcrop, strata very much contorted.

E 180 N 62 Old pit & gneiss.

Map IV

Run S from N 50° W 200 of C. of S 32-47-26

S 70° W 65- Banded gneiss Strike W 10° N, dip 29° N.

Evidently continues to W and overlies the Congl. ²⁴²⁴⁶ ~~22746~~

~~24249~~
~~22749~~

S 145° E 115- Outcrop of rotten granitic rock in small cut at foot of hill at end of back of Platt mine.

~~24250~~
~~22750~~

S 205° E 25- Round steep hill to location, small outcrop.

~~24251~~
~~22751~~

S 222° W 5- Small ledge of schist. Schistosity vertical and strikes about 20° E of N.

~~24252~~
~~22752~~

S 230° E 16- Outcrop of schist apparently two varieties. Schistosity vertical and strikes N 5° E and agrees with ^{apparent} bedding of schist.

~~24253~~
~~22753~~

~~24254~~
~~22754~~

S 200° W 50- Bone back of granitic rock with granitic dikes.

~~24255~~
~~22755~~

S 250° W 30- Same schist as ²⁴²⁵¹ ~~22751~~

~~24255~~
~~22755~~

S 345° E 50- Schist (amph.?) Schistosity vertical, strike N 20° E

~~24255~~
~~22755~~

S 335° W 5- Small outcrop of same schist.

~~24255~~
~~22755~~

S 345° W 30- Same

~~24256~~
~~22756~~

S 345° W 45- very small exposure

~~24256~~
~~22756~~

S 380° E 40- Schist (amph.!) Schistosity strikes N, is vertical.

~~24257~~
~~22757~~

S 380° E 100- Small outcrop of same schist. Strike N, vertical dip.

~~24258-59~~
~~22758-59~~

S 365- Schist cut by red granite ²⁴²⁵⁸ ~~22758~~

~~24260~~
~~22760~~

S 385° W 40- Schist cut by granite forms hill.

~~24260 1/2~~
~~22760 1/2~~

S 385° W 45- Schist outcrop.

Outcrops from this point to S 500 were located before.

Map IV

From C. of S 32-47-26 run W 600 then N
up to W 400 locations already given.

24263 ✓

22763

W 410 ⁵⁰⁰ Small knob.

24262 ✓

22762

W 470 S 20 outcrop of granite with inclusion
of or end of dike of greenish rock (22761)

24261 ✓

22761

Map IV

From W 600 run N. We go over level country
(with very few outcrops.)

N 170 W 50 Very small granite outcrop.

24264 ✓

22764

N 405-E 40 Small outcrop of granite showing on both
sides of trail.

N 465-E 35 Ledge of banded gneiss extending
S. At E 86 we get low. Congl. in places
with banded gneiss strata in it. Gneiss
& Congl. continue around hill S & E and join
same rocks located at N 440 W 400 from C of S 32-47-26
Strike little S of W, dip 30° little E of N. In places
very much contorted.

N 495 Small gneiss outcrop.

N 500 E 57 Higher up hill than N 465-E 35 small outcrop
of gneiss with bed of congl. 8 inches thick in upper
part of exposure.

N 500 W 20 Gneiss ledge strike NW dip 50° E of N

N 510 W 20 Another small outcrop of same ledge but ^{strata} higher.

N 530 E 45 Gneiss strike about W 30° N, dip 30° E of N

N 540 E 140 Gneiss ledge. Strike about W 30° N dip 35° E of N

Map IV

From N 600 W 600 of C. of S. 32-47-26 ran W.

~~to~~ Line at first goes in valley but quickly begins to ascend. and
 W 55 N 75 Gasper ledge.

W 55 Gasper continuing on and along line ^{Sm. Th.}
 W 120 S. Strike about W 20's dip 20° N slightly E.

The line begins to ascend hill which bands around to SW. Outcrop of gasper beginning at W 85 N 44 continues on to W and becomes larger until at W 200 we reach top of cliff about 40 ft high composed chiefly of banded gasper. General dip of gasper, the strata of which in places are badly contorted, as taken in several places and averaged is dip 35° slightly E of N strike about 25° N of W. At.

242650
 22767

W 190 N 30 There occurs a congl. (possibly of large boulders only). Could not get contact with gasper. Lies above gasper.

242660
 22766

Contains pebbles of ~~gasper~~ gasper, quartz and of rock in specimen.

W 205 S 77

Map IV

From W 800 N 600 of C. of S. 32-47-26 on brow of hill, large outcrop of Gasper, we run S.

242670
 22767

S 45 W 40 occurs the low. congl. Above this point it is mixed with gasper which, the lighter we ascend cliff, the more gasper we get.

until we get into the ordinary gasser strata at summit. In places slips and slight faults occur giving the gasser a brecciated appearance.

24268 V
22768

S20 W60 outcrop at foot of hill of small ledge of ²⁴²⁶⁸ 22768 under Congl. in horizon position. It apparently though can't see contact.

S78 W12 Small outcrop of same on cow path.

We now cross swamp and ascend a gently rising hill. At

24270 V
22780

24269 V
22769

24271 V
22771

S235 W72 we get large rounded knobs of greenish schistose rock (²⁴²⁷⁰ 22770) broken through by ²⁴²⁶⁹ 22769 across valley at

S348 W52 Small hill knob of 22771. To E the ground is low and we continue over a nearly level plain - here + there marshy ground to the N line. Then we are just on brow of hill which drops sharply, showing outcrops of granite and schist & valley of the stream is a branch of Ecanaba about 200 S of line.

24272 V
22772

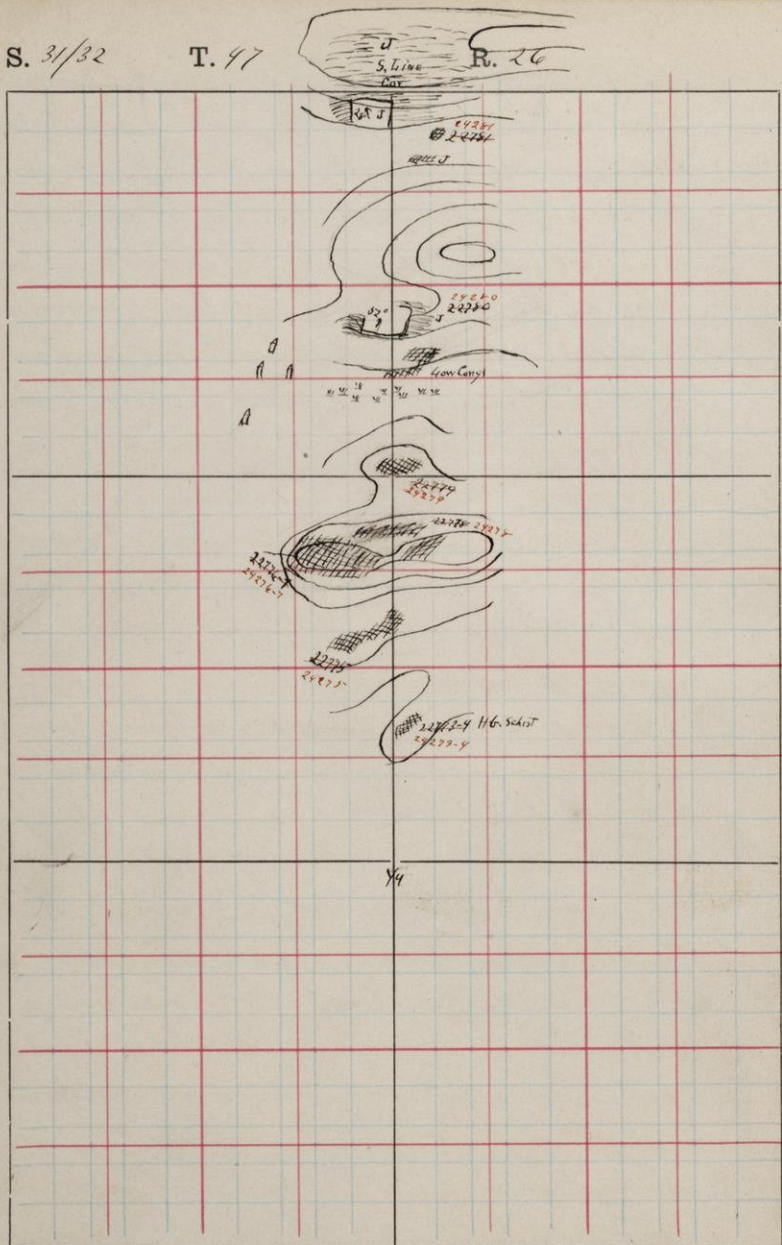
W820 from C of S32-47-26 outcrops a green schistose rock with slices of granite in it, lying parallel with schistosity bedding.

Bedding + schistosity agree in it. Strike NW, dip 45° ^{to N.} SE

V

S. 31/32

T. 47

NE 1/4
531NW 1/4
532

Map V

From W $\frac{1}{4}$ sec S 32-47-26 N on S line.Did not find $\frac{1}{4}$ sec D start from.~~24273-4~~
~~22773-4~~N 68 Schist with slices of granite ²⁴²⁷⁵ ~~22775~~ 22774, intercalated frequently parallel to schistosity. Schistosity strikes 10 S of W, dip 40° about NE.~~24275~~
~~22775~~

N 275-W 42 Outcrop of gneiss or a gneissoid granite. Line crosses same at N 290 & more at N 325.

~~24276~~
~~22776~~N 385-W 80 Top of high knob, predominant rock is a granite (²⁴²⁷⁶ ~~22776~~) cutting through schist (²⁴²⁷⁷ ~~22777~~).~~24277~~
~~22777~~

N 420 W 20 Schist broken through by granite.

~~24278~~
~~22778~~~~24279~~
~~22779~~

N 520 Knob of schist cut by granite. We descend and crossing marsh in valley come on other side to small outcrops of low. congl. at foot of hill N 630. Visited with Prof. Van Kise. At N 630 E 40 appears a large ledge of rock (more a graywacke than coarse congl.) with here and there gasper fragments in it, to the E about 20 paces is a little conifer phase.

~~24280~~
~~22780~~

N 675- we come to edge of large open pit in gasper (still ascending hill), strike W 25° N, dip 52° slightly E of N. To E of line same gasper outcrops in small ledges every few paces to E 75.

Continuing to N we cross w. ^{slope} ~~end~~ of hill, no outcrops seen apparently all drift just now, and get ~~in~~ descended to valley to N. At

N 925-E 25 at foot of hill is small outcrop
of gneiss with drift over it.

²⁴²⁸¹
~~22781~~

N 945-E 54 directly in centre of valley is
small knob of diabase (²⁴²⁸¹~~22781~~). No relations.

N 980 Large open working pit in gneiss.

Dip 28° little W of N, strike little S of W.

N 1000 Gneiss ledges outcrop every few paces.

Map III

S from 10400 from NE cor. S 32-47-26

We ascend gentle slope of hill with numerous old test pits two or three ft. deep now. at

S 24 W 30 test pit to gasper ledge and again at S 50 pit to gasper.

S 110 W 50 pit to gasper.

S 110 small gasper outcrop.

S 315 E 70 gasper outcrop.

We begin to descend at about S 400 and at S 550 are in middle of valley about 40 paces wide.

24286

22786

24282

22782

24283

22783

24284

22784

S 560 we ascend over greenish schist (amph.)

S 565 E 15 Dike of diabase (fine grained) cutting coarse amphib. hornblende schist ²⁴²⁸³ 22783S 590 E 35 Outcrops 22784 in a rounded back. Hornblende schist outcrops every 15 or 20 paces in small round backs on top of hill here, all same schist ²⁴²⁸³⁻⁴ 22783-4

S 734 small granite outcrop.

24285

22785

24286

22786

S 760 small knob of granite

S 790 Cross small outcrop of hornbl. schist - cut by granite dikes.

24286

22786

24286

22786

S 820 Hornbl. schist knob.

S 883 Hornbl. schist outcrop.

S 960 Granite outcrop.

24287

22787

S 1000 Outcrop at brow of low hill of very coarse hornbl. schist. Strike of schist about SW, dip 30 little W of N.

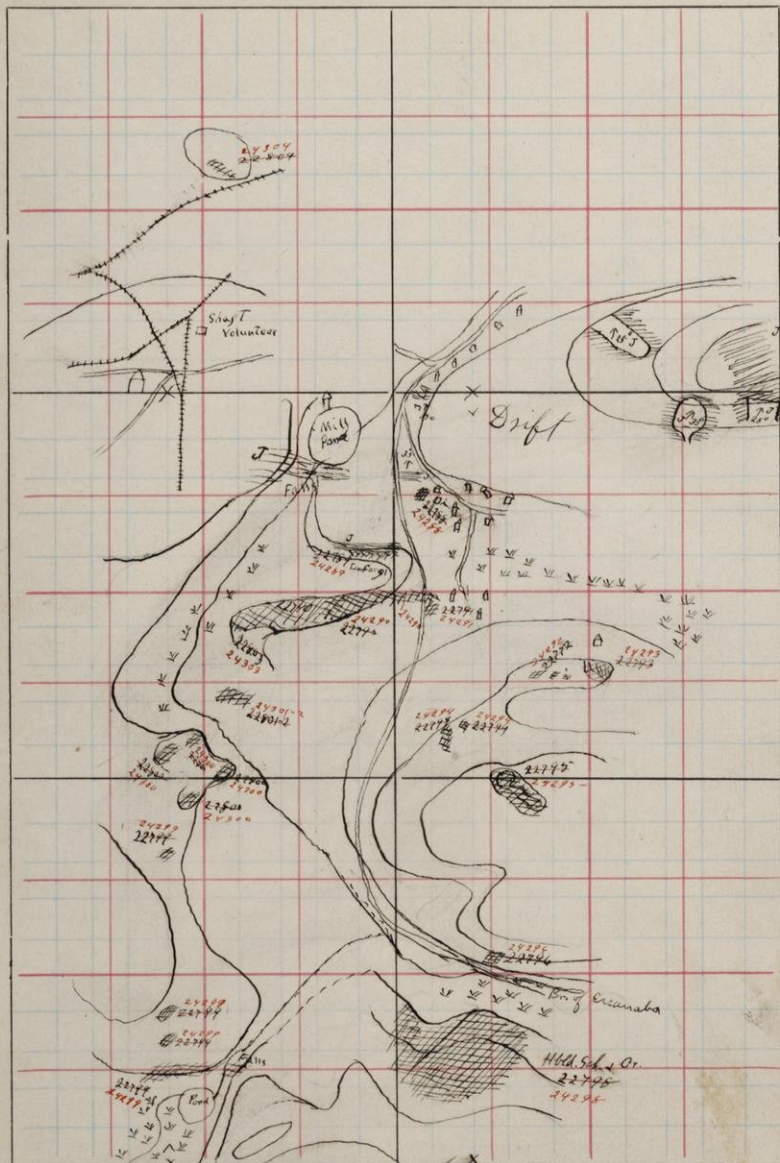
VI

S. 31

T. 47

R. 26

N. 1/4
Post



C.S.

