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Cacaquabic Lake: [specimens] 7069-7124. No. 19 1884-09

Chauvenet, W. M.
[s.l.]: [s.n.], 1884-09

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U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

9-891

No. 19
September 1884

Cacagnabic Lake

H. M. Chauvenet

7069-7124

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

INSTRUCTIONS.

1. Ordinarily at least two pages of this book will be devoted to one section. On the left hand page place a map of as much of the section as has *actually been seen*. Denote rivers, lakes, marshes, etc., by the usual topographical signs. Denote the ledges of rock, when no structure is made out, by cross-hatching, making the cross-hatching cover as nearly as possible the areas occupied by the exposures. If the rock is a massive one, but still more or less plainly bedded, use the same sign with a dip arrow and figure attached, showing the amount and inclination of the dip. Denote slaty or other very plainly bedded rocks by lines running in the direction of the strike, with figures and a dip arrow attached as before. In all cases where there is the least doubt about the true bedding directions, indicate it by a query. To each exposure on the face of the map attach the number of the specimen representing it. In mapping the section count each of the spaces between the blue line as 100 paces, and twenty of these spaces as one mile, or 2,000 paces. Usually the southeast corner will be placed at the bottom of the page, or at the first black line above the bottom of the page, and at the right hand side. If, however, for any reason, it is desirable to show portions of an adjoining section, the southeast corner may be shifted up, or the map may be turned around and the north placed at the left hand side of the page.

2. On the right hand page place the notes descriptive of the exposures. Begin in each case with the number of the specimen, placing the number on the left hand side of the red line, after which give in order on the right of the same red line the position of the ledges as reckoned in paces from the southeast corner of the section, and the dip and strike when observable, for instance: 4025 | 250 N., 300 W., Strike, N. 6° E., Dip, 50° E. Then follow with as full a description of the ledge as possible.

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

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

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

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

#19

No. 2. (1884)

T. 65 N - R. 7 W,

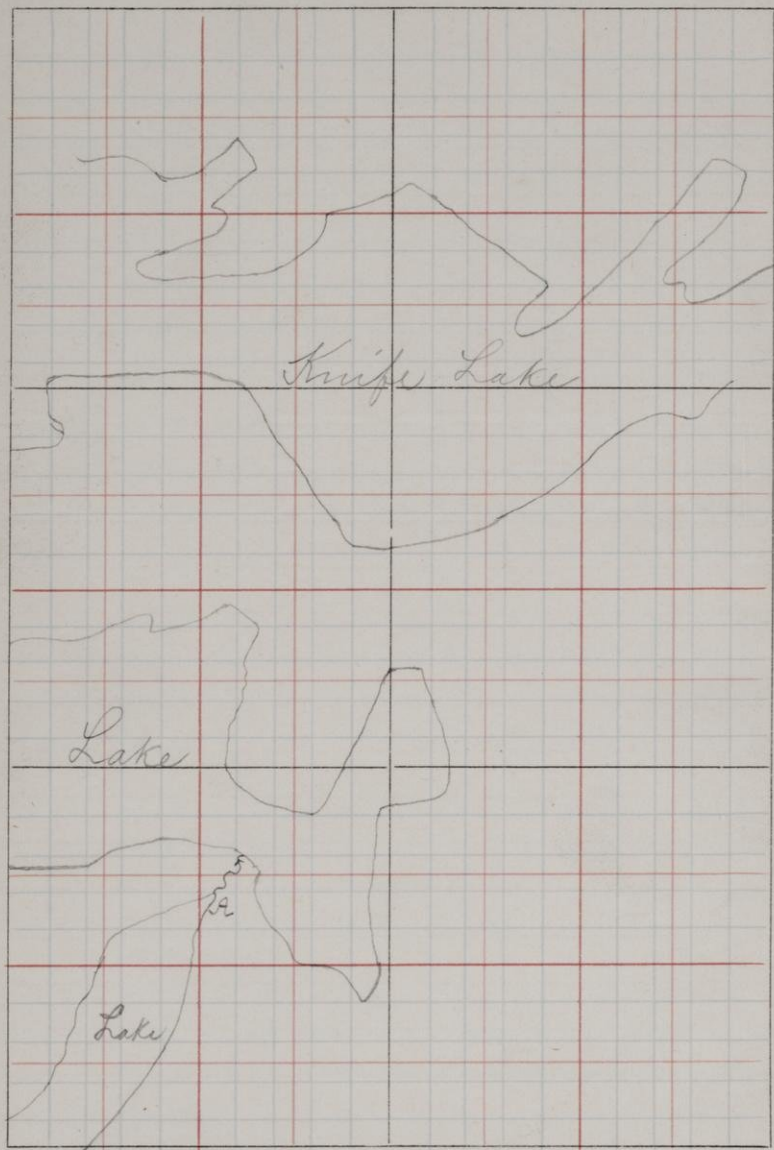
Cacaguabic Lake

to T 63 - R. 7 W,

Sept. 1884.

Sec 21 T. 65

R. 6 W.



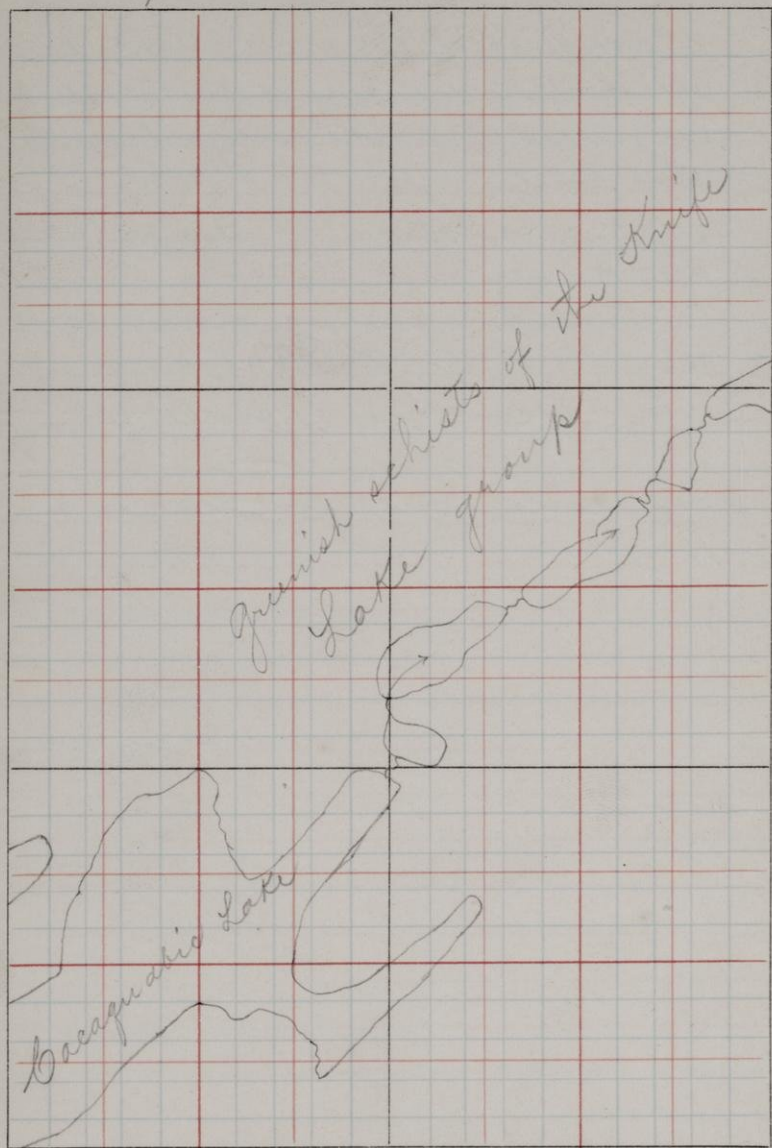
7069

In going from Ogishkemuncie to
Bacaguanabii there are eight portages
all short. There are seven lakes and
exposures of rock everywhere on
the route

7069 was taken in Sec 21. T65-6N
at (A) see map opposite merely
to show the jointing many such
samples of the Knife Lake group
were taken last year (1883)

Sec 29 T. 65

R. 67h.

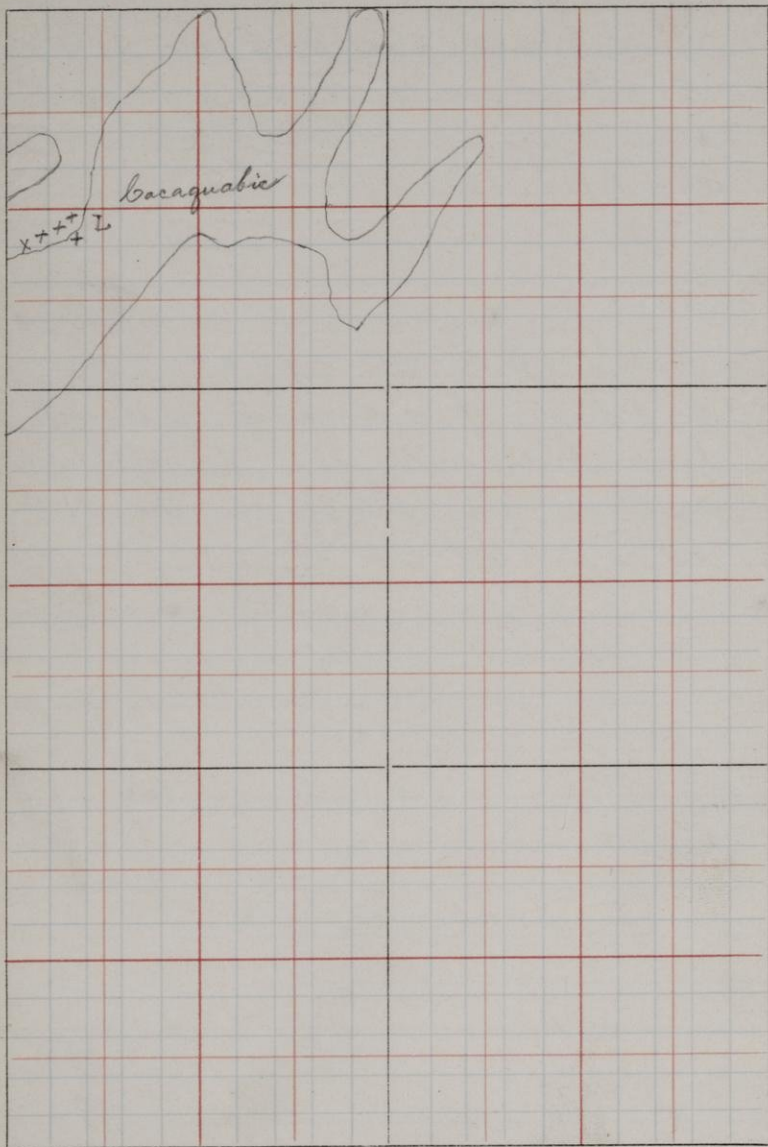


Throughout the N.E. $\frac{1}{4}$ and the center and S.W. $\frac{1}{4}$ of Sec 29 T65 R. 6 W. run the so slaty schists seen upon the Knife Lake portage sampled (1883) Book #2.

7070 Taken at B. sec. 29-65-6 W.
a schist of ordinary greenish kind but with the pinkish cast seen in the schists further N.E. as in T64-4 W.

Dec 32 T. 65

R. 6 W.



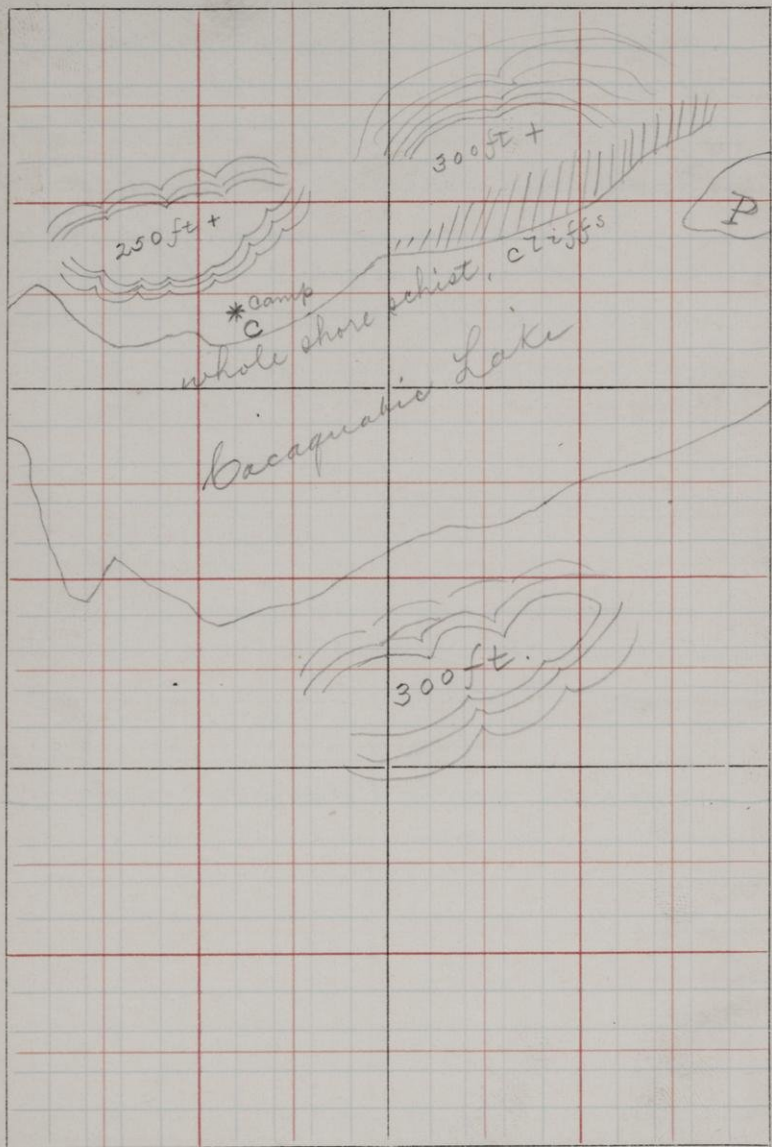
7071

This is a porphyritic rock quite distinct from anything heretofore seen in the region. It rises in a steep wall at T. sec. 32-65-67N. (map opposite)

It occurs again at the range line between R's 6 & 7 N. close to water on N. shore of Lake and in many other places as will be seen.

Sec 31 T. 65

R. 6 N.



7072 Upon entering Sec. 31 and going west on Cacaguabic lake the highest hills seen in this region rise on either side of the lake from 200 to 350 ft.

