



LIBRARIES

UNIVERSITY OF WISCONSIN-MADISON

Vermilion district, Minn. [with C.R. Van Hise, J.M. Clements, and W.S. Bayley]: [specimens] 27393-27399, 27350-27883. No. 307 Summer of 1897

Leith, C. K. (Charles Kenneth), 1875-1956
[s.l.]: [s.n.], Summer of 1897

<https://digital.library.wisc.edu/1711.dl/XTQGU5AZJZVSX8T>

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

For information on re-use see:

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

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

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

U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

9-891

LAKE SUPERIOR DIVISION.

INSTRUCTIONS.

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

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

3. Collect a specimen from every ledge, or wherever there is a change of rock on any one ledge, taking care to get fresh material, unless for a special purpose the weathered surface is desired. In case of trips made on foot or in canoes, for long distances, neighboring ledges, unquestionably of one kind of rock, need not be specimened. The position and extent of the ledges not specimened should be marked on the map, with notes that each is of a rock identical with specimen so-and-so. Under the same conditions small-sized specimens, trimmed to a uniform size of $2 \times 2\frac{1}{2} \times \frac{3}{4}$ 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. 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.

307

C. K. Leuth.

Terminon district, Minn.

Summer of 1897.

With C. R. Van Hise

J. M. Clements

W. S. Bayley.

Ira B. Weller

Compassman.

Vermilion district, summer
of 1897.

Continued from book 306.
Hade given instead of dip.
Plat complement of hade on map. C.
Aug. 18 17, 1897

Ran S. on range line
from ^{Little Long} ~~Long~~ lake to Long
lake. On N. line of 18 and
19, T. 63, R. 12

At lake is greenstone, like
27388

G. P.

27393

3005 ~~lake~~ ^{Massive} granite-jaspifying.

M. S.

27394

22

6005 ^{Quartz-diorite} ~~Greenstone~~ cut by
white-eyed granite-jaspifying
in belt about 2 ft wide.

12005 Red granite.
Normal, medium grained
granite.

S.

18
19

T.

63 Little Long Lake

R.

12

G

Gran. 27393

G. Gran. 27394

Gran.

G

G

G

G

G

Long Lake.

2.
1450 S Greenstone like
27394.

1500 S Greenstone like
27394, here, however showing
a slight laccapation. Fragments
sometimes 7 inches across.

1700 S. Greenstone, like 27386
27391

1825 S. A series of large
ledges of greenstone, like
27386 and 27388

V550 S 506 ~~19-63-12~~
Greenstone, like 27385

Aug 18.

Started from Ry and ran
S on E. line of 30, 5, and 8+17
to the quarter line of 17, offset
N. 1000 fms and returned
to track in 4th 32.

b.s.
27395 in 32. Chert-schist, showing
pyrite cubes. Schistosity $\perp$,
and strikes N 80° E.

At 200 S of track, is ledge
of same material.

400 S of track, same thing

500 S, ^{of track} same thing,
somewhat faciated. The
material reminds me of the
aa greenstone.

At 1200-1350 S of the N
line of 32. Schistose aa
greenstone, the spheroids showing
amygdular. No definite arrange-

ment

300 S O W in Sec. 5.
aa greenstone.

550-700 Same thing

1000 to 2000 S. aa greenstone.

2000 S. greenstone-schist
like 2739st. Here I believe it
to be the aag material, though
does not show this structure.

Effect and run of
quartz. In coming back of
on quartz found,
400-550 N 1000 W Sec.
5. aa greenstone.

830-930 N. 1000 W. aa
greenstone.

Same thing to 1400 N

1620 N 1000 W. Greenstone,
like 2739st.

4

1850 η Same material,
but here showing faint traces
of aa structure.

From here on to 550 η 1090
W in Sec. 32, aa greenstone
occurs in frequent and
typical exposure.

South run (continued)

0-200 S O W. Sec. 8 aa
greenstone?

350 S diorite, like 27387

Dr. P
27396

1740 S. Massive red
granite, medium grain; which
continues in frequent exposure
to 400 $\pm$ S O W in Sec. 17, at
edge of swamp.

Affected and ran W to
quartz line.

Granite is found on W line
run, and on η run as far

11.5. are 35 N 1000 N in Sec. 8;
 27397 where green schist comes in
 Schistosity strikes N 20° E.
 Variation is here great. This
 schist is ferruginous in places.

150 to 350 N Red granite,
 like 27396, with large veins
 of quartz, one of which was
 4 ft wide.

8. Di

27398 370 N Sec. 8. Coarse diabase
 cut by quartz veins.

8.5

27399 430 N Green-schist. This
 325 and 95 in places on weathered
 surface resemble granite.

8.5

This is followed in same
 27850 ledge by 27850, green-schist.
 Apparently a gradation:
 This schist contains a great deal
 of chert in veins, which are
 frequently broken and chert-
 tious.

Continues to 640 N

6400 to 1000 W., Sec. 8
 Dr. 27851 The green schist is cut by
 quartz-porphyrism similar to
 that in Central Wisconsin.
 This porphyry contains
 pebbles or boulders, 4 or 5 inches
 across of white granite-porphyrism,
 (the white-eyed porphyry).
 The fragments are completely
rounded. Few in number.
 Appeared only in flat surface,
 and though worked hard,
 was unable to get specimen.

640 to 900 W. Greenstone
 occasionally showing aa
 forms.

1000 to 1200 W. S 1000 W
 Sec. 32. Frequent exposure
 of typical aa greenstone.

Aug. 19

Started from Ry. E of ^{Ely} Tolson
to rim of N on N. side of Sec. 23,
63-12

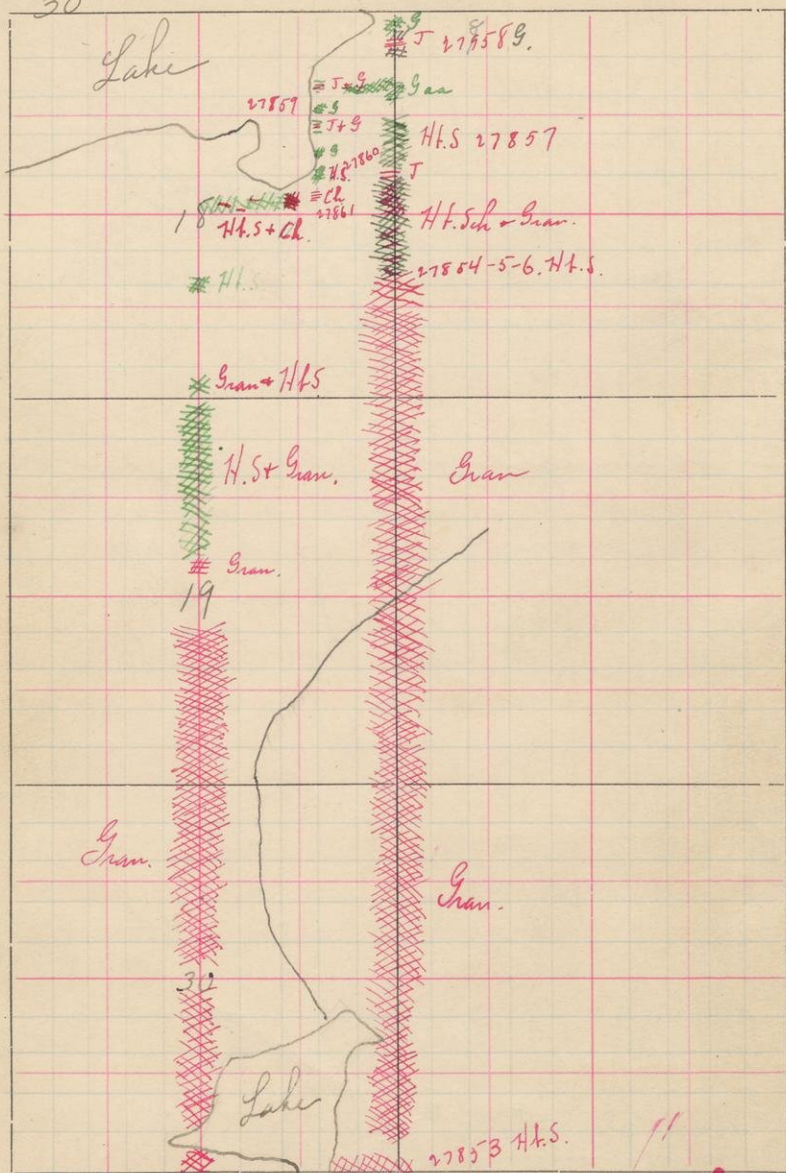
sl. The farm just of the Bay
about 500 N 500 E. Sec. 23
27852 Greenschist, Strike N 60° E.

