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Michigamme iron district: [specimens 22915-22936]. No. 165 1894

Clements, J. Morgan (Julius Morgan), 1869-
[s.l.]: [s.n.], 1894

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U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

9-891

LAKE SUPERIOR DIVISION.

INSTRUCTIONS.

1. Ordinarily at least two pages of this book will be devoted to one section. On the left-hand page, place a map of as much of the section as has *actually been seen*. Denote rivers, lakes, marshes, etc., by the usual topographical signs. Denote the ledges of rock, when no structure is made out, by cross-hatching, making the cross-hatching cover as nearly as possible the areas occupied by the exposures. If the rock is a massive one, but still more or less plainly bedded, use the same sign with a dip arrow and number attached, showing the direction and amount of the dip. Denote a shaly or other very plainly bedded ledge by right parallel lines, and a ledge having a secondary structure by wavy parallel lines running in the direction of the strike, with dip arrow and number attached as before. The greatest care must be taken to avoid confusing slaty or schistose structure with bedding, and in all cases where there is the least doubt about the true bedding direction, indicate it by a query. To each exposure on the face of the map attach the number of the specimen representing it. In mapping the section count each of the spaces between the blue lines as 100 paces, and twenty of these spaces to one mile, or 2,000 paces. Usually the southeast corner will be placed at the bottom of the page, or at the first black line above the bottom of the page, and at the right-hand side. If, however, for any reason, it is desirable to show portions of an adjoining section, the southeast corner may be shifted up, or the map may be turned around and the north placed at the left-hand side of the page. The ruling of the left-hand pages is also arranged so that, if desirable, a larger or a smaller scale can be used, eight inches, two inches, one inch, or one-half inch to the mile. With the two-inch scale, the squares outlined in black represent sections, and those in red, quarter sections and "forties," while the space between the blue lines is 200 paces.

2. On the right-hand page place the notes descriptive of the exposures. Begin in each case with the number of the specimen, placing the number on the left-hand side of the red line, after which give in order on the right of the same red line the position of the ledges as reckoned in paces from the southeast corner of the section and the dip and strike when observable, the latter always being expressed from the north; for instance 4025, 250 N., 300 W., Strike, N. 78° E., Dip 50° S. Then follow with a full description of the ledge. When topographical maps are used for locations this paragraph applies only in part.

3. Collect a specimen from every ledge, or wherever there is a change of rock on any one ledge, taking care to get fresh material, unless for a special purpose the weathered surface is desired. In case of trips made on foot or in canoes, for long distances, neighboring ledges, unquestionably of one kind of rock, need not be specimened. The position and extent of the ledges not specimened should be marked on the map, with notes that each is of a rock identical with specimen so-and-so. Under the same conditions small-sized specimens, trimmed to a uniform size of $2 \times 2\frac{1}{2} \times \frac{1}{4}$ inches will be allowed, but in all other cases *large-sized specimens*, trimmed to a size of $3 \times 4 \times 1$ inches, must be selected, in accordance with section 3, chapter IV, p. 44, Regulations of the U. S. Geological Survey. Specimens should not be placed together without protection in the collecting bag, as the fresh surfaces, important in determining the character of rocks, are thus destroyed. They should be damaged by no temporary mark, but the numbers should be at once marked in at least two places upon the inclosing paper or cloth bags. Specimens may be permanently marked in camp by painting the numbers upon them in white upon a black background, using Silver White and Ivory Black oil tubes for color, with turpentine as a diluent.

4. On the last twenty-five pages of the book give, as may seem desirable, a general account of the examination of the region mapped in the previous pages, correlation of observations, sketches, cross sections, etc.

5. Forward this note book as soon as filled as registered mail matter to C. R. Van Hise, U. S. Geologist, Madison, Wis.

(95)
T r 87 C - A

1.
Michigan
Iron District
more especially
the
Fence & Deer River Regions.

J. Morgan Clements.
1894

Chas. Alley
Comptroller.

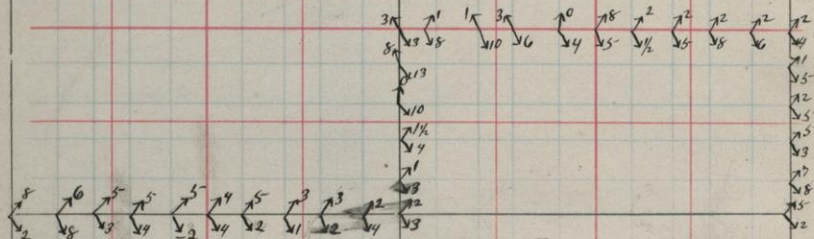
6

45-

31

NW

NE



SW

SE

1.
Made short run in afternoon
of July 5th. Day rainy.
Put pit in drift at

1000 N 1200 W SE Cor Sec. 6-45-31.

S. 5-

T. 45-

R. 31

NW

NE

12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

SW

SE

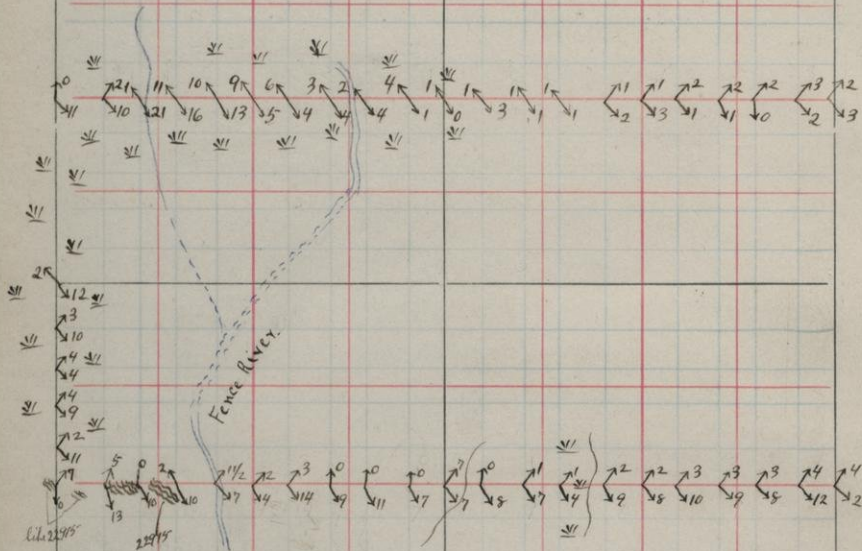
S. 31

T. 46

R. 31

NW

NE



S SW.

SE

22915- 490 N 1720 W SE Cor. Sec. 31-46-31

Moss covered outcrop in swamp
of schist striking $N70^{\circ}W$ and
dipping $45^{\circ}N$. Occurs just to west
of a westward trend and appears to cause it.
Same rock is exposed again a few paces
to the west and again appears in two
small ledges near the section line.

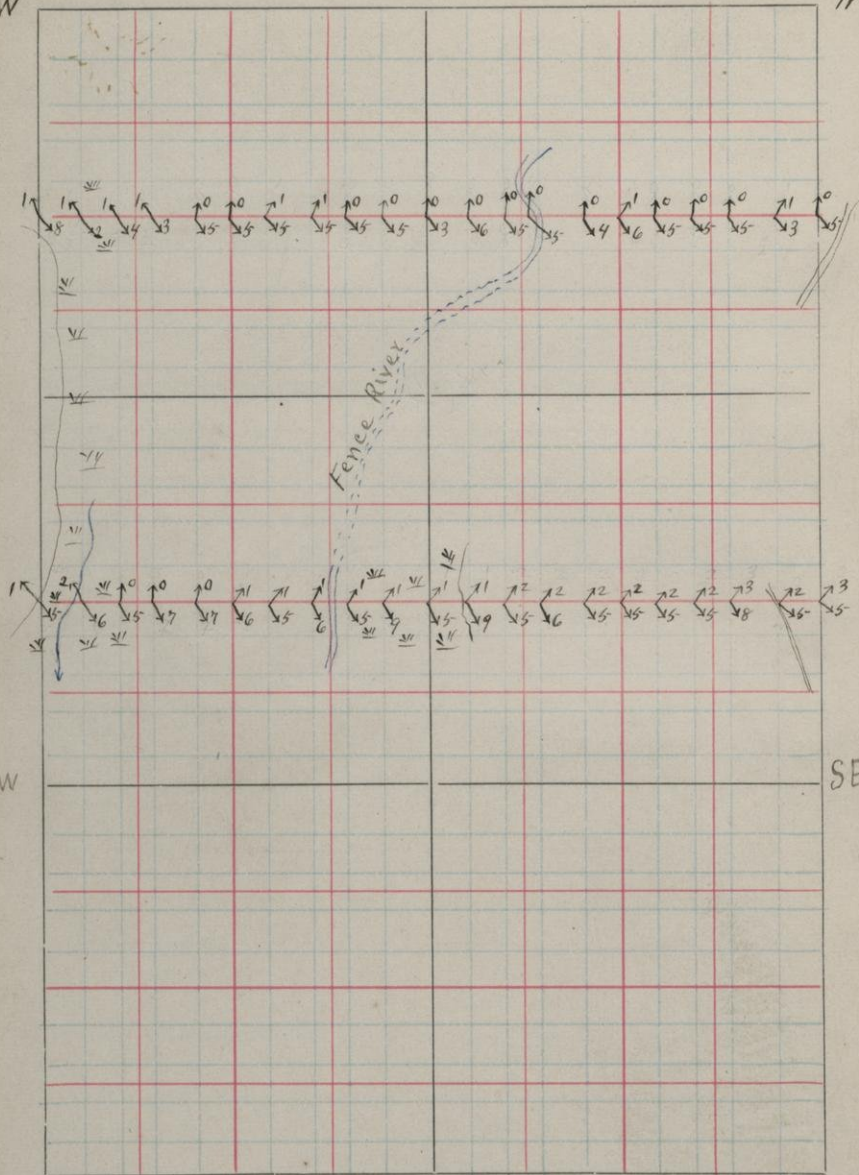
N NW

S. 30

T. 46

R. 3/

NE



S SW

SE

NE

S S VY

SE

The diagram is a hand-drawn map on graph paper. A river, labeled "Fence River", is depicted on the left side, flowing from the top towards the bottom. A dashed line, representing a fence, runs vertically and then curves to follow the river's path. The map is divided into sections by a horizontal red line and a vertical red line. Various points are marked with numbers and arrows indicating directions. The points are as follows:

- Top Section (above the horizontal red line):**
 - Top left: A point labeled "11" with an arrow pointing up and to the right.
 - Top center: A point labeled "16" with an arrow pointing up and to the right.
 - Top right: A series of points labeled "17", "17", "17", "18", "18", "18" with arrows pointing up and to the right.
 - Middle left: A point labeled "15" with an arrow pointing up and to the right.
 - Middle center: A point labeled "16" with an arrow pointing up and to the right.
 - Middle right: A point labeled "15" with an arrow pointing up and to the right.
- Bottom Section (below the horizontal red line):**
 - Bottom left: A point labeled "15" with an arrow pointing up and to the right.
 - Bottom center: A point labeled "16" with an arrow pointing up and to the right.
 - Bottom right: A series of points labeled "15", "15", "15", "16", "16", "16" with arrows pointing up and to the right.
 - Far right: A point labeled "15" with an arrow pointing up and to the right.

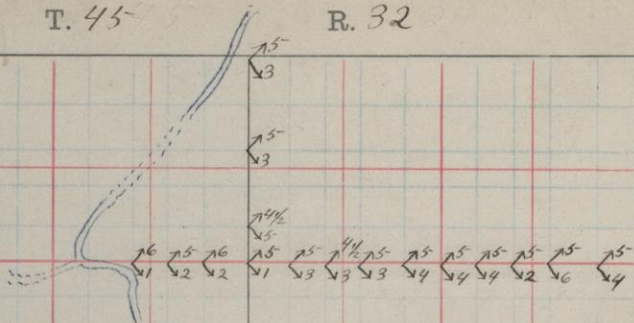
NW

S. 12

T. 45

R. 32

NE



SW

SE

NE

↗ 5-
↘ 5-

$\begin{array}{l} \nearrow 4 \\ \searrow 5 \end{array}$
 $\begin{array}{l} \nearrow 3\frac{1}{2} \\ \searrow 5 \end{array}$

Fence River

SE

VE

1/2

E

S. 36

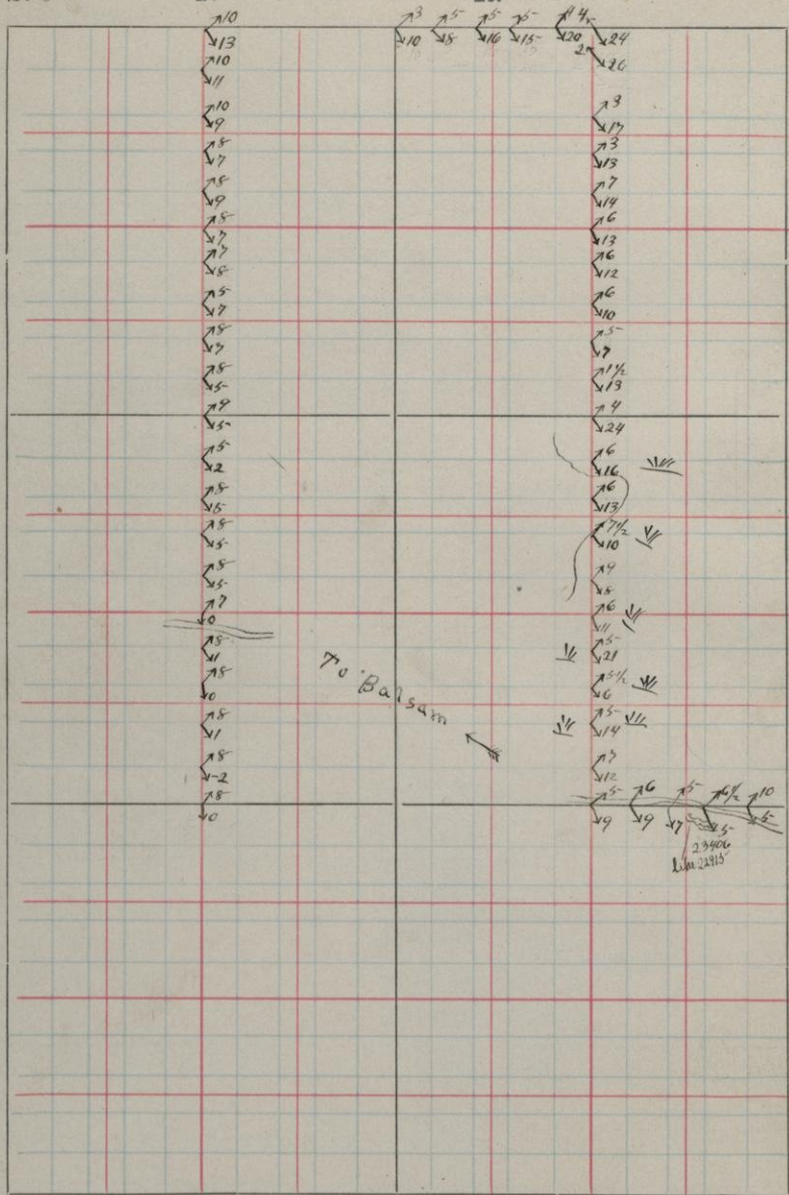
T. 46

R. 32

NE

SW

SE



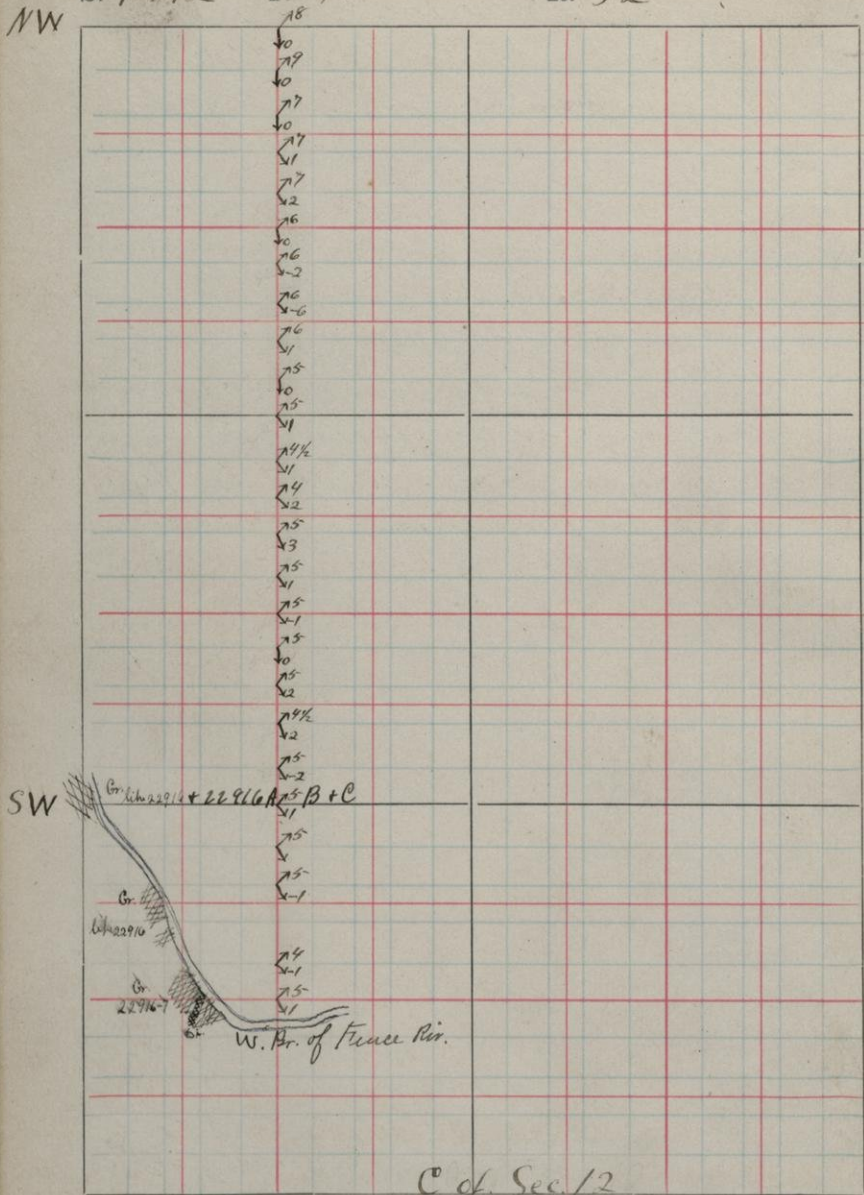
like 22915-1975 N 226 W SE Cor. Sec. 1-45-32

To S. of road outcrops a ledge of schist like
23406 of 22915. Specimenized and studied by Smyth.

Culver

22

NW



SE

2

22

2

C of Sec. 12

22916-17 1450 N 1650 W SE Cor. Sec. 12-45-32

Outcrop on west bank of W. Br. of Fence Riv. of a grey granite (22916) cut by a coarse diabase 22917. In places the granite is light greenish and somewhat schistose.