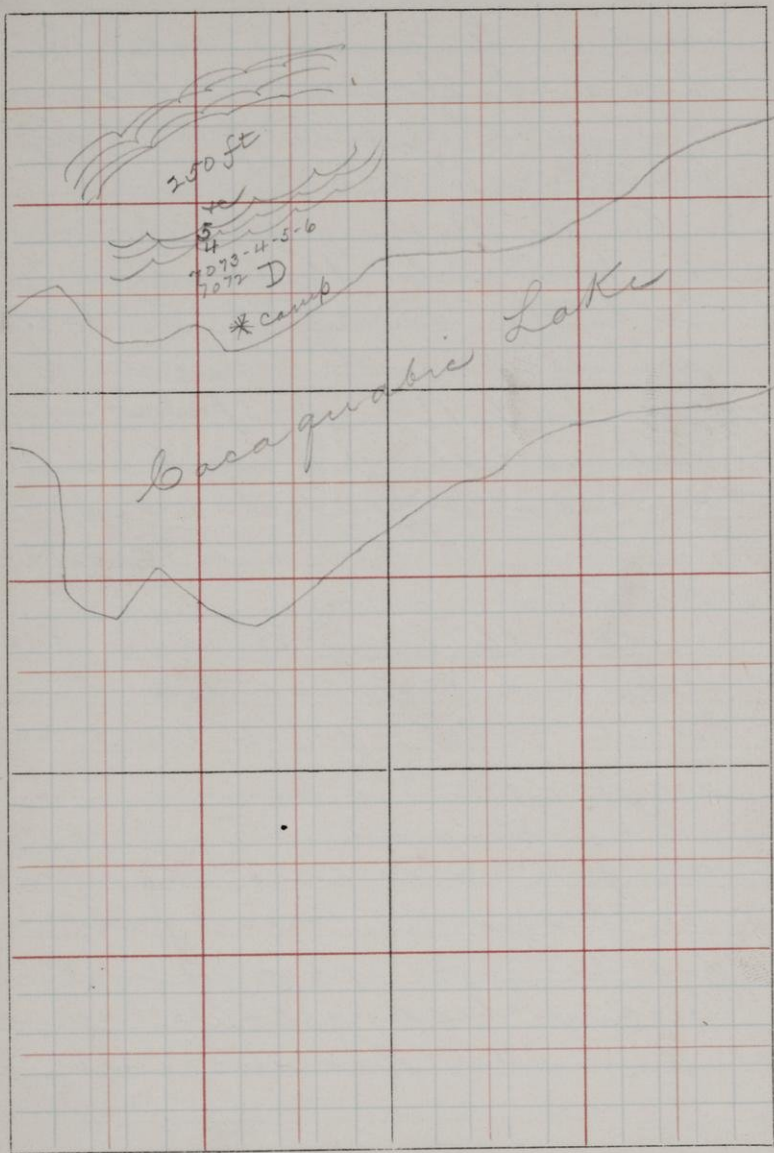
On the N. shore after passing the peninsula "P." which is to be further examined the hills are covered with a magnificent growth of Norway ~~Pines~~, white cedars and ash trees of huge dimensions beneath which the country is open and easy to travel over.

At "C" on the N. shore of the lake both high and low the series 7072-3-4-5-6 were taken as follows,

The hill immediately back of camp "C" was ascended. Here the ledges rise nearly vertically and the rocks appeared without distinct bedding, yet having some order of occurrence.

Sec 31 T. 65

R. 6 N,



- 7072 This forms the lower masses at "D" all along the shore and is fifty or sixty feet thick and perhaps much more. It is a green subcrystalline exceedingly tough rock, but appears like a green sandstone in place. It is finely but distinctly banded, cleaving most readily along the bands but these bands have no constant strike though always the beds forming them are upright.
7073. - is immediately above 7072, forming a shelf some feet wide and two or three high. It is a distinctly crystalline greenish rock, weathering in green and red, having a conglomerate appearance in places where the red granitic grains are scattered thickly.
- 7074 Rises prominently forming masses in 7075. It is a very dark green rock with no apparent crystallization.
- 7075 Forms the great mass of these hills, on the N. shore always.

Sec 31 T. 65

R. 62k.

Reheat Map

occupying the crowns

It weathers a pale green showing a speckled appearance due to the weathering out of softer crystals. It is thus readily detected. Its colors on weathered surfaces are very variable running through many shades of green and taking brilliant reds and purples where the granite inclusions, veins and seams are exposed.

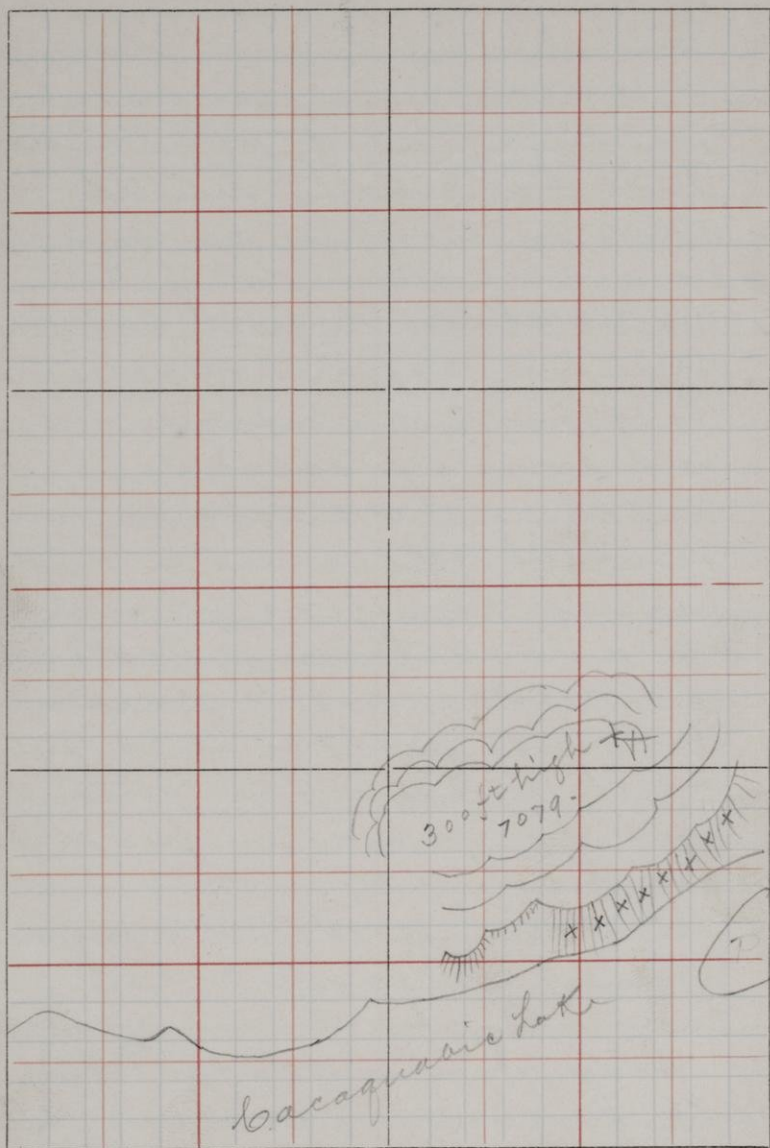
rendering the surfaces very beautiful. It occurs in rude masses, having no form and no distinct bedding, strike or dip, breaking in all directions but most readily along layers which are sometimes distinctly and always more or less schistose in structure.

7076 is a variety of 7075 showing a common red granite matter accounting for the red weathering.

7077) Other varieties of 7075 Taken
7078) at (from and in its area immediately back of camp at "C"

Sec 30 T. 65

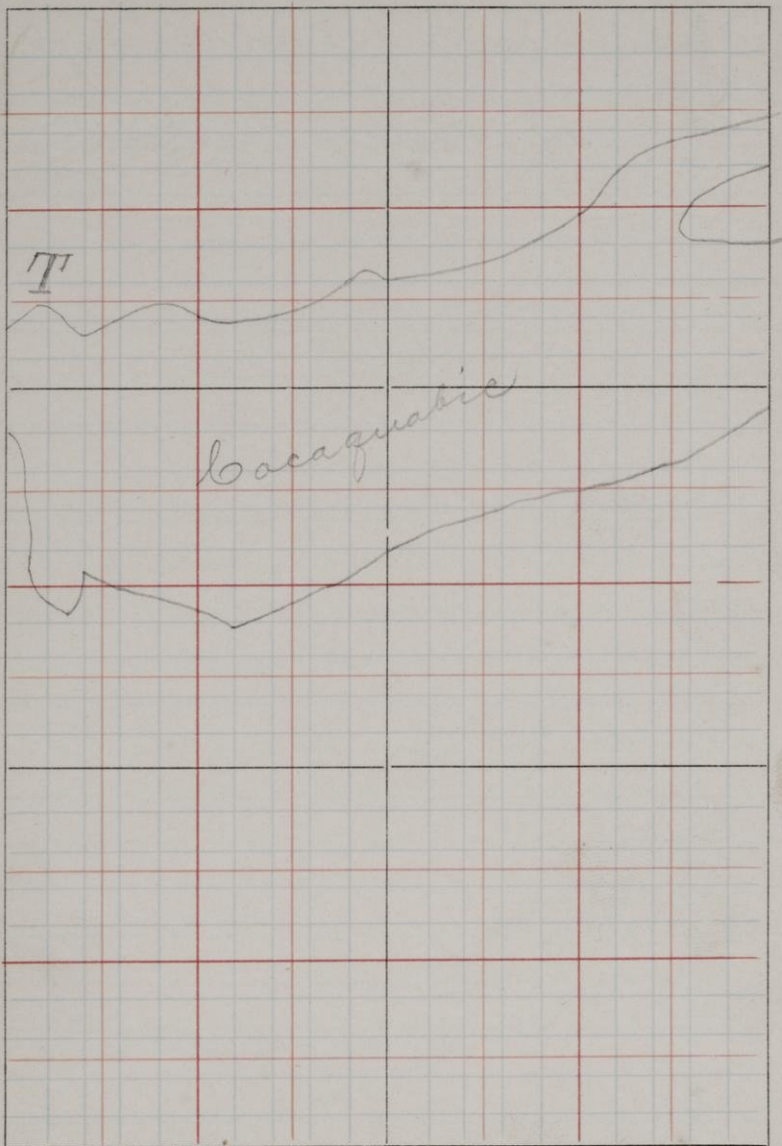
R. 6 N.



7079 Was from the top of the high
mountain in Sec 30-65-6 N.
(N shore of the lake) and is the
common schist of the region

Sec 31 T. 65

R. 624.



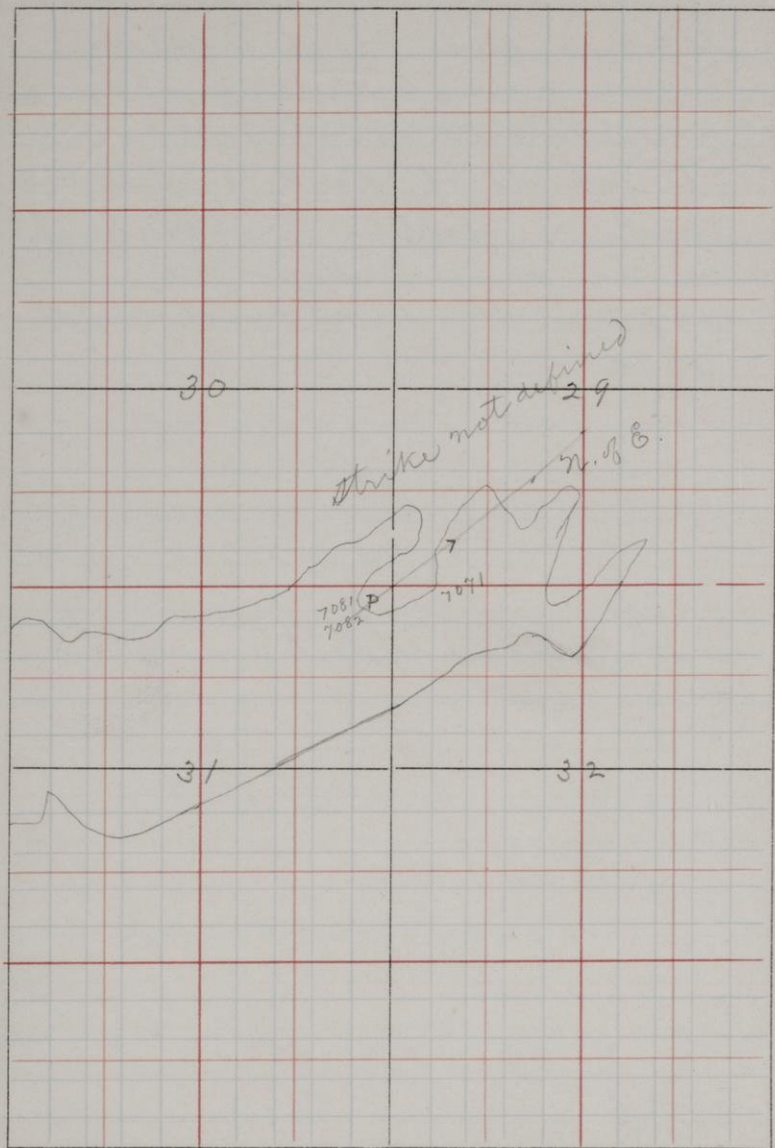
7080 From T' opposite map. Taken to show some black crystals causing conglomeratic appearance on weathered surfaces

A schist of dark green color with crystalline mass right on the same ridge as 7072-3-4-5-6 & on level with 7078.

Rain Sept 1st

Sec {29-30} T.
 {31-32}

R.



Macaquatic lake continued

The map opposite shows a peninsula in four sections Secs 29-30-31-32. T 65-67.

P sample 7071 is from this peninsula.

Here a good exposure both of the porphyritic and of a softer rock is seen.

