Mesaba [Mesabi] Range - 1901 - July 1 to Aug. 13: [specimens] 45270-45399, 46000-46005. No. 369 July 1 to Aug. 13, 1901

Newman, Mark H.
[s.l.]: [s.n.], July 1 to Aug. 13, 1901

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 x 2½ x ¾ inches will be allowed, but in all other cases *large-sized specimens*, trimmed to a size of 3 x 4 x 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.

Mt. Aba Range. — 1901 —
July 1 to Aug. 13 —
Specimen numbers — 45270 to
46005,

W. H. Newman.

Notebook No. 369

45270 - 45399
46000 - 46005

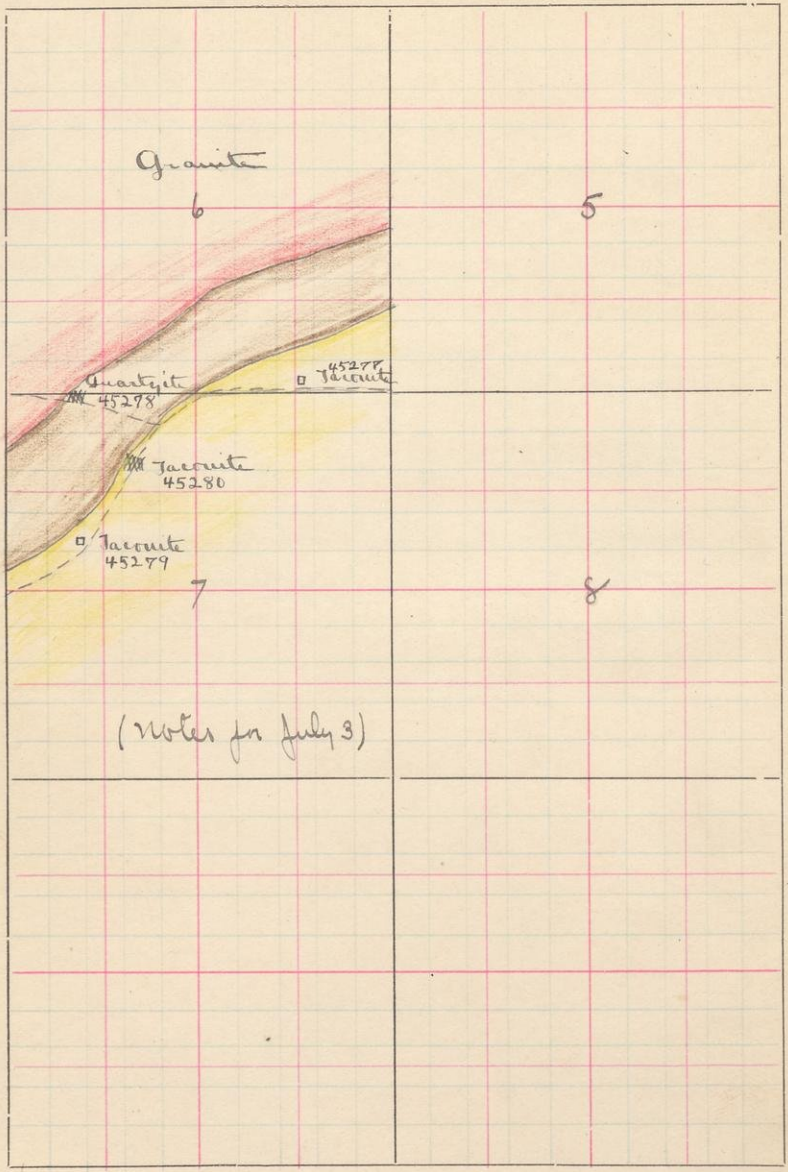
July 2-1901- — Starting at the S.E. Cor - 6-57-21- ran N 1000 steps to 1/4 post. Then W to center of sec. and S to camp.

Crossed the boundrary as mapped of Quartzite 9/4 Granite, and Quartzite 8/4 Iron Formation, twice but found no exposures to indicate their correct nerd

The Quartzite platted by Merriam at 300 steps N of the S.E. Cor. Sec. 6 was not found.

Near the Granite boundrary a number of boulders of granite, banded with typical hornblende-schist were observed.

S. 6 & 7 T. 57 R. 21


Granite
6
5
Quartzite
45278
45278
Taconite
Taconite
45280
Taconite
45279
7
8
(Notes for July 3)

July 3 -

At Stephenson Mine with Leith.

45270 Paint-rock layer in ore -

45271
45272 } Phases of the ore.
45273

45274 Taconite to S of shaft = above ore -
45275 " " N " " = below " -

45276 Sand layer in ore -
(See Notes by Leith)

In the P.M. ran W. along the S line of 6-57-21 to the S.W. cor - then S to road.