E
1/4 Post

Map VI

NE Cor S. 31-47-26 ran W. 400

- W Cor quit at edge of old open pit in gasper.
 W 100 old pit in gasper. Strike SE, dip 30° NE.
 W 175-N 50 Abandoned open pit in gasper. Strike E
 dip 25° N.
 W 470 old pit in gasper near bank of stream
 at foot of hill. Strike E, dip 32° N.

Map VII

From W 400 ran S.

Running W from Cor. line went along top
 of hill to S of Cascade, western end drift.
 Start S. also over drift. At
 S 100 W 70 ledge of gasper at foot of drift hill.

Dip 35° N, strike W 10 N. Same ledge outcrops
 again about 150 paces farther W and forms falls
 of the creek there. Between the two roads at
 S 125 W 70 outcrops diabase close to but not in
 contact with the gasper at any point. At
 S 185 W 95 outcrops another ridge of gasper
 forming a low cliff and at

S 195 W 90 at foot of cliff beds of low.
 Congl. appear in the gasper or rather
 alternating with gasper beds. Across the
 narrow ravine here, of which gasper forms N. side, at
 S 250 W 60 begins to outcrop, a white
 sericitic schistose (not perfectly) rock,
 probably that lying immediately under
 the low. Congl. although no outcrop at

24288 V
2278824289 V
2278924290 V
22790

this point shows contact. Compare specimens No. ²⁴²⁹⁰22790 and ²⁴²⁶⁵22765, latter lies undoubtedly under the Congl. (²⁴²⁶⁷22767) though not in contact with it. What appear to be ^{pebbles}specimens of ²⁴²⁹⁰22790 are found in the Congl.. This rock is exposed for over 100 paces S. & W. from this point and forms the precipitous S. side of the ravine. Prof. Vanuxem collected from this point when there in July -93.

²⁴²⁹¹
22791 ✓

S270 W55- This rock seems to be included in, or rather to be a bed in ²⁴²⁹⁰22790. At

²⁴²⁹²
22792 ✓

S372 E40 is the W. end of a ridge of drift but the numerous large boulders of diabase on it lead me to suppose it is formed by a diabase dike extending in direction of ridge. Alt. N.E.

~~22792~~

S364 E80 specimen was taken. E. end of ridge is formed by large box outcrop at S264 E180 of green eruptive(?) rock.

²⁴²⁹³
~~22793~~

²⁴²⁹⁴
22794 ✓

S425- W10 Schist (~~not~~ bld.) cut by granite.

²⁴²⁹⁴
22794 ✓

S425- W30 same schistose rocks as 22794

We have been ascending from S250 and now begin to descend gradually, line running along W. slope of hills to valley at S790

²⁴²⁹⁵
~~22795~~

S495 E25- box peak of 22795. about 40 ft high.

²⁴²⁹⁶
22796 ✓

S722 E20 Small outcrop on side of hill of hard grayish black rock.

S745- Stream, branch of Escanaba.

- 24297 ✓
22797 Crossing valley we come at
S845-W50 to S side of valley, a steep cliff
of amphib. schist about 40 ft high. at
24298 ✓
22798 S790 line touches schist.
24298 ✓
22798 S940 Same schist and at
24298 ✓
22798 S935-W60 the schist is cut by granite.

Map VI

From S1000 run W400 i.e. to 800 W of E $\frac{1}{4}$ S31-72-26

Running W. line carries us over high plateau
at first and then along S slope of hill, drift
apparently at least no outcrops on this slope, down
into meadow near stream.

Map VI

From W800 of E $\frac{1}{4}$ foot S31-47-26 to run N.

We go through meadow and cross
stream and begin to ascend slope at N100

- 24299 ✓
22799 " N115- Gedge of coarse hornblende schist cut
through at 75-E of location by stream forms falls.
Strikes NW and dip is 35° NE. Granite cuts it
and in places has followed the bedding of schist.

24299 ✓
22799 N165 Small schist outcrop

24299 ✓
22799 N200 Same again.

24299 ✓
22799 N410 Same schist

24300 ✓
22800 N475-^{E25-}Knoll of schistous rock badly out of hand
included in granite.

24300 ✓
22800 N500 E75- Same schist

24300 ✓
22800 N535- Same.

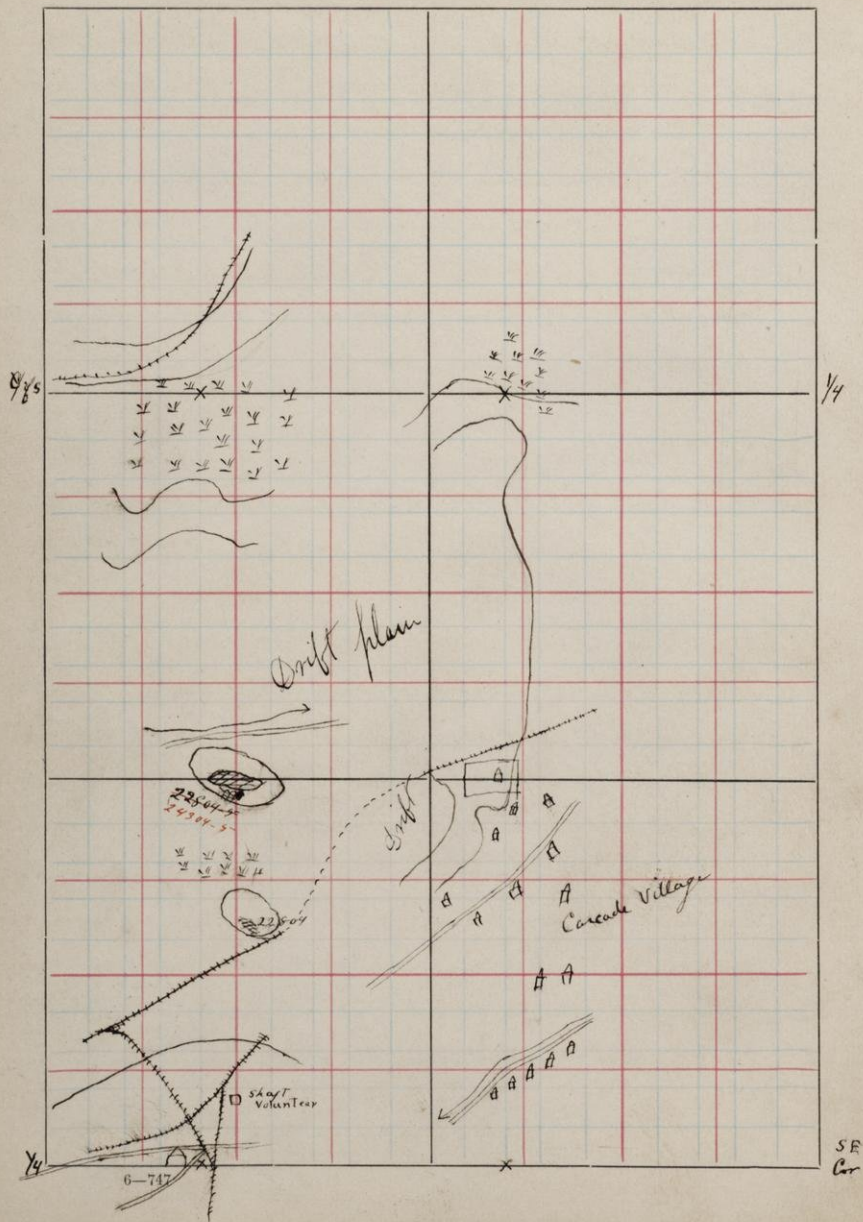
24300 ✓
22800 N545-E25- Same

VII

SE 1/4 S. 30

T. 47

R. 26



24301
22801

N 600 E 65° appears west end of cliff ridge of same rock as 22790. It includes a bed of a denser schist more a slate, only 4 in. thick. Dip 75° N, strike about E.

24302
22802

N 700 E 125° outcrop of same rock as above (also same as 22790) which continues to E and forms cliff ~~abundant~~ bend of creek and joins

24303
22803

At N 400 we are in valley but begin to ascend, at N 700, a hill showing only drift to S. On top of the hill to E + W of line are the pits of the Volunteer Mine just about on the S. 4. $\frac{30}{37}$

Map VII

Continue N in S. 30 from W 800 of SE Cor. Fine eroded dump and stock pile of pit and descends over drift to R.R. at N 255°. Across low ground to little rise at N 298 E 75° where schist shows. Marsh begins at N 340 continues to N 370 and we then ascend knob with granite showing. After leaving knob we go over drift plain, N 565 stream runs up E, N 900 begins marsh continuing to N 1030.

24304
22804

24304-5
22805-4

Ascending over drift at first we get to W. of line at N 1115-W 80 beginning of large bold outcrop of granite extending to W for

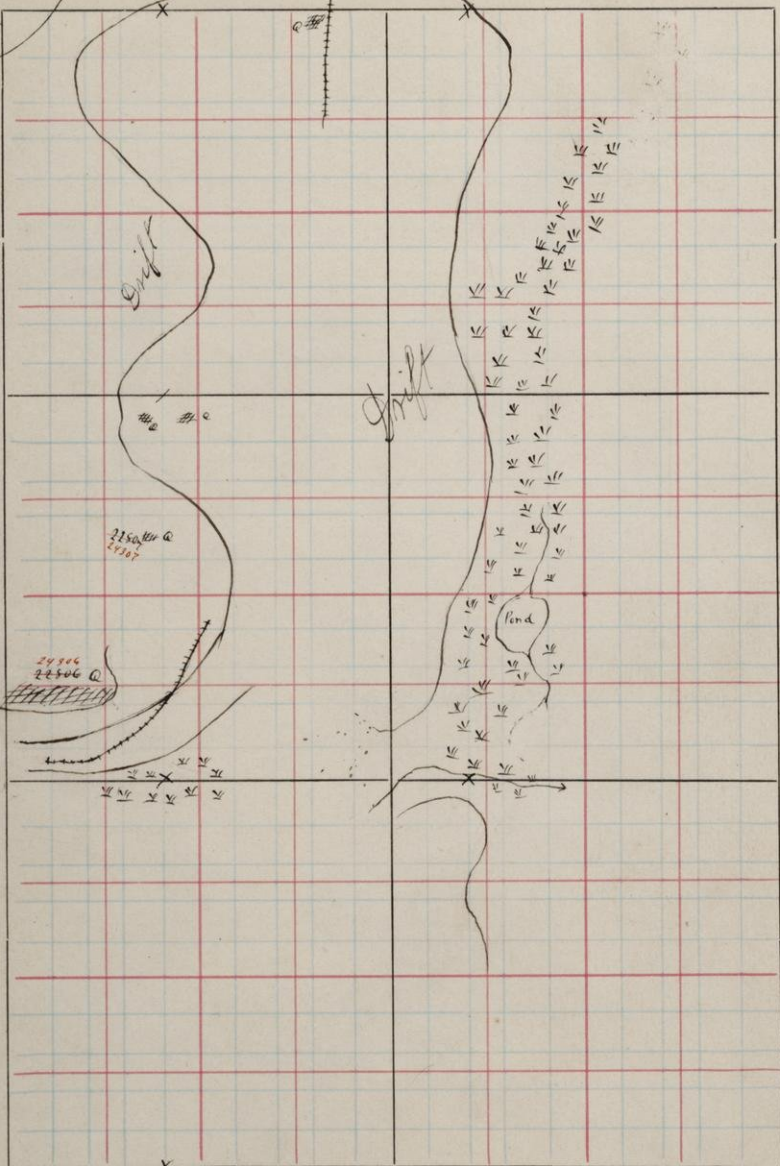
Map VIII
24306
22806

VIII
NE 1/4 S. 30
1/4
Post

T. 47

R. 26

NE Cor.



several hundred feet. White and reddish more or less schistose.

Dip about 75° N.

~~24307~~
~~22807~~

N 1325 W 5 small outcrop of reddish gneiss
N 1470 W 30 Bluish grey quartzite occurs ^{at}
N 1470 E 90 again.

do not plot.

~~24308~~
~~22808~~

Line goes over Eastern slope of hill
covered with large drift boulders
of quartzite and well banded rock probably
from gneiss beds above the quartzite 22807
and to N. farther.

Map VIII

+ VII

From N $\frac{1}{4}$ foot S 30-47-26 ran E. 600 + S.

E 420 S 10 small outcrop of black
qtz quartzite (graywacke) in R.R. cut.
Running E. we descended hill to E 500.

Ran S along slope of hill (drift) through
swamp then over drift through Cascade
village & S section line of S 30-47-26.

IX

31

S. 34

T. 47

R. 26

NW 64

44

Well. Schmit

22409
24309Engine House
of
Volunteer

Drift. Low ground.

22409
2430922409
2430922409
24309

Well. Schmit

22409
24309

Well. Schmit

22409
2430922409
2430922409
2430922409
2430922409
24309

CofS

Map IX

From W 1200 of NE Cor. S 31-47-26 to run S.

~~24309~~
~~22809~~S 60 W 25- Outcrop of Congl. in small ridge ^{just get}~~24309~~
~~22809~~S 215- Outcrop of same Congl. ^{at} strike S 45° E, dip 85° W.

S 285- Wagon road. We now cross valley and ascend

S 580 W 2 Small outcrop of hornbl. schist and again at

S 580 E 100 same schist.

~~24310~~
~~22810~~

S 590 W 40 Granite

S 600 Wagon road.

S 650 W 50 Schist outcrop.

We cross marsh and at S 800 begin to ascend hill and get no outcrop until reaching

~~24311~~
~~22811~~

S 885- where we come upon granite (3/4) outcrop of same at S 995 E 15-

~~24311~~
~~22811~~

S 1000 E 65-

~~24311~~
~~22811~~

S 1000 E 85-

~~24311~~
~~22811~~S 1000 E 125- We are on eastern slope of hill, southern brow of which overlooks meadow and is of ^{hard} rock, grayish black, cut by a ~~the~~ dike about 18 inches wide of 22813. Dike runs little N of W.~~24312~~
~~22812~~~~24313~~
~~22813~~

Map X

From W 1200 of SE Cor. S 30-47-26 to run N
E & W S. line of $S \frac{30}{31}$ runs here along ridge
on which shafts of Volcanter mine
are situated, farther E. Jasper + ore outcrop
on surface and can also be seen in the
open pits.