The same granite outcrops along river at intervals and occurs again at N.W. Cor. of sec. 12-45-32. Here along the river ^{and} is found a very quartzitic phase. Biotite play very small role in the composition of the rock and the feldspar seems to be present in comparatively small quantity.

22916 A This is a specimen of the schistose possibly recombined granite as it shows megascopically round quartz grains.

At top of this rock there are found

22916 B.

fragments of white vein quartz in it as though it was a conglomerate 22916 B.

22916 C This is followed by the very acid fine grained phase referred to above & repeated in Spec. 22916 C. There seems to be a false bedding in this rock but it is quite obscure. No true bedding was seen. Succession of rocks as given is from W to E giving a presumable strike of about N-S. ^{N.W. SE or} with fairly dip.

S. 2

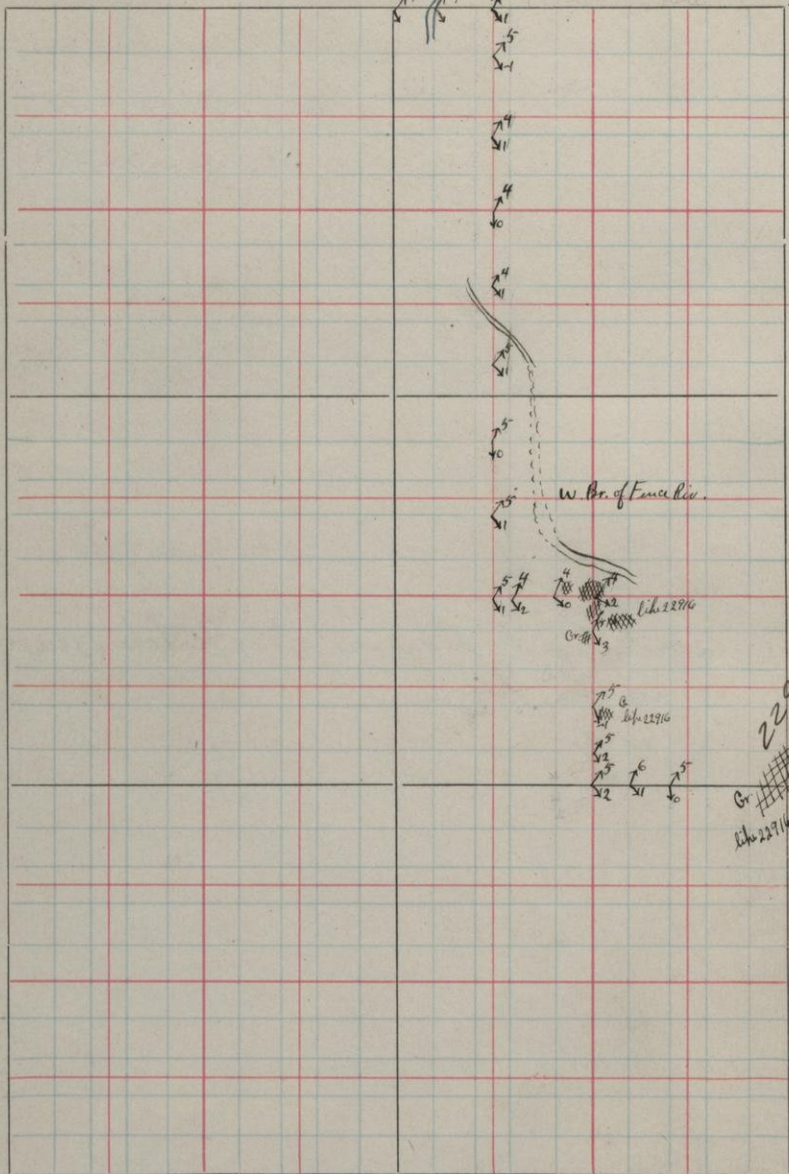
T.

45-

R. 32

NW

NE



SW

SE

In SE cor. Sec. 2-45-32 we get several small ledges of a granite like 22916. Outcrops occur chiefly near the river. Back of this the rock is hidden by a heavy growth of hardwood.

According to Prof. Culver (cf. N.B. 169 p. 10) the rocks referred to on preceding page are exposed for some distance N-W of corner. The part of the rock containing the vein quartz fragments is very small & appears unimportant. Could not get a specimen showing pebbles in it but 22916 B. is the matrix of the conglomeratic portion.

22916 A-B-C This is the schistose (unconformable) granite overlaid by 22916 B. and this followed by the quartzite 22916 C

NE

229/8 1880 N 1000 W SE Co. Sec. 35-46-32

Small exposure of diabase on hill
near river. In places it appears slightly
schistose. No relations.

SE

S 26
NW

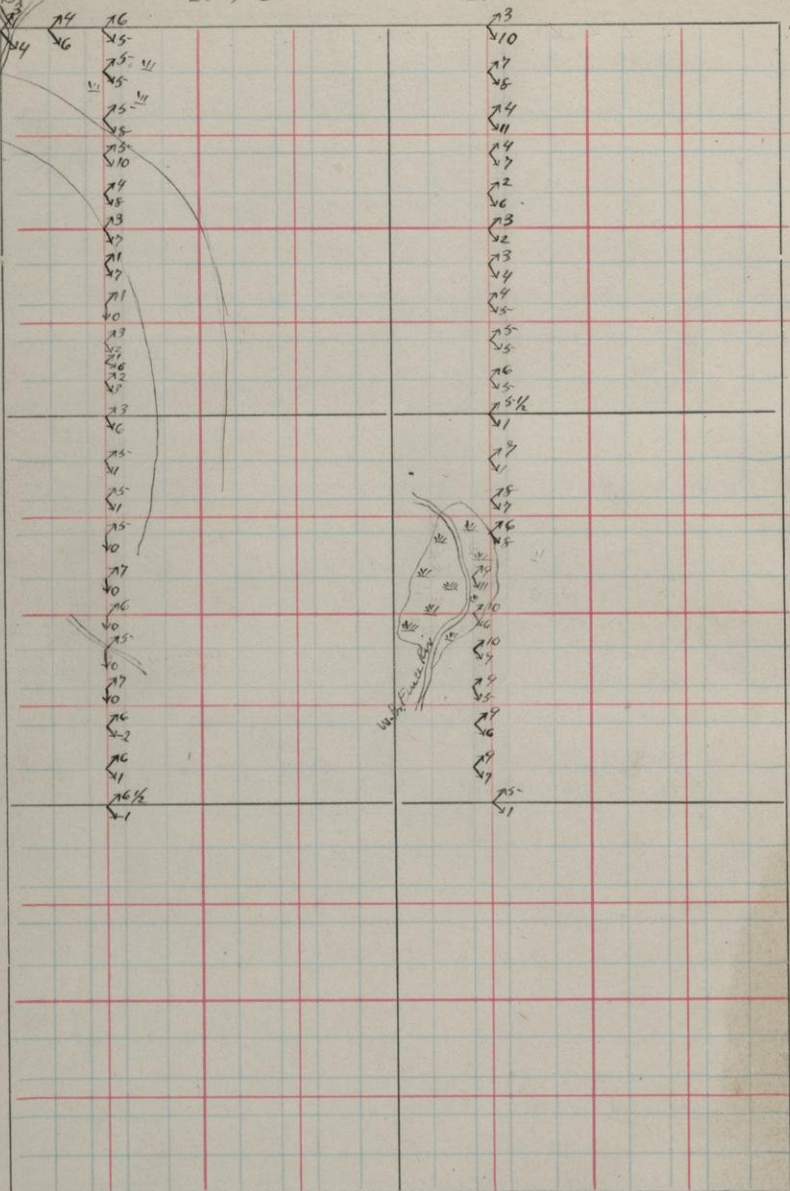
T. 46

R. 32

NE

SW

SE



E

S. 27

T. 46

R. 32

NW

NE

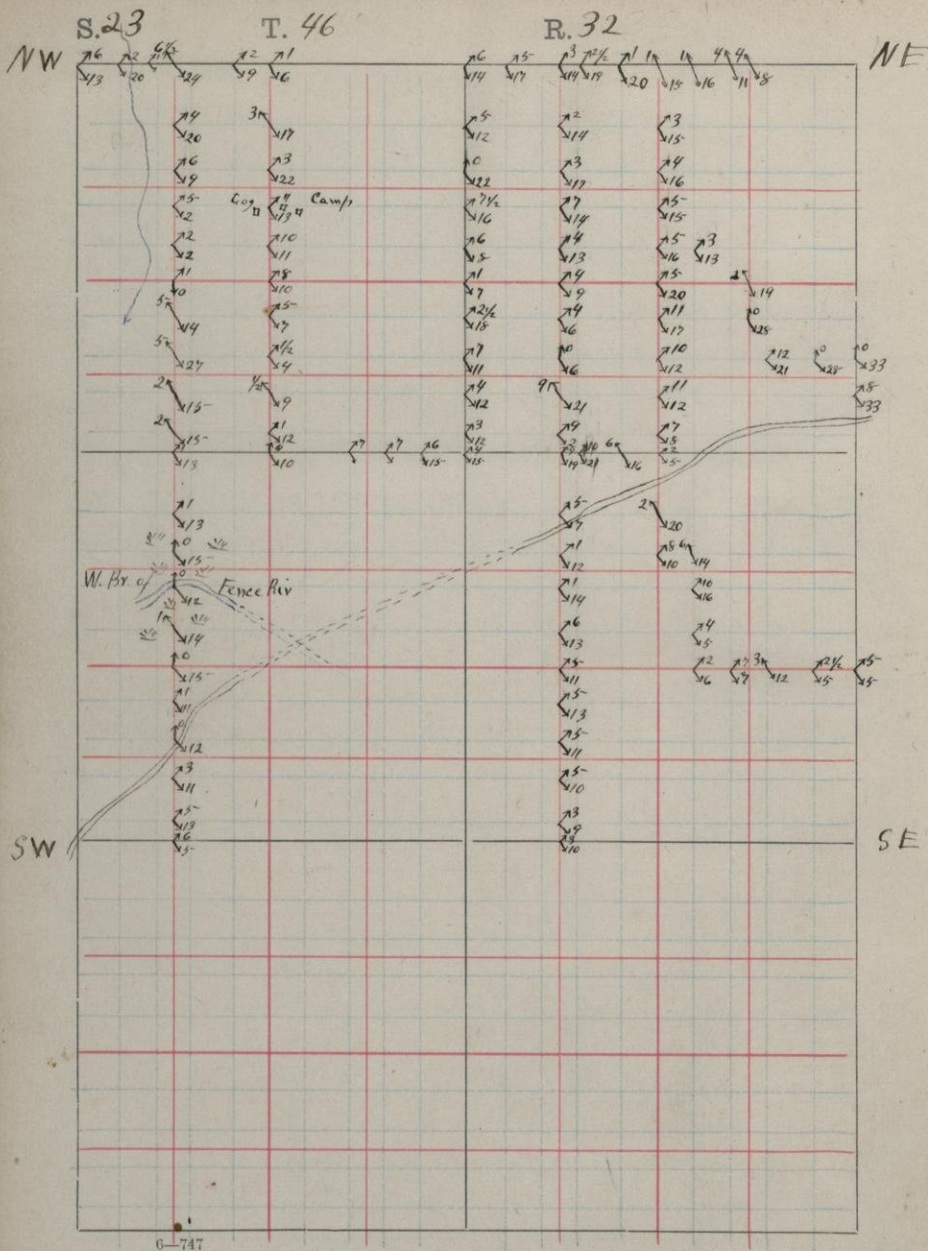
SW.

