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Marquette district, Michigan: [specimens] 19118-19222. No. 119 1891

Eriksen, E. T.

[s.l.]: [s.n.], 1891

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U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

Marquette District

C. F. Eriksen

1891

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 page is also arranged so that, if desirable, a smaller scale can be used, two inches, one inch, or even 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, for instance 4025, 250 N., 300 W., Strike, N. 6° E., Dip, 50° E. Then follow with as full a description of the ledge as possible. 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, but chips of them must be taken. 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 $2 \times 2\frac{1}{2} \times \frac{3}{4}$ 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. In all cases collect chips for slicing. 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. It is desirable that specimens 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.

Isiology and.

E. T. Eriksen

Plane Table

June 19, 1891

Part I Isiology

Part II Plane Table

Book 2 contains

{ Spec 19118 to
19222

also Plane Table Notes
for sheets 1, 2, & 3

19191 plotted ?

Book #19

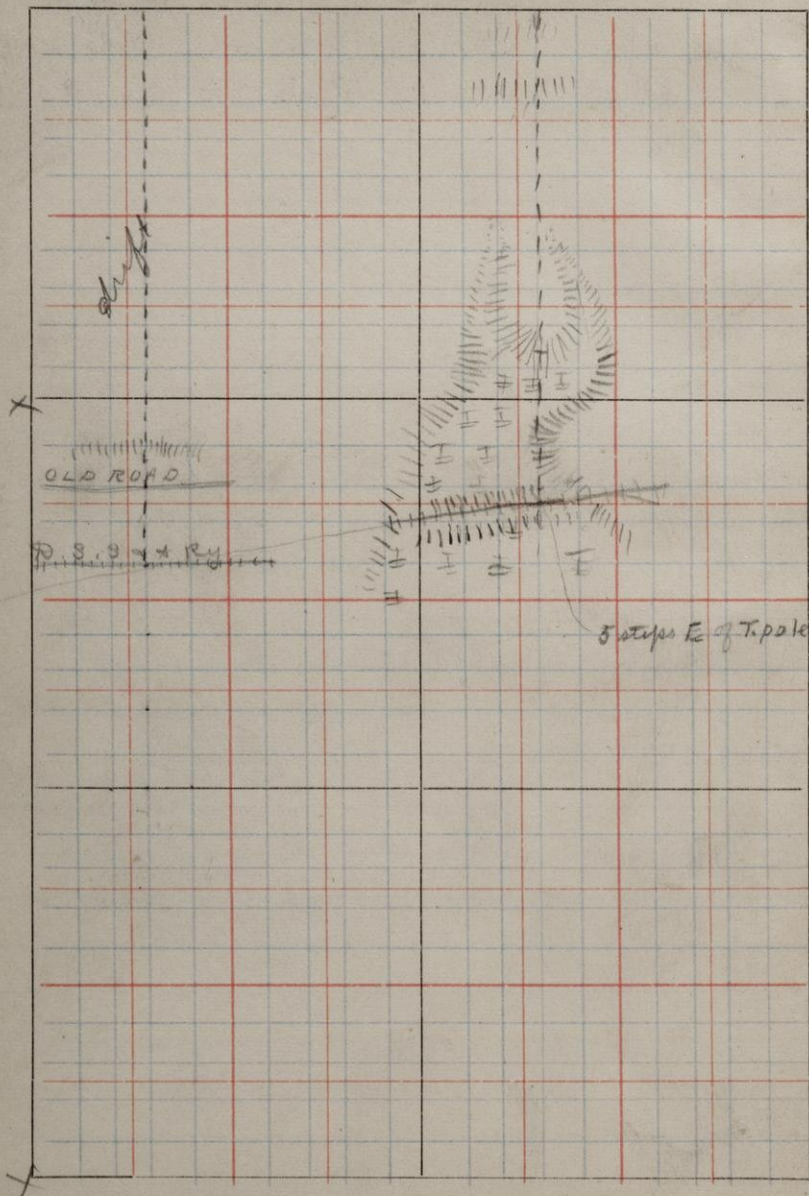
1

Part I

NW¹/₄ Sec 14 T. 47

2

R. 28



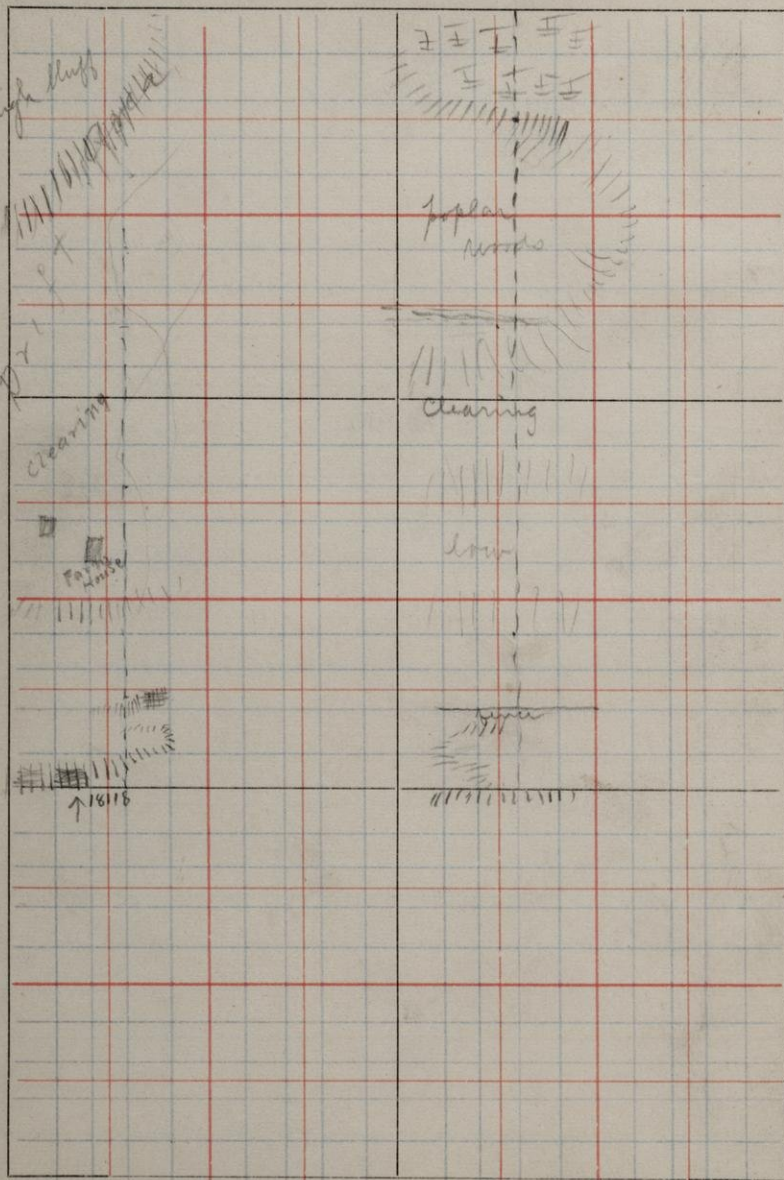
✓ 9/18 N 15 W 1965 SE Sec 11-47-28
Slate in large outcrop on south slope
of bluff Strike $N 80^{\circ} W$ Dip $80^{\circ} N$

S W $\frac{1}{4}$ Sec 11

T. 47

4

R. 28



1919

N 115, W 1825 SE Sec 11-47-28

Another small outcrop of the slate
strike E & W, as near as can be measured
Dip seems to be very high to North

NW 1/4 Sec 11

T. 47

R. 28

checked
in first

fence

clearing
drift hills

farm house

+ []

buildings

ROAD

clearing

woods

Hickory
poplar
woods18121
18122

18122

ROAD

cedar
tamarack

✓18120 N 1755 W 1350 SE 11-47-28
 A ledge of projecting high on
 SE point of bluff. It is very much
 contorted. Appears to have a schistose
 or somewhat slaty structure in parts
 but the strike and dip are very irregular
 and can not be taken

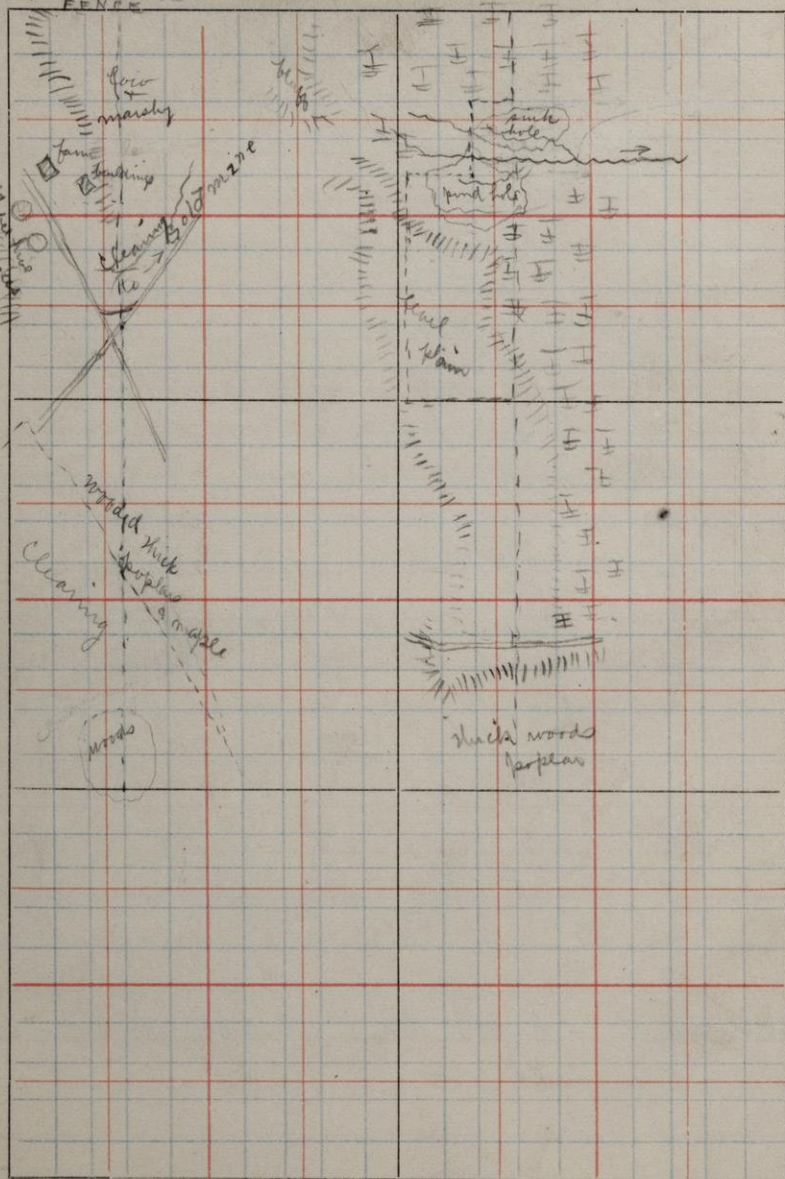
✓18121 N 1755 W 1340. 11-47-28
 Another specimen taken where the
 slaty structure was most plain. This
 is only in small portions of the ledge.
 A part of the ledge is lighter in color on
 the surface, due probably to weathering.
 This portion also shows light brown
 surface in the joints when freshly opened

✓18122 N 1490 W 1350 11-47-28
 Slate. Strike of slaty structure N 80° W
 dip, 80° N. Here is a small bluff
 some 30' high formed entirely of this
 rock. Sides have abrupt slopes & top
 somewhat flat

SW 1/4 Sec 2 T. 47

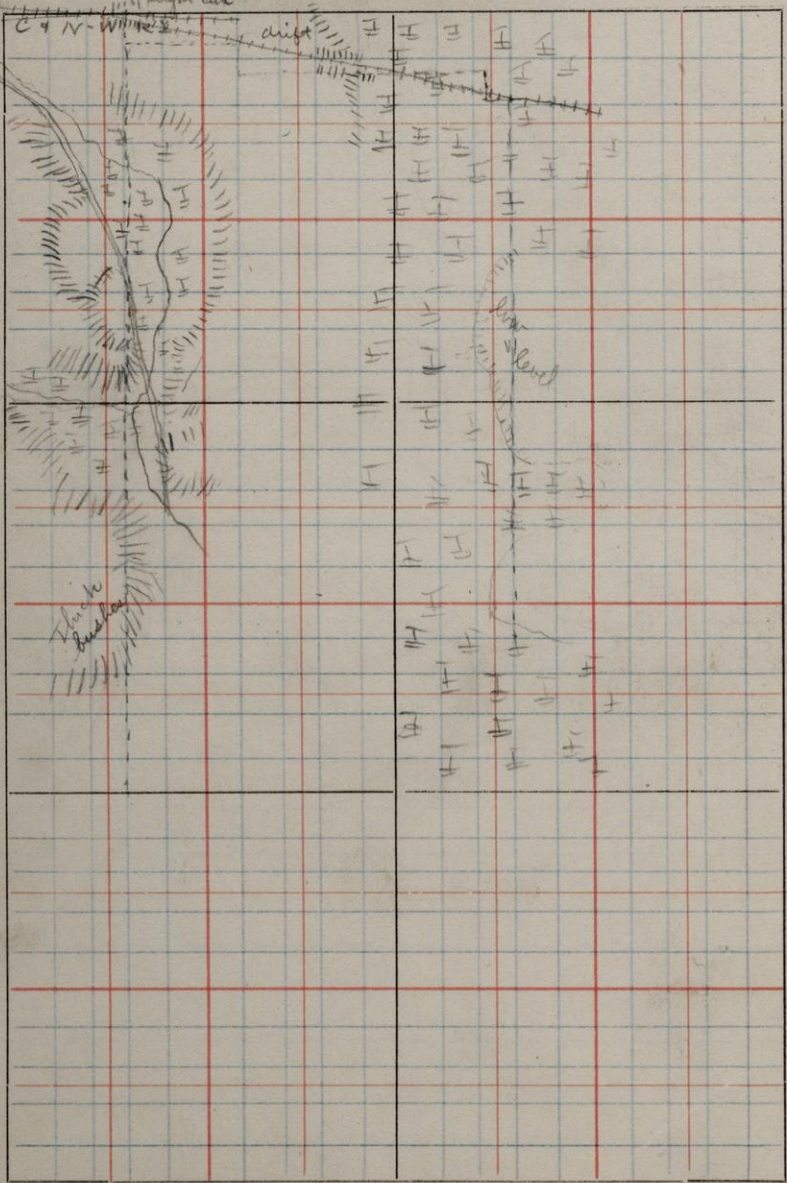
8

R. 28



NW 1/4 Sec 2 T. 47

R. 28



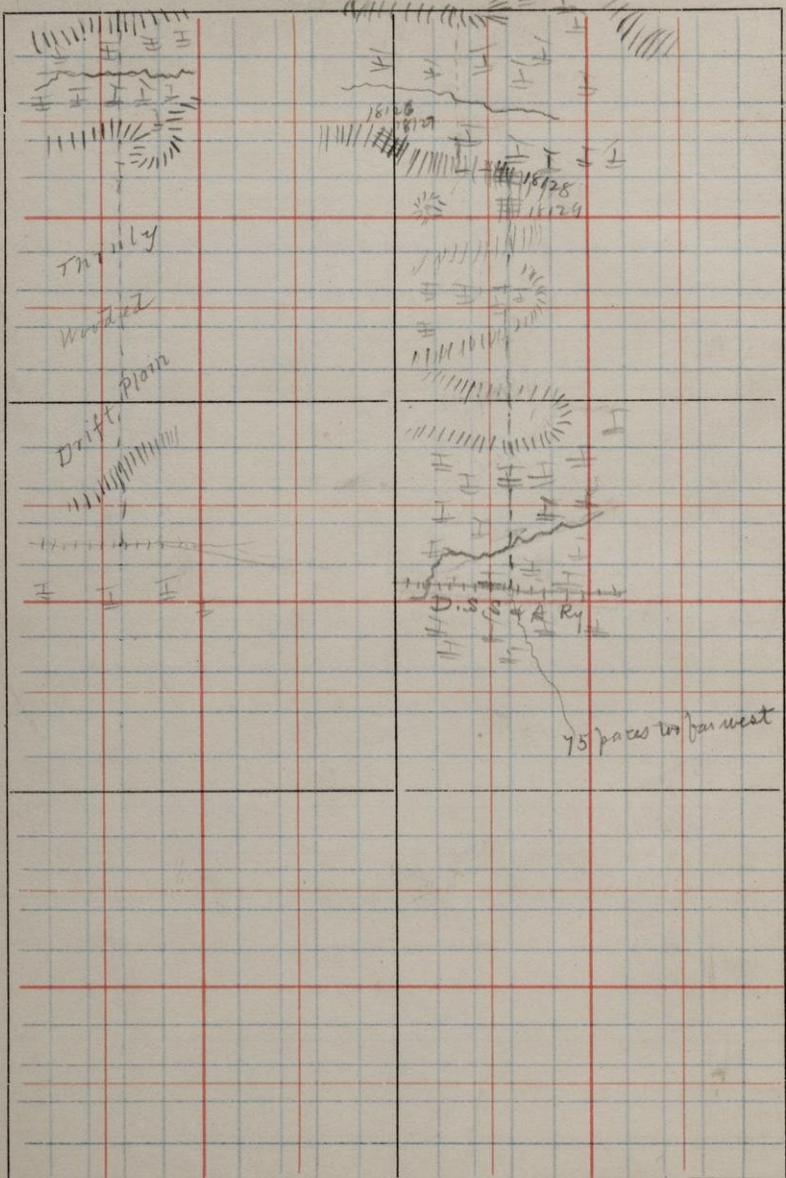
middle of pile bridge 70 from section

W end " " " 121

course yesterday 255 " "

NE $\frac{1}{4}$ Sec 14 T.

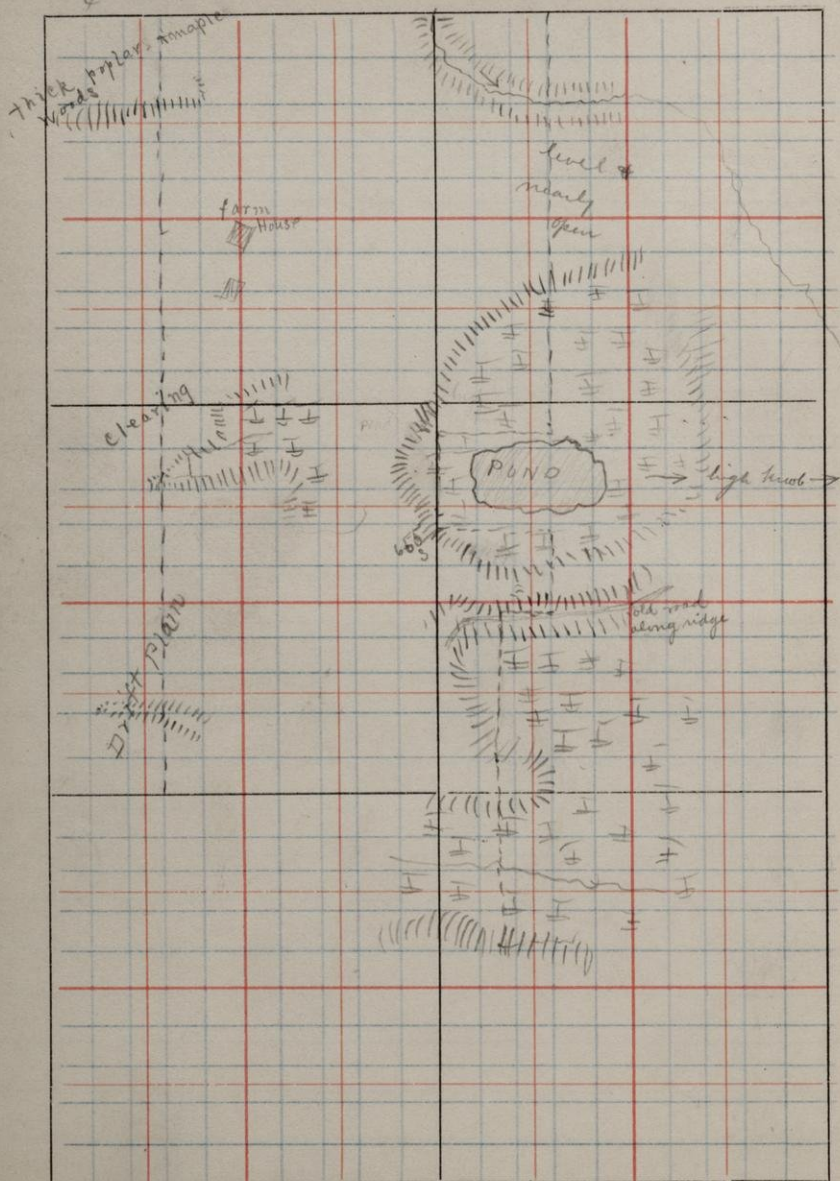
R.



S E $\frac{1}{4}$ Sec 11 T. 47

14

R. 28



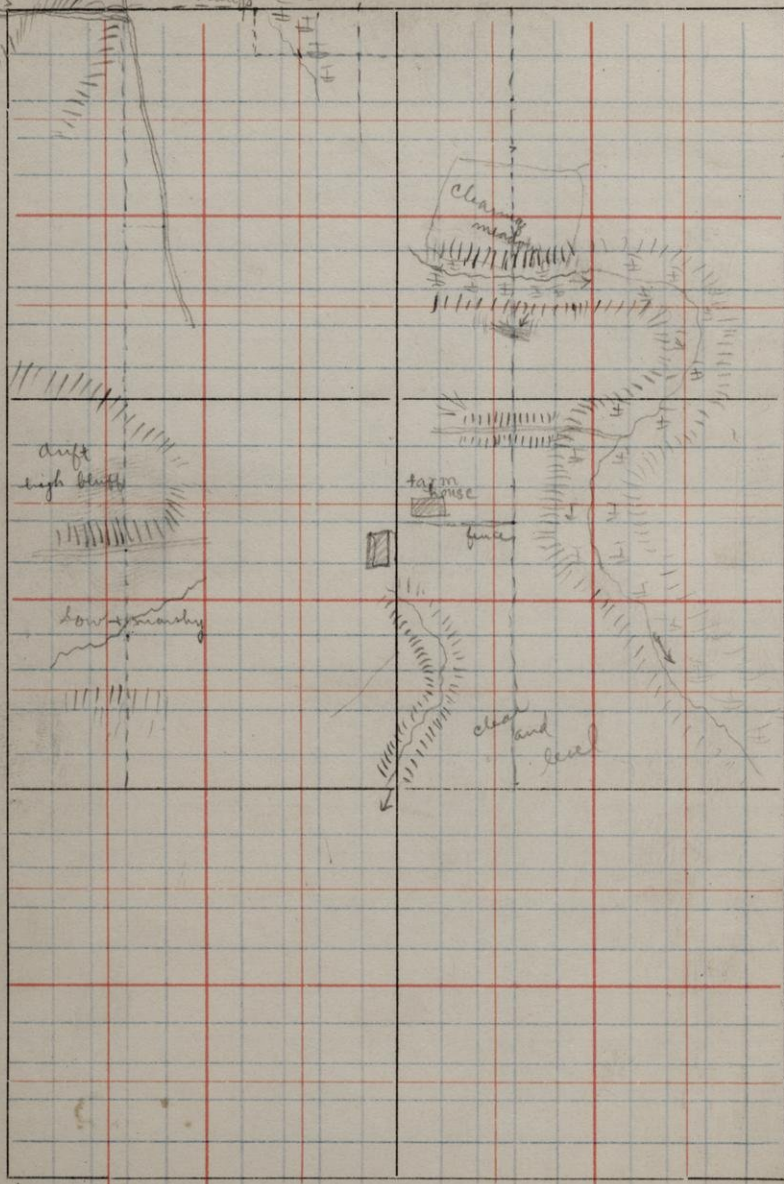
✓ 9123 N 90° W 85° SE sec 11 47-28

Strike of slaty structure E + W as near
as can be measured Dip about 80° (or
very high) to north. A low ledge
of slate with exposure on S. side of
low bluff which is higher to the west

± ± this end of line
is 50 paces too far east
NE 1/4 Sec 11 T. 47

16

R. 28



✓19124 N 158.5 W 350 SE Sec 11-47-28

A small exposure of a finely bedded rock on top of low bluff. The bedding is very much contorted and the strike could be made out only to be approximately N 55° W in general and dip about 65° N. A small part of weathered surface is shown.

