



LIBRARIES

UNIVERSITY OF WISCONSIN-MADISON

Felch Mountain District, Penokee-Gogebic Region Michigan: [specimens] 14001-14161. No. 67 August and September, 1887

Merriam, W. N.

[s.l.]: [s.n.], August and September, 1887

<https://digital.library.wisc.edu/1711.dl/3TD5AGKPEPVA78P>

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

For information on re-use see:

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

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

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

U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

No. 67.
August and September, 1887.

Felch Mountain Country

W. A. Merriam.

14001 - 14161

Survey of the Pre-Cambrian Rocks of the N. W. States.

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 figure attached, showing the amount and inclination of the dip. Denote slaty or other very plainly bedded rocks by lines running in the direction of the strike, with figures and a dip arrow attached as before. In all cases where there is the least doubt about the true bedding directions, 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 line as 100 paces, and twenty of these spaces as 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.

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.

3. The ruling of the left hand page is also arranged so that a smaller scale can be used. Each one of the black lines may represent a section line and the red lines quarter sections and "forties." The scale of the maps may thus be reduced, if desirable, to two inches to the mile (the ordinary town plat scale.)

4. Collect a specimen from each separate ledge of rock, or wherever there is a change of rock on any one ledge. In case of trips made on foot or in canoes, for long distances, neighboring ledges, unquestionably of one kind of rock, need not be sampled, the position and extent of the ledge being marked on the map, with a note that it is of a rock identical with specimen so-and-so. Under the same conditions small sized samples, trimmed to a uniform size of $2\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$ 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 § 3, chapter IV, p. 44, Regulations of the U. S. Geological Survey. In all cases collect chips for slicing. All specimens are to have numbers painted on them, in white on a black background, in the field.

5. 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., etc.

6. Forward this note book, as soon as filled, as registered mail matter, to R. D. IRVING, U. S. Geologist, Madison, Wis.

#67

2 jars Metro	to Regaunee	840
1 " " "	" Escanaba	<u>170</u>

14000 has to be added to the numbers
at present on the hand specimens to correspond
to the numbers in the book

Legend

\square \square - Hardwood	{ Maple, Birch, Ironwood
\square \square - swamp	{ with scattering Pine & Hamlock
\square \square - marsh	{ Cedar & Tamarack
* * Pine etc	{ Pine (white and Norway) with Hamlock and some Birch
v v	{ Old windfall burnt and covered with thick second growth in most places
\square \square - low ground	{ Hamlock, Ash, Balsam white Birch.

Herbert Armstrong
Iron Mountain
Mich

Write to for location and notes as to
diamond drill holes

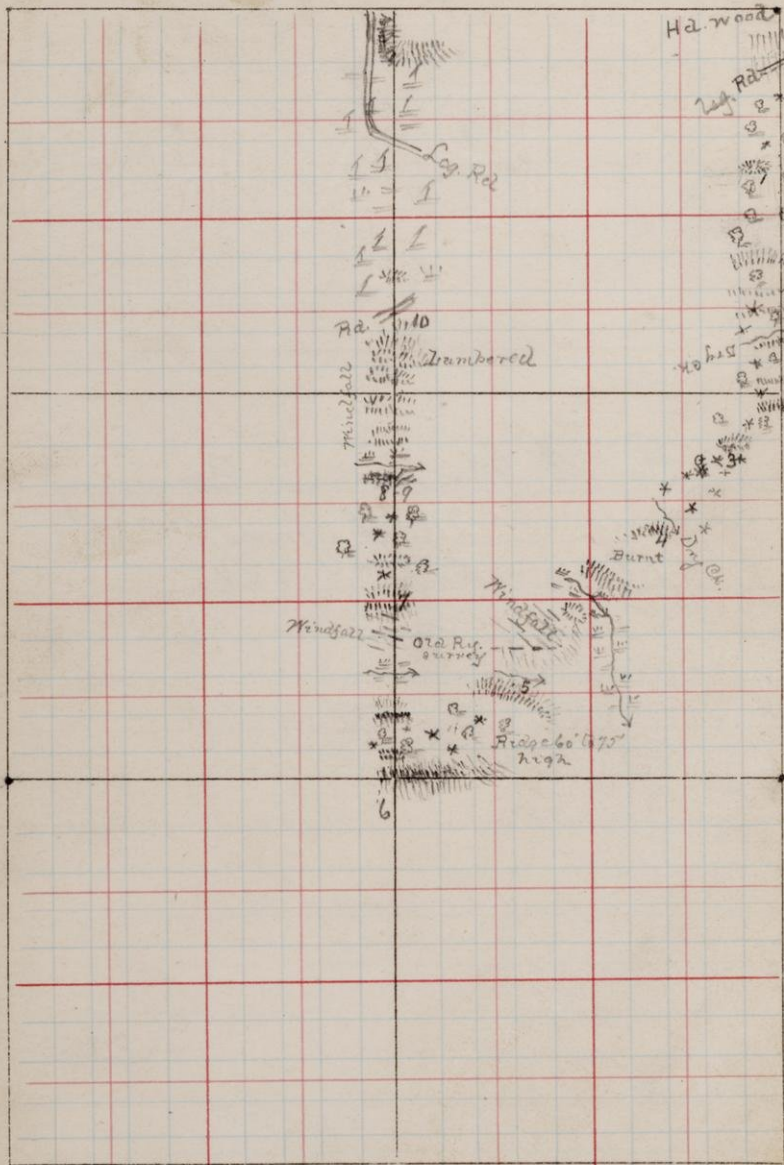
Capt. S. J. Curry
Chickering
Mich
for diamond drill holes near Metropolitan

Felch Mountain Country
Michigan
Aug & Sept. 1887

T. 41

R. 30

Sec. 2.

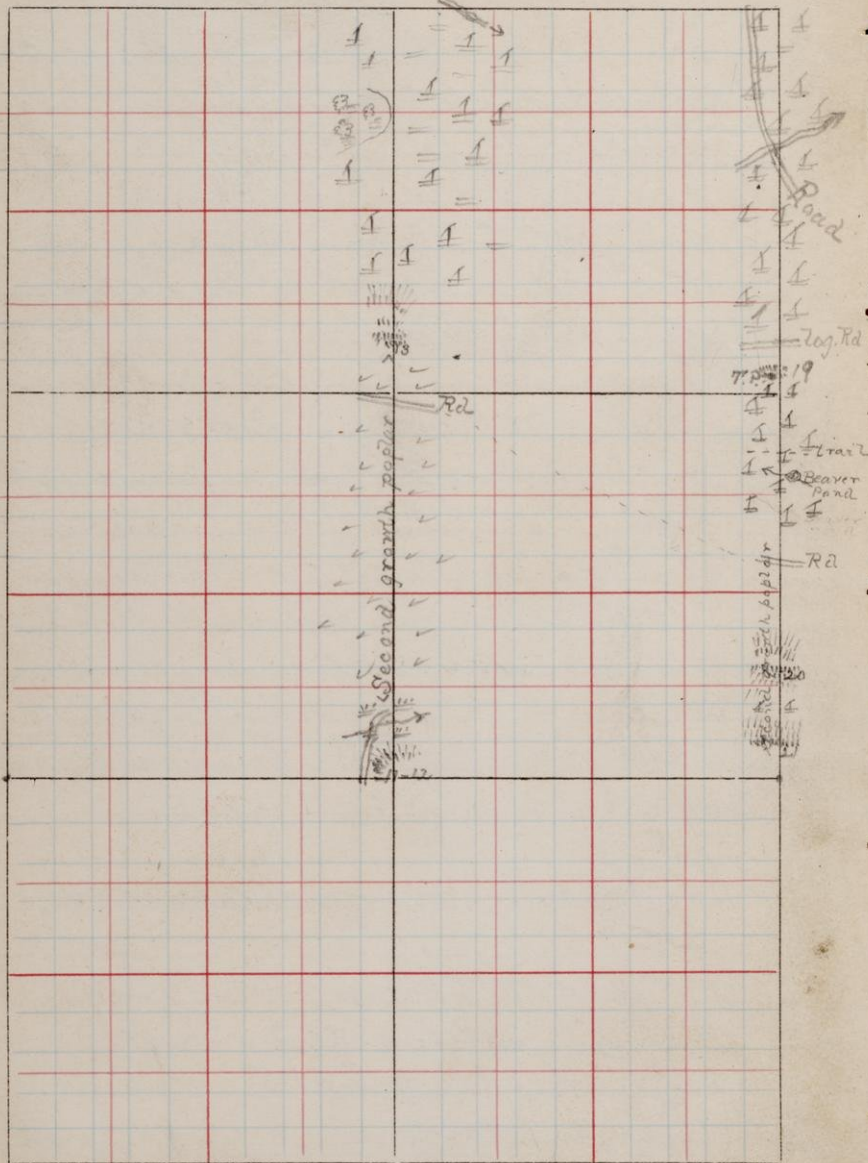


- 1
- 1 1620 N. 20 N. S.E. corner Sec 2-41-30
14001 a small knob of granite, rising a few feet above the general surface, mostly covered.
- 1370 N. 0 N. S.E. corner Sec 2-41-30
the granite is exposed on the north side of a low ridge
- 2 1185 N. 0 N. S.E. corner Sec. 2-41-30
14002 on the north side of an exposure of gneiss or granite. These ridges run about east and west as near as can be determined and are mostly covered.
- 3 900 N. 100 N. S.E. corner Sec. 2-41-30
14003 a knob of mica schist or gneiss with granitic veins
- 14004 650 N. 300 N. S.E. corner Sec. 2-41-30
- 5 275 N. 750 N. S.E. corner Sec 2-41-30
14005 From the north side of a hill 30 or 40 feet high. Much tumbled down in large blocks, and covered with moss and leaves

T. 42

R. 30

Sec. 35



6 07, 1000 N. S. E. corner Sec. 2-41-30
 14006 From a small exposure of Gneiss on the top of ridge. All the way across this section the granite- or gneiss shows in place or in large angular fragments. The surface is so covered that but a small percentage of the rock shows, although ^{it is} evident enough that it is very near the surface.

7 500 N. 1000 N. S. E. corner Sec 2-41-30
 14007 Light gray gneiss; banding irregularly in a N. 30° E. direction

8-9 840 N. 1000 N. S. E. corner Sec 2-41-30
 14008 Most of the ledge is made up of
 14009 the reddish gneiss; The dark portion appears to be in a nests

10 1230 N. 1000 N. S. E. corner Sec 2-41-30
 14010 From the creek near 899 the surface is very rough large fragments and ledges being crossed continuously

11 3000 N. 1100 N. S. E. corner Sec 2-41-30
 14011 A mica gneiss or quartzite which is

The specimen is from a west face of a bluff 50 to 75 feet high and is about an average specimen of the rock, although, in places, it is very coarse grained (probably vein)

The rock appears to pass from a mica schist or gneiss into a quartzite and in places into nearly a sandstone. Is the rock fragmental, and does it belong with the quartzites?
Dip 40 to 45° to the N.

14072 A more sandy phase of the rock

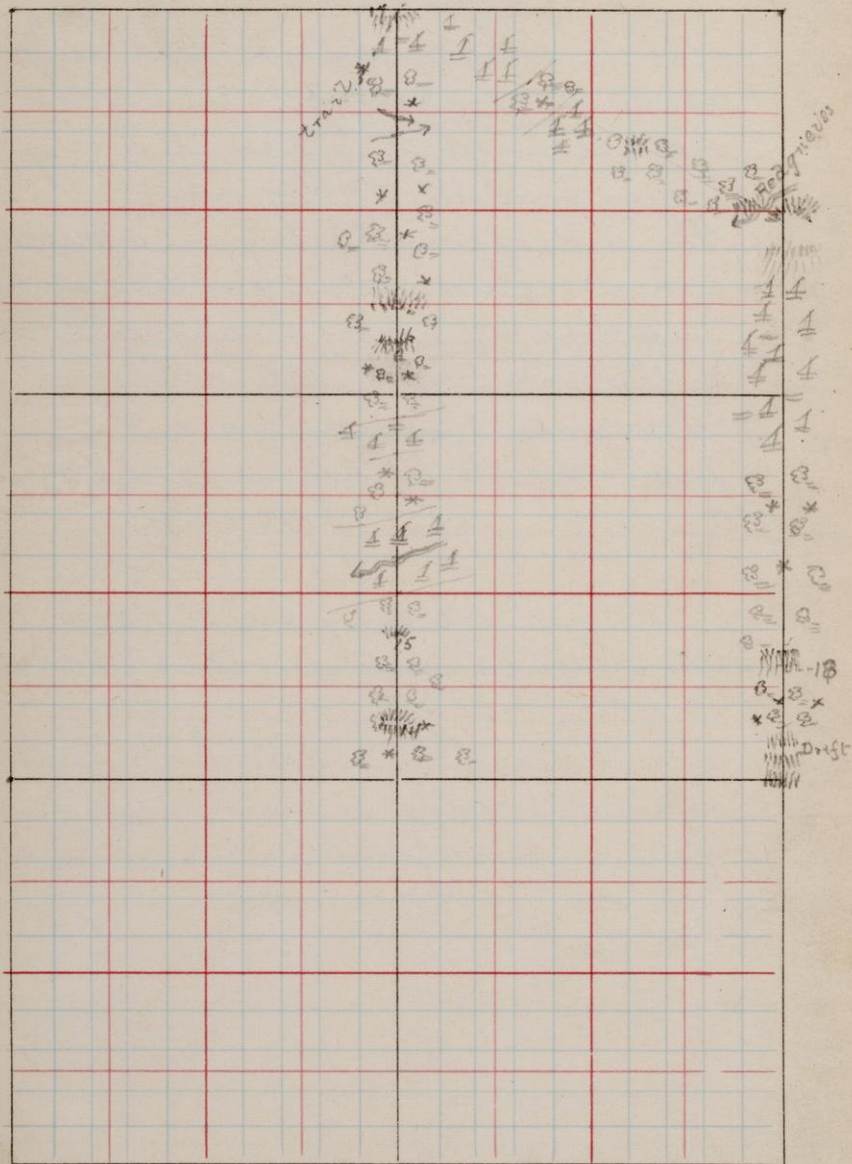
13 1150 N. 1000 N. S.E. corner Sec 35-42-30

14073 A low ledge of limestone(?) only a few yds. in extent - Weathers to a very rough surface due to the weathering out of what appears to be feldspar crystals. About ten paces farther north is another ledge about 25 paces long. Strike N. 42 E. Dip 65° N.

T. 42

R. 30

Sec 23



14 135 N. 1000 N. S. E. corner Sec. 23-42-30

14014 Gneiss from a small knob 20 or 30 feet high striking about E. 7 N. (30° N. of E. Mag.) (no sun)

15 400 N. 1000 N. S. E. corner Sec 23-42-30

14015 A very coarse grained muscovite granitic showing over an area of but a few yds.

16 1150 N. 1000 N. S. E. corner Sec 23-42-30

14016 A reddish gneiss is exposed in the south face of a small ridge for 10 or 15 faces. The same rock is exposed at intervals along the top and again on the north side of this ridge 1300 faces N. of sec. line

17 2000 N. 1080 N. S. E. corner Sec 23-42-30

14017 A knob of granitic similar to the last

1700 N. and 400 N. S. E. corner Sec 23 is another small knob of this reddish gneiss only 7 or 8 yds. in extent

18 350 N. 00 N. S. E. corner Sec 22-42-30

14018 An exposure of grey gneiss on the south slope of a low ridge. Some of the red gneiss seen $\frac{1}{2}$ mile west shows here in places but all the rock is so covered as not to be easily seen. Only about 15 steps wide.

1600 N. 100 N. S. E. corner Sec 26-42-30

an old shaft nearly full of water was seen from the fragments it would appear that the only rock they struck was a mica schist; and from the material thrown out it is doubtful if this was in situ.

19 1075 N. 00 N. S. E. corner Sec 35-42-30

14019 is an exposure in a narrow ridge, in the swamp, about 75 to 100 feet long. The rock is a dark colored mottled granitoid.

Strike E. 3° S. Dip 50° N.

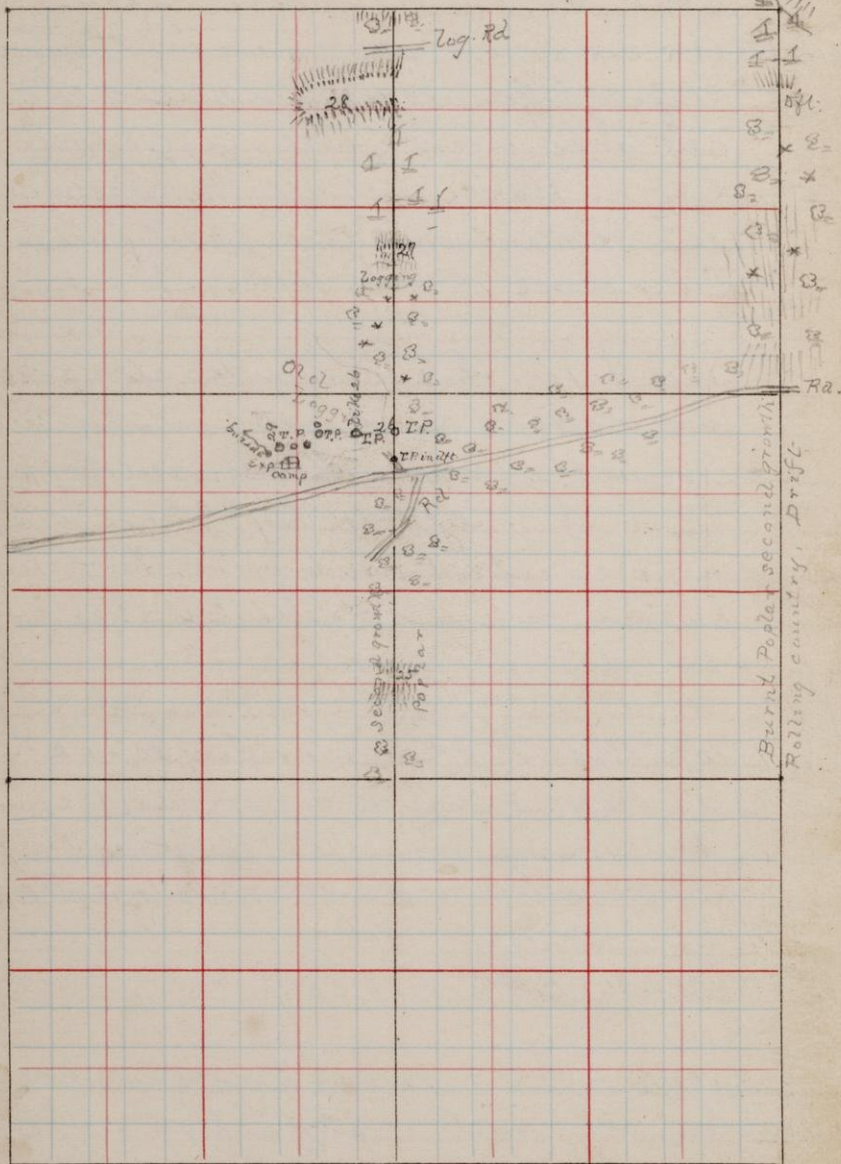
20 280 N. 00 N. S. E. corner Sec 35-42-30

14020 From the south slope of a high ridge running E+W. (mag. sun low). The rock

T. 42

R. 30

Sec 36



Burnt Poplar second growth
Rolling country, Drift

appears to be dipping into the hill or to the north

21 75 N. 00 N. of S.E. corner Sec 35-42-30

14021 a white quartzite is exposed in the north face and on top of a high bluff (one of the highest in this section) It shows on the surface the sparkling facets and looks on the whole very much like some of the Nebish and Dakota Plz.

22 00 N. 1980 N. S.E. corner 36-42-30

14022 A white quartzite exposed over an area of about 50 yds
Strike N. 10° S. Mag. Dip 80° to N.

23 1465 N. 00 N. S.E. corner Sec 1-41-30

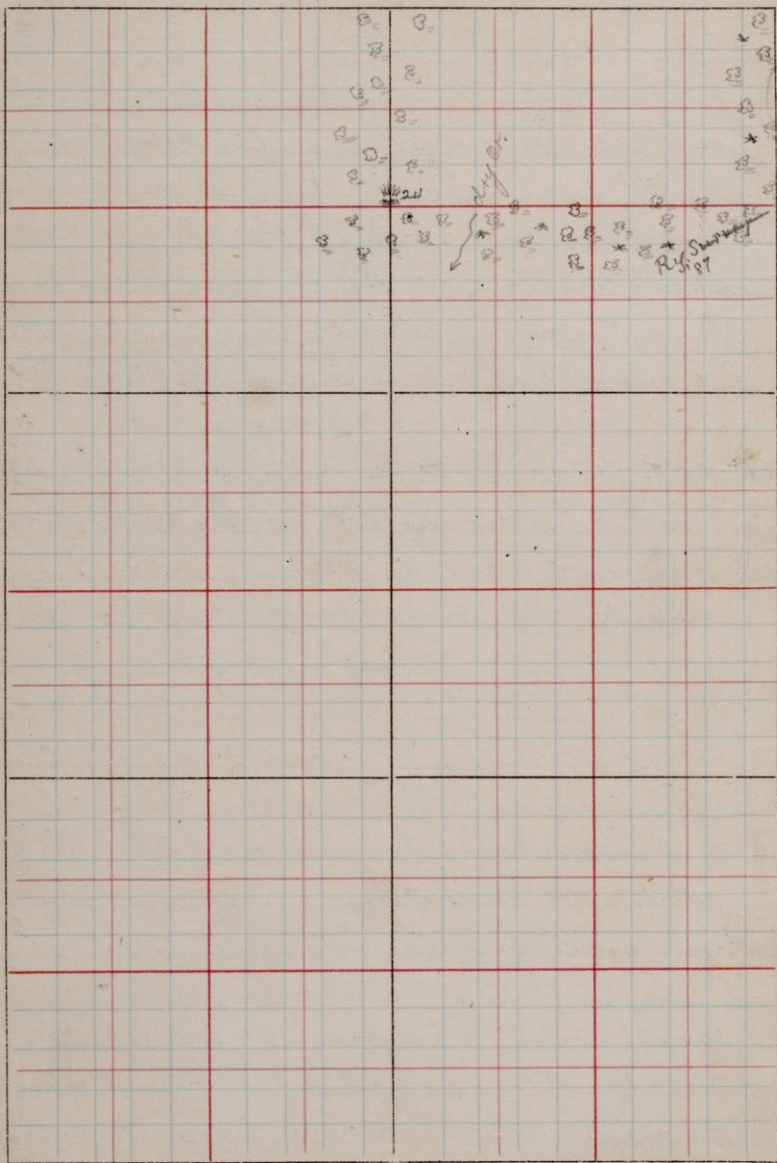
14023 a small ledge of granite a few feet east of line The ledge rises but very little above the surface of the ground
1465 N. 575 N the granite shows again in large angular fragments

24 1540 N. 1000 N. S.E. corner Sec 1-41-30

14024 a ledge of mica schist or gneiss about 20 steps wide and 50 long running E. & W. and with a dip of 55 to 30 N.