Had to get around lake
and by time reached N side
of lake it was 2 P.M., and
was unable to make run of
1/2 mile N from this
point.

18
S. 19
30

T. 62

R. 13



Aug. 26.

Can 7 on E. line of 19+18
62-12, just N + S around
lake to the quarter line,
then S to lake.

From lake E to SE cor of
30, about 400 paces, is
practically solid granite.

Hb. gn.
27853

507 NW Sec. 30 Black
hornblende-schist or gneiss, cut
by red granite. The black
material may be seen in
distinct inclusions in the
granite, in lense shapes.
Evidently a case of injection
by granite.

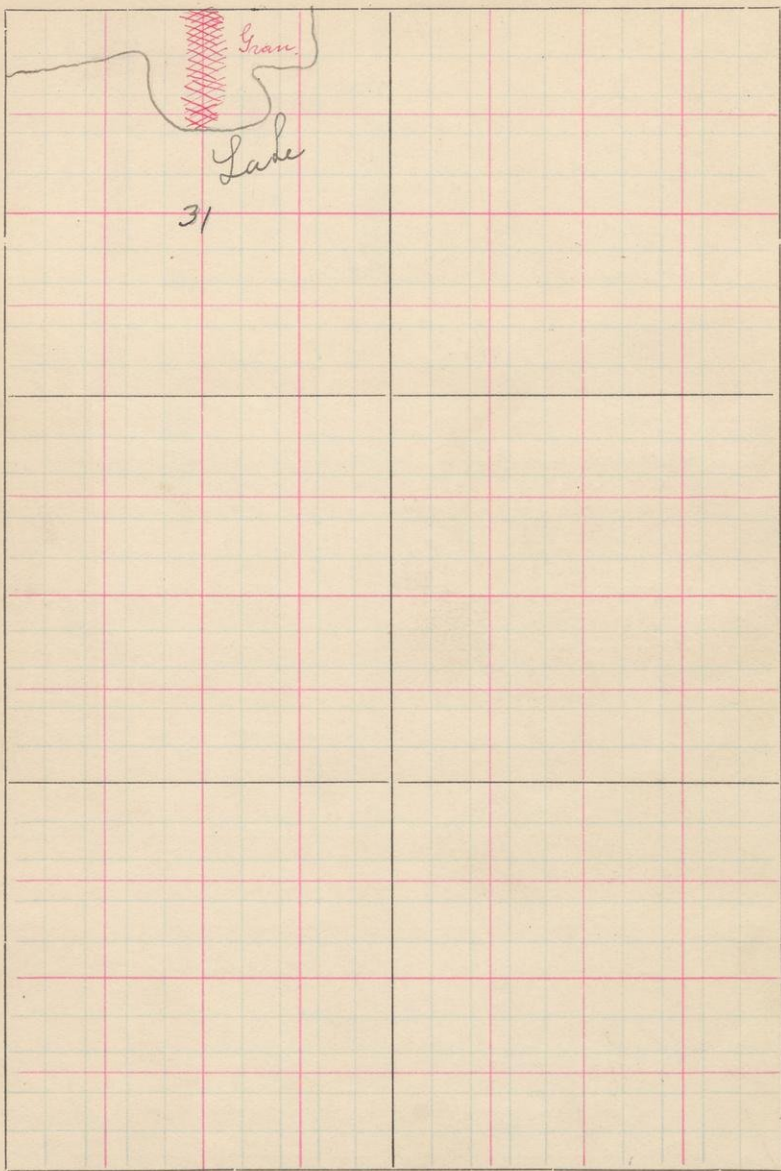
Granite continues in
frequent exposure to 720 7 in
Sec. 18

725 7 0 NW Sec. 18 Greenish
schist, containing large

S. 31

T. 62

R. 12



S.S.

27854 lenticular areas of granite.
The schist presents two
phases, one similar to
graywacke, somewhat buzziated,
the other is a chlorite-schist

800 η 0 η . Green-schist like
27855. Strike η 45° E. Dip 10° η .

S.

27856 Included in this schist are
numerous bands, lenses, and
fragments of epidiotic material
which I do not know. Probably
altered greenstone.

From 800 to 1200 η are
granite and hornblende
schist, the latter predom-
inating. In most cases there
appearing evidence of
injection by granite.

1220 η . 0 η . Sec. 18
Narrow belt of gneiss from
exposure. Strike η 80° E
Dip $\perp$. Belt as exposed, but
2 ft wide

h. si

27857

Immediately followed by
ht. schist in continuous
exposure for 300 paces.

1700 N 0 W. Typical aa
greenstone. Could not find
thick between aa greenstone and
ht. schist. Is it not
probable that the latter is
but a sheared form of former?

1900 N 30 W. Sep. 18
Jasper in belt 15 inches wide
in greenstone. May be a
lens. Strike N 80 E, Dip steep
to S.

h.

27858

is specimen of the including
green schist.

1995 N 0 W. Typical
aa greenstone.

Went back on line to
1700 N, then offset W.

In first 300^N paces is
aa greenstone.

1700 N 390 W. Greenstone
containing jasper. 2 jasper
belts 5 ft wide. Black. Strike
N 55 E. Dip steep to S.

Greenstone is cherty, and
contains numerous cherty
fragments. Weathered surface
frequently presents appearance
of Kona dolomite figured in
M. n. 78

9. 1700 N 425 W. The greenstone
27839 is cut by a coarse green schist
Sharp contact, and near
contact fragments of greenstone
contained in schist.

1540 N 430 W Sec. 18
H. b. schist

1440 N 430 W Green
schist with belt of black
jasper. Jasper strikes N 60 E
Dip $\perp$ to S. About 15 ft wide.
In places might be called a
ferruginous chert.

12.
1340 N 430 W Hornblende-
schist, with cherty looking
fragments.

11.9
27860 1260 N 430 W. Hornblende
schist, interbanded in
regular layers with lighter
green schist, 27860

27861 1220 N 430 W. Large
exposure of almost pure
white chert, of quartzite. In
S. W. corner, slightly pitted.
Possibly a quartz vein in
granite. The place shows a
fine banding, running N E & S W.

1100 N 430 W Sec. 18
Granite.

1100 N 540 W Belt of
chert. May be the same one
as 27861 before crossed to
NE. Here it is 50 paces wide.

1150 N 750 W Ht. schist.
which continues to 1050 W.

In place in this an exposure of ferruginous chert which may be continuations of Jasper Hts NE.

960 S 1000 W Sec. 18.
Undoubted aa greenstone.

1400 S 1000 W. Ht. schist.
Like 27856

1500 S Green schist, with doubtful trace of aa structure. Contains small lenses of granite.

1900 S 1000 W. Sec. 18
Granite and ht. schist

From here to 890 in Sec. 19 is hornblende schist in frequent exposure, frequently containing lenses of granite. At 800 S in Sec 19 are doubtful trace of aa structure.

At 8905 1000 W Sec. 19
Granite begins, and runs
in ~~is~~ practically continuous
exposed to lake in 31

S. $\frac{21}{28}$
33

T. 62

R. 12

21

Grav.

28

Grav.

