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Bayley, William Shirley, 1861-1943

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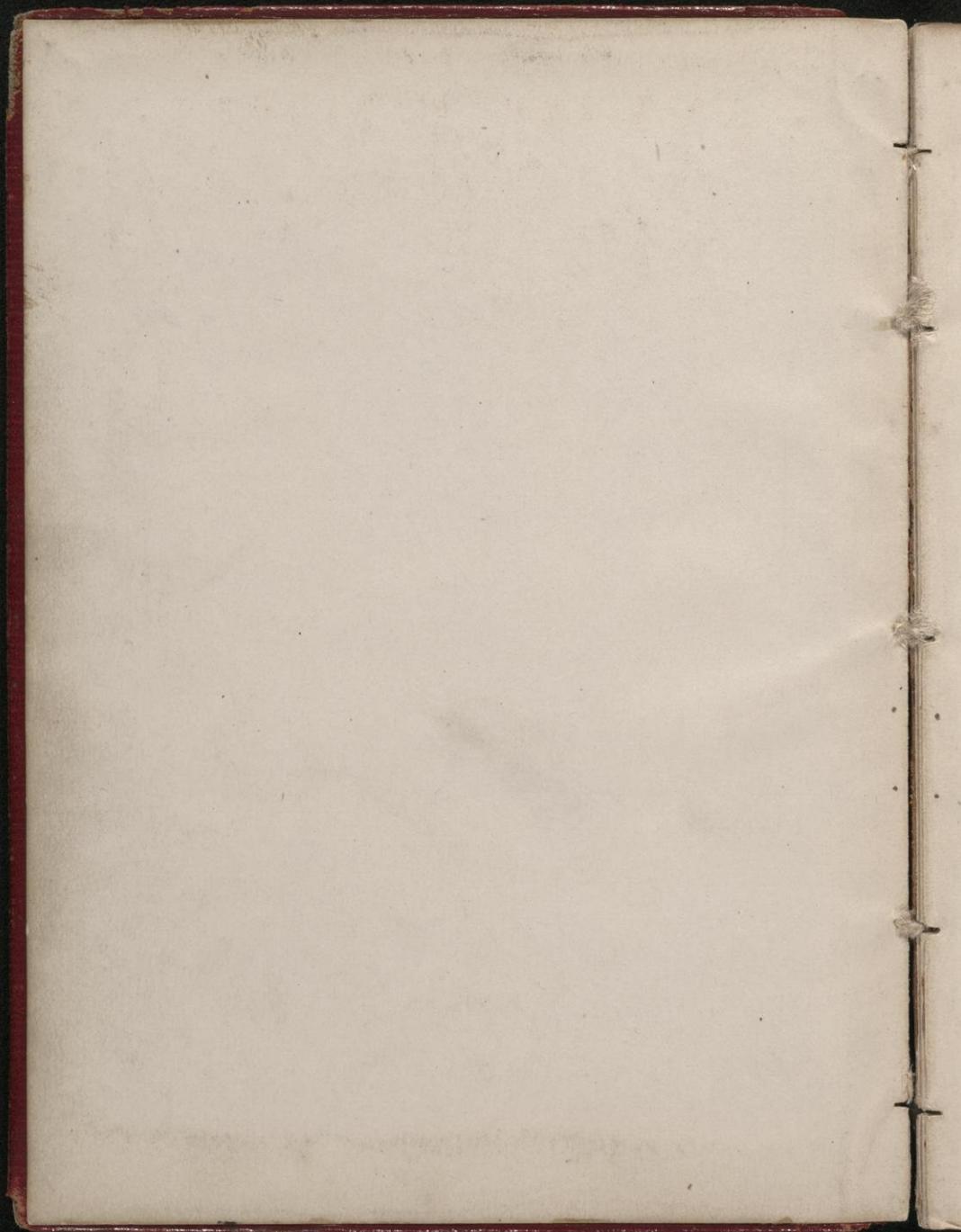
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U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

9-891

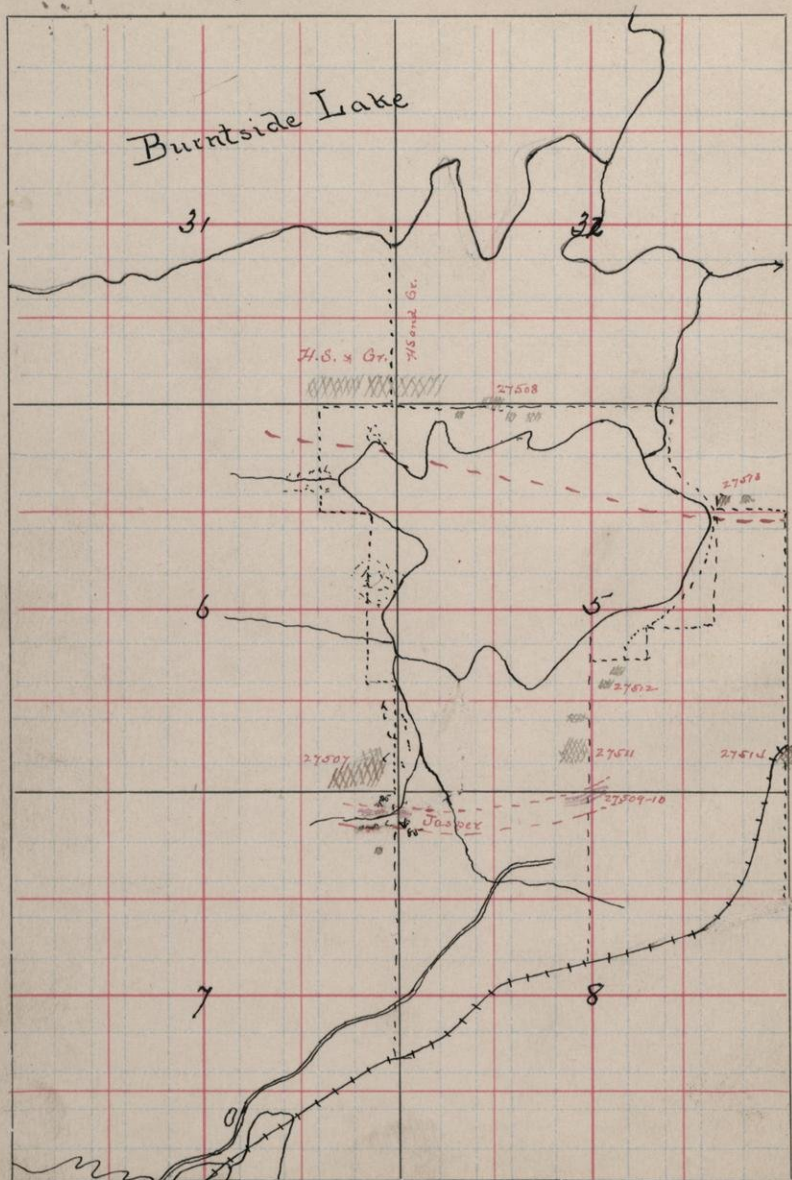


Notebook # 196

S.

T. $\frac{63}{62}$

R. 13



Aug 9

Ran north on Sec. line between Dees
708. T. 62 R. 13. over drift to 1700 N of
S.E. cor. of Sec. 7, where found small gas-
per ledge on north side of hill

At 1914 N of this corner found other
ledges striking 5° - 10° S of E and dipping
almost vertically 85° N and 85° S.

b. 7

27507 About the N.E. cor. Sec 7 and East of this
point is a great hill with an almost
perpendicular south face. It consists
exclusively, so far as studied, of a fine
grained greenstone with spheroidal
parting.

Just above the town line is a ridge of
greenstone and granite that runs East
on north side of Little Lake

b.

27508 At 500 W of N.E. cor. Sec 6. is a Bar
Knob of greenstone cut by granite, from
which took specimens
All the rocks both north as far as
Burntside are like this.

Rain in torrents!

Aug. 12.

Ran north on $\frac{1}{4}$ line Sec 8. to lake
then around lake and East to Sec line
and then South.

At about 50 W. of N. $\frac{1}{4}$ post Sec 8 is a
small hillock of interbanded jasper and
chert striking a little S of E, then E, then
a little N of E, as we pass westward along
the ledge. The rock is more or less con-
torted but according to no general law
of folding so far as could be determined.
The ledge is not more than 50 paces long
and 20 paces wide though in the map its
size is magnified. To the East it strikes
into drift hills.

1.C.
27509 Black jasper, fragmental looking
1.C.
27510 White chert

From this ledge

At 200 N. of $\frac{1}{4}$ post is the East end of
a greenstone bluff in which the fine
grained dense greenstone is beauti-
fully spheroidal. This rock extends north
to the lake. Great drift hills then come
in and separate it from knobs of
greenstone which north of lake.

h.
27511 Greenstone 200 N. of $\frac{1}{4}$ post Sec. 5
27512 " 600 " " " "

h.
27513 Greenstone schist 1500 ft. 300 W of OE.
Cor Sec 5.

S.E.
27514 Iron bluff, cut in railroad, 300 ft. of
Corner between Secs. 5 & 4.
The same rock, a spheroidal greenstone is
in cut near Center Sec 4. at 8 mile
post.

[Location of R. R. at this point does
not correspond with map.
cf. Clements & Leitch's notes]

Went East from this point to 1/2 mile
Sec 4, north of Center Sec 33, East
1000 paces and South to R. R.

h.
27515 Greenstone from South face of large
gcf. lies at 650-700 ft of Center Sec. 4. The
rock appears bluing with 27513 rather
than with greenstone brown. which
are dense and spheroidal. In places
it is speckled with hard weathering
dots that look like amygdulæ.

S. Sh
27516 Spotted phases.

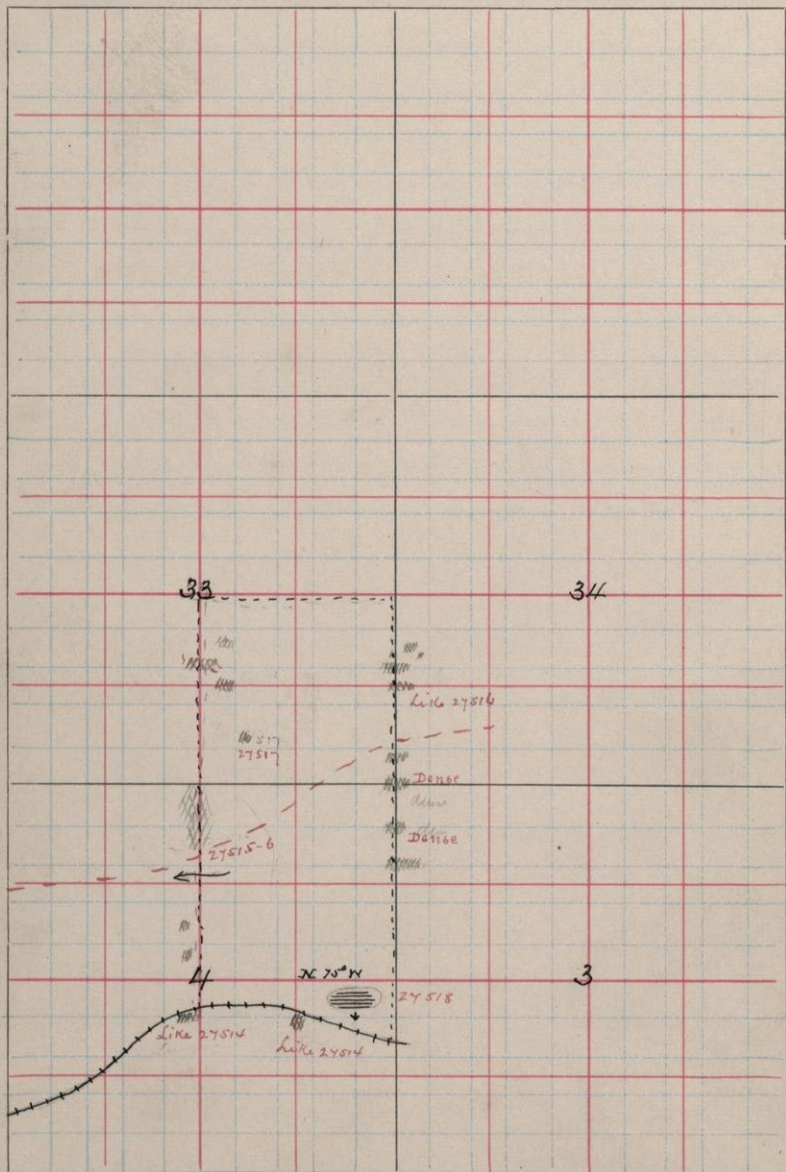
h.
27517 Greenstone schist from 300 ft. of S. 1/2
post Sec. 33.

Beyond this the hills are of greenstone

S.

T. $\frac{63}{62}$

R. 13



4

Schists? Some of which are cut by red granite?