T. 41

R. 30 Sec 1



25 300 N. 1000 N. S. E. corner Sec 36-42-30

14025 the quartzite is exposed in the top of a high ridge small showing
Strike E. 18° N. Dip high to N. 121

26 900 N. 1000 N. S. E. corner Sec. 36-42-30

14026 Lean banded ore from the bottom of test Pit about 20 feet deep The rock shows about 10 or 12 feet in the bottom

27 1375 N. 1000 N. S. E. corner Sec 36-42-30

14027 a limestone is exposed on the north face of a ridge A few quartz veins were noted
Ledge was small but dips apparently about 15° to the S. of N.

1700 N. 1000 N. S. E. corner Sec 36-42-30

a large ridge of limestone 200 paces wide was crossed The specimen

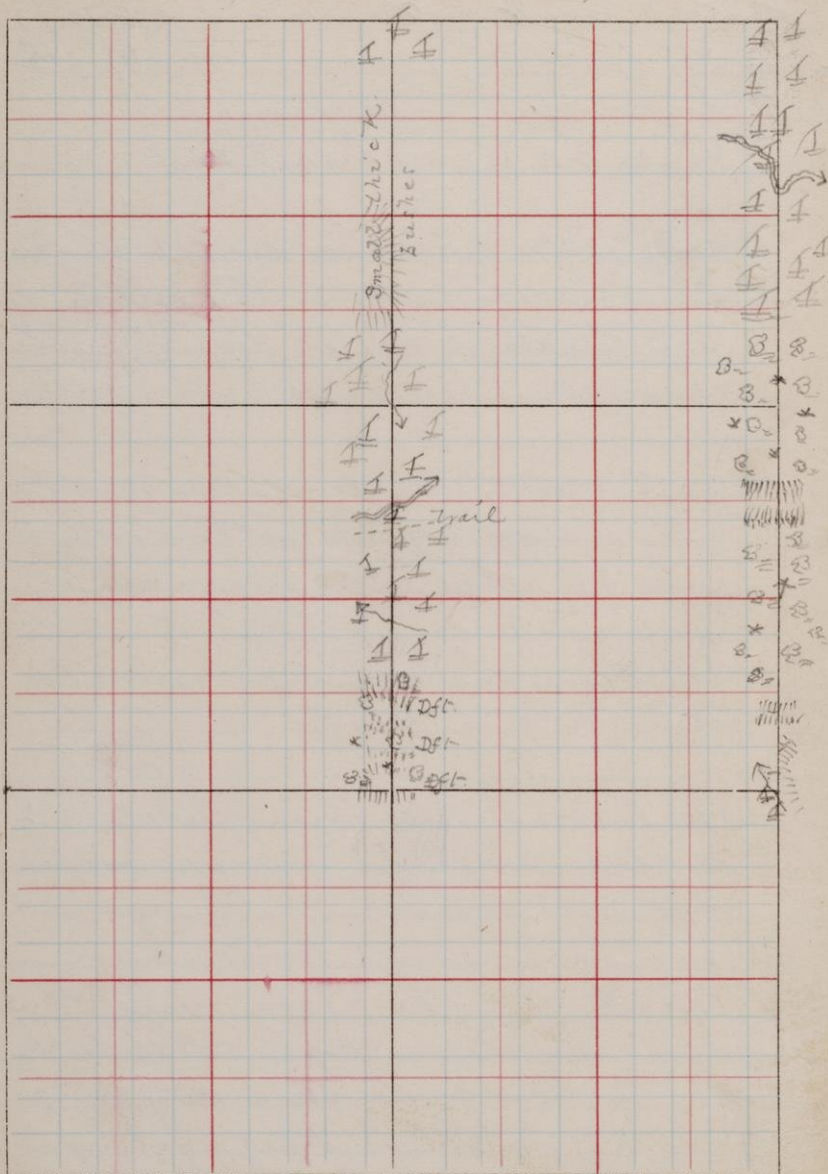
28 was taken about 1800 N. and

14028 1200 N. The ridge runs S. 50° N. and the dip is high 50 to 55 to the N. The surface is very rough due to the weathering out of feldspar etc.

T. 42

R. 30

Sec 25

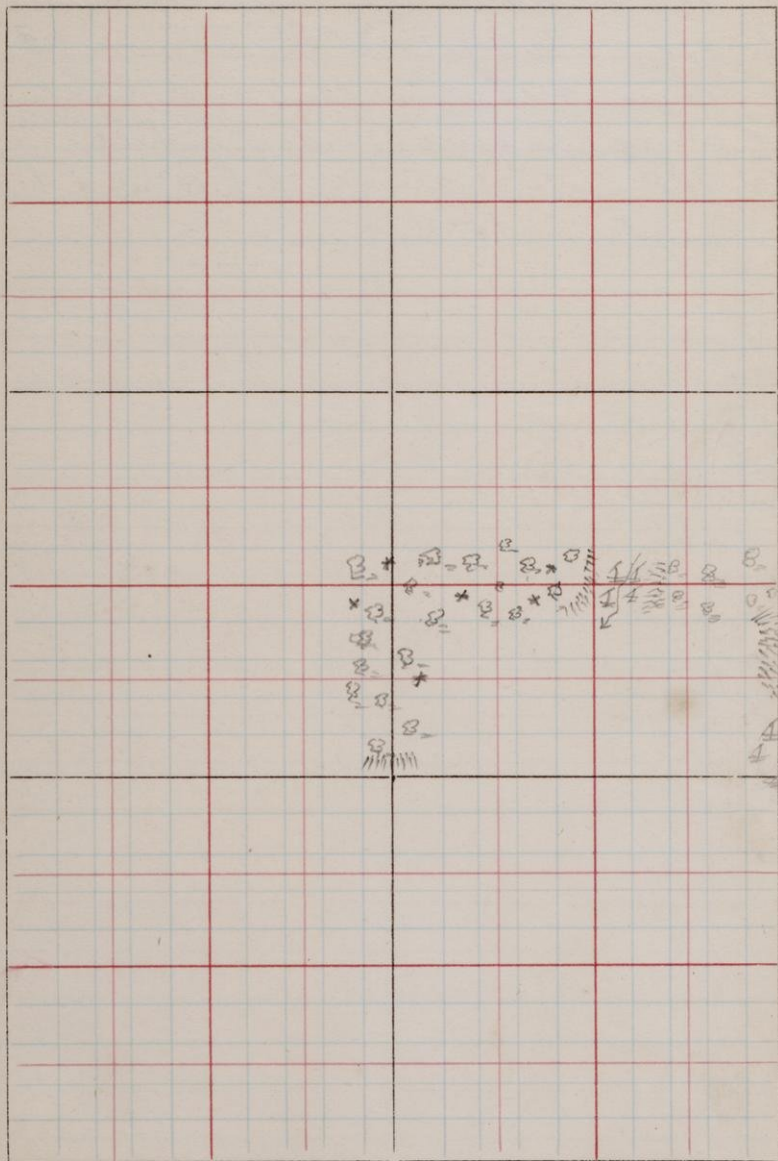


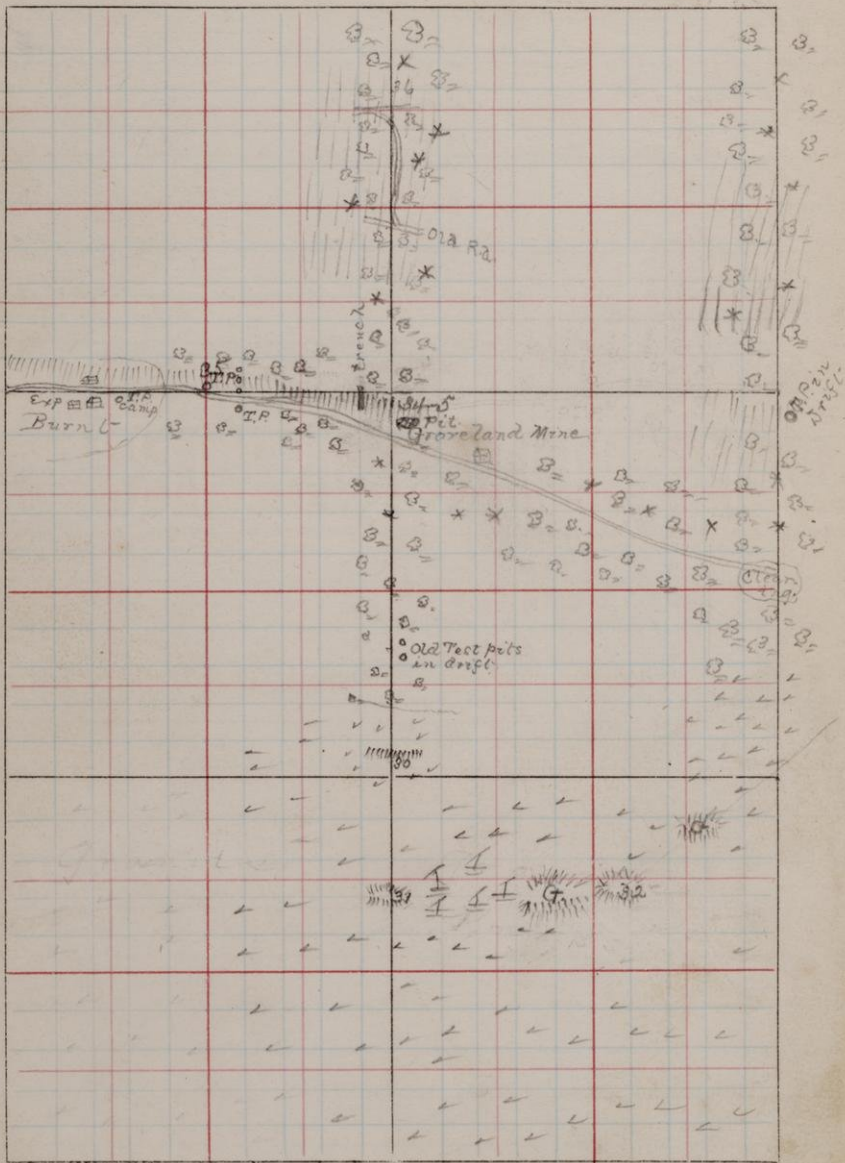
29 850 N. 1300 ft S.E. corner Sec 36. 12-30
14029 from a test pit in the lean ore
these pits run east and west
along the south side of a hill
The rock dips into the hill at a high
angle or 55° N.

T. 42

R. 30

Sec 24





30 50 N. 1000 W. S.E. corner Sec 3-42-29

14030 White quartzite similar to that found in several places a mile or so west. It is on the south slope of a ridge; across a valley about 350 feet south the granite outcrops can be seen extending from that point a long distance south. Strike of gtz. N. 8° E. Dip 65 to 70° N.

31 1700 N. 1000 W. S.E. corner Sec 6-41-29

14031 Red granite from a knob about 20 slip wide and 50 long

32 1700 N. 435 W. S.E. corner Sec 6-41-29

14032 Gray gneiss. The granite and gneiss are exposed all along this line nearly and as far south as can be seen

33 1000 N. 1000 W. Sec. 31-42-29

14033 From the stockpile at the Groveland mine

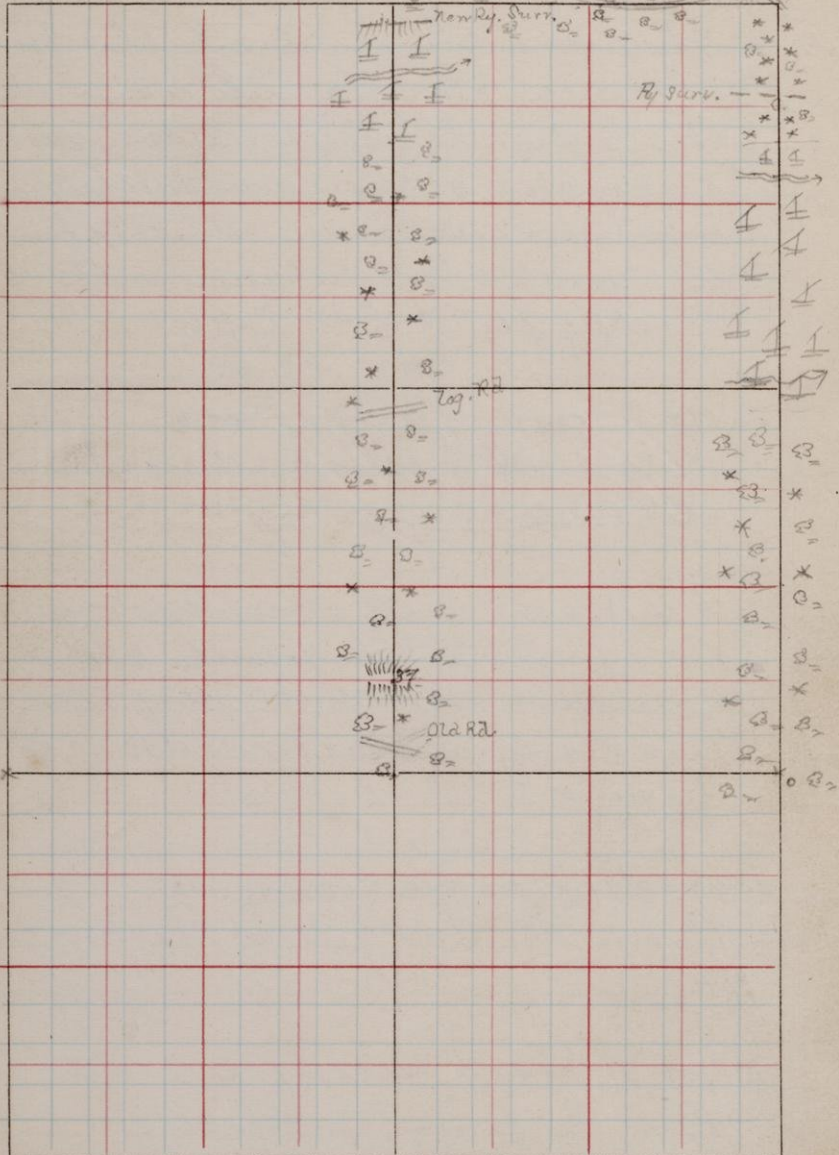
34 1010 N. 1000 W. Sec. 31-42-29

14034 Lean ore from top of hill just above the mine

T. 42

R. 29

Sec 23 38

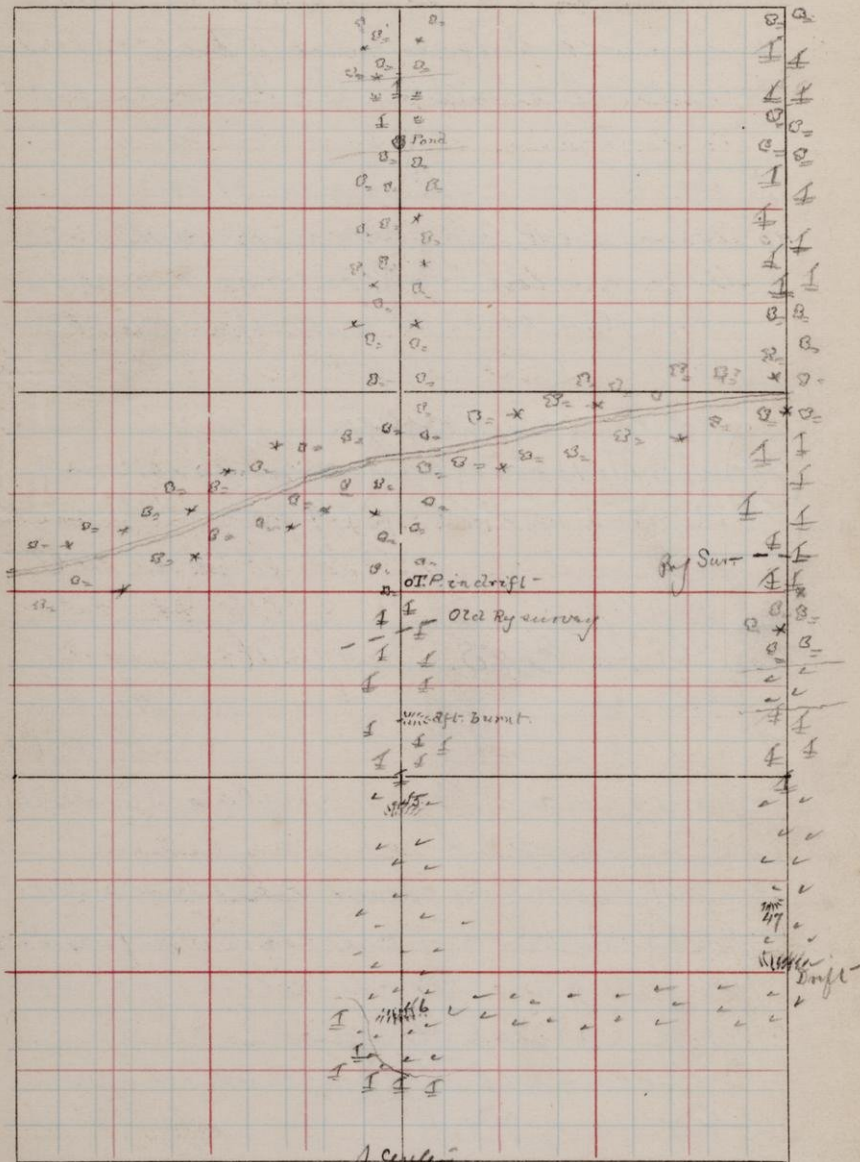


35 1000 N. 1500 N. S.E. cor 31-42-29
14035 Lean ore from test pit, north side of road

36 1800 N. 1000 N. S.E. corner 31-42-29
14036 A loose red sandstone in a small ledge near the bottom of a long north slope. Could not make out the dip well but think it is flat

37 268 N. 1000 N. S.E. corner 30-42-29
14037 A mica schist and gneiss. The rock is exposed along the line for about 500 steps
Strike E. 8° S. Dip 63° N.
Some very coarse red granite was seen but so covered that I could not tell whether in a layer or cutting the schist

38 40 N. 160 N. S.E. corner see 19-42-29
14038 A high knob of very coarse red granite carrying much or concretions of muscovite with a radial structure
I followed the ledge about 100 paces East W. and N. & S.



Section 32

39 2000 N. 800 N. S. E. corner Sec 29-42-29

14039 a small ledge of mica schist in a
lamarac swamp Too much covered
to determine Dip and strike

40 2000 N. 710 N. S. E. corner Sec 29-42-29

14040 A greenstone(?) appearing to carry
considerable iron compared with
19 It seems to run E & W. and
stand nearly vertical

At 600 N. 2000 N. the line strikes a
narrow ledge (30 to 40 ft) of mica sch. similar
to 39 which it follows 75 paces east
giving the strike E. & W. The dip
is high inclining in either way to
the N.

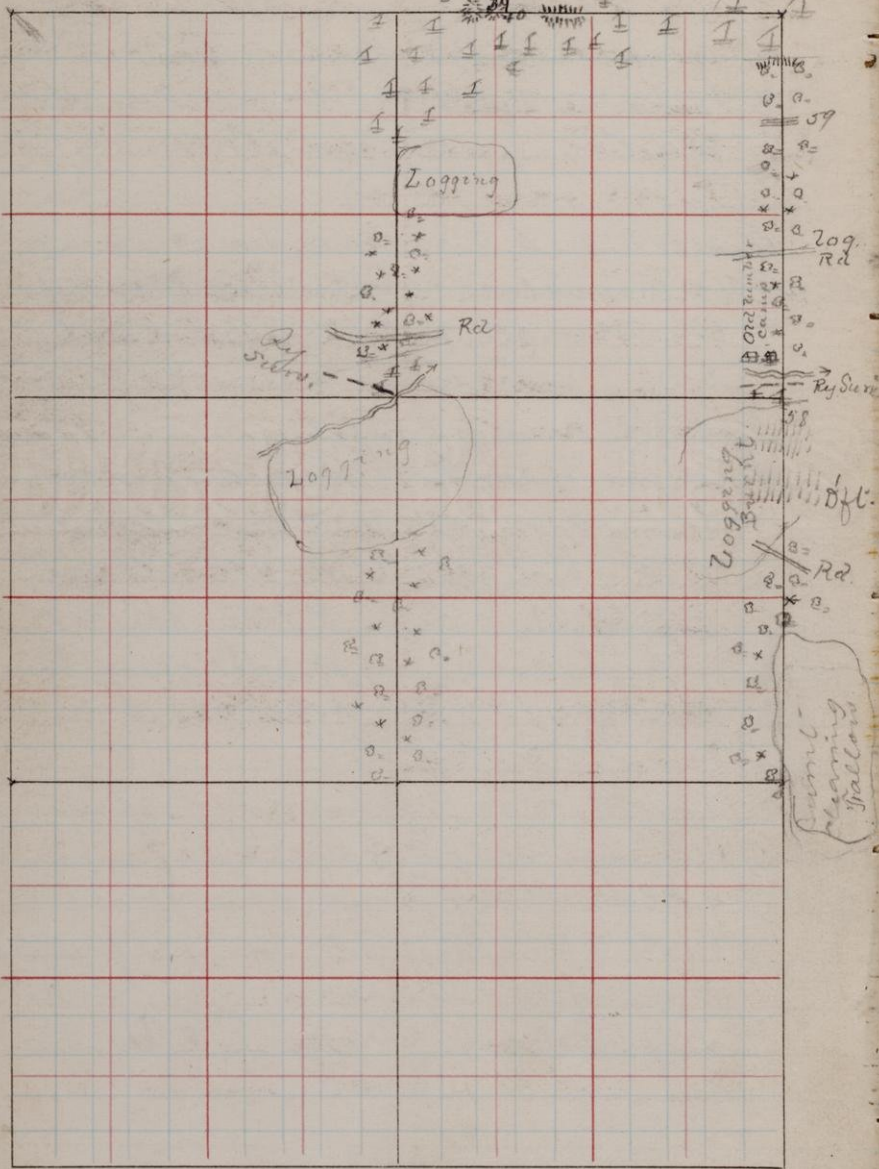
41 2000 N. 1550 N. S. E. cor. Sec. 28-42-29

14041 A large ridge of mica schist
follows along from this point
east to the N. post; lying a few steps
south of the line
Dip vertical strike E. & W.

T. 42

R. 29

Sec. 29



42 1900 N. 1000th S.E. cor Sec 28-42-29

14042 a small ledge of mica sch. similar to that a short distance to the N. of 41. The strike and dip appears to be the same as 41

43 625 N. 1000th S.E. cor Sec 28-42-29

14043 On the west side of ravine and in the bed of small creek a greenish black rock is exposed 100 steps north a reddish green is exposed I think in place but am not sure
Strike of 43 E 20° S. Mag. (sun low)
Dip 75° N.