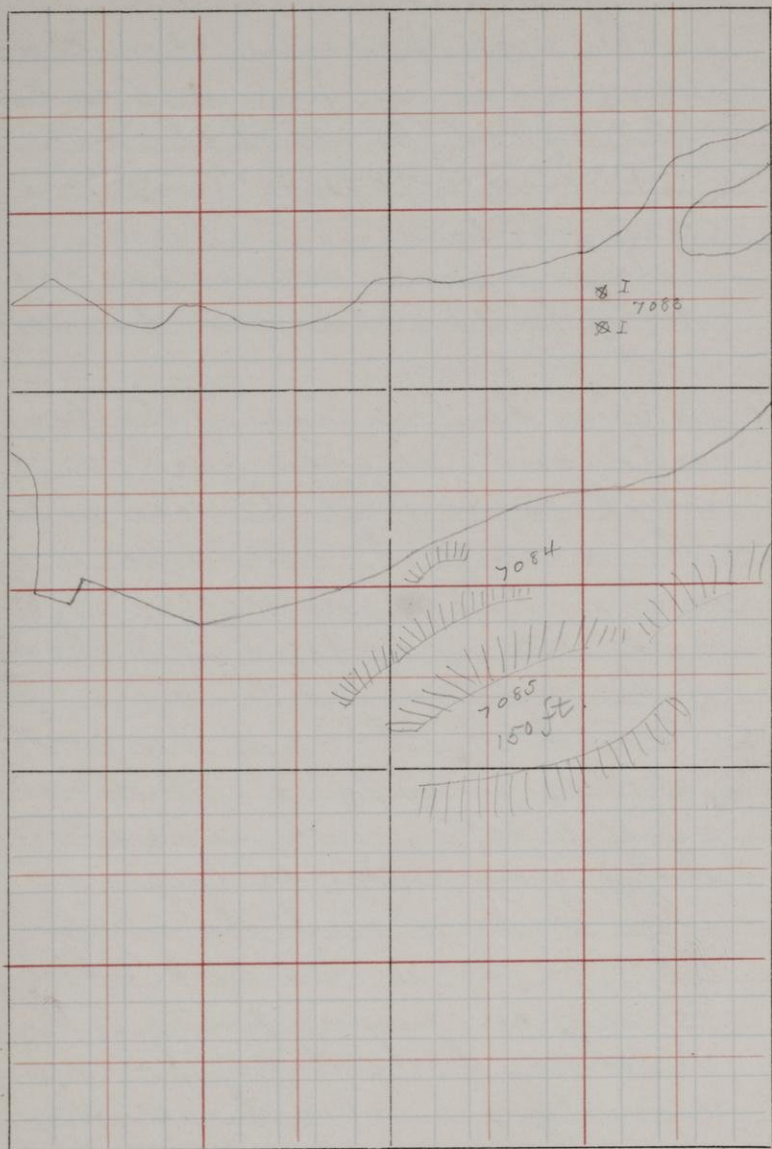
7081 Is from the bay side of the peninsula and is redder than 7071, which comes from the lake side.

The neck of the peninsula is low and no direct connection of the rocks of the mainland and those of the point could be seen.

7082 Through the body of the rock 7081, apparently as a bed in it runs a soft much decomposed shaly gray rock, in layers on edge striking with the arrow N. of E. It is this rock which occurs in many parts of the N. shore of the lake that upon crumbling makes the sticky clay bitious in places

Sec 31 T. 65

R. 6 N.



It has many phases and will be described as the rocks of the whole lake are located. It is seen on both sides of the peninsula.

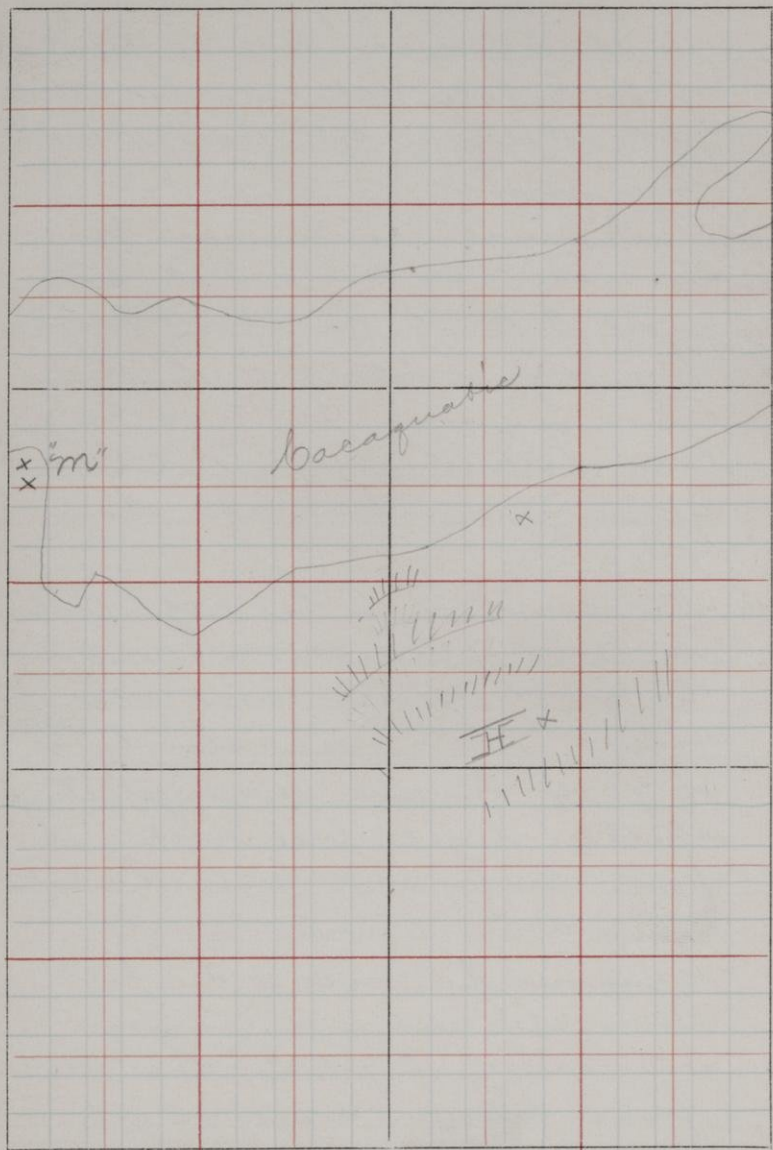
7083. Two small rocks rise from the water in Sec 31. T 65-6th just S. W. of the above peninsula they form a dike that strikes seen for some 50 ft on the lake bottom about N. + S. a dense greenish rock shown in 7083.

7084. Crossing S. to the high hill in S. E. $\frac{1}{4}$ Sec 31. (map opposite) the whole shore line which rise at first rises slowly is of 7084. This rock is a crystalline speckled light colored rock and forms ledges 40 ft above the lake coming down to water level.

7085 Composes the mass of the hill above 7084. and is a common slaty variety of schist. The relations of one layer or mass, or group to another are difficult to make out anywhere on Lacognatic

Sec 31 T. 65

R. 6 W



because there is no bedding and no readings of direction are possible

7086 Is another variety of slate like rock found with 7085 on the hill at H - the two are rudely mixed.

7087 At M. opposite map. just where the range line crosses the lake from N. to S. the conglomerate appears on the shore

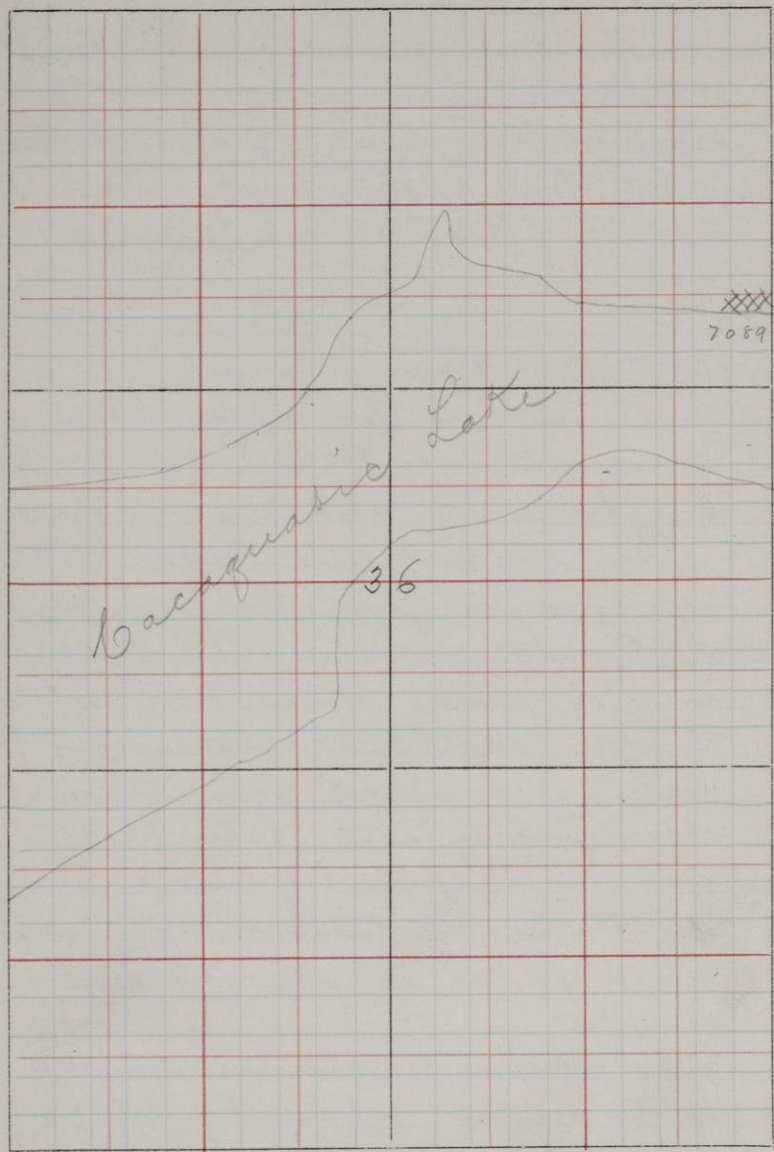
The rock differs little in appearance from the conglomerate of Ogishkeuncie. The pebbles are of many kinds but not so thickly scattered. Jasper pebbles are very common, granite ones clear quartz and slate pebbles.

This was specially the case on weathered surfaces though repeated efforts failed to get satisfactory samples.

7087 shows the usual fracture of the mass where the ledges rise boldly in huge blocks.

Sec 36 T. 65

R. 7th



7089-80

7088 shows the weathered surfaces. the protruding pebbles are thus seen in many places on the wall. larger masses show some Jasper blotches six inches across. Quartz pebbles were seen as large also.

7089 Where the range line between T65-6N. and T65-7N. touches the N. shore of the lake a very peculiar variety of the soft gray clay making rock is seen again associated with 7081 and having the same relation to it i-e. It is in it as a vein or bed. 7089 is a nodular clay weathering so as to leave its nodules protruding like marbles from the mass.

7090 The pebbles are shown in 7090 they were knocked out of the rock with the hammer and were scattered 2-3-4 inches apart. They seem to be portions of the rock of the matrix rolled and rounded and then bedded rather than concretions.

The condition of this rock seems to depend upon its exposure for at times it is crumbling at others very solid and tough. but always cutting readily with the knife so that the indians make pipes of it.

7091 The cliff back of the shore rocks rises abruptly and shows a surface blotched with a pebbly like appearance showing a dark green dense crystalline mass upon fracture

7092 Was here taken to show the surface appearance the pink spotting being weather surface, like 7094.

Sec 36 T. 65

R. 72W.



7093. At the point c and also on three islands c-i-c the nodular rock is prominent.

Striking N. 40° - 45° E. and on edge as heretofore the rock on islands is very hard and is shown in 7093.

The highest hill on the lake is at "T" N. W. $\frac{1}{4}$ Sec 36-65-7th. The ascent was made from A where the country is burnt and fallen. The barometer marked 1100 ft at lake level and 1350 on crown at "T"

7094. At height of 175 ft. (F) a green conglomerate rises in large ledges. The broken pieces from which cover the hill below.

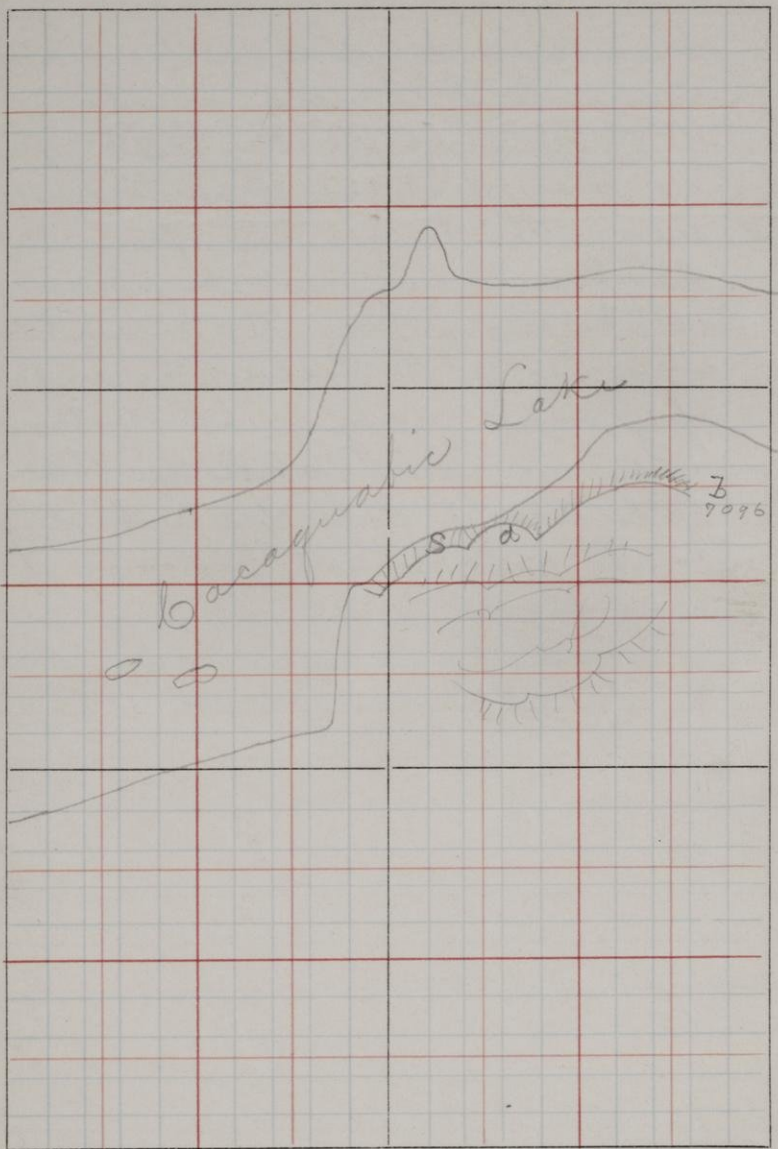
This rock though having some included pebbles, is well represented by the sample 7094. which shows the handsome appearance of the weathered surface everywhere.