Lake

33

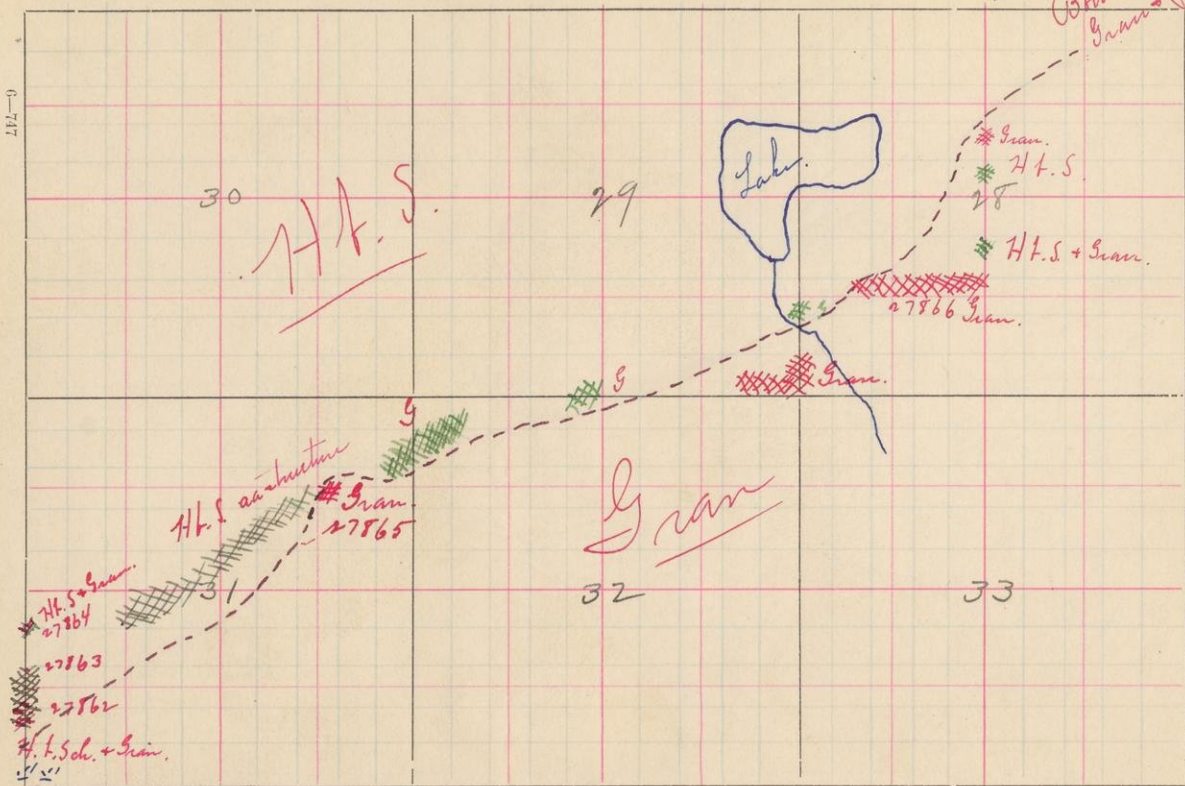
Aug. 17

Ran from the SE cor of 28
to the N.E. cor of 21 - 22 - 12, to
see if there was anything else
but granite.

In much of the distance
is swamps, but in swamps
are numerous small islands,
uniformly drift-covered, but
all show numerous granite
boulders.

At two places only were
undoubted granite outcrops
discovered, at 6200 ft in 28
and 1800 to 2000 ft in same
section.

Returning, worked E shore
of lake. Not a thing
but granite.



Aug. 29 .

Started at lake in SW on
7 31/62/13, and zigzagged
NE to the quarter line of Sec. 28
as shown on opposite map.
Object was to take contact of
granite and greenstone.

4007 NE in 31 appears
a high ridge overlooking
swamp to S. This is com-
posed of hornblende schist,
including numerous large
masses of the granite. About
250 paces to the SW large
knobs of red granite may be
seen.

The ht. schist shows various
phases, like 27853-6. At the
E it is very schistose and
black. In going N, in it are
found lighter colored fragments
and lenses of material colored
by epidote (27856), so frequently
seen to the E in my run
of Aug. 26

I do not know how to explain these. They give the ~~rock~~ a slightly becciated appearance.

G.A.

27862

At 450 N 0 E the schist shows a doubtful flow structure. In 27862 may be seen faint lines of lighter color crossing the rock diagonally to the schistosity. This specimen also shows amygdaloidal texture. Some of the amygdulæ are a half inch in diameter, and their character is undoubted. Most are filled but some have been weathered out.

27863

~~red~~

590 N on same ridge is typical fine grained leucschist, showing no fragments interlaminated with bands of white crystalline schist, & masked granite?

The belts of black and white material vary from

those 5 ft. across to those invisible to naked eye.

The white material is generally in layers, but these layers are seen frequently to peter out like lenses. These seem to me to be pieces of granite pinched in during folding.

The schist is like N 862, except that amygdaloids are lacking.

This rock has a magnetic attraction.

Strike of schistosity is $N 45^{\circ} E$. Dip $\pm$

850 $N 0^{\circ} E$, Sec 31-62-13
Hornblende-schist showing fragments, etc., occur in bands sharply separated from the material showing amygdaloids. The latter occasionally is in lenses in the former.

This exposure seems to show that the hornblende-

F.P.

27864

19.

schist (hence considered
by Dr. Clements and myself
as probably schand a mater-
ial) has been cut by and
has finished in during
folding, the amygdaloidal
greenstone.

In 1864 also an occasion-
al lens of red granite.

Worked NE along ridge.
Beginning at 130 E of the
quarter post in Sec. 51, the
material, with fragments, which
I called 'hornblende-schist'
shows undoubted aa forms
although still very schistose.

It seems to me clear from
this section that the ho. schist
and aa greenstone are the
same. However, I am at a
loss to account for the layers
and lenses of porphyritic
material included with in
the ho. schist with such sharp
contact.

Following ridge N.E. it
is found to be the same
material - ht. schist with
fragments, in place showing
undoubted aa structure

On S slope of ridge
granitic inclusions are
frequent.

At one place 1300 N 1100 E
Sec. 31 undoubted aa
material including large frag-
ments of granite.

1400 N 1600 E Sec. 3.
Granite appears in continuous
exposure.

Hb. Gr. or foliated schist. 1650 N 1600 E The
27865 basic phase granite takes on a peculiar

3 T

1675 N 1925 E Sec. 31
Greenish schist again
appears. Weathers white.

Followed ridge through
N part of Sec. 32, running

about 200 paces S of η
line.

From 200 paces E is ht. sch.
with occasional fragments
and granite inclusions.

2000 η 900 E Sec. 32.
Same thing

1500 η 1600 to 2000 E in
Sec. 29. Low flat exposures of
granite.

Ran η on E. line of 29
to find contact of granite +
green schist
Granite continues to 2000 η

4600 η Green-schist with
granite inclusions.

From 5300 η ran E to
 $\frac{1}{4}$ line of Sec. 28

5600 η 350 E Sec. 28
Granite again appears.

530 N 800 E Sec. 28
 Granite has redder color than
 heretofore, containing large
 layers and lenses of green-
 schist (27866)
 Continues to 1000 E.

Hb. 3.

27866

530 - 630 N 1000 E. Granite.

780 N Green schist with
 granite fragments and lenses.

1200 N Green schist. ~~No~~
~~Granite~~ No granite.

1300 N. Granite. Followed
 by Green schist.

Aug. 30

Took course in 20, 21, 29, 28
62-13 indicated in opposite
page.

~~1300 N~~ 0 N 1240 W Sec. 21
Ht. schist with fragments.

1500 to 2000 W 0 N Sec. 21
Ht. sch. in places showing
trace of aa structure
750 W in the above is a belt
about 5 ft wide of white chert.