14044 575 N. 1000th S.E. corner Sec 28-42-29
from a test-pit

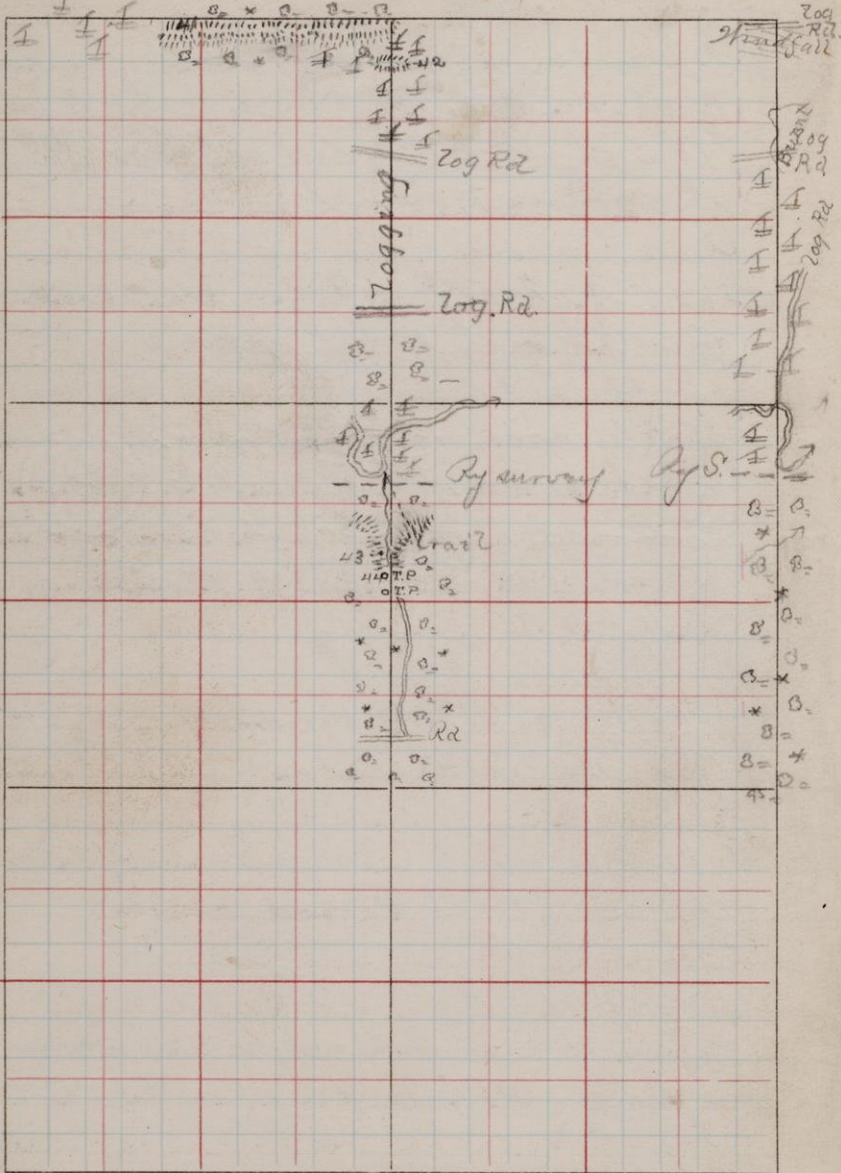
14045 1940 N. 1000th S.E. corner Sec 5-41-29
A black Hb. schist

46 1200 N. 1000th S.E. corner Sec 5-41-29

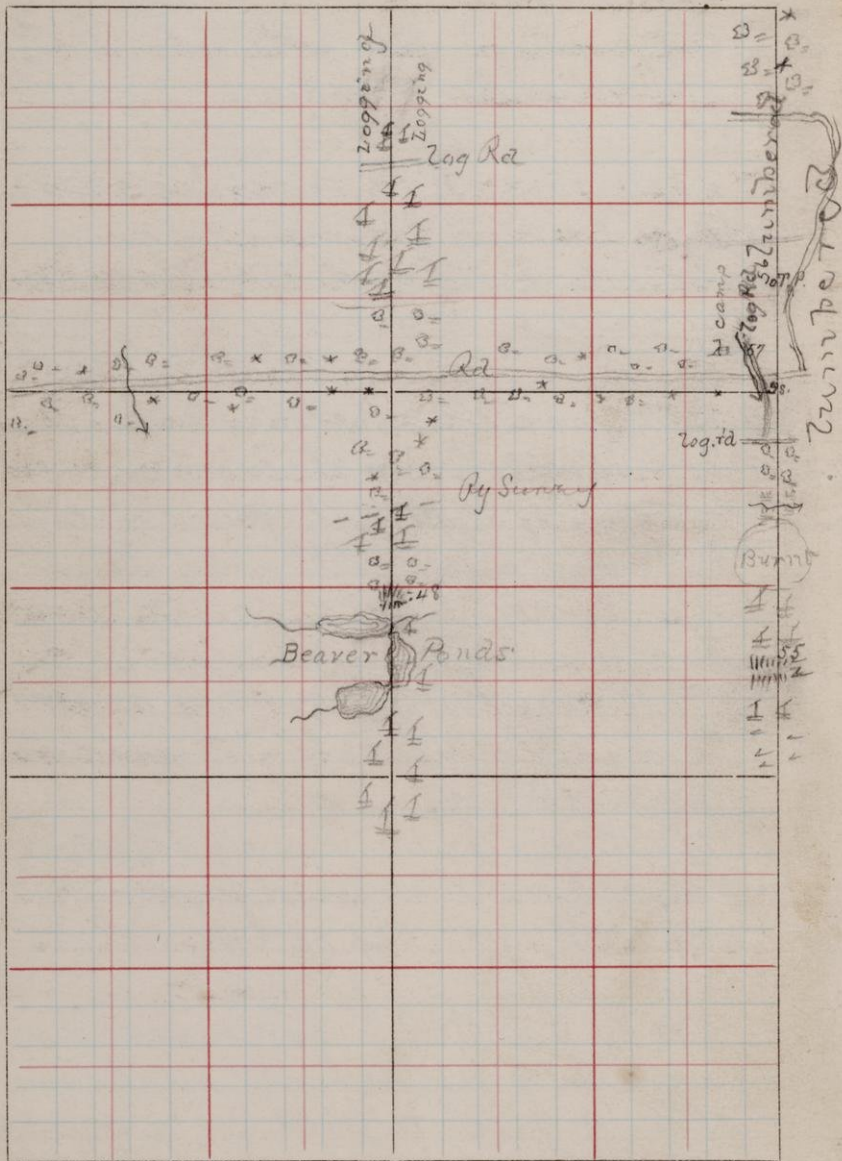
14046 A small exposure only a few yds in extent of Hb sch. similar to 45

T. 112

R. 29 Sec 28



- 47 1700 N. 1000 N. S. E. corner Sec 5-41-29
 14047 An exposure only a few yds in extent
 of a red gneiss or granitic
- 48 450 N. 1000 N. S. E. corner Sec 33-42-29
 14048 A red gneiss from an exposure
 about 12 high and ten slips wide
 by 20 long.
- 49 720 N. 1000 N. S. E. corner Sec 4-41-29
 14049 A mica sch. with coarser patches
 or veins of a reddish gneiss or granitic
 Exposure small on the south slope
 of a small hill
- 50 375 N. 1000 N. S. E. cor Sec 4-41-29
 14050 A mica or Hb. schist with small
 granitic veins
 100 N. 900 N. S. E. corner Sec 4-41-29
 the schist is exposed again
 Strike E. & W. Dip 75° to N.
- 51 450 N. 550 N. S. E. corner Sec 4-41-29
 14051 a mica or Hb. schist on the south
 slope of hill. Exposed for a number
 of paces east and W.



Strike 15 S. of E.

125 paces N. E. is another ridge of rock similar to 51

52 1040 N. 00 N. S. E. corner Sec 4-41-29

14052 A mica or Hb. schist -

Strike 18 S. of E (M. P. G.) Dip. vertical

53 1700 N. 30 N. S. E. cor. Sec 4-41-29

14053 A mica gneiss from a mass of large fragments I think in place without any doubt.

54 1950 N. 00 N. S. E. corner Sec 4-41-29

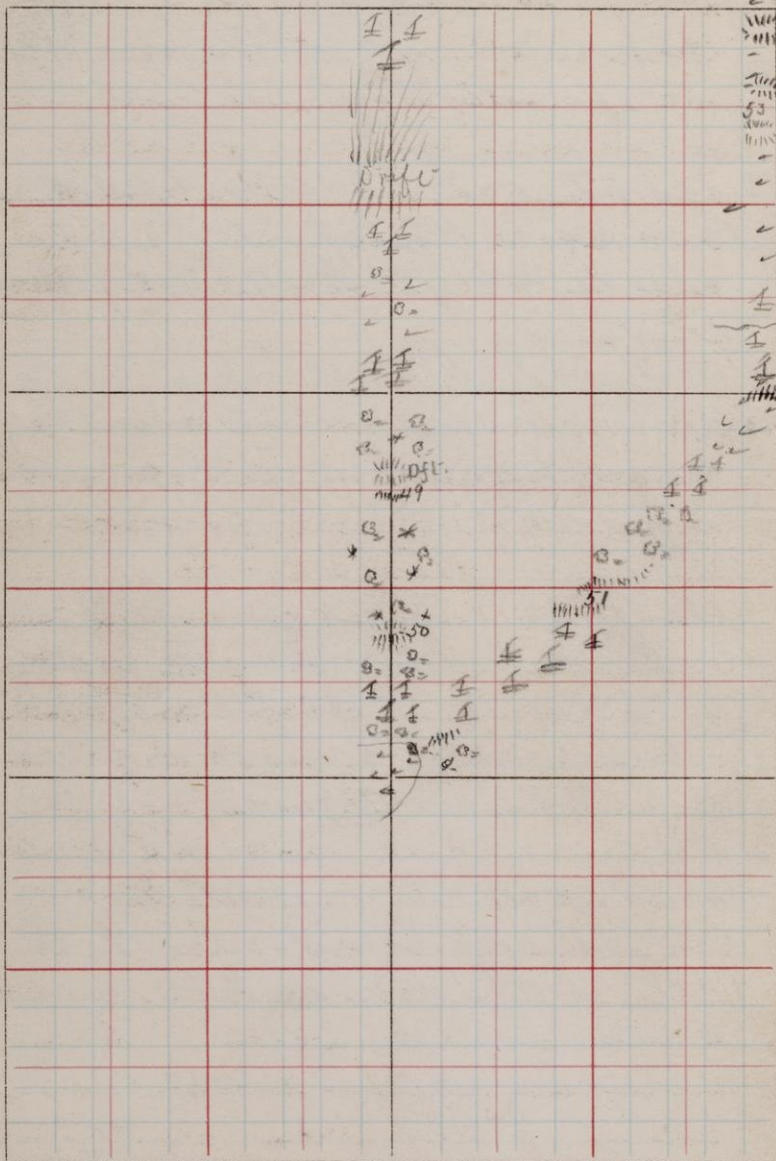
14054 A large ridge running E. & W. of red gneiss 100 paces south - a small exposure of rock similar to 53 & 54 was noted

55 285 N. 00 N. S. E. corner Sec 33-41-29

14055 A black rock exposed near the bottom of the north slope of a hill running E. & W.

T. 41

R. 29 Sec 4



56 1300 N. 00 N. S. E., corner Sec 33-42-29

14056 From an old test pit The rock thrown out is mostly a quartzite with more or less softer bands of a yellowish material sometimes like a sandstone and again earthy The pit is old and the rock thrown out badly decomposed

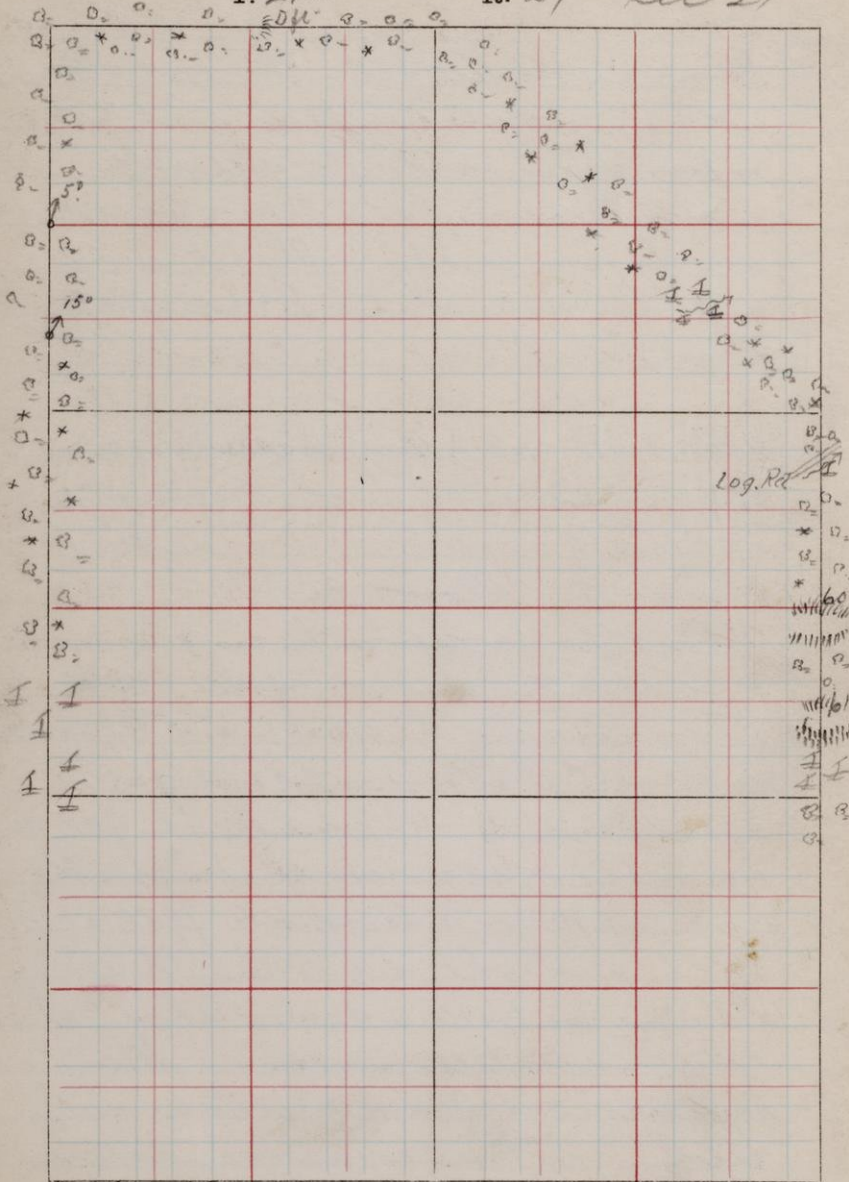
57 1150 N. 110 N. S. E., corner Sec 33-42-29

14057 a small exposure in the logging road east side of small creek of a marble or limestone Strike $E. 5^{\circ} S.$

About 20 paces south in the road and also on the sides of the creek is an exposure of a loose red ^{or buff} sandstone so friable that I could not get a specimen It is exposed for a number of paces along the creek and appears to lie quite flat or with a slight dip to the N. W. It was so broken down that I could not tell well The limestone appears to stand in end The same sandstone is exposed a few steps below the

T. 1/2

R. 29 Sec 21



E. & W. road or about 1000 N. and 100 W. of P.E. corner 33

Two fragments of a pure quartzite was seen in this rock the largest about 1 1/2" across

58 930 N. 00 W. S.E. corner Sec 29-42-29

14058 A mica or kb. schist - exposed at the foot of the north side of a hill
Strike E 25° S (Mag. no sum)
Dip 74° N.

59 1730 N. 00 W. S.E. corner Sec 29-42-29

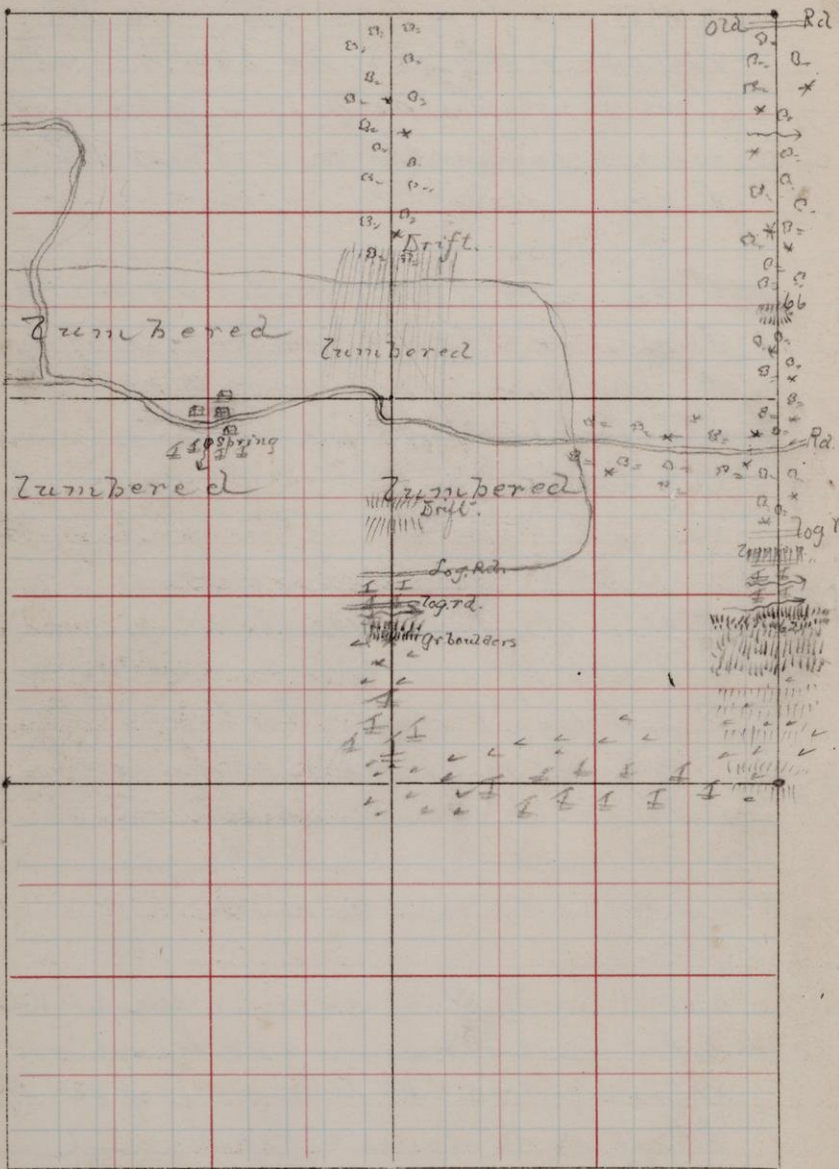
14059 A kb. or mica schist - striking as near as could be determined a little N. of E.
Dip vertical or very high to S.
1900 N. The same schist shows again on the south edge of swamp
Strike and dip about the same as near as could be determined

60 500 N. 01 W. S.E. corner Sec 21-42-29

14060 A large exposure of schist
Strike E. 15° W. (Mag), Dip 84° N.
Bluff 40 to 50 feet high and 100 steps wide

T. 42

R. 29 Sec 31



61 2400 N. 000 N. S. E. cor. Sec 21-42-29

14061 A ridge of black lb. rock running E. 12 N. The south slope is very steep and descends 75 or 100 feet in a few steps. Width of ridge 120 slips.

62 410 N. 000 N. S. E. cor Sec. 34-42-29

14062 A red granite form near the top of a large bluff 175 feet high and running for a long distance east and west. The north face forms two perpendicular faces. In places the rock is very coarse grained, the quartz and feldspar sometimes showing in large veins. From this point south to the corner the granite shows almost continuously.

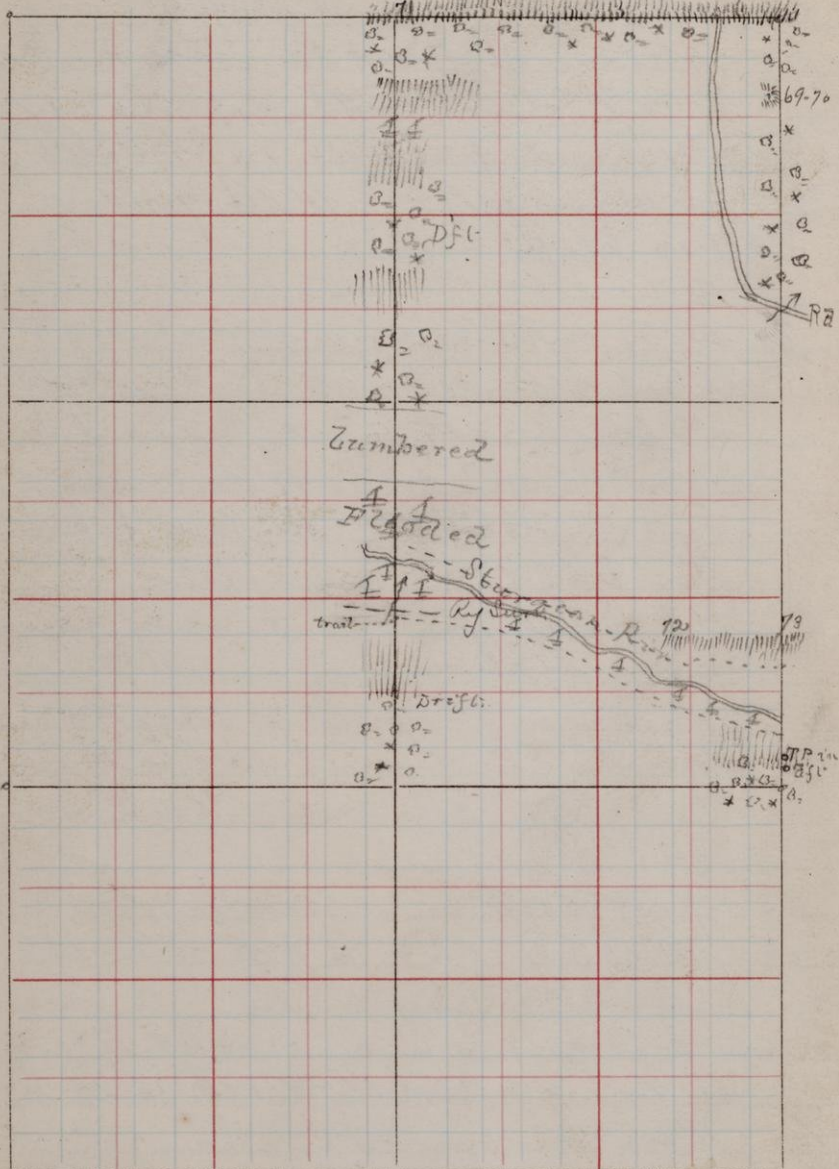
63 1900 N 1500 N. S. E. corner Sec 35-42-29

14063 At the south end of dam on the west branch Sturgeon Riv. A mica schist exposed in an excavation for the dam. Strike E. & W. Dip 57° S. More micaceous in places.

T. 112

R. 29

Sec 27



64 1900 N. 1500 N. S.E. corner Sec. 35-42-29

14064 About 100 feet north of the mica schist '63 at the north end of dam in an excavation a light-colored micaceous rock is exposed. Some of the layers are much decomposed and seem to be chiefly a serpentine.

The strike appears to be more to the N.E. than in '63.

Dip 50° E 50° S.

The dip looks as though it was getting flatter near the top of the exposure or in other words at the top of a fold.



I cannot be very sure of the strike as the strata were well broken down.