On run south crossed many irregular greenstone schist ledges to 500 ft of SE cor Sec 33. Then dense, spheroidal greenstones to 400 ft of this corner.

st
24518

At about 150 paces N of R.R. track, west of E $\frac{1}{4}$ post Sec 4 is a hill of slate, the first seen for some time. The rock is dense, jointed, striking about 12° - 15° S of E and dipping very high to S.

The knob is isolated so that rock cannot be studied in its relation to other rocks.

Aug. 11-12

H.S.

Long Lake.

27519

At S.W. Corner of Long Lake there is a high cliff of green schist that looks much like the dense greenstone of the iron-bearing series. It is schistose, with foliation nearly E-W and is coarser grained than the Spheralitic greenstones.

The little island near the N.E. Cor. Loc. 1 is mainly a green-schist conglomerate grading to the south into grit and slate. The conglomerate has a green schist matrix and contains pebbles of white or light colored granite. Exclusionary. Its strike and schistosity are a few degrees N. of E. No sun, but strike taken by sighting to mainland. Believe this to be upper conglomerate.

27520

Conglomerate showing portion of pebble

27521

Pebble from conglomerate

27522

Slate and graywacke

27523

Graywacke or grit

Strike of schistosity determined later is N. 65° E. This is probably also heading. Dip vertical.

27524

Slate from south side of island

h.

27525

The next hill to north in west shore of lake is composed of dense greenstone schists - that look like sedimentary rocks but are probably eruptive.

h.

27526

The little island off this hill is composed of practically the same rock.

In the NE of the NW Sec 30 a large rock face overhangs the lake. This is a green stone, which in places is coarse, as at water's edge, and in top of hill, while at other places it is fine grained.

missing

27527

h. 281

27528

b.s

27529

Little point in south side of little bay.

b.s

27530

Green-schist with chert or otterite spots.
Green schist from point north side little bay.

b.s

27531

Fine grained green-schist from a little further east in same bay.

A little further along the north shore of this little bay is a fissile schist that looks at first sight like slate. Followed back from the shore it becomes more and more massive, and is fissile only when weathered.

b.s

27532

More massive phase about 100 feet from water's edge.

The point about 500 SE of U.W. on Dec 29 is mainly green-schist, but on its north side is a bedded white rock striking E.W. that looks like Anorthosite. There is only a few steps distant from the green-schist, but nevertheless could get no relations between them.

W.
27533

Feldspathic rocks - Anorthosite L.I.

B.
27534

Dense greenstone, from Cottage island.

The shores of U.W. Bay are green-schists so far as they consist of rocks. On the north side of the bay is a ridge of coarse greenstone, and north of this, some 1/2 mile from the shore is another ridge of coarse greenstone.

B. 27535

The greenstone near the lake is a coarse banded. In places it is light colored and weathered so that it looks very much like granite. In other places it is finer grained and looks more like the usual greenstone.

B.
27536

Green schist from point near Center Sec 20.

On the north side of the little bay opposite

B. D.

27537

They are large bare knobs of coarse greenstone that weathers like granite. It is apparently the same rock that forms the hill in Sec. 19.

B.

27538

The little island off the point is dense greenstone. It contains dykes or beds

S. S. + J

27539

of a white weathering schist, and in addition a bed of black jasper dipping vertically and striking N. 50° E. The jasper bed is 12-15 ft. thick.

S. S. + J

27540

The next island west is composed, on its north side of a well bedded greenstone or slate - striking N. 60° E and dipping 80° S. It contains a few seams of jasper 1 in wide.

This seems to show that much of the rock called dense greenstone is a fragmental rock. Of course it is possible that it is a lava flow or bed, or at least a surface greenstone.

B.

27541

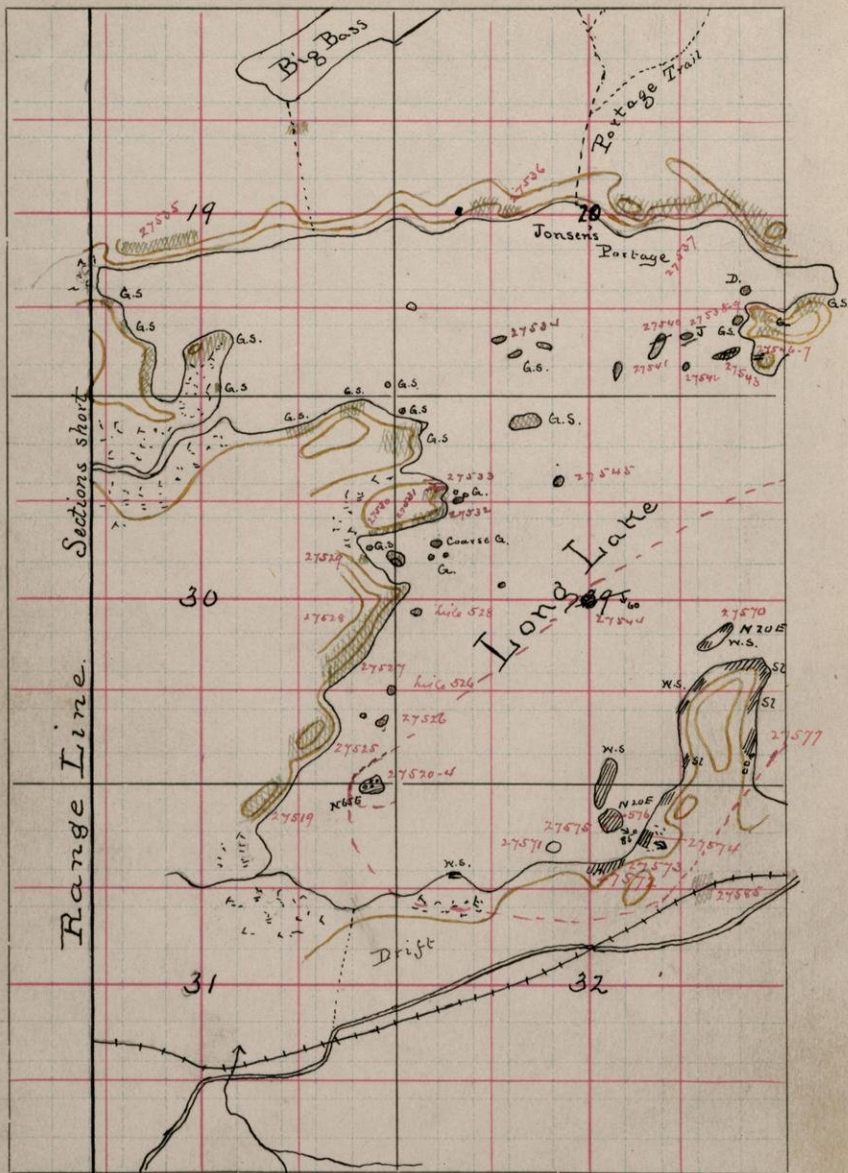
Some massive phase of rock from S.W. corner of the island.

B.

27542

The outer one of the Southern islands off the point is a dense, ringed rock like greenstone, but it contains well rounded pebbles that weather

Is not this like the gneiss this island? Take for postage from there into W. side



legible than the matrix in which they are imbedded. No bedding could be detected. The specimens show
 49 are small pebbles.

27543

The island nearer there is also composed of the same rock apparently, but in this case the pebbles, some of which are rounded, are plainly due to pressure. The rock in places is banded with narrow bands of a white weathering rock like the material of the pebbles. These are first separated into lenses and then into rounded masses.

 C?
 27544

The little island in the center of Reef 9 is a schistose rock with bands of white weathering material becoming pebbles like in places, similar to 27543. The banding, and bedding of the rock is fragmental, strikes N. 60° E and dips 65-70° S.

 H.
 27545

The next little island north is what have been calling dense greenstone, though it may be gray-wacke.

h. El

27526

On the little point on north side of bay opposite the island the rock is greenstone, which on the north side of the point is spheroidal and in places is amygdaloidal. In other

h. El

27547

places the rock is streaked like 27523. It may be that 27543 may after all be eruptive.

h. S

27548

Around the point on its southern side is a dense greenstone schist.

The shore of the promontory as we pass eastward is a series of greenstones that I believe the lavas varying in schistosity and in color and density.

h. S

27549

From westernmost ledge, schistosity - strikes N.E.

h. S

27550

Beyond this, both back and further from the shore the rock is darker and more schistose and is interstreaked with a

h. S

27551

white rock

Certain bands are also filled with white oval blotches that look like pebbles, but which are probably amygdaloids.

h. El

27552

27553

are from a base, prominent terrace that overlooks lake. The predominant rock, which is spheroidal is represented by

27552. It includes a few large pieces
of a white rock (27553) that may be ei-
ther a chert or a fine grained felsite.

S.S.
27552

Schistose dark green rock from near
East end of promontory.

S.S.
27555

The great ridge of hills running along
lake for a mile in Deco 21022, is com-
posed of a diabasic greenstone.

S.S.
27556

This is faced to the south by a small
bluff of dense greenstone which like
the usual greenstone.

Think 27555 is huge dyke in the lava
greenstone so abundant in the dis-
trict.

The little island off the Point Shero rock
may on its west side. There the rock is
very schistose, is white and at times
very fissile.

Sl.?
27557,
Sl.
27558

Very fissile phase

A portion of the fissile rock is quite hard
as though calcified.

S.S.
27559

The little island south of this is dense
spheroidal rock of usual character.

ms
27560

The middle of the group is found in the N.E. $\frac{1}{4}$ Sec. 28 contains a bedded tuff, striking a little N of E and dipping south at about 45° (where seen). The ledge however, was loose and this dip may not be the correct one.

h.
27561

The line between Sec 21 and 22 crosses a ridge of coarse granitic but far from water edge, where schistosity is about parallel to the trend of the ridge. Beyond this ridge across a swamp the line crosses a second ridge which is the extension of the ridge from which 27555 was taken.

Aug 13"

ms
27562

South side of Lake East End.

From one of a number of well bedded ledges in which the rocks, which is certainly a fragmental, dips vertically and strikes a little N of E (to line)

gl
27563

Near the shore the rock is certainly slaty

on north shore of lake, a little west of 27563, is a white and rusty stained

sl. 7

27564 Schistose rock like 557-8, in which an opening has been made, presumably for view line. The rock is probably a fragmental.

sl.

27565 From top of ridge back flake. Evidently extension of ridge 561.

From this point went west stopping at several islands 'en route'.

27566

27567 } Three phases of well bedded schists?
 striking a line N of E and dipping
 27568 } vertically. Rocks taken from NW.
 across island.

tw

27569

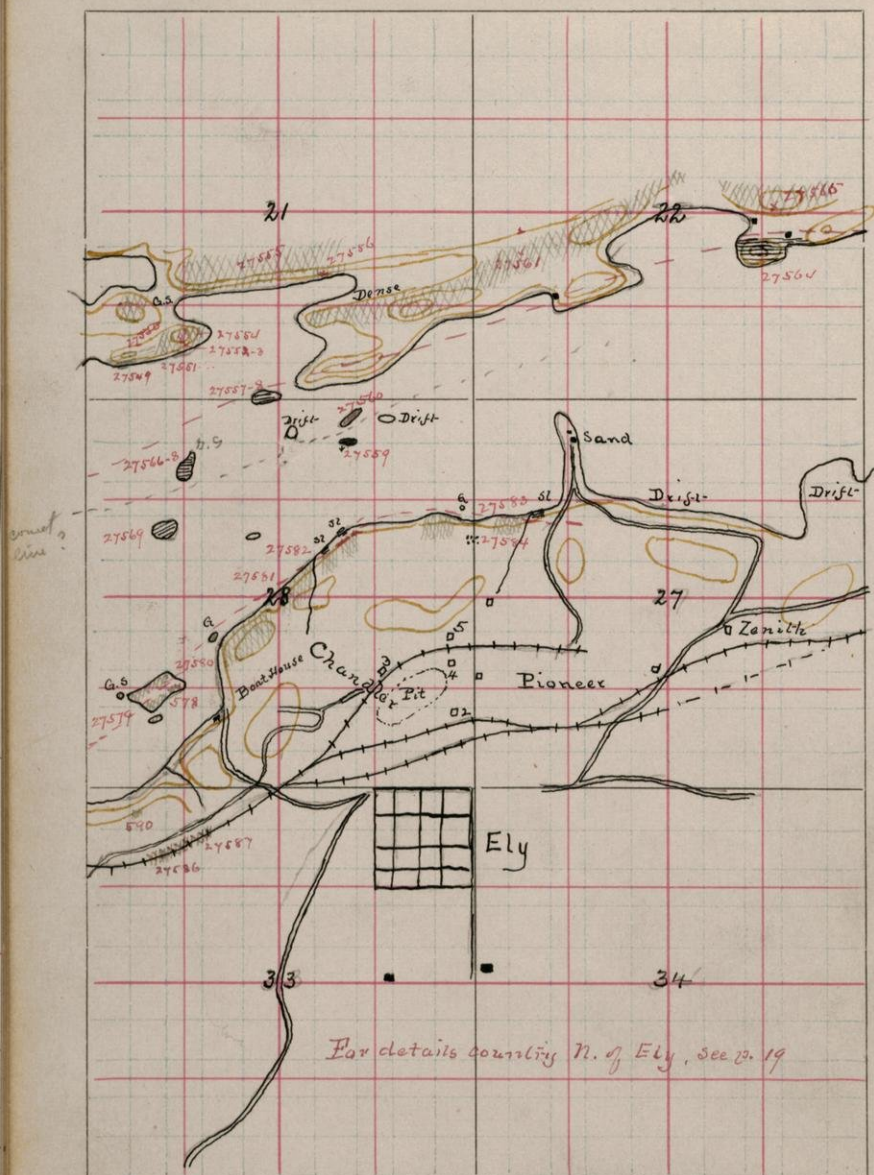
The next island south is composed of a white schistose rock that appears to be a grit. Strike of schistosity is directly into island from which 27557-8 were taken.