On W. line of 21, ran N
to swamp. 1750 N Ht. schist
all the way, from 750 N to 1750 N
showing aa structures

1750 N 500-650 E Sec. 21
Ht. schist.

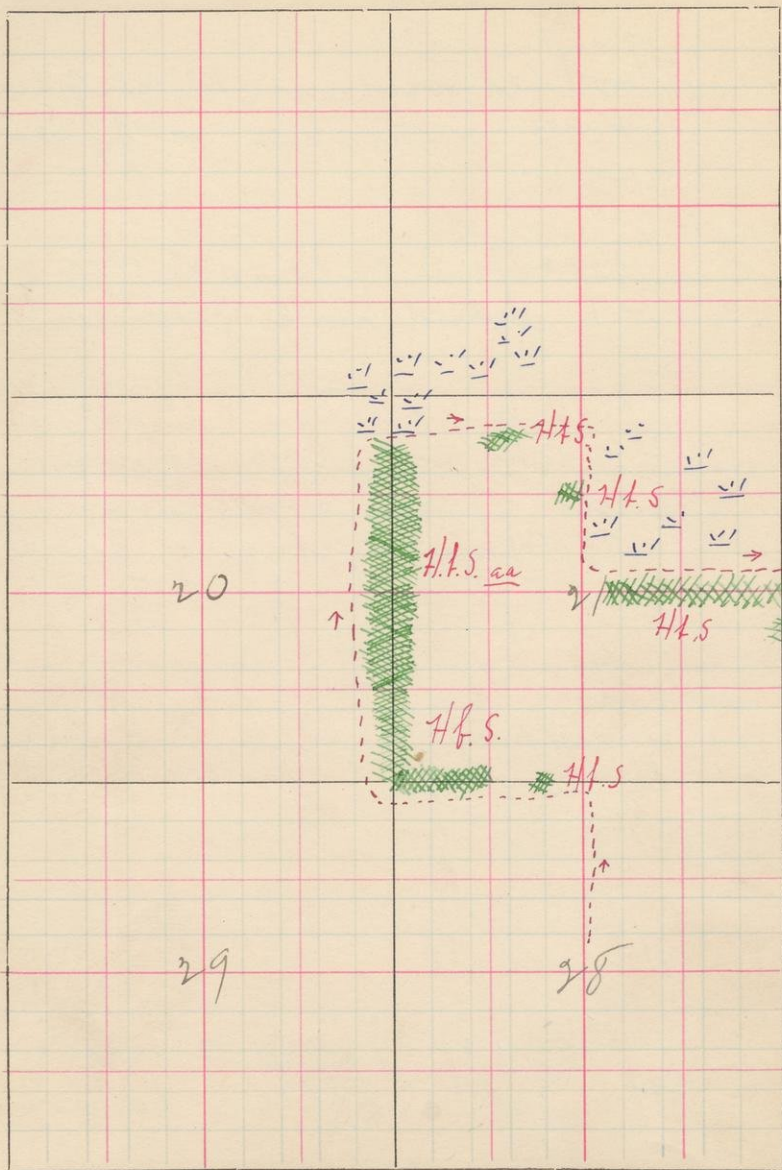
1500 N 920 E Sec. 21
Ht. sch. with aa forms.

1000 N 1150 to 2000 E. Gorse

S.

T. 62

R. 13



24.
and even-grained ht. schist
with no trace of a structure

8007 0 W., Sec. 21.
Ht. S.

Returned to camp and
paddled up Beaver Creek to
get other game.

Killed a MOOSE !!

Went in lake at end of river
and returned to camp, nearly
frozen, but happy.

S.

T. 63

R. 11

Full Lake.

16

9

9 27867

~~J?~~~~J?~~~~J~~~~Lake~~

21

9

9 27868

Sept. 3.

Ran S on N. line of lake
16 and 21 - 63-11 to lake.

No exposure until
875 S W E in Sec. 21, where
is fine grained massive
27867 ^{h. di} gneiss (aa?) Very massive.

Reached lake at 1000 S.

Ran E 700. paces.

All along E run is heavy
magnetic attraction, and
numerous test pits. However,
they have bottomed in gneiss
in only one place, 400 E,
and there no strike or
dip could be made out.

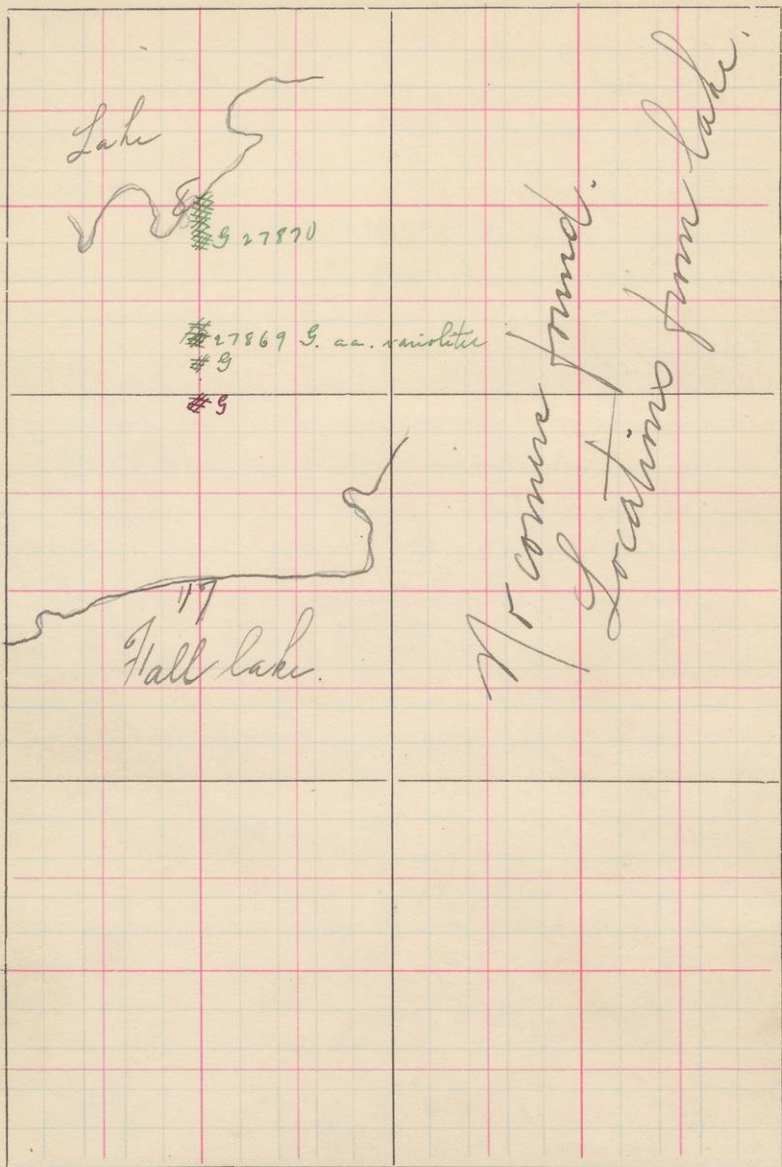
From 700 E 1000 S ran
S to 1350 S then E to $\frac{1}{4}$ line
No exposure.

^{h. di} 27868 1350 S 1000 E Sec. 21
Coarse gneiss

S.

T. 63

R. 11



770 η 1000 η Sec. 21
Greenstone like 27867 (aa?)

300 η 1000 η Sec. 16
Greenstone like 27867

In afternoon, ran η
from Hall Lake on $\frac{1}{4}$ line
of 17 + 8 63-11

900 η 1000 η ^{Lake} in Sec. 17
Greenstone like 27867 (aa?)

1240 η 1000 η ^{Lake} N., Same
material.

1500 η 1000 η ^{Lake} Typical
aa greenstone, showing
variolites, some of which
are as much as 3 inches in
diameter.

Continues to 1600 η ^{Lake}.

1800 η 1000 η ^{Lake}, Coarsely

YEL
GASH.
27869

9.21

27870

crystalline greenstone. No
ad forms.

Continues 300 paces to
lake.

27.

S.