14065 From the more decomposed portion of the exposure

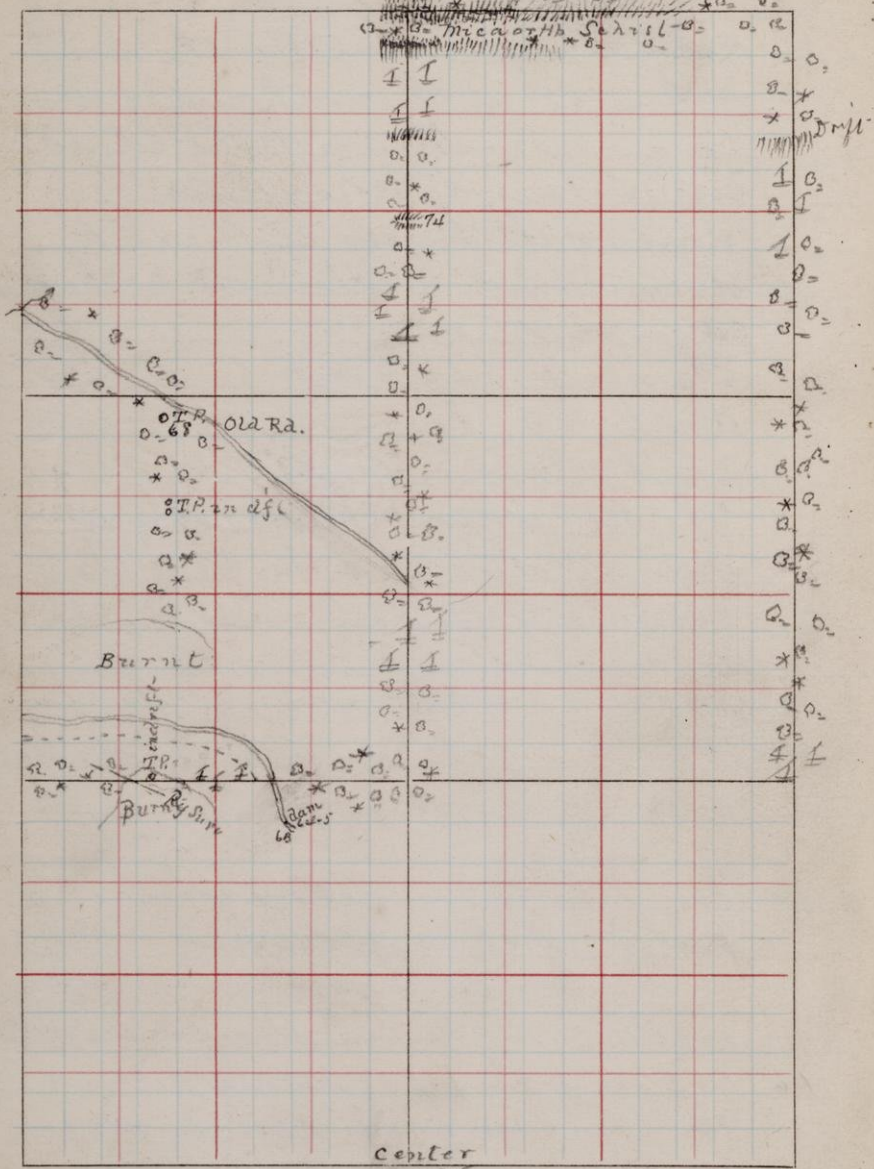
66 1235 N. 007 N. S.E. corner Sec 35-42-29

14066 A ledge of loose sandstone follows the upper edge of a horseshoe shaped depression (305' slips across)

T. 42

R. 29 Sec 26

175 *
Mica or Hb Selsil - 0



Center
Sec 35

Am not certain as to dep
rock too much tumbled down

67 1250 N. 950 E. S. E. cor. Sec. 35-42-29

14067 From the top of a large quartzite
ridge 40 or 50 feet high and
running 15° N. of E (mag.) I follow
ed it about 100 paces EPN.
The dip I think is high to the
N. though one large surface
was noted with the bandings
dipping to the E. but it was I
think not in place

68 950 N. 1685 N. S. E. corner Sec 26-42-29

14068 From a test pit about 15 ft. below
the surface

69 1800 N. 25 N. S. E. corner Sec 27-42-29

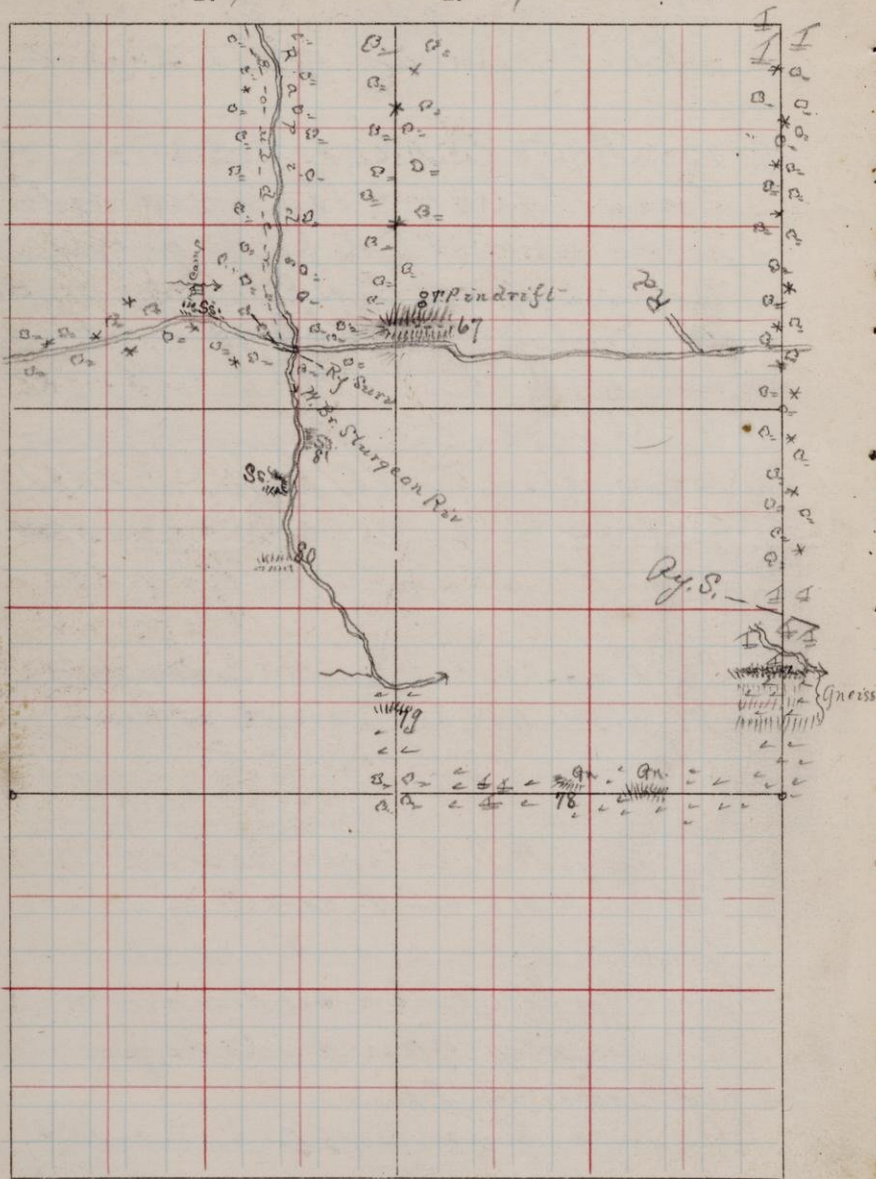
14069 A black Hb. rock carrying small
granitic veins and associated
with or penetrated by larger masses
of a coarse granitic red granite

70 shown in 70

14070 Angular fragments of this rock
shown frequently as far as the

T. 42

R. 29 Sec 35



N. E. corner of Sec 27-42-29
where there is another outcrop

71 2000 N. 1000 N. S. E. corner Sec. 27-42-29

14071

This ridge of rock follows along the line from the N. E. corner west to the 1/2 post, Sec 27. It is a continuous ^{ridge} ledge and will average 75' to 100 feet in height.

72 400 N. 300 N. S. E. cor Sec. 27-42-29.

14072

A large ledge of schist or gneiss with granitic veins. This ridge runs along east from this point 500 or 600 paces. It looks exactly like some of the veined schists of northern Minnesota.

73 400 N. 1900 N. S. E. corner Sec 26-42-29

14073

From same ledge as 72

74 1460 N. 1000 N. S. E. corner Sec 26-42-29

14074

A small knob of mica or hb. schist with granitic veins

1700 N. 1000 N. S. E. Sec 26-42-29

A ledge of schist similar to 72

T. 42

R. 29

Secs 23 24

1
I I
x o
o x
o o
o o
o o
x o
o o
o o
x o
o x

75 2000 N. 1000 W. S. E. cor. 26-42-29

14075 A large ridge, 100 to 125 feet high, running east and west, of mica or hb. schist, all this schist stands nearly vertical or if dipping either way dips to the N.

76 815 N. 00 W. S. E. corner Sec 23-42-29

14076 A small ledge, on the north side of low ridge, of slaty mica schist. The ridge runs about east & west. Dip seem to be high to the north (65° to 70°)

900 N 00 W. S. E. cor Sec 23-42-29

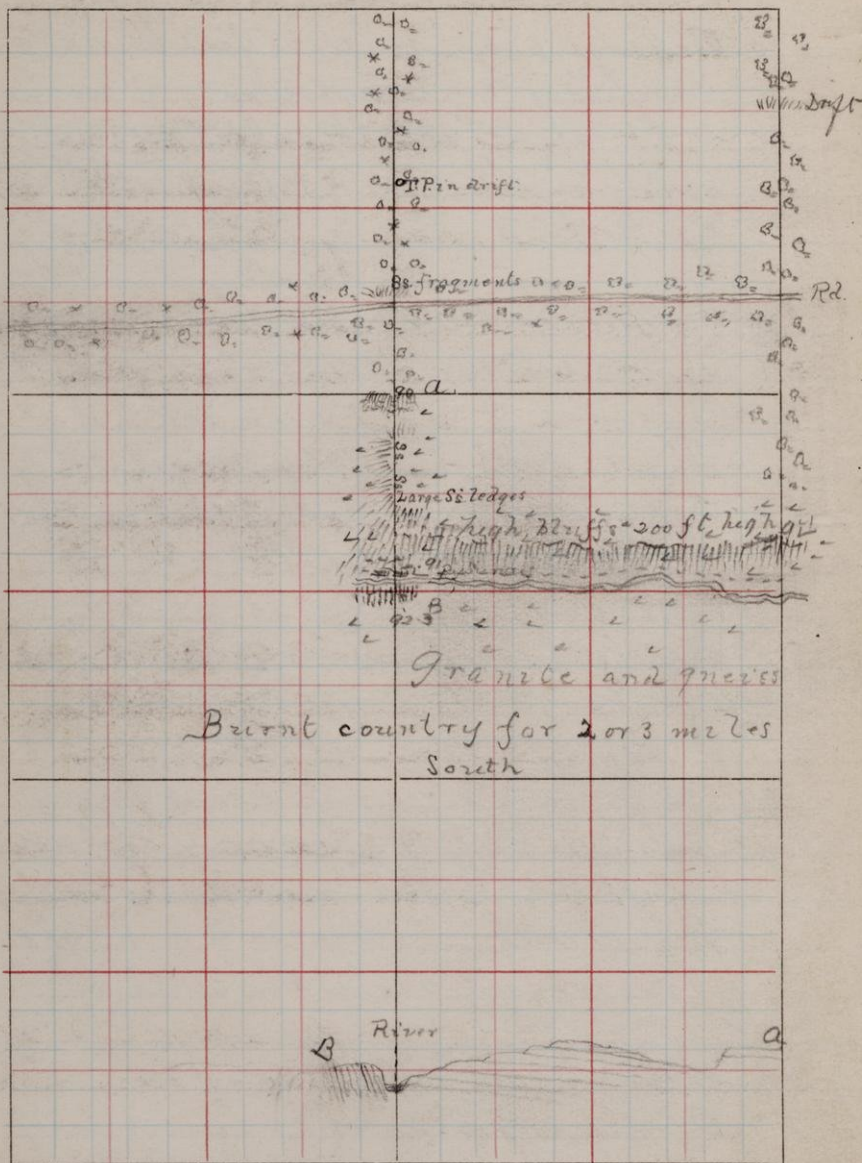
is another exposure of mica sch similar to the last

77 350 N. 00 W. S. E. corner Sec 35-42-29

14077 A large bluff of gneiss on the south bank of the Sturgeon River. It rises within 50 paces to a height of 75 or 100 feet above the stream

78 00 N. 600 W. S. E. 35-42-29

14078 A mica gneiss. A number of exposures of gneiss could be seen



from the higher knobs along this
line

79 220 N. 1000 N. S. E. cor 35-42-29

14079 A low ledge of red granite a
few slips south of the river

80 650 N. 1300 N. S. E. corner 35-42-29 (approx)

14080 on the west side of Sturgeon Riv
Dip 16° to S. E. (?)

200 slips up river from 80 is a
large ledge of loose flattying
red sandstone

81 950 N. 1250 N. S. E. cor 35-42-29

14081 Another exposure of sandstone
in the east bank of the river

1300 N. 1550 N. S. E. corner 35-42-29

Sandstone ledge, much broken
down

82 800 N. 1000 N. S. E. corner sec. 25-42-29

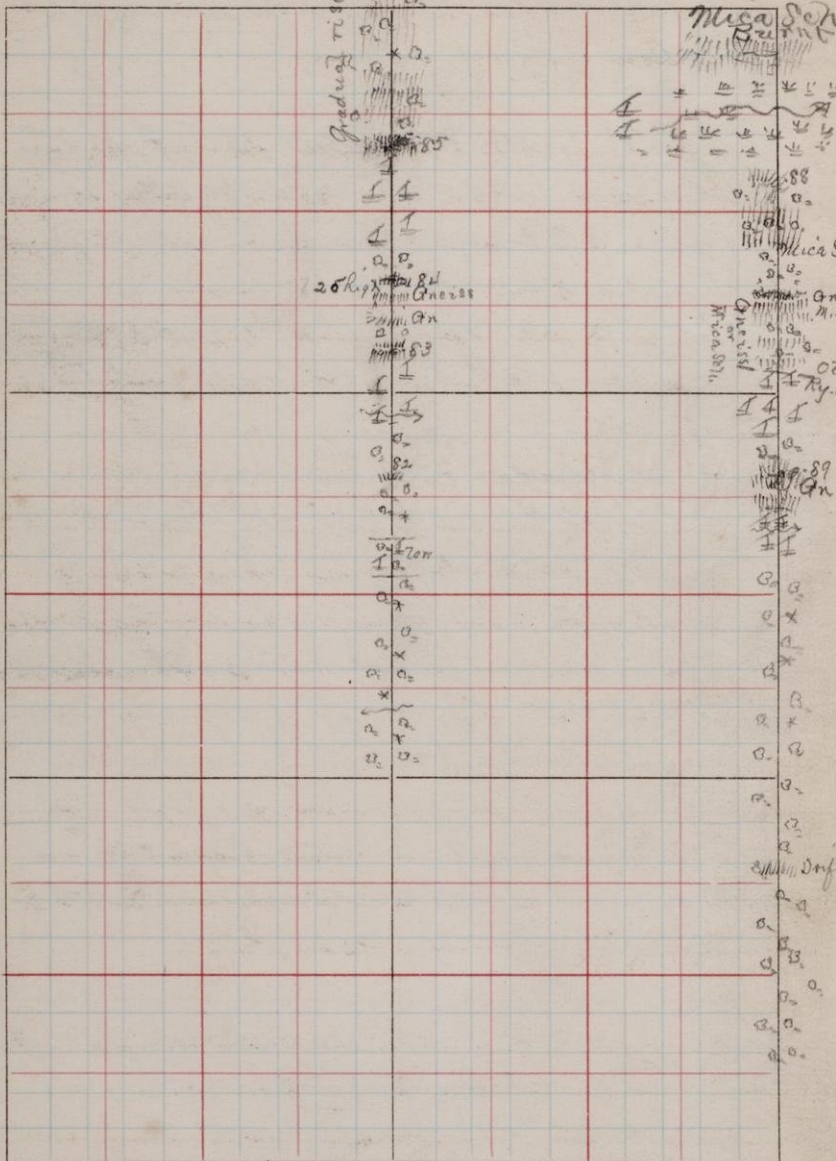
14082 A low north facing ledge of lb. schist
Strike E. 12 N.

Dip vertical or within a few degrees of it

T. 12

R. 29

Sec. 25



83 1130 N. 1000 N. S. E. corner Sec 25-42-29

14083 a low ledge of gneiss

1300 N. 1000 N. S. E. corner Sec 25-42-29

A ledge of gneiss or schist 25 or 30 feet high with veins of a clear white quartzite

84 Sample of vein about 1' wide

14084 Do not all the quartzite in this region similar to and of the same origin as this vein

Strike of ledge E. 15° N.

85 1700 N. 1000 N. S. E. corner Sec. 25-42-29

14085 A ledge of gneiss rising 20 or 25 feet above the swamp on the south and running about E. & W.

86 600 N. 1000 N. S. E. corner Sec. 24-42-29

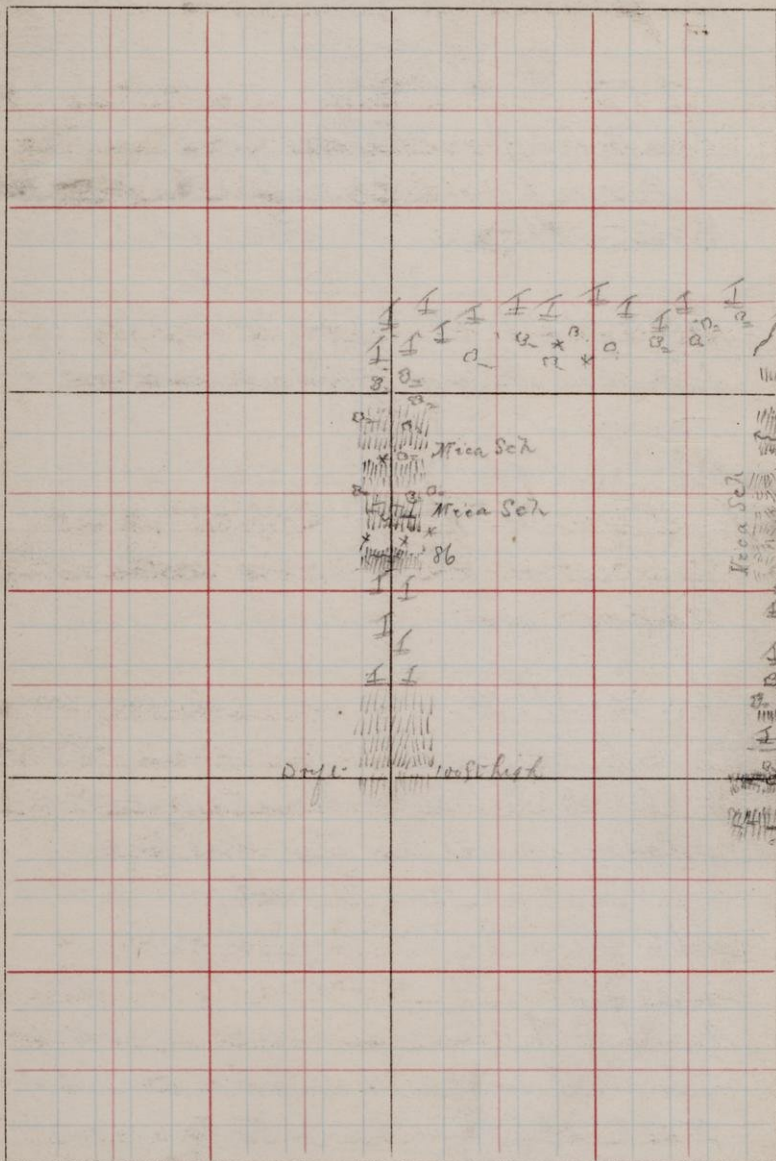
14086 A ledge about 20 feet high of a somewhat more alaly mica schist
Strike 5° S. of E., Dip 56° N

87 900 N. 000 N. S. E. corner Sec. 24-42-29

14087 From the corner ^E $\frac{1}{2}$ post Sec. 24 south the line runs over large outcrops of this mica schist

T. 42

R. 29 Sec 24



in places 50 to 75 feet high

88 1564 N. 000 N. S. E. cor. Sec. 25-42-29

14088 A ridge of mica sch. running
E. S. W. and dipping almost 90°
to the N. (80°)

1270 N. 000 N. S. E. cor. Sec. 25-42-29

A high ridge of gneiss running
N. 11° N.

89 825 N. 000 N. S. E. cor. Sec. 25-42-29

14089 A light-colored gneiss with white
quartz veins

90 955 N. 1000 N. S. E. corner Sec. 36-42-29

14090 A loose sandstone exposed in the top
of an almost perpendicular south facing
slope; it shows for 3 or feet -
Too much fall for dip

700 N. 1000 N. S. E. cor. Sec 36-42-29

and from here north a couple hundred
paces the loose sandstone is exposed
near the top of a high hill. At the
S. W. side of this hill the sandstone
plainly shows a dip of but a few

dipress to the N.E. in other words it is
a flattening rock

Large ledges of gneiss and granite
can be seen from this point south
across the river for nearly a mile

The sandstone is exposed at intervals
down this slope to the river where it
breaks out in a cliff along the north
side for a couple hundred paces

In places along the base of this cliff
the rock is conglomeratic the bands
dipping to the N.W. at from 20° to 25°

14091 Pebbles from this conglomerate

On the south shore the gneiss is
exposed dipping about 75° N. and
striking E. & W.