✓19125 Another specimen from same ledge showing the bedding where it appears very plainly defined.

✓19126 N 1850 W 500 SE 14-47-28

A ledge of greenstone of small exposure on South point of bluff. The structure is massive. The weathered surface is rather light and filled with pores in places.

✓19127 N 1850 W 500 14-47-28

Another specimen from same ledge showing process of weathering from the outer surface inward.

✓19128 1800 N 350 W SE 14 47-28

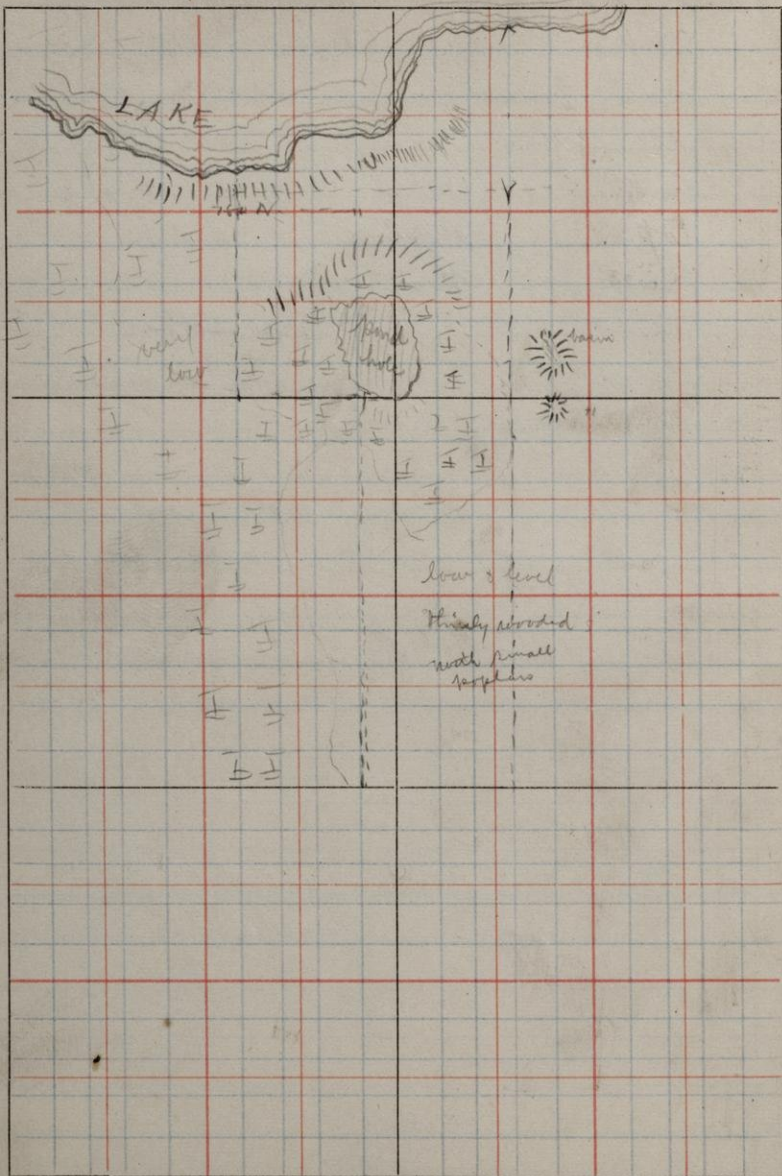
Another exposure of greenstone, coarse and massive, on south side of bluff, about 30 ft. high.

SE 1/4 2

18

T. 47

R. 28



✓19129 N 1795, W 350 S.E. 14 47-28

At the top of the bluff the rock seems to be finer and of lighter color on the surface, or much like 18126 or 18127 in the ledge. The bluff is quite flat on top. About 100 steps to the west a knoll rises some 30 feet above the rest of the bluff. At its foot is a slope of breccia of rock like this but no ledge can be made out.

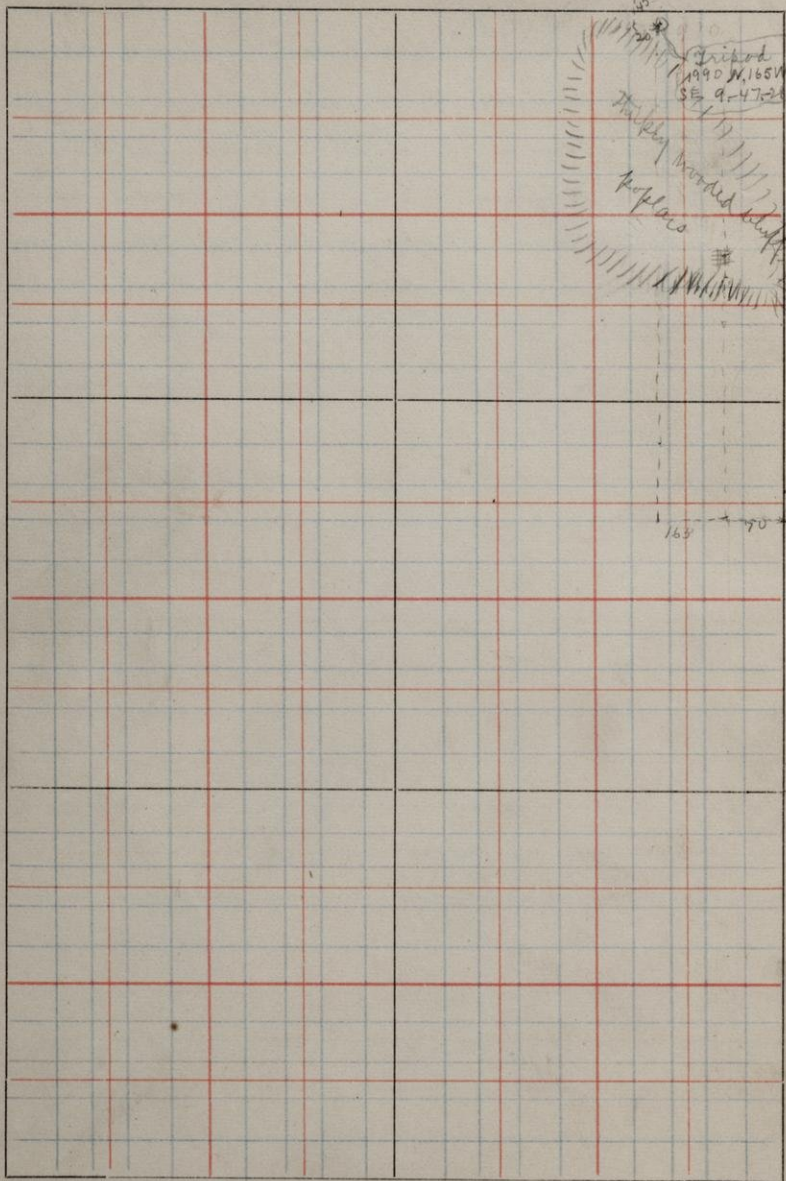
NE $\frac{1}{4}$ Sec 16

T. 47

20

R. 28

85N 195W SE 9-47-28
Edge of plate sampled
by W. N. Morrison



✓19130 1690 N. 70 W. SE Sec 16 47-28

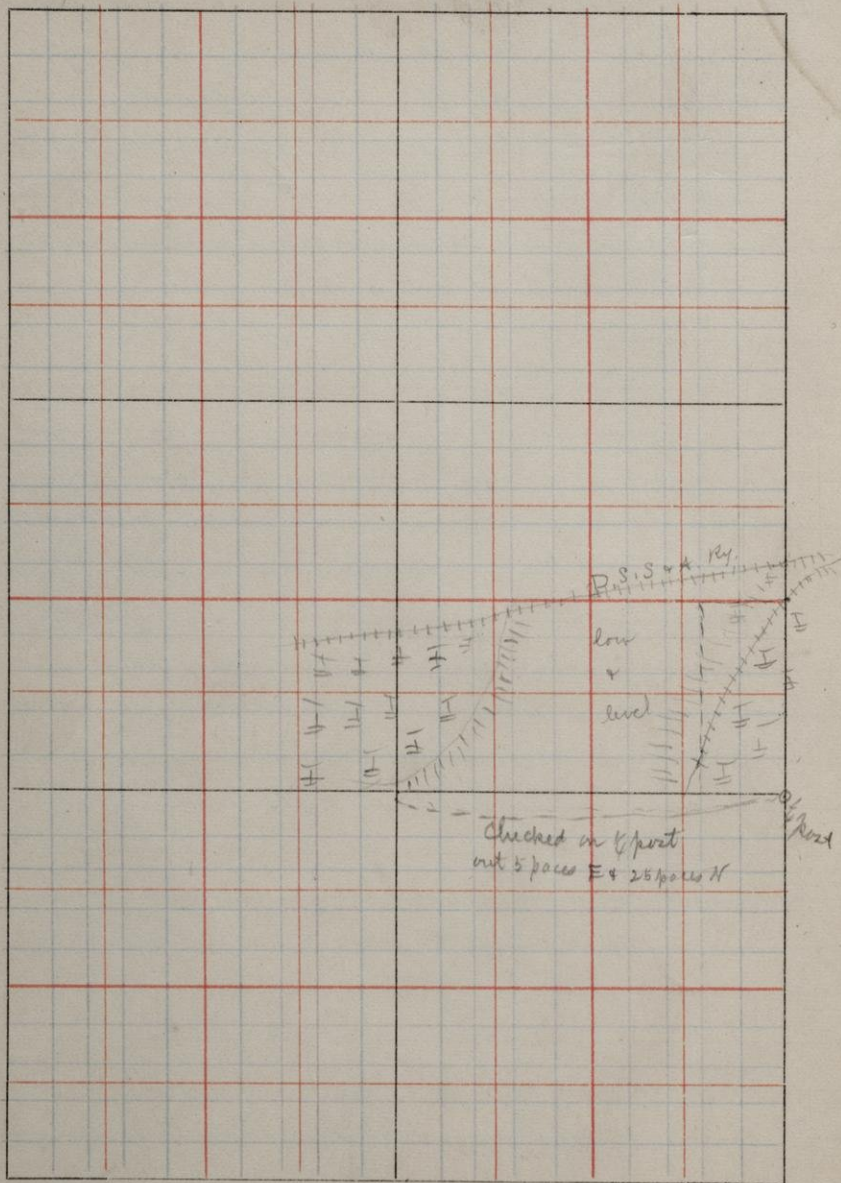
Here is a small exposure of fine greenstone on top of bluff. Possibly it is not in place as the bluff is quite large, though only some 40 or 50 ft high, and quite thickly wooded, and this is the only exposure found.

NE $\frac{1}{4}$ 14

T. 47

22

R. 28



2000
1210
750

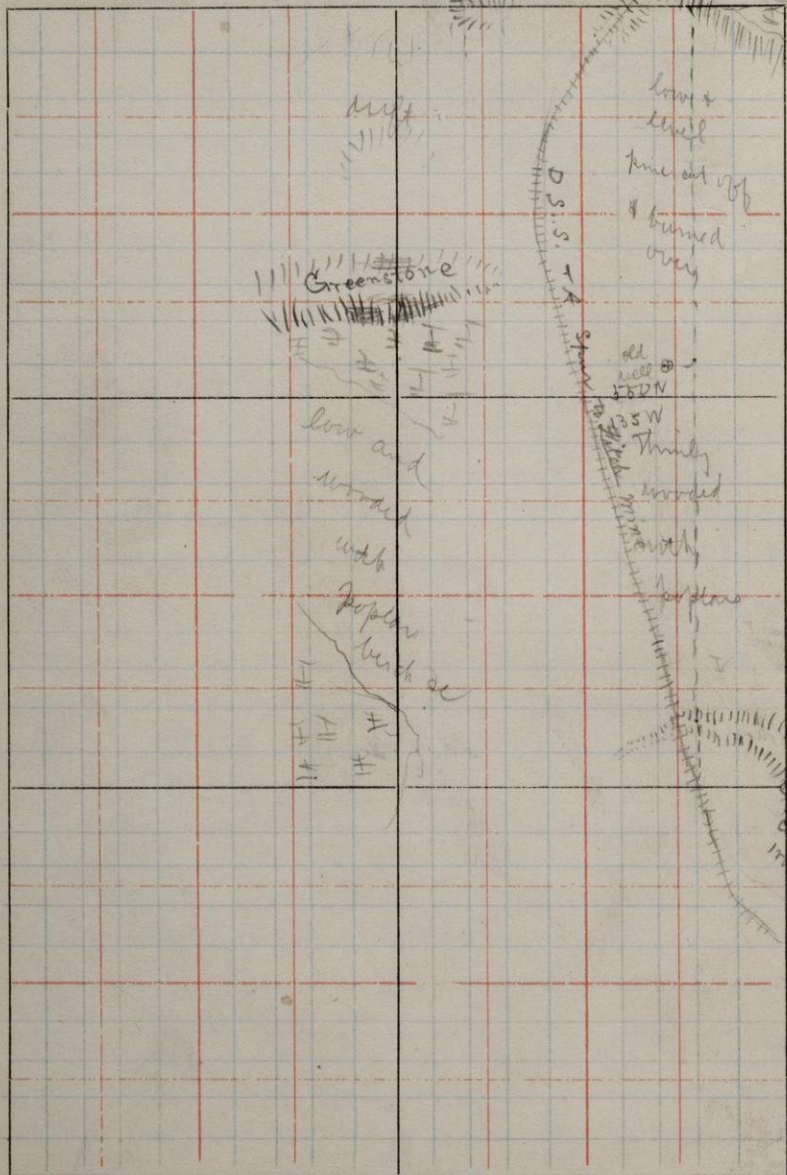
757
186
943

743

SE 1/4 T. 47

24

R. 28



19131 175 N 125 W SE 23-47-28
 Granite. An exposure on SE
 side of rounded bluff. Very dark when
 weathered, pink on fresh surface.
 At 300 N 100 W on North slope of
 Huffs is a small exposure which is
 doubtless in place and forms part of the
 same rock (p. 28)

19132 50 N, 125 W SE 23 47 28
 Another outcrop of granite. Light
 pink on outside. At 00 N 125 W
 is another small outcrop (p. 28)

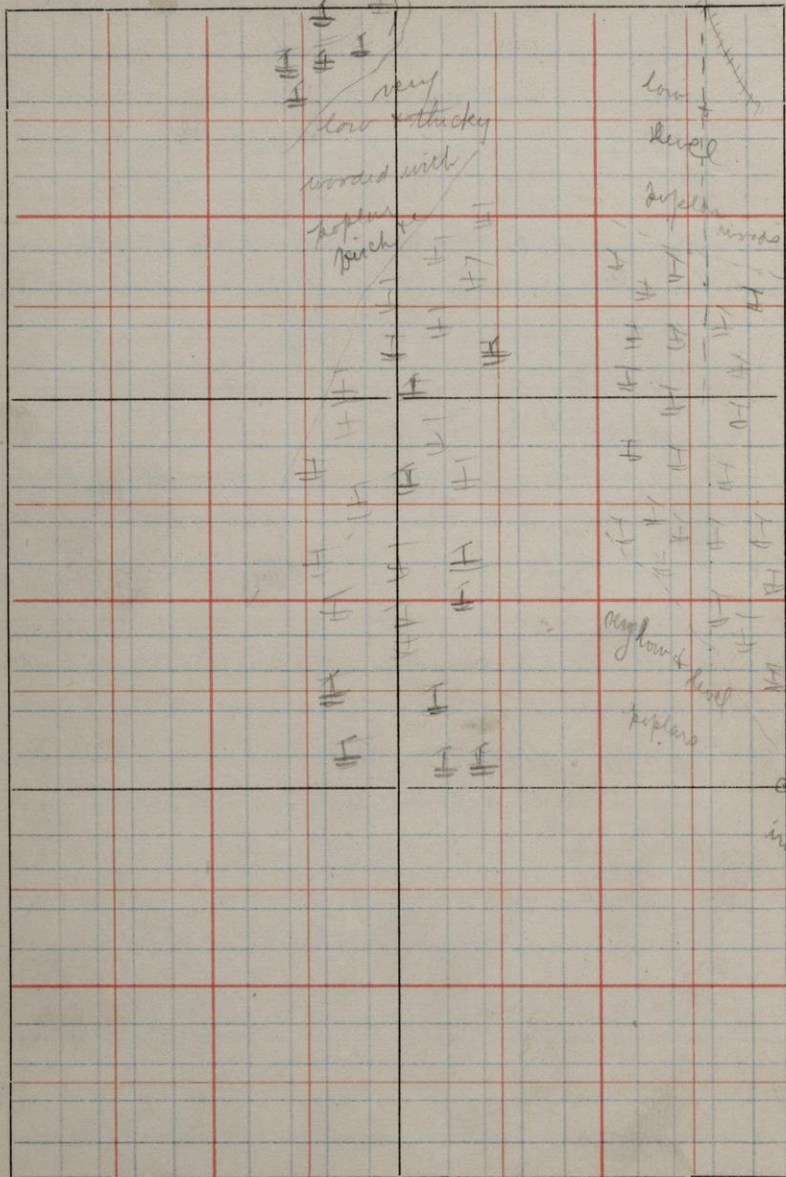
At 00 N 250 W 23-47-28 is granite
 (Run out to check on Sec line) (p. 28)

19133 At 00 N 410 W 23 47-28 is granite
 Quite a large exposure with almost vertical face to
 the east. Pink granite (p. 28)
 At 200 N 450 W ^{about} 23-47-28 is
 granite similar to 18132 (p. 28)

At 425 N 535 W is granite (p. 28)

NE $\frac{1}{4}$ Sec 23 T. 47 =

R. 28



✓ 19134 620 N 500 W SE 14 - 47 - 28

Coarse greenstone conglomerate
massive, forming high bluff with
an abrupt slope to the south running
a little north of east and becoming much
lower to the east,

✓ 19135 Another from same ledge showing weathered
and fresh surfaces

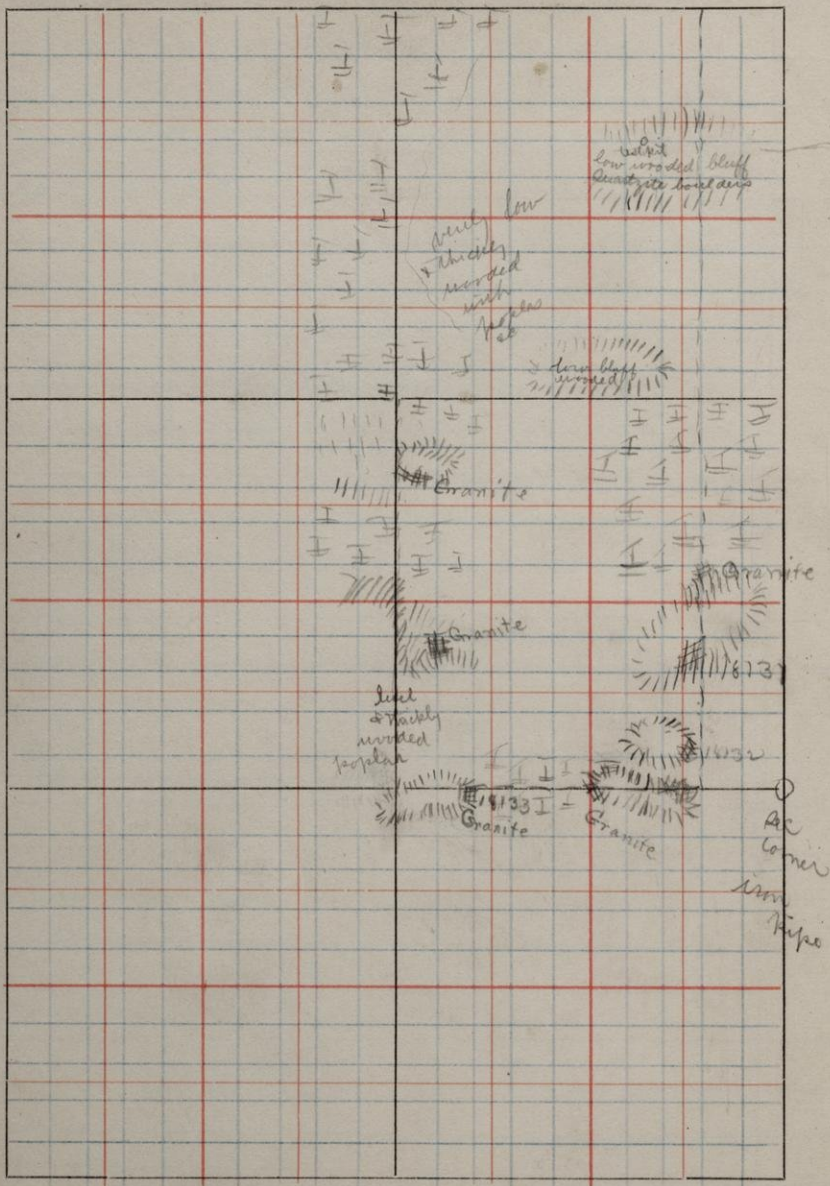
The bluff slopes more gently to the
north and has some exposures on that
side also page 241

SE 1/4 23

T. 47

28

R. 28

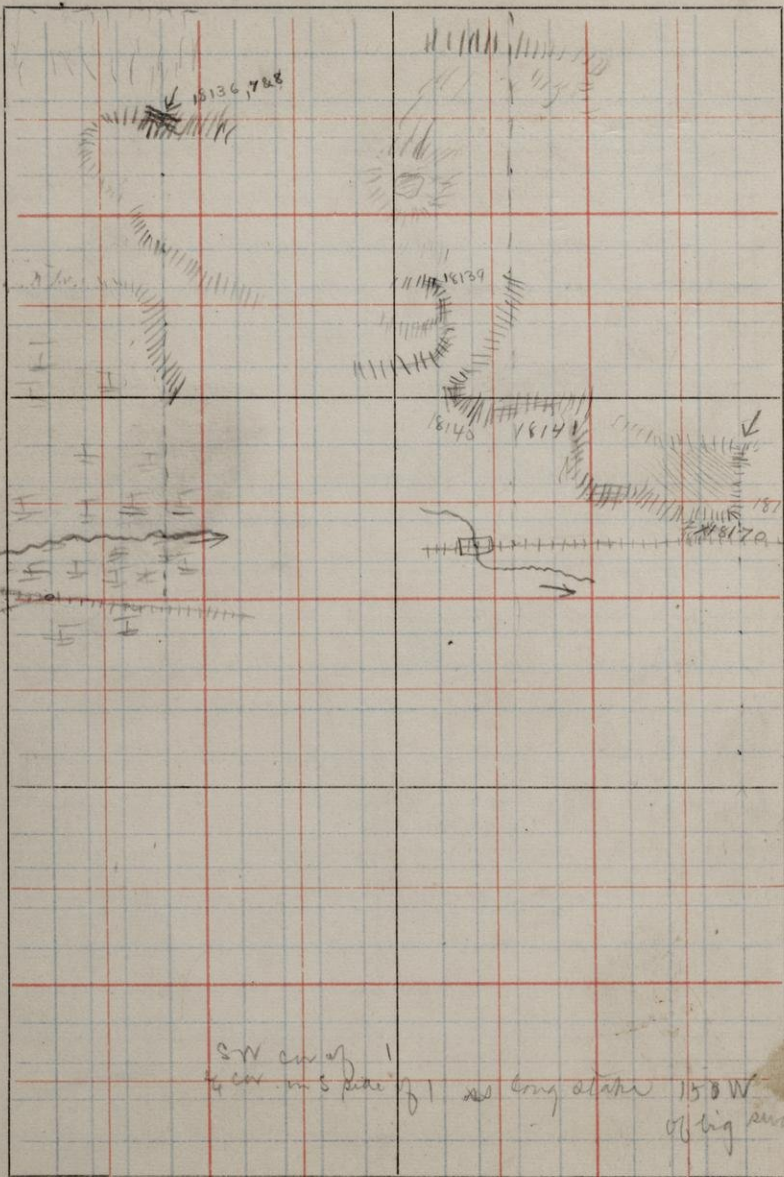


NW 1/4 Sec 13 T. 47

30

R. 28

6/20/91



to Fitch

SW corner of 1/4 sec. in S. part of 1 no long stake 150 W of big stump

✓ 19136 N 885 W 1810 S.E. 13. 47-28

A ledge in south side of low bluff.
Part of it seems to have a foliated structure
which may coincide with the bedding.
Strike of this structure is N 70° W ^{about} and
dip quite high to the south about 75°
but difficult to measure as the exposure is
small and smooth. The appearance
here is of chloritic schist.