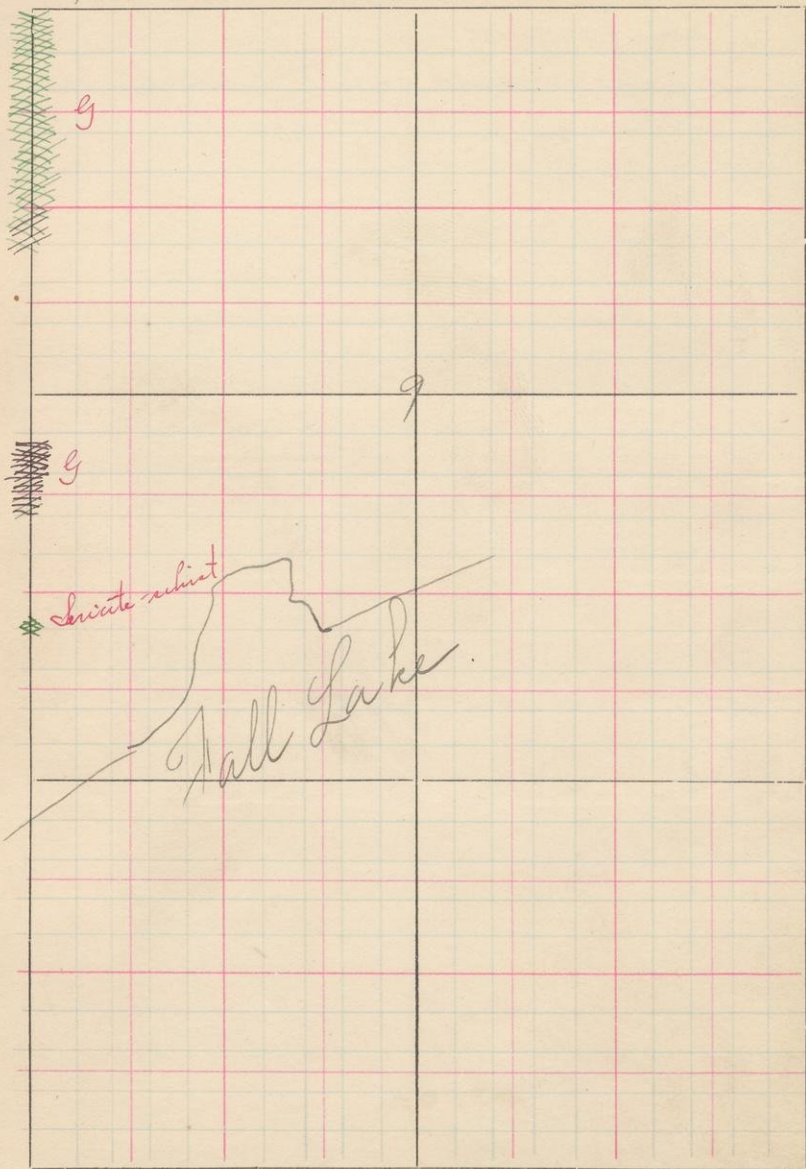
9

T.

63

R.

11



Left. 4.

Ran η on N. line of 94 and 33-63-11 to the quarter line of 33-64-11, and returned on $\frac{1}{4}$ line to E

400 η 0 E Sec. 9. Rotten white exceedingly friable sericite-schist. Strike η 55° E. Dip I

700 to 800 η Greenstone-schist like 27870. Cherty fragments. Strike η 50° E. Dip 55° N.

1400 η 0 E in Sec. 9 to 1390 η in Sec. 4. Greenstone in practically continuous exposure. At 430 η in 4 the greenstone begins to show aa forms, and at 1800 η amygdaloidal structures also appear.

1390 η 0 E in Sec. 94. Belt of gasper about 5 ft wide in greenstone. Strike η 60° E

S. 4

T. 63

R. 11

N. Line of Sec. 33.

N. line of Sec. 4

Section short.

g
≡ J

g

4

g

1390 N 0 E Sec. 4 to
1000 N in Sec. 33 Greenstone
in frequent exposure, rarely
showing aa forms.

Sec. 4 is about 500 paces
short N + S, and there is a
gap in the line to the N as
we pass into Sec. 33.
Therefore when we reached
33 we were 400 E of the N.
line of 33.

33
4

Start N 1200 paces into 33,
then E. 1000 paces, and then
S.

In N + E run, nothing but
greenstone

G.S.

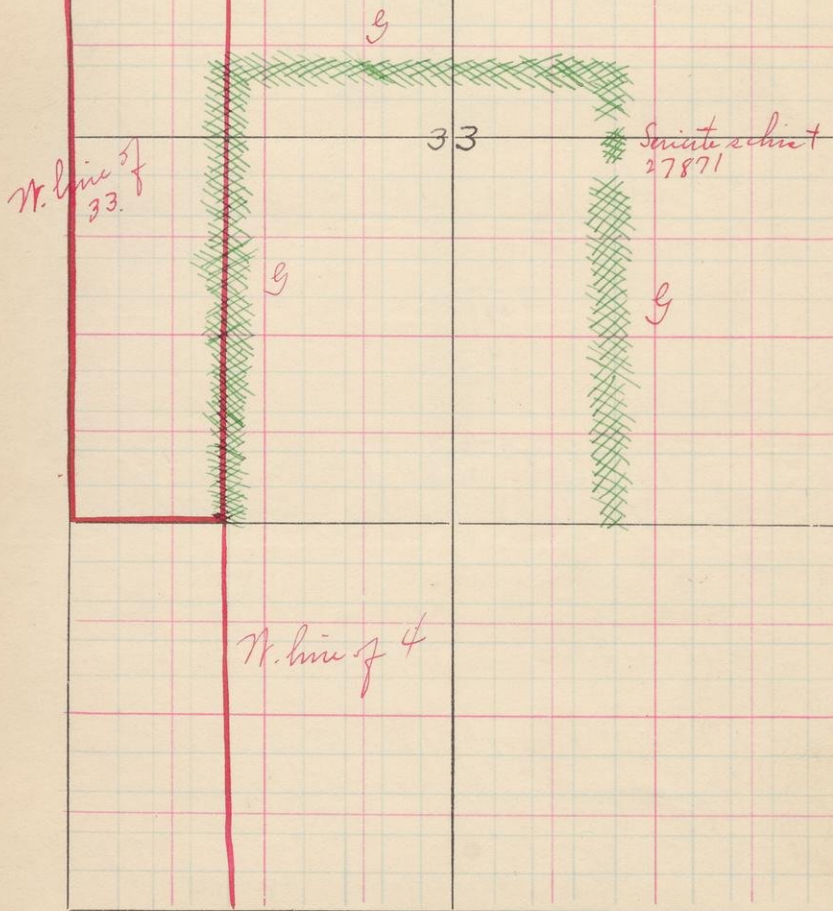
27871

1000 N 1400 E Sec 33
Fine-grained sericite-schist,
showing on weathered surface
elongated roundish areas which
resemble washed pebbles; some

S. 33

T. 64

R. 11



of them are 7 inches across.
 I think these are eruptive rocks.
 Material of spheroids and
 matrix identical on fresh
 fracture.

Continues for 100 paces.

From here to S line of
 Sec. 9, is greenstone in very
 frequent exposure. In the
 most part schistose like
 27870, but at numerous
 places showing aa forms.
 These shown especially well
 for about 200 paces N + S of
 the N line of Sec. 4.

Lake 1500 S in Sec. 9.

S. //

T. 63

R. //

Hall Lake.

5

5 27872

//

9

5 27873 ✓

2.P 27874

Sept 7

Ran S on $W \frac{1}{2}$ th
line 7 11, 14 and 23
to river in 23, and back
on E. $\frac{1}{2}$ line.