92 510 N. 1000 ft. N.E. corner Sec. 36-42-29

14092 Azucia schist striking E & W, and
dipping 71.75°

14093 about 50 feet south of 92

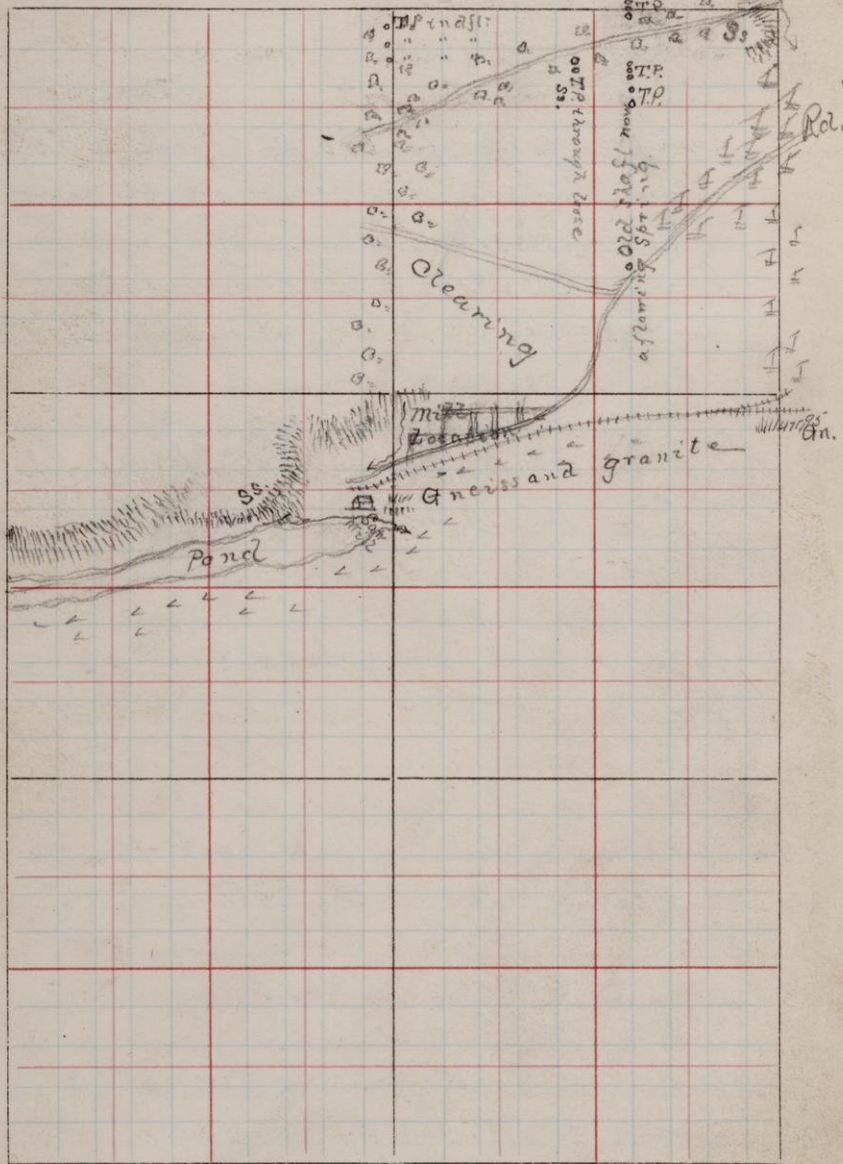
94 660 N. 000 ft. S.E. corner Sec 36-42-29

14094 From top of light bluff
Dip slight to the N.

T. 42

R. 28

Sec. 31



It followed along under this bluff half a mile the loose sandstone is exposed almost the entire distance along the trail at the top of the bluff it seems to be finer or a sandy limestone?!

On the south the granite and gneiss can be seen exposed

1900 N. 00 N. S. E. corner Sec 31-42-28

A ledge of loose sandstone from the corner south about 100 steps

Dip 12 to 15 N. of N.

95 900 N. 00 N. S. E. corner Sec. 31-42-28

14095 A large ledge of a grey gneiss just south of the Ry.

96 1980 N. 412 N. S. E. corner Sec 31-42-28

14096 A marble from the bottom of an old test-pit 60 to 80 feet deep. To judge from the material thrown out most of this distance was through a loose sandstone

North of this pit for 100 paces were six more though not so deep and

all of them appeared to be in the
sandstone South of the road
100 paces another large shaft
is sunk with several smaller ones
just to the south this shaft
also seems to be through a
sandstone to the marble and the
smaller ones in the sandstone
The ss. from the lower portion carries
pebbles

14097 750 N. 1000 N. S. E. corner Sec. 30-42-28
A low ledge of quartz

14098 1100 N. 750 N. S. E. corner Sec 29-42-28
A. low ledge of mica quartz

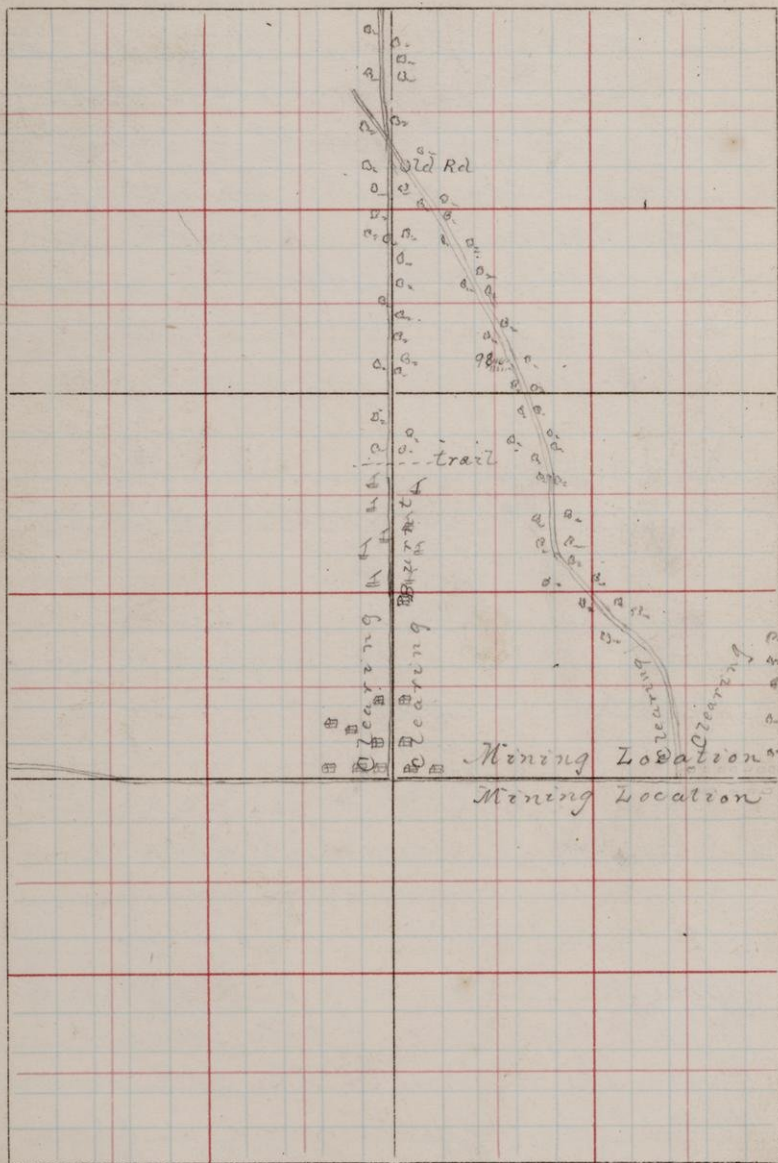
99 1700 N. 00 N. S. E. corner Sec 32-42-28

14099 From the eastern most of the open
pits at the Metropolitan mine
contains much of a carbonate
Strike E 2° S. Dip 85 to 90 North
The lean ore is highly banded
with the carbonate the latter making
up the bulk of the rock in places
and appearing to pass from this phase

T. 42

R. 28

Sec. 29



through rock carrying more and more iron up to the rich ore

Is not this carbonate of iron mostly?

100 1700 N. 300 N. S. E. corner 32-42-29

14100 from an open pit just west of
199

101 1750 N. 250 N. S. E. corner 32-42-29

14101 From the west end of long open
pit near the engine house
Metropolitan mine

102 1800 N. 530 N. S. E. corner Sec. 32-42-29

14102 From an abandoned working or
shaft just south of the Py track

14103 1800 N. 1000 N. S. E. corner Sec 32-42-29

14104 Ore and rock from the Northwestern
mine; the rock in a large open
pit at this mine dips high (85 to 90°)
south

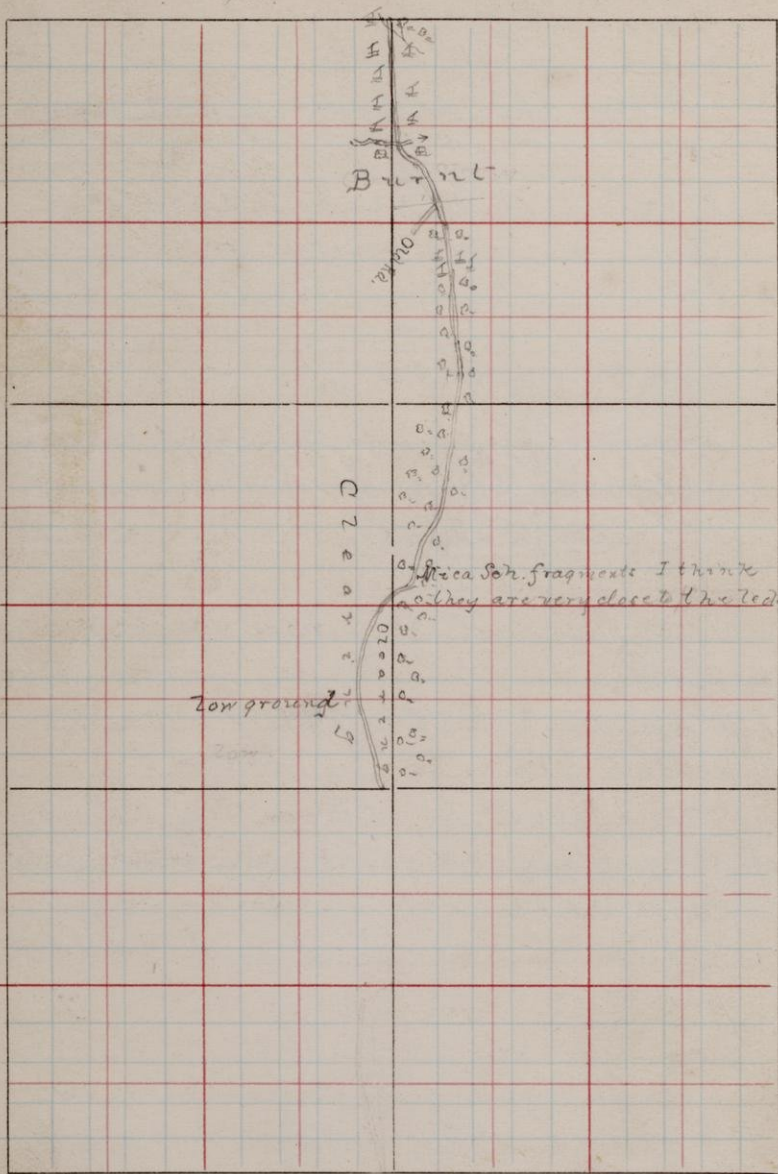
105 1700 N. 1000 N. S. E. corner Sec 32-42-29

14105 from the top of a ledge of lean
banded ore

T. 42

R. 29

Sec 20



Burnt

D
Z
e
a
r
t

Mica Sch. fragments I think they are very close to the ledge

low ground

Strike E+W. Dip 85° S.

In a test pit 1470 N. 1300 N. they appear to have taken out a sandstone a "yellow ochre" a rock similar to 104 and a limestone or marble but in what order is more than I can tell

156 1410 N. 1800 N. S.E. 32-42-29. (8)?

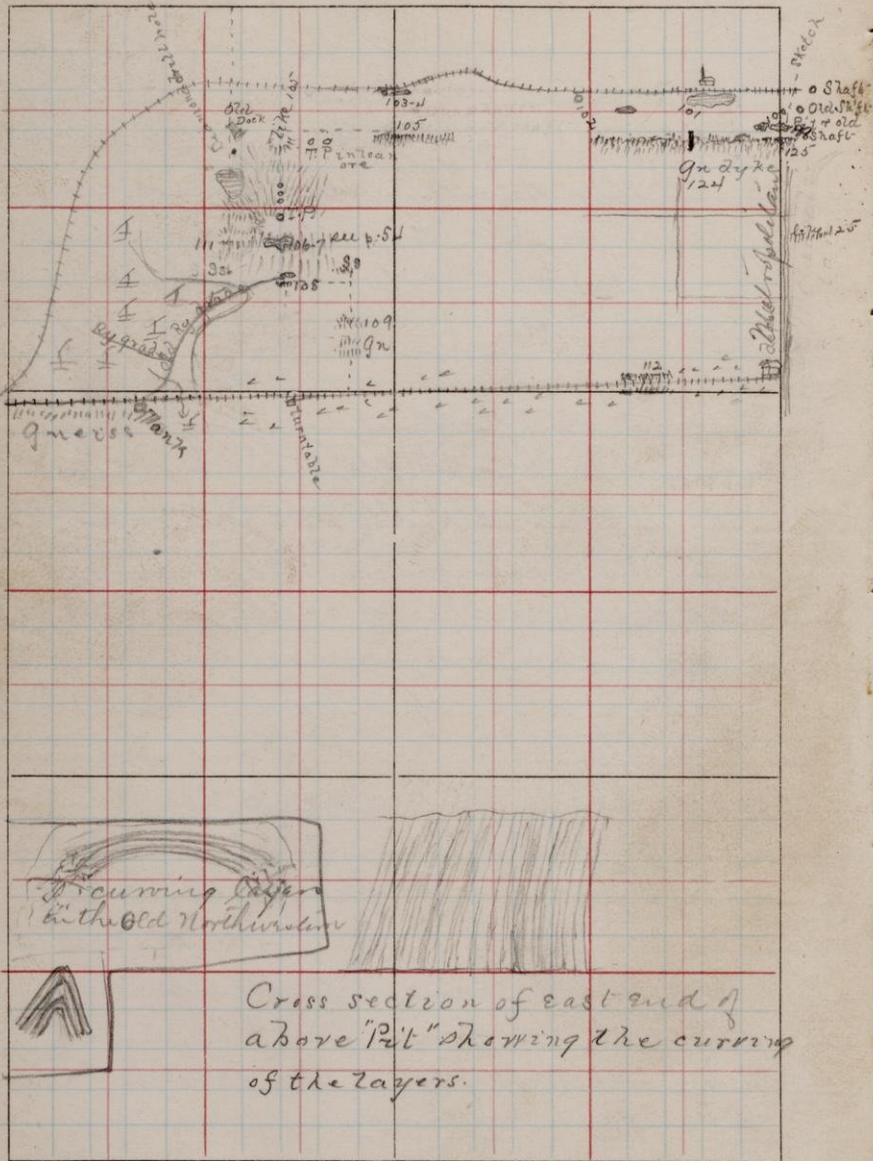
14106 An old pit showing the limestone or marble rising in the center in rounded knobs and on each side the sandstone and clayey layers saturated with ochre dipping away from it on the N. at an angle of 22° on the S. at an angle of 31°. The rock at the south seems to be a breccia or conglomerate large pieces of quartzite banded or being cemented together by the sandstone

14107 Sandstone from the south side of this pit. Fragments of the Marble were seen in the

T. 42

R. 28

Sec 32



Ss.

rock on the north side

1320 N. 1300 N. S.E. 32-42-29

A marble ledge overlain by the sandstone. A pit has been opened on the south and the face shows the above relation.

108 1300 N. 1300 N. S.E. 32-42-29 a

14108 ledge of sandstone (?) a few feet high. It seems to be an more indurated portion of the sandstone.

1320 N. 1140 N. S.E. 32-42-29

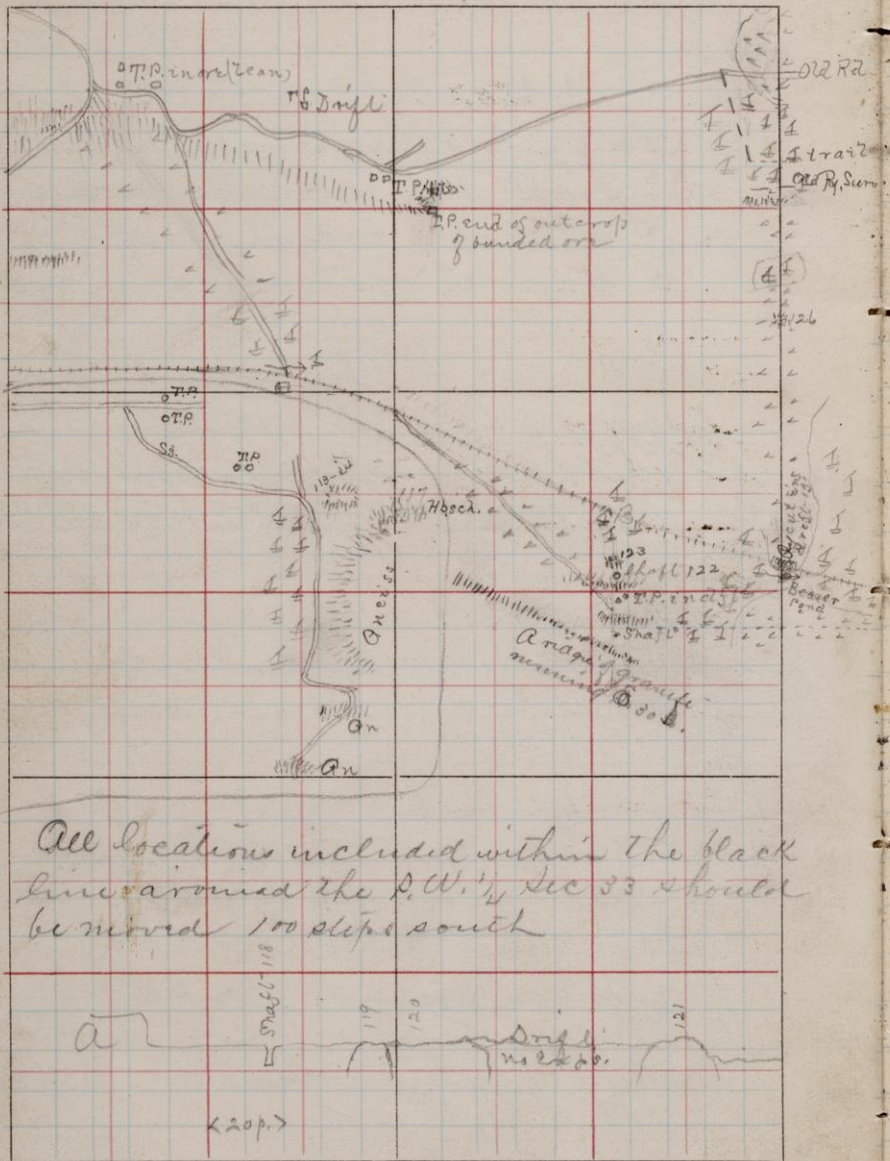
another ledge of the horizontal sandstone

109 1220 N. 1140 N. S.E. 32-42-29

14109 A ledge of light gray quartz running about E.W.

1140 N. 1140 N. S.E. 32-42-29

Another ledge of dark colored schist or quartz with a band of the lighter material on the south side.



110 1575 N. 1425 St. S. E. cor. Sec 32-42-28

14140

From a shaft a few feet deep on a large strapping known as the Old Northwestern on the west slope of the ridge. Around the edges (S. N. & W) the flattying sandstone is seen carrying fragments of the lean ore near the contact.

The dip of the lean ore in the above shaft seems to be flat both to the N & S; the layers can be seen curving over and forming an antedinal structure.

111 1425 N. 1425 St. S. E. corner Sec 32-42-28

14111

A ridge of white limestone (?) seems to be a continuation west of 106

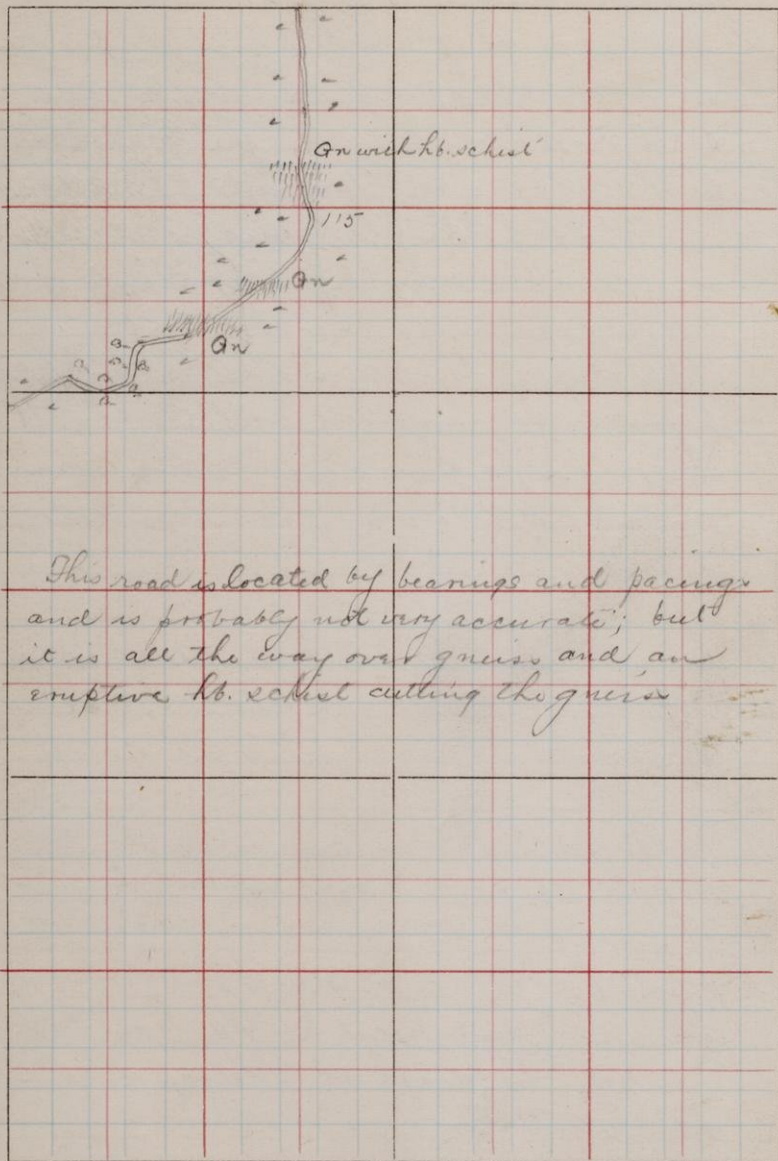
1325 N. 1425 St. S. E. 32-42-28. "The Horizontal Sandstone"

112 1025 N. 350 St. S. E. 32-42-28

14112

From a cut on the Ry 300 paces west of the depot at Metropolitan Dip 50° N. E.

Cut about 75 to 100 paces long.



This road is located by bearings and paces
and is probably not very accurate; but
it is all the way over gneiss and an
eruptive hb. schist cutting the gneiss

750 N. 1150 N. S.E. cor Sec 33-42-29
 At this point there is an exposure
 of marble about 50 paces wide and
 60 to 70 long similar to III. On
 the west end a conglomerate shows
 in two places for a width of a
 few feet but the exposure was so
 tumbled down and covered that
 I could not tell the relation of the
 two rocks. The conglomerate
 seems to be a mass of iron fragments
 quartzite and marble fragments
 held together by a loose red sand
 stone.