SE

7a Balsam

NE

E



NW

S. 2

T. 45

R. 32

NE

22910
 6. #
 4
 2

4
 0

4
 1
 4
 0

5
 0

4
 0

4
 3

4
 0

3
 0

4
 6
 3
 0

SW

SE

NE

SE

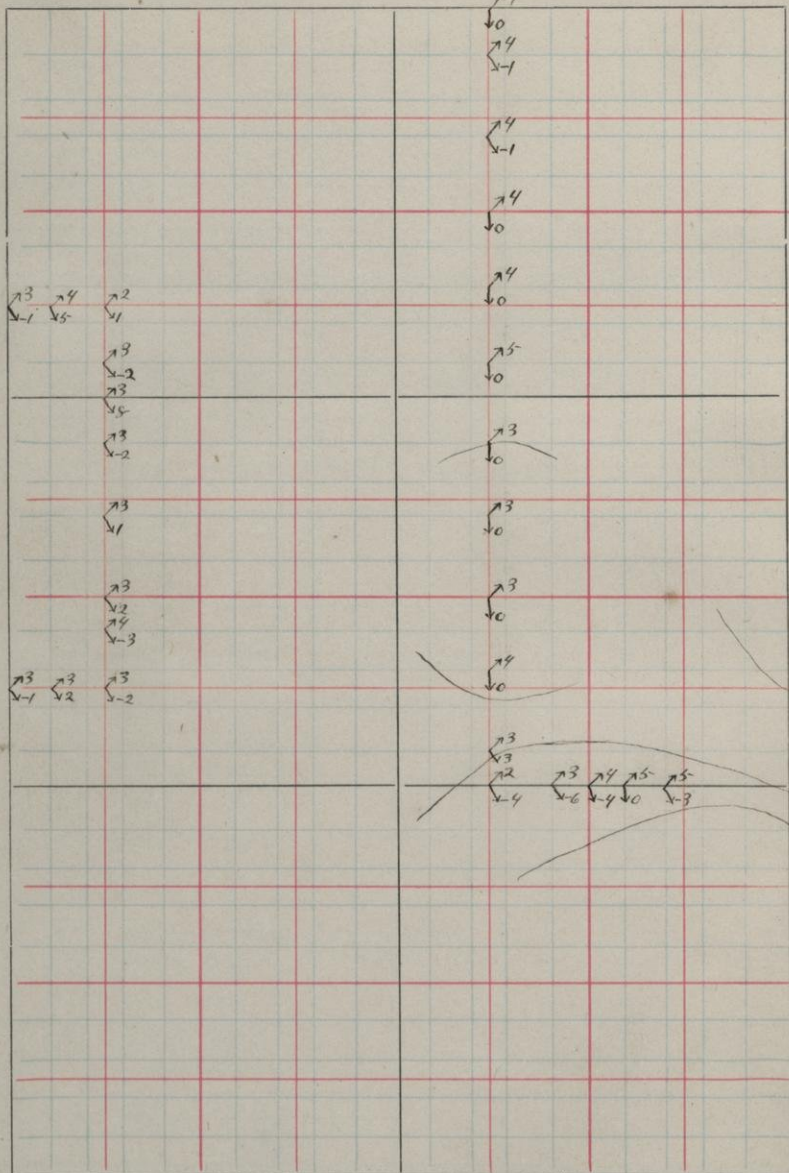
S. 3

T. 45

R. 32

NE

NW



NE

SE

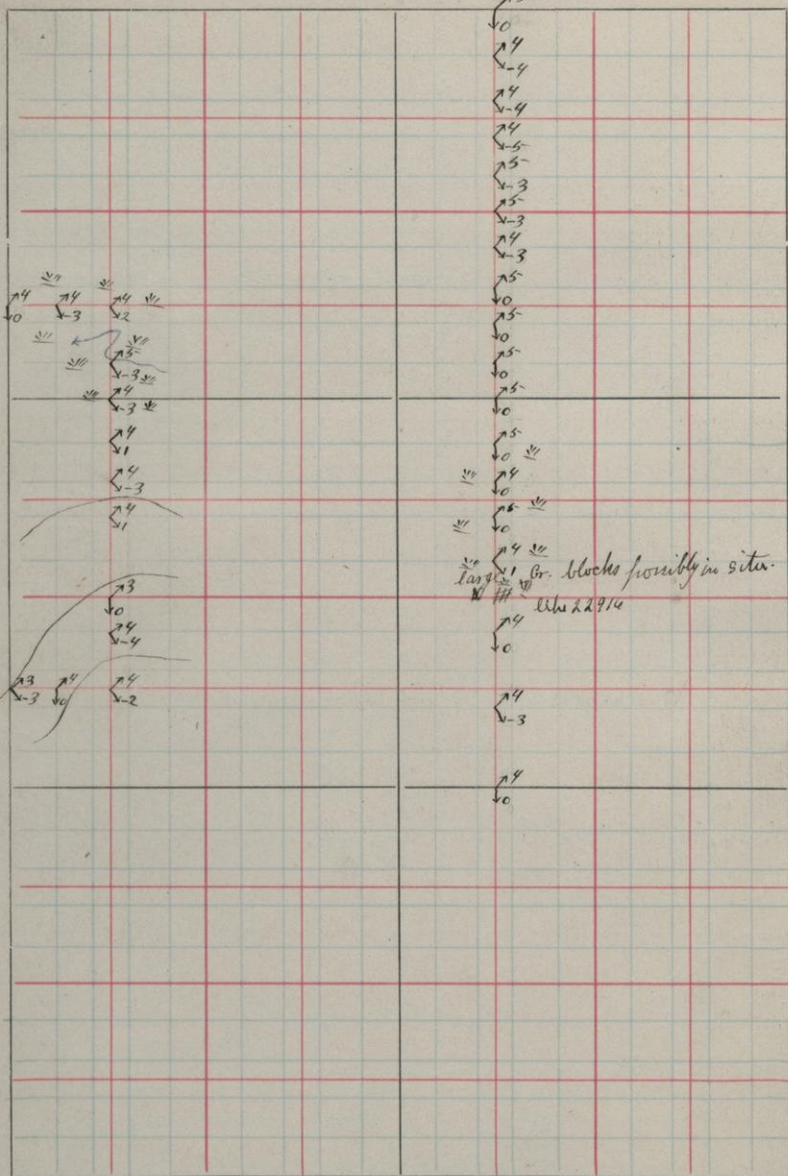
S. 34

T. 46

R. 32

NE

NW



SW

SE

rw

S. 22

T. 46

R. 32

NE

Bone Lake

Sam

Fence Riv

Lib 22921

GA22919-20

4. Conf.

209.00

22922

22921

SW

SE

NE

22919-20 1075 N 1075 W SE Cor. Sec. 22-46-32

= 455.280

Exposure at S. end of dam of rock like specimen, very evidently granstone. 22919 is an amygdaloid with epidote amygdules. Most of the exposure is like 22920 with here & there in it porphyritic feldspar crystals. They are however present in only a small proportion of the mass. Quartz fills the amygdules in part of the ledge. Lines apparently of flowage run $N 60^{\circ} W$ and are inclined about $60^{\circ} NE$.

22921 875 N 1670 W. SE Cor. Sec. 22-46-32

Quite schistose rock (granstone?) with strike $N 62^{\circ} W$ and dip $70^{\circ} NE$.

22922 645 N 1750 W SE Cor. Sec. 22-46-32

Ledge of rock like specimen showing imperfect schistosity striking $N 65^{\circ} W$ & dipping $70^{\circ} NE$

22923 250 N 1750 W SE Cor. Sec. 22-46-32

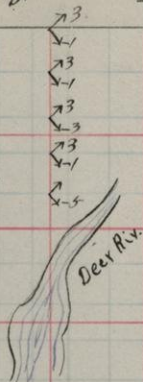
Exposure of schistose rock like specimen. Strike of schistosity $N 75^{\circ} W$, dip $75^{\circ} NE$

NW S. 28

T. 46

R. 32

NE



SW

To Balsam

SE

22924 1900 N 75° W SE Co. Sec. 28-46-32

Exposure of slightly schistose rock. Schistosity
imperfect, striking N 70° W. Not sure of dip.