24389
~~22809~~

N 10 E 30 Small ridge of Congl. on N. slope. At
N 110 R.R. N 145 R.R. N 260 R.R. Cross marsh

24314
~~22814~~

N 346 E 80 Small granite knob.

24315
~~22815~~

N 395 we are at foot of knob of schist cut
by dikes of granite.

24314
~~22814~~

N 645 Crk. running through marsh. Go over drift to

24316
~~22816~~

N 1170 outcrop of a schistose quartzite (?) more
or less sericitic. Dip about 60° slightly E of N.

Map XI

This seems to be a lower phase of the quartzite
which appears at

24317
~~22817~~

N 1225. ²⁴³¹⁶ ^{SE} ~~22816~~ connects with outcrop of ²⁴³⁰⁶ 22806 + is same.

Cornell

24318
~~22818~~

N 1730 From top of this aren't we go over
rolling hills apparently chiefly drift. At

N 1730 outcrop of bluish grey quartzite
N 2000 at foot on drift - to N ridge with Jasper.
^{General junction of face of ridge}

Map XI

From NC Cr. S30-47-24, W1600 to run S.

BU 1600 N75- outcrop of upper gasfer.

We go S over rolling drift hills with swampy ground between and to W of L at

24319

22819

S735 E85- is an outcrop of fine congl. with only occasionally a piece of green decomposed rock. Nearly a quartzite proper. But contains numerous large pieces of milky vein quartz more or less rounded. A little coarser phase of same ^{congl.} rock occurs at

24319

22819

24320

22820

S755 E95- ~~which~~ and atS790 E100 a regular coarse congl. occurs. at S785 we come upon row of shallow test pits only a few feet deep in drift but ~~but~~ out at

24321

22821

24322

22822

S810 shows gasfer just below surface

S815 small ledge of very rotten schist. Strike about E(?) Dip 85° NNE E of N. Cross creek at S1015- continue

Map X

24329

22823

24323

22823

over rolling ground and across marsh S1420-1540 to

S1670 foot of granite hill, exposures on N side and at

S1780 on S side.

S2000 R.R. with here several switches and places for stock fields.

Map IX

From NE Co. S31-47-26 W1600 to run S.

Leaving track of R.R. we come at S300 to swamp extending to S395 then around small hill with granite outcrop at summit at S435 + at S435 W40. We now continue to south, ^{to S1000} crossing ^{low} small hills, with granite and schist - schist frequently cut by granite outcrops on sides and summit, with usually narrow marshy valleys intervening. S675 Schist cut by fine grained red granite dikes. S740 E15 Prevailing red granite breaks through and includes schist (hornblende).

S800 W25 Small granite outcrop

S820 E10 Small granite (red) outcrop.

S900 E50 large outcrop of granite - more or less gneissoid in places.

S920 W25 small outcrop of apparently same rock as 22826 but slightly more schistose.

Map IX

From S1000 run W ²⁰⁰ along S slope of hill ^{X. 200}.

24327-28

22827-28

24326

22826

W120 N45 Schist (22827) cut by granite dikes (22828) W130 N100 same rock as 22826. W210 4 in swamp. 24326

Map IX

From W1800 of E. 1/4 part S31-47-26 to run N.

We run N over country similar to that on W1600 from NE Co. S31, Granite + schist hills with intervening swamps.

- ~~22826~~ 24326 N160 Outcrop of 22826 again
 24326 N160 W100 same rock
~~22826-27~~ 24326-27 N260 W20 Outcrop of apparently 22826 cutting through schist 22827
~~22826~~ 24326 N260 E75 same granite 22826 forming cliff on opposite side of narrow valley.
 24327 N570 Outcrops close together of schist (hornblnd) on S side of hill.
~~22827~~
- Map X From W1800 of SE to S30-47-26 to run N.
~~22827~~ 24327 N18 W75 cliff of hornblnd schist
~~22827~~ 24330 N80 Foot of hill of schist ^{cut} ^{red} ^{NE} ^{granite dikes.}
 At foot of hill ^{NE} is small drift plain.
~~22830~~ 24330 N150 W50 same schist cut by granite.
~~22831-32~~ 24331-32 N210 W20 Outcrop on same hill where schist is very much cut & broken by the granite 22832.
 Schist is finer grained than that at N150 W50 (24330, 22830)
~~22831-32~~ 24331-32 N250 E40 across narrow valley outcrops schist cut by granite again.
~~22833~~ 24333 N260 W30 Outcrop in old wagon road of greenish micaceous schist. At
~~22833~~ 24333 N530 we come to steep cliff of green micaceous schist very much cut & contorted by red granite.
 The schists located above seem to have a general dip about NE. and up N.W.
~~22834~~ 24334 N540 W20 Schist (hornblende).
~~22834~~ 24334 N785 W25 Outcrop of 22834.
 We now go N over drift & marsh with

Map XI

N1055 station

26

outlet of lake running through it. Then we around and go over drift hills with boulders of quartzite strewn over them but no rare outcrops. Noticed at N1320 that the conglomerate ⁽²⁴³³⁵⁾~~(22806)~~ boulders seemed to predominate and were then followed forth north by a dense quartzite. Possibly in situ? Continuing over rolling drift hills we begin at Me 25845 to find old test pits at first only in drift but at

24335
~~22835~~
24335
~~22835~~

N660E65 the dump from pit is all gneiss

N670E70 pit is gneiss

N675E65 pit down to gneiss. We begin to around a very steep hill about 80 ft high and pass gneiss fragments all over hill side though no positive outcrops, but on top of hill at

24335
~~22835~~

N830E60 there is a small ledge of gneiss ^{iron} ore.

N850E60 same ledge outcrops again on N. brow of hill. Was not sure of dip + strike.

Descend hill and end run in valley at N2000

XII

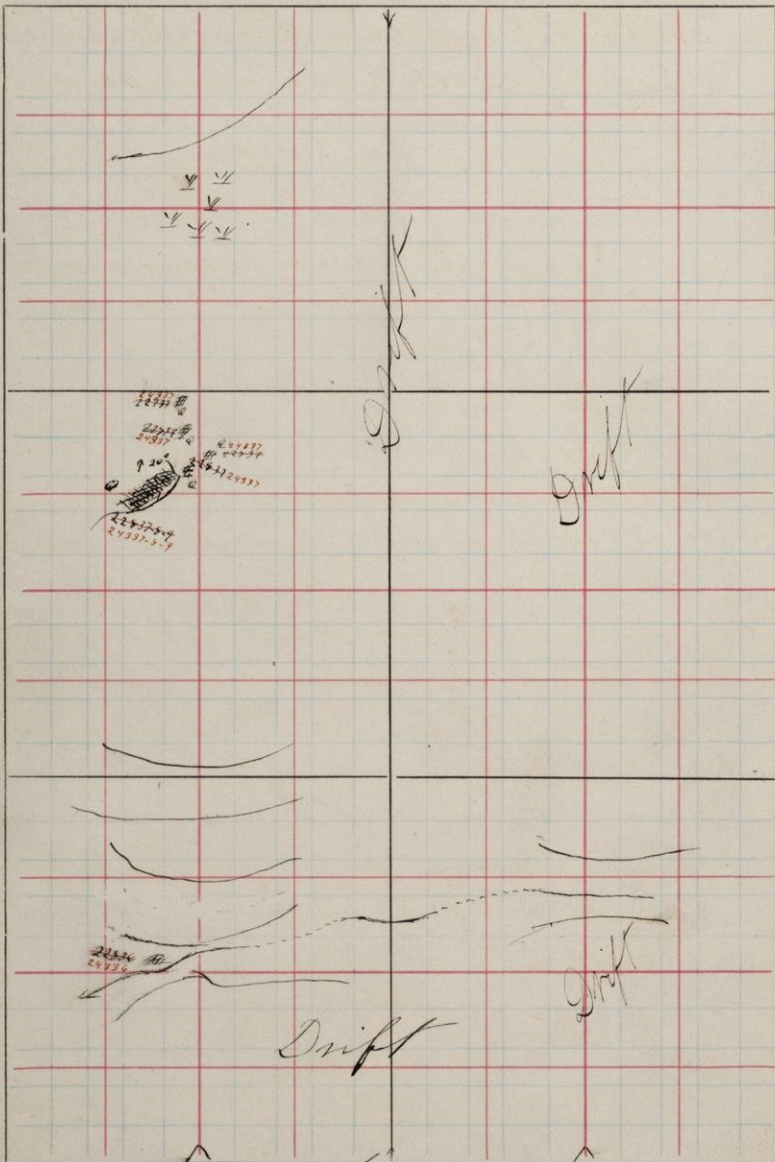
S. 20

T. 47

R. 26

NE Cor

1/4 Post



C/S

1/4 Post

Drift

Drift

SE 1/4

N 500 feet from SE Cor

Map XII

I made three runs in S 20-47-26 from south line of section to north line, running on W 250, 500 & 750 from S.E. Cr. S 20-47-26. With the exception of few outcrops of quartzite on W 750 the lines were entirely over drift ~~formation~~ gently rolling with some swampy ground. Test pits were found here and there but never a ledge.

W 750 from S.E. Cr. S 20-47-26 to run N.

N 770 Creek.

24336
22836

N 775 W 65 Small outcrop on side of hill just after crossing creek. We ascended rather high hill but very gradually.

24337-8-9
22837-8-9

N 1355 W 65 Large ledge of thick bedded quartzite (22837). Between the beds are quite thin beds or layers of a very dark fine grained slate (kind of rock (22838)). Dip about 20° N. 24339 is a specimen showing both coarse and fine grained phase together. As they were collected fine grained was lowest.

24337
22837

N 1405 W 15 Small outcrop of same quartzite

24337
22837

N 1430 E 15 Same ~~qtz~~ quartzite.

24337
22837

N 1555 W 18 Same quartzite in small outcrop.

24337
22837

N 1585 W 25 Small ledge of same quartzite.

XIII

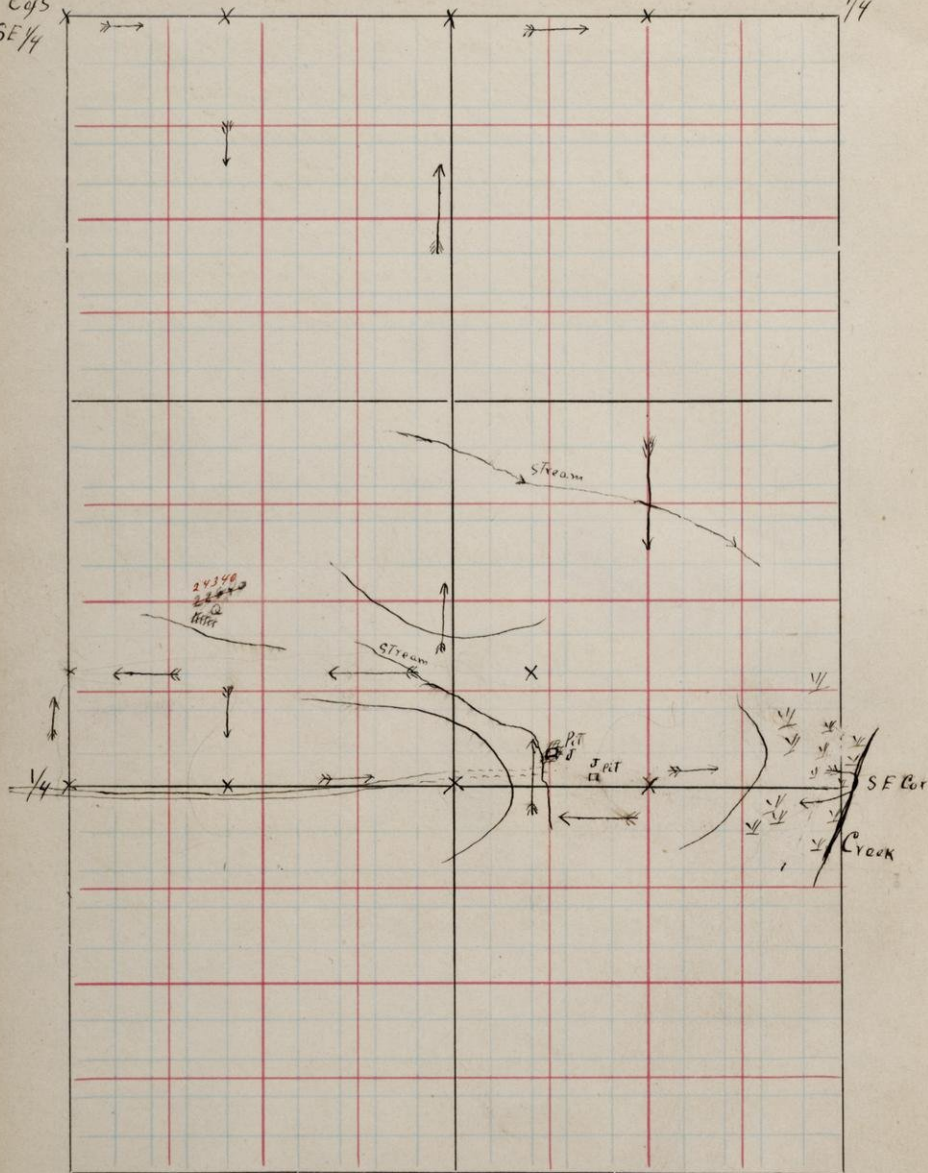
S. 27

T. 47

R. 26

Cos
SE 1/4

1/4



Map XIII

24340
~~22840~~

SE 1/4 S27-47-26 is well wooded rolling ground with very few outcrops. The runs were made as shown by arrows on map. At N230 W 835 from SE Cor S27-47-26 is a small outcrop of quartzite.

N15 W 320 from SE Cor. S27-47-26 old pit to gasfer.
N50 W 375 - Old pit to gasfer.

Map XIV

24351
~~22851~~

SW 1/4 S27-47-26 is also rolling drift hills apparently.

Locations from SE Cor. S27-47-26

W1650 N12 Blocks of granite possibly in situ (?)
W1715 on S slope of rise are numerous gasfer fragments but did not get more ledge. Near here are some test-pits with some gasfer fragments around.