14113 Specimen from this congl.
 Number
 110

14114 Pebbles from the above congl.

115 1500 N. 1200 N. S.E. corner Sec 4-41-29

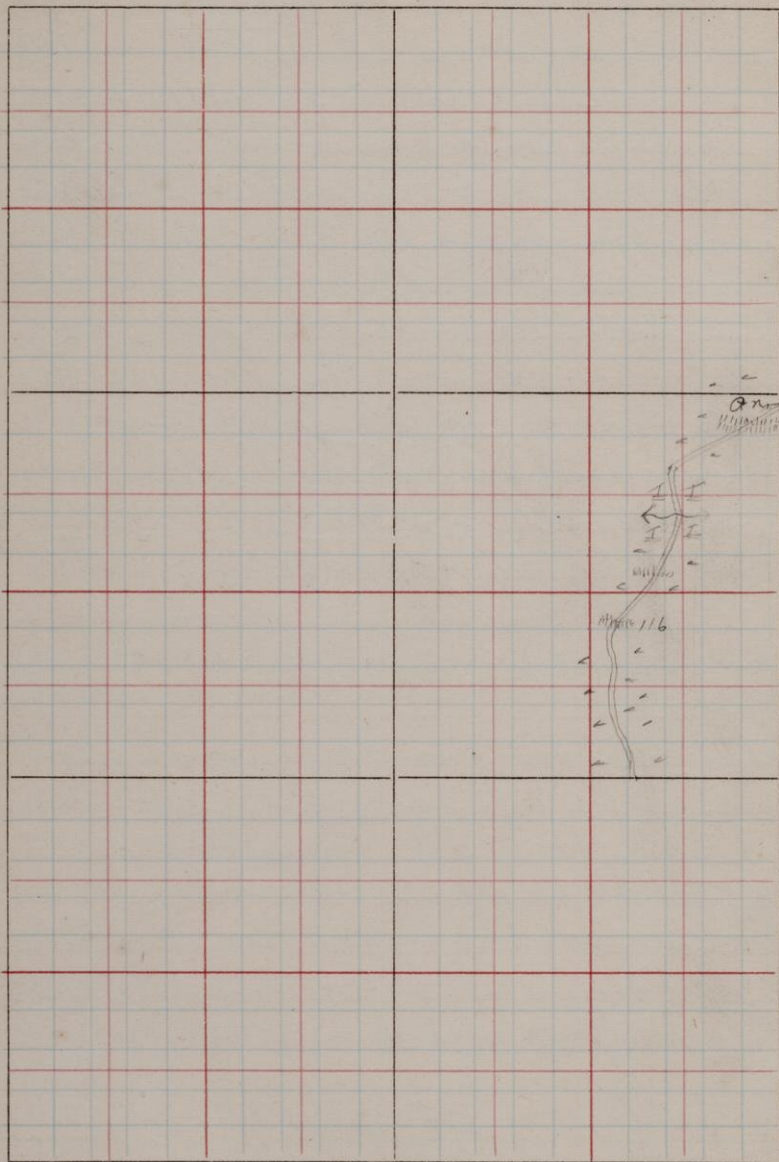
14115 A black lb. schist cutting the gneiss
 and including fragments of the gneiss
 in places following the gneissic structure and
 again cutting it doubtless eruptive

14116 400 N. 400 N. S.E. Sec 5-41-29
 A gray gneiss

T. 21

R. 28

Sec. 3

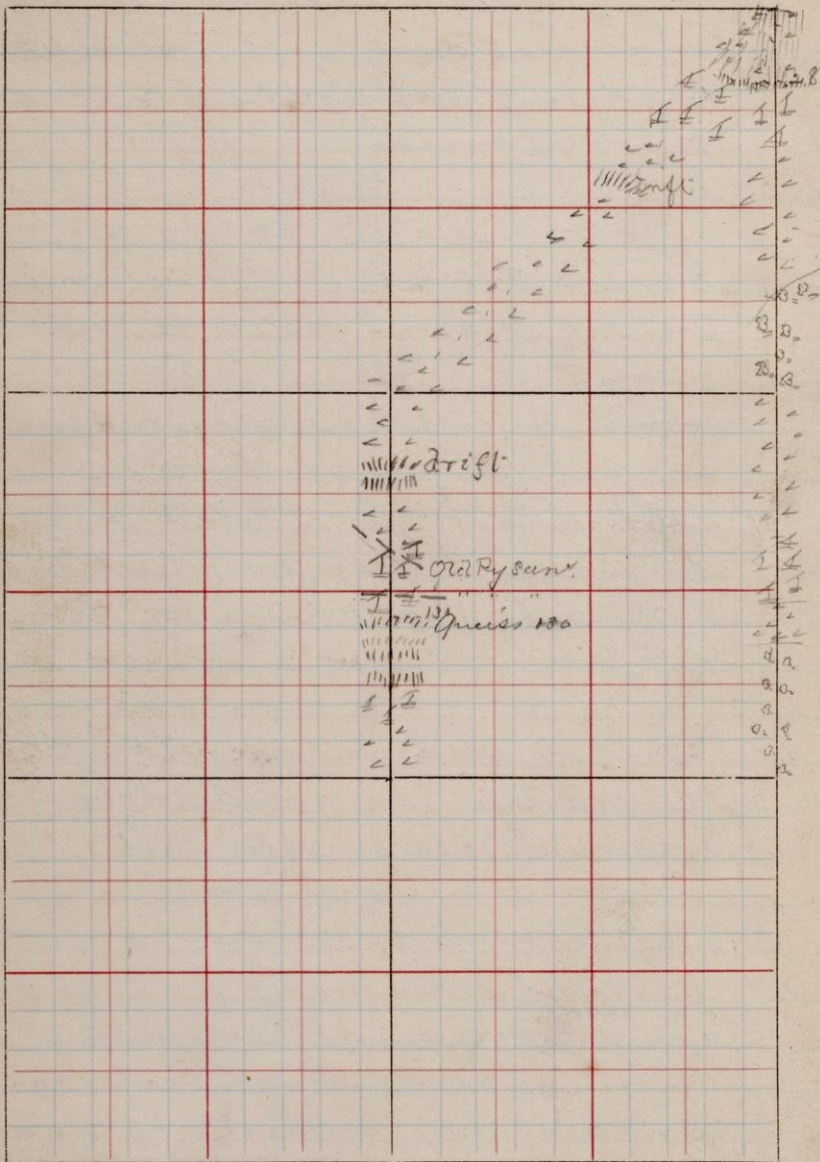


- 117 1725 N. 1000 N. S.E. 33-42-28
- 14117 Aht. schist cutting the gneiss and also lying just north of a large knob of gneiss
- 118 400 N. 450 N. S.E. 33-42-28
- 14118 From a test pit Howie says the dip is about 90° as he remembers it. The pit is 50 steps south of a large ledge of gneiss
- 119 425 N. 450 N. S.E. 33-42-28
- 14119 A ledge of ^{very} coarse granitic six steps wide and running about E. & W.
- 120 North of and in contact with
- 14120 the granitic this rock was crossed for about 30 steps after that
- 121 520 N. 450 N. S.E. 33-42-26
- 14121 A ledge of lean over running about ~~E. & W.~~ and dipping 70° S. The observations across here are Mag. as there was no sun see back of book page 54.

T. 42

R. 28

Sec 28



- 122 530 N. 450 W. S. E. 33-42-28
- 14/122 from a test pit about 10 paces north of the lean ore (2)

- 123 575 N. 450 W. S. E. 33-42-28
- 14/123 A lb. rock similar to 117 about ten steps across it To the north the line passes through a swamp

- 124 1650 N. 250 W. S. E. cor. 32-42-28
- 14/124 From the granite dyke in the lean ore near Metropolitan

- 125 1630 N. 00 W. S. E. corner 32-42-28
- 14/125 A dark colored rock looks like a lb. sch. and lies within a few paces and south of the lean ore at Metropolitan

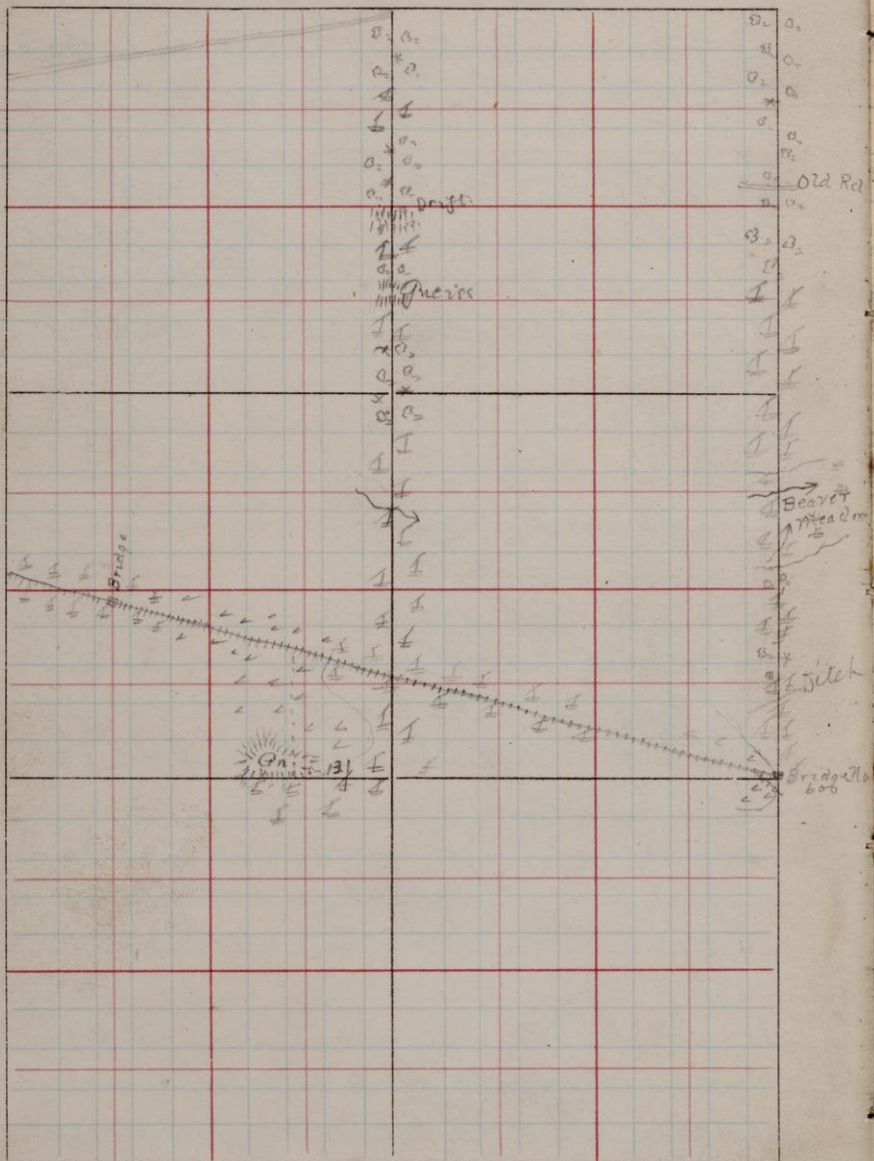
- 1400 N. 00 W. S. E. corner 32-42-28
- Near the Hotel at Metropolitan a rock similar to 125

- 126 1200 N. 00 W. S. E. corner Sec 33-42-28
- 14/126 a low ledge, rising but a foot or so above the surface, of a gray mica gneiss

T. 42

R. 28

Sec. 34

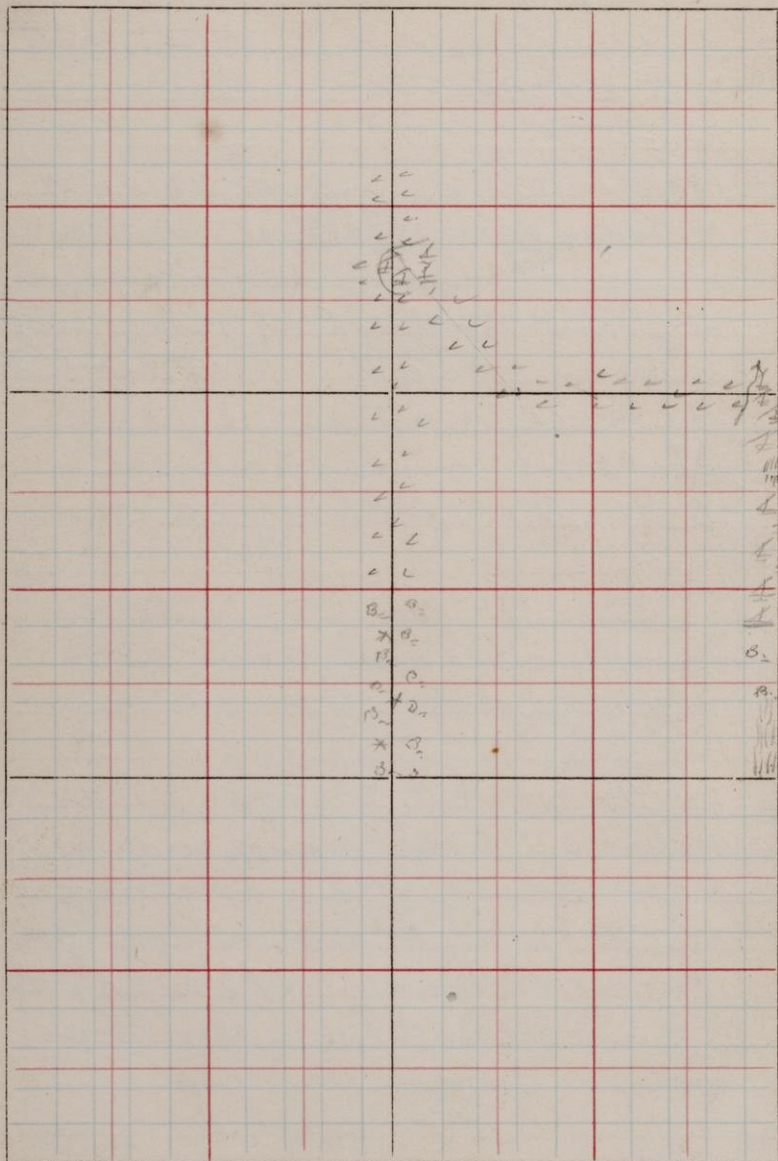


- 127 1530 N. 90 N. S. E. corner 28-42-28
- 14127 a ledge of loose red sandstone dipping
10° to 12° S. of S.
- 128 1800 N. 00 N. S. E. corner 28-42-28
(or. 46.)
- 14128 A ledge of mica schist with granitic
veins The ledge rises abruptly from
a swamp to a height of 12 or 15 feet
and runs 5° S. of W. Dip high to
the south or vertical
This rock continues to show at intervals
to the top of the hill or to the corner
north
- 14129 2000 N. 00 N. S. E. corner 28-42-28
a coarse grained granitic vein(?)
130. 440 N. 1000 N. S. E. corner 28-42-28
- 14130 a dark H.S. sch. rising in a low
knob. South of this for 200 paces
the dark rock and a light gray
gneiss alternate; the exposures
rising near the center to a
height of 30 or 40 feet

T. 42

R. 28

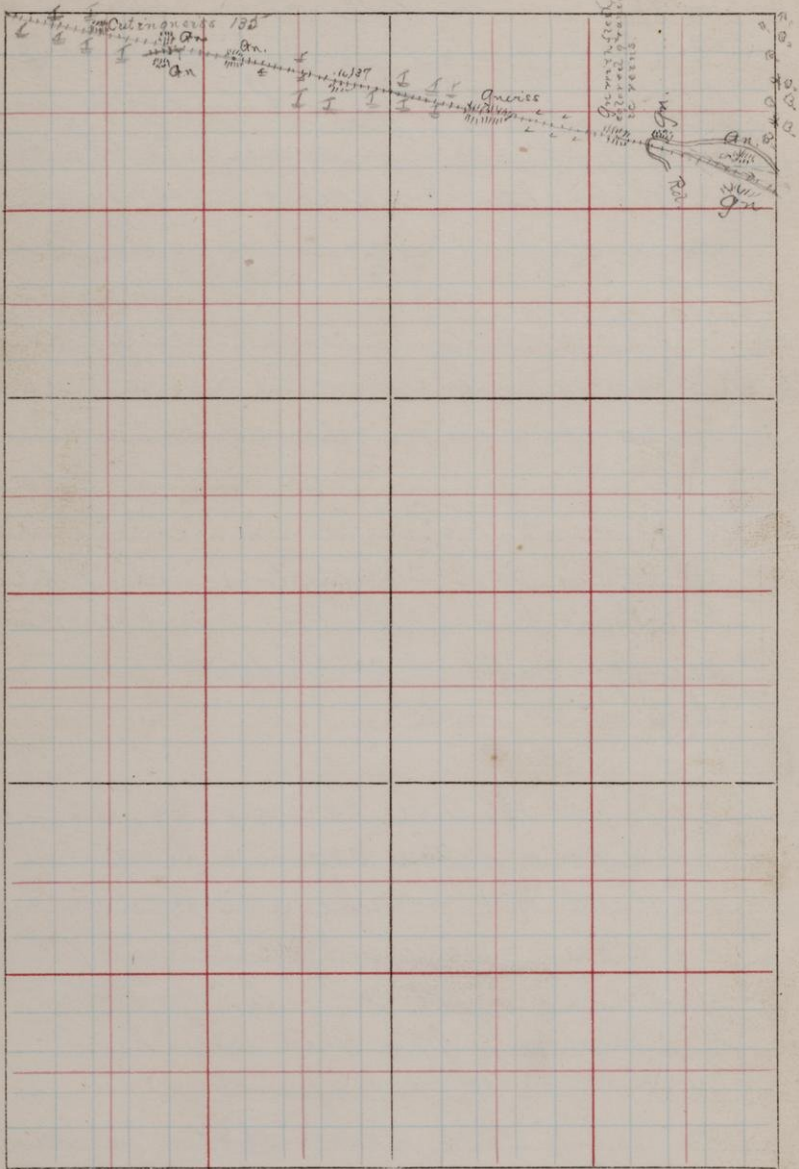
P. 27



- 131 30 N. 1225 ft. S. E. corner Sec 34-42-28
- 14131 A knob of gray gneiss 200 to 300 paces long E. & W. and a hundred wide south of this is a swamp to the south of which can be seen more of the granite
- 132 1275 N. 1000 ft. S. E. corner 34-42-28
- 14132 A ledge of gneiss rising 20 or 30 feet with an abrupt slope on both sides
- 133 60 N. 00 ft. S. E. corner 34-42-28
- 14133 a loose red sandstone near the top of a high bluff could not see enough of the ledge to get dip or strike
- 134 60 N. 00 ft. S. E. corner 34-42-28
- 14134 This quartzite seems to be included in the sandstone as fragments containing both ss and quartzite could be broken off but whether it is in the shape of a vein or congl or some other form I could not determine

T. 41

R. 28 Sec. 2.



135 1950 N. 1790 N. S.E. cor Sec 2-41-28

14135 A small exposure of gray gneiss on the north side of the Ry.

Most of the exposure is very gneissic with thin bands dipping at a high (50°) angle to the E. of N.

136 A band about 4 feet wide running

14136 N. S. and standing vertically in the above gneiss the junction is well marked

137 1830 N. 1950 N. S.E. corner Sec 2-41-28

14137 A black hb. schist in a small exposure on the south side of Ry

Dip 30° E. (Mag)

1750 N. 7500 N. S. corner Sec. 2-41-28

A gray gneiss the dip being to the east at about the same angle as 137

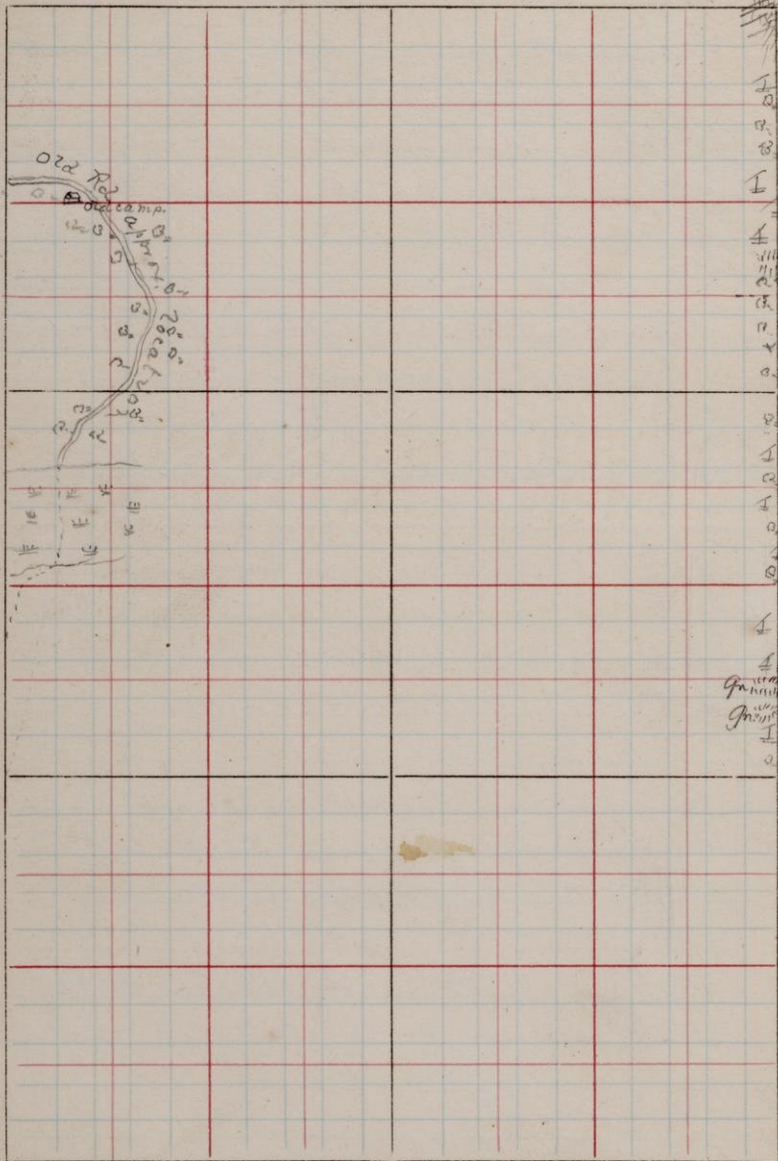
138 250 N. 000 N. S.E. cor. sec 26-42-28

14138 A hb. gneiss or schist with granitic veins

T. 42

R. 28

Sec. 35



~~Old River~~

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50

Old Camp
Zocalo

Old Camp
Zocalo

139 2000 N. 1620 N. S.E. cor. Sec 36-42-28

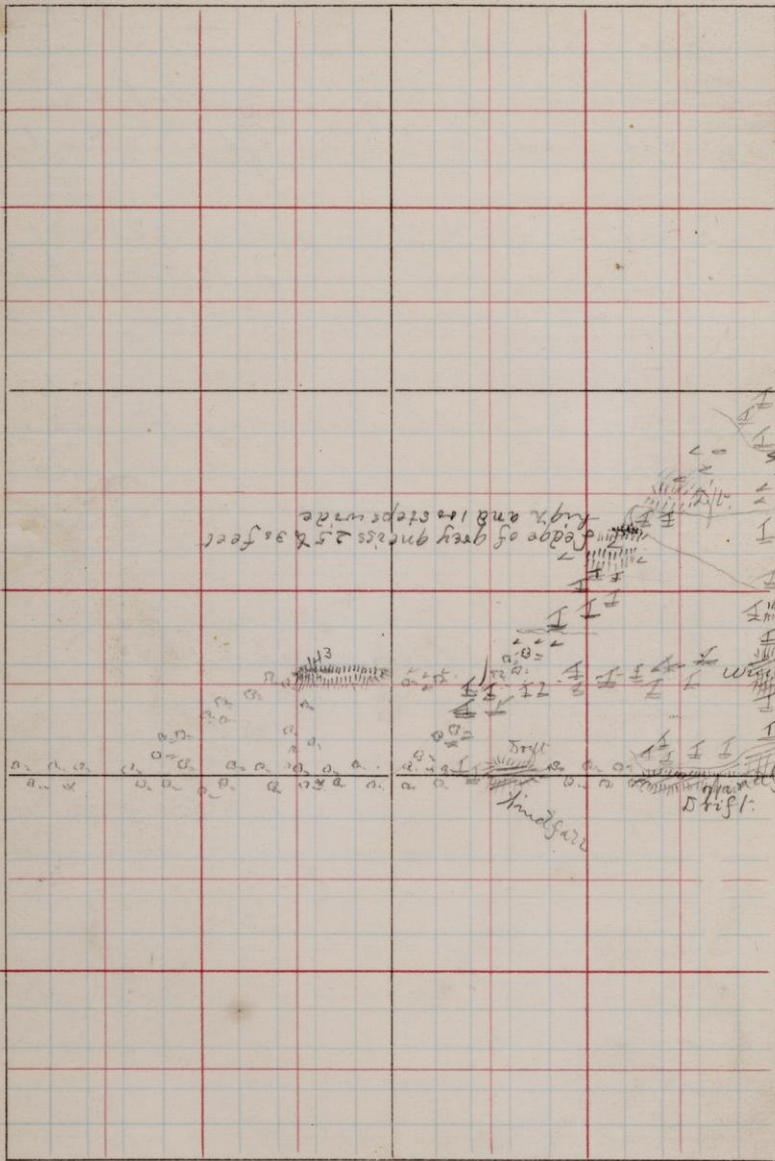
14139 A gray to reddish gneiss rising just above the surface of the swamp on the north and but a few yds. in extent