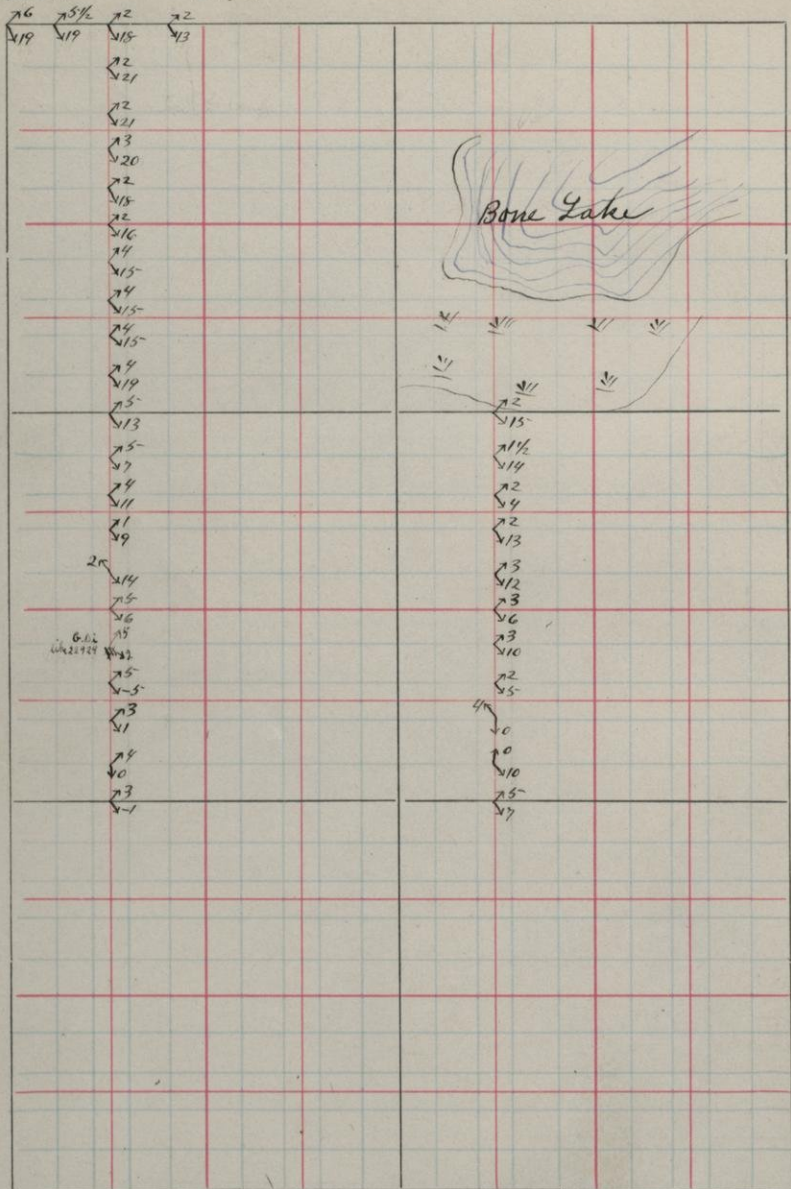
S. 21

T. 46

R. 32

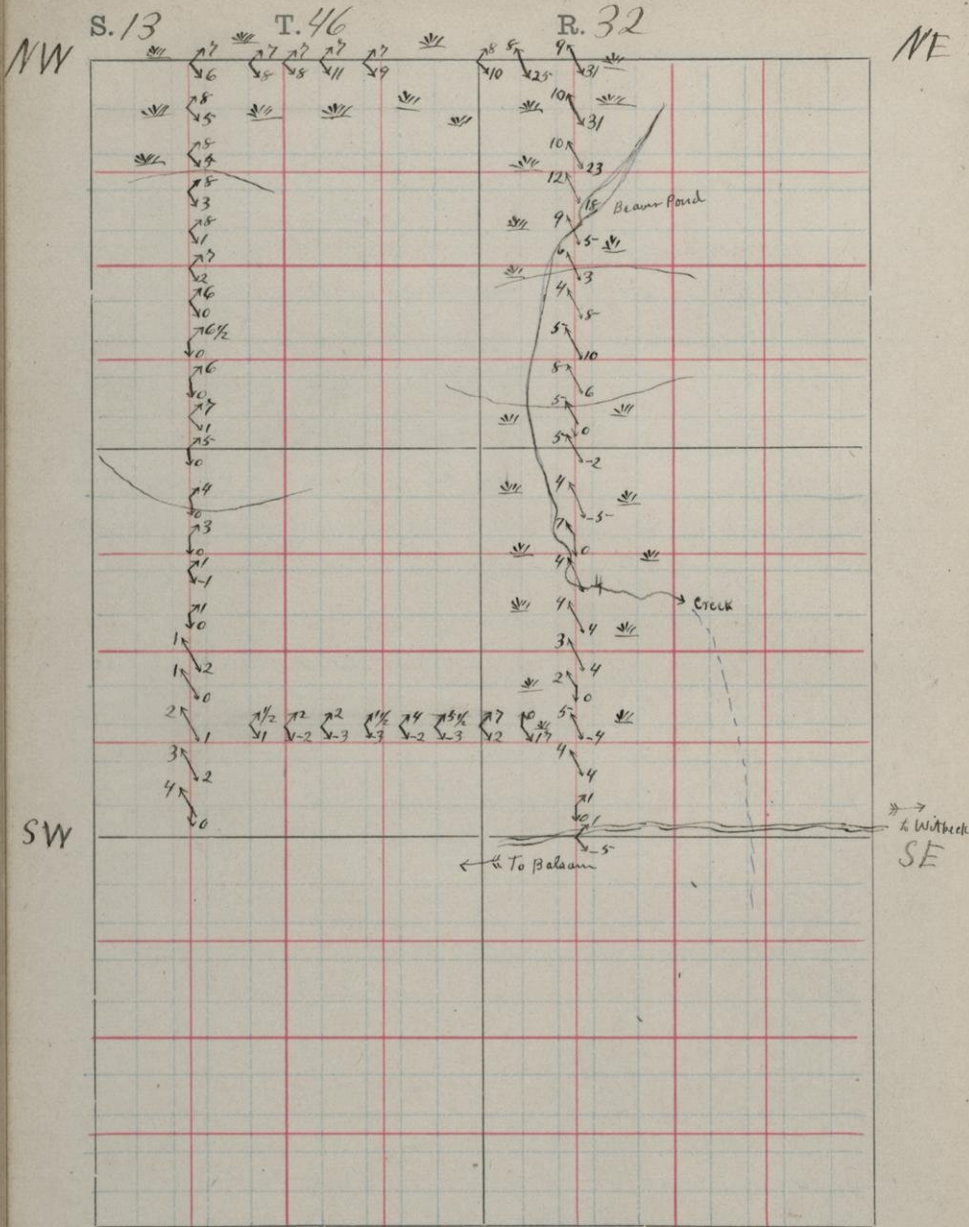
NE

NW



SW

SE



E 22925 85 N 75 W SE Cor. Sec. 15-46-32

Small exposure of granstone. Does not show schistosity in part exposed yet quite like the rocks to south of Bone Lake. 22919-20