11
✓ 19137 N 885 W 1800 S.E. 13 - 47-28

A specimen from the same ledge which
seems to be quartzite and the strike
and dip are probably the same as that
given above. The rock seems to be
between a schist and a quartzite.

✓ 19138 N 885 W 1785 S.E. 13 - 47-28

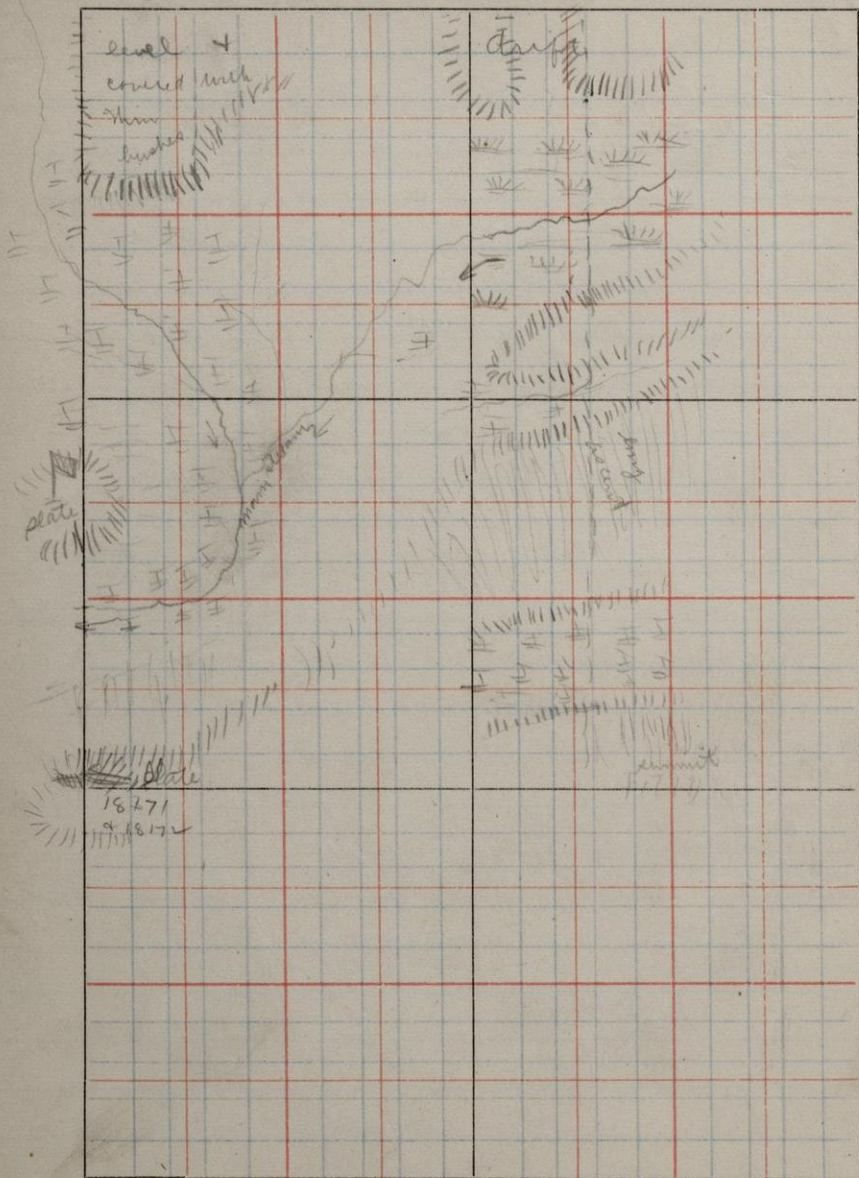
Some chipping from an exposure about
15 steps east of the others.

There are thus three small exposures; the
furthest west seems nearly all schist.
The middle one seems to have both schist and
quartzite ^{schist} and the easterly one is all
quartzite ^{schist} apparently. The cherty
portion may be a replacement along lines
of bedding.

SW¹/₄ Sec 12 T. 47

32

R. 28



✓19139 1660 N 1440 W 13. 47. 28

Coarse greenstone ^{conglomerate}. It forms nearly the whole of several high knobs just north of the railroad

✓19140 1500 N 1430 W SE 13-47-28

A coarse greenstone conglomerate forming a ridge broken here and there but having a general east and west direction

✓19141 1465 N 1355 W 13 47-28

A ridge here runs nearly E & W with an abrupt slope to the South. A hundred paces east it turns north of east
Coarse greenstone conglomerate

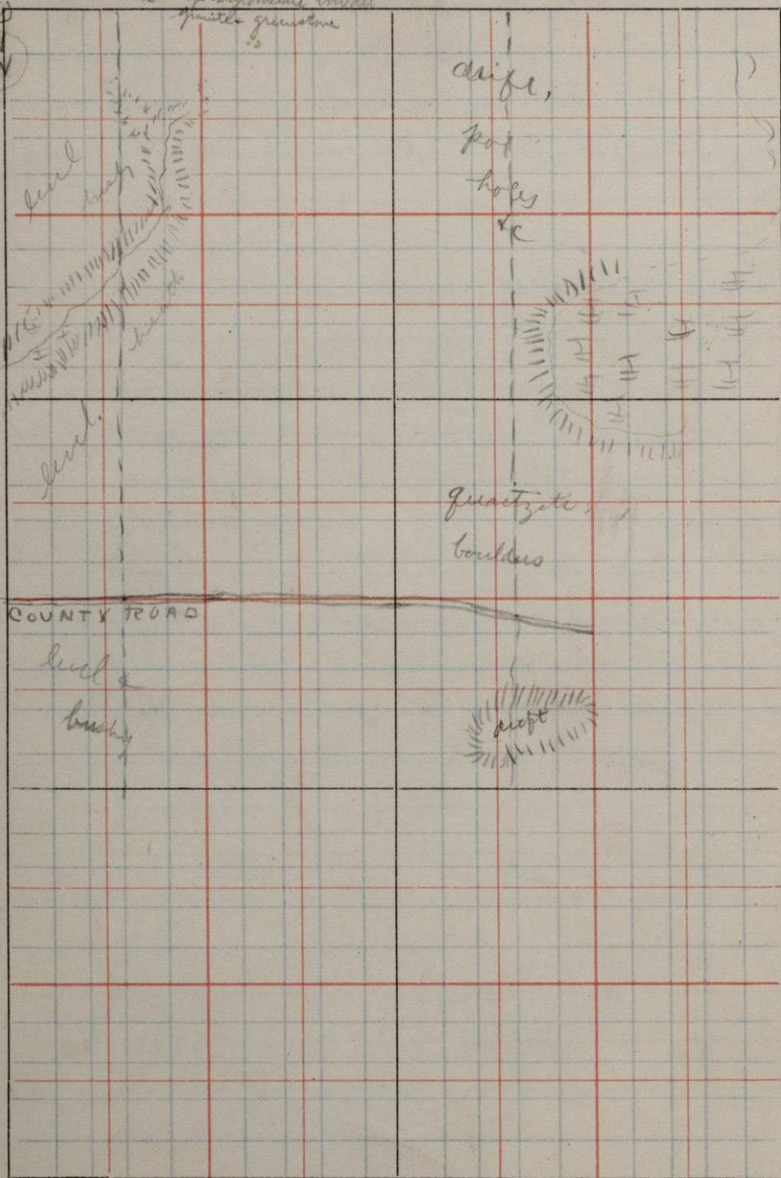
NW 1/4 Sec 12 T. 47

34

R. 28

check Sec. cor.
40 to 60 ft N
18" W

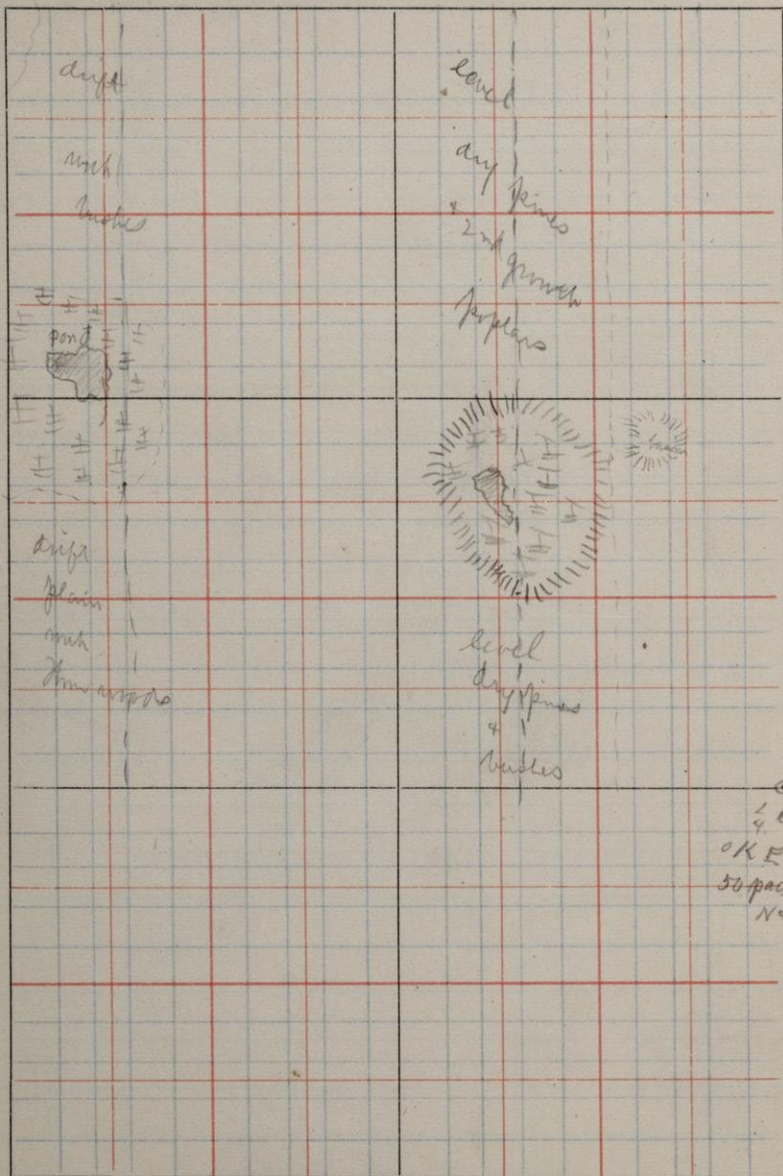
large conglomerate boulders
quartzite granitoid



S W 1/4 Sec 12 T. 47

36

R. 28



OK E & W
50 paces short
N & S

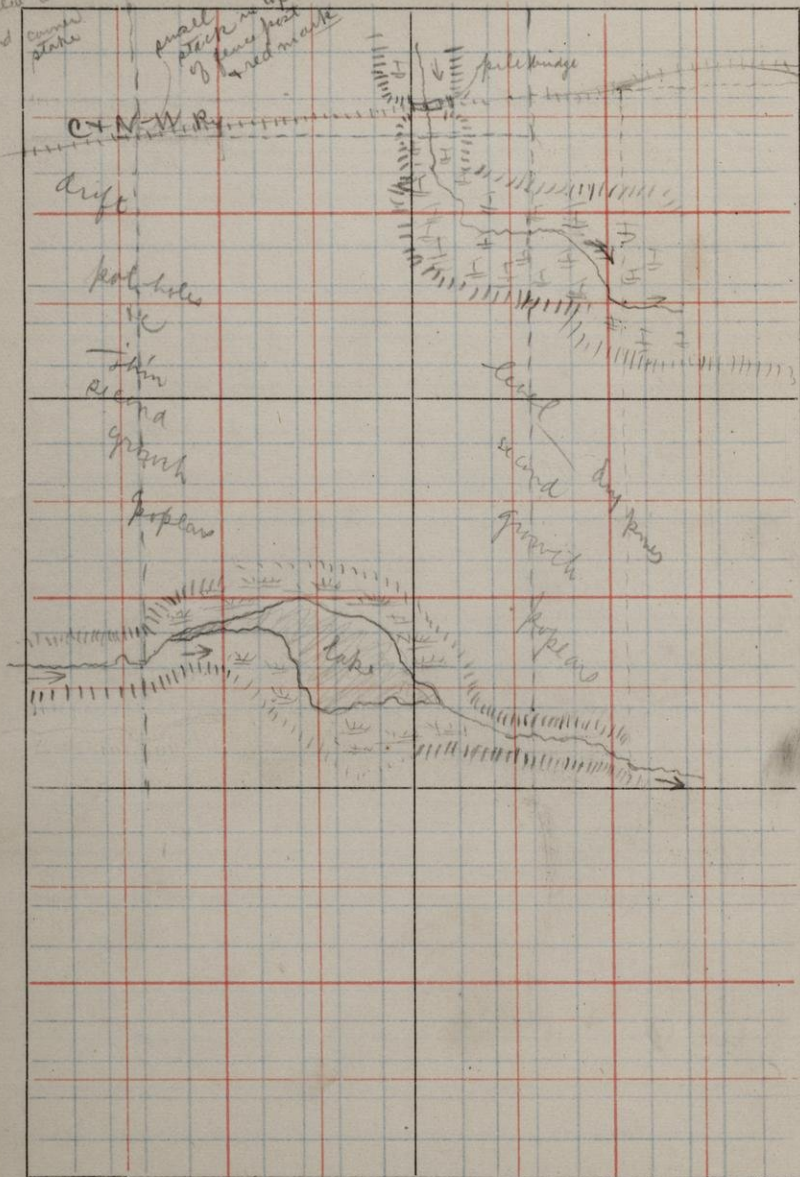
NW $\frac{1}{4}$ Sec 1

T. 47

R. 28

failed to
find corner
stone

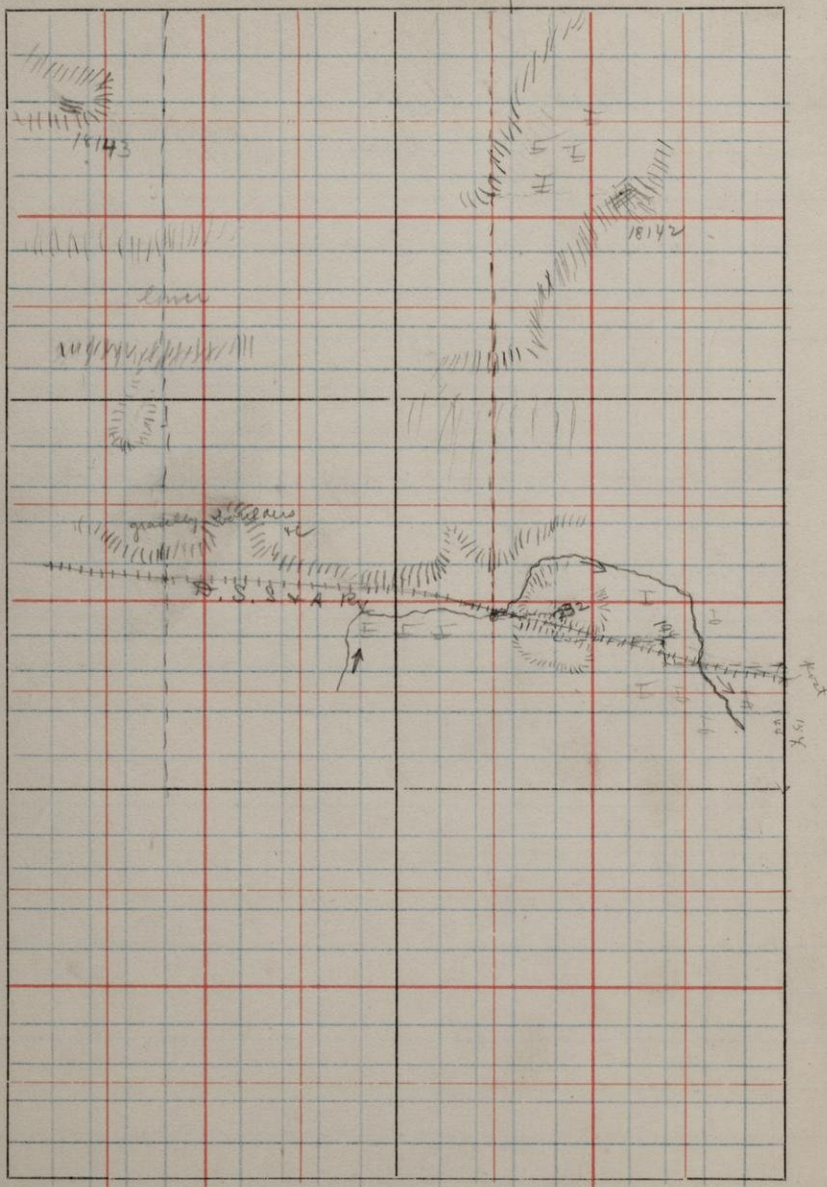
small
steep
of fence post
red mark



NE $\frac{1}{4}$ SICK T. 47

40

R. 28



✓ 19142 1770 N 205 W SE 13-47-28

A ledge about two thirds down the north west slope of large bluff. There are two or three small exposures. The structure seems to be massive. The exposures have a smooth surface sloping to the S.W. at an angle of about 20° . It is a greenstone conglomerate.

✓ 19143 1885 N 920 W 13 - 47 - 28

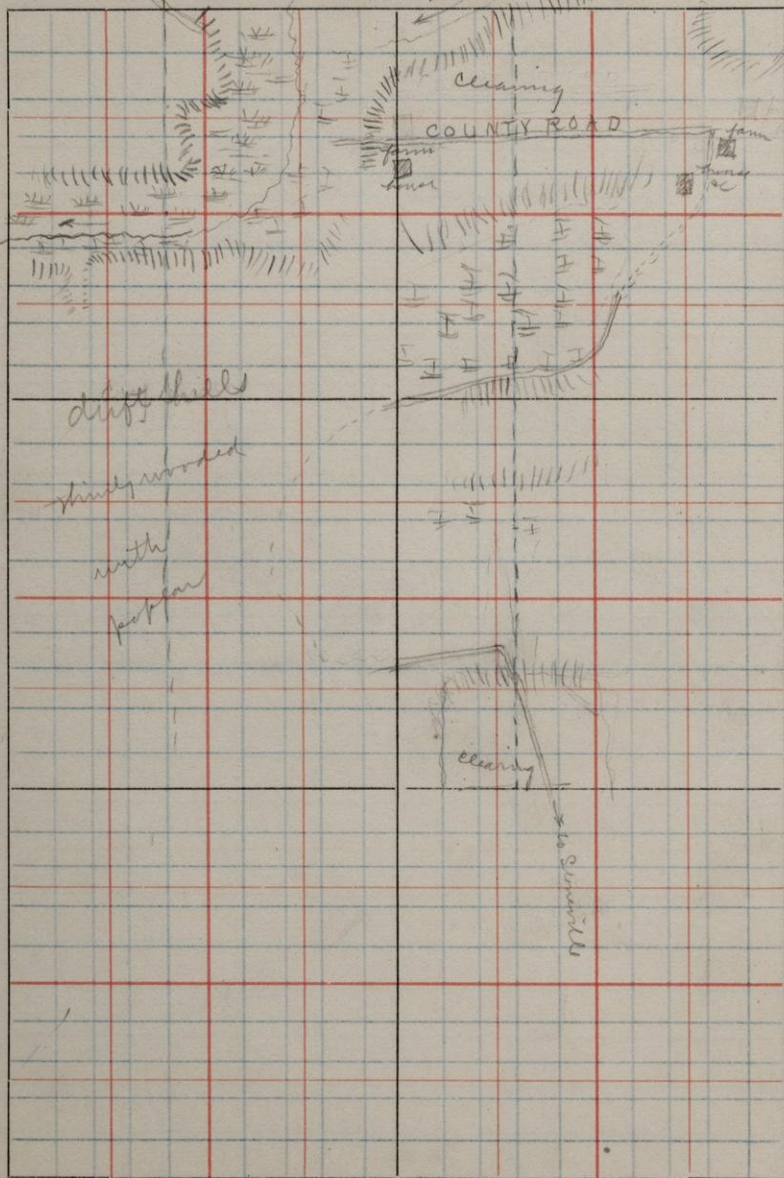
There are two small exposures on a low bluff having rather flat top. Strike N 75° W. Dip nearly vertical but not to be seen on the small exposures. The rock seems quite finely bedded. Probably belongs with the black slate.