7095. Came from the crown at T and forms a higher & separate rise from the ledge at F.

The whole hill covering a large area and sending a long crown ridge to Westward is made of these two rocks 7094-95. No other distinct varieties were seen. The ledges are often 50 ft high and can not be climbed so sheer are they. No attempt was made to follow the contact of groups along great distances and in no instance on these hills was it possible to find layers or apparent bedding of any kind.

Dec 36 T. 65

R. 776.



We now return to the South shore of Bacaquatic and follow it W. + South.

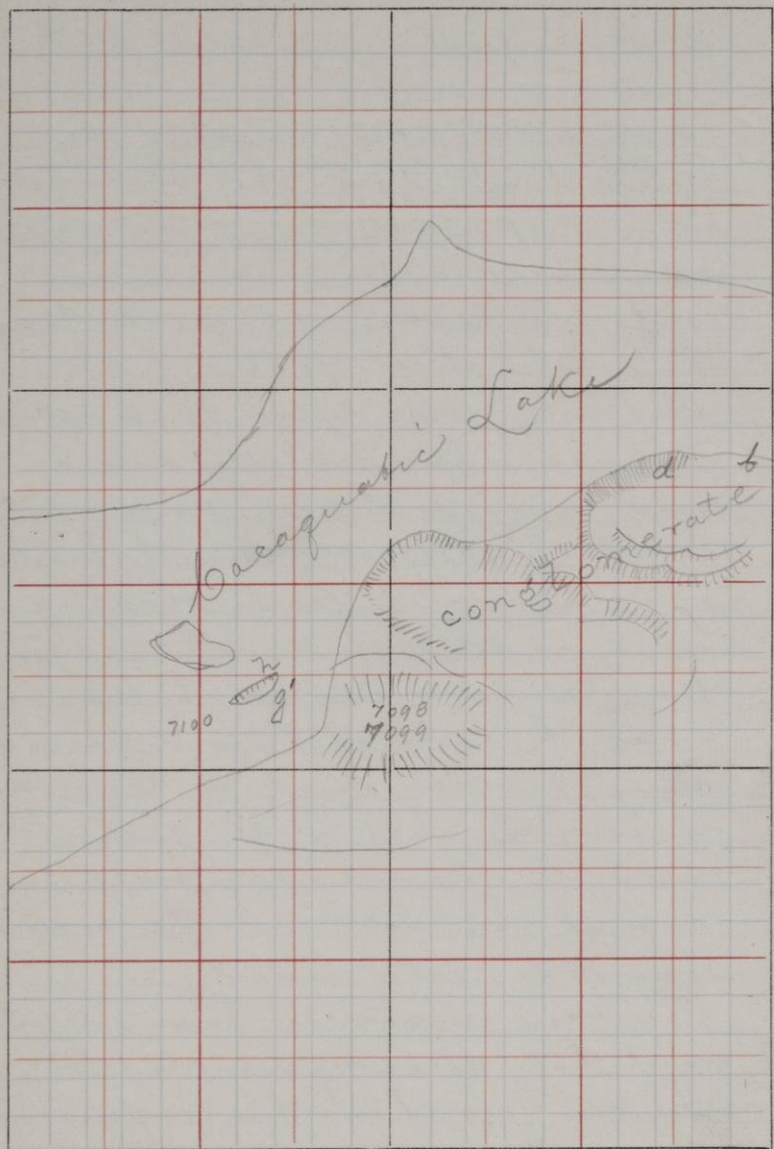
7096. Immediately after crossing the range line at "C" the shore rises in a steep wall from the water's edge. Here a dense green rock with few pebbles appears to form the whole cliff. -7096.

7097 The continued ledge 7096 seems to pass imperceptibly into a bold rugged and imposing cliff at "d" which is distinctly conglomerate at water level, showing great masses of smooth ledges beneath the water, with beautiful areas of red jasper and various other pebbles. High on the broken faces of the cliff at 48' jasper could be seen thickly scattered through the rock and the appearance was of peculiar beauty.

The base or matrix was identical with that already sampled (7087). Sample 7097 shows this conglomerate.

Sec 36 T. 65

R. 7 N.



7098 South of the center at H. of Sec 36 T65-7N. A high bold hill stands sending its almost vertical flanks westward into the lake here the conglomerate of the preceding hill (d-f.) is not seen again but a new variety of rock comes in 7098. is a whitish rock with pale colored crystal spots.

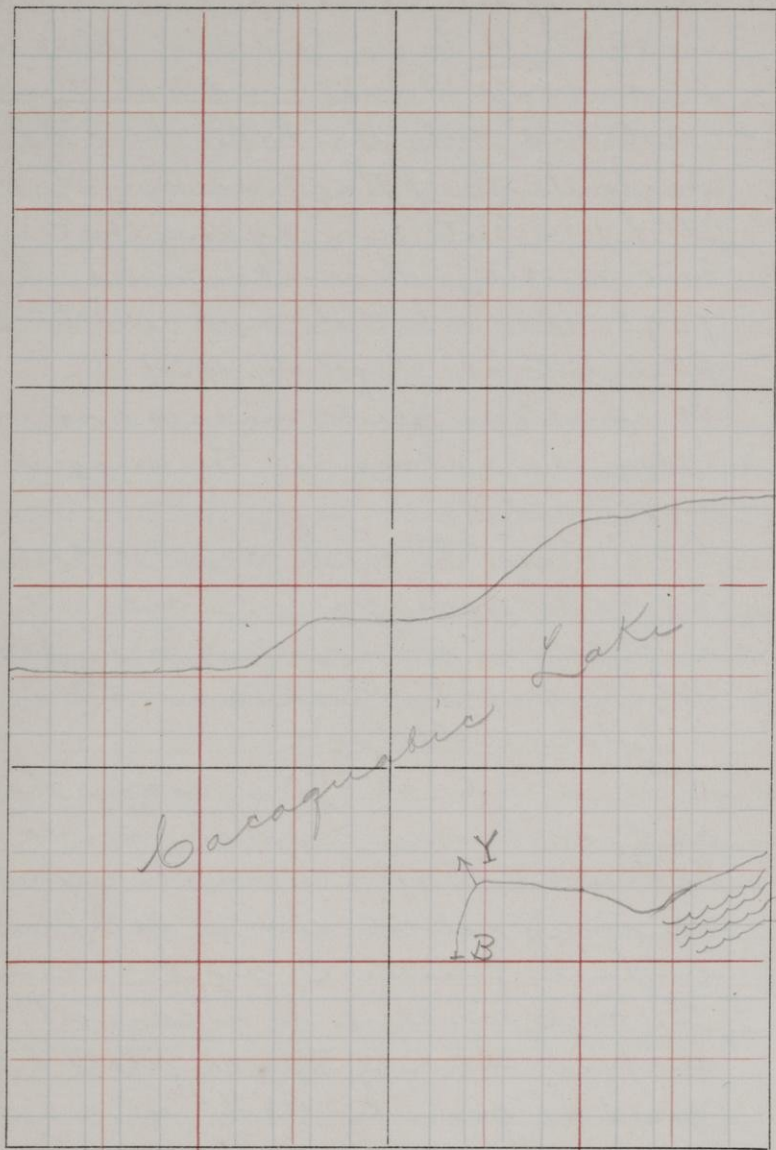
It composes great masses and irregular areas in the rugged wall. while

7099 Comprises the rest and is perhaps the bulk of the great mass. It is a Syenite or a pink + green porphyry. When freshly fractured it is brightly colored.

7100 The island at "g" is again the rock of the peninsula in sec. 31 T65-6N. Here it much resembles an amygdaloid and is detected without fracture by the weathering. The rock weathers to a smooth surface, showing the crystals like graphic granite At "h" see sample 7101)

Sec 35 T. 65

R. 724.



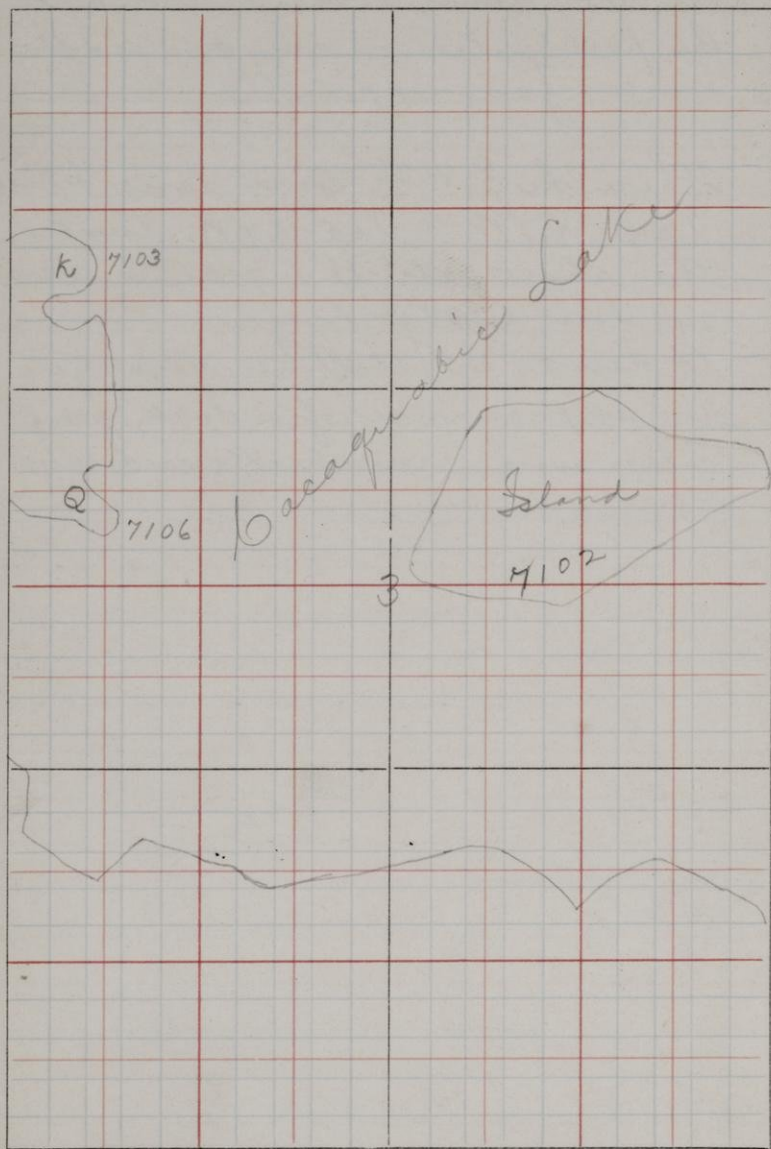
At the point Y Sec. 35 T65-R7N.
the porphyritic or amygdaloidal
rock again appears

7101. Where the E. + N. town line between
T64-R7N. + T65-R7N. touches
the shore at ("B") 7101 is seen
in low, lying ledges

A dense crystalline quartzite
in appearance, of a dark gray
color with red specks and crystals.

Sec 3 T. 64

R. 77.



We now leave the shore where the lake widens out into its great south bay and cross to the large island

7102. This island is wholly of a dense reddish finegrained rock much like 7099

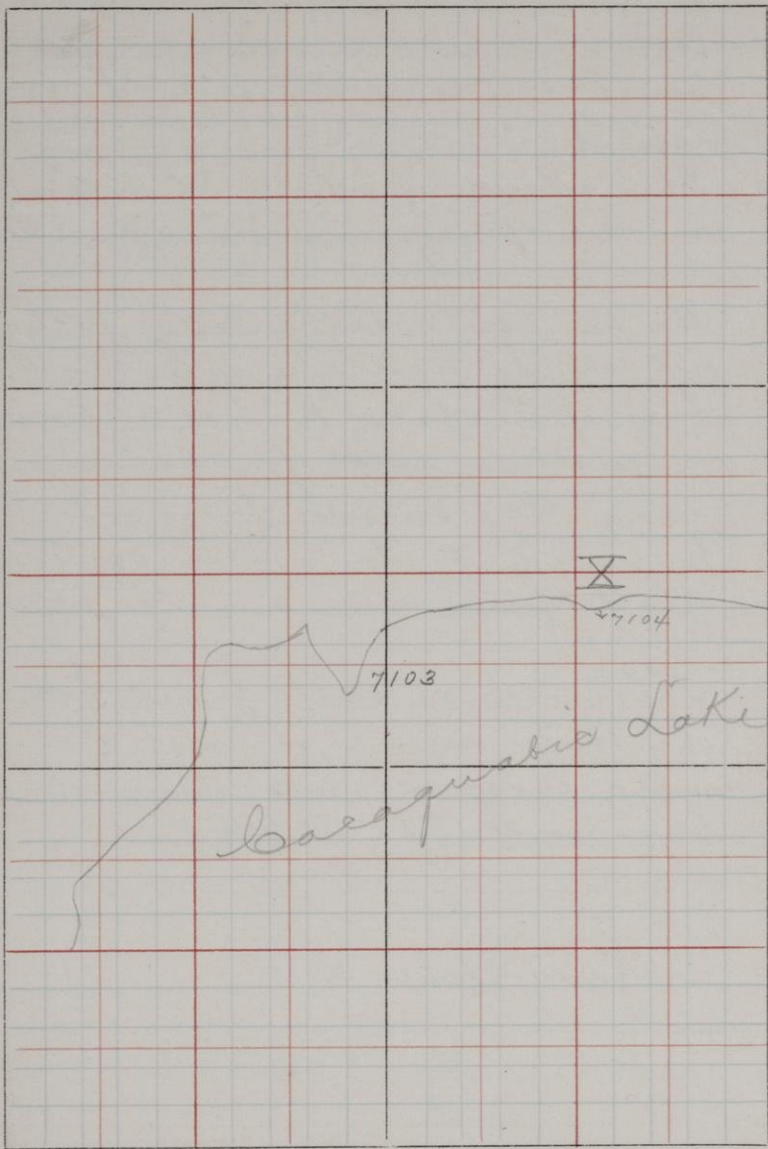
7103 The peninsula irregularly jutting out at the west side of the south bay of the lake "K" is a dense crystalline rock of a handsome gray. very smooth faces are presented to the water square block forms and smooth planes

This rock is still found holding the shore as we go north & eastward crossing into the next town north (565 - R 7 W.)

Rain Sept. 213.

Sec 34 T. 65

R. 7th.



7104 Is a dense smooth fracturing
rock at the point X showing
more pyrites and a more
brittle structure.

7105 At the point where stands the meander post between Secs 34 & 35 on N. shore of lake 7105 shows in ledges rising massively and slowly from the lake inland. It much resembles 7103 but is not so crystalline it is of a dark gray color and dense and hard.