Cf. 566-8 with 27569! Strikes as different.

sl

27570

The same rock is found in island off point in S.E. $\frac{1}{4}$ Sec. 29.



Aug 14.

Coasted along South side of lake from S.W. corner Eastward to the sand spit East of Ely.

On the shore 500 E of W. line Dec 32 is a small ledge of white schist that is taken for grit or fine grained conglomerate.

S.S.
26571
7

This forms the entire mass of the little island off the coast just East of this point. Now, however, it is greener than it is in the western ledge. The schistosity - strike about N.E. and dips about 75° - 80°.

sl
26572
7

The shore line East of the islands near N. 1/2 post Dec 32 is composed of a slaty rock not very different from 26571, but more like 26570.

air
26573
7

At one place it is cut by a 6 ft. bed of a cherry looking rock 26573. This latter may be a vein. Strike and dip could not be obtained because of loosening of ledges by frost.

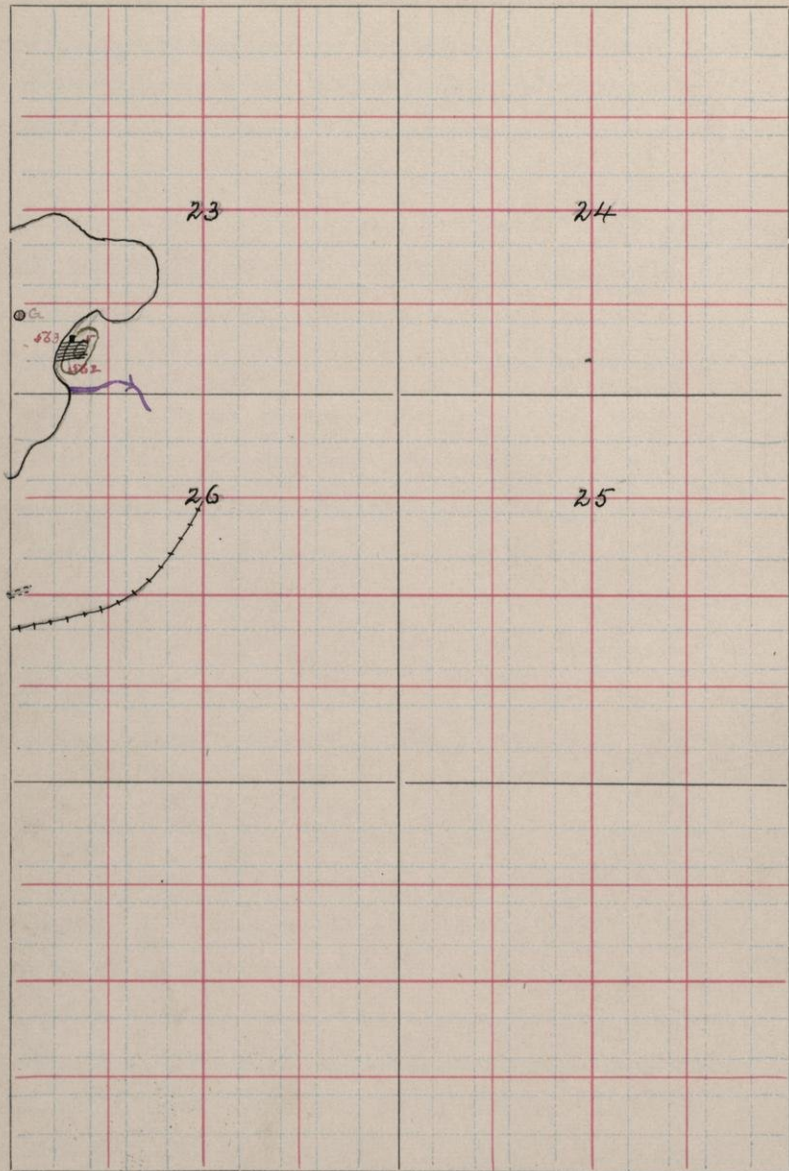
7
26574

Further up the shore the rock is more massive, like a coarse grained grit or fine grained conglomerate. It

S.

T. 63

R. 12



strike N. 15° 20° E and dip high to the S.E. At this place the rock apparently contains small fragments of slate.

out.
27575
sl
27576

The southernmost of the two islands lying off this shore is slate on its south side and over most of its surface, though its highest point is made up of a ridge of grit. The rocks strike N 20° E.

Evidence 27571-6 bearing to the same fragmental formation.

The island to the north of this is the same rock, though it contains a large quantity of white-schist that seems to be a schistose grit.

pr
27577

The shore line all the way to the end of the promontory is of the same rock with strike N 25° E and dip high to S.E.

On east shore of the same promontory is a ledge of coarse grained conglomerate striking and dipping like the schist on its west side.

The little island off the Boat House consists of spherical greenstone on both north and south sides forming high

h.

bare knolls

27578

Dense greenstone from this island

h. sl

27579

Spheroidal greenstone

On some surfaces the spheroids are so abundant and so well rounded that the rock looks like a conglomerate. Specimen 27579 is one of the spheroids.

g.

27580

Though the center of the island runs a knoll or ridge of a white splintery rock that may be a sedimentary rock, but which is more likely a greenstone.

The little island S. of the main island is greenstone and greenstone schist.

h.

27581

The balance of the line to the sand point in which are the Otter's ground is dense greenstone except at two

sl

27582

places where slates are exposed very near the waters edge.

h.

27583

Schistose greenstone from shore near where East line of Sec 27 crosses it.

g.

27584

Graywacke short distance from water. South of 27583

Aug 15.

Worked between R.R. and Long Lake
The big hill in which $\frac{1}{4}$ part between Secs.
31 and 32 is situated is drift as are also
the hills cut by the railroad as far east
as the N.E. $\frac{1}{4}$ Sec 32, where a cut has been
made through a spheroidal dense greenstone
containing light colored spheroids in a little
darker schistose matrix.

B. 4-
27585

Beyond this, and end about 200 paces W of
the water tank on south side of railroad
is a cut 325 paces long. All through its
extent it seems to be greenstone, but there
is no evidence of spheroidal structure
from west end of cut.

B.
27586
B. 27587

" East " " "

The hills N and N.W. of Ely are well
exposed. To the west and N.W. of the boat
house on the Lake shore the greenstone
is schistose and spheroidal, with spher-
oids amygdaloidal, especially on S.E. side.
The rocks are also much jointed with joints
traversing spheroids and matrix as well.
Specimens of schistose rock from N.W.
Cor. of hill near pump house. Looks like
slate but believe it to be greenstone.

B.S.
27588

- B.
 27589 From small ledge of banded rock from
 N.W. junction of country road and road
 to boat house. Probably greenstone tuff.
 B.
 27590 Little coarser greenstone from ledge
 marking little north running about.
 west on north side of hill overlooking
 westernmost house on lake.

Just north of S. 1/4 post Dec 28 the nor-
 mal, jointed, amygdaloidal green schist
 is in contact with a brown weathering
 5.5
 27591 rock that looks like a tuff. The strike
 of the contact is N. 30 E. Magnetism - a deter-
 mination of practically no value.

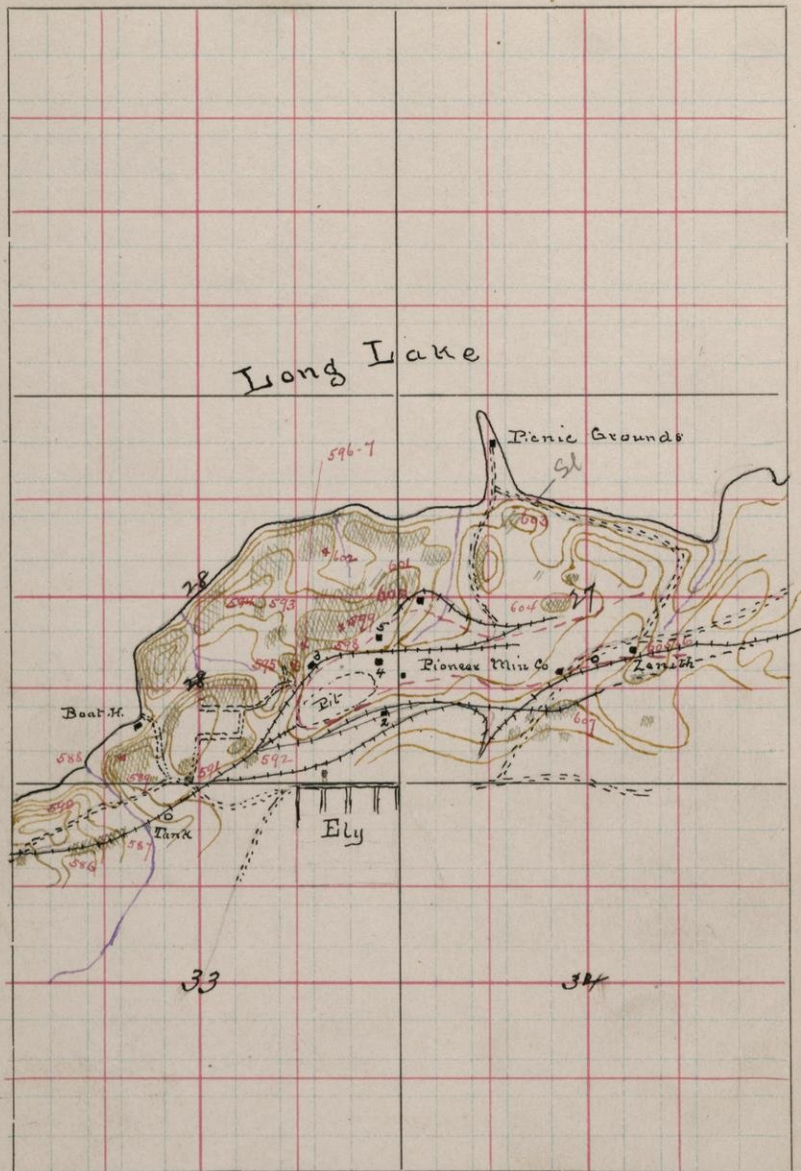
The dense amygdaloidal greenstone ap-
 pears to extend south as far as road.
 B.
 27592 The cut in the railroad about 200
 paces W. of west end of Chandler open
 pit is a dark greenstone that is more
 like an intruding than any other
 rock hereabouts.

From this point north to the lake
 is the spheroidal greenstone which
 on the east end of the hill west of the
 stream near center Dec 28 is as much
 like a conglomerate as the rock on

S.

T. 63

R. 12



the island opposite the Goat-Lens. In no place it contains two inclusions of chert about 9 in long each.

27590 Tuff interfolded with normal greenstone.

27591 Dense greenstone just west of 590.

27595 Center of hill west of westernmost shaft. Rock coarse in center of hill; amygdaloidal and spheroidal in edges.

27596 The little hill north of No 3 shaft of Chandler mine is also the spheroidal greenstone, but in the center of the west end of the hill is a dense, black rock, which on top of hill weathers red. The rock looks like dyke in greenstone. It may be a peridotite.

The large hill N.E. of No 3 shaft is composed of a dense rock that looks more like a tuff than anything else.

27598 From bottom of hill, near road

27599 Inward top of hill.

27600 From top of N.E. spur of hill.

S.

T.

R.

6-717

60% + 3 are remnants of sed. material which
covered the granite + in Penn. Main belt less in Gray Lake!

Along the south side of the hill and at its west end the rock appears to be mainly tuff, but on the top of its N.E. spur it is partly, at least, the dense greenstone. The tuff is more schistose to the East than it is toward the west and is much more decomposed. Its schistosity strikes N.E. Two sets of joints are present cutting each other at acute angles.

H. #

27601

L. #

At the extreme N.E. end of hill, overlooking Swamp to NW the tuff covers much of the slope.

S.

27602

The hill to the N.W. is probably a fine grained tuff though it weathers like a fragmentary

From this point Blake is again dense spheroidal greenstone.

st.