24341
~~22841~~

W1750 N480 pit with gasfer dump.

W1746 N600 pit with gasfer on dump

Within 20 fms here are three more pits one W1736 N600 with gasfer dump, others only in drift.

N975 R.R.

N. on S line 28/27. no outcrops up to R.R.

N790 R.R.

N910 W50 (in S26) Test pit in gasfer.

N925 W125 Pit in gasfer.

flat

XIV

S. 27 T. 47

R. 26

SW 1/4

RT

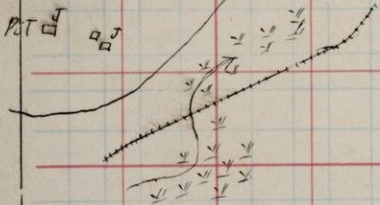
1/4 Post

47

X

X

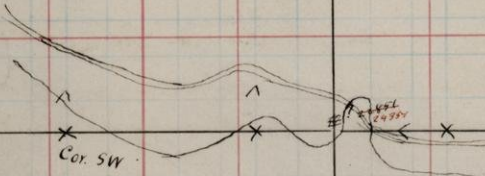
X



RT

RT

Covered with drift.



Cor. SW

1/4 Post

X

X

6-747

From SE Cor 527.

W 1750

W 1500

W 1250

Map XV

From SW Cor. S26-47-26. E500 to run N.

24342
22892

E475-N60 Outcrop of hornblende schist cut by granite. Line goes through swamp then crosses ridge of drift and enters cedar swamp.

N920 E600 Outcrop a large ledge of quartzite with fractious face 25 ft high.

Line is through swamp with exception of couple of low drift hills. Run no further than N1715-R.R.

Map XVI

Run E 500 faces to $\frac{1}{4}$ line on N1700 then S.
S on $\frac{1}{4}$ line

S300 is still in swamp which continues to S600 when sandy plain begins (covered with high grass) and continues to S950 where there is a gentle rise in the plain covered for some distance - to S1450 - with pines then open plain, covered with blueberry bushes, which runs little into S34.

XV

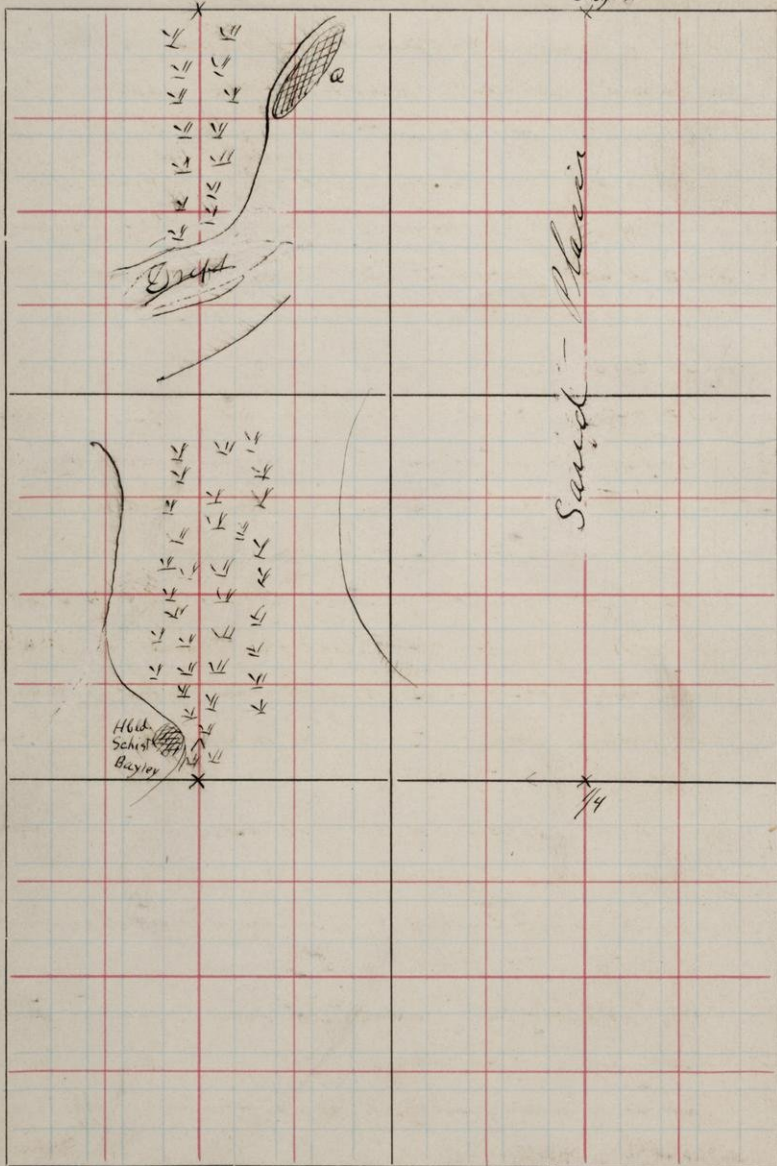
S. 26

T. 47

R. 26

c of S

SW $\frac{1}{4}$



Map XVII

S from N 1/4 part S 35-47-26

S. of 1/4 part ground begins to rise
and about S 200 we are near top of
a ridge of schist + granite in the sand plain.
(including some schistose rocks)

24343
22843

S 50 W 80 Granite outcrop followed at

24343
22843

S 100 W 95 by greenish schist cut by granite

24343
22843

S 120 W 25 Granite, in places gneissoid.

24343
22843

S 160 E 35 Same granite + greenish schist.

24343
22843

S 160 E 70 Same granite again

24344-5
22844-5

S 210 W 45 Schist outcrop on hill side. It is much
cut + broken and included in red granite (24345).
(22844-5)

24345-6
22844-5-6

S 225 E 95 Schist (24346) predominates in this outcrop,
cut by granite (24345).
(22844-5)

24347
22847

S 270 W 25 Schist (gneiss?) in face 30 ft high at S foot
of hill. We now cross sand plain and run to C of S. 35
From C. of S 34-47-26. Ran W over sand plain for
500 paces then N. Line crosses sand plain
with sand hill to W.

24348
22848

N 448 W 500 from C of S 35-47-26. Line crosses a
small ledge of (24348)
(22848)

24345
22845

N 500 W 425 of C of S 35-47-26 small isolated knob of
granite with little schist.

24349
22849

N 645 ^{W 500} Outcrop of quartzitic rock very similar to
that at N 448 W 500.

24349
22849

N 760 ^{W 500} Very small outcrop of same again.

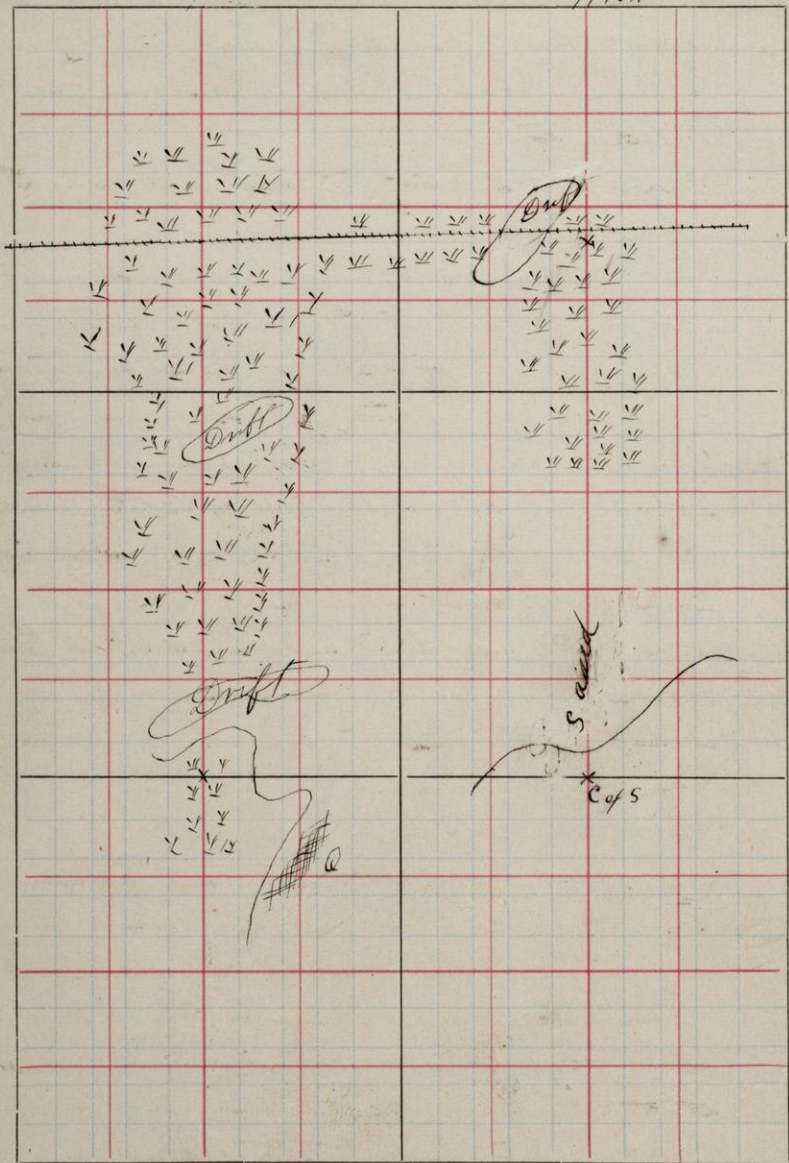
24350
22850

N 800 W 520 of C of S 35-47-26. Outcrop of a variate schistose rock on top of hill.
Steep face of it shows on N. base of hill. We descend to sand plain.

XVI

NW $\frac{1}{4}$ S. 26

T. 47

R. 26
 $\frac{1}{4}$ Post

Map XVIII

Made traverses of south east portion of SE $\frac{1}{4}$
S 28-47-26 every 100 paces.

S from N 800 on W 100. Location from SE cor. S 28.
W 100 N 700 R.R.

W 110 N 590 Old test pit with gopher dump. Several
test pits in drift near by.

W 100 N 565 Test pit to gopher ledge.

W 200 N 325 Test pit to gopher ledge.

W 315 N 340 Test pit with gopher fragments on dump.

W 300 N 290 Test pit with " " " "

W 320 N 235 Several old pits within few paces of each other with Tm dump.

W 395 N 8 Test pit (caved in) with some quite fresh gopher on dump.

W 392 N 340 Pit in gopher. About 2 ft below surface.

W 500 N 315 Old pit in gopher.

W 500 N 155 Small open pit in gopher. Could not get deep etc.

W 510 N 135 Old pit to gopher ledge.

W 500 S 60 (in S 33-47-26) pit in gopher.

W 525 S 60 (in S 33-47-26) " " "

W 588 S 55 (in S 33-47-26) pit in gopher.

24352-3
24352-5

W 600 N 45 Outcrop of a rock with smooth weathered surface

On face of rock there are spots which seem to be
harder ⁽²⁴³⁵²⁾ than other portions and stand out, ⁽²⁴³⁵²⁾
giving the rock the appearance of a conglomerate.
Nearly all of ^{outcrop} rock is covered by large gopher dump.

24354-5-5 1/2
24354-5-5 1/2

W 700 N 92 is mouth of a long open pit running
about SW into gopher in side of hill.

Strata dip 40° nearly N.E. strike NW.

XVII

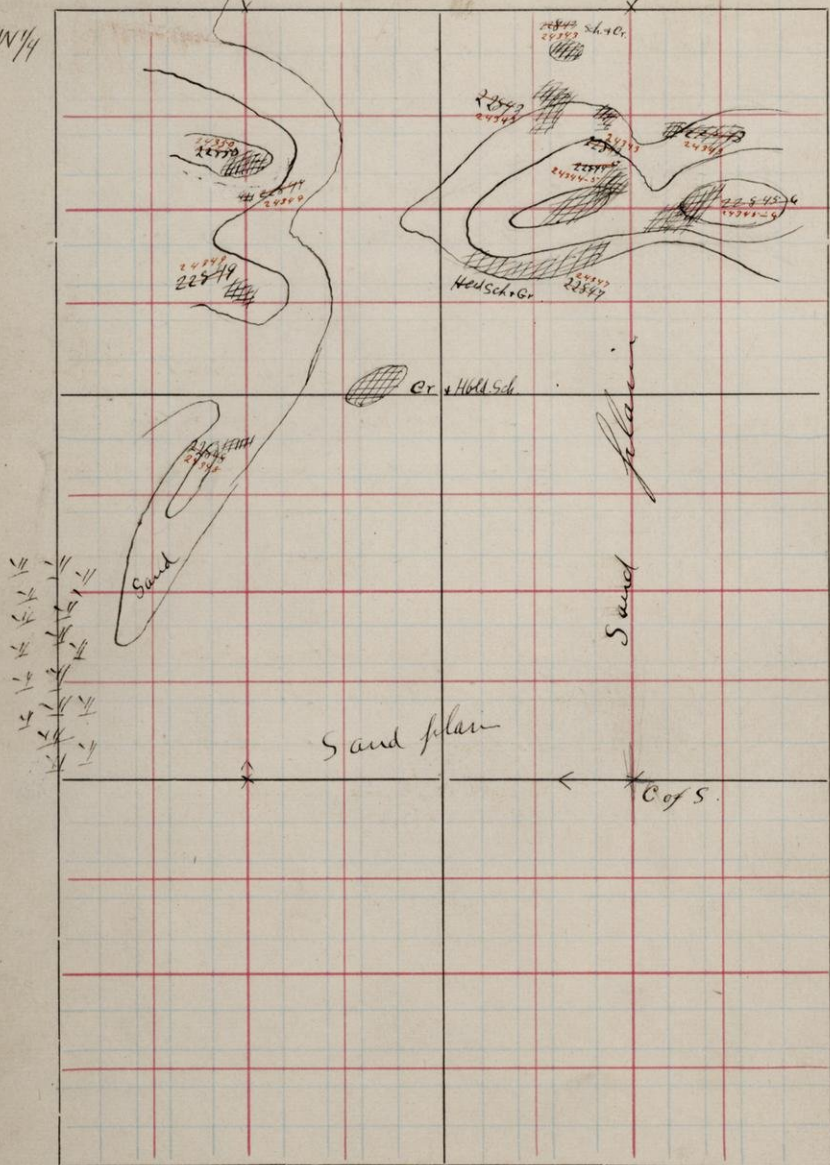
S. 35-

Held. T. 47
Sch. 11

R. 26

R. 26 $\frac{1}{4}$ Post

NW 1/4



Near entrance to pit the rock is very rotten
 and quite schistose. It rapidly becomes more
 ferruginous and passes over into well
 banded iron gosses. In the gosses about
 20 ft from pit entrance is a bed of
 arkose (?) (24355-5/2) (or dike) extending across
 pit. It is about 1 1/2 ft wide thick.