140 2000 N. 1250 N. S.E. corner Sec. 36-42-28

14140 An exposure of gneiss and Hb. schist. The Hb. rock is shown in the specimen exposure too much covered and broken to get the relation of the two. This rock is exposed at intervals for the next 200 steps east

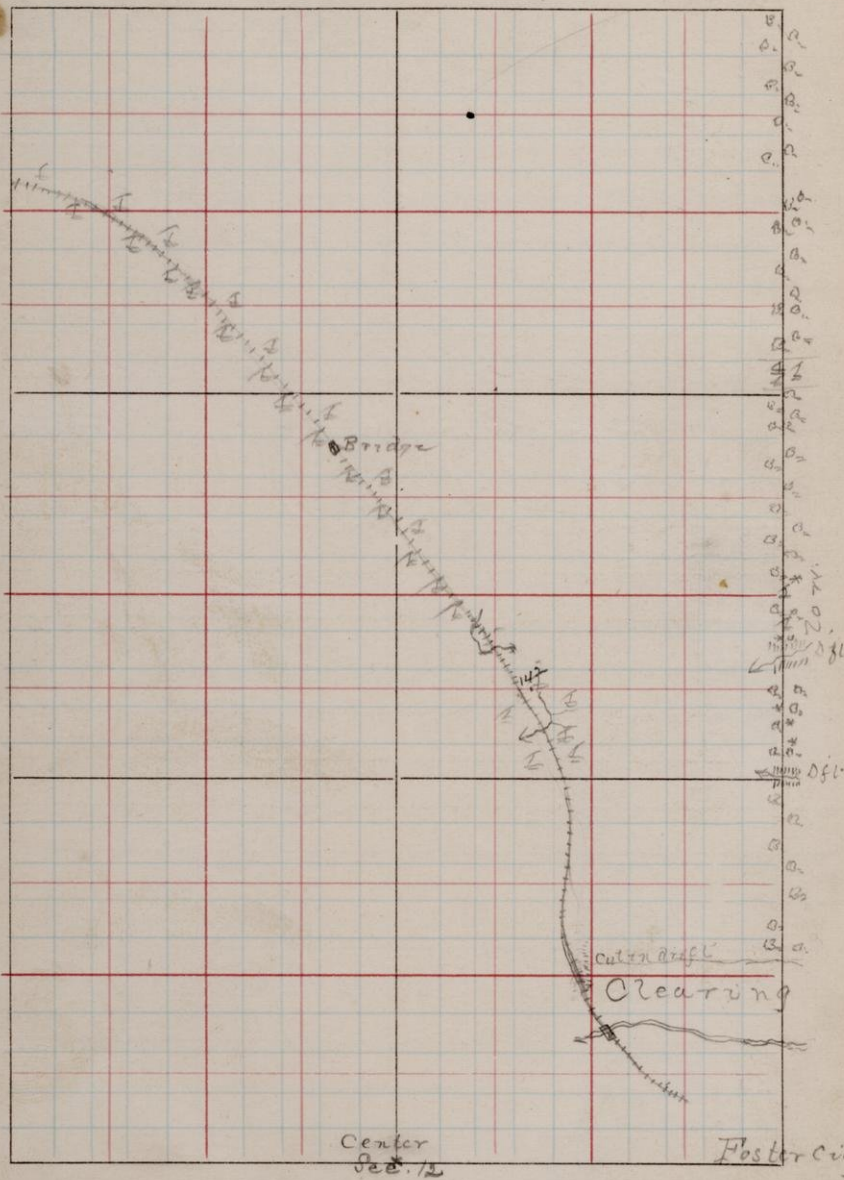
141 1460 N. 60 N. S.E. corner Sec 36-42-28

14141 A ridge of Gneiss about 75 steps wide running E. & W. (mag)



T. 41

R. 29 Sec 1



142 250 N. 700 N. S. E. cor Sec. 1-41-28

14142 An exposure in a Ry. cut of mica
Schist; very shaly

Dip 25° E. 15 S.

This rock is exposed along the
Ry for about 500 step (at intervals)

143 300 N. 1250 N. S. E. corner Sec 26-42-28

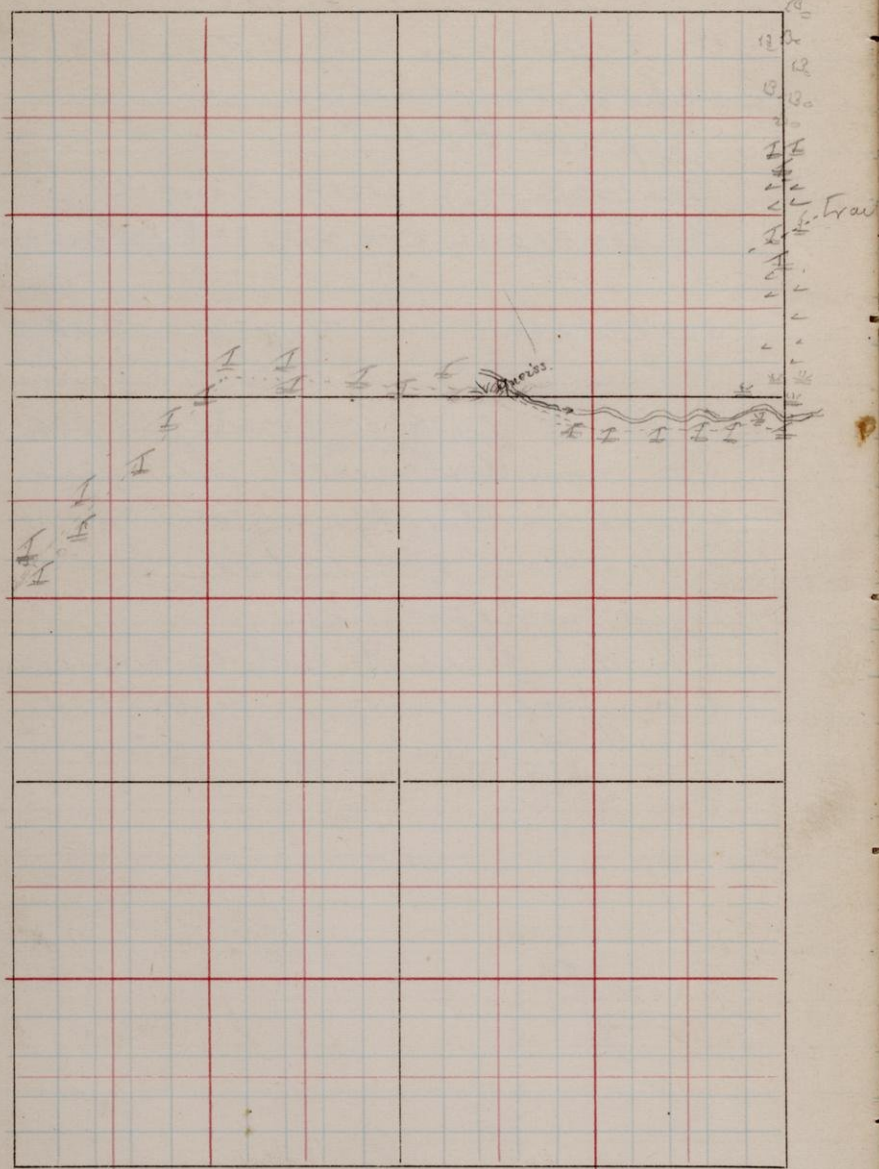
14143 A large ledge of Marble running
E. W. (mag.) for about 250 paces

For some distance it has an
abrupt northern face and the whole
exposure is at the base of a
long north slope

The dip I could not determine
to any satisfaction but it seems
to be at a low angle (12 to 15°) to
the S. E.

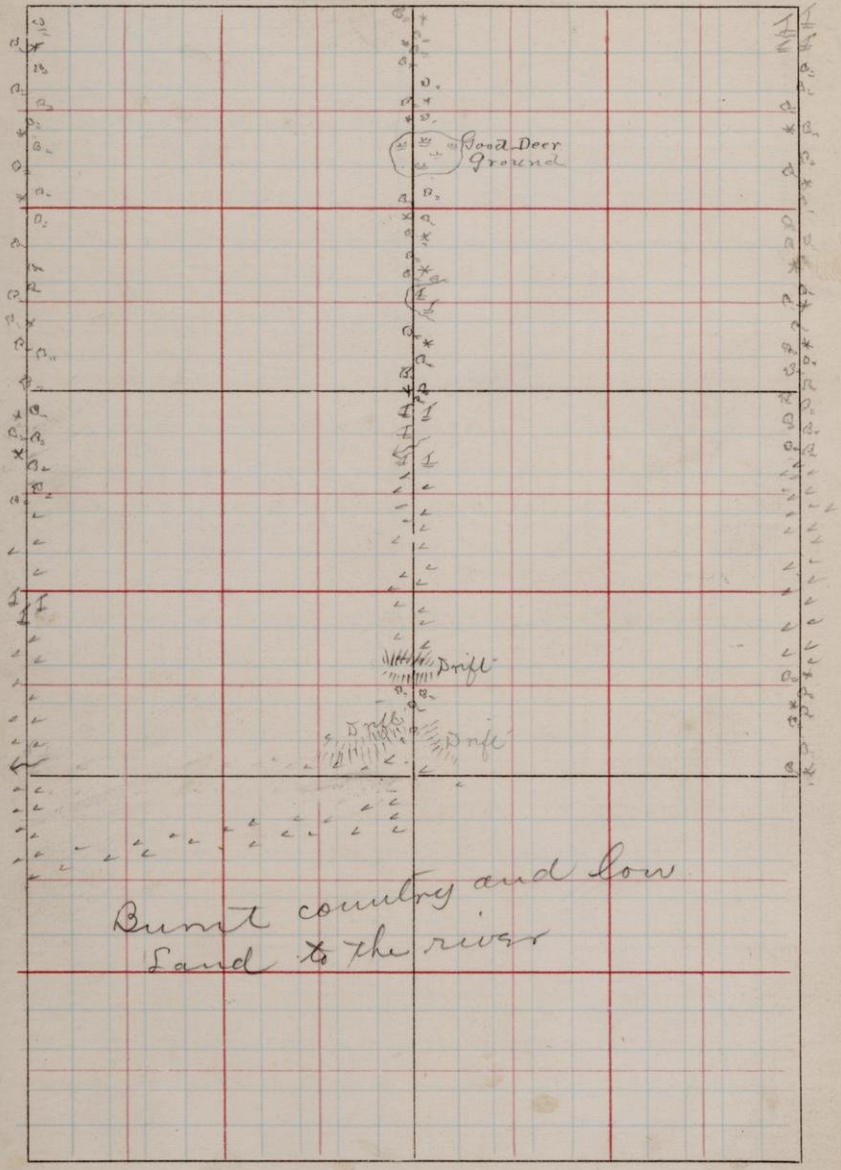
T. 42

R. 28 Sec 25



T. 42

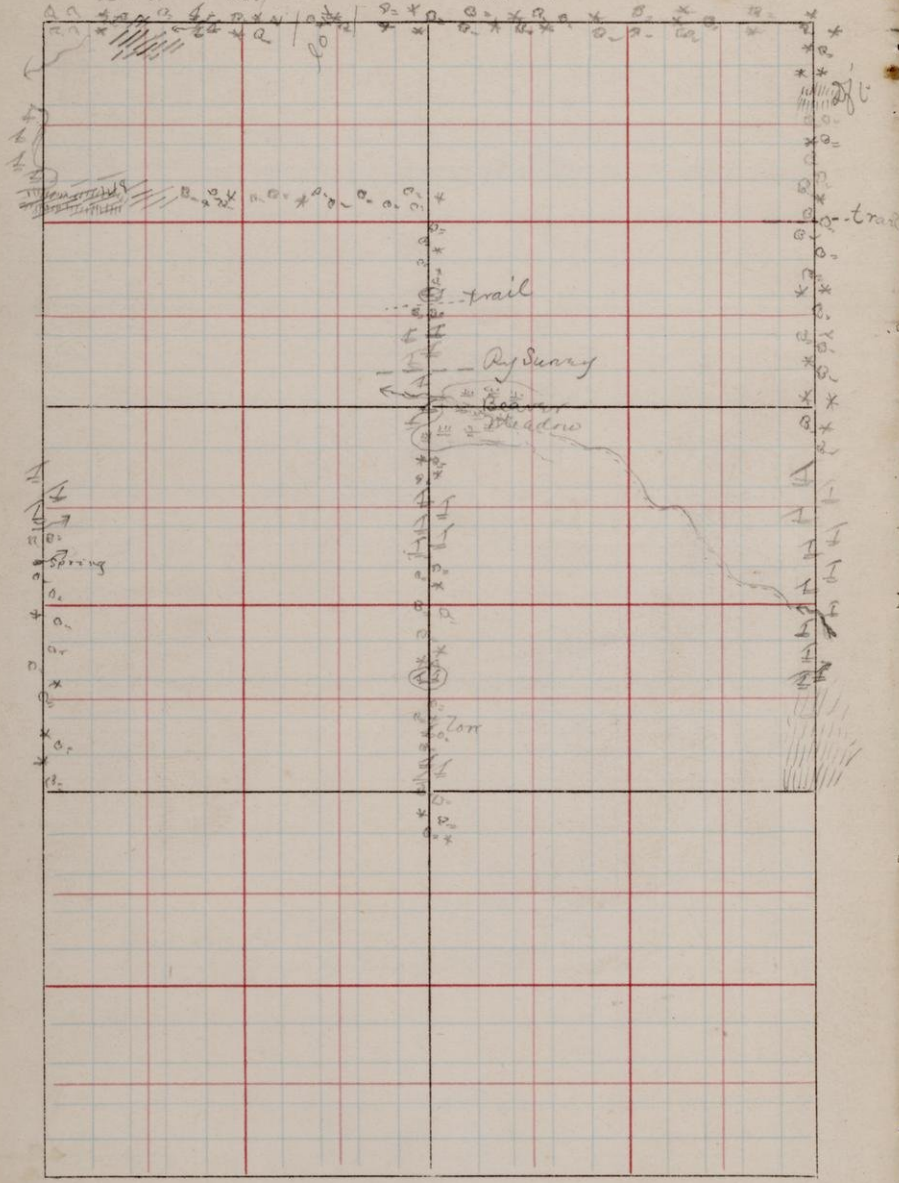
R. 28 Sec 24



lon T. 42

R. 28

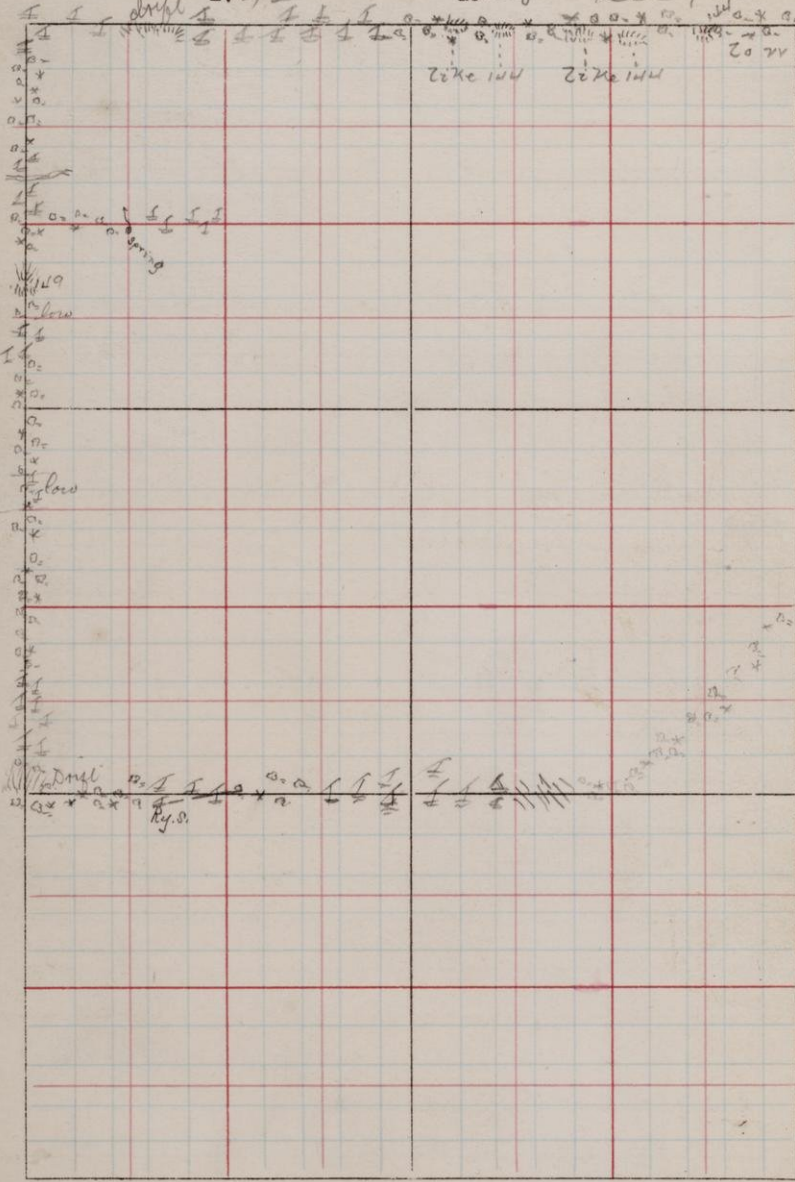
Sec 13



T. 42

R. 28

Sec 14

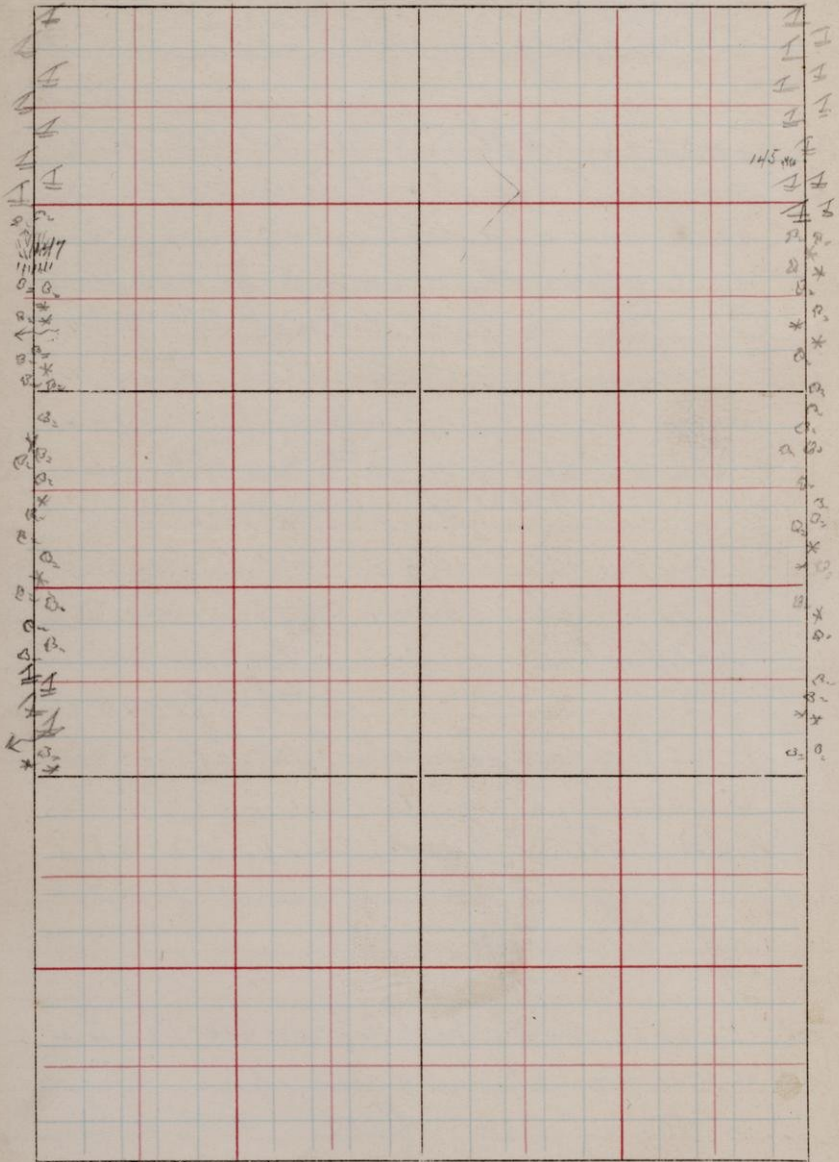


- 144 2000 N. 225 N. S. E. corner sec 14-42-28
- 14144 A low ledge of granite
- 145 1600 N. 50 N. S. E. corner sec 12-42-28
- 14145 a small ^{rounded} ledge about ten slips across each way and rising but five or six feet above the swamp of conglomerate
- (2) The surface shows the pebble outlines very distinctly. They also show plainly on a fresh surface. The pebbles seem to be all a more or less ^{light} dark colored quartz. The rock itself looks more like a granite than anything else, with the fragments elongated by pressure. The fragments are lance shaped from pressure.
- 146 75 N. 00 N. S. E. cor. sec 1-42-28
- 14146 A ridge of gneiss rising from the swamp.
- 147 1360 N. 2000 N. S. E. cor sec 12-42-28
- 14147 An eruption exposed in the north slope of hill not showing much where crossed.