450 S 500 E Sec. 11
27872 Greenstone schist

1240 S 500 E. Sagny as
72 but more schistose.
Strike $N 40^{\circ} E$.

1800 S 500 E. Green-schist
27873 Graywacke-like.

Running up E quarter line
F. P. 30 N 500 W Sec. 11 Quartz-
27874 fanglomerate, which on bedrock is
surface appears brecciated

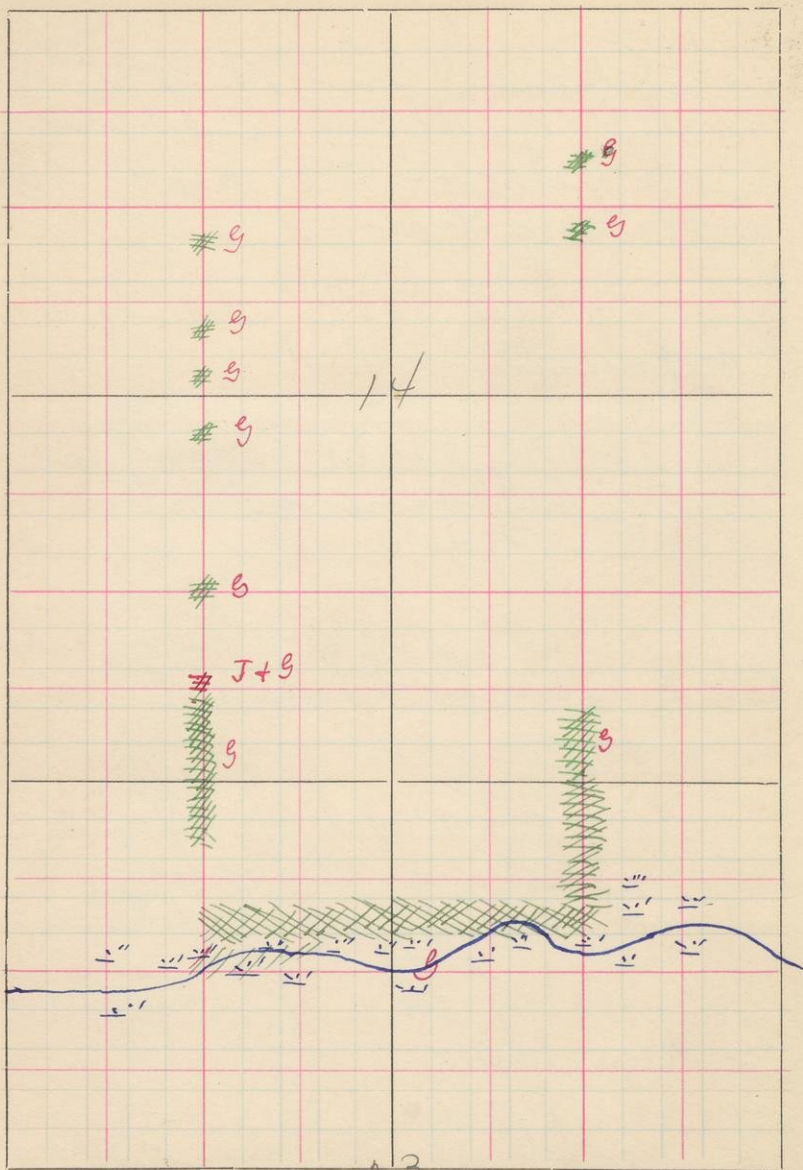
1800 N 500 W, Sec. 11
Greenstone.

Hills are heavily moss
covered, and exposures hard to find.

S. 14

T. 63

R. 11



6005 500 E Sec. 14
greenstone (aa?). Schistose
and fine grained.
Considerable magnetic variation.

8205 Greenstone, like 27873.

9505 and 11005. Same.
15005 Same.

17005 to 17305 are numerous
test pits sunk in what is
taken as a wide belt of gneiss.
Gneiss rarely and poorly
exposed, so could tell little
about it. Strike $N 60^{\circ} E$. Dip 1.
The gneiss is associated
with sheared greenstone.

17305 500 E Sec. 14 to
1505 in Sec. 23. Frequent
exposures of greenstone like
27873.

Then struck the big swamp.

From 4005 in 23, ran E 1000 feet.

Greenstone for entire run.

1500 η. 500 W Sec. 23
 to ~~500 η~~ 200 η 500 W. Sec. 14
 same thing

1430 η 500 W Sec. 14
 Greenstone

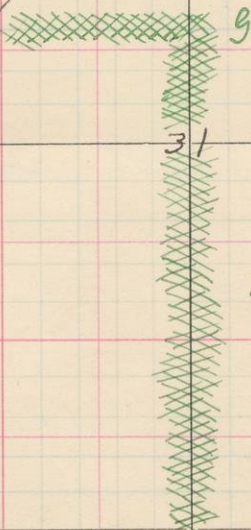
1620 η 500 W. Greenstone.

S. $\frac{31}{6}$

T. $\frac{64}{63}$

R. 10

Saturday Lake



#g 27875



Sept 10

Ran S on W. line of 31-64-10
from lake to ship section.
Then E on account of jog in
line, to W. line of 6 then
down west line of 6 $\frac{1}{2}$ + 18
63-10, 1000 feet east 1000 paces
and returned to lake.

A.S.

27875

750 S of $\frac{1}{4}$ post of 31
Fine grained green schist.
Graywacke-like! Strike N80E.

NW. cor of 6 was found
450 E of SW of 31

Sec. 6, a short one. N - exposure.

400 to 450 S 0 E Sec 7.
Green-schist, like 27875

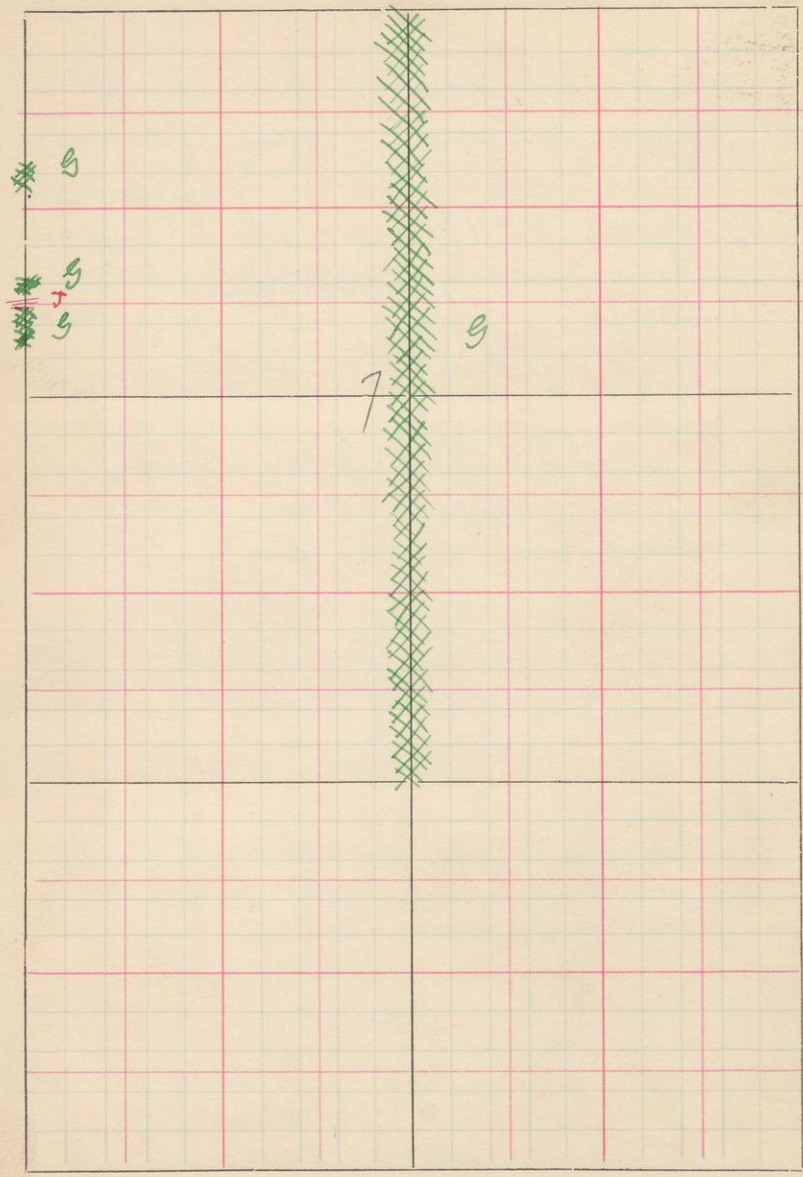
700 S. Same.