27603

L. #

On hill just south of Perring ground is what is apparently a bedded rock striking approximately N.E. and dipping vertically. Rock looks like slate though structure taken to be bedding may be fluvial.

All the country East of this point is drift-covered except for a few ledges

sw. ? Lee and there, all of which are spheroidal
 27605 } from small ledge near center Sec 27

1.C 27605 } Jasper from dump heap of Ze-
 27606 } with riming

South of the Zenith mine the R. R.
 right of way cuts through Greenshire
 and again S. of E Pioneer mine
 27607 } from latter place.

Aug 16.

26608
H. 24608

Crossed Johnson's Portage trail to Little Bass Lake crossing ridge of coarse greenstone like Diorite near S. 1/4 Sec 17.

Then coasted along shore of the lake, first Eastward along N. shore then west along South shore.

26609
H. 24609

The knob at 500 W. of Center Sec 17 is a fine grained greenstone

26610
H. 24610
H. 24611

The north shore of the lake is bordered by a ridge of light colored Diabasic greenstones represented by 24610 and 24611

26611

Toward East and the rock is even less feldsparlike than it is to the west.

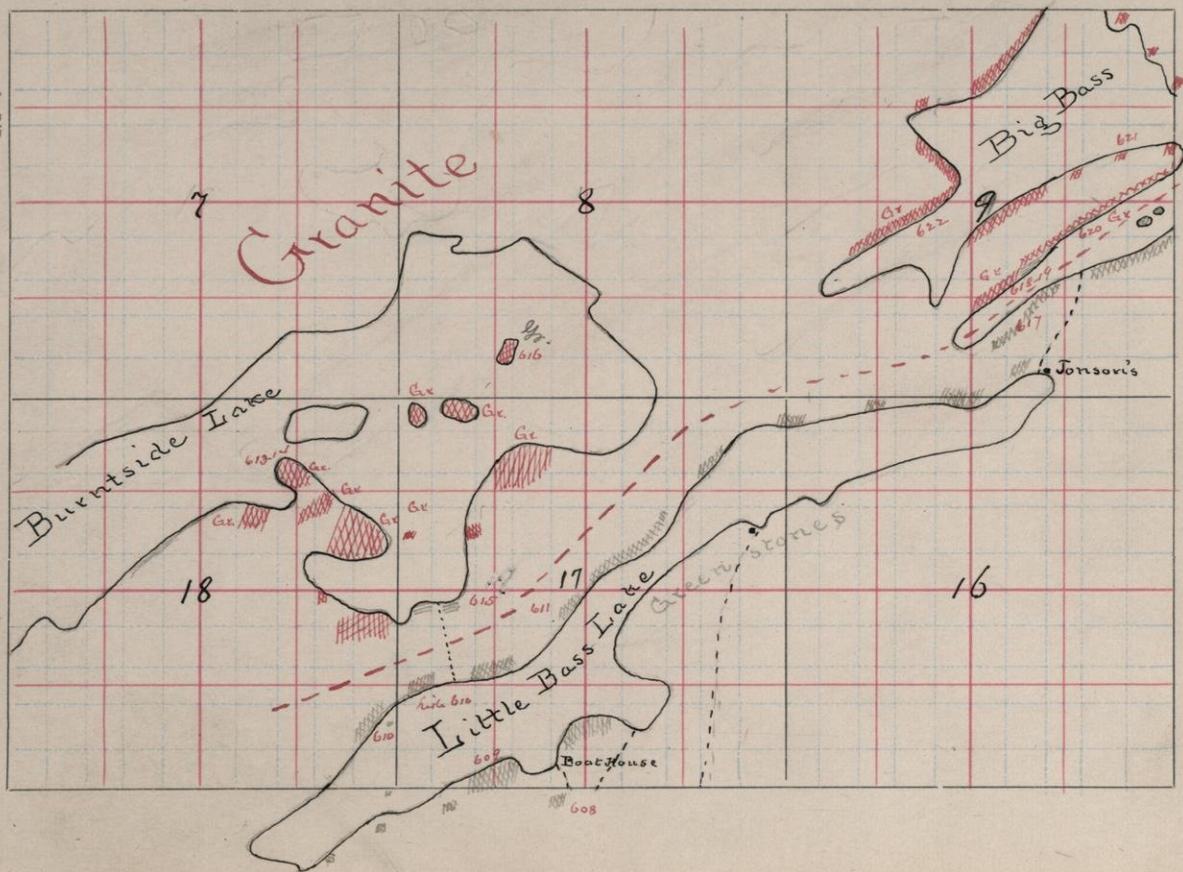
The South-East shore is likewise of greenstone but did not locate ledges as it was rough not worth the while in view of the short time at our disposal.

From Little Bass Lake went over into the East end of Burnside Lake. The South shore of this lake is composed mainly of white granite, with a pinkish tinge

27512
H. 24612
H. 24613
27513

From near N. S. 1/4 line Sec 8

Predominant granite - white -



S.

T. 63

R. 12

27514
Mm

27614

dyke of red granite cutting white?

So far as observed no rocks but these are
formed in sec 18.

27515

27615

Hb. 5c

In section 17 however on the south side
of the lake is a great Exposure of Horn-
blende or mica schist cut by dykes of
white granite?

27516

27616

Hb. 5c

The white granite on the island in sec.
8 contains several inclusions of
a chert-like looking rock of which
27616 is one.

Aug 17

Crossed on portage into Big Bass Lake
and coasted shores first going west along
south side and then east on north side.

27517

p. 91

27617

on south side of D.W. bay is a ridge
of diabasic greenstone like that on the
north shore of Little Bass.

27518

Hb. 5c

27618

On the north side of the Bay is a black
mica schist cut by red granite dykes.
This rock constitutes the promontory
separating the two bays, the line
between the granite-schist series
and the greenstone series evidently
passing up the southern bay.

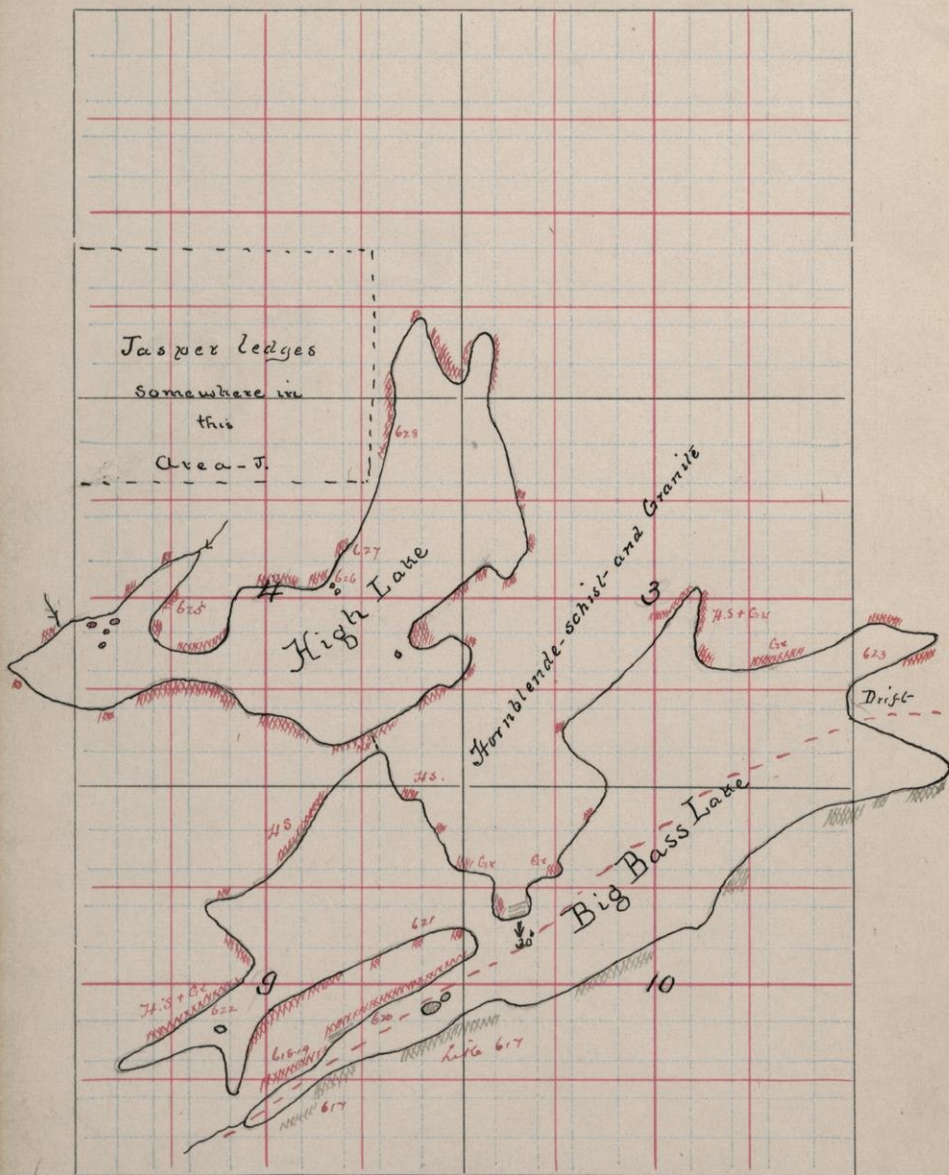
Mm. 27619

27519

Hb. 5c

27620

Coarse hornblende green from same



ridge rock further east.

27521
M24621 On the north side of the promontory and on the south side of the northern bay is a fine grained white-granite replaced to the east by hornblende-schist and granite.

27522
M24622 The points (volcans) on the north shore are made up mainly of granite and the straight courses by schist. The schists are apparently bedded, with bedding striking N 70° E and dipping N. at high angle. The schists are cut by abundant dykes of white granite.

27523
M24623 At N.E. end of the lake granite is the predominant rock. It is evidently intrusive in the schist. Near the shore it is often fine grained and intrusive, further inland it is coarser grained.

27524
24624 No specimen

Aug 17-

From Big Bass went over into High Lake. This was beginning of a trip down into Basswood Brook at Camery and to try to discover whether or not it presents the pre-Algonquian aspect.

High Lake is surrounded by big granite hills, and by others consisting of Keweenaw and Muskegon schists cut by granite dykes.

Although in maps the ledges are marked in red, the schists are probably predominant.

West of the northern portion of the lake it is said that jasper occurs. This we did not see since had been told the jasper exists in lake shore - and we found here ledges of iron stained schists. Later in the season we learned very definitely that jasper ledges occur a few paces inland from lake, but this knowledge came too late for value last season.

The occurrence is a remarkably interesting - unique since it is in the midst of the granite schist complex.

Only four specimens were taken from High Lake as follows:

- 27525
M.S. 27625 Micaceous schist, from shore 500 W of Center Sec 4. Strike about N.E. Dip N.W. at 75°.
- 27526
M. 27626 Granite cutting schist like 27625
from shore 350 E of Center Sec. 4.
- 27527
H.S. 27627 Hornblende - schist, through which gran-
ite cuts. 150 N.E. of 27626
- 27528
27628 Oxidized greis cut by red granite dykes
and veins. N.E. of NE 1/4 Sec 4.

Storm, Camped at Big Bass Lake.

Aug 18.

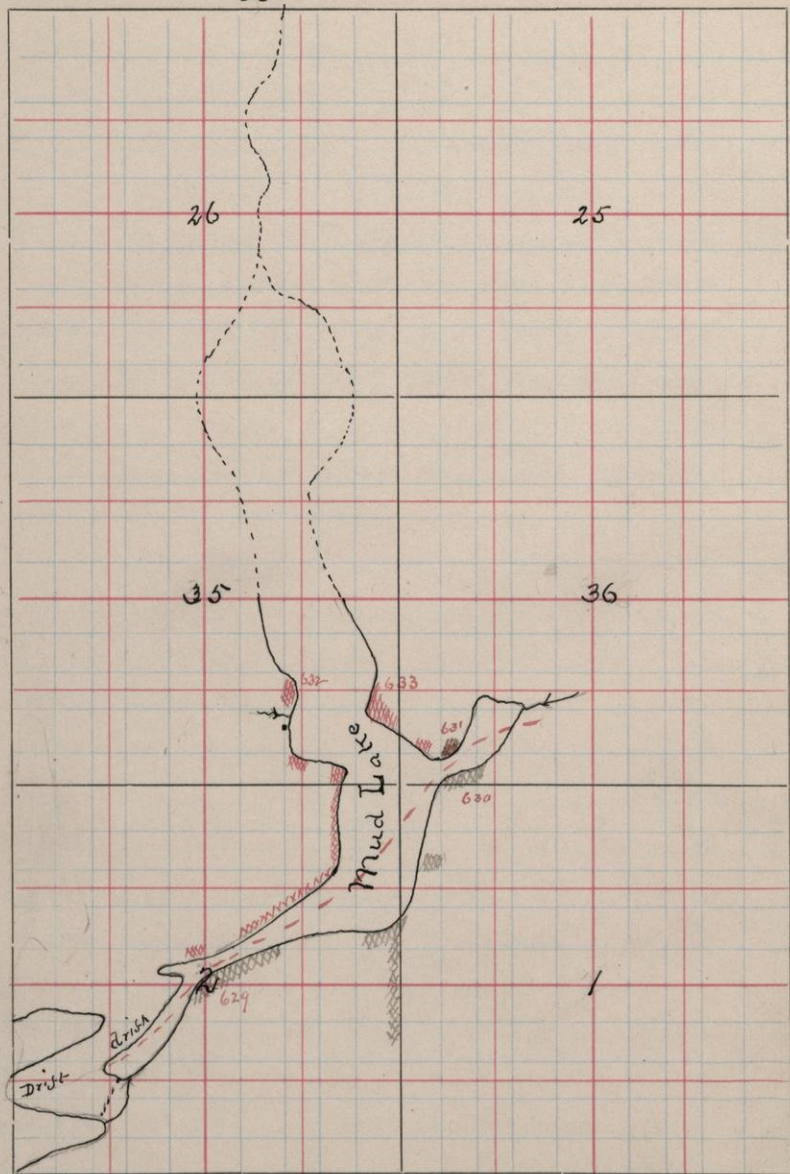
From Big Bass went into Mud Lake
and down river into Pike Lake.