NW

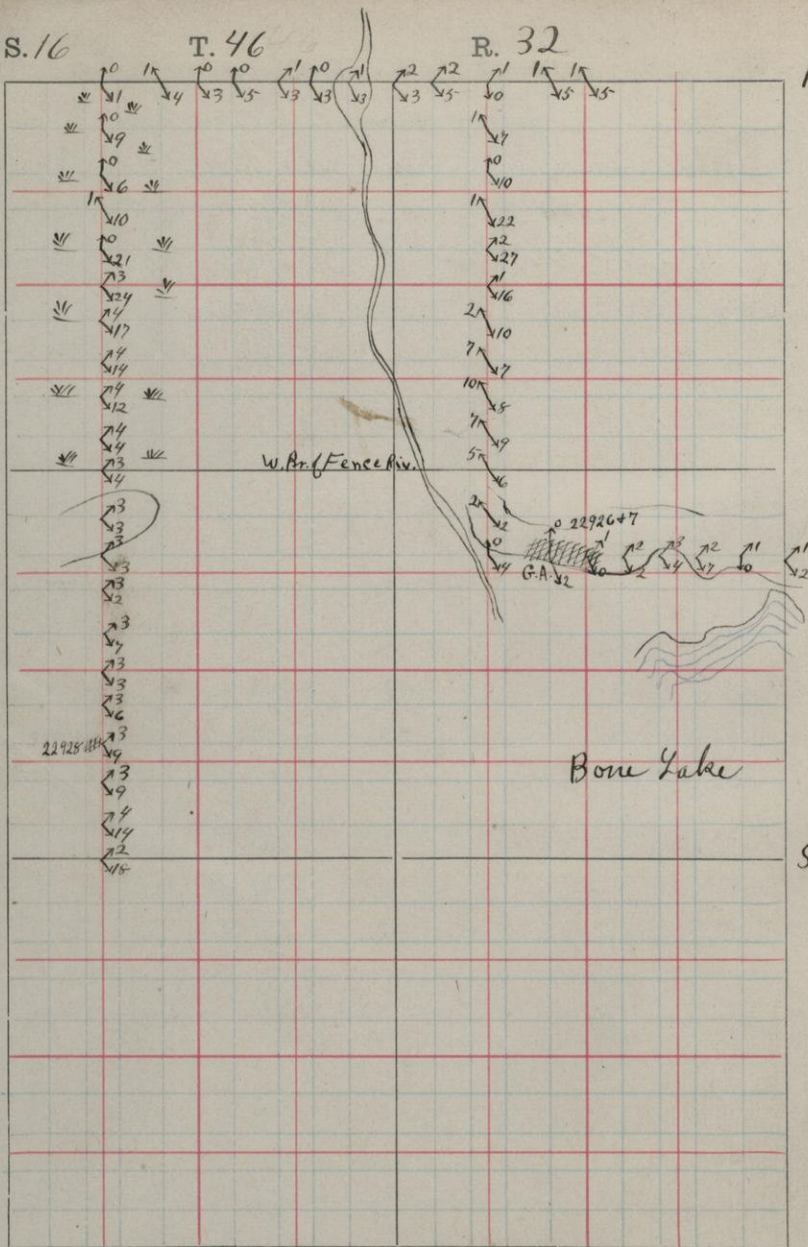
S. 16

T. 46

R. 32

NE

22



SW

SE

E 22926-7 800 N 500 W SE Cor. Sec. 16-46-32

At the W. end of a ridge mostly covered with drift there is exposed a dense rock (granite?) like 22926. In places it is amygdaloidal and seems to contain a good deal of magnetite. At any rate it affects the rock. When amygdulae ^{fillings} have been leached out the rock appears scoriaceous. Lines of Amygdulae run about $N 45^{\circ} W$ and are inclined $77^{\circ} N$.

22928 300 N 1750 W SE Cor. Sec. 16-46-32

Ledge of rock like specimen. Shows no structure.

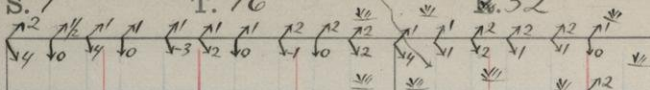
S. 9

T. 46

R. 32

NE

NW



SW

SE

VE

E

22929

800N 1210W SE Cor. Sec. 17-46-32

Small exposure, on south side of hill, of
granite.

VE

E

Deer Riv.
C. Camp

S. 33

T. 46

R. 32

NE

22

rw

To Witbeck

SW

Z. Balzan

SE

Gr. Libu 22930

✻ ✻ G.

22930

300 N 530 W SE Cor. Sec. 33-46-32

Exposure in swamp of coarse granite like specimen.

like 22930

N400 W 800 SE Cor. Sec. 33-46-32

There is at this location a large exposure of granite just like 22930.

NW
S. 44

T. 45-

R. 32

NE

Deer
Lake

To Ball Lake

SW

SE

22933

275N 1220W SE Cor Sec 5-45-32

Small outcrop of rock like specimen. No
relations or structure. Coarse granitoid.

NW S. 20

T. 46

R. 32

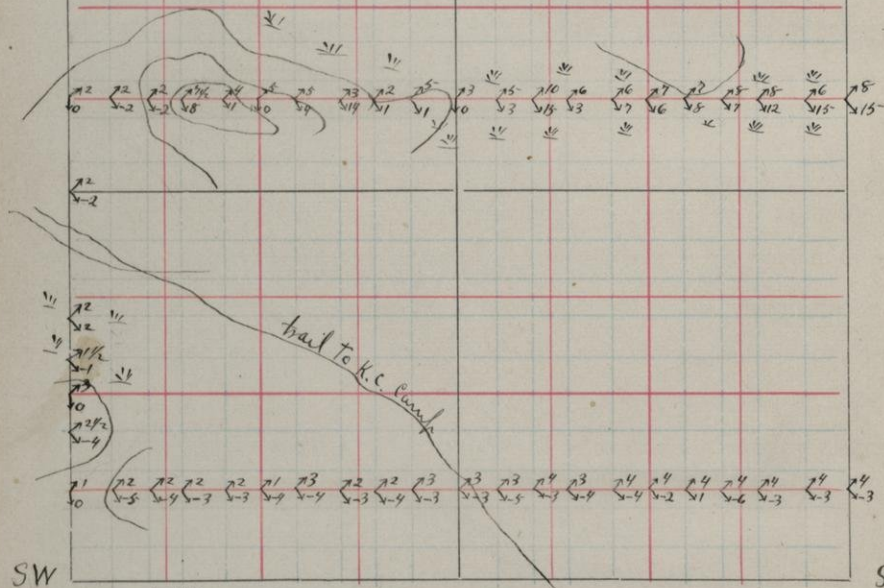
NE



S. 19

T. 46

R. 32

NW
Cor.NE
Cor.

S. 30

T. 46

R. 32

NW

NE

$\nearrow^2 \searrow_{-2}$
 $\nearrow^1 \searrow_{-2}$
 $\nearrow^1 \searrow_0$
 $\nearrow^1 \searrow_3$
 $\nearrow^{1\frac{1}{2}} \searrow_1$
 $\nearrow^2 \searrow_2$
 $\nearrow^2 \searrow_1$
 $\nearrow^2 \searrow_{-3}$
 $\nearrow^2 \searrow_1$
 $\nearrow^3 \searrow_0$
 $\nearrow^3 \searrow_0$

$\nearrow^{\frac{1}{2}}$
 $\nearrow^{\frac{1}{2}}$
 $\searrow_{-9}$

$\nearrow^1 \searrow_{-2}$
 $\nearrow^1 \searrow_0$
 $\nearrow^{1\frac{1}{2}} \searrow_1$
 $\nearrow^1 \searrow_2$
 $\searrow_0$

$\nearrow^{1\frac{1}{2}} \searrow_{-1}$
 $\nearrow^{1\frac{1}{2}} \searrow_{-4}$
 $\nearrow^{2\frac{1}{2}} \searrow_{-2}$
 $\nearrow^2 \searrow_{-1}$
 $\nearrow^{1\frac{1}{2}} \searrow_0$
 $\nearrow^1 \searrow_0$
 $\nearrow^{1\frac{1}{2}} \searrow_0$
 $\nearrow^2 \searrow_{-5}$
 $\nearrow^2 \searrow_{-1}$
 $\nearrow^2 \searrow_{-3}$
 $\nearrow^2 \searrow_{-1}$

SW

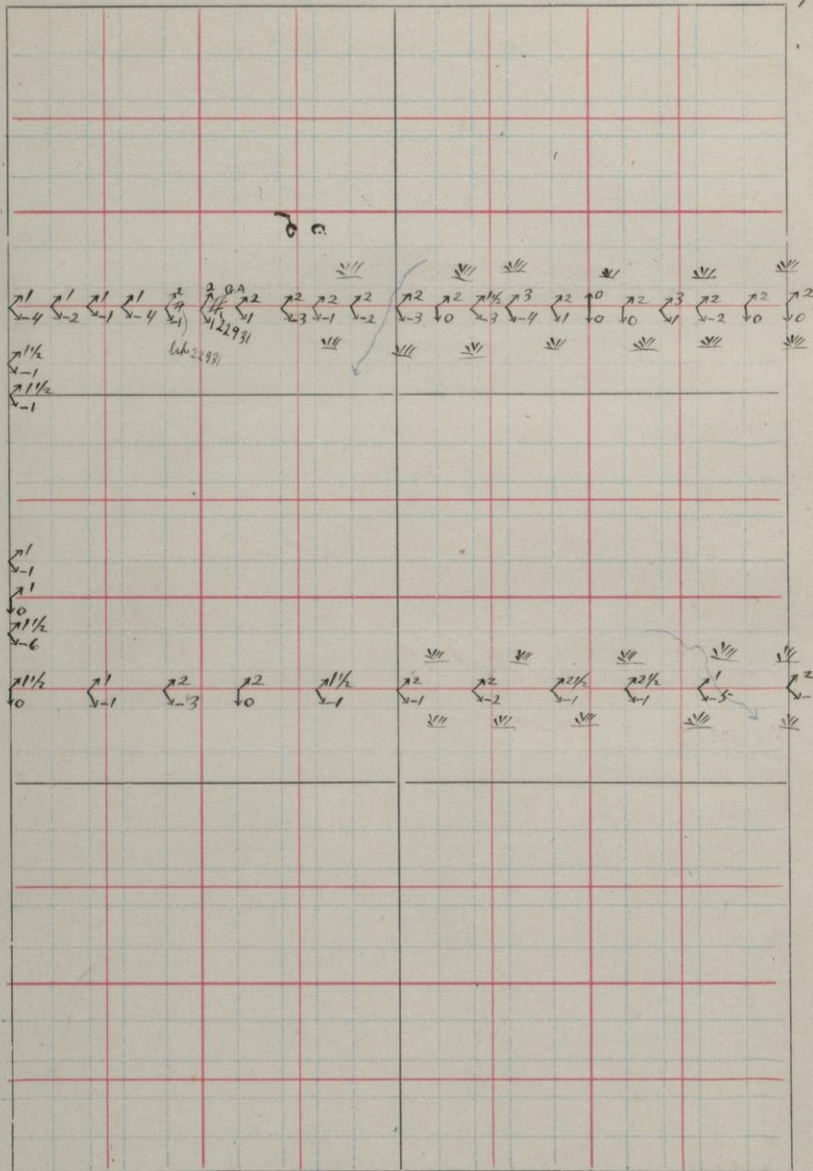
SE

NW S. 31

T. 46

R. 32

NE



22931 1250 N 1480 W SE. Co. Sec. 34-46-32

Exposure of altered amygdaloidal granitoid with schistosity, as indicated by flattened amygdules, striking E-W + dipping 75° N.