750 S. Here is strong
variation and much gasper
debris. Searched for outcrop

S. 7

T. 63

R. 10



8
27

and found but one moss covered gasper knoll, and this I could not be absolutely sure was in situ. However I think there is undoubtedly a gasper belt here.

This is followed by green-schists like 77875, for 100 fms.

b.
27876

855, 0 & Sec. 18 Coarse greenstone, injected by granite. The granite may be seen in masses 2 ft across, but whether in lenses or clinks the exposure is too poor to determine.

7505 0 & Sec. 18. Dark fine-grained greenstone. Iron pyrites. Has the general appearance of the red material, but no aa forms were seen.

11805 0 & Sec. 18. Same.

1350 5 0 & Sec. 18 Typical.

S. 18

T. 63

R. 10

* g + g.
27876

g

g

g

18 g

g

* g

g

g

= Firmly. Ch. n. paper.

Magnetic variation

aa greenstone.
Continues to 17805.

07 540 E in Sec. 18.
A small knoll in swamp
is composed of gasper.
Much gasper debris about.
Could get no strike.

30 7 1000 W. Sec. 18
Funguous chert; the quartz
is white and with this are
bands of bright red gasper.
Strike 750 E. Dip 11°?

275 7 1000 W. Greenstone
aa?

850 7 1000 W Same.

970 7 1000 W. Same

1200 to 1300 7 Same

1550 7. Greenstone like
27876

From here to 2000 ft
are frequent moss covered
knolls, with greenstone
debris, which are probably
of greenstone

At 2000 ft is an undoubted
exposure of greenstone, like
1st (aa?).

All way ft on $\frac{1}{4}$ line in
Sec. 7, are the moss covered
knolls, with occasional poor
exposures of similar greenstone.
Have mapped as solid
greenstone.

The same continues through
Sec. 6.

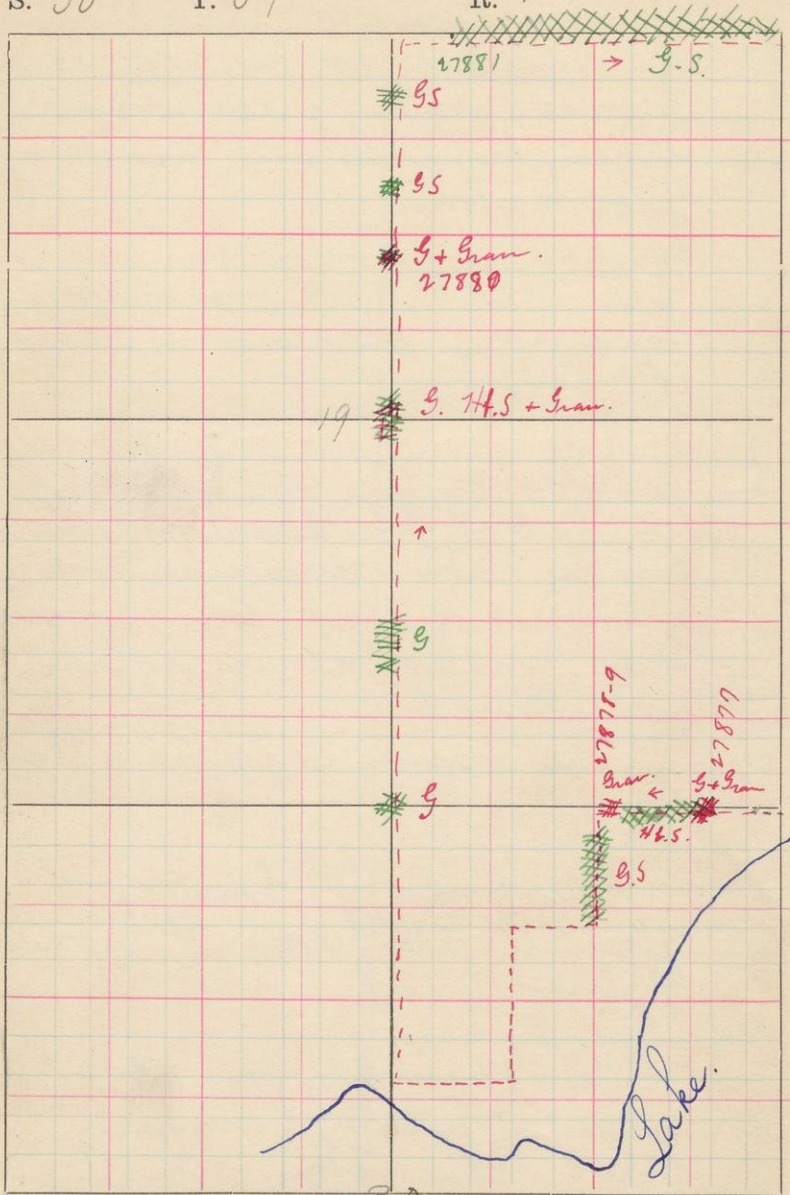
Reaching ft line of 6
ft ~~500~~⁴⁵⁰ ft to strike
ft line of 31.

Can ft in 31 for 1350 ft,
and ft to Saturday
lake. Greenstone like 1st (aa)
in poor moss covered exposures

S. $\frac{19}{30}$

T. 64-

R. 10



for entire distance.

Sept 11, 1897.

Started at lake in N.E.
corner of 30-64-10, and took
course indicated on opposite
map - to find contact of
green schist and granite.

2000 N 200 W Sec. 30.
Coarse greenstone, like 27876,
including lenses of fine-
grained gray granite, in
lenses and in layers, probably
intrusive.

2000 N 300 W. Typical
black hb. schist, cut by gray
granite in belts, 4 ft wide.
Schistosity strikes N. 75 E.
Dip 5° N. The hb. schist is
again cut by a coarse greenstone
like 27876.
The hb. schist continues to
450 W.

S. 20

T. 64

R. 10

~~g.s.~~ →

g.s.

↓

20

g.s.

2.S. 27882

Lake

br. p
2787

oplite
2787

Dr. P

27878

9000 N 475 W. Massive
granite-porphyr, in large
exposures. Probably a phase
of the previous granite.

aplite

27879

The granite-porphyr is
seamed through and through
in places, with exceedingly
fine grained granite, with
general parallel direction. Seems
like a still later granite.

1700 to ¹⁹⁵⁰ 2000 N 500 W.
Green schist. To the N the
greenstone is less schistose, and
resembles the aa material,
and to the S., it is typical
ht. schist.

0 N 6000 W Sec. 19.
Ht. schist with becciated
and cherty forms, exactly
similar to that found near
the granite along Beaver river.

375 N 1000 W Sec. 19
Green-schist becciated, cut

40.

by granite. Continues to
5000 ft. In place is inter-
bedded with coarser doleritic
material

975 to 1050 N 1000 W
Sec. 19 Typical as greenstone,
passing into ht. schist, and
both cut by coarse greenstone
like 27876, and by granite-
porphyry.

1425 N 1000 W Greenstone
with granite in small layers
and lenses. Greenstone has
two phases, a typical ht.
schist and 27880.

1625 N 1000 W. F.H.
schist. No granite.

1840 N. same thing.

Hb. S. 27881 2000 N 850 W. Coarse
dolerite.

Continues to 640 W, where it
is heavily ferruginous.

From here to NE corner
of 19, are numerous exposures
of same; however taking on
more the aspect of the lb.
schist to the S.