SE 1/4 12

T. 47

42

R. 28

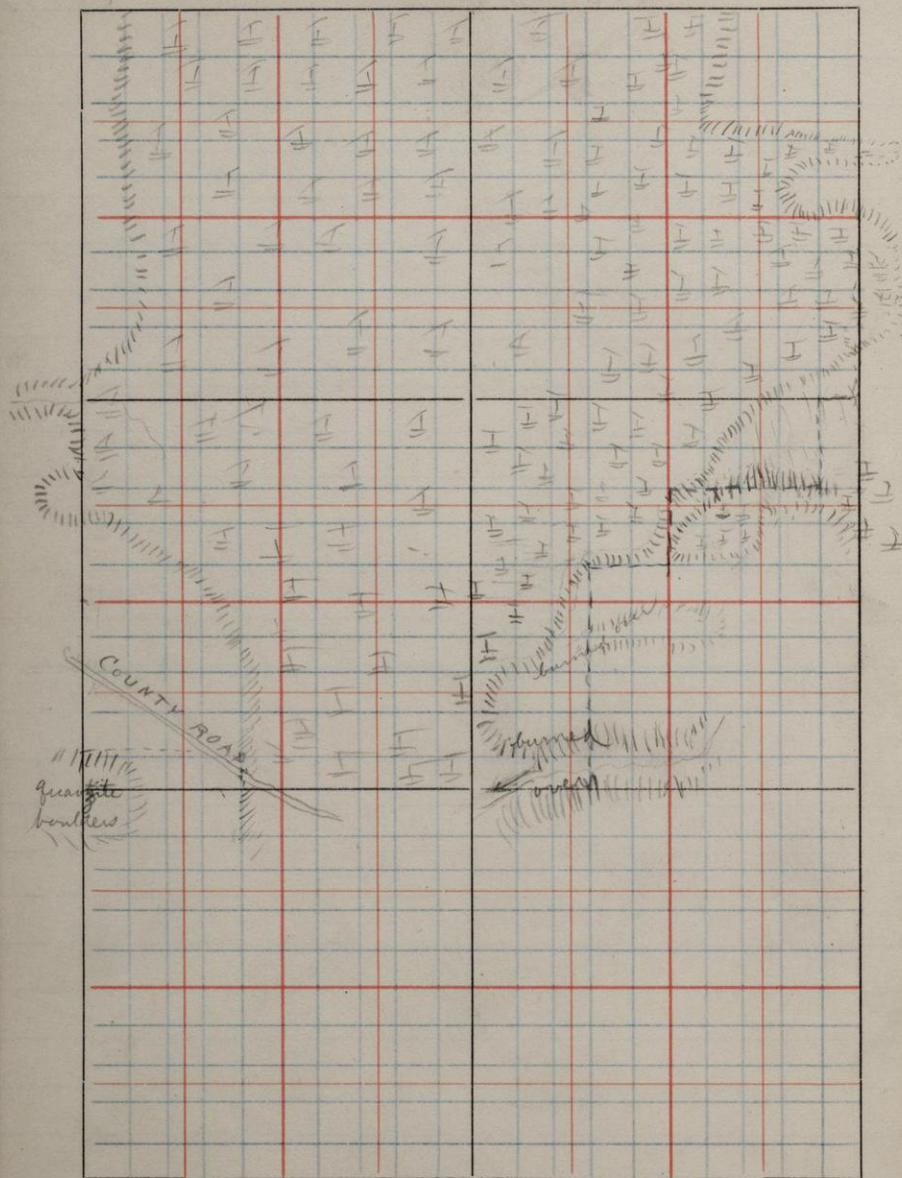


NE $\frac{1}{4}$ 12

T. 47

44

R. 28

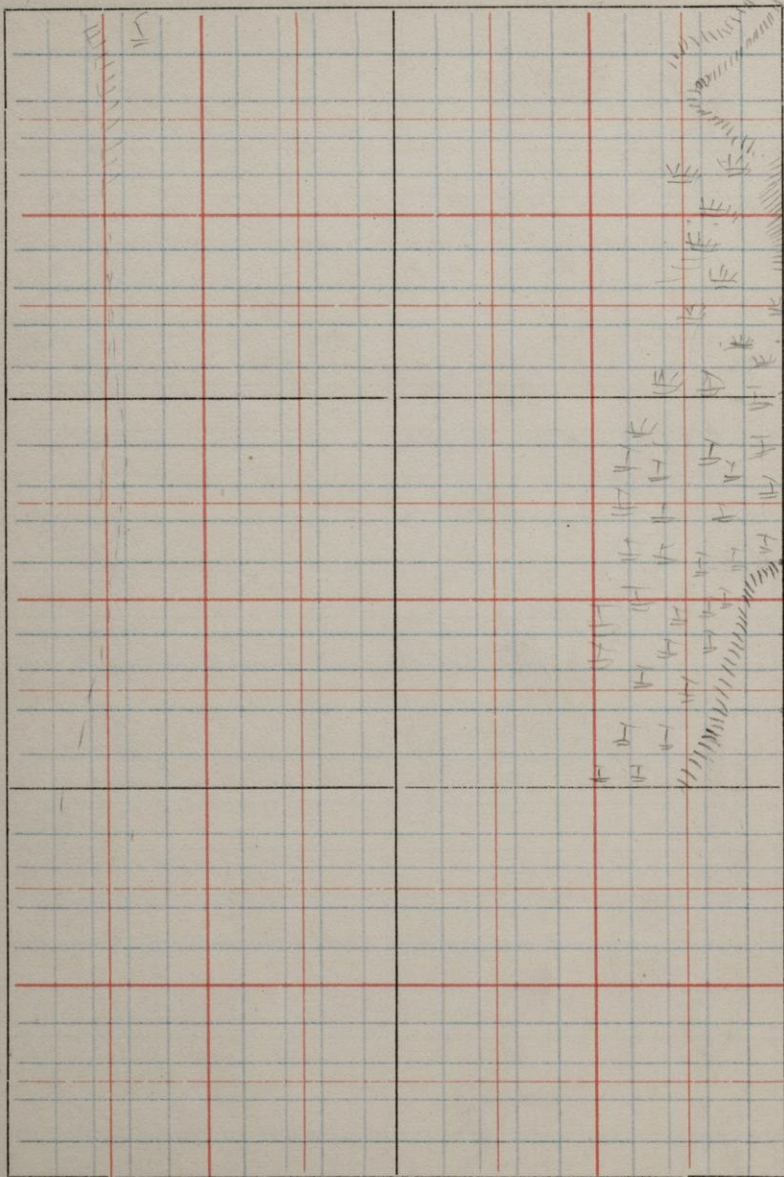


SE 1/4

T. 47

46

R. 28



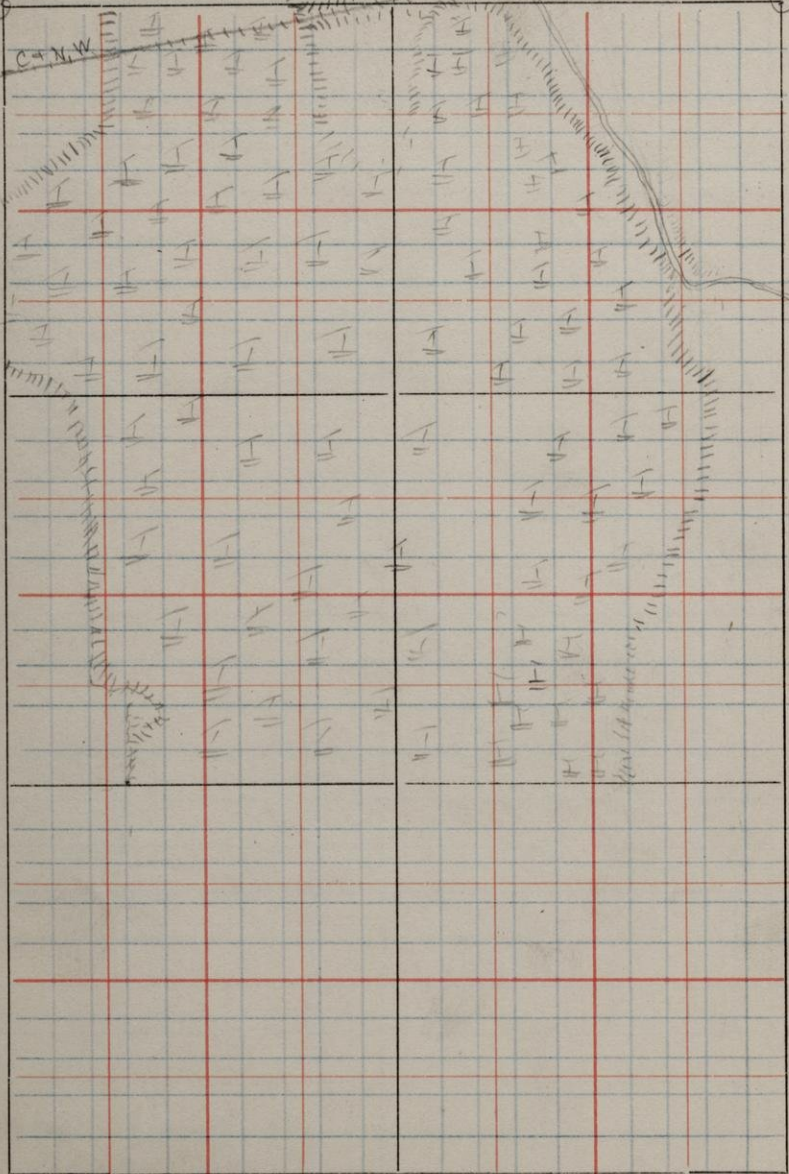
NE 1/4 1

48

T. 47

R. 28

C. & N. W. R. Town 200



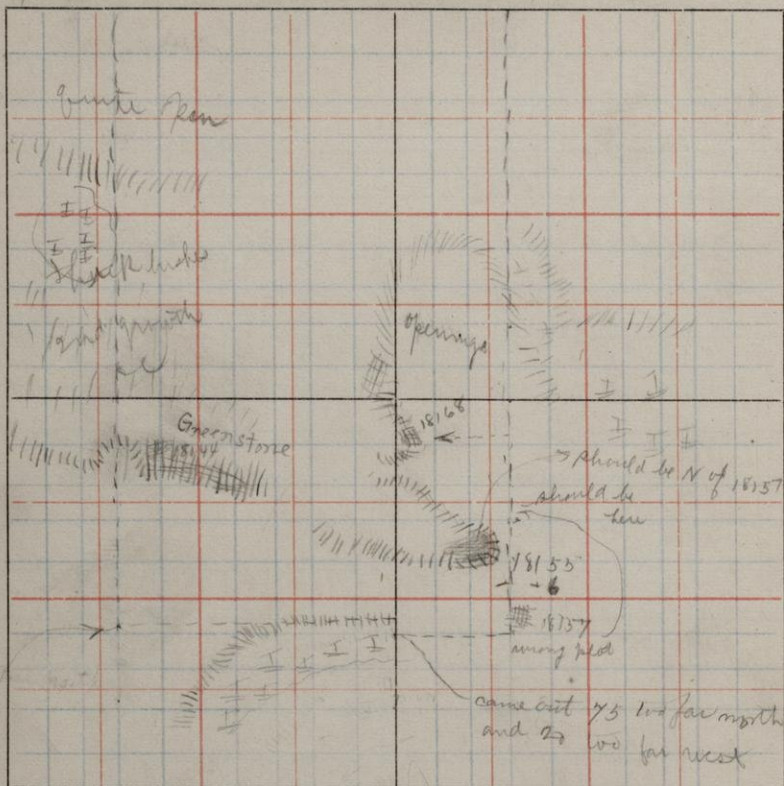
came out 75 steps too far north and 90 steps too far west

NW $\frac{1}{4}$ 18

T. 47

50

R. 27



On the run north on this line through Sect 18, 7, & 6, we came out 170 steps too far East on the north line of Sec 6. We then corrected on the $\frac{1}{2}$ post and in running back came out 75 steps too far North at our starting point which was 1216 N. 1500 W, SE. Sec 18-47-27

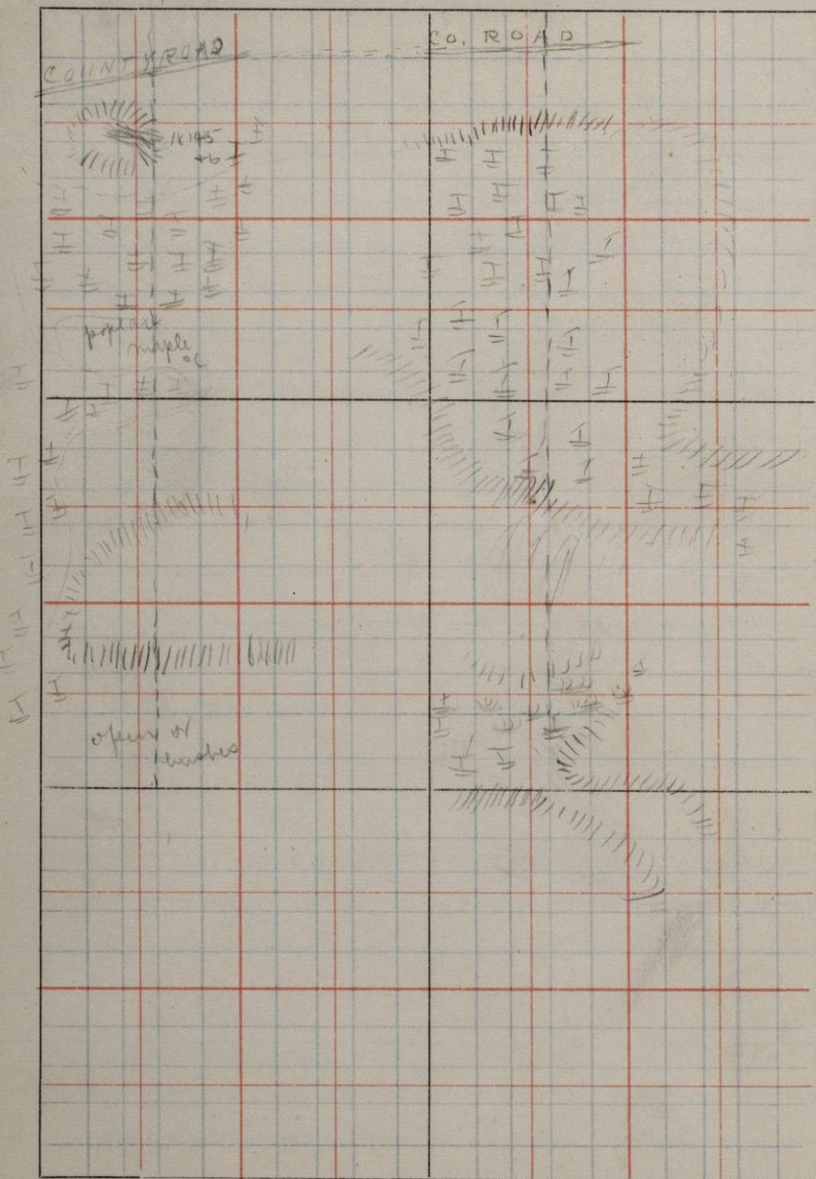
✓ 19144 N 146° W 250 SE 18 47 28

Coarse greenstone conglomerate
ridge 75 to 100 ft high running S of E
The slope is quite abrupt to the south
being about 45° or 50° and quite regular
and smooth on the exposed rock surfaces
To the north the slope is quite gradual
but rough

SW 1/4 Sec 7 T. 47

52

R. 27



✓19145

840 N 1880 W SE 7 47 27

A small knob 40 or 50 ft high having an exposure on the top on north side which also has most abrupt slope

It probably belongs with the black slates. The structure is very much contorted and the strike could only be seen to be generally a little N of W and dip nearly vertical. The exposure is nearly all on top of knob.

✓19146

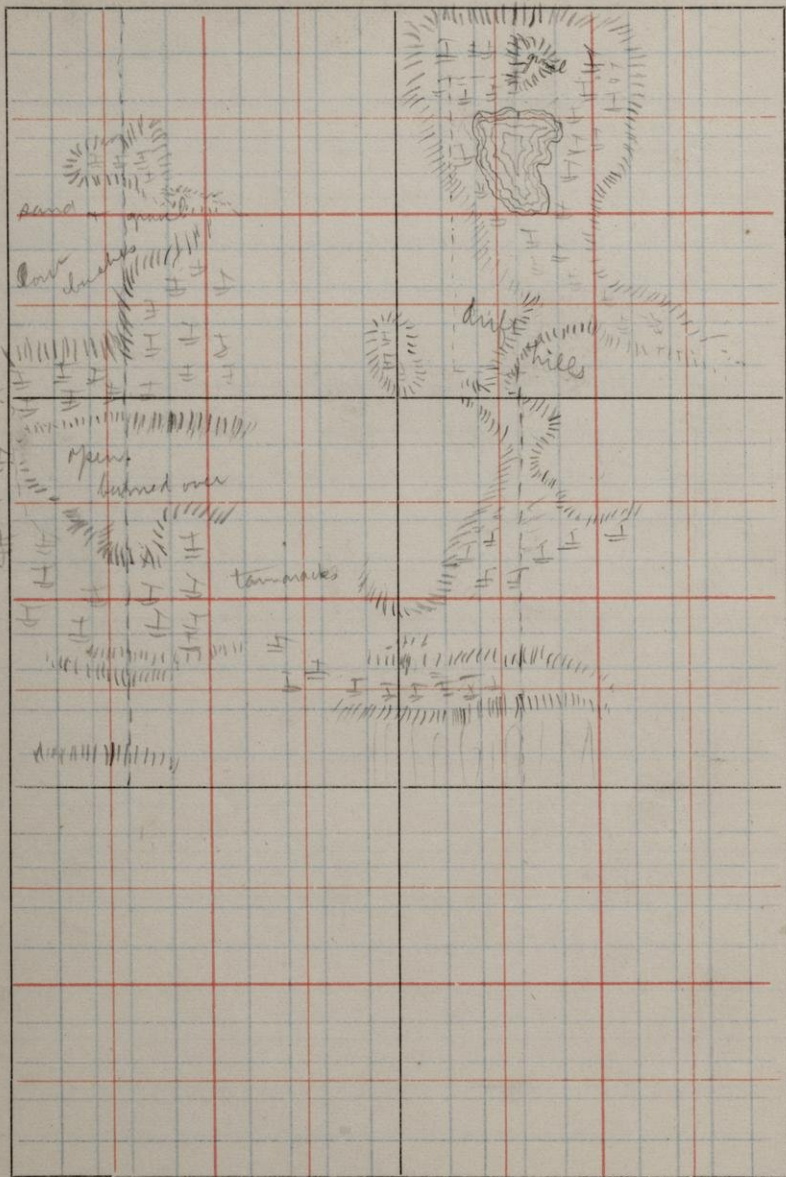
840 N 1880 W SE 7 - 47 - 27

From same knob, shows weathered surface, which also in places has red and yellow streaks

NW 1/4 Sec 7 T. 47

54

R. 27

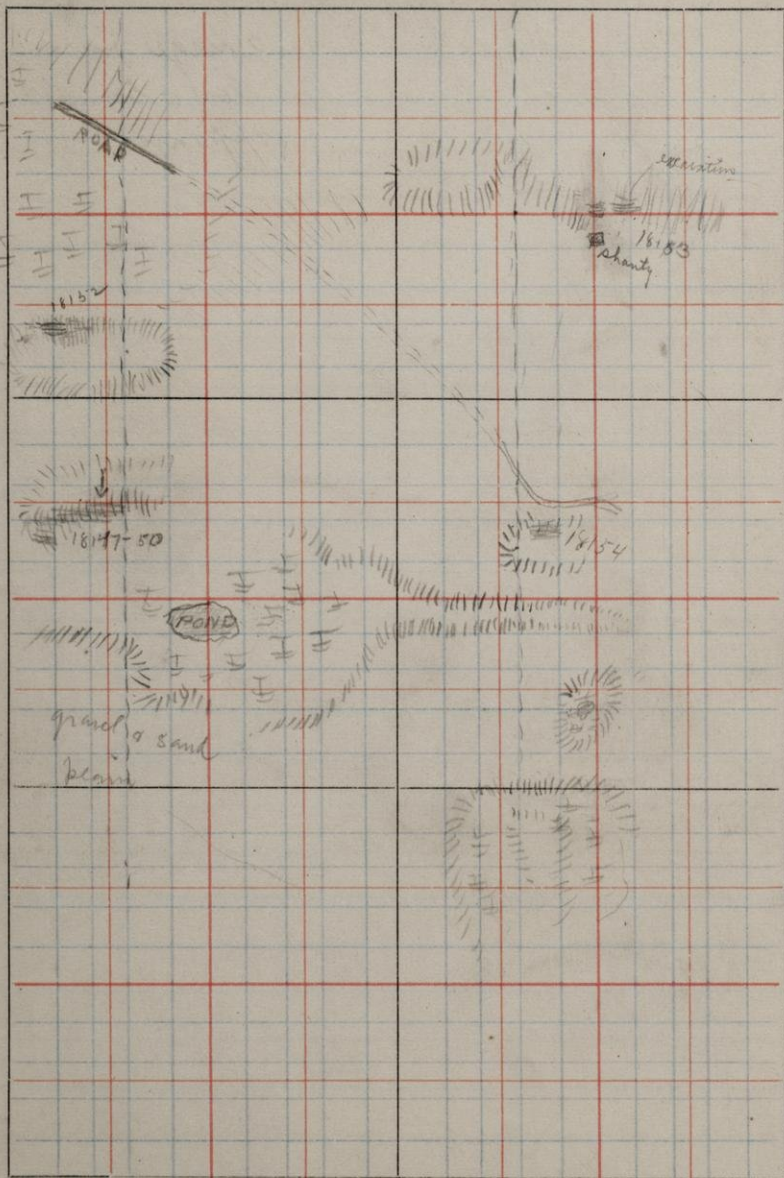


SW 4 6

T. 47

56

R. 27



✓19147 370 N 1970 W 6 47 27

Here is the SW corner of a ridge running nearly E & W. It is a lean banded ore. In the exposure there appears a band of another rock only some 5 or 6 feet wide see 18148 + 18149, parallel with the banding. Strike N 85° W dip 75° S.

✓19148 370 N 1970 W SE 6:47-27

A specimen from the layer between the two exposures of lean banded ore

✓19149 370 N 1970 W SE 6 -47-27

Quite near the contact between the ore and the other layer. It has a deep dark brownish red color.

✓19150 370 N 1970 W SE 6 -47-27

The lean banded ore north of the intermediate layer

✓19151 460 N 1890 W SE 6 -47-27

Another specimen of the lean banded ore. There are outcrops at various points along the south side of the ridge from about 1840 to 2000 W all having same strike and dip.