22932 See note book 167. p 5

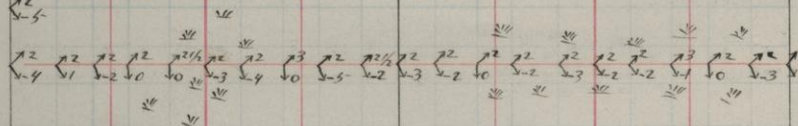
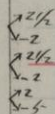
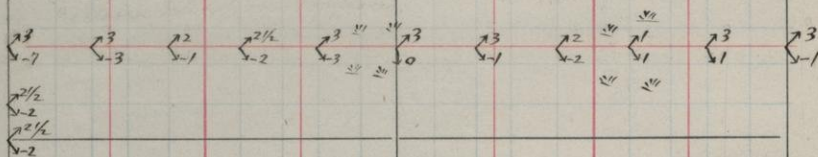
NW

S. 6

T. 45

R. 32

NE



SW

SE

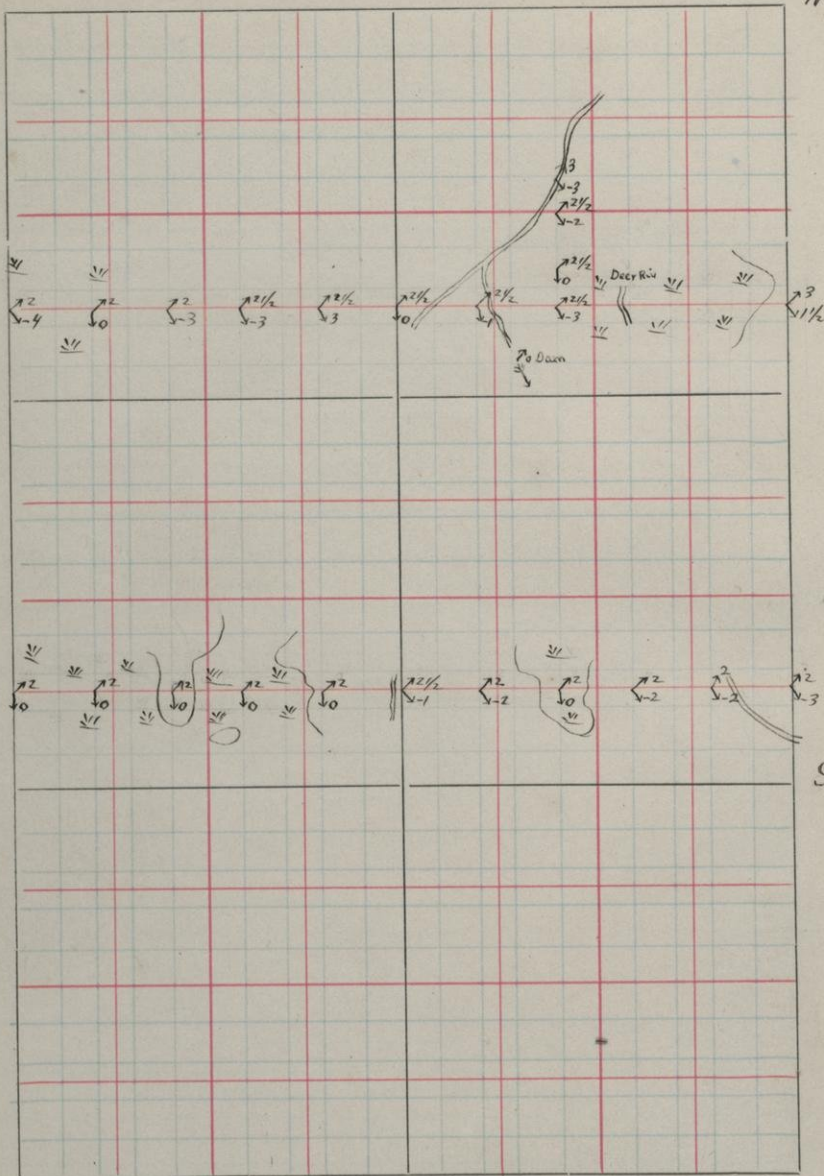
S. 8

T. 45

R. 32

NW

NE



22934

1250 N 1725 W SE Cor. Sec. 7-45-32

Exposure of amygdaloidal graptolite.

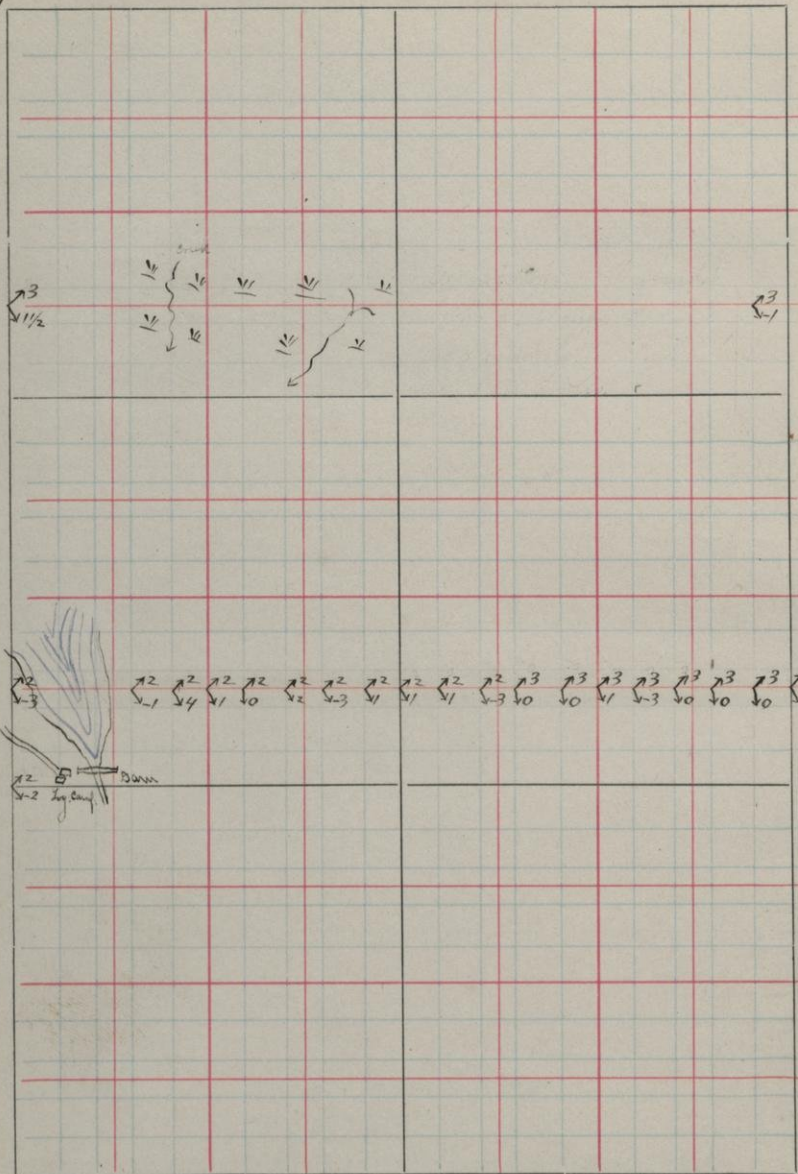
Us relations.

NW S. 9

T. 45

R. 32

NE



SW

SE

S. 10
NW

T. 43-

R. 32

NE

NW

SW

SE

$\begin{matrix} 2\frac{1}{2} & \nearrow^2 & \nearrow^2 & \nearrow^2 & \nearrow^3 \\ \searrow_2 & \searrow_0 & \searrow_2 & \searrow_{-2} & \searrow_0 \end{matrix}$