T. 42

R. 28

Sec 12



- 148 1540 N. 1825 N. S. E. corner Sec. 13-42-28
- 14148 A granstone that seems to be similar to some of the rock in the gneiss that I have called H. schist
A large ridge of this rock running east and west, ^{for 200 to 300 steps,} and rising 20 or 30 feet above the general surface
- 149 1350 N. 2070 N. S. E. corner Sec 14-42-28
- 14149 A ledge of granstone running E. & W.
- 100 350 N. 300 N. S. E. corner Sec 22-42-28
- 14150 A high ledge of mica sch. with quartz and granitic veins
The schistose structure runs E & W. (Mag.) and stands vertically
The ledge rises 75 to 100 feet above the river at its base
- 151 860 N. 1000 N. S. E. corner Sec. 15-42-28
- 14151 A mica schist exposed in an abrupt-north face about 20 feet high and for a distance E & W. of about 100 steps
Strike as nearly as could be obtained

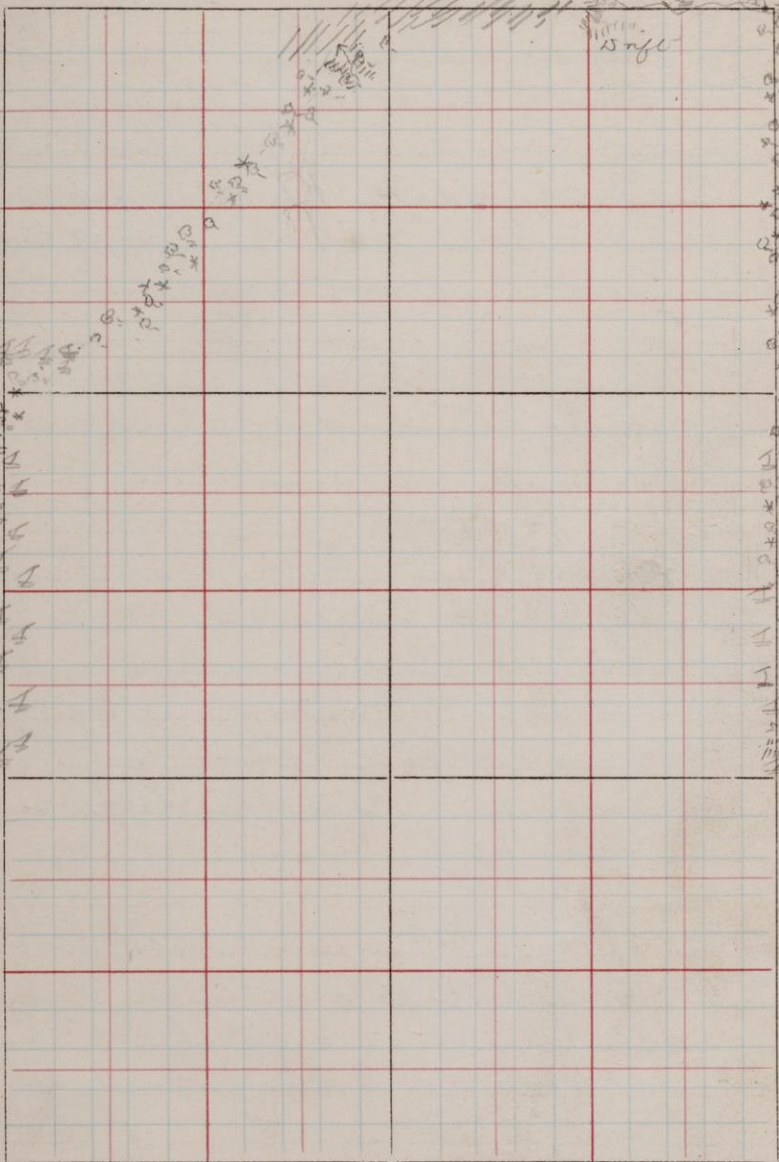
T. 1/2

R. 2

Shoreline
1896

209
R2

100 ft
15 npl



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

is E & W. (mag) Sep 70 870 N.

152 1240 N. 1030 ft. S.E. cor 15-42-28

14152 A granitic probably a continuation of that to the east (144-47-8-16)

14153 1550 N. 1050 ft. S.E. corner 15-42-28

A large ledge of granite

154 285 N. 00 ft. S.E. corner Dec 10-42-28

14154 A ledge of granite striking E. & W. (Mag) with an abrupt southern face of about 7 feet

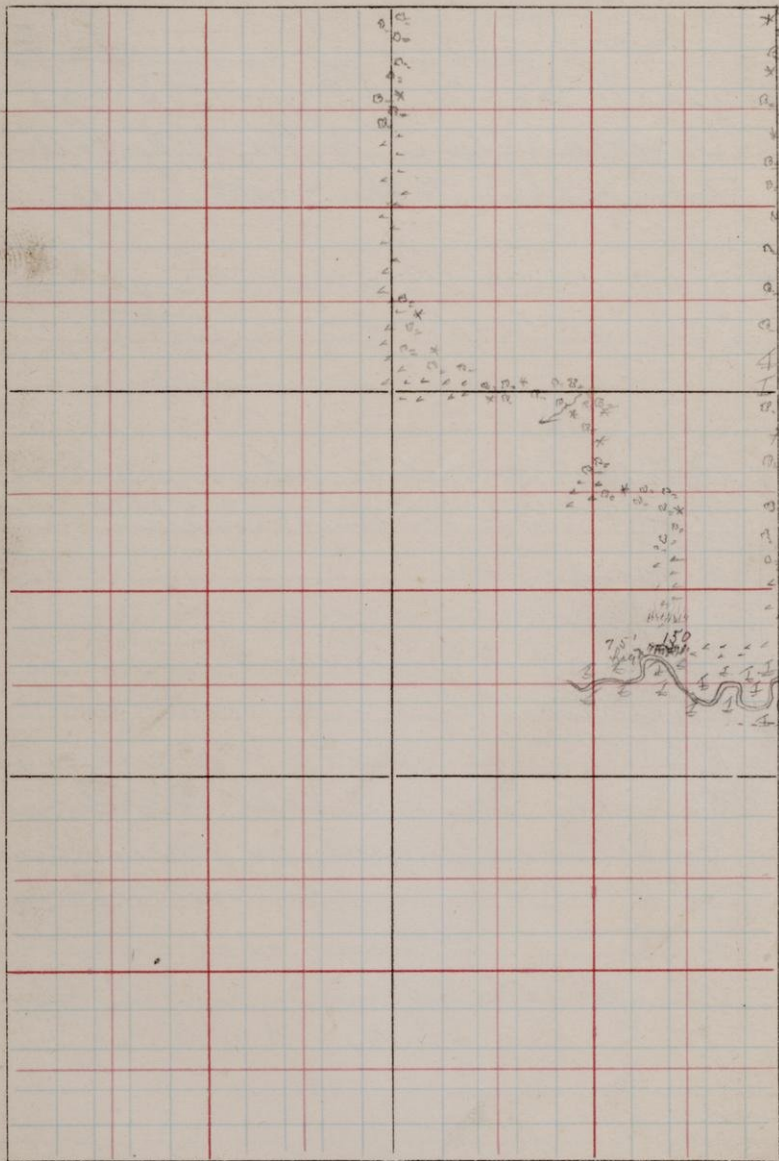
155 1600 N. 00 ft. S.E. cor Dec 10-42-28

14155 A small ledge only about 20 to 30 feet in diameter of a gneiss (?) It is very like 145 that I called a conglomerate and in places shows as much of a conglomeratic structure as that. It has also somewhat of a schistose structure that dips 75° N. and strikes it 10° A (Mag)

T. 42

R. 28

Sec 22



L7022

156 25 N. 1000 ft. S. E. cor. sec 3 - 42 - 28

14156 A large ledge of rock similar to 156. The dip and strike is the same

157 80 N. 1600 ft. S. E. cor Sec 2 - 42 - 28

14157 A ledge running E. & W. of a very firm rock (felsitic?) followed for about 100 steps E & W. the same rock is exposed 50 steps S. E. of 157

158 1880 N. 1000 ft. S. E. corner Sec 10 - 42 - 28

14158 A high ridge running about E. & W. of rock similar to 155-156 taken $\frac{1}{2}$ mile East

159 2000 N. 1875 ft S. E. corner Sec 15 - 42 - 28

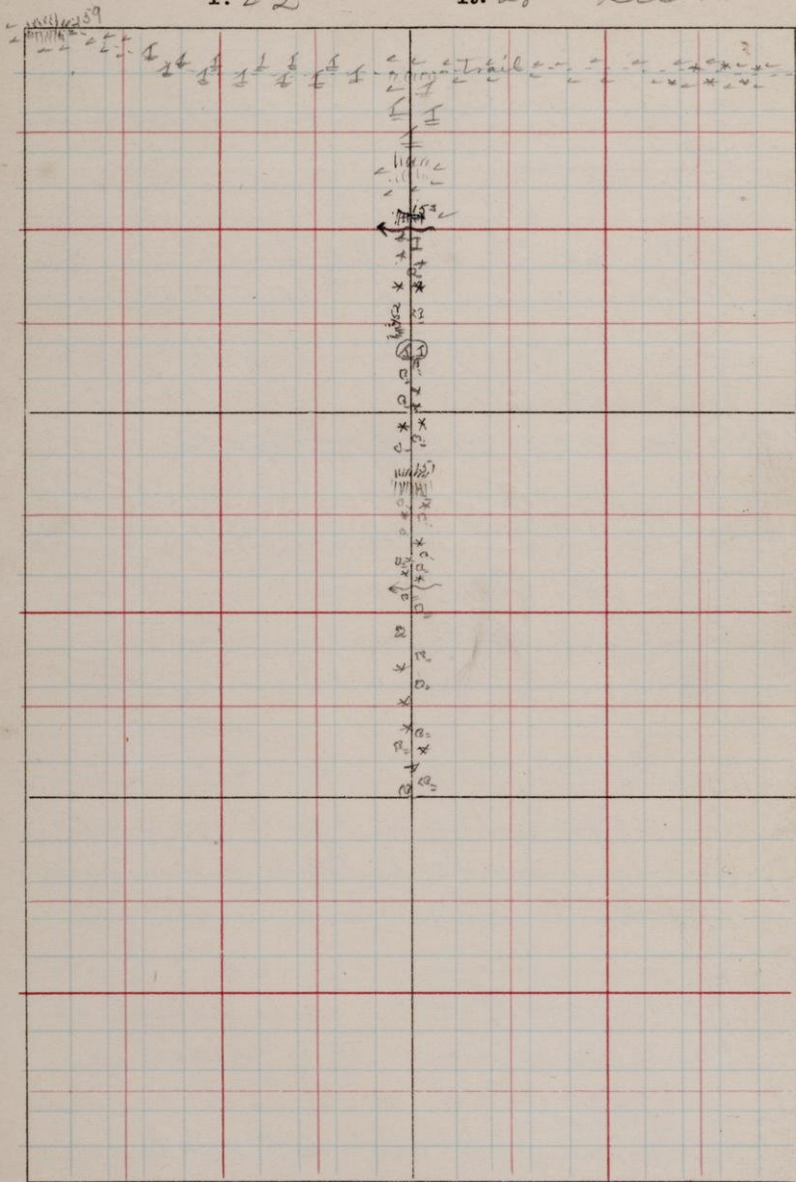
14159 A ridge of Hb. sch. (?) running along the line West to the corner strike E 10 N. Dip, vertical

160 1800 N. 2000 ft. S. E. corner Sec 15 - 42 - 28

14160 From a small outcrop of greenstone 50 to 75 steps long and 20 or 30 wide running about 20° N of E.

T. 12

R. 28 Sec 13.

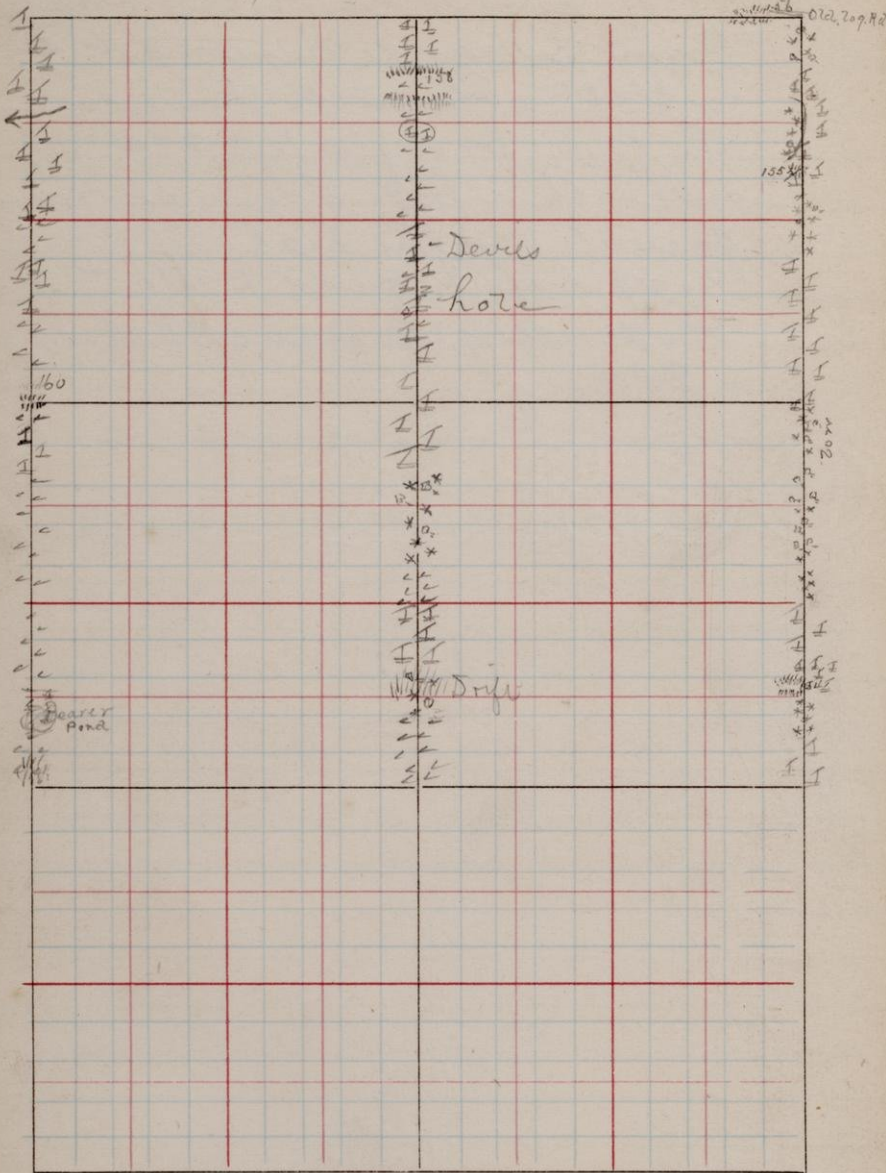


161 65 N. 2000 N. S.E. cor Sec 3-42-28

14161 From the marble ledge marked on flat This rock shows on the line for a few feet E & W and with a broken down moss covered face about 4 feet high No dip or strike could be obtained The strike of the face of the ledge is E & W.

T. 1/2

R. 28 Sec. 10



T. 1/2

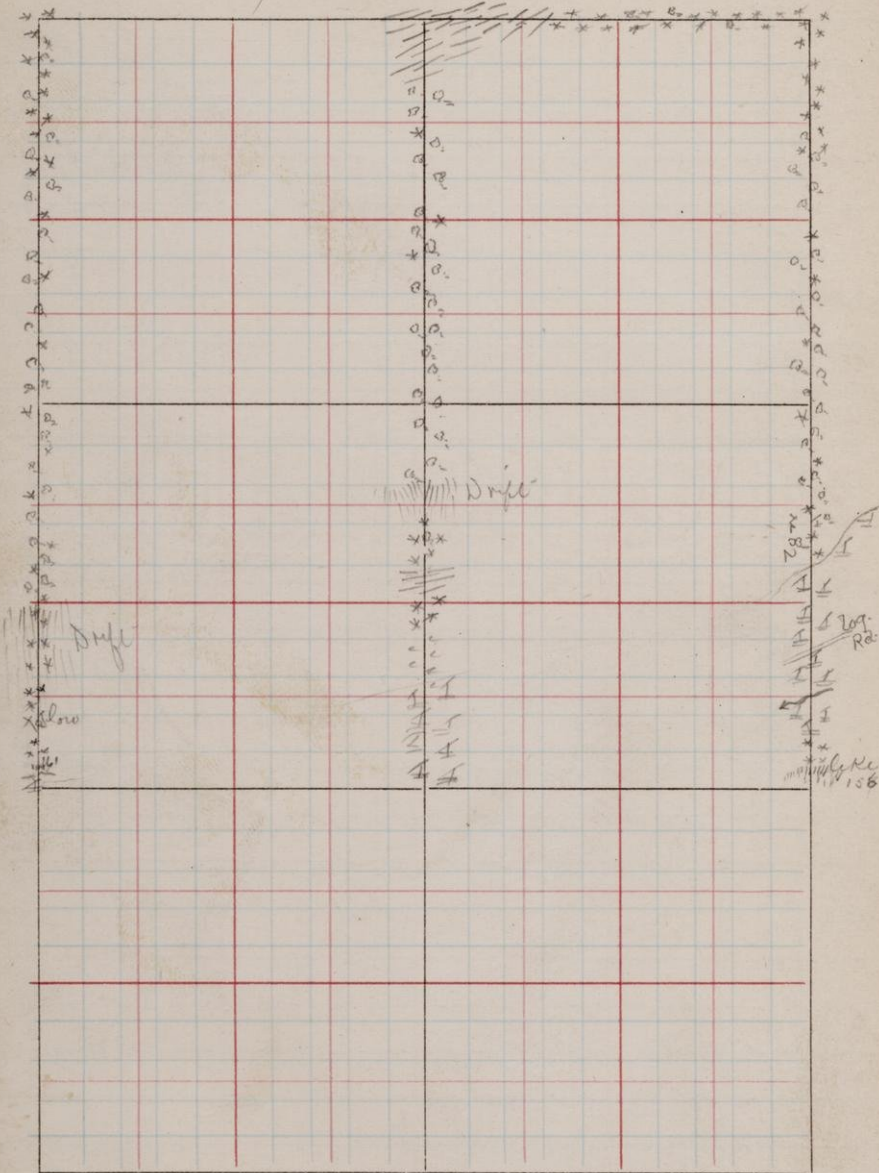
R. 28

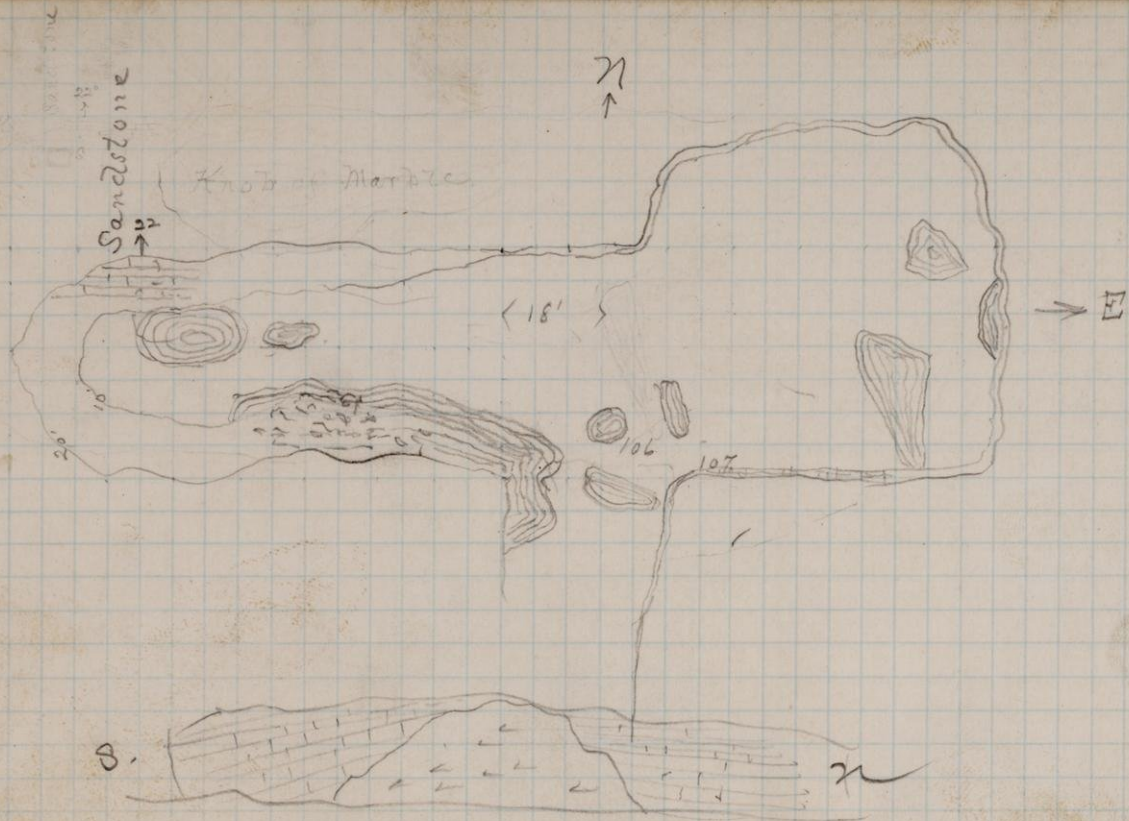
Sec 2.

Like 156
2 x 2 157
2 x 2

T. 42

R. 28 Sec 3





No. 121 Further observations with the
sun shows the strike of the iron rocks
to be from E to W and the
dip to vary from a high angle either
north or south to a horizontality.
They show this folding in several places
and places it reminds one very much
of some of the Vermilion Lake iron rocks.

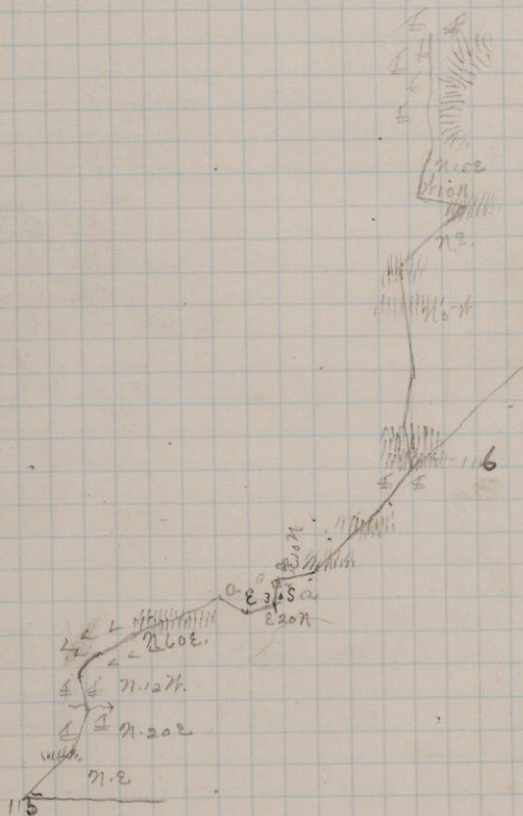
A					
31	32	33	34	35	36
				H?	
6	5	41	3	2 2 2	1 1
7	8	9	10	11	12
18	17	16	15	14	13
		<u>41 - 30</u>			
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1820 N. 1300 N. S.E. 32 Marble overlain by ss.
in a pit

1800 N. 1700 N. S.E. 32 a ss⁽²⁾ ledge No 108

1800 " 1140 " " " " "

1220 " 1140 " " " " " "gnais " 109



Creek 300 N.

Swamp 50 to 75 paces wide 300 N.

30 29 28 27 26 25
31 32 33 34 35 36

780
720
1152
860
628
525
7 P
Old by running
860 & exp. 1000 and 11000 of burnt country
1152
720
780
7 P

Q Q

* *
* *

1150
750
400

113 N.C. 150 300 pades

N208 150 200 100

1600 300

280 400 1000 also ring

W W
W

~~scribbled lines~~

* I E

*