The shore line is now occupied by the greenish 7094 rock and varieties of it reaching along toward the high hill in Sec 36 N. W. $\frac{1}{4}$ and being outliers of its 1st or lowest rock

From ~~near~~ the little deep bay running into the north shore in Sec 36. T 65 - R 7 N. all along the shore line the gray rock (7072) and the clayey group are seen in great abundance in place and ~~running~~ forming ledges so we return to camp and have rounded the lake

A general resumé of the basin will be attempted.

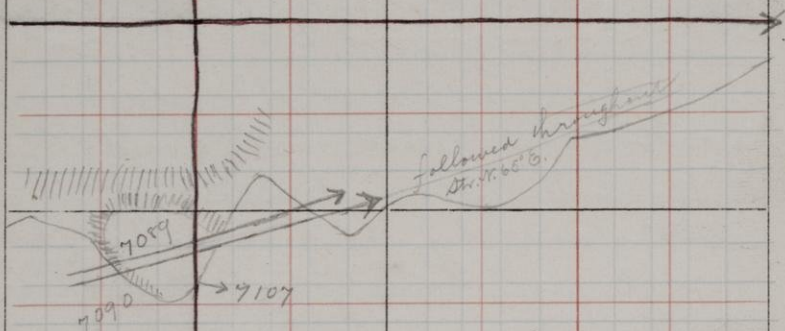
N. 21. $\frac{1}{4}$ Sec 31 T. 65 N

R. 6 W.

Sec 36

T 65 R 7 W.

Sec 30



Additimal

7106 was taken at Q (map 4 pages back)
sec 3 T 64 R 7 N.

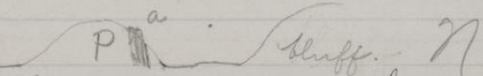
A pink and green oddly blended
schist or syenite.

7107 From the point on N. shore where
range line crosses in Sec 36, T 65
R 7 N. with 7089-7090.

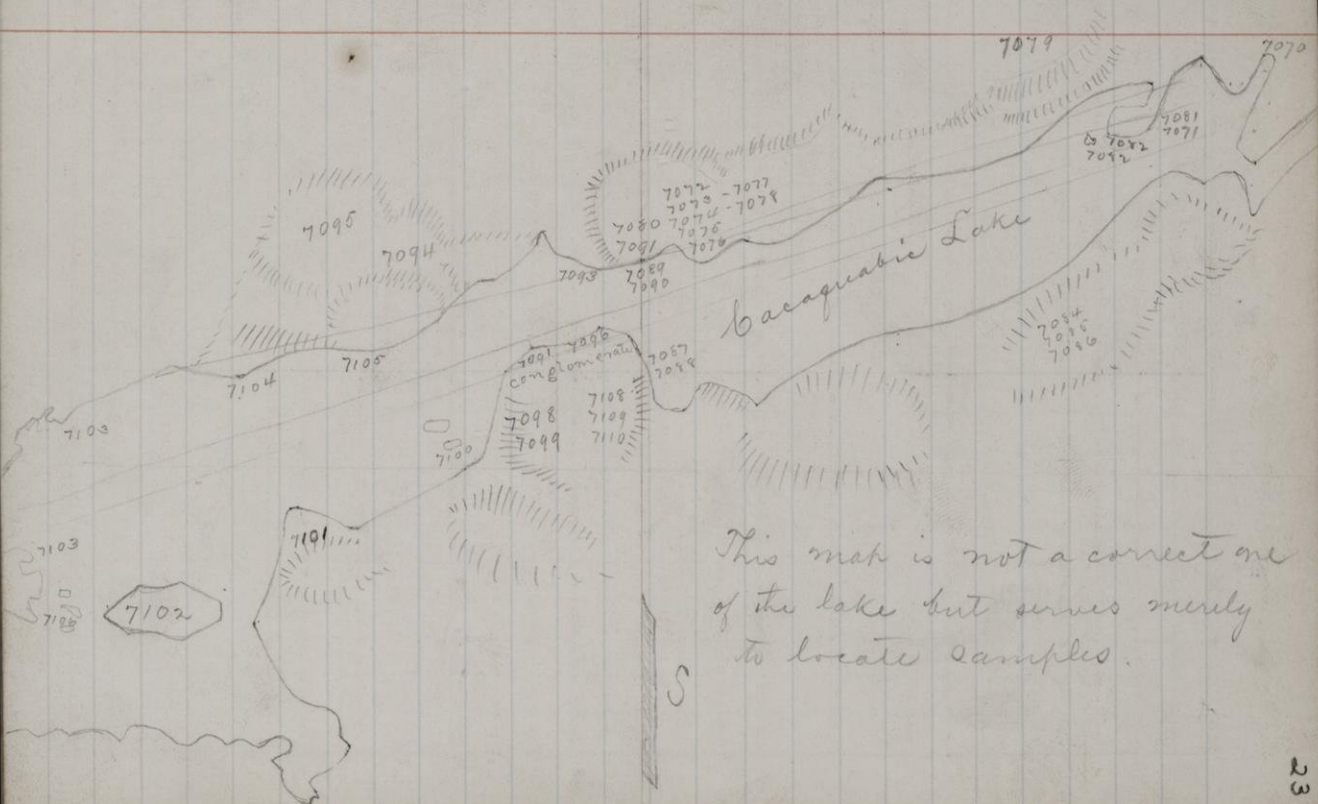
Further examination of this
point reveals the following

The clayey group of shaly +
nodular rock passes along the
inside of the peninsula here as
at 7081. But it seems when closely
followed, to project against the
rock (7107) which at such points
seems to break through it.

Let the page opposite
represent the $\frac{1}{4}$ section in which
the point occurs. The arrows
show the strike and position
of the shaly group. The point of
the ~~group~~ peninsula being of 7107.
The profile as at 7081 is thus.

Lake  P^a bluff. N

P. is the peninsula + a the softer rock



This map is not a correct one of the lake but serves merely to locate samples.

1st

The group of rocks ~~shown~~ forming the clays shown in samples 7082-7089-7090-7093 gives the only bed of any kind on Cacaguabie lake by means of which strike of the system can be arrived at.

If this bed be taken as a guide its strike of N. 65°-70° E will indicate the strike of the whole system of schists and quartzites here.

This is exactly the strike we should expect so that we shall conclude that it is indicated along this bed which can be traced for some mile and a half. We conclude that it is safer to take the strike of these beds from their position on the map, as the layers where exposed are much fallen and crumbled into clay.

2nd

The rocks north of the lake are quite different from those on the south as far as the N. line of S. 65° N. R. 6° W. Here the conglomerate comes in on the south and after that the south side of the lake has a different character.

3^d The high hill S. of the lake in Sec 31. T65-R6N. is a continuation of the quartzites south of Ogishkemuncie and this group appears to end where the lake turns toward the narrows.

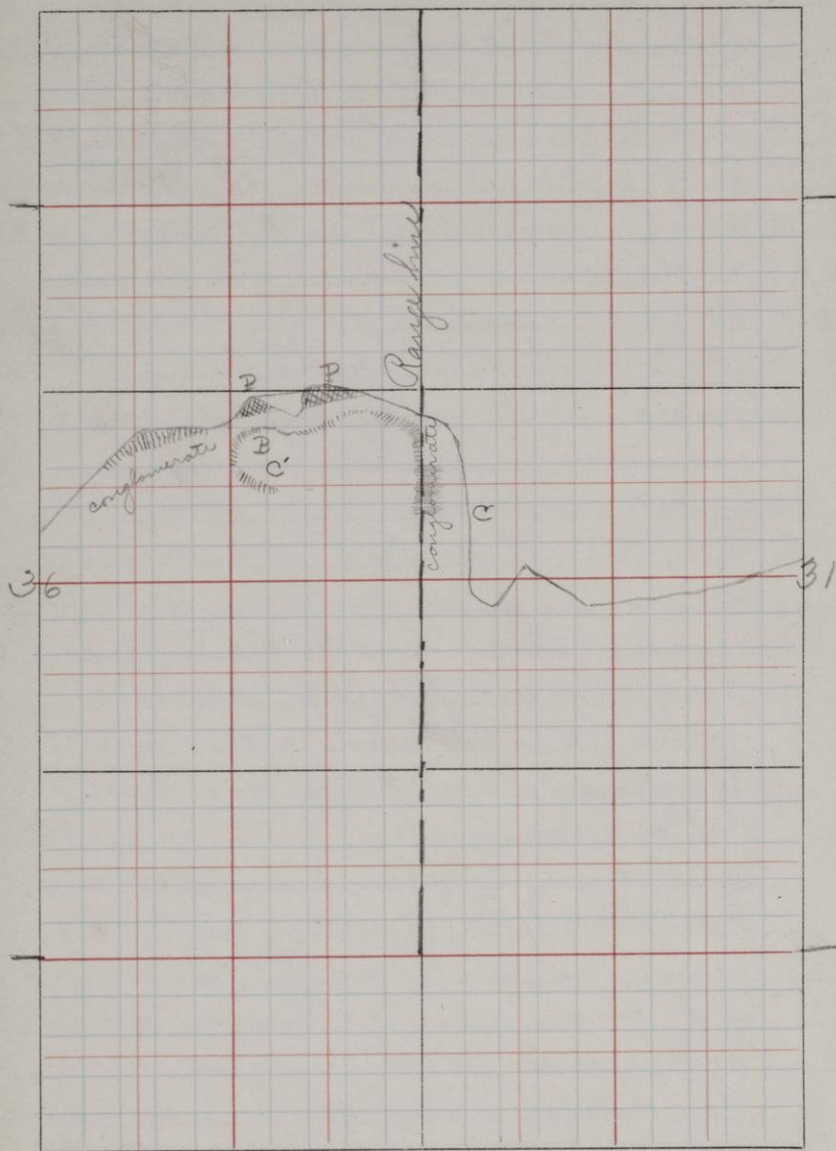
The conglomerate on the south side of the lake is where we should expect it if it came in at all, but since it is not seen at the E. in the two arms of Lacagrabie it was not expected here and seems an isolated mass.

The schists N. of the lake are so varied and so variable that little classification can be attempted. The varieties of schists, granites, syenites and quartzites ~~are~~ scattered as float over these hills seem endless both in color and kind. Pieces of iron ore from the N.E. at Akely and other places as well as the ^{various} quartzites of the more easterly towns are found on the sides of the highest hills. No doubt many of the pieces have come from long distances to the North, so no variety seen in the lake.

Sec 31 T65 R67v.

Sec 36 T. 65

R. 7th.



has been left unsampled. More detailed examination of the peninsula on the S. shore over the E. part of which the range line between T65-64, T65-71 runs reveals the following most interesting facts.

At C. east of the line the conglomerate shows in steep walls with ledges thickly set with pebbles under the lake

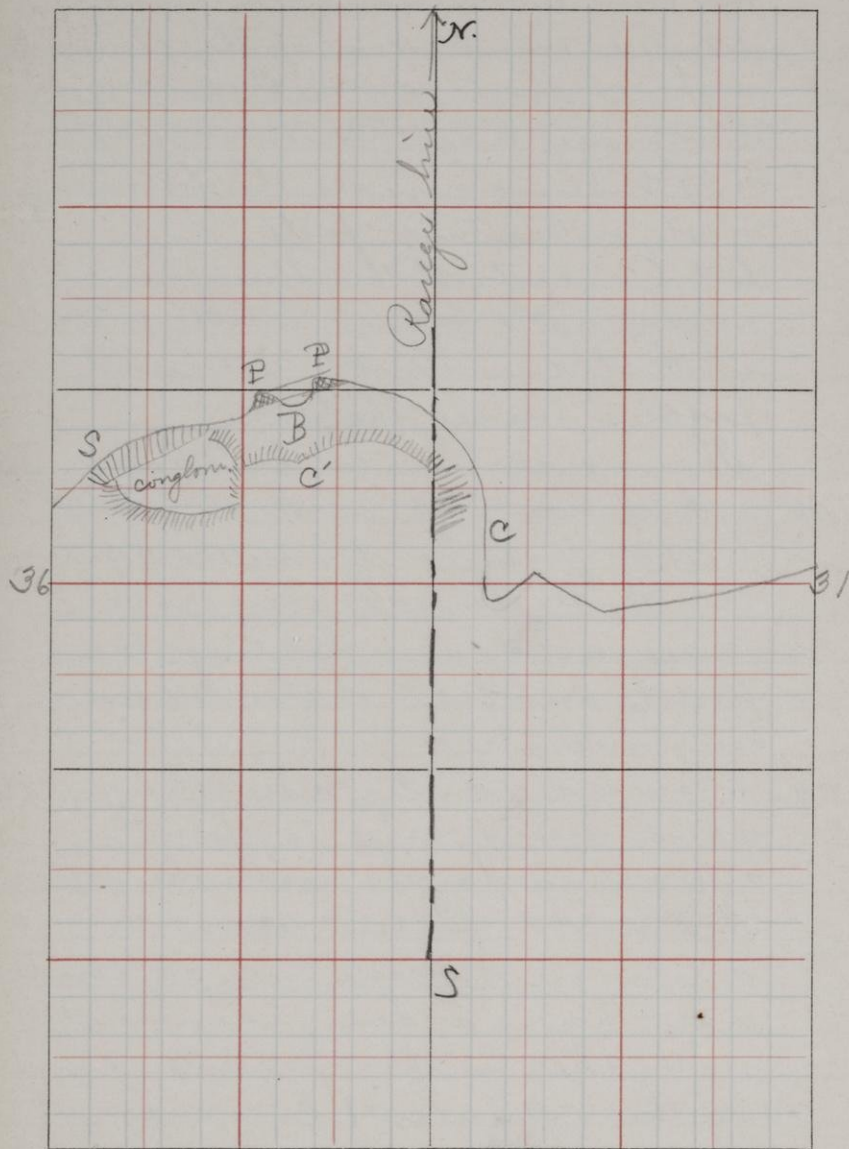
7108 The conglomerate is shown in which was taken at C' when freshly fractured it smelled of pure gum

At P-P the soft clay rock comes in again holding the points in front of the ledges of conglomerate.

7109 shows a variety resembling 7072 which seems here to form alternating layers with the softer Too much fallen down to determine strike we conclude that this is a bed. identical with that on the peninsula in the extreme N. E. corner of Sec 31. and making a line with the same rock found in the

Sec 31 T 65
Sec 36 T. 65

R-6 N
R. 7 W.