As in the case of Big Bass Lake, the
South and South-East side of the lake is
greenstone and the North and North-
west sides granite and hornblende
schist. No definite contacts between
the two series of rocks are seen. It is
probable that the greenstones are all
portions of the same intruding dykes
which constituted the South side of the
lakes and separates the dense greenstone
to the South from the greenstone cut by
granite to the North on the other hand

S.

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

R. 12



the schists may be metamorphosed from
the greenstone.

Only two specimens of the greenstone
were taken.

27529
g. 27629

From high cliff, south side of Mud
Lake. Rock extends continuously for a
bout 1/2 mile.

27530
p. 27630

Little different phase from near S.W.
cor. Sec 36.

g. 27531
27631

On the north side of the narrows imme-
diately opposite 27630 and only 100 paces
distant is a ledge of fine grained, dense
greenstone, that contains a few pocket-
like masses or nests of granite, and some
veins of the same rock. This may indicate
that the schists are portions of the greenstone
series.

North of this all the ledges on both sides
of the lake are granite or hornblende-
schist.

27532
H. 27632

White-granite at contact with hornblende-
schist.

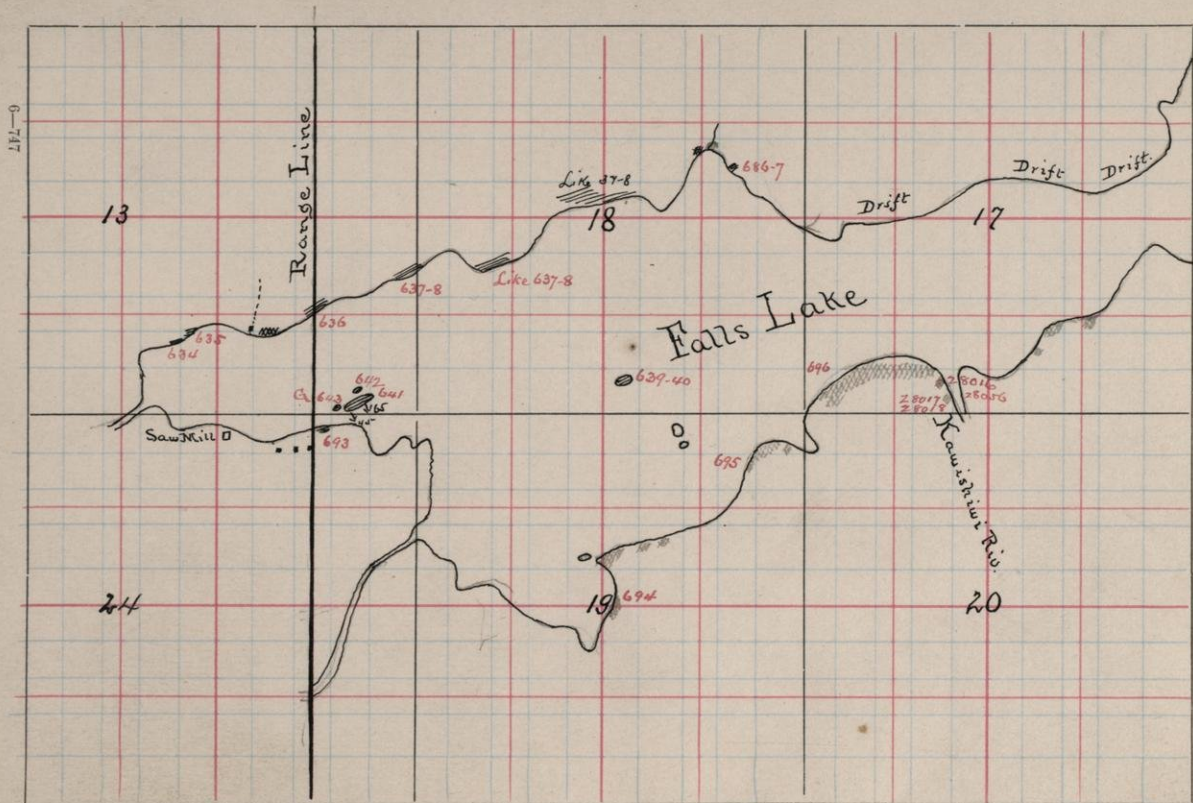
H. 27533
27633

Hornblende schist, through which great
granite dykes cut.

S.

T. 63

R. 11



Aug. 19

From Pike Lake went to Basswood
then to Funes Lake through Newton

Aug. 20-22

Remained in camp

Aug. 23.

Falls Lake

Beginning at N.W. corner find ledges
of fine grained sericite^d schist, very
schistose near lake shore, more massive
a little further East. This corresponds
to the white^d schist, supposed to be schis-
tose grit, in Long Lake.

Still further East the same rock occurs
but it is even more massive than 27635
though its schistosity is still marked.
This strike N. 50° E and dips about
vertically. Certain seams of quartzite
rock appears to be interbedded with the
schist. These may indicate the position
of bedding planes, in which case the
bedding is parallel to the foliation.

Further East the rock becomes very shaly
like a slate, and near the water's edge
it is interbedded with seams of a cherty

127536

SS 27634

SS 27635

27535

127536

SS 27636

127537

SS 27637

27538

27538 26

27638 rock, like pale jasper.

The little island near the S.W. point Sec 18 is a gritty, schistose rock looking more than ever like a schistose conglomerate. Strike about N.E.

27539

sl 27639 West schistose phase

sl 27640 Massing phase. Looks very much like greenstone.

27540

sl 27641 Right gray schists, probably sedimentary from large island off point in S.W. corner Sec 18. It dips to the S.E. at about 65°-70°. At SW end of island the rock is more massive. It is marked

27541

by streaks looking like fence post lines.

sl 27642 This rock dips much lower than the rock to the N.W. Say at an angle of

27543 45°.

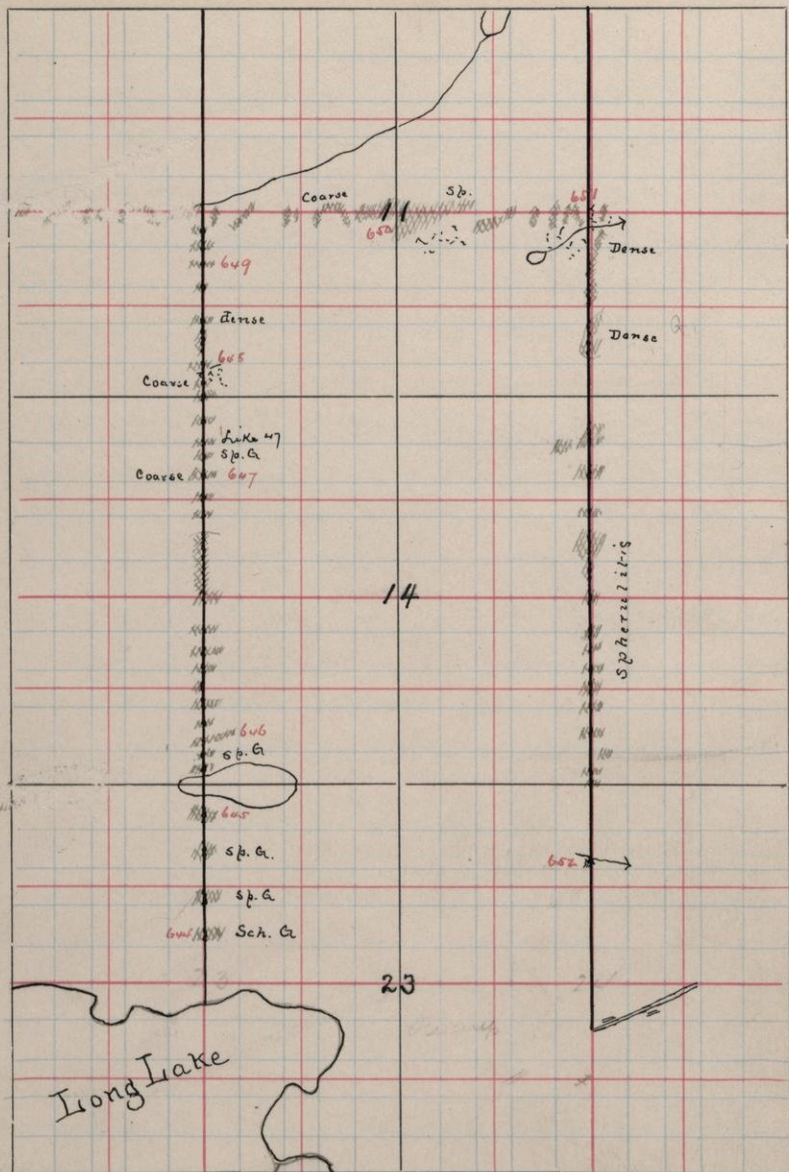
sl 27643 From little island to N. of big island. Probably spherical greenstone.

The little island to the west of the big island is like 27642. Dips 50° S.E.

S.

T. 63

R. 12



Aug 24

Ran north from Long Lake on line between Secs 22 and 23. For two miles, then East one mile and back. On this run saw nothing but greenstone of different varieties until reached end.

It will not be necessary to describe the different ledges. They are plotted on app. page with explanatory notes. The country is very rough and exceedingly rugged. Nearly all the time we were on bare rock and in windfalls.

The first ridge crossed on run north is a fine grained, obscurely schistose, dense greenstone, that looks like a spheroidal rock like that just west. It is cut in all directions by joint planes.

A little further north it becomes coarser. It is schistose - dips to south. The rock is cut by many quartz veins.

At about 1400 ft the spheroidal greenstone is very schistose, the spheroids appearing as lines of lighter colored rock in a darker schist. At one place there is a line of interrupted chert in the rock.

27544
H. 27644

27545
H. 27645

Same rock from mass covered ledge on

South side of Little Lake near N.W. Cor
Sec. 20.

27546

N.W. 27646

Near the N.W. Cor Sec. 20, on the South side of a high cliff is again the dense greenstone

From this point north for a little distance are other ledges of the spheroidal greenstone that possesses no special peculiarities. The spheroids are in bands, composed of several spheroids united together by quartz and by schist, the whole rock being cut by quartz veins.

27547

N.W. 27647

The coarse greenstone met with in the dyke like ridge to the west is first seen at 1600 N. of W. Cor Sec. 14 on the South side of a high ridge. It is cut by quartz veins. A little further north the coarse rock is very spheroidal with large spheroids separated from an abundant groundmass by thin layers of schist.

27548

N.W. 27648

Fine grained, light colored feldspathic greenstone like that South of Little Bear Lake.

27549

N.W. 27649

At about 1700 N. the feldspathic diabase is coarser and of a little different char.

27550
H. 27650

actes from that south.

Medium grained, light colored greenstone from about center Sec. 11. All the rock in the neighborhood is of about this character.

27551
H. 27651

The coarse greenstone like 27547 is again seen near the E. 1/4 post Sec. 11

All the rocks south to Sec. 14

27552
H. 27652

are spheroidal greenstones

At 325 S. of U.E. Cr Sec 23 is a small log of very schistose rock like that in N.W. shore of Falls Lake. Probably fragmental.

Aug 25

Visited little lake north of Falls Lake.

27553
H. 27653

All along the S.W. side are fine grained greenstones, probably of spheroidal variety. These are represented by a specimen from the S.W. end of the lake.