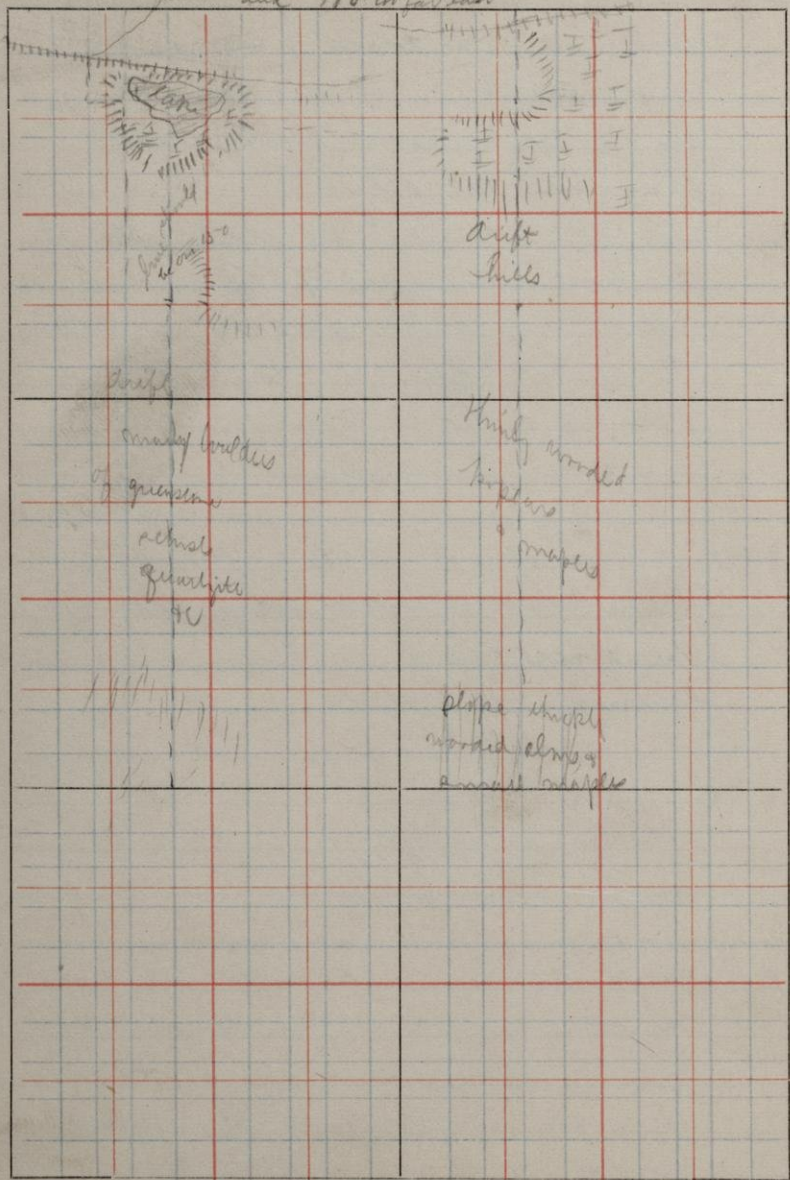
NW $\frac{1}{4}$ Sec 6

58

T. 47

R.

T. 47
Camel out 50 paces for north
and 170. for east



✓19152 600 N 1950 W SE 6/47/27

Here is another knob some 50 or 60 feet high having the same banded ore. The slopes to the north are covered with loose fragments of the ore and not enough could be seen in place to get the strike and dip accurately but they seem to be the same as in the preceding specimens and I think there is no doubt the knob consists of this rock

✓19153 N 750 W 1210 SE 6/47 27

Lean banded ore strike E and W nearly Dip 78° S There is an excavation here some 10 or 12 ft deep and 30 x 20 ft in the hillside

N 750 W 1235 6 47 27

is another outcrop striking a little N of W

✓19154 342 N 1315 W SE 6 47 27

Lean banded ore on a low knob strike E and W about and dip very nearly vertical but can not be made out There are indications of ore all over the top of the knob but only one or two small exposures

✓19155 N 1350 W 1380 SE 18. 47-27

The ridge here runs a little N of E and is broken through here by a small patch of swamp so that at this location is a bold bare ledge 75 to 100 ft high. The rock here probably belongs to the slates and also somewhat resembles the tuffs. Two or three hundred steps W. is a contact between this rock and the greenstone conglomeration like 18144. This contact line runs nearly E & W, possibly a little S of E.

✓19156 From same ledge showing slaty structure a little better

✓19157 1353 N 1330 W SE 18. 47-27

Quite a large exposure nearly even with the surface running north about 40 paces from the point coarse greenstone conglomerate.

✓18158 1700 N 895 W 18-47-27

Strike N. 50° W. Dip 85° S W.
A knob of slate or rather forms part of

SE 1/4 Sec 7 T. 47

62

R.

27

skipped by
Pine to 64
mistake

a ridge running approximately E & W. The highest point is about 50 paces W & 30 N of this point and it slopes away to the E

'18159 N 174° W 815 W

strike N 60° W dip high
A small outcrop of the slate farther E on this ridge. Indications of it are seen all along the ridge.

'18160 N 199° W 885 SE 18, 47 27

At this point is a contact between slate and Sandston Congl. exposed. The strike of the slate is N 60° W and dip high to the south west. The specimen is taken near the contact.

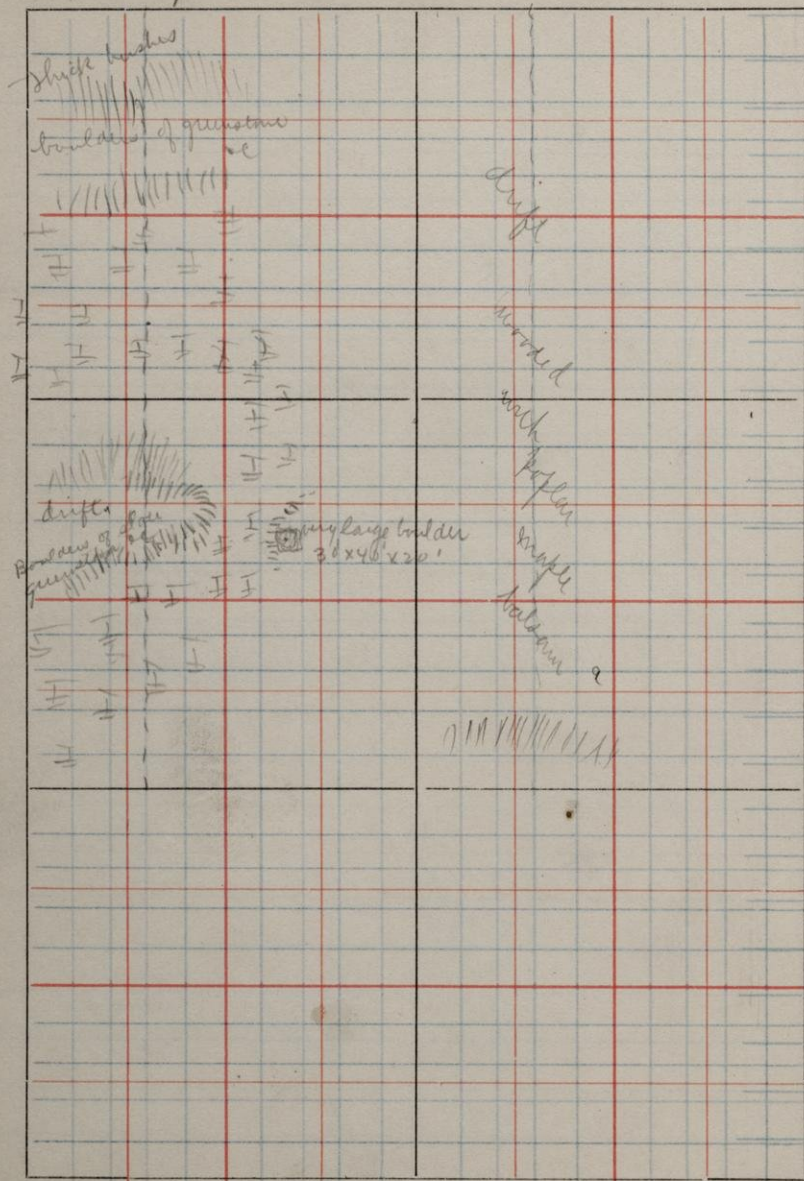
'18161 Quartzite near contact about two feet north of where 18160 was taken. The line of contact runs about N 50° W

The exposure is not much above the general gradually sloping ^{to north} surface.

SE $\frac{1}{4}$ Sec 7 T. 47

64

R. 27

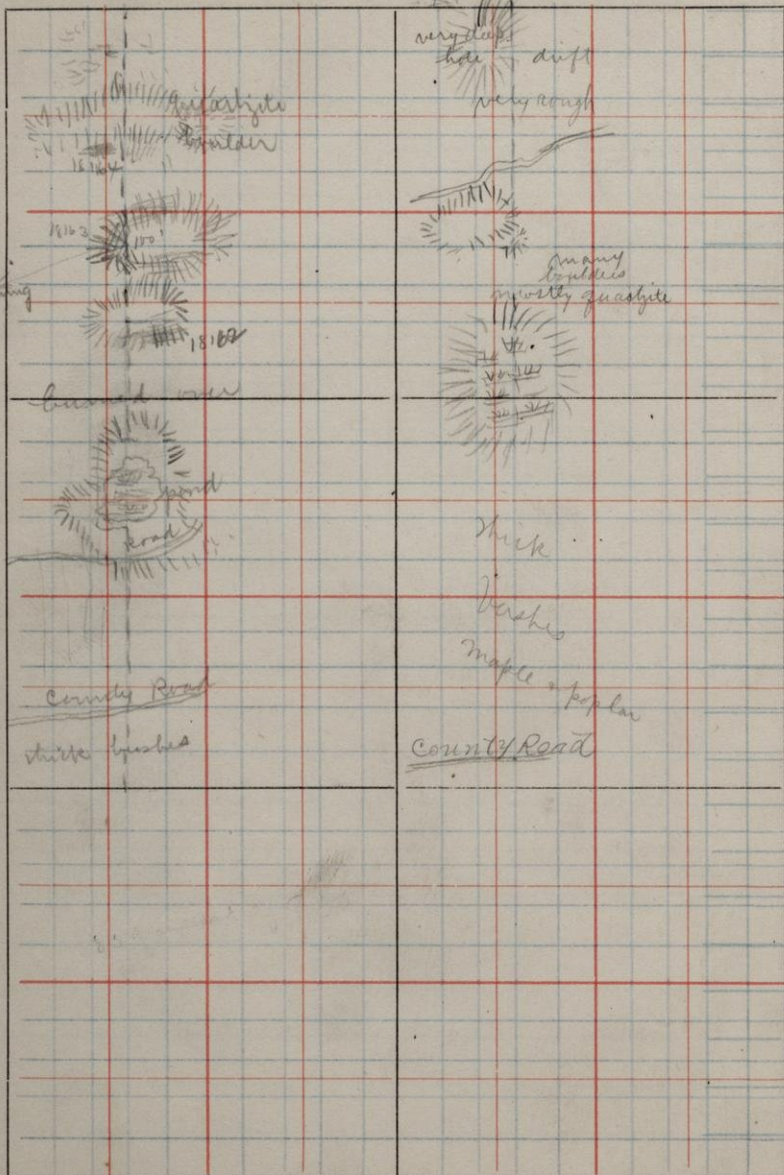


NE 1/4 7

T. 4y

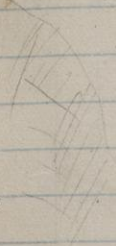
66

R. 27



✓ 19162 N 60° W 830 17 47 78.27

Strike of schistose structure N 80° to 85°
E Dip 60° N An outcrop of schistose
rocks



Section N + S.

✓ 19163 N 615 W 850 7. 47-27

A high knob (about 100') of a schistose
rock probably an altered greenstone
similar to and a part of 19162 where
there is a smaller exposure. The strike
and dip can not be seen plainly
as in the smaller but are the
same viz N 80° E and dip 60° N
There perhaps are two anticlinal folds
There is also an exposure on the N. slope
of this knob presenting the same appearance
These seem to be very old rocks

✓ 19164 N 1830 W 925 17 47 27

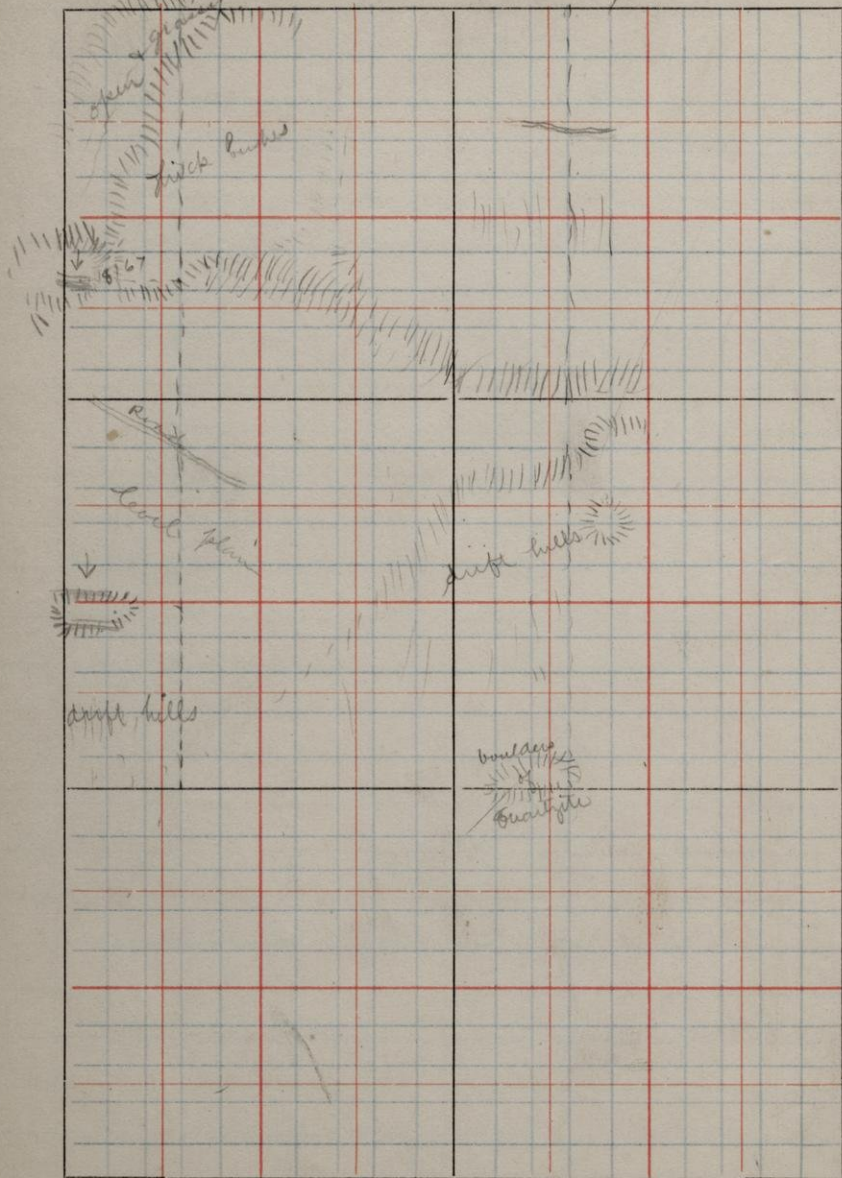
Here is some quartzite which perhaps is
not in place appearing like boulders but
there is a general strike of N 40° E in
several near together and a dip of 40° to the
W. Wrecking it appears possible that it is
later, probably not in place

SE 1/4 6

T. 47

68

R. 29



✓19165 N 240 W 940 6 47 27
 Quartzite. Strike nearly E & W
 Dip 60° S. A ledge about 100 steps E &
 W and 15 N & S. Quite low

✓19166^{up}
 From same ledge showing brown coloring
 which appears in streaks

✓19167 N 656 W 980 6 47 27
 Another ledge of the lean banded or
 Jasper. A ridge here runs N of E
 strike nearly E & W Dip 80° S

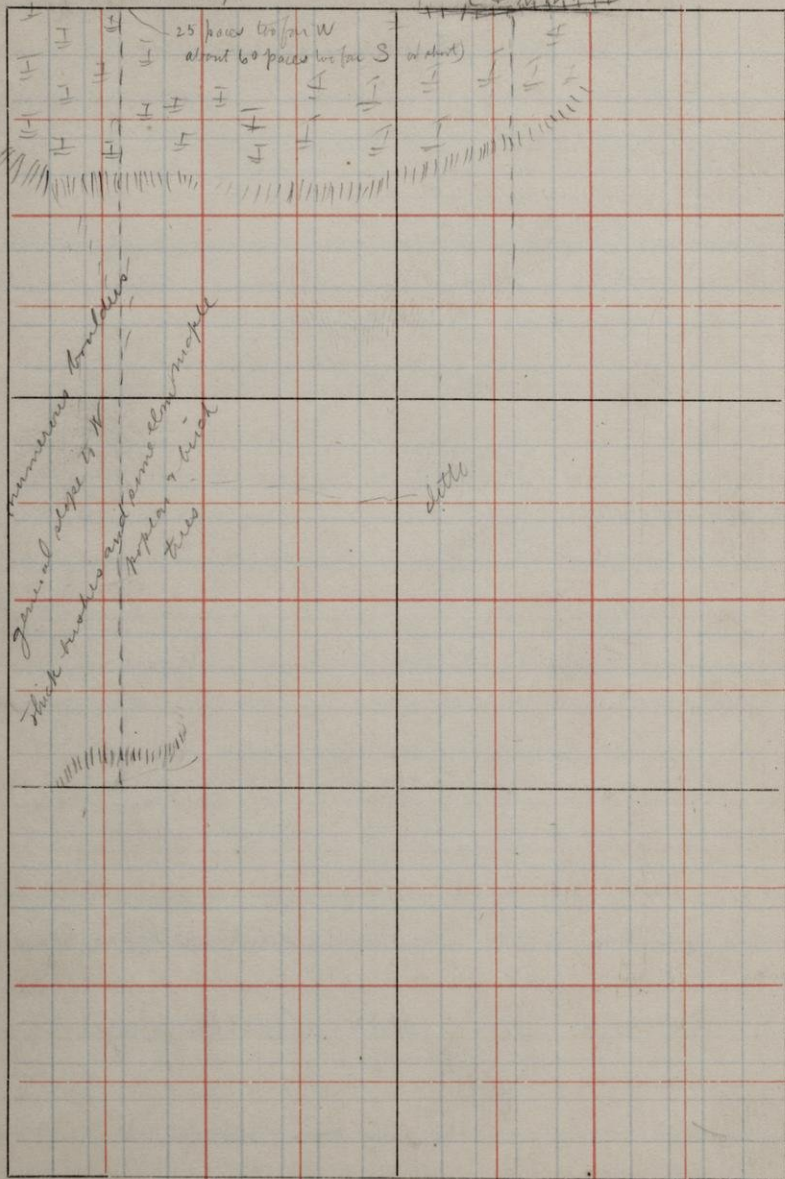
✓19168 N 1460 W 1480 SE 18- 47 - 27
 Coarse greenstone conglomerate
 (exp 50) There is a contact between this
 and the plates between here and 18155
 but it is not exposed excepting east and
 west of this line

✓19169 N 1335 W 1050 SE 13, 47-28
 This point is the SE corner of a knob which
 runs back about 100 steps north and
 whose face or most abrupt slope runs
 E and W. about 150 steps then runs off

NE 1/4 6 T. 47

70

R. 27



S of W. Also has a low branch running S. a few paces (see p. 30)
Has a bedded structure whose strike is about N 45° W, and dip 35°-40° S.E. Also a marked schistose structure whose strike is nearly E & W and dip very nearly vertical or high to the south. The exposed surfaces are very rough and coarse; the bedding is contorted somewhat on the north face but elsewhere quite regular in strike and dip.
It is a greenstone conglomerate.

19170 1300 W 1100 W SE 13.47-27.28 (8H4)

Slate. Strike of cleavage nearly E & W dip high to S. Here seems to be a contact between this rock and the greenstone which also shows in the small rock cutting on the P.R. a few steps West.

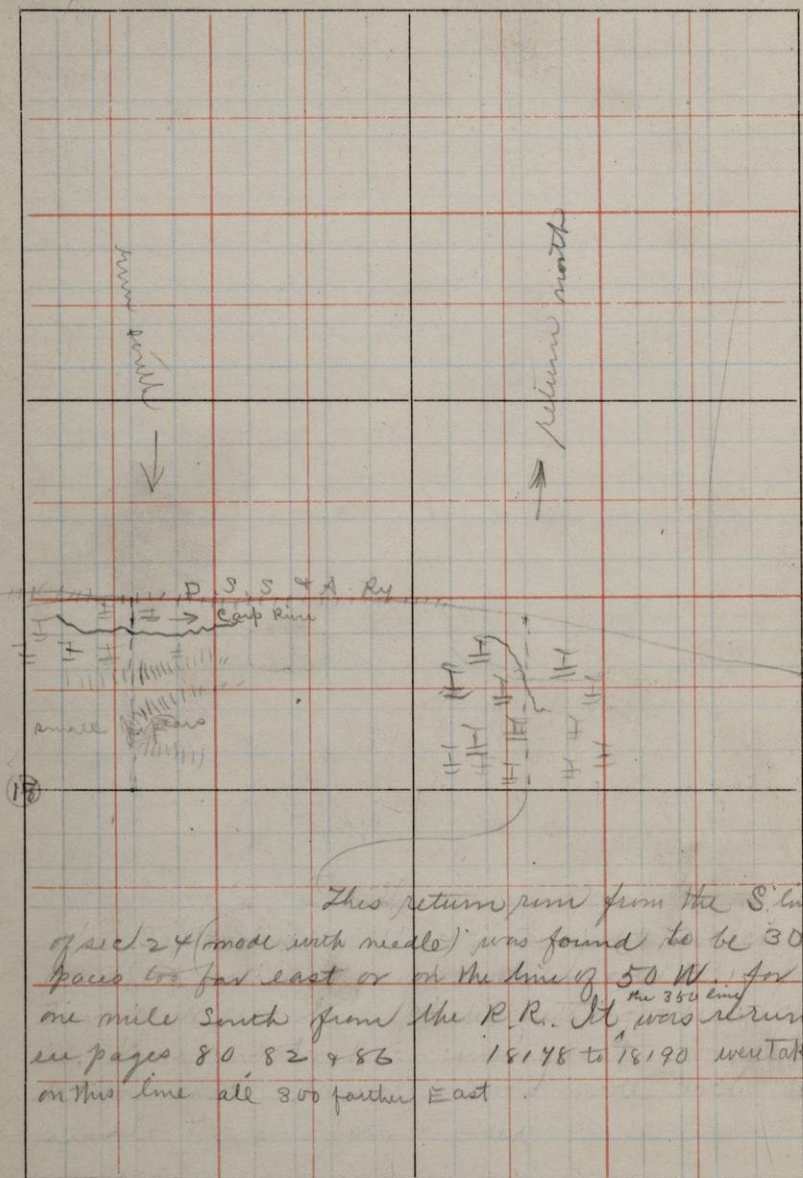
19171 N 10 W 2000 SE 12.47-28

Slate in a rounded exposure on N.W. side of top of bluff. Strike of cleavage N 75° W, dip nearly vertical or very high to the S. The bedding showing in weathered fragments only does not seem to coincide with the cleavage. There are some glacial scratches on surface.