24356
 22856

W700 N20 Large open pit in gosses. Dip 40° NE.
 Strike NW. About 60 ft from entrance to pit is
 a bed about 6 ft thick of red + white mottled
 micritic schistose rock intercalated in the gosses.
 W800 N70 Test pit to gosses.

W800 N110 Open pit in much contacted gosses.

General dip to E of N.

24357
 22857

W770 N140 Outcrop of a ledge of schist running to
 NW. Line crosses it at W800 N170.

24357
 22857

W800 N220 Wagon road and outcropping along this
 to W for 20 ft is same schist (24357)

XVIII

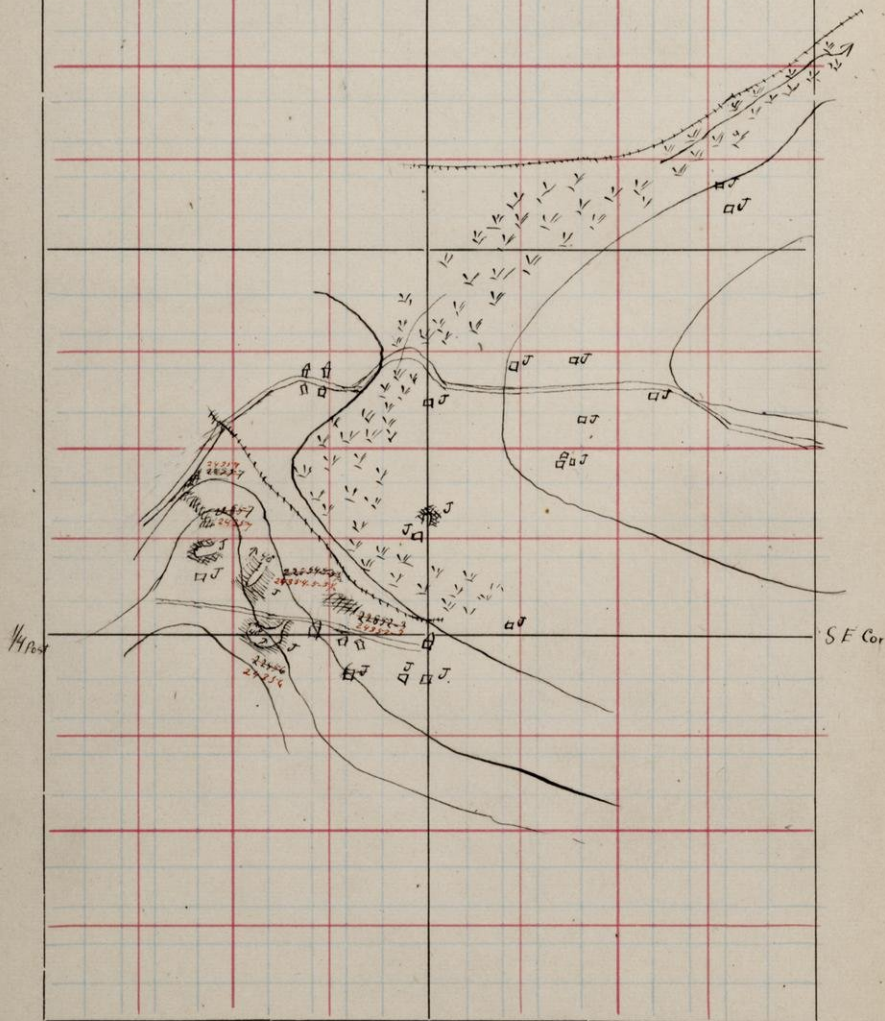
SE 1/4 S. 28

T. 47

R. 26

1/4 Post

Coy's



FROM CAMP ON

DR. MCKENZIES FARM

EAST OF EAGLE MILLS.

S. 2. T 47 R 26

XIV

SE 1/4
C of S

S. 2

T.

47

R. 26

1/4 Post

Drift



Drift



1/4
Post



Farm

SE Cor.

~~Drift~~

July 24-93

Map XIX Ran W250 from SE cor S2-47-26 then N.

Line runs W along fence near foot of sandy slope then N on gently sloping ground to N365-wamp. The swamp continues to N1775: when we cross a sandy stretch of ground, rolling gently, and come to Corp. Pines at N1080, here about 25-ft wide. Swampy ground continues, then alternating with dry sandy stretches to N1720 where sand hills begin and continue to N.S. line.

Map XX

Maps XVI + XVII

Continuing on same line in S35-48-26, we keep on up hill and descend to large sand plains which begin at N400 W250. N550 Wagon Road N1140 State Road.

Map XXII

N1500 is where plant of Morgan furnace used to be. Furnace itself is just at foot of hill on side of R.R. about N1775. Line runs now (from N1500) along a ^{rapidly} narrowing tongue which projects into the valley and descends rapidly to it on the sides and end. The E slope is covered still with drift, the W and N however show outcrops of marbles, slates and calcareous (quartzite?) sandstones. N1650 W38 Marble bed 10 ft thick, cherty, followed to N by bed of calcareous slate 55 ft. thick. Dip 80° S. Strike E. ²⁴³⁶⁰ 25000 fresh specimen. Not exposed all the way. Probably entirely too thick.

24359

~~22850~~

24358

~~22855~~

24360

~~22860~~

XX

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

S. 2

T. 47

R. 26

NE Cor.

Co of S

 $\frac{1}{4}$ Post

Sand Hill

Good sandy plain
in place mostlyRaid
Winter
Road

Carp River

24359

22859

24361-1/2

22861-1/2

Bed 15 ft thick of ²⁴³⁵⁹22859 followed by bed 27 ft thick of thinly bedded cherty limestone (²⁴³⁶¹22861). In places the beds are very much contorted (^{24361 1/2}22861 1/2). Dip 70° S strike E.

In the series which I am giving here the strata seem to be perfectly conformable and show merely the alternation of limestones or marbles, calcareous slates and calcareous & sandstones (quartzites?). Strike E Dip 85° S.

24362

22862

Following the cherty beds is a narrow bed of red feldspathic marble 18 in thick.

24363

22863

Then comes a bed 1 ft thick of reddish slaty limestone.

24364

22864

Bed of purplish slate (calcareous) 3 ft, much broken.

24365

22865

Marble slightly cherty 6 ft thick.

24361

22861

Thinly bedded cherty limestone 2 1/2 ft.

24362

22862

Marble (red feldspathic) 4 ft.

Bed, 12 ft thick, of chiefly reddish limestone with thin bands of purplish and violet slates in it.

24366

22866

Bed 10 ft thick of different colored marbles — about 2 ft of coarse cream colored marble, 3 ft of reddish marble (²⁴³⁶⁶22866) and 5 ft of light grey marble —

24367

22867

Then follows a bed 30 ft thick of slaty limestone reddish marble and reddish and violet slates.

24359

22859

(Bed 7 ft thick of ²⁴³⁵⁹22859

Bed 5 ft " " ²⁴³⁵⁶22866

XXI

S. 35

T. 48

R. 26

SE $\frac{1}{4}$ C_os $\frac{1}{4}$ Post

Sand plain.

Sand hill.

*

SE Cor

 $\frac{1}{4}$
Post

24367
22867

Bed of ²⁴³⁶⁷ 22867 32 ft thick
Then 50 ft of pinkish limestone with
thin bands of white and pink chert.
Then about 6 inches of purple slates. The slates
then alternate with quartzitic bands and pass
over into a calcareous sandstone. ²⁴³⁶⁸ 22868
bed 3 ft thick. Then follows a bed
2 ft thick of thinly bedded slaty limestone
with good deal of quartz ²⁴³⁶⁹ 22869
quartz and passes into a marble bed, 3 ft
still with some quartz in it.

24370
22870
24371
22871

Following S.N. is a bed of pink marble - more
or less quartzitic - about 8 ft thick and then
a bed 3 ft thick of a rock which on weathered
surface is a dark brown, fresh specimen shows
a sandy (quartzitic) red marble ²⁴³⁷⁰ 22870. The N side
of bed is almost a pure quartzite or very compact
near calcareous sandstone ²⁴³⁷¹ 22871.

24367
22867

Next follows a thin stratum 3 in. of reddish marble.
We then have a thickness of 100 ft of reddish
and purple slates (calcareous). In places the
slate nearly disappears and we get a
marble with thin layers of slate through
it and in other places the marble reaches
a thickness of from 6 in to 1 ft.

Strike 15° N of E. Dip 85° S.

N. 1780 E 90 End of outcrop of slates just behind old
furnace at foot of steep hill.

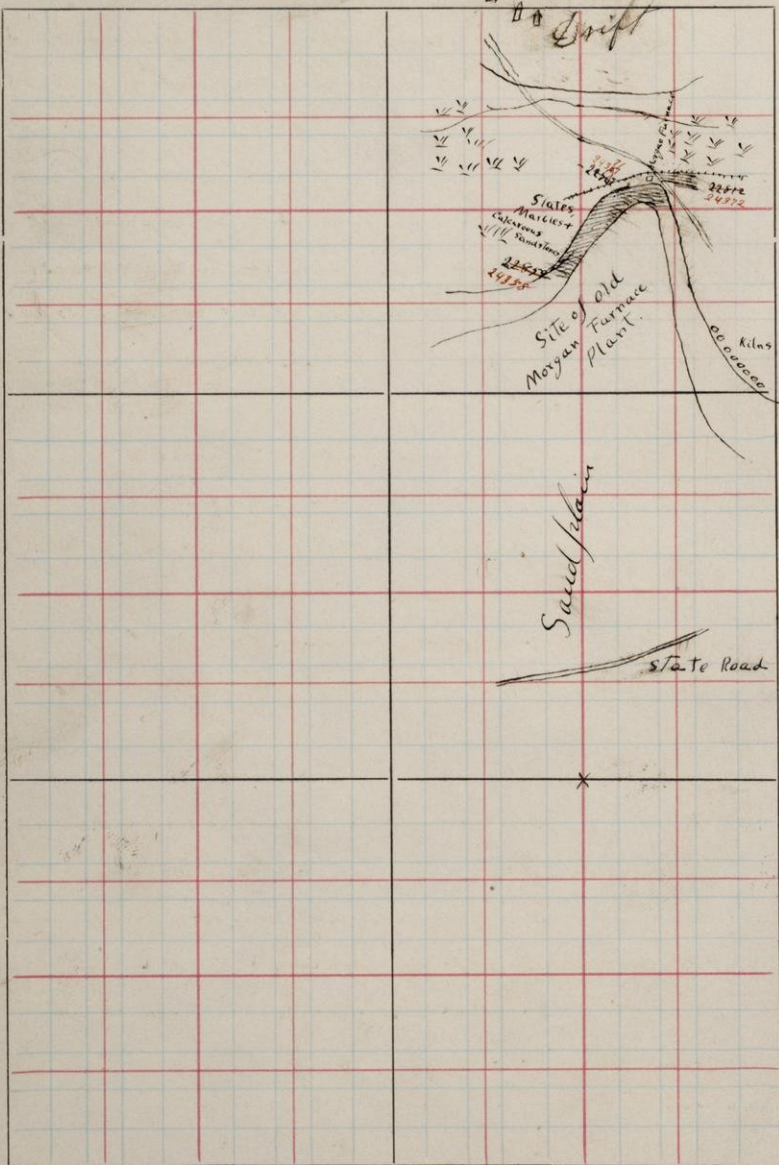
XXII
NE 1/4 S. 35

T. 48

R. 20

NE Co.

1/4
Post



Co of S

1/4 Post

24367
22872

N 1780 E 115- Begins outcrop of purple slates with two thin beds of marble. Series 15 ft thick.

① Strike 10° N of E. Dip 85° S. the a bed 9 ft. thick of pink and white marble, cherty, and 35 ft of purple and reddish ^{calcareous} slates. Bed 13 ft thick of pink & cherty marble and 30 ft of slates and slaty limestone.

24372
22872

15 ft of slates and calcareous sandstones (22872)

The thin sandy strata alternate with thin beds of slates. Lowest stratum is 3 ft of ^{calcareous} sandstone.

25 ft. of variegated cherty marble.

8 ft of thinly bedded slaty marble.

4 ft of of a light colored almost white, sandy (quartzitic) marble. Strike 10° S of E.

6 ft of purplish slates followed by 2 1/2 ft of calcareous sandstone (quartzitic).

1 ft of purple slates

1 ft of calcareous sandstone

50 ft of slaty + cherty marble. Very much contorted. Though the contortion seems to be in the individual beds not in any large number of them uniformly.

N 1800 E 150 End of outcrop of marble series.

N 1800 E 70- R.R.

N 1800- stream. Crossing this we ascend low sand hill and continue over sand plain to E of house to N 2000 where run ends.