27554
H. 27654

On the middle bay the rock is of the same general character but is more

27555
H. 27655

schistose

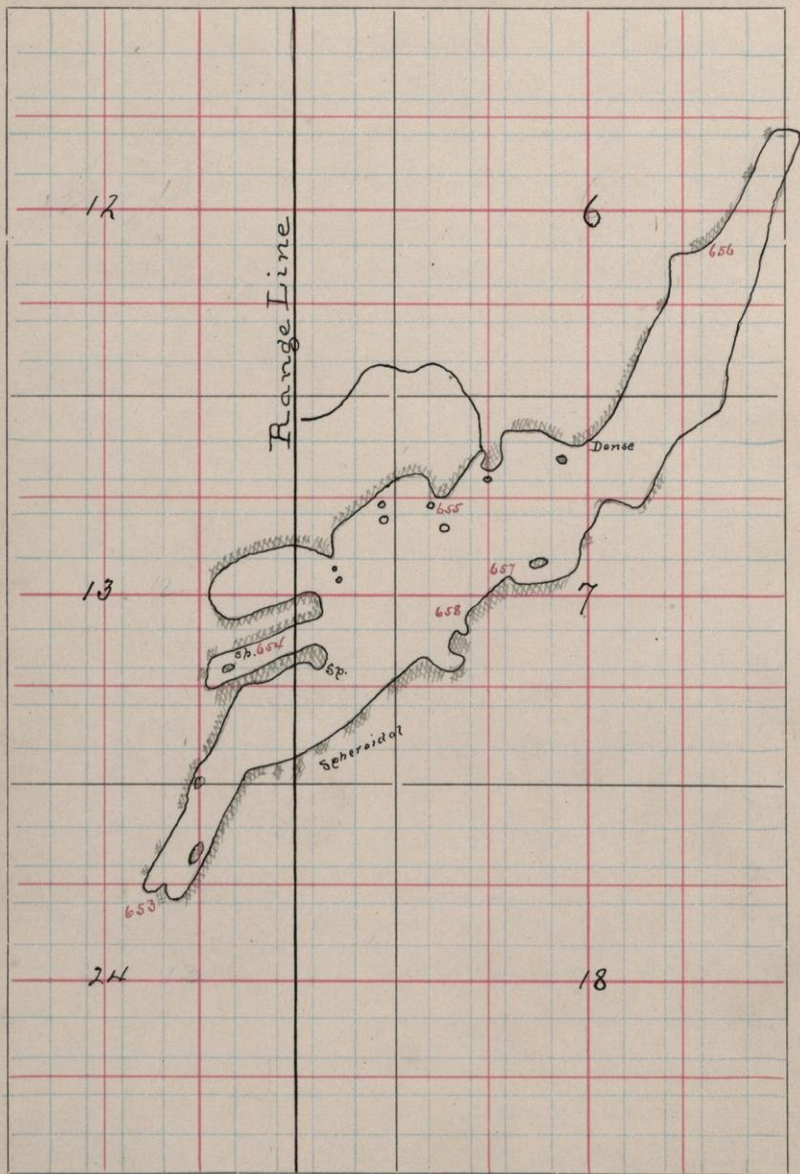
From little island off point near middle of North shore.

All the rock along this shore is practically the same.

7s.

T. 63

R. 11 & 12



27556
H. 27656

Specimen from near N.E. corner of lake.
The little point in South shore a-
bout 400 E of center Dec 7 is a schis-

27557
H. 27657

tine greenstone that has a purple
tinge in the fresh fracture due to
alteration. In places it looks a though
finely amygdaloidal or tuffaceous.

The point East of the little bay in S.W.

27558
H. 27658

Dec 7 is mainly greenstone schist, but
this apparently cuts a banded finely-
greenstone. Its banding is quite dis-
tinct but the ledge is so badly exposed
that could not get strike nor dip.

27559
H. 27659

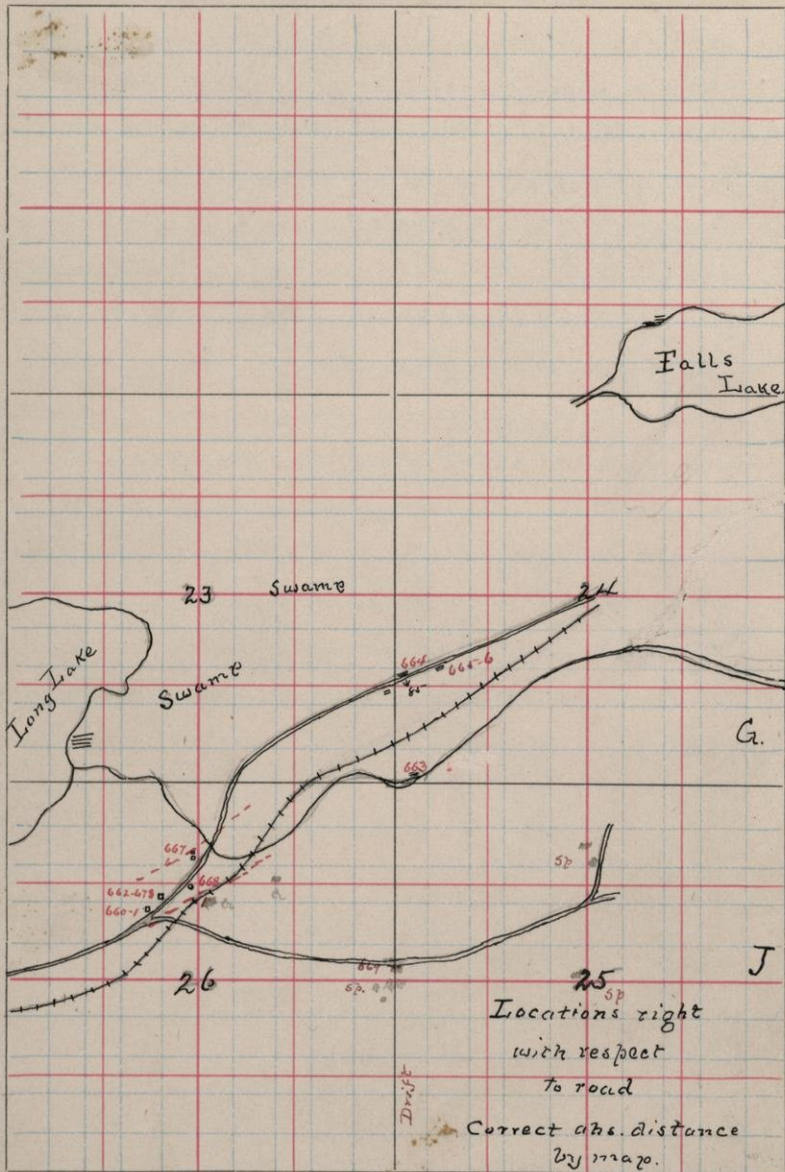
The postage trail from Falls Lake to
little lake is over greenstone, some of
which is moderately coarse.
is from big ridges between the two lakes.

+

S.

T. 63

R. 14 x 12



Aug 26

Examined mines in Sec. 26 and ran
over country in this Sec and Sec 23. No
Sun. blifflines running. Location not
accurate? Locate mine accurately by U.S.
and map.

The Sec 26 Mine Shaft is at 1320 N.
1290 W of S.E. Cor. Sec 26. It is in green-
stone that is dense and schistose. Below
the greenstone is stained with ochre and
below this is the ore. The shaft is 385 ft.
deep and is still in greenstone, though
its bottom is thought to be near the ore. The
ore body is supposed to dip South.

The little shaft at 1435 N. 1220 W of
S.E. Cor Sec 26 is in jasper and ore.

One

Jasper

This ore body is thought to be north
of 667-8.

At 1385 N. 1255 W. is another pit in
jasper

About 75 E of S.W. Cor Sec 24. Very like
27664

27560
N. 27660

4. 27661
27561

10 27562
27662

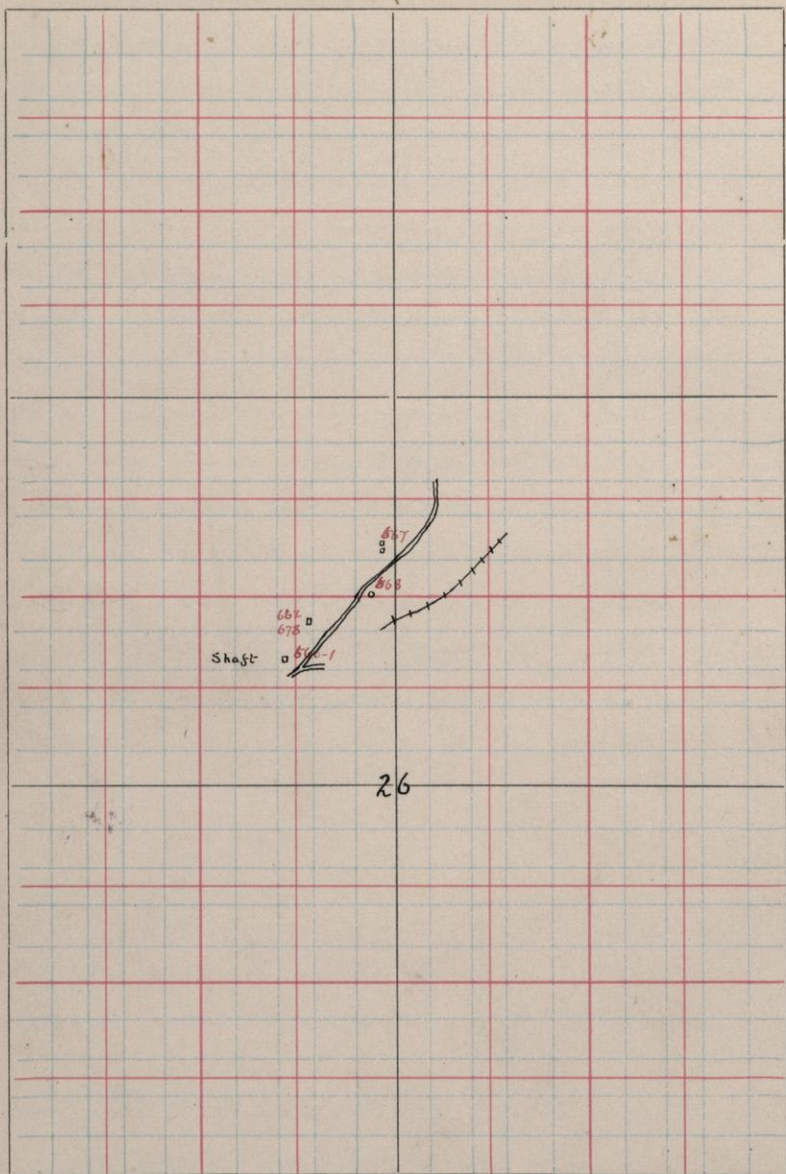
15 27678
27578

SE 27563
27663

S.

T.

R.



SL 27564
27664

Specimen of slate from N side of road
0-30 paces E of E line Sec 23. Strike
about parallel to road. Dip 85° S.

27565
SL 27665

Further E on south side of road is
another exposure of same rock, thin-

SL 27666
27566

bedded with coarser gray rock strike-
ing a triple time north than road
About 200 E of 27664.

27567
SL 27667

From dump heap, west at 1630 N. 1030
W. of D.E. cor Sec 26. White slaty rock
that may be schistose greenstone.

27568
SL 27668

Paint rock from little test pit on
side of road, 60 paces W. 500 N of Center
Sec. 26.

One and Jasper are beneath the paint
rock, all dipping South. Jasper is
to the north

Aug 27

Ran S. in line between Secs. 25 and
26 two and a quarter miles, East 1/2
mile and back broad.

Ledges of greenstone begin on south
side of road 135 N. of quarter post between
25 and 26. These are dense and spherulitic.