N.F. 1/4 13 T. 47

72

R. 28



This return run from the S. line of sec 24 (made with needle) was found to be 300 paces too far east or on the line of 50 W. for one mile south from the R.R. It was returned on pages 80, 82 & 86. 18148 to 18190 were taken on this line all 300 further East.

✓19172 N 10 W 2000 SE 12-47-27

From same ledge as last, showing bedding differing from cleavage

✓19173 1353 N 1330 W SE 18-47-27

Ground mass of Greenstone Conglomerate in low ledge (78157 taken from same ledge p 50 and points 10 + 11 in Plane Table map)

✓19174 1353 N 1330 W 18-47-27

Pebble

✓19175 Chips from another pebble

✓19176 From another pebble

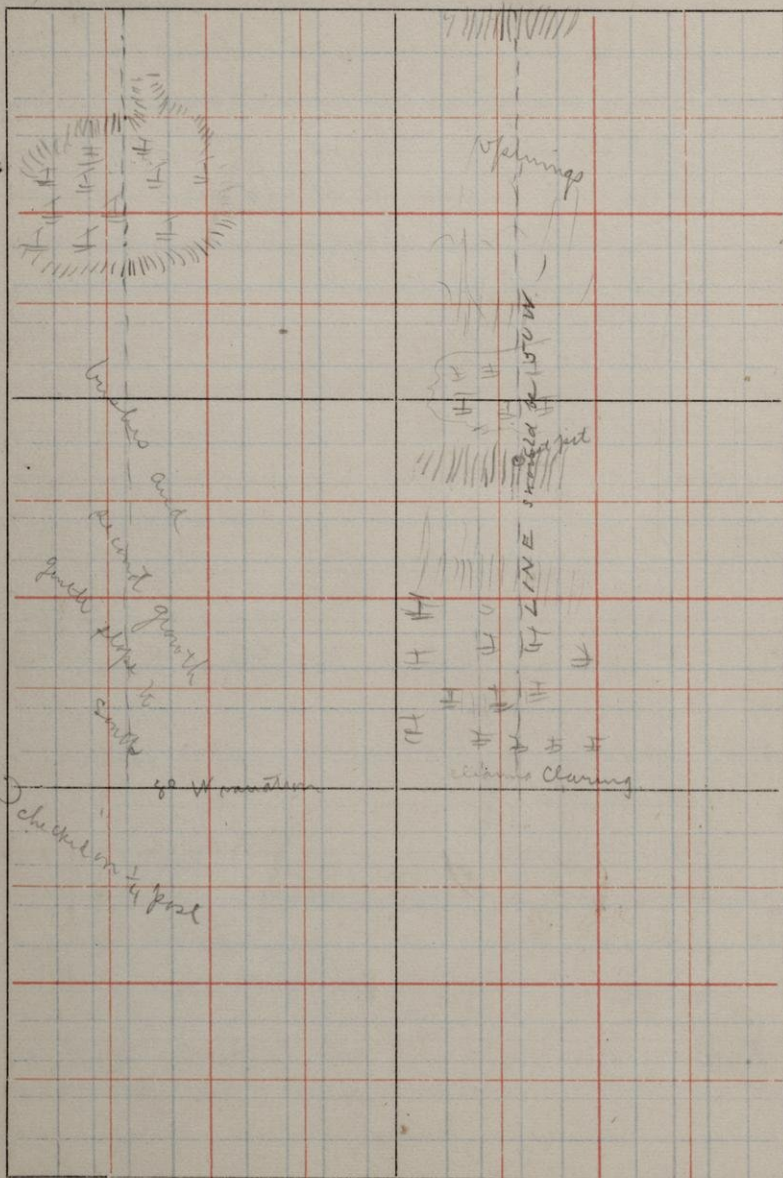
✓19177 Another pebble showing rounded surface

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

T. 47

74

R. 28



19178 N 1570 W 885 SE 24 47-28
a low exposure of fine grained
granite on S edge of swamp

19179 N 1480 W 835 SE 24 47-28
A ledge of Jasper conglomerate crops
out here on N brow of bluff at the
foot of which 18178 was found
Exposure is narrow and some 15 steps
E & W

19180 N 1480 W 835 SE 24 47-27
Shows bright red pebble

19181 Another from same ledge showing pebble

19182 N 1370 W 835 NSE 24 47-28
Jasper. Conglomerate in small exposure
just South of top of bluff
I am not sure that I make out the
strike and dip but they seem to be
about E & W or a little S of E and
about 30° to 35° N respectively.

19183 N 1275 W 700 (about) sharp
Specimen of oil from Fitch mine

19184

leats

n n

n

n

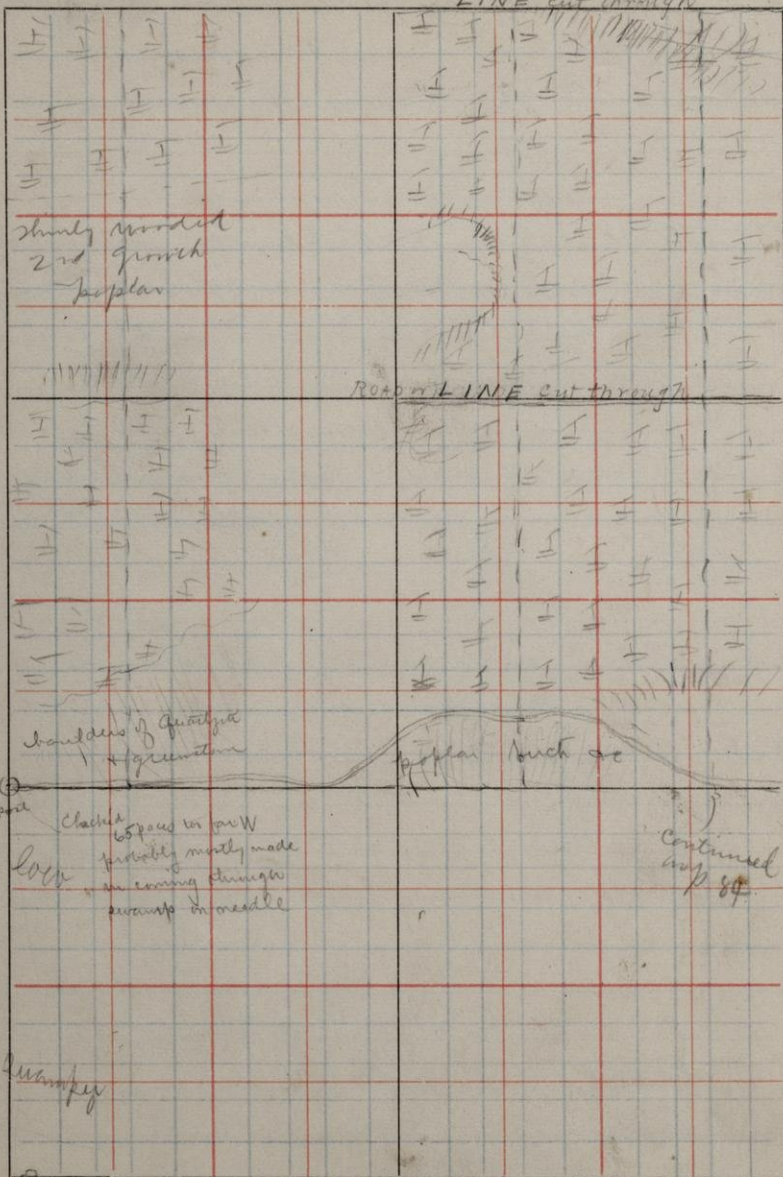
n

SE 1/4 24 T. 47

78

R. 24

LINE cut through



Grants here
2000
18185

✓18183 1200 N 975 W SE 25-47-28
Granite in low rounded exposure
on SE side of low knob

✓18186 N 1330 W 400 SE 24-47-28
Here in the south side of large bluff
which runs nearly N.E. + S.W. is an
outcrop of Gaspar or lean banded ore.
The strike varies within short distances.
The dip is 70° W. at one point and
about 40 west in an old excavation
(quite deep)

✓18187 N 1330 W 400 SE 24 47 28
Another from same ledge showing the
banding better

✓18188 1425 N 350W SE 24 47 28
Banded lean ore or Gaspar high up
on slope of bluff. Small exposure so
that strike & dip could not be made out but
strike is about E & W

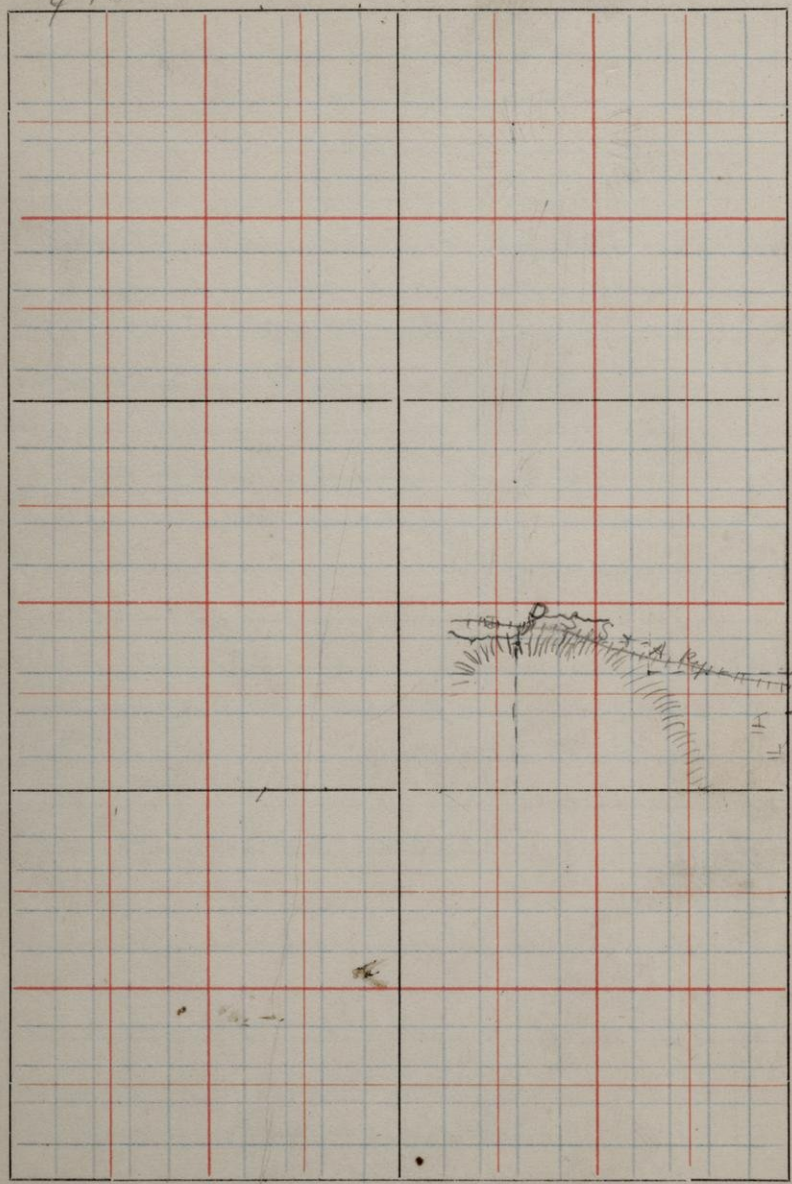
✓18189 N 1840 W 340 SE 24 47-28
Quartzite ^{or Gaspar} in a small exposure at
foot of bluff on border of ^{very narrow} swamp
The dip seems to be high to N and
strike E & W but in the small exposure
it can not be made out plainly at all

SE $\frac{1}{4}$ 13

T. 47

80

R. 28



19190 N 1920 W 350 SE 24 - 47-28

An exposure of quartzite in pasture at edge of woods. There are two or three outcrops having a strike of E4W as near as can be made out. The edges only reach the surface which is level here. The constancy of this strike is the indication that they are in place though the outcrops are so small and even with the surface.

At 1970 N 325 W is a small exposure belonging to the ledge in which the strike appears to be about N 56° E and dip 70° N.

19191 N. W. SE Sec 18 47-27

(See on Plane Table map of bluff)

Stony rock similar to 18155 and from same kind there being a small patch of soil between the two exposures.

18192 1928 N 80 W SE 24. 47-28

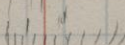
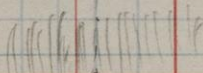
A ledge of quartzite has a small exposure here a little above surrounding surface. The strike and dip could not be made in the ledge at the point where it ¹⁸¹⁹² was broken but where 18194 was taken it shows

SE 1/4 12

T. 47

R. 28

gradual
descent
to South



LINE cut through

Feet over E 250 and

continued

in p 76

I = 3

✓ 19193 N 1920 W 75 SE 24-47-28

Another exposure a little larger. The rock is lighter in color, strike seemed about same as in 18194

✓ 19194 N 1928 W 80 24-47-28

at the E end of this small exposure are red, also light grey bands. The strike is N 65° E and dip 30 to 40°
N

✓ 19195

✓ 19196 } from same ledge as last

✓ 19197 N 990 W 215 SE 25-47-28

Granite in small ledge in midst of very thick brush. There are exposures SE of this

✓ 18198 N 1490 W 350 SE 24-47-28

A ledge of granitic sandstone or coarse quartzite having small exposure. The strike, if I make it out correctly is some 15 or 20° North of East

Am not sure of the dip as the bedding does not show but then. Possibly it is not in place

NE $\frac{1}{4}$ Sec 25 T. 47

84

R. 28

Ham
House Clearing

3 5
= 5 5
I 5
I 5
I 5
I 5

House found 615 S

1897

Granite

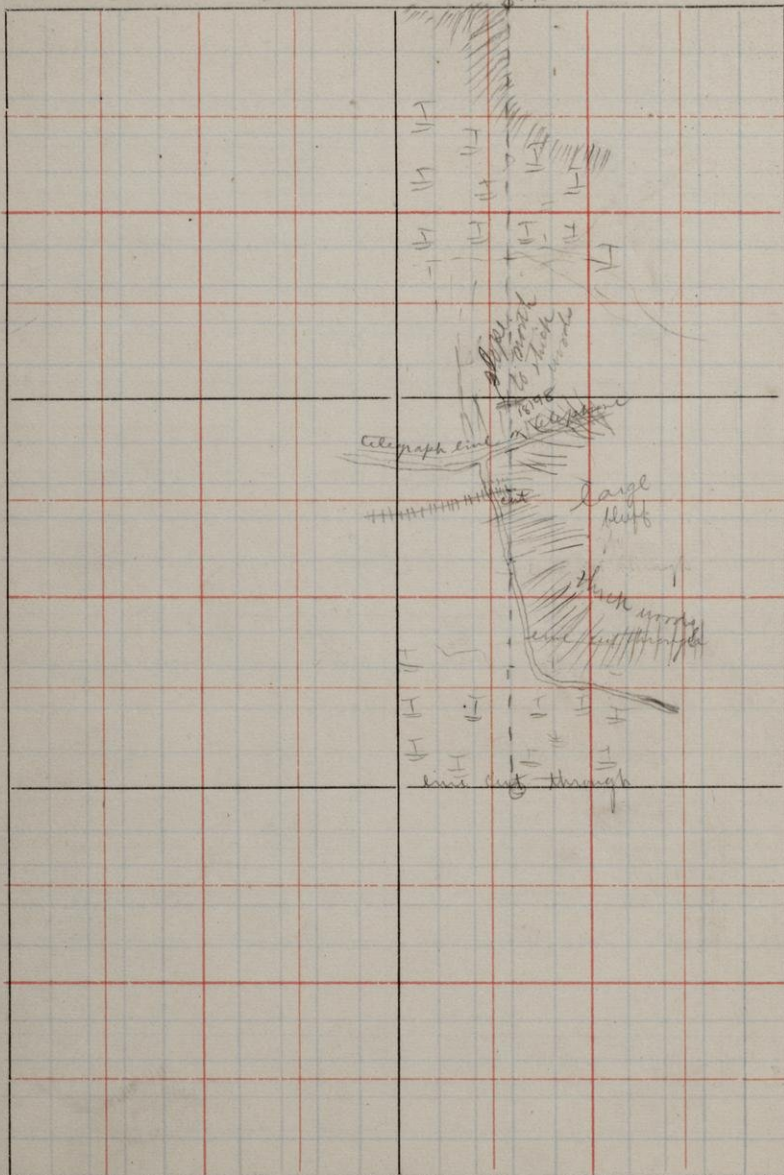
approx
Granite
road

NE $\frac{1}{4}$ 24 T. 47

86

R. 28

OK

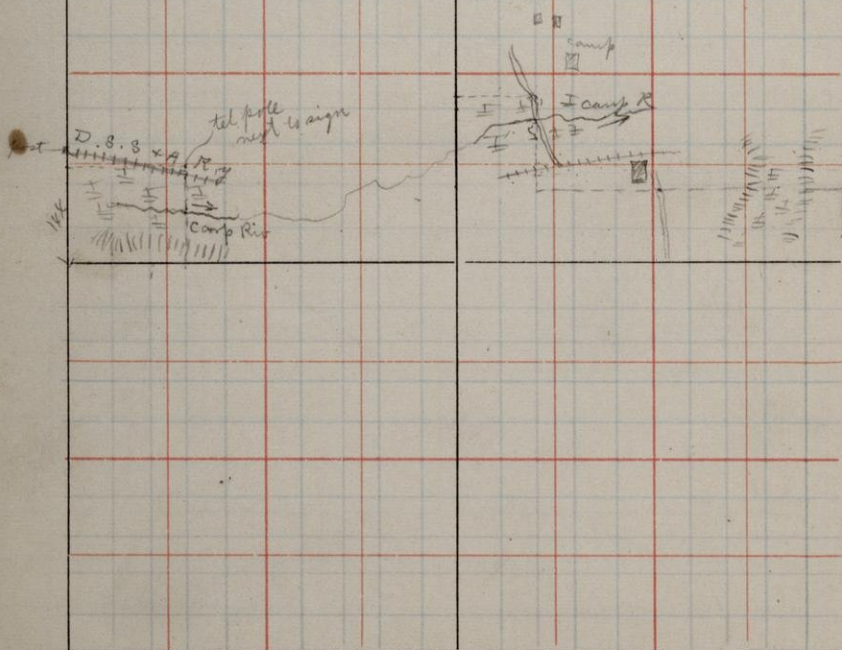


NW 1/4 18

T. 47

88

R. 27



89

316
122
—
89

At 175N 1850 W SE 18-47-27

Is a small exposure of quartzite probably in place

18199 1910 N 1805 W SE 19 47.27

Here in a clearing is a large number of small exposures of Quartzite. Strikes about $N 85^{\circ} E$ Dip 45° to 55° N. It is about the top of a large low knob

19200 240 N 1830 W SE 19-47-27

Another exposure of Quartzite having apparently
the same strike and dip

1920 1700 N 1840 W 19 - 47 - 27

Here are several exposures sticking up
some six or eight ft above the ground
some 20 ft long having the same strike
and dip, a little N of E, and dip about
50° N. This ^{in part} is ~~part~~ coarser like granitic sandstone

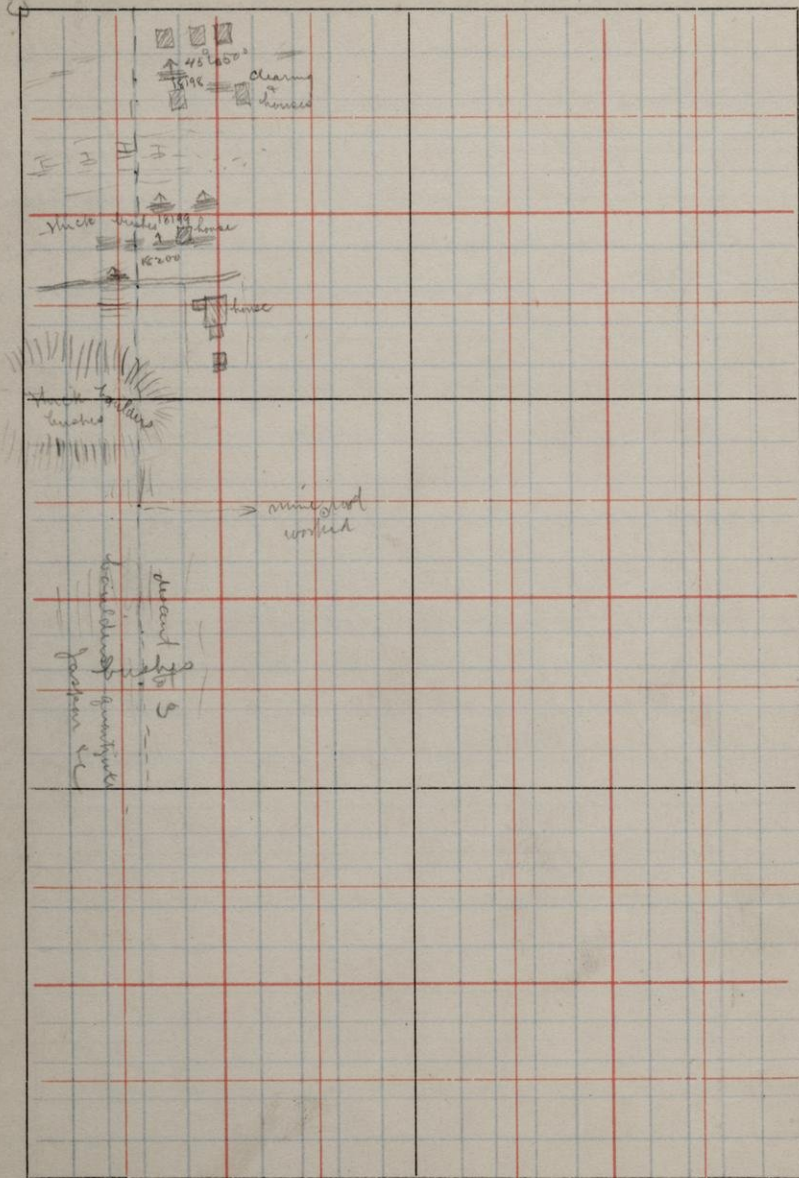
At 1645 N 1850 W is a small exposure, probably in place, of the Quartzite

NW $\frac{1}{4}$ 19 T. 47

92

R.