XXIII

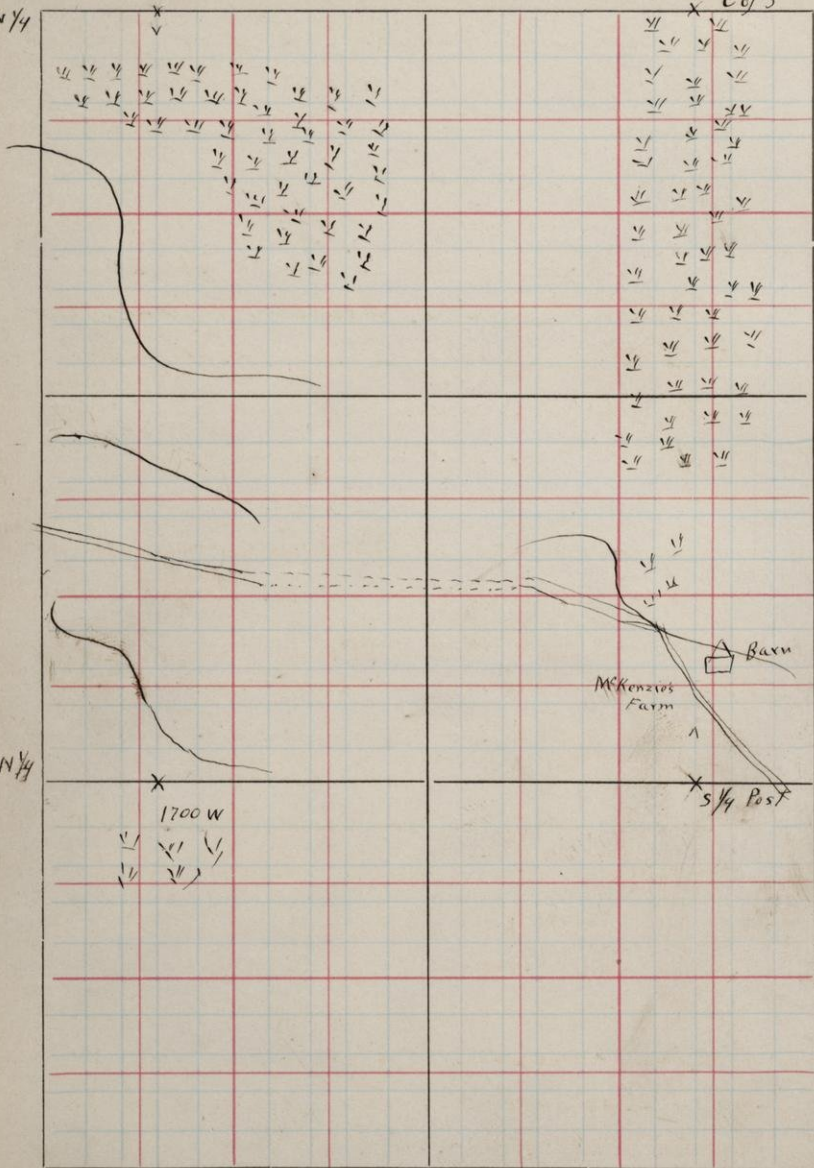
S. 2

T. 47

R. 26

Co 5

SW 1/4



SW 1/4

X

1700 W

SE 1/4

X 1/4 Post

Map XXIII

From S $\frac{1}{4}$ foot S 2-47-26 - fence at McPang's
 farm is on S section line, $\frac{1}{4}$ foot near gate -
 run N, at first slo descending over
 gently sloping drift to swamp N 420
 which continues to N 1050 when we

Map XXIV

ascend a slight sand hill and then
 descend to Cash River at N 1285; here
 about 30 ft wide. Crossing river we
 come to sand plain which continues

Map XXV

into S 35-48-26. We begin to ascend
 drift hill at N 350 and near top at
 N 545 we reach outcrop of greyish blue
 slates in places with bands colored by iron.
 Strike almost due E(?) Dip 60° S(?) Outcrop runs to
 form back bone of ridge.

24373
2287924373
22879

N 505 W (80 Outcrop in plain near N. end of ridge
 of same slates. Dip 35° about SW. Strike NW.

Schistosity dips 70° little W of S. Strike 20° N of W

* Outcrop at N 545 continues to N 500 E 65 and
 at this point the slates are very
 much contorted. There is evidently
 a fold and this is apparently
 the N end of an antiformal fold.

General strike is 15° N of E Dip 42° little W of N.

24374
22874

N 480 E (80 Small outcrop of same slates

Strike little W of NW. Dip 25° SW.

24373+24075
22873; 22775

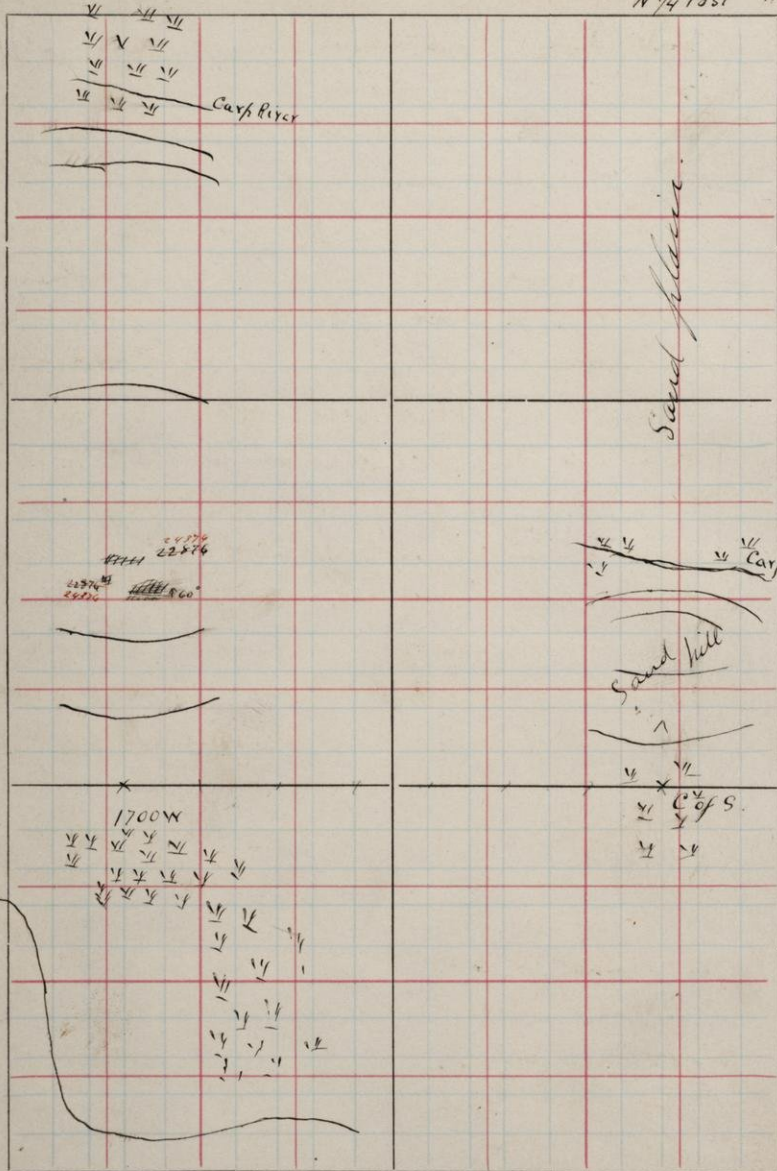
N 600 W 20 Outcrop of slates with bed 4 ft thick

XXIV

S. 2

T. 47

R. 26

N $\frac{1}{4}$ Post NE $\frac{1}{4}$ NW $\frac{1}{4}$ 

(24375)
of Conglomerate in them. Strike E. Dip 30° S.

N625- Small slate outcrop.

N840 E95-880 Rounded outcrop of slate at foot of hill. Strike 10° S of E. Dip 52° with E of S.

From N550 we have been descending hill and reach sand plain at N775 and keep on over it.

Map XXVI

N965 State Road.

N1100 R.R. D.S.S. & A.

For about 250 paces before reaching $\frac{1}{4}$ foot we go along slope of descent leading to swamp and through swamp to $\frac{1}{4}$ foot. We then run W over sand plain, W1152 R.R. D.S.S. & A.

Map XXVI

W1620-1790 Swamp. Run S from W1700 on S. line.

Map XXVI

S from W1700 from NE cor. S35-48-26.

Line begins in swamp and touches it at goes along it for some distance, then crosses a marshy pond and continues across a wide sand plain crossing the 2 main lines and some switches of the D.S.S. & A. R.R. near Eagle Mills Station.

S600 R.R. D.S.S. & A.

Map XXV

S1105- State Road.

S1180 R.R. (switch).

S1285 R.R. D.S.S. & A.

S1875- Alder bottoms.

Map XXIV

S75 in S2-47-26 Corp River.

XXV

S. 35

T.

48

R. 26

C of S

SW 1/4

Eagle

Mills

2554A

Sand plain

Sand plain

24373

24373

24373
24373
2437324373
24373
2437324373
24373
24373

1700W

Carp River

A

S 1/4 Post

SE 1/4

After crossing Corp we begin to ascend hill - test pits at foot only show drift - and continue over high ground to

24376

~~22876~~

24376

~~22876~~

24377

~~22877~~

S 685 - where we get outcrop of quartzite.

S 8735 - W 35 - Same quartzite.

S 740 E 5 - Same quartzite about 12 ft across with 6 in stratum of slate in it. Strike & Dip 60° N.

Conformable with bedding of quartzite.

At S 800 as we descend hill I noticed blocks of a compact reddish sandstone or quartzite + pieces of reddish slate but saw nothing which I was sure was in situ. We cross a swampy valley and ascend a hill showing only drift. It is for the most part covered with a second growth of hard wood. S. 680 Wagon Road. (McClung's Farm road)

XXV

S.

35

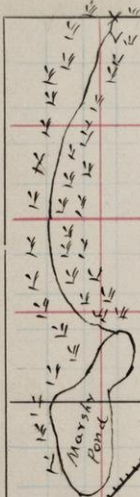
T.

48

R. 26

Sand plain

NW 1/4



12 1/2 ft

1700 W

Sand plain

D.S.S+A

Sand plain

Sand plain

D.S.S+A

Cof S.

N 1/4 Post

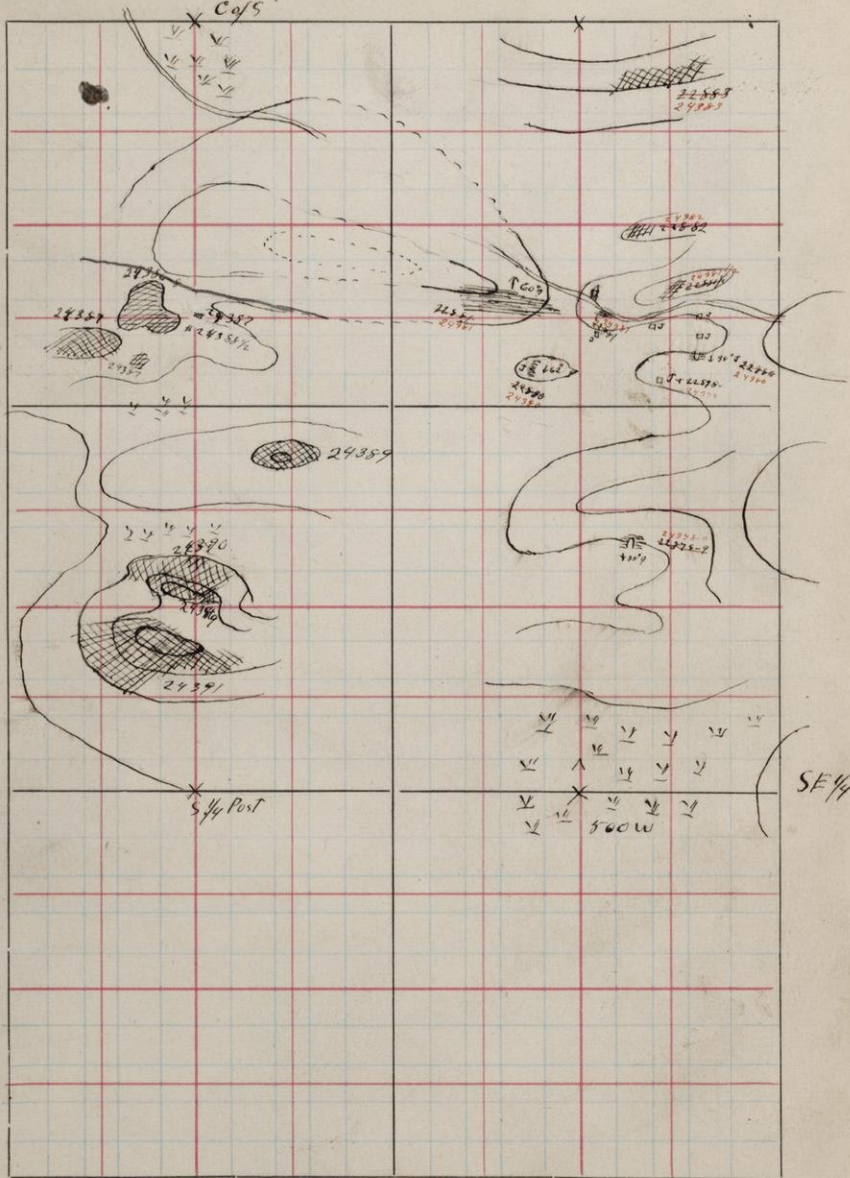
NE 1/4

XXVII

S. 3

T. 47

R. 26



Map XXVII

From S.E. Cor. S3-47-26 run W 500. over rolling ground - no outcrop - and through swamps and then run N.

Low drift ^{potholes} alternate with swamps. At N330 E75 in side of hill is pit in ferruginous slates with bed 2 ft thick of a green slate in ~~the~~ (22879). Dip 85° S (?) Strike little N of E (?). (22878)

24378-9
22878-9

N520 E110 Old pit with slate fragments on dump and also pieces of iron gasper. Fragments of gasper scattered over surface of hill.

24380
22880

N580 E170 Test pit in gasper in hill side.

Strike E. Dip 35° about 5° E of S.

N600 E170 Test pit in little valley. Reached gasper.

N610 E160 Opening in side of hill + gasper on dump but opening nearly filled now and does not expose it.

N610 E100 Pit with gasper on dump.

24380
22880

N555-W70 Outcrop on crest of hill of same gasper

Strike 20° N of W. Dip 62° little W of S.

24381
22881

N635-W20 At foot of hill consisting of arenaceous green slate much contorted.

Strike 5° S of E in general and dip seems to be about 60° little E of N.

24381
22881

N635-E35 Same slate showing in Wagon road.

24381 1/2
22881 1/2

N650 E120 Outcrop on top of hill of grey quartzite.

N620 E25 Pit with gasper outcrop.