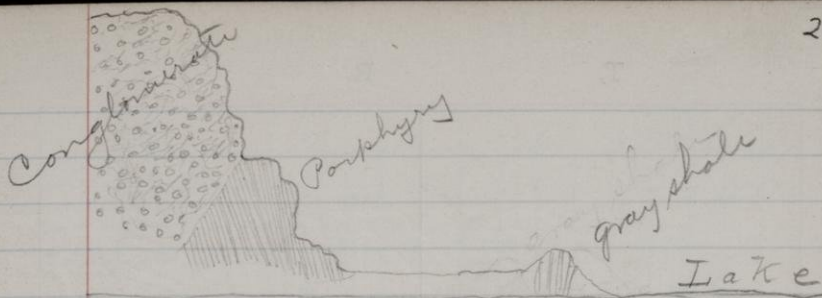


west side of the bay in N.E. $\frac{1}{4}$
 Sec 4 - T6N - R7W. This gives a
 line of the outcrop four miles
 in length striking approx. N. 70° E.

In hopes of finding the
 porphyritic rock near this group
 as has been the case heretofore
 we went back to the cliff at "B"
 and there rising 30 ft was the
 rock as expected.

7110 was a sample taken here
 because it presented some
 differences in color from those in
 other parts of the bed. Finding
 large pieces of conglomerate
 at the base of this porphyry
 cliff. further examination was
 made resulting in finding
 the crown of the cliff to be conglomer-
 erate. rich in pebble masses and
 brilliant with jasper. The section
 was thus though the masses showed
 no bedding. (see top next page.)

High on the cliff at S the
 conglomerate again shows plainly
 descending to the water at S
 The island previously shown which

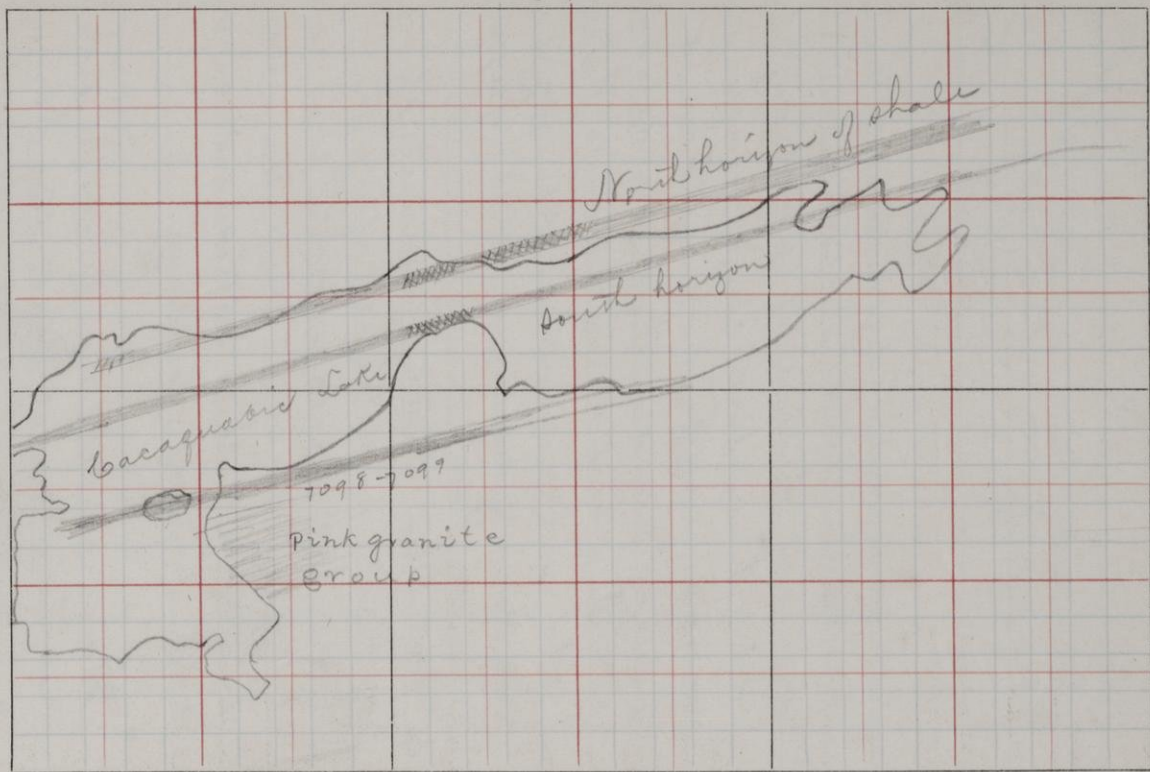


lies immediately west of the peninsula under description continues the bed of porphyry. Though unless its surface is very uneven we do not see how it passes under the conglomerate at S. which steps deep into the water. The rocks which next come in are largely displayed 7098-7099.

Note 7100. when freshly fractured showed a black substance along the fractured surfaces. It was evidently - by pine resin from the odor and was perhaps introduced along some line of jointing.

We conclude from the above section that there are at least two horizons and perhaps more at which the shaly rocks always associated with

N.



T.

R.

S.

the porphyry occur.

The one touching the N. shore at the Range line can be followed E until it is lost in the wood $\frac{1}{4}$ mile away in Sec 31, some 100ft N. of the shore. It is again seen in the small islands (not on the plat) at the mouth of the V shaped bay on the N. shore Sec 36-65-7N.

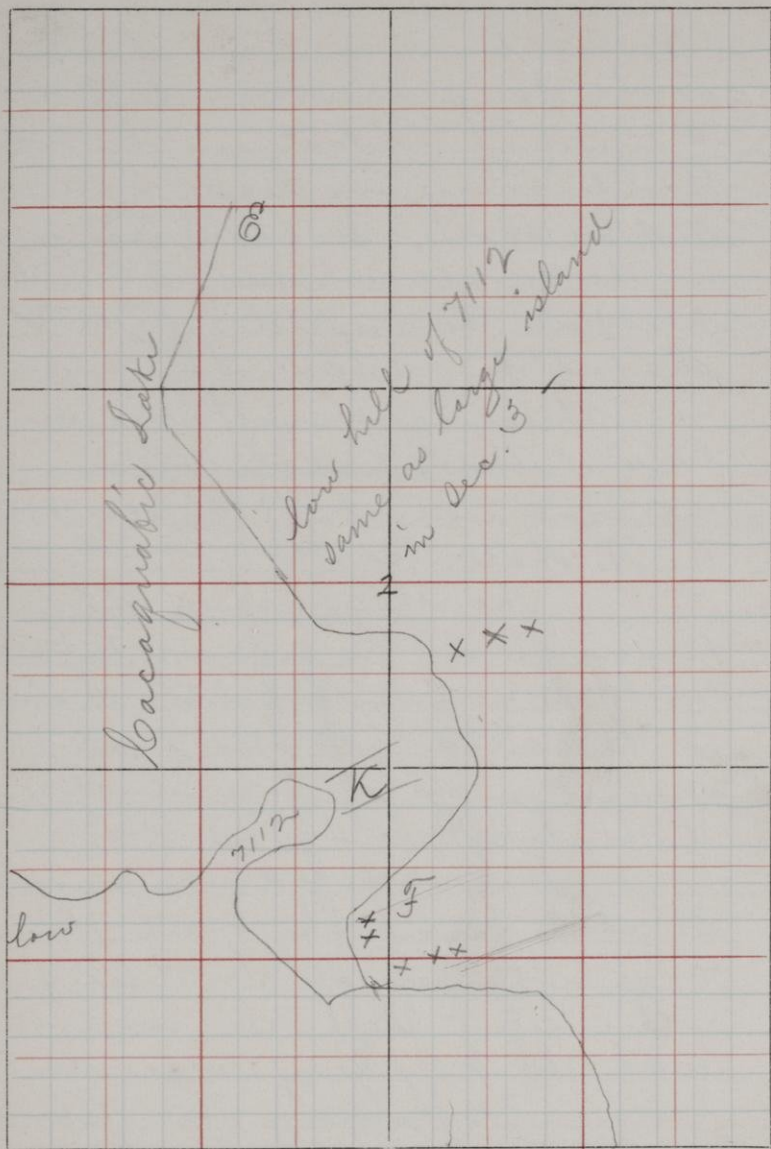
These three constitute one line of beds and the same horizon and may be called the N. shale beds.

The other crosses the peninsula in the extreme N. E sec. 31 touches the peninsula on the S. shore at the range line and again appears in the extreme west end of the lake sec 4-T64-R 7N.

The north bed shows nodules in abundance. The south shows none whatever at the three points where seen. Both are associated with the porphyry. These two ranges are shown on the opposite map. With the two porphyry beds we have four distinct beds running

Sec 2 T. 64

R. 7 St.



long distances

We now complete the S. shore by a few more observations and then go S. through T64-7N. into T63-7N.

7112

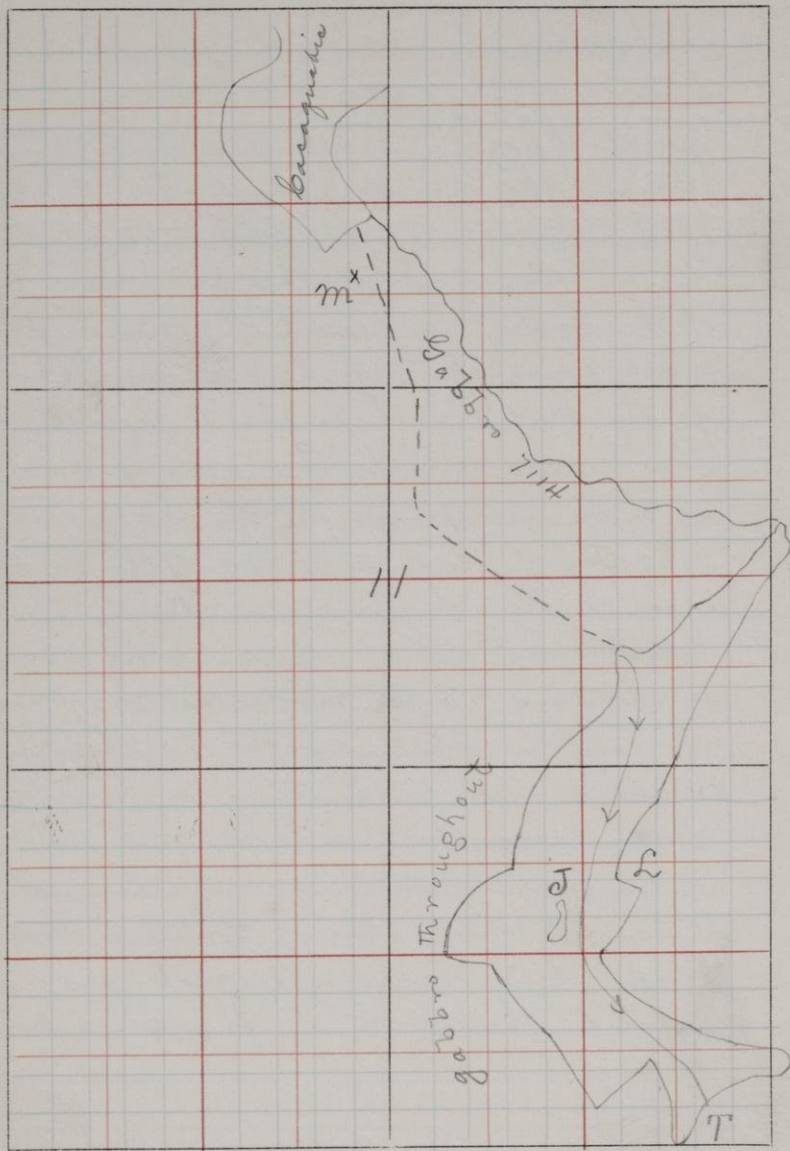
From the point where the S. shore of the lake enters T64-7N. at E. to the point F. at the extreme foot of the lake in Sec 2 - 7112 a pink rock somewhat granitic and showing gray blotches throughout was taken. This seems much the same rock as that sampled on the large island (7102) and also at 7099. 7112 is also seen at the peninsula "K"

7113

At F. comes in a dense gray rock weathering with nodules protruding not unlike other rocks heretofore sampled yet presenting a fracture more resembling a quartzite and containing granitic inclusions in spots. It also shows some irregular bands but these are not seen until the rock is fractured.

Sec 11 T. 64

R. 72k.



7114 Immediately upon entering Sec 11
 T64-YN. at "m" a fine grained species
 of gabbro rises in round low ledges
 on a hill side that rises 50 ft or
 more. †

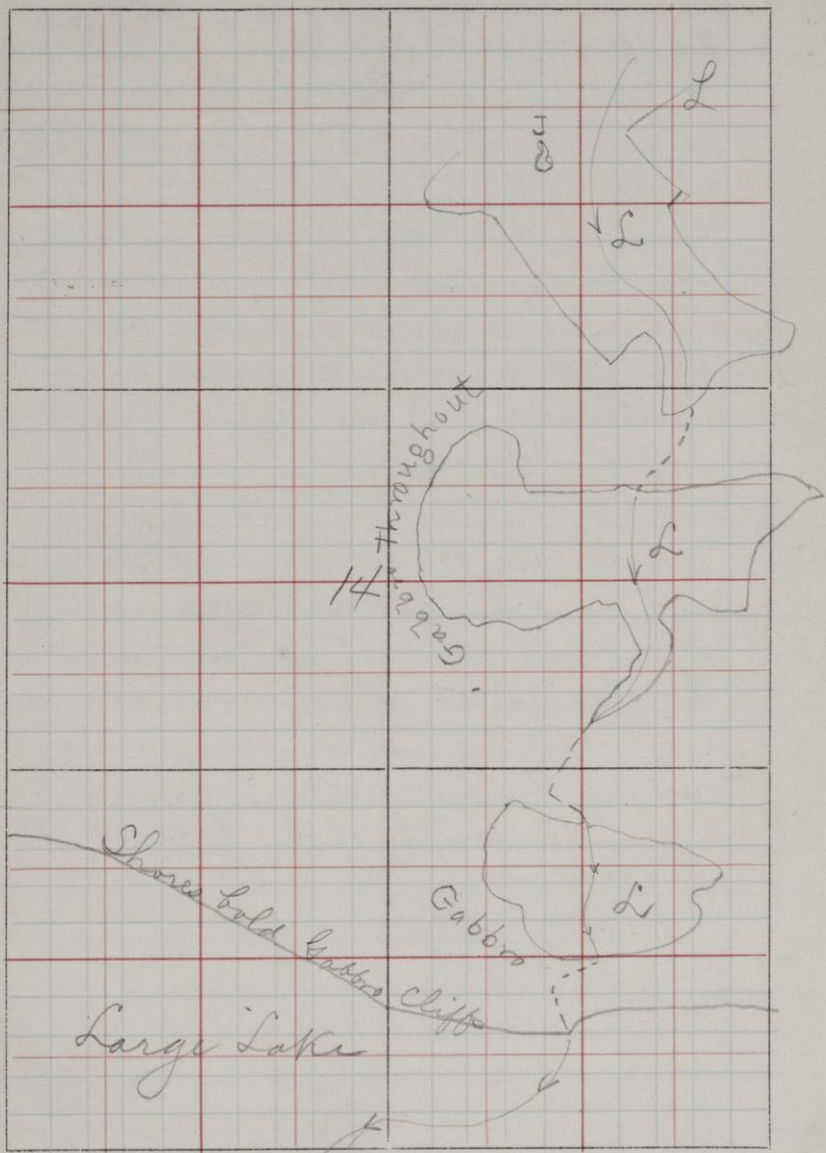
From this point throughout
 the town and to the extreme South
 running even far into T63-YN.