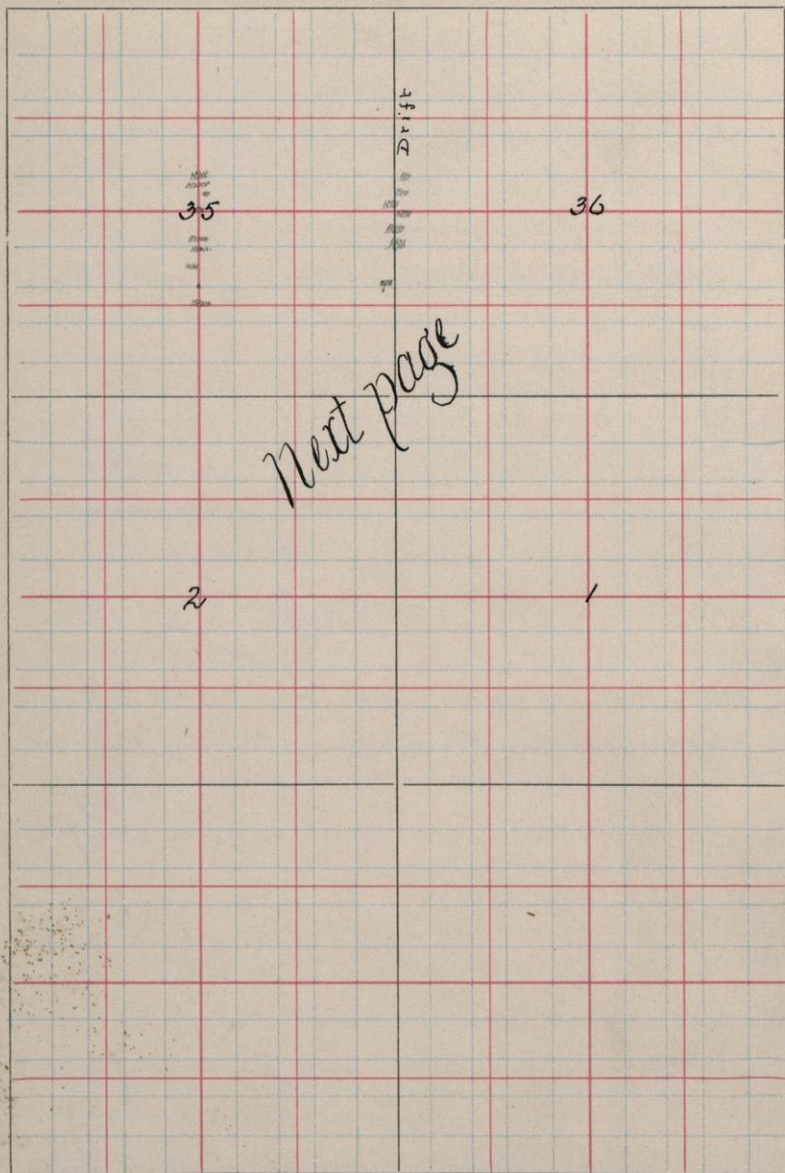
SL 27569
27669

The ledges about the 1/4 post are fine grained

S.

T.

R.



and diabasic, but are without distinct spheroidal structure.

Drift hills are south of these ledges and then occur the greenstone schists in great profusion.

27570
9527670

Green schist from about 800 S. of U.E. Cir Sec. 35.

A few paces beyond this spherulitic greenstone again occur.

18527571
27671

From about 900 S. is a ledge of rock that looks like a gradation between spherulitic greenstone and more usual hornblende schist?

27572
9527672

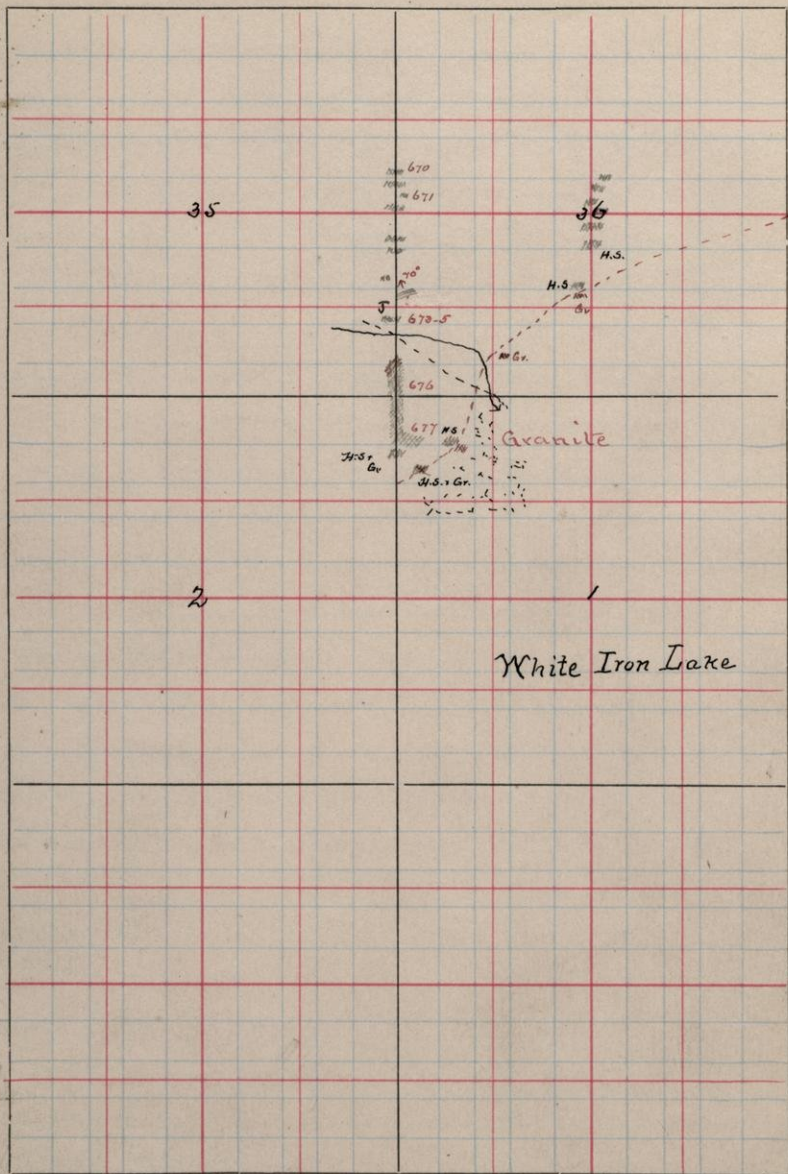
At 1000 S. the rock is more schistose than further north. Its schistosity strikes N. 65° E. and dips 70° N.

At about 1600 S. is a moderately large sized ledge of greenstone schist like the others to the north. On the south side of the ledge is a small exposure of Jasper apparently striking 30° N of E. and dipping N. in a single small fold pitching high to the N.W. The Jasper extends but a short distance N.W. being bounded on both sides by greenstone schist and spherulitic greenstone. The Jasper may be merely

S.

T. $\frac{63}{62}$

R. 12



White Iron Lake

6—747

an inclusion in the gneiss or it may be a very small fold.

27573
1.027673

Banded white? chert and ore

1.027674

Black quartzite? interbanded with the jasper.

1.027575

1.027675

More typical jasper.

9.927576
27676

Near I.E. Cor Sec 30. More schistose gneiss than any heretofore collected in this run. It is clearly one of the amphibole schists though it is cut by two granite veins.

27577
MS27677

Another specimen of same kind of rock from about 120 S. 75 E of NW Cor Sec 1. T. 62 R. 12.

The new rock was a repetition in reverse order of that South.

It is noticeable that the white iron granite does not at this place intrude the greenish schist, though it does intrude the blue schist - that occurs in its periphery. These latter schists do not occupy as wide a belt as they do around the First Lake is no known granite? This may be due to the fact that there has been little intruding

active.

27578

1. J. 27678

Jasper from pit, East of Shaft of
mine in Sec 26. T. 63 R. 12.

Aug 28-29

Made a short run between Falls
Lake and Lake to the north, beginning
at point where range line crosses
shore line. From this point went north
to sec line, East 500, South 1000. Then
went north on East line Sec. 18 to 1600
N of S.E. cor Sec 4. West 400, S. 600, west
400, S blake.

For the first 300 paces north in the
range line found fine grained green
stones, not noticeably spherulitic, but
evidently belonging with spherulitic series.

27579

N. 27679

27580

N. 27680

At 200 S of the W. line Sec 18 is a large
ledge of dense spherulitic greenstone,

cut by a dyke of the coarse variety.

At the contact of the two there are seams
of cherty quartz that look something like
jasper. The strike of the contact, which may
be the strike of two beds is N 50° E.

A little further north are red jasper

seams in the greenstone. These seams are
 from a fine inches wide and are folded
 most intricately. One seam was noted that
 turns on itself so sharply, that its
 opposite ends are only one foot dis-
 tant from each other.

27561

I.D. 27681

Jasper from 75 S of N¹/₂ Sec 18.

27582

H. 27682

At 100-200 ft of ¹/₄ post are ledges of
 dense greenstone and others of the
 coarser variety-like 27650

27583

H. 27683

Coarse grained greenstone 800 E. 200

27584

S of N. W cor Sec 18

H. 27684

Greenstone 800 W of center Sec 18.

Aug 30

Went East along shore from west side
 Sec 17 to big island in Sec 10. Worked

27585

ing in afternoon. Morning rain!

H. 27685

Barrier rock of Little Falls. 500 N of E.

27586

line Sec 18.

H. 27686

Point jutting from east side of Green
 Bay into which stream empties.

27587

H. 27687

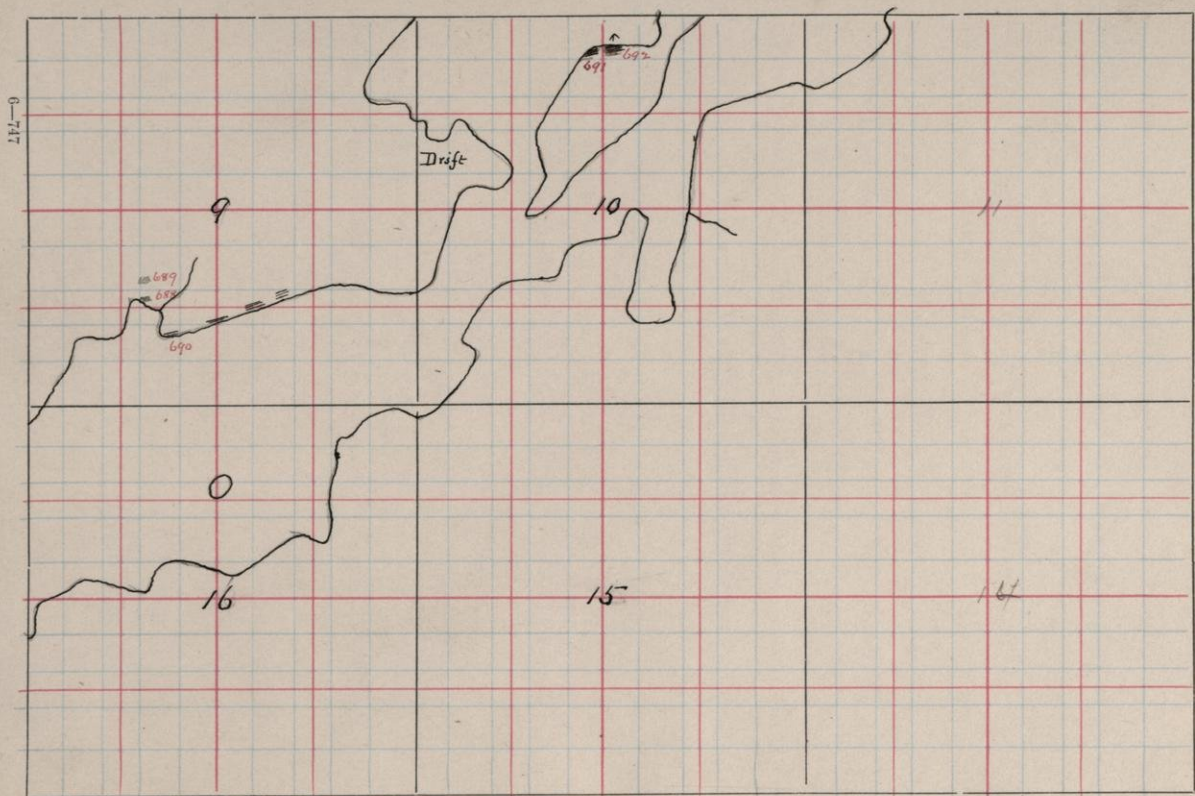
None massive and harder phase, prob-
 ably silicified, of same rock.

This rock looks very much like the

S.

T. 63

R. 11



white & schist Thung Lake. It is prob-
ably a fragmental rock.

27588

S.S. 27688

is from little bay on SW $\frac{1}{4}$ Sec 9. From high
bluff of white & schist near shore. The rock
is crumpled as is usually the case, with
a general dip high to the South.

27589

S.S. 27689

Green schist from about 150 paces
E of 27688. The white rock white-rock
in places looks as though it might
be pure of the greenstone, in other
places as though fragmental. Am
inclined to the belief that it is a green-
stone.

The green rock is amygdaloidal, the
most amygdaloidal parts being more
schistose than those that are less amy-
gdaloidal.

27590

sl 27690

Graywacke or slate, on point, East
side of this bay. The strike is about par-
allel to shore line.

27591

sl 27691

Green-schistose rock, from South
side of bay on island in Sec 10.

sl 27692

27592

The schistosity-dips high to the North.
The rock is jointed by open cracks
inclined at very high angle to schistosity.
Prob. same rock as 27689.

Sept 1.

Ran out from Falls lake in line
between Secs 19 and 24 (range line)
as far as 1/2 post between Secs 31 and 36
then East 1/2 mile and back.

No rocks were seen between the lake
and the river. Except the following:

- 27593 At 1100. 80° E of N.W. Cor. Sec 19 is a ledge
of white schist in side of hill. Strike of
schist is 1/2° N. 40° E. Dip 85° S.

From this point we coasted along S.
side of lake to mouth of Kaurishivi
river, then continued on.