We cross low ground with small rise S & E at

24382
22882

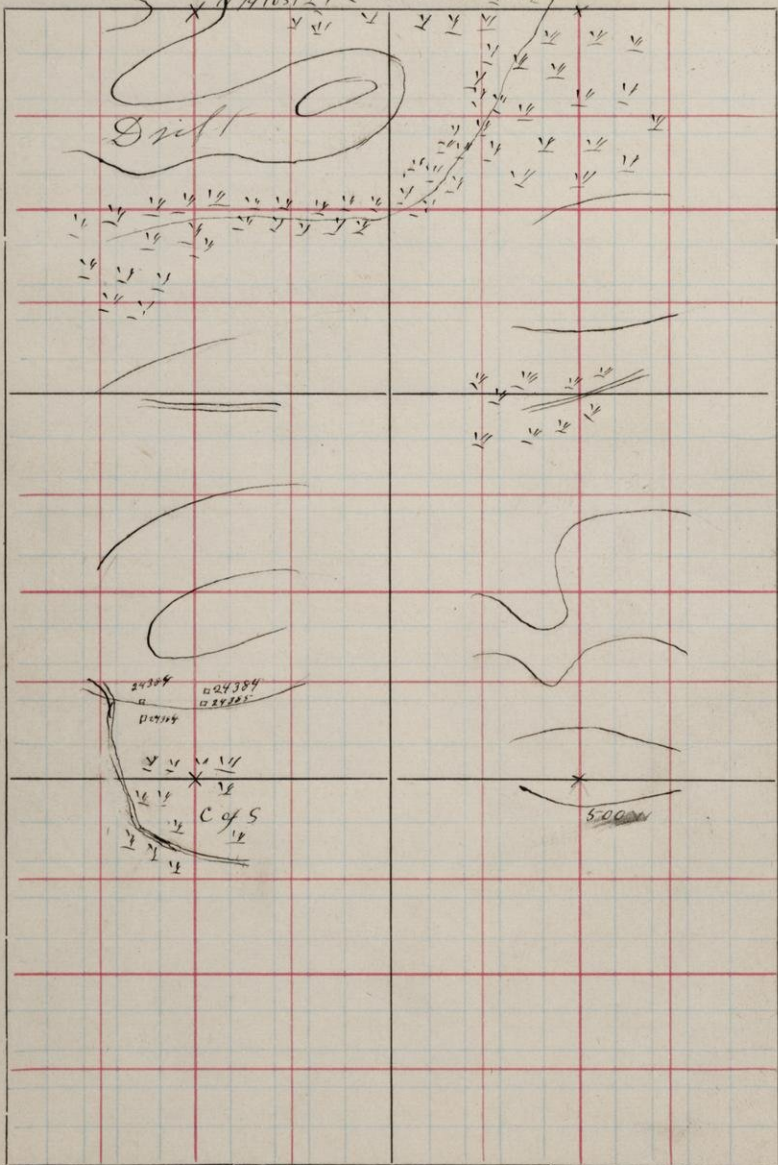
N735-E65 Small outcrop of sandy slate, and

XXVIII
S. 3

T. 47 R. 26

NW 1/4

NE 1/4



24383
22883

begin shortly to ascend hill. At N 975 E 65- is an outcrop on hillside of a greyish quartzite or greywacke continuing S & E for about 80 fms.

Map XXVIII

We now begin to descend over hills covered with drift apparently, at least I found no outcrops, & the older bottoms of the Corp. River at N 830. Ran to N 2000 still in swamp then W 500 fms.

This was for the most part in the swamp but near $\frac{1}{4}$ point we came out on a drift-hill with $\frac{1}{4}$ point on E slope. Ran S over drift with a little swamp from N $\frac{1}{4}$ P. 53-47-24

Map XXVIII
24384
22884

S 885 E 10 from N $\frac{1}{4}$ point 53-47-26 is a pit, now caved in, with dump of greywacke.

24385
22885

S 908 E 8 In pit green slate exposed, weathered it becomes red. To N in pit is large block of quartzite possibly in situ though can't be sure. Schistosity dips S & N.

24384
22884

S 910 W 75 Old pit to ledge.

24384
22884

S 920 W 75 Old pit with same rock on dump.

Map XXVII

S 1090 Wagon Road to McKingie's farm.

Road is just on S edge of swamp between the hills. We now ascend, crossing ~~of~~ near the W. end of the ridge formed by the gneiss and auriferous green slate at N 630 W 520 from S E. S. 3. We get no outcrops until we begin to descend on

southern slope and here we get knobs of
eruptive rock. Diabase.

²⁴³⁸⁶⁻⁷⁻⁸
~~22886-7-8~~

^{24388a-b-c-d}
~~22888a-b-c-d~~

S/345-W75- Knob of greenish eruptive rock
fine grained (²⁴³⁸⁵22885) with coarser phase showing
to a few places (²⁴³⁸⁷22887), both phases cut
by narrow dikes of ²⁴³⁸⁸22888. In south side just
below rounded knob of summit the fine
grained dike (²⁴³⁸⁸22888) continues but is here very
slightly schistose (^{24388a}22888a) Rock is covered for
3 1/2 ft between ~~mass~~ lost outcrop of the
massive dike (^{24388a}22888a) and the schistose
variety of same (^{24388b}22888b) (?). Continuing to
descend hill we find at foot outcrop of a
dense green rock which on weathering
shows lines of schistosity or banding, ^{24388c}22888c
of ^{24388c}22888c with ^{24388d}22888d. At foot of hill
through the green schistose rock run two
small ~~granite~~ (?) dikes (^{24388d}22888d). They both
occur near veins of quartz covered with
chlorite but run parallel to these and also
cut them. The dikes are at maximum about
2 inches thick wide.

^{24388 1/2}
~~22888 1/2~~

²⁴³⁸⁷
~~22887~~

S/385-W15- Outcrop of a schistose green rock.

S/372 Small outcrop of 22887

We cross small marsh and ascend; at

²⁴³⁸⁹
~~22889~~

S/540 E80 we are on top of round knob of ²⁴³⁸⁹22889.

Cross small marshy ~~valley~~ meadows which

ends at foot of steep one knob of
diabase at

~~24390~~
~~22890~~

S1675- Here I find a banded (schistose) rock
apparently in situ as if the diabase
above had broken through it.

~~24389~~
~~22889~~

S1730 Top of diabase greenstone knob.

~~24391~~
~~22891~~

S1825- Eruptive rock forming S and SW cap
of hill. Run ends near foot of hill on
drift plain which runs down to swamp.

XIX

S. 11/2

T. 47

R.

5/2

NE
SH

511

Cor

NW 1/4
S12

512

Farm

Clearing

May 11

24992

24382

24384

5144

M 24973-4

6-747

Map XXIV

To run S from W 250 from NE Cor. S 11-47-26

Starting from fence which is on section line we cross field ascending drift slope and going over ~~rolling~~ hills covered with timber find no outcrops until we reach S 810. Here is a ~~red~~ reddish cherty marble outcrop forming cap of hill and showing around the E. end of hill. Hill slopes gently - nearly flat top - to NW. From cherty bands in marble it seems to be lying nearly horizontal, in places however strongly foliated.

24392
~~22892~~

S 1000 W 100 Marble beds dipping gently to NW.

Very much contorted.

24392

S 1045 W 50 on side of hill small marble outcrop.

24393-4
~~22893-4~~

S 1085 Steep face of marble on S side of hill top.

24394
~~22894~~

Dip about 15° NW. Strike NE. It is 9 ft thick and underlain by grey marble, fraginous. Hill about 75 ft high, very steep at foot small stream running through narrow valley. We cross slope of hill covered with bushes and cross narrow swamp. Hill rises from swamp and at

24394
~~22894~~

S 1710 we get outcrop of marble. Am not sure but seems to dip little to NW.

24394

S 1760 Higher bed of marble, very small outcrop. From S E Cor. S 11, S 20 paces is ledge of marble

XXX

S. 11/12

T. 47

1/4

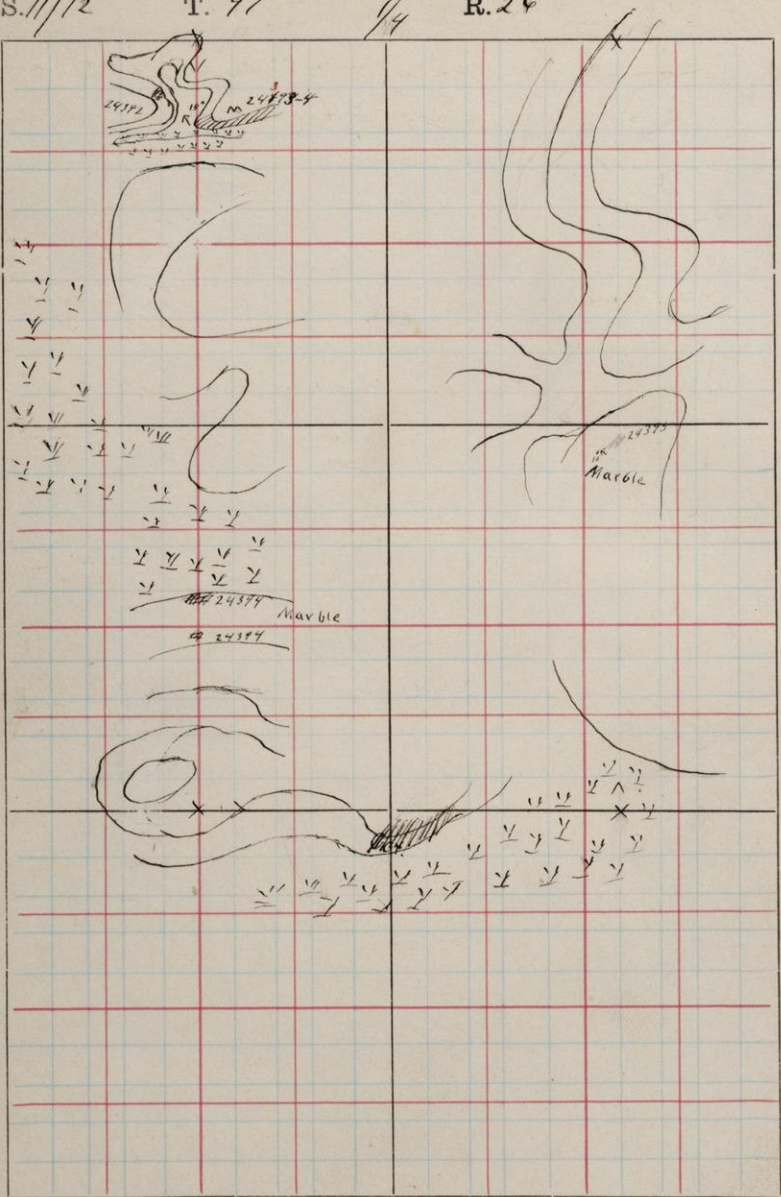
R. 26

SE 1/4

511

SW 1/4

512



dipping gently & NW.

Map ~~XXV~~

Ran E 300 fms from SW Cr. 512-47-26.

Line went through swamp, then N through swamp at first then over gentle slope of hill covered with hardwood.

Map ~~XXX~~

~~24395~~
~~22895~~

N 480 Outcrop in bed of brook of reddish limestone dipping about 10° NW strike NE.

We continue over hills covered with timber showing no outcrops.

Map ~~XXIX~~

~~24396~~
~~22896~~

N 1450 Cross hill with outcrop on top of dense gray limestone. We then come into clearing which continues to section line.

XXXX

S.

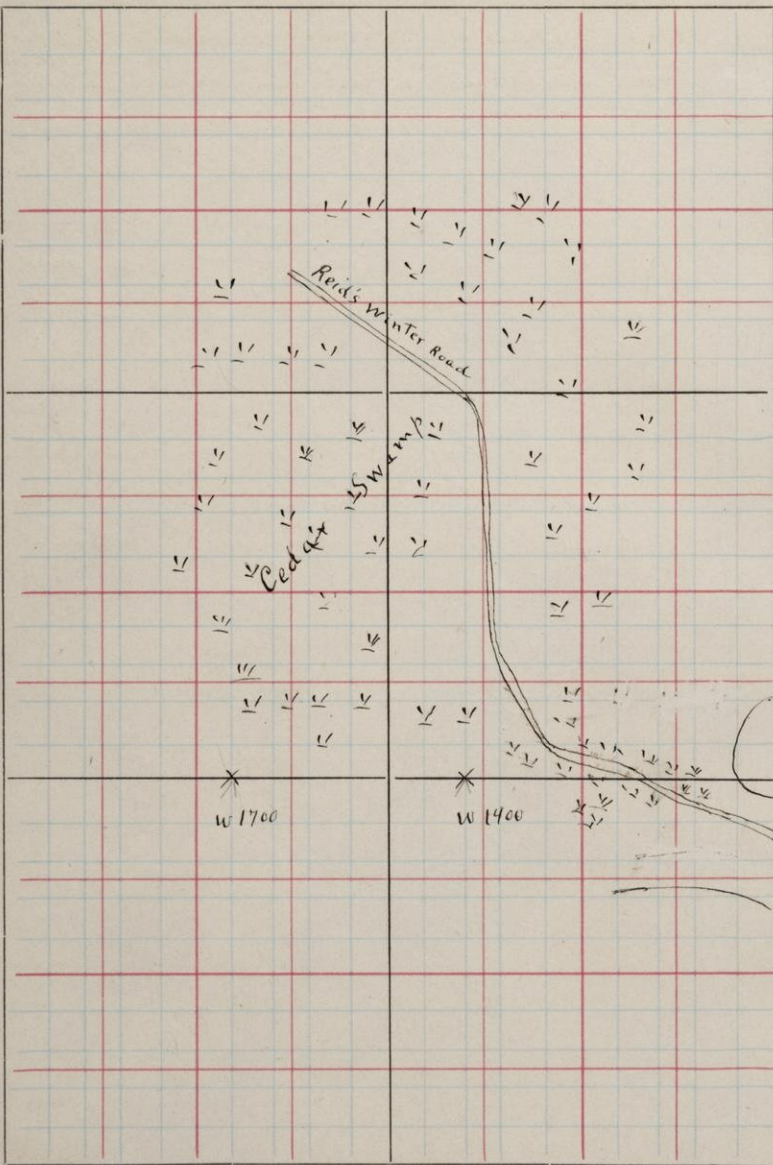
1

T. 47

R. 26

C of S.

SW $\frac{1}{4}$



SW
Cor

W 1700

W 1400

SE $\frac{1}{4}$ Post

Map XXXX

SW¹/₄ of S1-47-26 is covered by a
large cedar swamp with logging
road cutting obliquely through it.

XXVII

$\frac{\Delta H}{S.}$ 12

T.

R.

↑ 62" 24408

NW 1/4
AA

AA

NE $\frac{1}{4}$

Cleaning

Clearing

state

24.89

Slate

11

~~293~~ ~~limestone~~

24900

Beaver Meadow

C of S

Calculations should be made from red line instead of from line 100 inches Eq.

E 1500

Move all ledges etc.
100 pages W on map.

Map XXXVII

From E 900 of NW Cor. S12-47-26 to run 9.

Start in cedar swamp which does not continue very long and then we ascend a steep hill.

S 215 W 40 near top of hill outcrops a ~~Quartzite~~.

24397
~~22577~~
 24398
~~22578~~

S 230 E 10 outcrops a slaty bed in the quartzite. Strike W 10° N dip 80° little E of N. It is just at top of hill.