The gabbro extends and was followed
 southward in one days trip somewhat
 over five (5) miles.

7115 At T. Sec 11 is a small island
 and here the gabbro is mostly of
 the kind shown in 7115 also on
 the ledges at L. This variety was
 seen but it is mixed with the
 coarser brown gabbro immediately
 upon the south. of the lake at T

Sec 14 T. 64

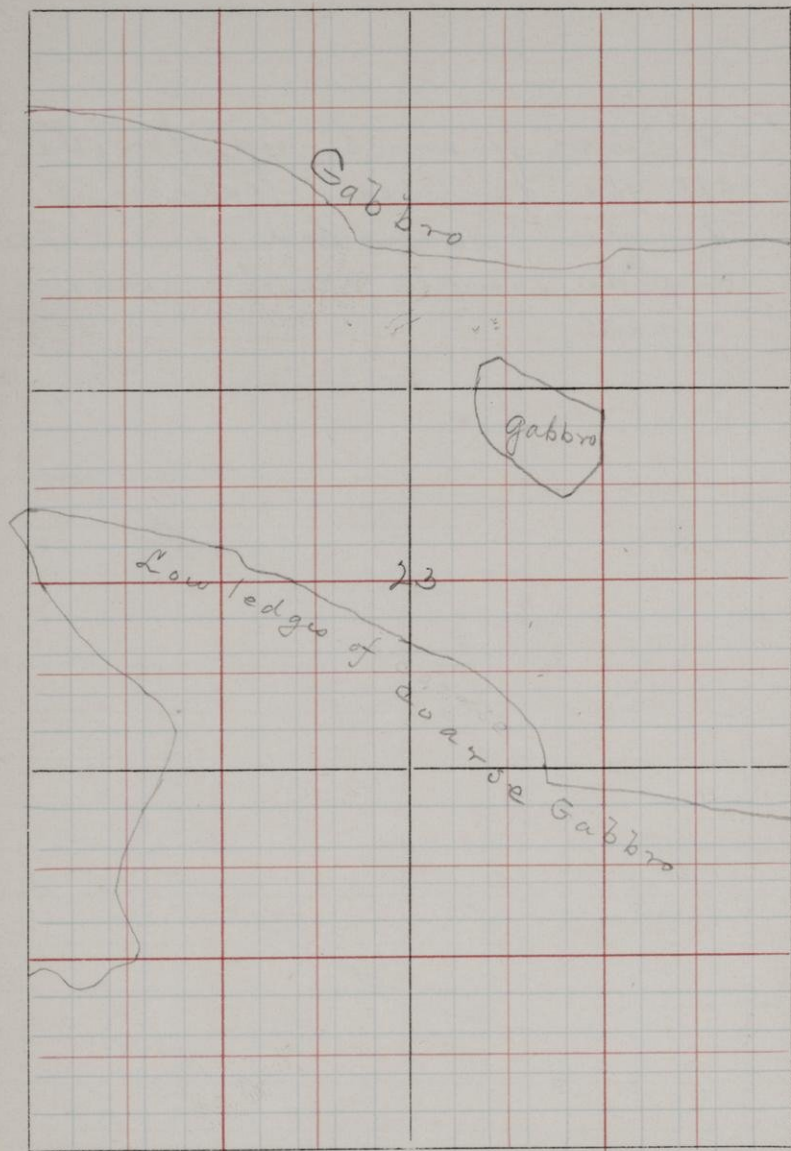
R. 7th.



As we go south in Sec. 14
all the familiar features of
the great gasbros bed again appear
and the samples are of a coarser
grain.

Dec 23 T. 64

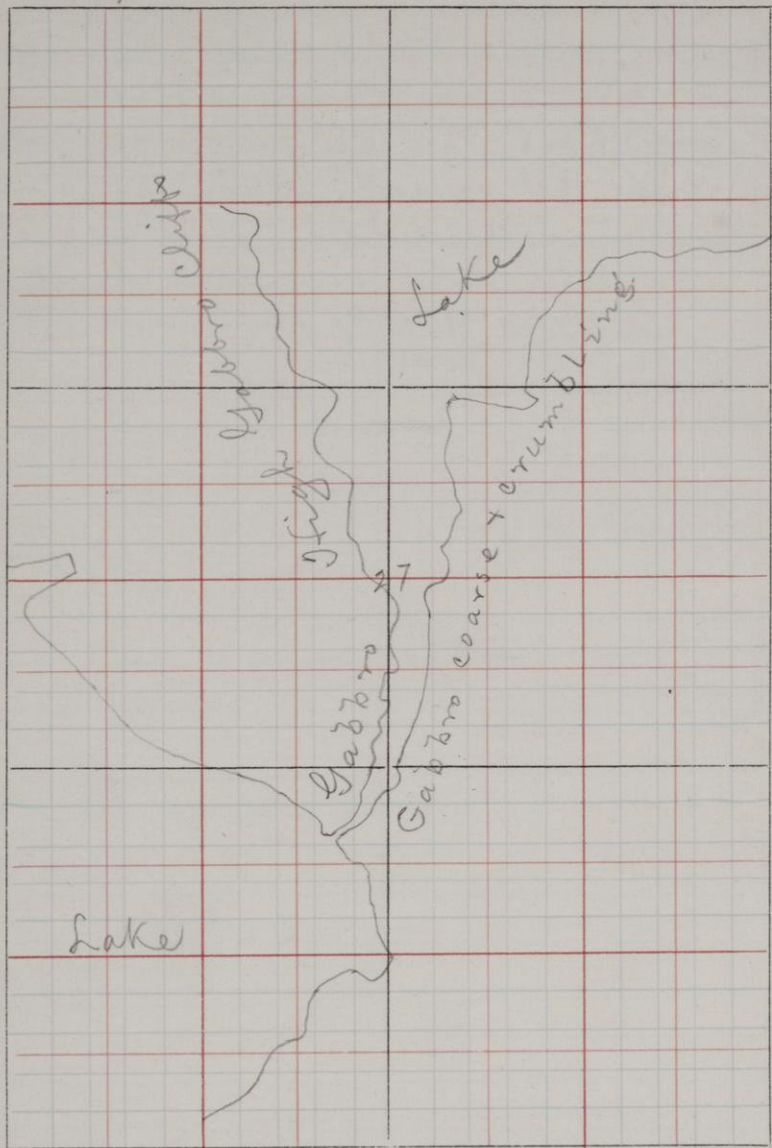
R. 72h.



Upon entering the large lake
See - 23 - 22 - 27 + c it is seen
to lie in a basin of gabbro and
we have the rude broken shore
cliffs the smooth glaciated domes
entering the water and all the
characteristics described last
year (1883 N. B. #1.)

Sec 27 T. 64

R. 7th.



At the S. end of the lake in Sec 27 the gabbro is seen to be exceedingly coarse the feldspar crystals flashing on the smooth surfaces as we pass.

The flat shows no connection by water between the lake and the one just S. W. equally large.

There is in reality a good water way though narrow the canoe goes through without carrying. The margins of the two lakes are only 50 ft apart through that space the water falls a foot or two.

Sec 33 T. 64

R. 75th.

Large Lake

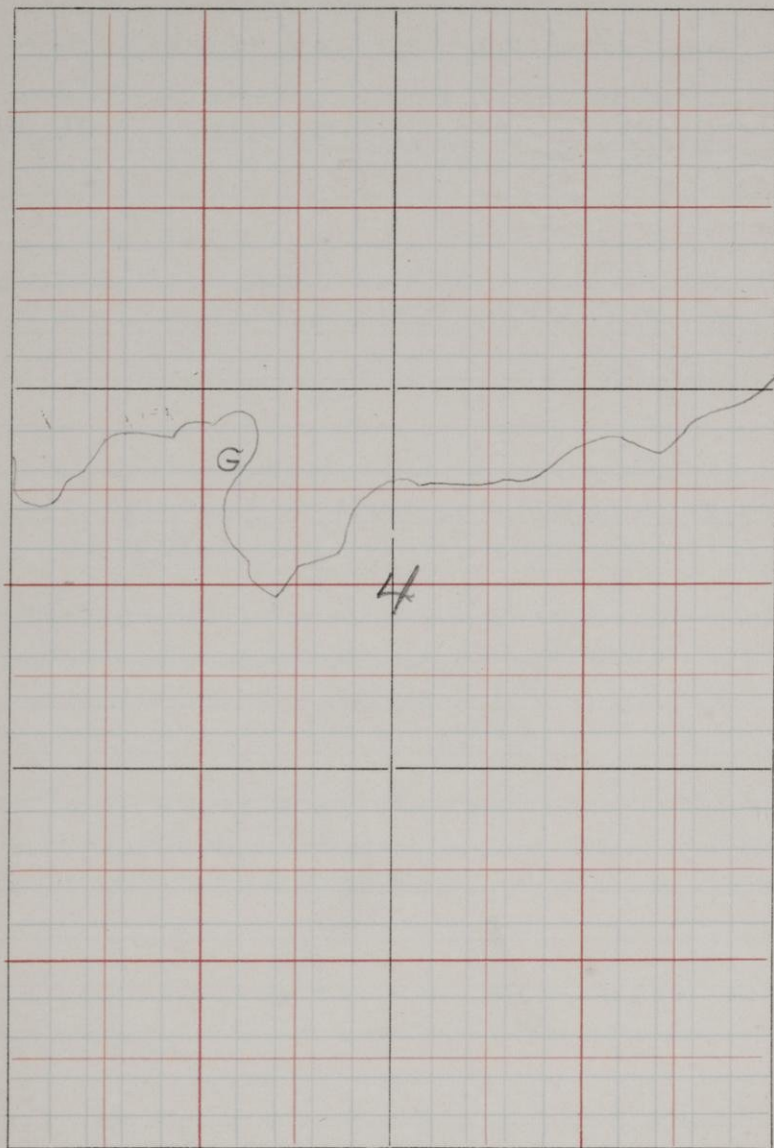
33

Gabbro coarse and showing
everywhere

Throughout the great lake
in Sec 28-33-32 to the gattro
ledges and shore lines continue
growing coarser as we go South.

Sec 5 T. 63

R. 7W

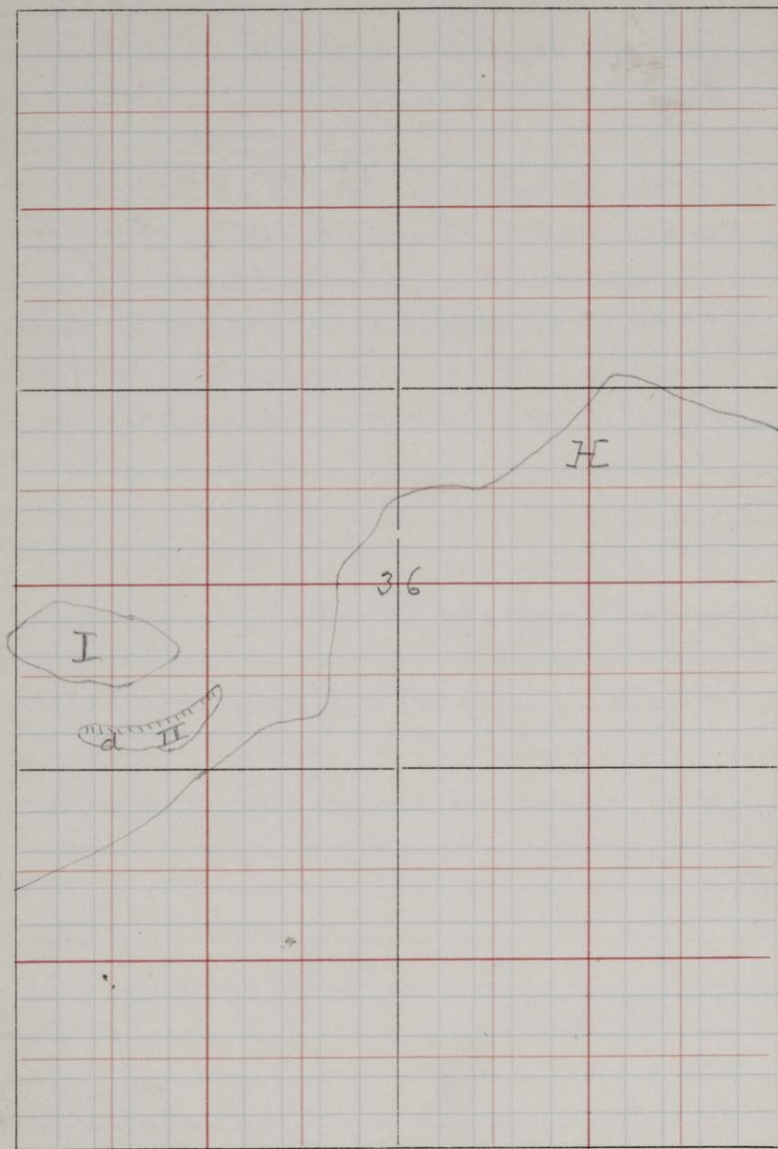


The extreme S. of the lake
is in section 4 T63 - R7N.

7116. Was taken at G to show the
rock seen throughout the town
S. of sec. 11. Sometimes the
beds or shoulders are of a finer
texture sometimes even coarser
than this but no samples were
taken. —

Sec 36 T. 65

R. 724



Returning to Bacaguanic
the following additional
observations were made.

The island I is composed of the
porphyritic rock which was
sampled on the S side of
island II (7100) and seen under
the conglomerate at H

7117 Upon examining the high cliff
on the outside of island II
it was found not to be this
porphyritic rock But the
main mass of the island which
is prominent and bold is
7117 while the (7100) porphyritic
rock shows only near the water
on the South side at "d"

Rain on the 5th + 6th Sept.