27

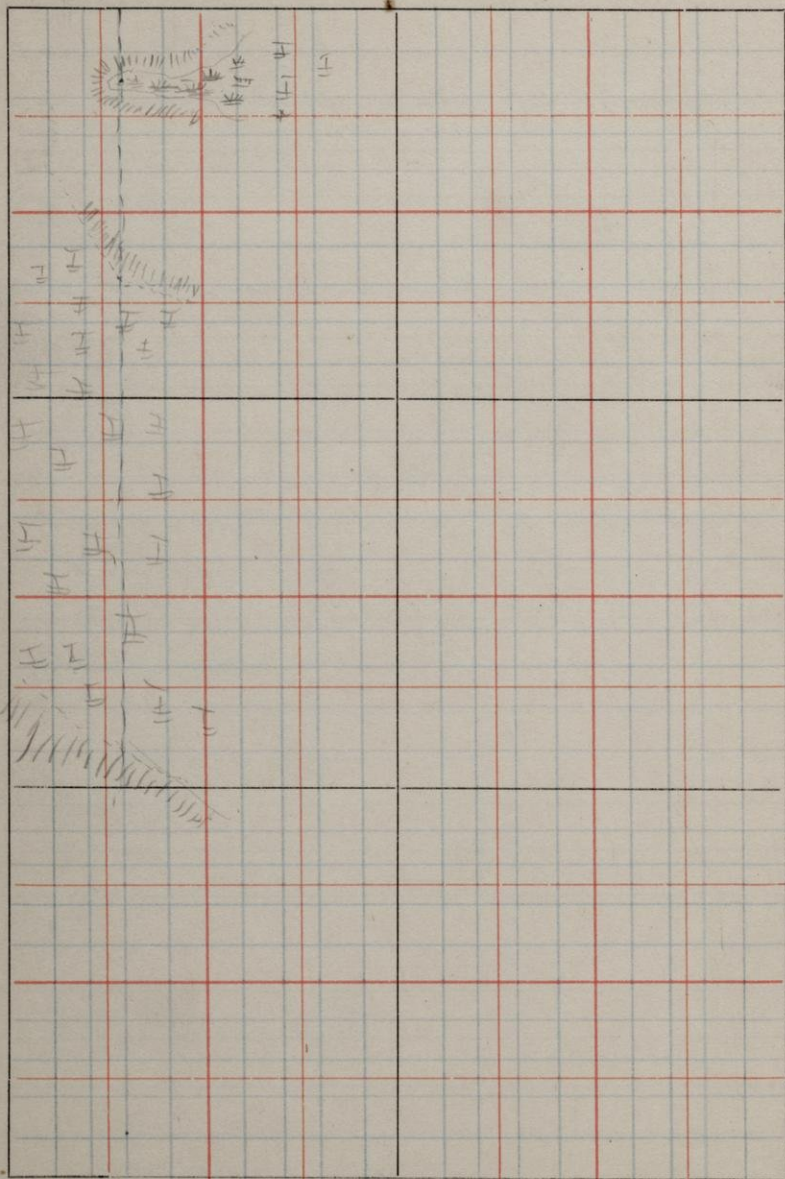


SW³ 19

T. 47

94

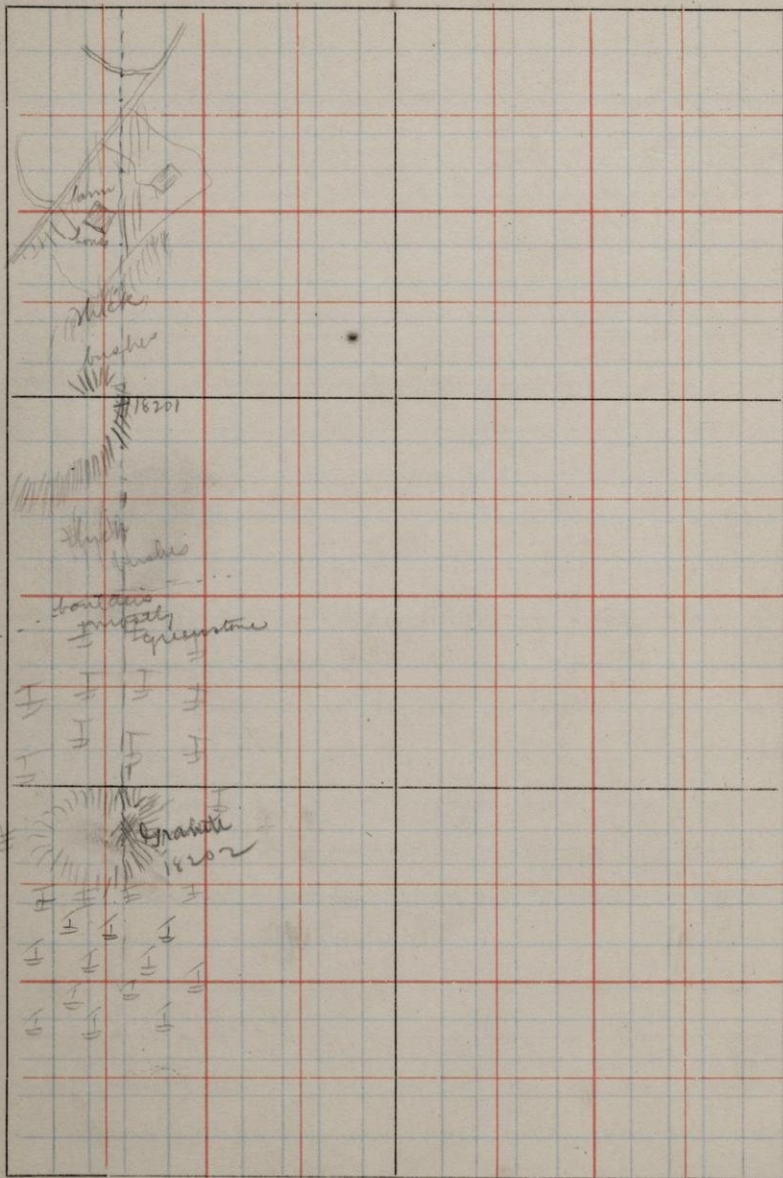
R. 27



NW 1/4 30 T. 47

96

R. 27



✓ 19202 N 1490 W 1850 SE 30-47-27
 limestone in a small exposure on
 south east side of bluff. The slope
 is steep here. Perhaps not in place
 though appearing like a ledge.

✓ 19203 N 946 W 1850 SE 30-47-27
 ls. in small exposure on low
 knob. Some 200 or 300 ft. S
 further across a small patch of swamp
 is a ridge running approx. E+W with
 white granite cliffs on the N side with
 abrupt slopes. There is also a small
 exposure between this and the cliffs.

NE $\frac{1}{4}$ 18

T. 47

98

R. 27

D. S. S. + A Ry
|||||

The runs pages (98-106) were to be on the lines 850 and 350 N in sec's 18, 19, & 30. We run south from 1089 N in sec 18 to 410 N Sec 30. Then run E 500 steps and started north, not having been able to find a corner to check on. At 1500 N sec 30 we found we were 250 steps too far west, set over that distance, and run on north, coming out at 1445 N Sec 19 175 steps too far East.

S E

18

T.

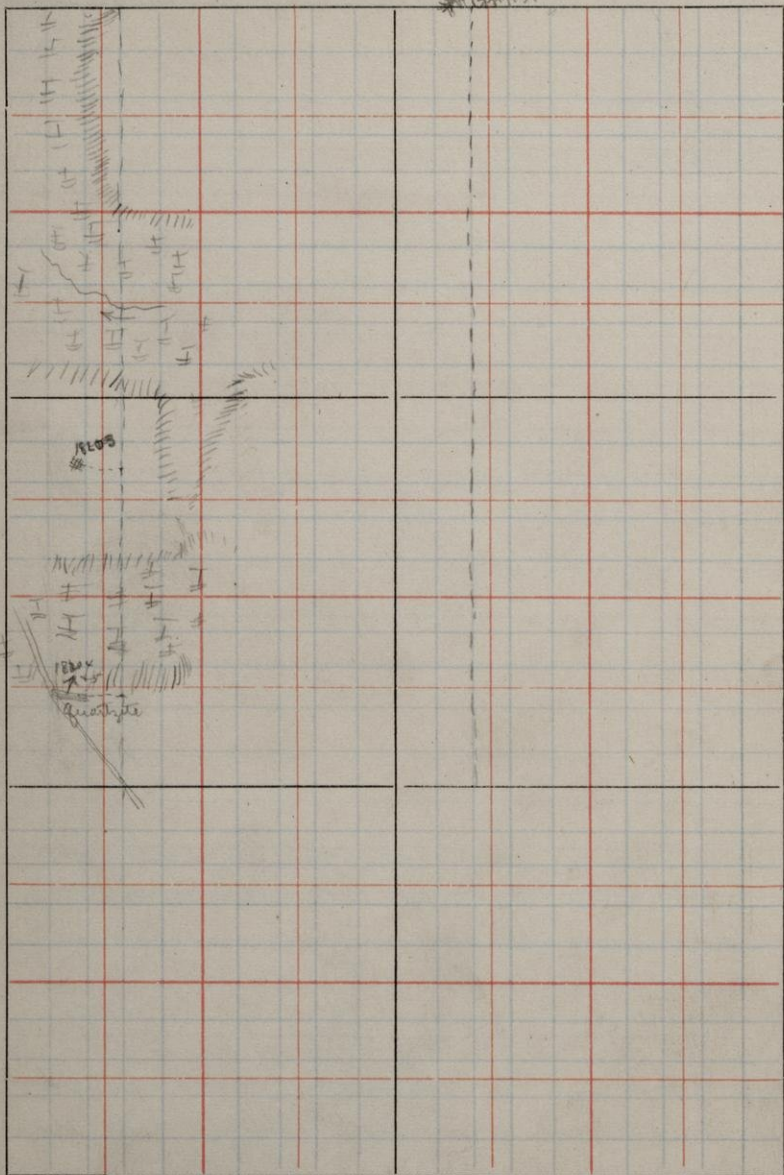
47

100

R.

27

* Garnet



✓ 18204 N 418 W 905 SE 18-47-27

A small low outcrop of greenstone I
think in place

✓ 19205 N 115 W 905 SE 18-47-27

A low exposure of Quartzite strike
N 80° to 85° W Dip about 71° N

This specimen is from the finest
grained part of the ledge which shows
fine red bands or streaks

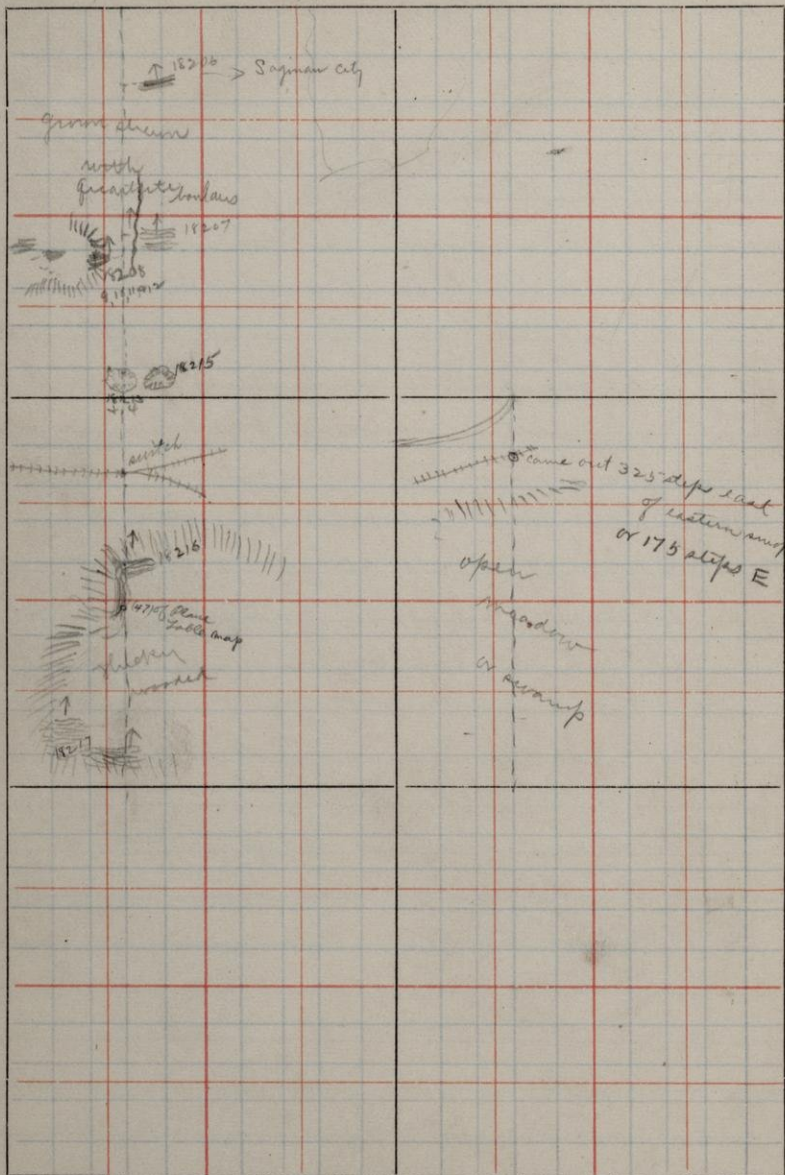
✓ 19206 N 115 W 925 SE 18-47-27

From same ledge in a layer two
or three ft. south of that from which
18204 was taken

✓ 19207 N 1915 W 815 SE 19-47-27

Quartzite strike N 85° E Dip 55° N
An exposure about 40 ft long the
north layers are somewhat shaly and
colored red gray & brown

NE $\frac{1}{4}$ 19 T. 47 102 R. 27

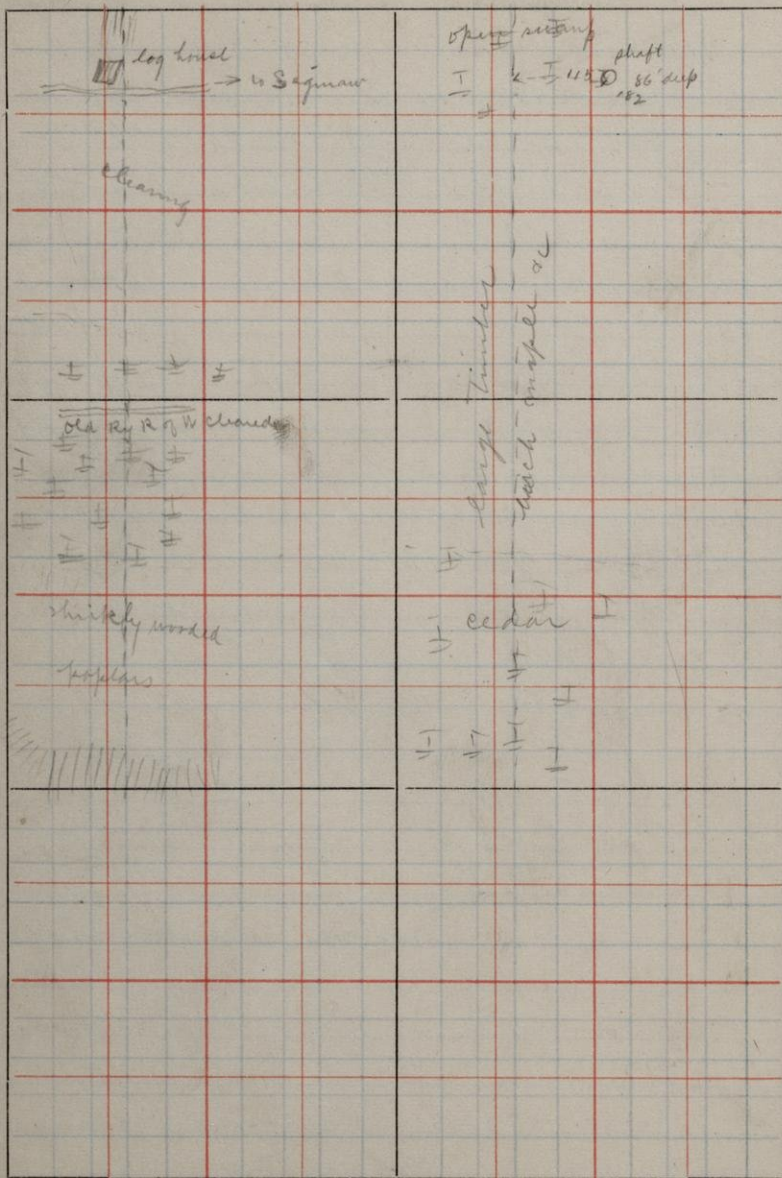


- ✓ 19208 N 1725 W 815 SE 19-47-27
A ledge of quartzite, strike nearly E & W or N 85 to 90 W Dip 56° N
This weathers quite dark, and verges towards granitic sandstone in texture
- ✓ 19209 N 1695 W 880 SE 19-47-27
- ✓ 19210 A knob of jasper conglomerate
- ✓ 19211 The strike and dip are not easily
- ✓ 19212 seen but I think the strike is
- ✓ 19213 nearly E & N and the dip quite high about 75° to the north.
Some of the pebbles enclosed show layers or laminae of their own. The knob is about 20' high and runs to the west from this point
- ✓ 19214 N 1550 W 850 SE 19-47-27
One from excavation at Saginaw not now worked
- ✓ 19215 From same excavation very near 19213
Are conglomerate. The strike of these seems to be approx E & W and dip 35° or 40° N
There seems to be soft or earthy, or in the bottom of these excavations dipping about the same. The jasper conglomerate forms the largest part of exposed surface

SE 1/4 19 T. 47

104

R. 27



It is more banded but otherwise similar to specimens taken

✓ 19216 N 1550 W 800 SE 19-47-27

Dike rock from the opening just east of last. Two dikes noticed are nearly vertical, 2 to 4 ft thick

✓ 19217 N 1300 W 850 SE 19-47-27

Probably belongs with the slates. A banded or finely bedded rock very much contorted. At 1300 N, it has a strike about E & W with dip 55° N. a few steps W it turns south and runs irregularly N & S for some 50 or 75 steps south a dip to the W of about 50°

It is on the NW side of large high bluff very near top

✓ 19218 N 1050 W 940 SE 19-47-27

Another quite large outcrop of the rock similar to 18216 here on the SW base of the bluff 100' or more above country directly to the south. It is also much contorted here striking both a little S & N of W on different places. The dip is to the North from 50° to 70°

At 1025 N 1850 W is another large outcrop of the same

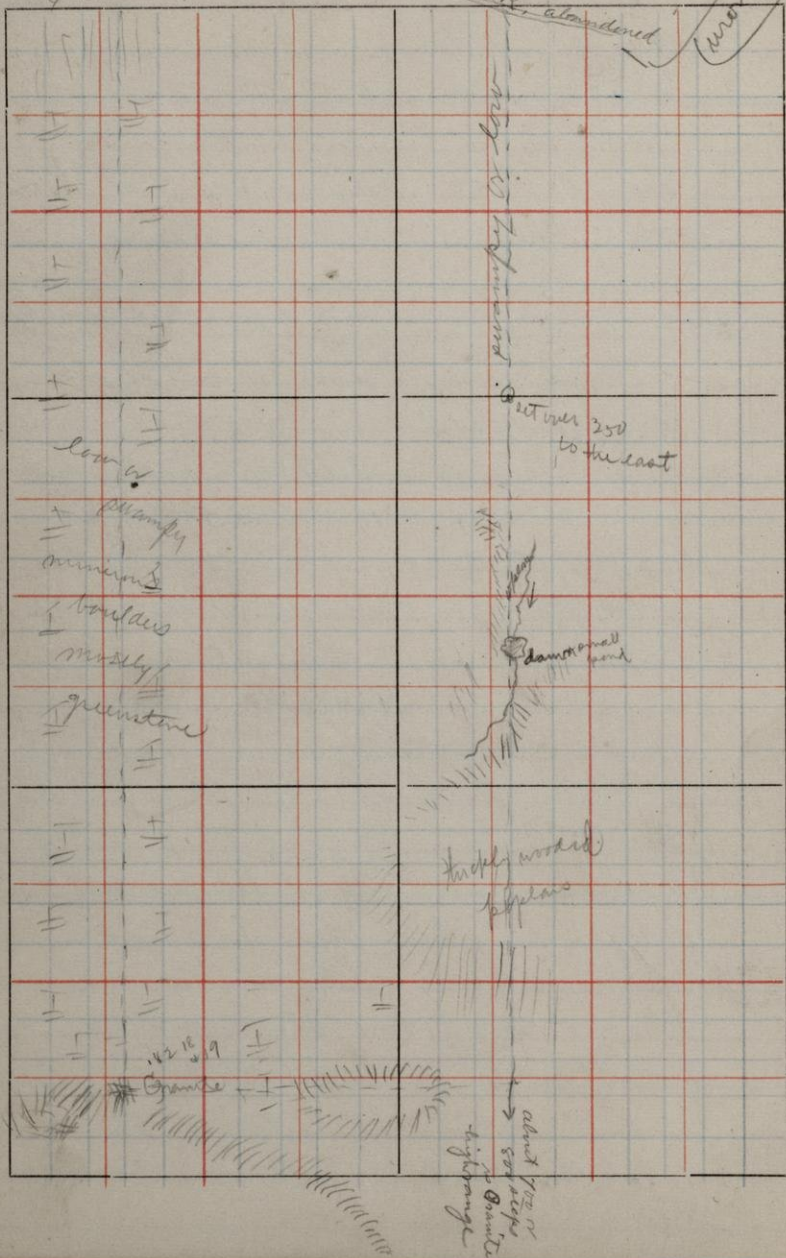
NE $\frac{1}{4}$ 30

T. 47

R. 27

R. abandoned

Cure of Glen



- ✓ 19219 N 610 W 850 SE. 30-47-27
Granite in small exposure in bank of very small stream, abrupt slope to North. There is another exposure S. W. from here about 100 steps on brow of bluff, an outcrop to the east about 50 steps and one about 15 steps S.
- ✓ 19220 from same ledge showing dark colored portion probably part of or near a vein or dike
- ✓ 19221 N 920 W 235 SE 19-47-27
Ore from shaft newly opened, about 86 ft deep
- ✓ 19222 N 1000, W 425 SE 18. 47-27
Greenstone, Ledge 30 steps N & S, 5 or 6 steps N & S, on east edge of bluff

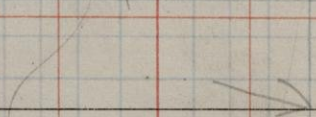
T.