Quartzite continues to outcrop to N 26° at foot of hill.

24399
~~22579~~

S 445° Here outcrops on side of low hill a black slate

24399
~~22579~~

S 550 E 30 small outcrop of same slate

24399
~~22579~~

S 570 W 40 Outcrop of same slate. Dip 18° little E of N. Strike about E. Schistosity runs 20° N of W and dips 65° E of N.

24400
~~22580~~

S 620 W 40 on S side of hill we get first outcrop of limestone; it is dense bluish grey.

Map XXXVIII

24401
~~22581~~

We now enter swamp which continues for about 200 f. and then ascend slope of a high hill. At S 1670 W 40 we get outcrop of marble here very much contorted but dipping in general to NW.

24402
~~22582~~

S 690 Small ledge of reddish marble.

XXXIII

S. 12

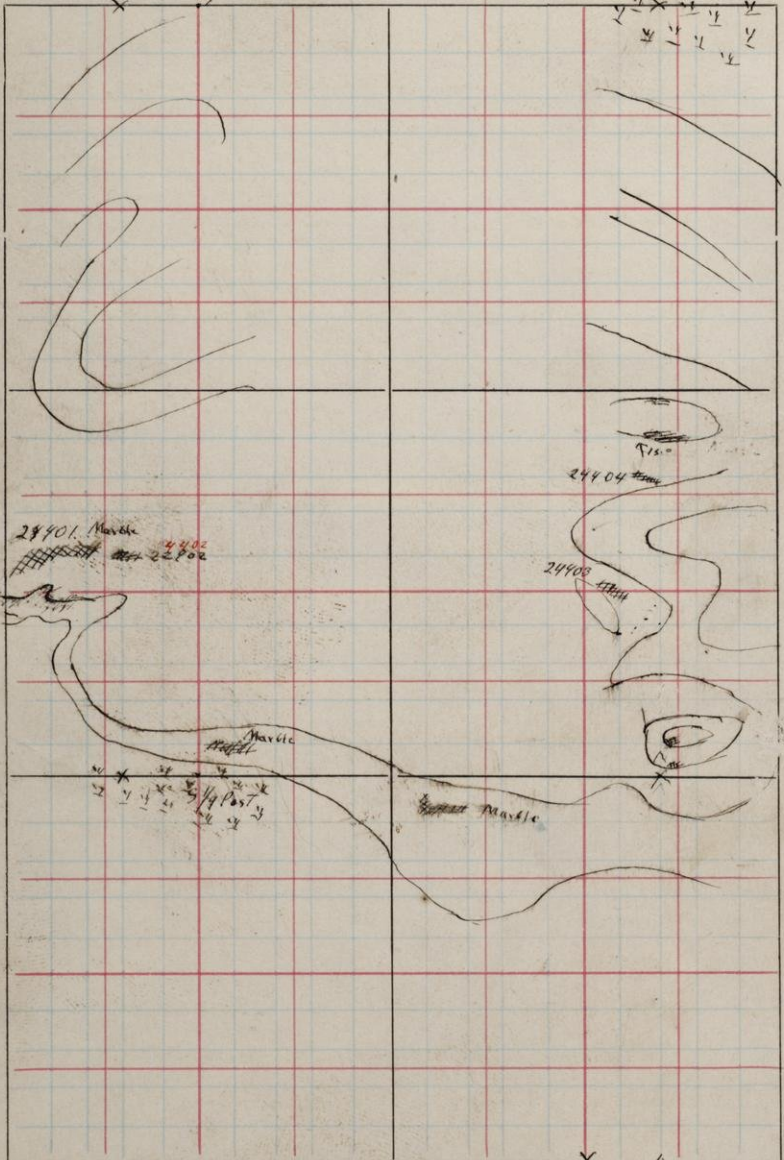
T. 47
Cof 3

R. 26

11 11 11 11

N
A SW 1/4

SE 1/4



6-747

X A
E 1500 Move all ledges etc. 100
feet W on Map, to red line!

Map XXXIII

Outcrops begin on southern slope of hill.
 Decend & swamp at 52000 + run E 600.
 & E 1500 from SW Cr. 512-47-26.

E 1025-N 50 Marble outcrop, con.

E 1290 S 40 Outcrop of reddish marble overlaid by a red slaty limestone.

Map XXXIII

N on E 1500 from SW Cr. 512-47-26

N 20 E 10 Small outcrop of reddish marble.

N 50 E 12 Outcrop of light yellowish marble.

24403
 22903

N 240 W 45 Outcrop of dense bluish grey limestone.

24404
 22904

N 390 W 5 Small outcrop of light colored calcareous sandstone underlying a pink marble.

N 465 Purplish slaty limestone. Dipping about 15° N as well as I can tell. Very much broken.

N 495 Very small outcrop of same again.

Hill slopes down gradually to swamp N 968 which continues to N 1560. When we enter have nearly level ground covered with hardwood.

N 1865 Wagon Road (Birds)

N 2000 on S slope of hill.

24408
 22908

W 595 from NE Cr. 512-47-26 occurs an outcrop of slate seemingly folded around great boulders of a grey quartzite. Exposure not very good. Strike about E Dip 62° N.

Map XXXIV

W 1015 Same slate. Strike E, dip 60° N.

XXXIV

S.

T. 47

R. 26

NW 1/4

NE 1/4

C of S

SW 1/4

SE 1/4

21407

24406

S section line

G-747

state 5/4 Post.

24407

state

24406

state

24407

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Map XXXIV

From S. section line S1-47-2 to run N on E 1500.

Start on southern slope of hill which rises gradually.

24405
22905

N315 W50 Ledge of quartzite. Strike about E, dips 50° N as near as I can determine.

24406
22906

N320 W50 Same quartzite but here with a few thin shales of schistose quartzite in it. Strike E. Dip 38° N. Quite contorted.

24407
22907

N700 W40 Small outcrop of 24407

Strike little N of E. Dip about 50° N like W.

Hill is covered with a low growth of bushes which conceal the outcrops and make it very difficult to go over the hill.

We begin to descend at about N 600.

At N 1300 a swamp begins which continues to Cass River. Ended run at Swamp.

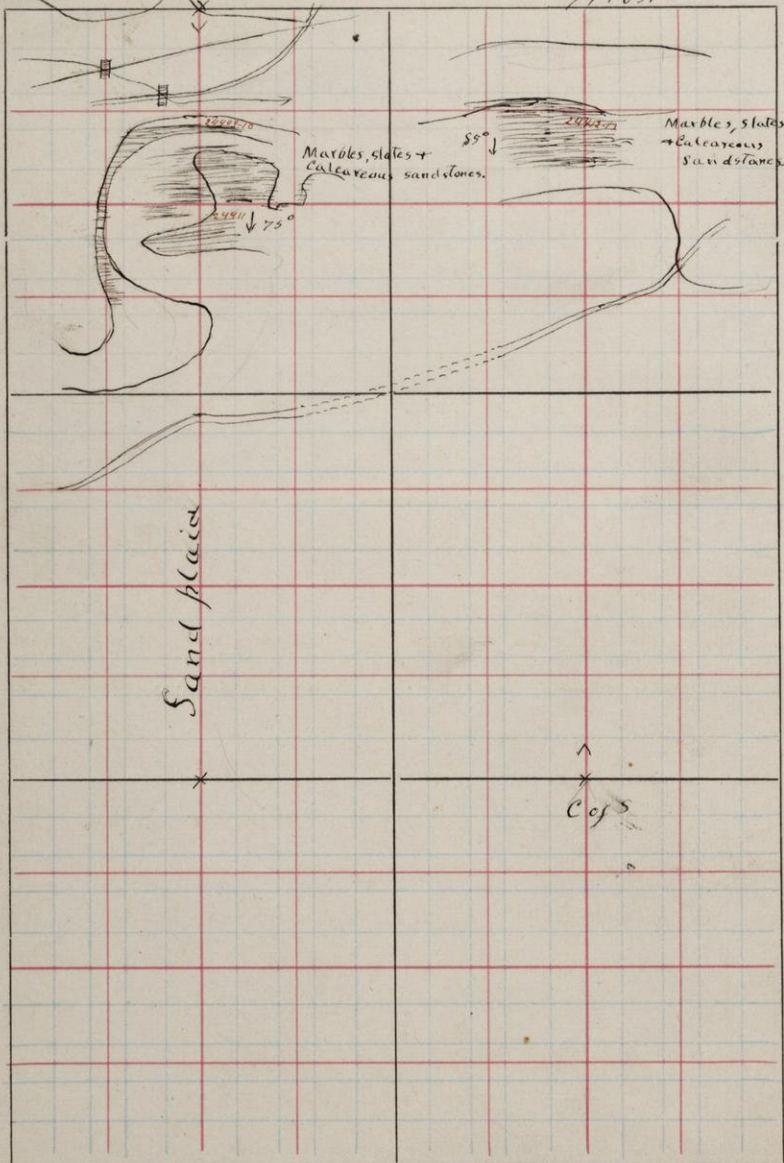
XXXV

S. 36 T. 48

R. 26 ^{Creek}
N 1/4 Post

NW 1/4

NE 1/4



Camp on Carpe River at Wages' Farm.

Map XXXV

From NW Cor. S36-48-26 ran E 500 partly through swamp and part of the way on slope of drift hill. From E 500 of NW Cor to run S.

Map XXXV

S 50 R.R. D.S.S. & A. S 85- State Road. S125- Oak.

24409-10

~~22909-10~~

S140 Begins outcrop of marble series. Large face of purple slate. In places this has been quarried through and we see an overlying bed of cherty marbles 9 ft thick. Strata are more or less contorted but strike is E and dip 75° S. Following the marble bed is a calcareous sandstone (quartzite) bed (22910).

They are the same rocks which were located at Morgan Furnace in S35-48-26 at N1650 W288 from SE Cor.

This series of ^{cherty} marbles, slates and calcareous sandstones (quartzite) continues to outcrop to S400. General strike is E dip 80° S.

24411

~~22911~~

S285- Pink marble bed 10 ft thick.

After ascending this hill, which was very rough, we cross a wide sand plain.

S525 Wagon road. S1180 Wagon road.

Sand plain ends at S1475 and we ascend a hill chiefly of sands - shows no outcrops - to S2000 which is near top.

Map XXXVI

24373

~~22973~~

S2000 E 140 from SW Cor. S36-48-26 is a small outcrop of slate. Exposure is very poor. Strike seems to be nearly E & W. Could not get dip.

XXXXV

S.

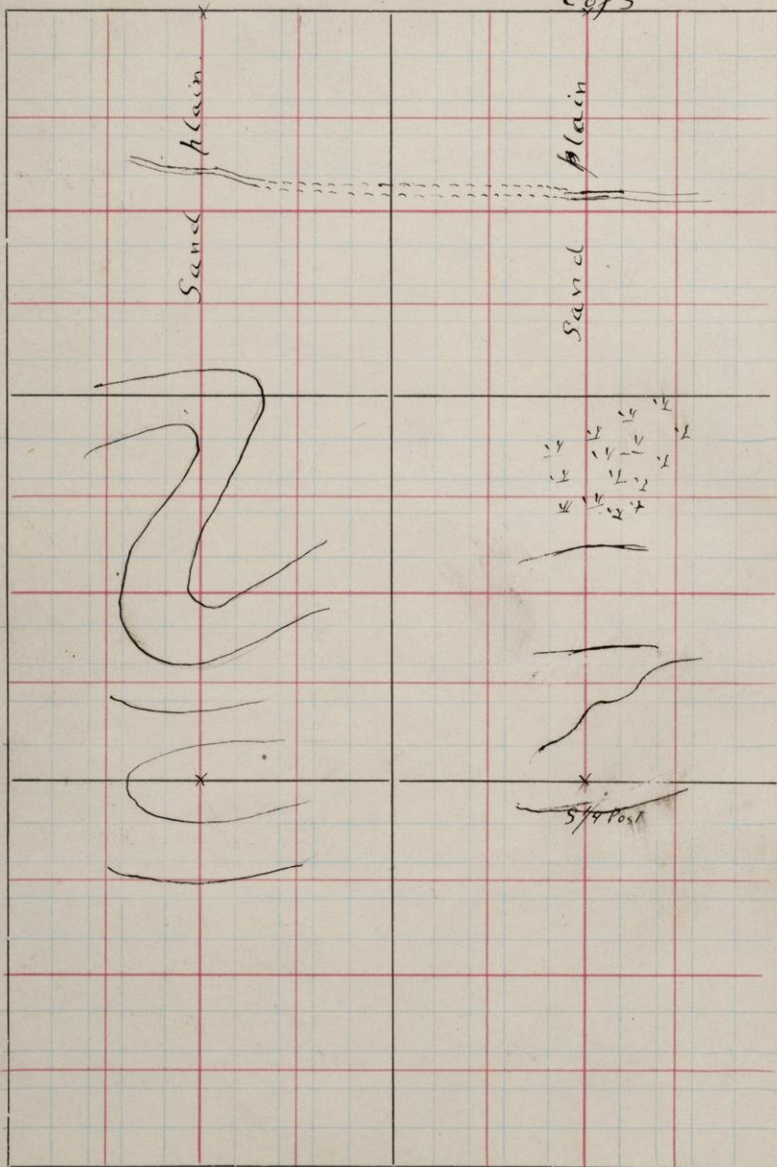
36

T.

98

R. 26

C of S



Map XXXVII

Continuing on same line in S1-48-26 we descend sand hill to where marsh begins at S300. Then we run E along the rolling sand hills near swamp to E1000 then N.

Map XXXVII

On $\frac{1}{4}$ line. We ascend sand hill with test pits but showing no outcrops and

Map XXXVII

then descend in S36-48-24, crossing small local swamp, and come to wide sand plain again. It is covered with a low growth of Chenier and popples.

Map XXXV

N775 Wagon road. N1600 Wagon road. At N1750 we begin to descend hill and at N1800 the marble series begins to outcrop and continues to N1900.

24412-13

22712-13

N1870 Cherty Marble. Dip 85° S. Strik E. Outcrop continues to W for more than 125 fms and is in places 20 ft high showing slates and marbles. To the W got dip of 80° S. Strik E.

Leaving the outcrops at our slope of hill we pass over drift and end run at N2000. Stream is about 90 fms beyond and R.R. about 125 fms. From above point on section line run E 500 fms to E1500 - brings us to deserted village of Lower Bagdad - and then S.

XXXVII

S.

1

T.

47

R. 26

N 1/4 Post