NW S. //

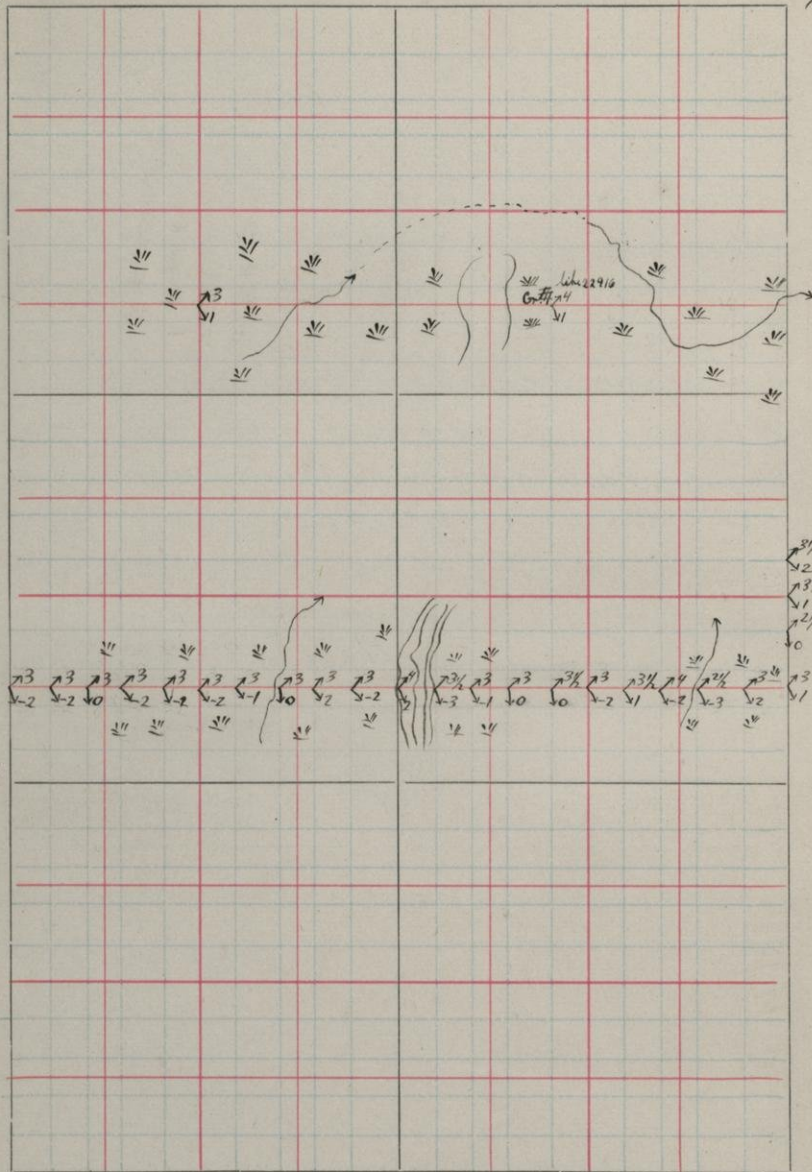
T. 45-

R. 32

NE

SW

SE



S. 16

T. 45

R. 32

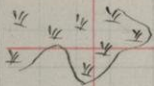
NW

NE

12
10

7

10



SW

SE

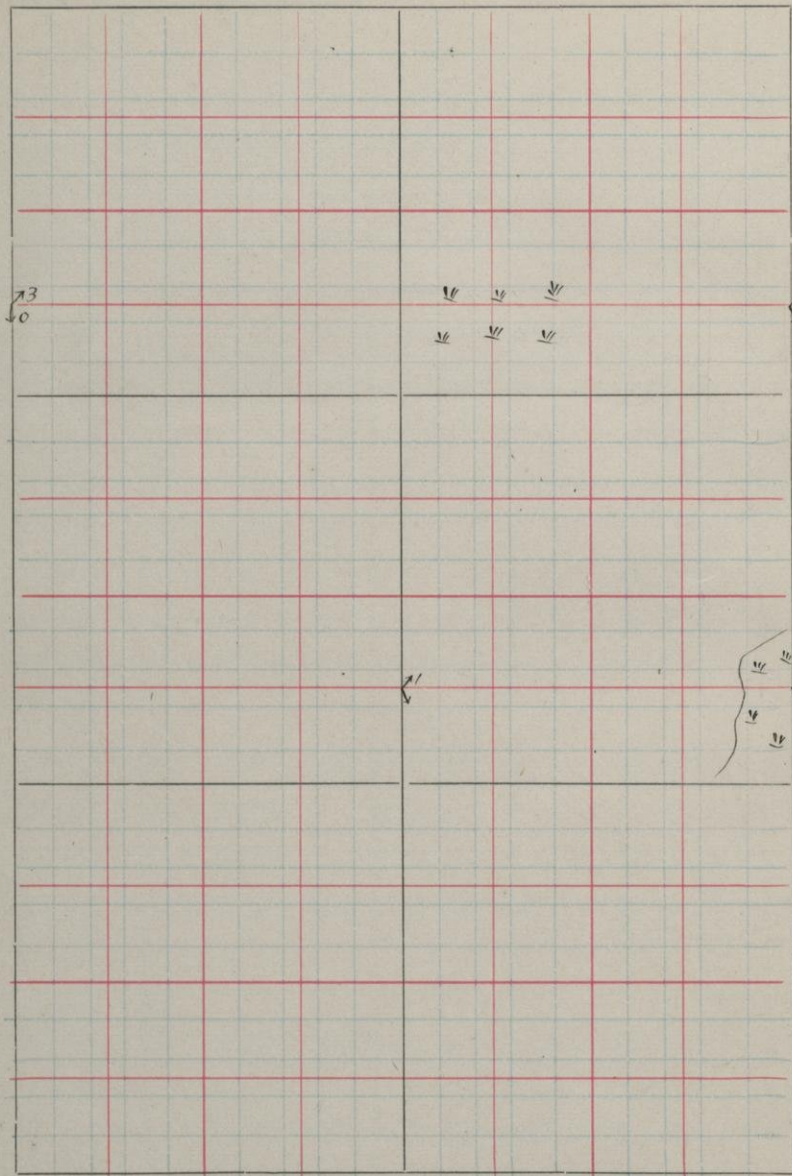
Ran E on 1250 N & back on 240 N. Found
no outcrops, country heavily drift covered.

6 S. 15
NW

T. 45

R. 32

NE



3
0

3
1

11 11 11
11 11 11

1
1

11 11 11
11 11 11

SW

SE

50
No outcrops. Country heavily covered
with drift from NE.

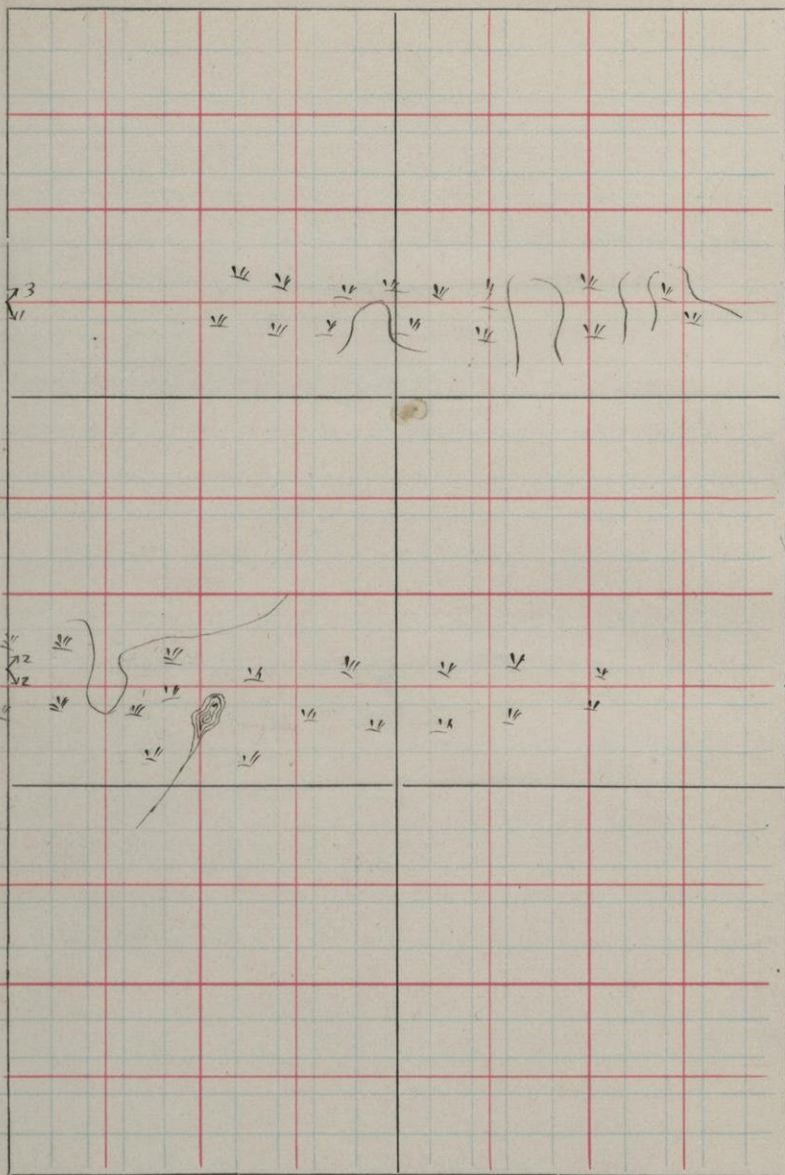
S. 14

T. 45

R. 32

NW

NE



22937-8 ON 850W SE Cor. Sec. 18-45-32

Large exposure of fine grained amygdaloidal
granstone. A coarser grained variety
of same is represented by 22938.

like 22937 200 N 820 W SE Cor. Sec. 18-45-32

Another large exposure of G.A. like 22937.
This shows in places spheroidal parting
with radial cracks.

like 22937 ON - 275 N 650 W SE Cor. Sec. 18-45-32

Large ridge of granstone like 22937.
Glacial striae found on it run NE-SW.

66

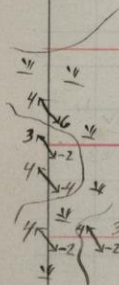
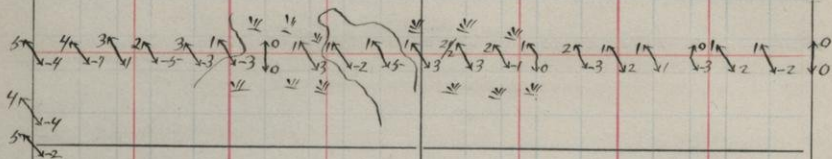
S. 13

T. 45-

R. 33

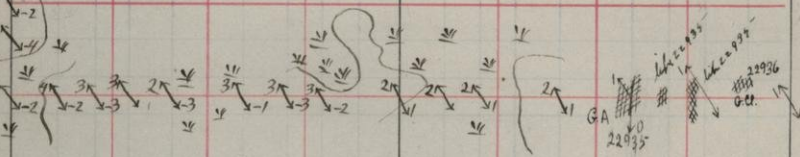
NW

NE



SW

SE



22935

250 N 400 W SE Cor. Sec. 13-45-33

Ledge of amygdaloidal granstone.

22936

270 N 125 W SE Cor. Sec. 13-45-33

Small exposure of a granstone ash bed or congl.
 Matrix is quite porous, amygdaloidal, and in places shows what appear to be a fluidal structure. Fragments of rock lying in the matrix are both of dense and pumiceous phases of the granstone, dense predominating. They vary in size from fine ashes up to large boulders.