108

R.

$$\begin{array}{r} 4130 \\ 33 \end{array}$$
$$\begin{array}{r} 1157 \\ 38 \end{array}$$

Part II



On Sheet 1 (Small map of Stranville)

Plane Table SW 1/4 18. 47 - 27

- pt b2 72' -15° at E end of bluff
c3 180 -20
d8 152 -11
e5 78' +5° greenstone at N edge of ledge
On high exposure, 12' wide
red 3' from S side. In
direction of line 40' Rod
10' from end towards inst.
rock dips north about 50°
Strike on line
f5 82' Strike exactly on line, 8' W of the
N. end of ledge
Dip N.W. about 40°
g7 118 End of ledge / far
ledge is just a little longer
in direction of strike than the
direction measured
h8 point of 2nd setting
i9 92 19° S. edge of cliff is 5' south of
pt i
j 210 40° 20' Greenstone
k 330 45' slate (set up)
l 23' 6' below k contact gneiss & slate
m 74 -10° greenstone W end of where
j was located
general strike at k on line
between
n 14 122 -104° slate
o 15 34' -00 Little of contact
p 16 460 12° pt back of A tent in camp
q 17 65' 00 pt of contact
r 18 106 +20° 10' very edge of cliff and contact pt
s 19 500 8° 57' highest pt greenstone
T 21 102 10° E end of large gneiss ledge
u 21 50' 00 From this pt to + shows a
ledge about 10' wide
v 23 10' -20° ledge 65' E + W
w 90' -90 edge of gneiss
x 24 100' west end of ledge
Edge of cliff 15' south

- (11) 2566' 00° set up
- 226 125' +6°15' E end of ledge little gully bet. it & up along edge of ledge
- 1127 230 +9°30' Set up
- 221 350 +6° E end of crest
- 1324 114 -5°45' S edge bluff
- 1431 66 28' from 2 is 3 edge bluff
- 1531 104' 2°+10' S W cor bluff
- 1632 68' here is an abrupt descent of probably 100' Wedge of bluff. Breaks away abruptly for quite ans. of ft. encloses small round sharp angle
- 1733 60' N. edge 20' from 2
- 25' wide and runs E & W for about 20 ft
- 1834 656' NW cor.
- 1935 295' -14° Hat of small ledge just congl about 20' in diameter
- 11036 385 S W cor. Limestone ledge is about 60' wide
- 11137 222 +2° 16' S. edge of slate, foot of slope
- 11238 162 Limestone conglom. 20' long in line 9 & 12
- 11339 220 +10° About half way down slope on S E corner of bluff. Slate in place
- 1440 115 +4° from 14 to 10) 290 -4½
- 1541 86 +2½° +4 109
- 1642 114 -11½° Greenstone -23 82
- 1743 108 -3½° -6 99
- 1844 217 +16½° +36 141
- 1945 130 -2° Greenstone high knob. -5 95
- 2046 500' -1½° +7ft bluff of slate east
- (21) 47 850 -4½° +5 -20 80
- 2248 156 +4½° -67 33
- 2349 144 Top of highest pt. bump 20 = 80 +12 92
- (11) 2450 448 -1½° Centost -10 70

$$\begin{array}{r}
 174 \\
 220 \\
 \hline
 3948 \\
 341 \\
 \hline
 8828
 \end{array}$$

$$\begin{array}{r}
 41293 \\
 74 \\
 \hline
 \end{array}$$

2) *Sketch* Plane Table Saginaw July 7 1891

Sta A N.S. & S Δ Sta

Diff Elev

(1)	47'	0°	(-9)	1670	
(2)	70'	9° below A	(+10)	1680	N. of S edge of bluff
B (3)	990'	+36'	(-7)	1680	Top (red mark) Greenstone ledge
(4)	48'	7° below A	(-8)	1683	Gravel conglomer. just beyond ridge of 1:1, 705
(5)	86'	6 1/2° " "	(-8)	1664	Great S. slope of bluff
(6)	98'	-(4° 40' + 6 1/2°)	(-14)	1656	
(7)	218'	-(5° 55' + 7')	-21	1649	
(8)	660 ft	-7° 32'	-86	1584	
(9)	765 ft	-(5° 40' + 4 ft)	-78	1572	
(10)	725'	-(5° 36' + 4 1/2 ft)	-80	1590	
(11)	1260	-(2° 24' + 5 ft)	-36	1614	
(12)	1380	-(1° 26' + 3 ft)	-38	1632	
(C) (13)	1290	-(2° 52' + 5 1/2 ft)	-70	1600	Edge on plain right Kink N.E. 2 mi. back S. of cliff base nearly on line
(14)	520	-(9° 51')	-84	1592	Just past 10-15 ft above valley
(15)	810	-3°	-43	1637	Just pit side of bluff
(16)	645	-5°	-56	1624	Ledge on side of bluff
(17)	695	-4° 55'	-57	1621	
(18)	675	-5° 23'	-63	1617	
(19)	925	-2° 55'	-47	1633	Ledge at E point of bluff
(20)	960	-5° 6'	-85	1595	" " E point of bluff
(21)	143	0°		1600	
D (22)	518	0°		1600	
E (23)	404	-1°	-7	1593	Ledge
(24)	274	-(3° 45' + 3 ft)	-30	1570	at W edge of excavation
(25)	350	-(5° 17')	-32	1568	" Super " "
(26)	1340	+(20' + 2 ft)	+10	1610	E end bluff Oct. schist
(27)	1260	+1° 30'	+33	1633	
(28)	390	0°		1593	E end pit
(29)	260	-(3° 45')	-17	1576	
(30)	360	-4 1/2°	-25	1568	
(31)	310	-4° 15'	-23	1570	
(32)	180	-5°	-16	1577	
(33)	440	-4°	-30	1563	Sharp bend NW "NE" line
(34)	735	-2° 54'	-37	1556	Corner SW of NE cor of Sec 19
(35)	68	-9° 15'	(-10) 1553		E end large shaft
(36)	168	-4 1/2° - 5'	-15	1557	Gravel conglomer. ledge about 100' long

7798
141

15 10
5 15
5 55

15 10
5 38
7 32

15 10
5 38
5 40

7683
993

215
31

7663
947

15 10
12 46
2 24

7625
132

7665
1087

15 10
12 18
2 52
14 58
43 9
45 51

15 10
13 44
1 26

7725
1037

77520
745
7635
45

7810
1017

7960
137

14 52
4 32
5 19

7910
74

15 10
5 25
5 45

7) 1340
191

1260

235

71240
191

7260
97

7860
51

2181
26

63

(2)

E=1593

- (37) 218 -30 (-11) 1582 small ledge conglomer.
 (38) 440 -3° 27' (-26) 1567 " " St₃
 (39) 780 -3 20 (-44) 1549
 (40) 9120 -2 30 -49 1544
 (41) 970 -1° 52' -31 1562

Fancine 252 20 -9 1584

F) (42) 805 -2045 -38 (1555)

(43) 140 " Edge of pit E. end

(44) 202 " "

(45) 182 " " W end

G (46) 337 1560 west side round pit

199

125 + (3 1/2°) +7 (1567)

80

(47) 785 +6° (+72) 1632 S. side of high bluff near top

(48) 385 -30° (-2) 1558 W. End

(49) 400 +1° 10' (+8) 1568

(50) 330 +1° (+6) 1566

H (51) 2080 ft +2° 12' (+50) 1640 Endrich mine 1640.

(52) 152ft edge of dike } N contact of dike

(53) 58ft " " " }

78

55

88. West end Pit 10' wide

(54) 130' S. edge of bluff and ledge

(55) 136ft contact bet. Cong. & underlying chert of spar.

(56) 18ft " " "

(57) 100 S. edge of W end of pit & contact. and S. edge of pit

Pit is 15' longer in same line

(58) 138 (-50) 1568 cor pit near old shaft Congl.

(59) 100ft (-50ft) N edge pit Congl.

160 135 NE side pit (or cor) N Congl.

(60) 190 N. side pit more Congl.

(62) 385 (-52°) (34) 1604 Congl.

(63) 445 (-5 1/2°) (-40) 1596

(64) 475 (-40) (-33) 1601 NW 25 paces

(65) 560 (-40) (-38) 1602

$$\begin{array}{r} 7970 \\ 139 \\ \hline \end{array}$$

$$\begin{array}{r} 21120 \\ 160 \\ \hline \end{array}$$

$$\begin{array}{r} 71337 \\ 48 \\ \hline \end{array}$$

$$\begin{array}{r} 1640 \\ 80 \\ \hline 560 \end{array}$$

- (66) 670 -2° 15' (26) ¹⁶¹⁴ side small bluff opposite
- (I) (67) 760 -2° 10' (28) ¹⁶¹²
- (68) 795 -3° 46' (50) ¹⁵⁶⁰ Quartzite ^{cliffs}
- Ledge 160 E 130 S of (67)
- Congl. on 30.3
- (69) 246 center of road
- (70) 460 Road
- (71) 685 "
- (72) 905 "
- (73) 280 Ledge fine grained congl. approaching sandstone
- (74) 460 Quartzite c 30' north
- (75) 2400
- (76) 265 + 1 1/2° (7) Quartzite
- (77) 270
- (78) 128 E end narrow qtz. ledge
- (79) 265 W " " "
- (80) 114
- (81) 575
- (82) 78 Quartzite ledge
- (83) 450
- (2) (84) 70 Qtz. ledge
- (85) 127 Qtz " 20' NE of (84)

$$\begin{array}{r} 1448 \\ 858 \\ \hline 547 \end{array}$$

$$\begin{array}{r} 7105 \\ 127 \end{array}$$

$$\begin{array}{r} 2160 \\ 653 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 7100 \\ 38 \end{array}$$

$$\begin{array}{r} 727437 \\ 23 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 2117 \\ 102 \end{array}$$

(3)

Plane Table Wanthrop July, 1891

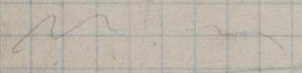
Sta	H			Elev.	Diff. elev.
"	(1)	1310'	50	First set up near road	
"	(2)	1300'	+2°	road	A=1420 Diff
"	(3)	1060	+1° 29'	top bluff	1469 49
"	(4)	910	+2° 24'	"	1447 27 1/2
"	(5)	900	+1° 30'	foot of cliff	1458 38
"	(6)	830	+1° 42'	top bluff	1443 23 1/2
"	(7)	570	+7° 20'	"	1442 22 1/2
"	(8)	640	+8° 26'	Flag sta	1492 72
"	(9)	760	+4° 30'	gap bet.	1513 93
"	(10)	770	+7° 48'	top bluff	1479 59
"	(11)	755	+8°	" "	1523 103 1/2
"	(12)	840	+9° 8'	" " short dist back	1523 103 1/2
"	(13)	710	+6°	halfway down bluff	1551 131 1/2
"	(14)	720	+5° 45'	" " "	1494 74
"	(15)	890	+7° 40'	" " "	1492 72
"	(16)	800	+10°	" " "	1537 117
"	(17)	700	+9° 33'	" " "	1557 137
"	(18)	710	+10°	" " "	1534 114
"	(19)	690	+10° 20'	" " "	1541 121 1/2
"	20	600	+9°	" " "	1540 120
"	(21)	820	+9° 45'	" " "	1522 102
"	(22)	1080	+9° 30'	" " "	1557 137
"	(23)	1000	+8° 30'	" " "	1596 176
"	(24)	800	+4° 44' - 9 ft	vally	1566 146
"	25	940	+9° 40'	Wend bluff	1477 57
"	26	520	+8° 40'	" " "	1375 155 1/2
"	27	735	+7° 51'	" " "	1539 119
"	(28)	785	+9°	" " "	1510 90
"	(29)	810	+9° 30'	" " "	1541 121
"	(30)	875	+9° 57'	" " "	1552 132
"	31	730	+8° 31'	" " "	1570 150
"	32	740	+7° 41'	" " "	1527 107
"	(33)	740	+8° 21'	" " "	1518 98
"	(34)	940	+3° 36'	" " "	1507 81
"	(35)	1100		m slope	1478 58
"	(36)	1090	6° 42'	large	1546 126

Sheet 3

17
23

$$\begin{array}{r} 25 \quad 15 \\ 15 \quad 18 \\ \hline 9 \quad 57 \end{array}$$

2139



(3) 37/ 1240 + 6° 56'
 38 1200 + 6° 45'
 39 1550 + 40° 25'

B = 140/ 1260 + 5° 25'

from 3 to 41 665 + 8° 33'

42 695 + 6° 41'

43 735 + 6° 53'

44 640 + 4° 48'

45 665 + 40° 10'

46 765 + 70

47 840 + 10° 81'

48 1140 3° 38'

49 3° 56'

50 1300 1° 04'

51 1420 - 2°

52 1610 - 3° 12'

53 1340 - 2° 38'

54 - 3°

55 1100 - 4°

56 885 - 3° 50'

57 940 - 4° 30'

58 800 - 5°

59 990 - 5° 50'

60 605 - 5° 49'

A 652 = 61/52 = C + 1° 13'

" " 62 = C 60 60

" " 62 = C 60 60

C 63 845 + 8°

" 64 1580 + 1° 1'

" 65 1500 + 49'

66 1140 - 2° 45'

67 820 - 4° 15'

68 670 - 4° 30'

69 420 - 6° 45'

70 560

71 180 - 4° 47' + 11'

72 150 - 8° 40'

73 200 - 12° 22'

74 290 - 7° 50'

Maximum

1420 3 1543 123

1560 140

1539 119

1537 117

1607 70

14610 73

1624 87

1589 52

1585 48

1630 98

5 1553 16

1609 72

1561 24

1488 49

(c) 1453 84

1475 62

1461 76

1477 60

1464 73

1460 70

1505 32

1475 62

first (c) 1455 + 35

63 = I = 1458 3

1483 28

1477 22

1401 54

1395 60

1403 52

1405 49

1430 25

1432 22

1413 42

1413 42

flag

46 49

8

40' S in creek

lowest pt bottom slope

1440

$$\begin{array}{r} 2739 \\ 1526 \\ \hline 833 \end{array}$$

16.11

12.30

2.45

(C) to length of Alley + 226'
by mine + 57'

flag 12
72 6° 18'

166

$$\begin{array}{r} 13.75 \\ \hline 96 \end{array} \quad \begin{array}{r} 7\frac{1}{2} \\ \hline \end{array}$$

(3)

C=1455

C to	75	360	-40°	1430	-25'
"	76	405	-2°	1440	-15'
"	77	510	+2° 45'	1480	25'
"	78	570	+2°	1475	20
"	79	580	-30	1425	-30
"	80	635			
"	81	700	+3° 42'	1500	45
"	82	830	+10° 20'	1474	
"	83	850	+20° 29'	1492	31
"	84	1000	+70° 15'	1530	125

D=84

D to	85	365	+10°	1581	1 ft
"	86	360	+5° 18'	1612	32
"	87	400	+6°	1622	42
"	88	440	+7°	1633	53
"	89	235	+3° 30'	1594	14
"	90	135	-6° 17'	1567	-13
"	91	300	-90° 39'	1630	-50
"	92	505 453.6	+17° 45' -145'	1435	-145
"	93	435	-11° 25'	1496	-84
"	94	560	+24°	1584	4
"	95	550	+3° 56'	1616	38
"	96	540	+1° 4'	1590	10
"	97	740	+40° 27'	1638	58
"	98	790	+6°	1640	82

from 98 = E to

99	200	-10° 00'	1606	-34
100	330	-7° 30'	1597	-43
101	255	+3° 30'	1655	15
102	50	-3°	1637	-3
103	910	-11° 40'	1460	-180
104	940	-8° 9'	1508	-132
105	1060	-5° 23'	1504	-100
106	1030	-11° 39'	1437	203

F=145

F=1504

D	107	880	0°	1504	
"	108	1240	+2°	1541	37
"	109	990	+4°	1572	68

valley

highest pt birds

F = 1500

from F to 110 890 + 3 1/2°

1558 54

111 840 + 3 1/2°

1555 51

112 910 + 4 1/2°

1571 67

113 900 + 5° 00'

1582 78

114 978 + 6° 5'

1606 102

115 910 + 5° 20'

1583 79

116 630 + 1° 41'

1516 12

117 520 - 4° 16'

1465 - 39

118 610 - 0° 16'

1301 - 3

119 790 + 2° 15'

1535 31

120 775 + 3°

1544 40

G = 121 500 + 1° 52'

1520 16

from F to 122 320 - 1° 30' lower

1496 - 8

123 210 + 4°

1306 2

124 240 - 11° 16' - 4 ft

1466 - 38

125 170 - 2° 15'

1497 - 7

126 65 - (5° + 4 ft)

1494 - 10'

127 100 - 3° 14'

1496 - 6

128 118 - 3°

1498 - 6

129 200 - 3°

1494 - 10

130 118

G = 1520

from G to 139 810 - 9°

1395 - 125

140 125 - (1 1/2° + 4 ft)

1513 - 7

141 495 - 6 1/2°

H = 1500 1465 - 55

from H to 142 785

143 980 + 2°

1534 34

144 1090 + 2° 4' 1484

1539 139

145 35 - 6 1/2°

3 edge bluff Sand 5' north 46

146 800 - 1° 6' 1485

above edge of banded rock 15

edge of bluff N of G 15 ft

147 100 - 4° 1493

near E end top of bluff - 7

148 615 - 10° 1383

1485 - 117

149 54 13 ft below G North drop of about 20' this - 15

sides of the knot all around

are very steep especially to W

+ W just beyond

150 15' below another drop of 20' contact 1485 - 15

(3)

J 2120

K 1200

2120
12001200
2120

H = 1500

another contact

✓	151	40			
	152	190	$-6\frac{1}{2}^\circ = 10\frac{1}{2}^\circ$	1470	-30
	153	225	-80	1469	-31
✓	154	260	$-7\frac{1}{2}^\circ$	1465	-35
H to	138	1450	-40	1398	-102
"	134	2150	-30	1482	-18
	135	1030	-6.35°	1400	-117

flat up limb (low)

63-I = 1458

I = 63	6056	285	-60	1428	-30
"	157	735	-10	1445	-13
"	158	680	-10	1446	-12
"	159	710	$+10.50^\circ$	1481	+23
"	160	360	+20	1476	+20
"	161	635	+30	1491	+38
"	162	720	$+4\frac{1}{2}^\circ$	1514	+36
"	163	640	+40	1501	+43
"	164	800	$+1\frac{1}{2}^\circ$	1481	+23
"	165	735	+38	1466	+8
"	166	805	+10	1472	+14
"	167	975	-25	J = 1400	-7
from 155 = J to	168	305	00		
"	169	410	+small	1405	
"	170	460			
"	171	550	$+2^\circ 30'$	1424	+24
"	172	615	+30	1432	+32
"	173	795	+60	1482	-82
"	174	760	+50	1466	66
"	175	750	about 100	1480	+80
"	176	715	$+3\frac{1}{2}^\circ$	1444	44
"	177	820	$+3\frac{1}{2}^\circ +$	1450	50
"	178	620	+10	1411	+11
"	179	125	-90	1381	-19
"	180	112	-90	1383	-17
"	181	480	-10.50°	1385	-15
"	182	575	-30	1395	-5
"	183	620	00	1400	
"	184	800	+10	1414	+14
"	185	820	$+10.4^\circ$	1415	+15

J = 1400

186	990	+ 2° 20'	1440	+ 40
187	1090	+ 40 3'	1477	+ 77
188	1350	+ 5° 21'	1525	+ 125
189	1380	+ 2 12'	1453	33
190	1360	half way up to flag		
191	1600	+ 20 40'	147K	74
K1 = 192		+ 37' to 52 100' dist	K 1510	55
K4 193	1340	3.36"	1595	85
194	1200	+ 2° 28'	1562	52
195	1210	+ 4°	1594	84
avg. 197 to 52		- 37'		
196	980	+ 1° 6'	1529	19
197	930	00		
198	1100	+ 1° 6'	1531	21
199	1750	+ 2° 20'	1590	70
200	1330			
201	825	- 1° 30'	1484	- 22

A to L + 54'

L (from 191 to 202 flag as on small - right to line from L to 202, 130 - 110)

L = 1480

202	130	- 110	1465	- 15
204	95	- 9 $\frac{1}{2}$ °	1450	- 30
205	180	- 9 $\frac{1}{2}$ °	1455	- 25
206	210	- 7 $\frac{1}{2}$ °	1433	- 47
207	325	- 8 $\frac{1}{4}$ °	1420	- 60
208	980	- 8 $\frac{3}{4}$ °	1462	- 18
209	70	- 15°	1424	- 56
210	320	- 10 $\frac{1}{4}$ °	1467	- 13
211	176	- 4 $\frac{1}{2}$ °	1424	- 56
212	590	- 5 $\frac{1}{2}$ °	1437	- 41
213	675	- 3 $\frac{1}{2}$ °	1433	- 47
214	600	- 4 $\frac{1}{2}$ °	1436	- 42
215	620	- 4°	1424	- 56
216	540	- 6°	1456	- 22
217	995	- 1° 20'	1460	
218	1270	00	1487	
219	1150	00		
220	8250	+ 4° 2'	1568	+ 88
221	785	- 43'	1470	- 10
222	630	- 1° 47'	1460	- 20

Lapse from 1568 + 88

(3) Z to 223, 715 - 26

$Z = 1480$
1475 - 5

224 M - flag

1480

from M to 225 750 - 5°

1415 - 65

226 720 - 3.4'

1441 - 39

227 925 - 1°50'

1450 - 30

N = 228 995 + 15'

1484 + 4.4

from N to 229 1100 - 2°50'

1430 - 54

230 1200 - 2°

1442 - 42

231 1540 - 1°36'

239 x d

1441 - 43

232 960 - 0

1484

233 1045 + 1°20'

1540 26

(3) 234 1200 + 2°

1526 42

continued in Book 4

0.4.6

$$\begin{array}{r} 13 \ 22 \\ 14 \ 46 \\ \hline 37 \end{array}$$

200	24 00
200	25-0
400 00	625 00
	400 00
	10 25 00 (32.0)
	9
60	125
64	128

$$\begin{array}{r} 445 \\ 14375 \\ \hline 9 \end{array}$$

31 32 33 34 35
 6 8 9 10 11 12
 18 17 16 15 14 13
 19 20 21 22 23 24
 30 29 28 27 26 25
 31 32 33 34 35 36
 6 5 4 3 2 1

$$\begin{array}{r} 1200 \\ 2260 \quad 836 \quad 144 \\ 3112 \quad 264 \\ \hline 1480 \quad 1712 \\ 1720 \quad 0136 \\ 1600 \quad 3424 \\ 1560 \quad 3424 \\ \hline 225984 \end{array}$$

$$\begin{array}{r} 2140 \\ 2260 \quad 14 \\ 204 \quad 380 \\ 264 \\ \hline 1160 \\ 1160 \\ \hline 1160 \end{array}$$



500 E
 1216 N

NW 18 47 27

$$\begin{array}{r} 24330 \\ 66 \end{array}$$

$$\begin{array}{r} 1800 \\ 22 \\ \hline 4100 \end{array}$$

$$\begin{array}{r} 284132 \quad 44 \\ 112 \\ \hline 200 \end{array}$$

$$\begin{array}{r} 284548 \quad 19 \\ 27 \\ \hline 248 \\ 2 \end{array}$$

$$\begin{array}{r} 618 \\ 4,00 \\ \hline 218 \end{array} \quad 215 \quad 3$$

$$(2) \quad 625 \quad 619 \quad 6$$

$$(3) \quad 1085 \rightarrow 1075 \quad 10$$