Continues to 2000 N 500 E
in Sec. 20

500 E 300 S in Sec. 20.
Ht. sch.

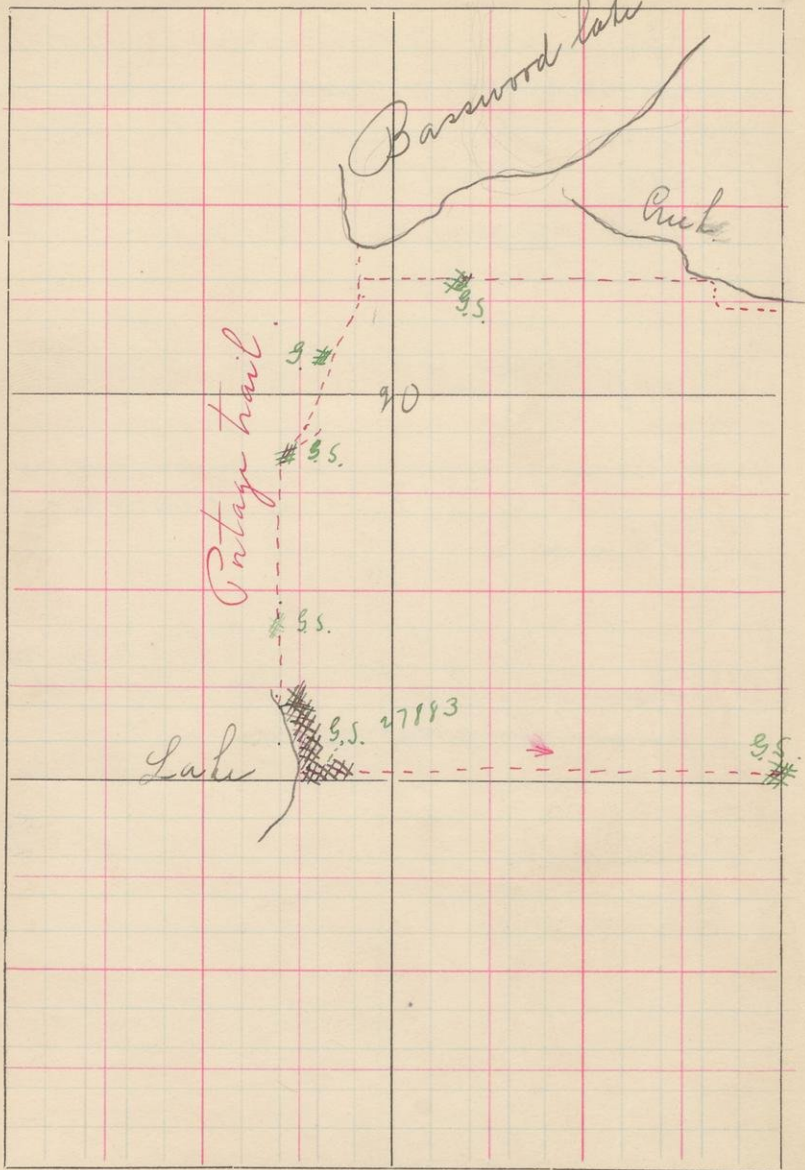
500 E. 1230 S Sec. 20.
Ht. sch.

Qs 500 E 1450 S Sec. 20
27882 Igneous-schist. ~~Probably but~~
~~probably of gneiss origin.~~
Thick lake at 1825 S.

S. 20

T. 64

R. 10



Sept. 13

Took course indicated
on opposite page. Came
to point lake on Sec. line.

G.A.

27883.

ON 0 to 100 ft of shore ^{Sec. 20}
Green schist (?) weathering fine
white. Rather acid. Another
person might possibly call
it a quartz schist. This
material continues N around
bay of lake to almost to portage.
Great variety of shapes and
dips. Made nothing out of
them, except that the rocks
have been greatly disturbed.

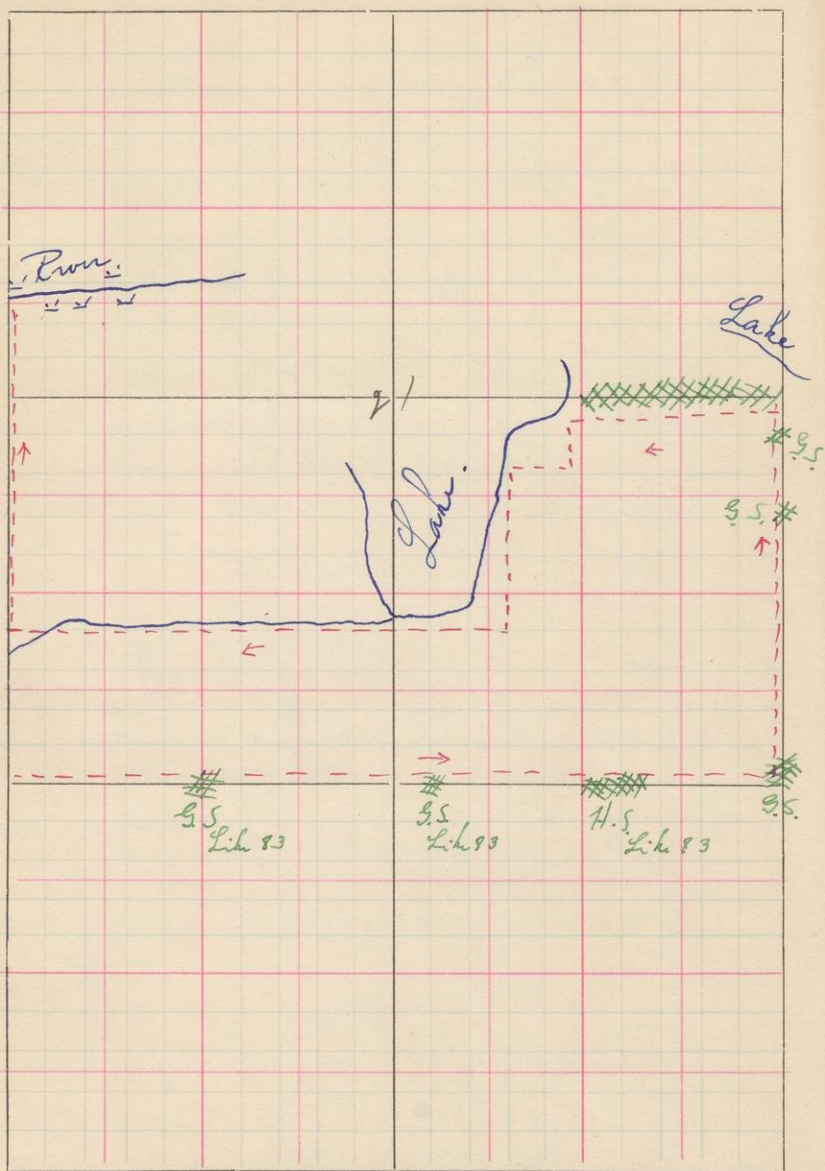
ON 1200 ft. of shore ^{Sec. 20}.
Green schist. (acid?) Fine-
grained, resembling graywacke.

ON 1700 ft. of shore
^{Sec. 20} (500 ft in Sec. 21) Same
thing here showing a few
minute amygdulæ.

S. 21

T. 64

R. 10



0 N 1100 E Sec. 21
Green schist. Graywacke-like.

0 N 1500 to 1650 E. S.
Numerous exposures of same
thing.

0 N 2000 E Sec. 21
Same thing. Rather ferruginous
and apparently affects needle

Can N on E. line of Sec.
21.

700 N 0 W Sec. 21. Green
schist, resembling graywacke.

900 N same.

Can W on $\frac{1}{4}$ line of 21
Almost continuous exposure of
green schist. More rounded
blocks.

Struck lake at 550 W.
This does not agree with
township plats.

800 η 600 η Sec. 21.
Green schist, here heavily
ferruginous, affecting middle.

1300 η 820 η Sec. 20
Ht. sch., Strike η 80° E.

Struck faultage at 1300 η
1100 η , where it enters the
marsh leading to lake.

On faultage trail about
1100 η 1200 η Sec. 20. Coarse
greenstone, - dolomite (?)

On faultage 850 η 1300 η .
Ferruginous green schist.
Strike η 80° E., Dip 10° S.

On faultage trail 400 η 1300
 η Sec. 20 Green schist
resembling greenstone.

Throughout day all
knolls have been heavily
moss covered, making

discovery
difficult. 7 g exposures