- 27594 Jointed green schist from shore of lake
about 1000 W. of E line Sec 19 in Little
Bay.

The point north of this is composed of same
rock, which however is not quite so
schistose.

- 27595 Beaded greenstone. Fine grained, dense
variety - from point at west side Little
bay at E. section line Sec 19.

The rock appears heavily beaded with
the beds dipping S.W. at 50°.

- 27596 Green schist: From high bluffs just
west of mouth of river.

[See page 28 for Map]

S.

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

R. 11

Pipestone Rapids
Shulls

27

Newton Lake

Rapids

34

35

3

2

This map is taken from town
 26 plat's. They are plainly
 wrong. Corrections
 should be made with reference
 to
 Muldrow's map, which is correct.

All the ledges between the river and the river and the D.E. Cr. Sec 25 are of dense green schist, until the top of the hill near corner is reached, where the rock is so fissile that I suspect it to be a fragment. It strikes $N. 40^{\circ} E$ and dips vertical.

From 400-400 ft of the U.W. Cr. Sec 30 are great boulders of green schist partly banded. These are not in place but ledges of the same rock can be seen to the east. From one of these so large and angular that I suspect ledge immediately beneath.

At 1275 U. 100 W of D.E. Cr. Sec 25, on top of a very rough hill is a beautiful exposure of Jasper and one, more contorted than any rock thus far seen. There is no generally prevailing dip and strike to the beds. Their axes point in all directions and dip at all angles.

The general trend of the ledge is $N. 40^{\circ} E$. Specimens of the Jasper.

Larger and more abundant exposures of the Jasper constitute bluffs on the north side of the White-Brown road for a distance of 400 paces west of quarter post between Secs 25 and 30. This jas-

27597

H.S.

27697

27598

H.S. 27698

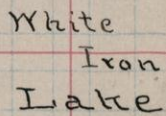
27599

H.S. 27699

S.

T. 63

R. 12-11



[For 28001 to 28012 see pages 11-13. Book 197]

per strikes about N. 40° E. and dips at 45°-60° to the north. The exposures are excellent. At the base of the hill openings for one have been made, but they do not seem to have yielded much ore.

Between the N.W. corner of Sec 36 and the E 1/4 post four sections are several small thin covered ledges of green-schist and of horn-blende-schist. These horn-blende-schist-near the 1/4 post are cut by granite veins of small size.

27600
M.
28015

On return trip no rocks were seen until reached point 1500 W. 560 N. of S.E. cor Sec 31. There is a ledge of green-stone not unlike others.

Sept 2.

Visited ledges on west side of mouth of Kawishiwi River, then portaged over into Garden Lake and made trip into White river and back.

M.
27601
28016

1st ledge from mouth of river on its west side. It is a gashed and jointed greenstone.

✓
28017

27602

for 28018

27603

27603

27604

28019

27605

1.5 28020

27606

28021

27607

28022

27608

28023

28024

27609

Beyond this a few paces is another ledge of greenstone not unlike last one.

It is associated with a red rock, and cut by dykes of this rock, which was taken for granite? More careful observation seems to indicate that the red rock is an altered greenstone just below the outlet of Garden Lake

on the East side of the river is a large ledge of greenstone, west of which is a well banded jasper bed only 10 ft. wide and striking N.E. and dipping 70° N. South of this and separated from it by a space of 30 paces is another greenstone ledge 30 paces wide.

The jasper appears to be interfused between greenstone. The rocks are exposed on the edge of the water only, being covered inland by drift hills.

The west bay of Garden Lake is surrounded by dense, jointed greenstones like specimen of raw extremely flaky

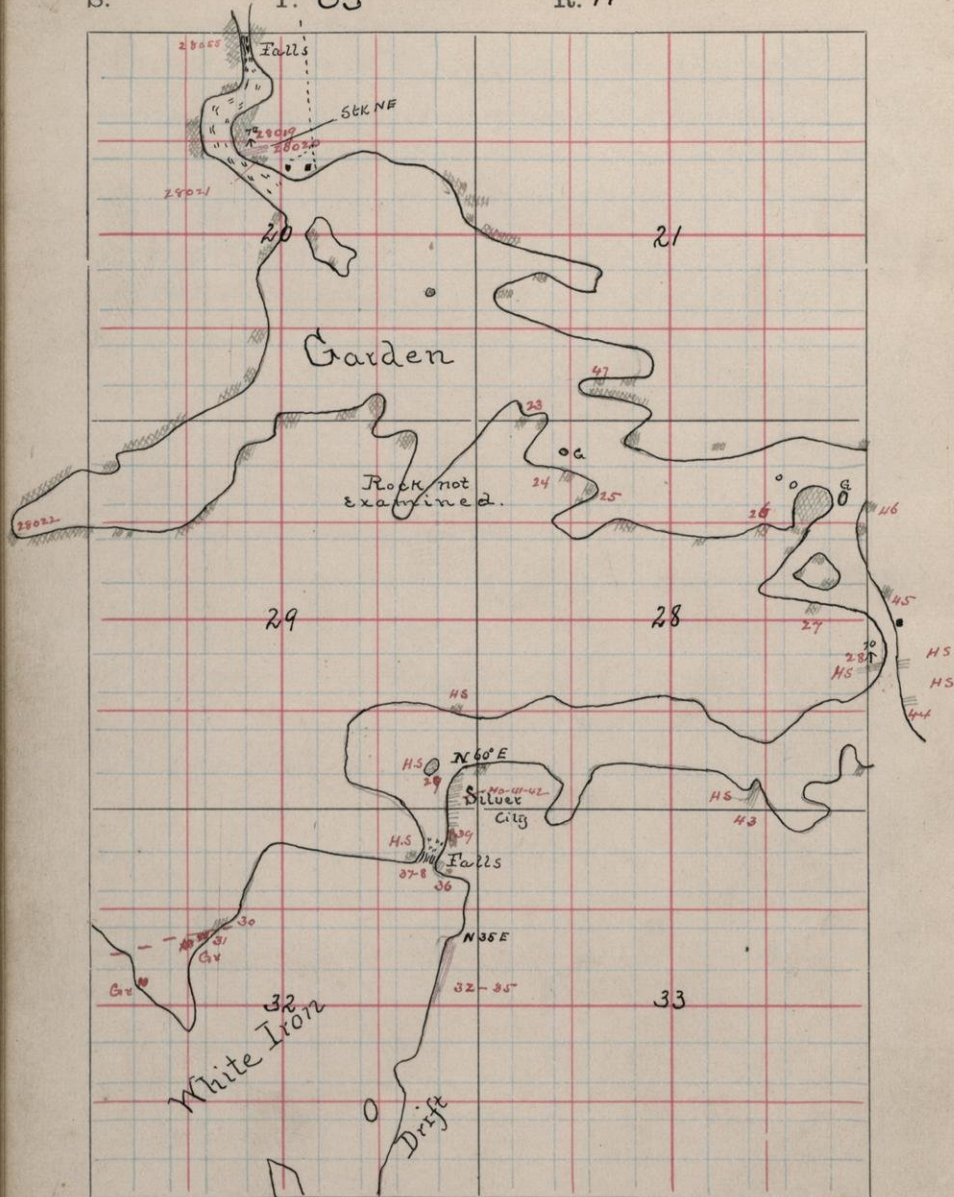
The south shore of the lake is likewise of greenstone. Specimens were taken from near Cor. 29, 28, 20 & 21.

from shore opposite timber island in

S.

T. 63

R. 11



UW $\frac{1}{4}$ Dec 28

H²⁷⁶¹⁰
28026

from and of point, west side of bay in
UW $\frac{1}{4}$ Dec 28.

H²⁷⁶¹¹
28026

from near center U.E. $\frac{1}{4}$ Dec 28

The west side of the river from Farow
Lake into Garden shows several ledges
of greenstone and hornblende schist in
which it is believed a transition is
noticeable.

H²⁷⁶¹²
28027

is greenstone-schist from near E.W.
 $\frac{1}{4}$ line of Dec 28.

H²⁷⁶¹³
28028

is a distinct hornblende schist with
a dip of about 40° N.W.

M²⁷⁶¹⁴
28029

from East end little island off foot
of White-Iron rapids.

On the west bank of White river lake
the rock is ^a jointed and gashed hornblende
schist cut by granite dykes, and just
beyond this, practically connected with
it is a large ledge of light colored gran-
ite.

M²⁷⁶¹⁵
28030

Hornblende schist from this place.
Granite.

M²⁷⁶¹⁶
28031

On the East side of the lake near its-

outlet are several ledges of a white chert or quartzite rock extending in all about 200 paces along the shore. The rock strikes N. 35° E and dips practically vertically. It seems certain from a consideration of the ledges that the rocks belong to the iron formation, although they are dark like Kumbundu schists. The relations of the rocks to the schists and the granite are hidden by drift.

27617

28032

27618

28033

27619

28034

27620

28035

Phases of the chert. The beds are cut by joints striking W. 20° N.

On the point at the mouth of White Deer outlet are large exposures of rock that may show some light in the chert to the south.

27621

W 28036

is apparently a granite of the character of the rock so frequently found as dykes in the Kumbundu schists.

H. 27622

28037

is a dense greenstone into which 28036 is intruding.

27623

H. 28038

is a banded Kumbundu rock into which 28037 grades. It looks as though

it might give rise to 28032-35 by
silicification.

27621 The beaded rock last met with some-
#65 28039 times below the falls and outcrops
again below the rapids. Here it looks
like a silicified hornblende schist.
Strike of beds apparently N. 25° E.
Further north the bedding is more
distinct, striking N. 60° E.

The rocks are certainly beaded.

Least siliceous phase.

Most siliceous phase

Quartzite phase.

Openings for ore have been made
at several places in these rocks but
there is no evidence that anything was
ever obtained from them. The location
to know as Silver City.

Upon returning followed south and
East shores.

27628 Hornblende schist from 500 W of U.E.
#65 28043 Cr. Sec 33.

27629 Hornblende schist. SW. 1/4, Sec 27.
#65 28044

At the camp on the East side of the river
27630 near the E 1/2 post Sec 28 the greenstone
#65 28045 is a partly schistose coarse green varie-

ty. To the south of the ledge it is so schistose as to look exactly like a hornblende schist.

H. 27631
28046

Greenstone. South side Little Bay in S.W. 1/4 Sec 27.

H. 27632
28047

Greenstone schist. South side Little Bay in S.W. 1/4 Sec 21.

An abundance of specimens was taken here in order to give opportunity for studying the greenstone schist carefully, with the aim of discovering whether or not they pass into hornblende schist.

Sept 3.

E 1/2 Secs 18 & 7. T. 63 R. 11.

[For map see page 39]

H. 27638
28048

Nothing but greenstone.

Fine grained greenstone. 250 ft. E of E 1/4 Sec 7. T. 63 R. 11. Small ledge in Swamp.

H. 27639
28049

Coarse greenstone, presumably younger than fine grained, which it intrudes from 200 ft. E of E 1/4 Sec 7.

At 1600 ft. ¹⁸⁴ of Sec 7 the greenstone is evidently a flow rock with amygdala.

coral phases in places. Through it runs a very continued band of Jasper varying in width from a few inches to about 2 ft. It runs irregularly and bends in itself, seemingly being squeezed into a line by rolling pitching East. Whether this is an inclusion in the greenstone, or a thin bed between thicker beds of the eruptive rock, cannot say.

27685

1528050

27686

28051

jasper

Amygdaloidal greenstone.

At 125 N. 300 W of 6 1/4 Sec 7 is a spherulitic greenstone containing nodules and stringers of a white chert, like 28050. These look very much like beds that have been pinched.

37687

28052

At 100 N the nodules are rounded like lithophyres or like pebbles.

27688

28053

There is a splendid exhibition of the spats at this place. The rock is spheroidal, and around the spheroids are rows of small spats like amygdaloides. There are also rows of spats of iron or fine deep running in lines which appears like at the contacts of two beds. Judging by this the bed

are folded closely in troughs pitching East. A brown weathering greenstone is seen in the contact with the spale. This appears like little than the Amygdaloids for its apparently cuts them - though the appearance of intrusion may be deceiving. The brown rock being closely interfolded with the others.

g. 27639

28054 At 500 N. 800 W of the Cr T is a small thinn of dark, coarse rock containing large crystals of feldspar. These are all drawn out in a direction striking N 70° E in such a way as to produce the effect of fibrous structure. Dip of planes of elongated xls is variable. This may be the equivalent of the coarse grained rock to the East.

Kawishiw River

Dense greenstones line the west side of the Kawishiw from the shore of Falls Lake to Garden Lake. The rock is similar throughout, no Jasper occurring in this side as the extension of that in the East side.

The rock is everywhere jointed and abraded spheroidal, and is in one place cut by a red weathering rock like that occurring in the greenstone near the mouth of the river.

g. 27640

28055 At this place it is unquestionably the greenstone.

g. 27641

28056 Another specimen of the red weathering rock near mouth of river, for comparison with 28055