In concluding the remarks upon Bacquabic we would state as follows

The rocks on Bacquabic are so varied and so many new varieties are introduced that we are inclined to separate the group from the schists lying N.E. of these which are here true eruptive rocks.

The quartzites of Aganook and Fox lakes and those going S.W. from Ogishkenuncie appear to extend to Bacquabic appearing in the high hills sampled on the S. shore at the east end of the lake samples 7085-7086.

If they continued into T64-7W. they would come out upon the S. shore of the lake but this they fail to do. The porphyry and conglomerate which has its place W. of them on Ogishkenuncie occupying the shore at about the point where we might expect them

If they continue westward further south we would have found them in T64-7N. on the E shore of the great bay of the lake but here a rock of an entirely distinct type holds the shore throughout.

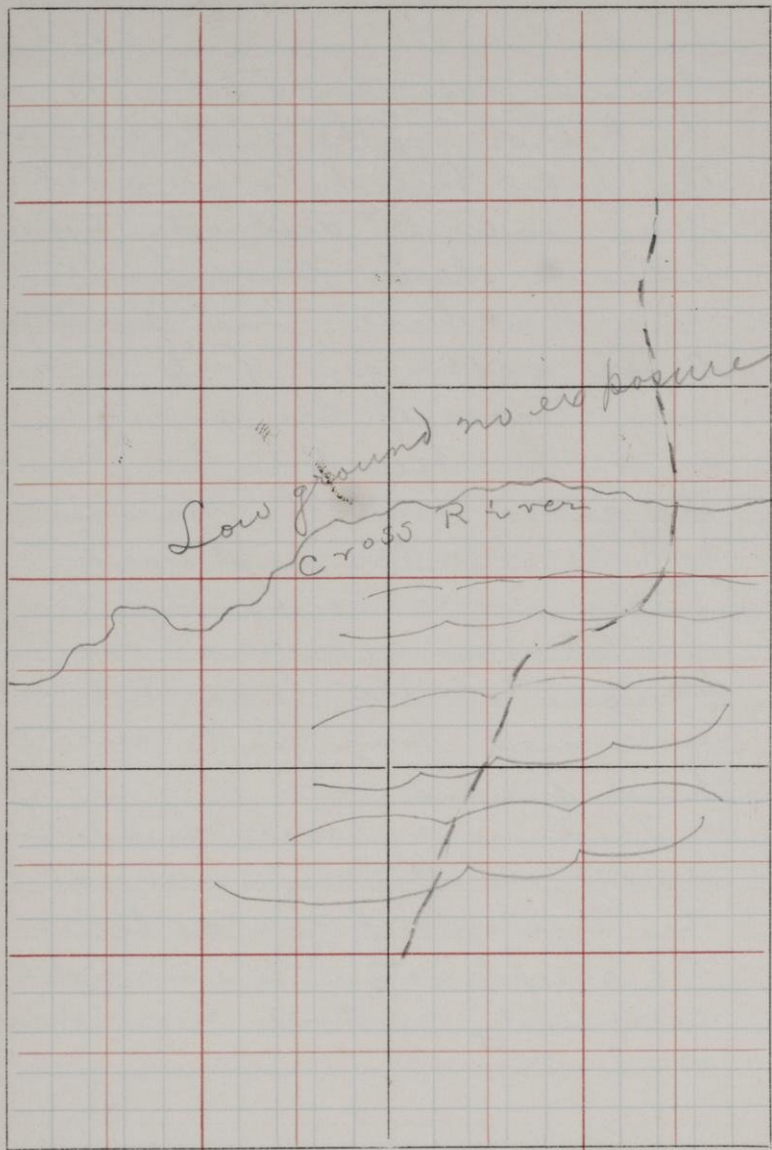
We have gone southward to the gabbro and fail to find any traces of the quartzites and other beds that lie between the gabbro and the granites & schists further eastward.

They were carefully looked for at the extreme south tongue of the lake but not even any fragments were here found.

There is a vast field for study on Lacaguatic alone the system of rocks being too complicated to unravel completely without more detailed surveys.

Sec 26 T. 65

R. 4 N.



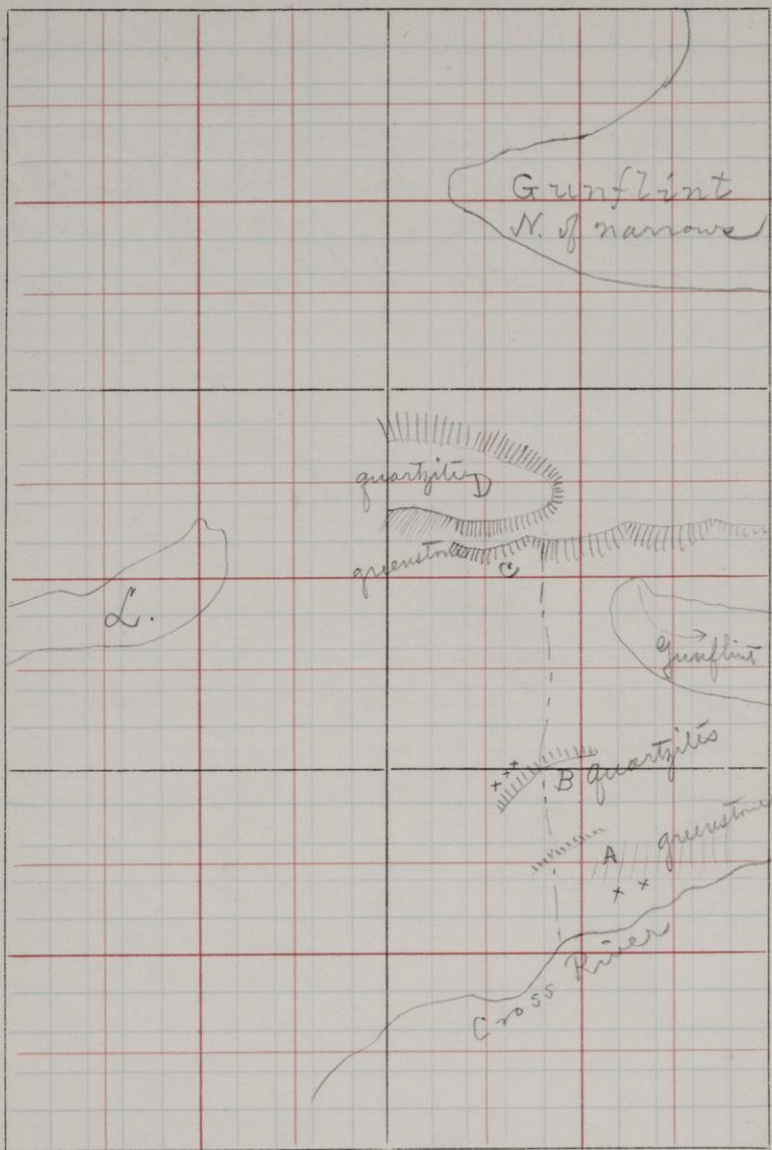
Sec 26 was crossed from the south center to the N. E. corner

There is no exposure north of Cross river. The Gunflint basin continuing to the west line of the section

Rain on the 7th & 8th

Sec 24 T. 65 N.

R. 45 W.



In going from Cross river directly north to the section (24) the Gunflint beds west of the lake are largely developed and finely exposed.

From the river the ground rises gradually exposing greenstone layers until at A a ledge of greenstone stands descending this we find quartzite layers at the base ascending a steep grade to B. where a ledge 40 ft. high exposes the quartzite beds, repeating the conditions seen in 1883 on the points in the Canadian back bays of Gunflint lake
Strike N. 40° E. dip 10° S. E.

7118. was taken on the crown - A gray dense quartzite. The layers of semi translucent ^{quartz} bands with chert lenses spreading the seams apart cover 10-15 ft. with occasional thinner platy bands or layers and heavy iron seams some of them breaking
- 7119
- 7120

with a peculiar luster as 7120. It was not considered desirable to sample throughout as these beds a little further east were so thoroughly covered by specimens last summer (1883).

The cliff was descended a low valley crossed and a high wall of greenstone climbed at "C" exposed toward the S.E. in a cliff the crown of which forms a table ascending gradually to a more prominent crown which also presents a face to the S.E. consisting of massive quartzites weathering smooth on the face. but composed exactly as the cliff B. just described of banded layers and alternating slates chert beds - iron bands &c &c &c.

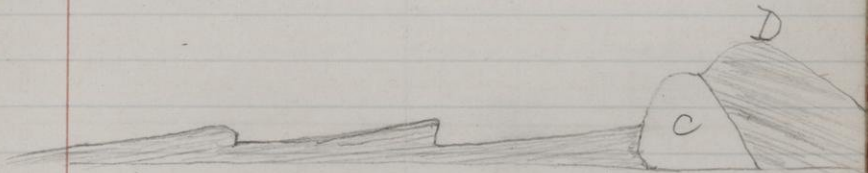
Upon approaching this great wall the peculiar dip of the layers struck us. - in descending the very precipitous S.E. face many opportunities were had to observe the strike and dip

and we find the whole hill opposed to the usual strike and dip of the Gunflint beds though by far the grandest exposure in the vicinity N. of the lake

The strike was N. 40° W. the dip N. E. 8°

No peculiarities other than this of position was noticed on the whole exposure.

The section from Cross river northward is then like this. The readings are with the needle and are only generally correct



The greenstone at C seems as a facing to the cliff of quartzite D and whether it dip beneath it or not, can not be determined that it presents a S. E. cliff an unusual thing in this region would lead to the supposition that it did so. "C" can be

followed eastward some $\frac{1}{2}$ mile to the Gunflint narrows. "D" ends abruptly as shown on the map descending to the eastward suddenly.

Samples were taken at various parts of the descent.

7121 On the south side near the crown - a shining gray crystalline rock in beds of some inches thickness

7122 On the N.E. side ~~near the crown~~ lower down. It has some curious inclusions and points of segregation of unusual appearance.

7123 Was taken from layers directly under and against 7122.

The slabs are large parting readily when struck.

7124 From the S.E. face near the bottom - dense layers thick and oft repeated. a dark gray close grained quartzite.

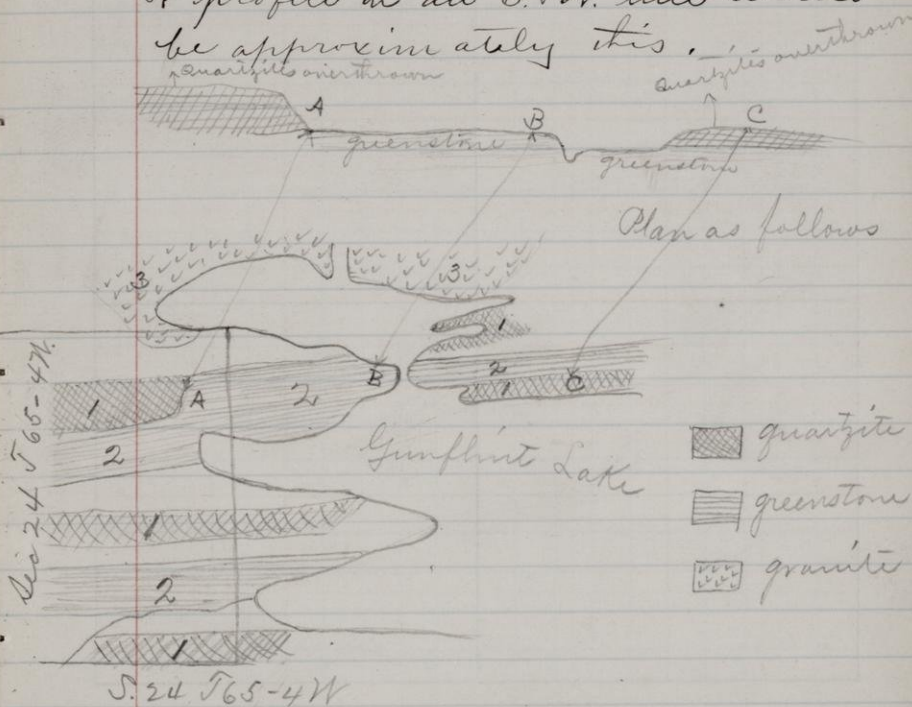
Raining on the 8th

We notice the absence of any gasser in the foregoing section. There can be little doubt that this (D) is the same ridge crossed in E. section 21. north of the middle shown in (N B #1) though in that place the layers assume the usual south dip and the greenstone is not seen though the rock there seen on the south side of the hill may be of importance (7051) as it also seemed inclined to break down to the South.

We call attention to the fact that this high quartzite hill D the layers of which are tilted to the N.E. is directly E of the point on the N. shore of Gumpshut E. of the narrows where the layers are of the same nature also tilted to the N.E. and showing the upturned edges toward the south. The rusty peculiar nodular quartzites seen at the shore on this point were again found in abundance

on the south face of the hill D though not worn as by the waves along the shore.

When it is also considered that the narrows - or water way to the north breaks through between the two exposures mentioned (so similar in all respects) it is very probable that the quartzite layers has been removed here for some distance. A profile on an E. & W. line would be approximately this.



The sudden ending of the quartzite hill at A leaving the lower ridge A.-B. denuded of them strengthens ~~this~~ opinion though the beds at C were last year supposed to be portions of those seen N. of the narrowest.

Remarks !!!

In again crossing the gabbro beds southward through T 64-7th. we were struck with the total absence of slaty layers quartzites or in short any rocks whatever besides the round shoulders of gabbro coarse at times and often finer especially toward the north.

No slate pebbles were seen here and no shingle beaches of any kind. This condition of things we think could not exist if such slaty layers had been removed in forming the lake basins. We therefore, considering too the great thickness of these beds, must conclude them to belong to the Keweenawian rather than to the Animikie.

Conglomerate The conglomerate on Ogishkemuncie has been again considered and its equivalent on Lacagnabic carefully examined

If there be a break and there seems to be between the Knife lake schists and slates and the schists lying to the E. it is along this conglomerate both on Bacaquabic and on Ogishkemuncie. The conglomerate is local. it is not found elsewhere than along this line (Vermillion &c)

It is the newest rock in the region yet shows no bedding whatever

It has quartz veins but no granite veins.

Remark II !!!

The quartzites interbedded with the gabbros throughout Gunflint beds nowhere give evidence of upheaval cracking or bending as might be the case if the gabbros had been forced between them. The lower and upper contacts have been seen.