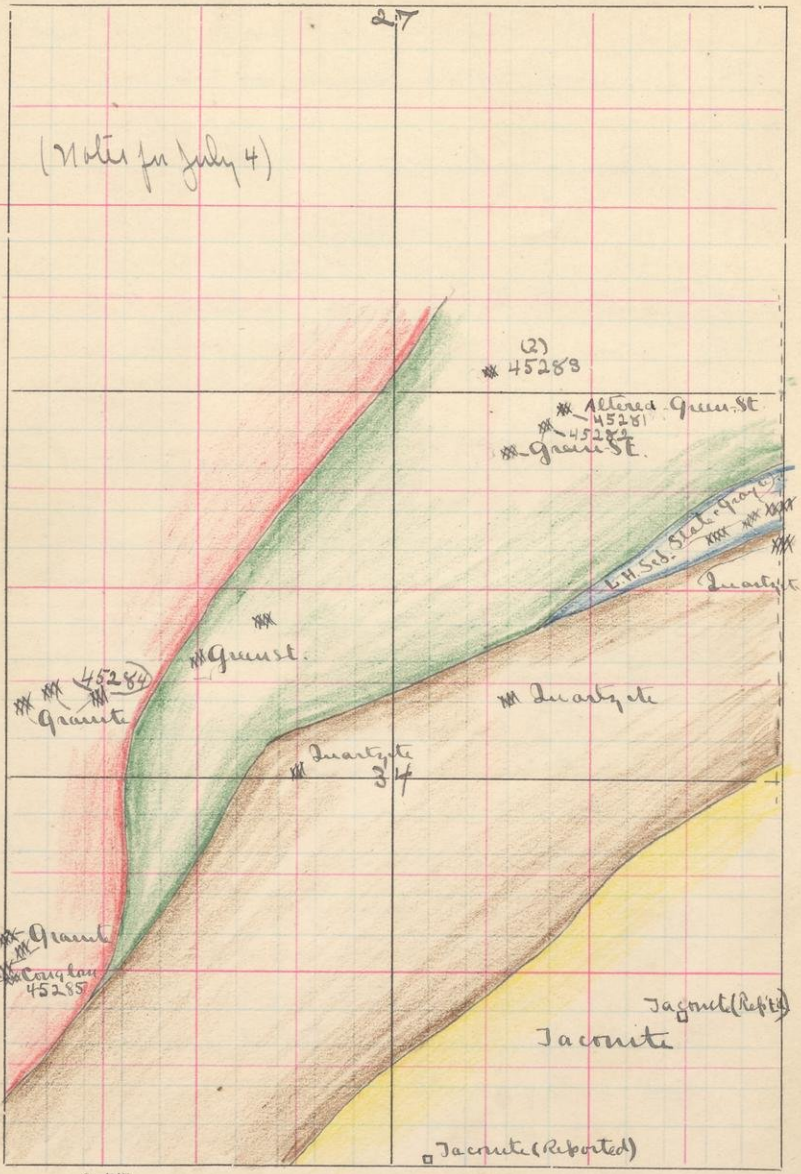
At 472 W of the S E cor just N of the road
45277 is a pit in Taconite -

At 700 W from the N 1/4 post Sec 7., just
45278 S of the line is outcrop of Quartzite with very flat dip (not more than 8°) to the S - Rock is filled with little red spots -

About 400 steps E from W 1/4 post Sec 7 on N side of road on top of knoll is is test
45279 pit in Taconite -

About 700 steps E from same 1/4 post is
45280 outcrop of Taconite in road -

S. T. 58 R. 21



6—747

July 4 —

In morning started from N.E. Cor 34-58-21

Schistose Amygdaloidal basalt 45281 At 575 paces W of Cor., 50 S of line is outcrop of pinched out iq veins rock, extending along S side of hill. The specimin shows amy q dules -

At 600 W - 100 S of line the continuation of the same outcrop shows larg & phenocrysts of some micaceous mineral showing

Gamphonite Hornblendic 45282 that the qreenstone has the ordinary surface characteristics.

These exposures are directly along the strike of what was thought to be hornblende-schist, along the road, and qradation phases between the two are to be seen -

Therefore it is concluded that the Hb. Sch is a washed qreenstone -

Throughout the qreenstone exposures fine dikes of qranite and qranite-porphyry occur

At about 750 W and 50 N of Cor is outcrop 45283 of what appears to be a fine-qrained-qranite (2) (From later observations it was concluded that this exposure is not qranite but of a basic rock allied to the Qreen-stone -)

Diorite

At 700 W, 1878 S from Cor. is outcrop of Qreenstone.

Qranite 45284 At 1766 W, 800 S is outcrop of Qranite -

Running in 34-58-21- from ¼ line westward to the sec. line Quartzite was found to 1500 W-700 S

Beginning at 1700 W-800 S - Granite appears which continues W to the Sec. line

At the Sec. line turned S - Granite appears at about 400 S of W¼ post 34 which continues to 500 S - just before reaching the swamp on the S side of the escarpment of the Granite is a thin film of
45285 conglomerate, mantling over the Granite - The Conglomerate contains pebbles up to 4 or 5 inches in diameter, of vein Quartz of various colors and of Granite identical with that of the solid ledge under neath. The Vein-Quartz is in the greater abundance which is believed to be due to the fact that it is more resistant than the Granite, the latter having yielded and when attacked by water.

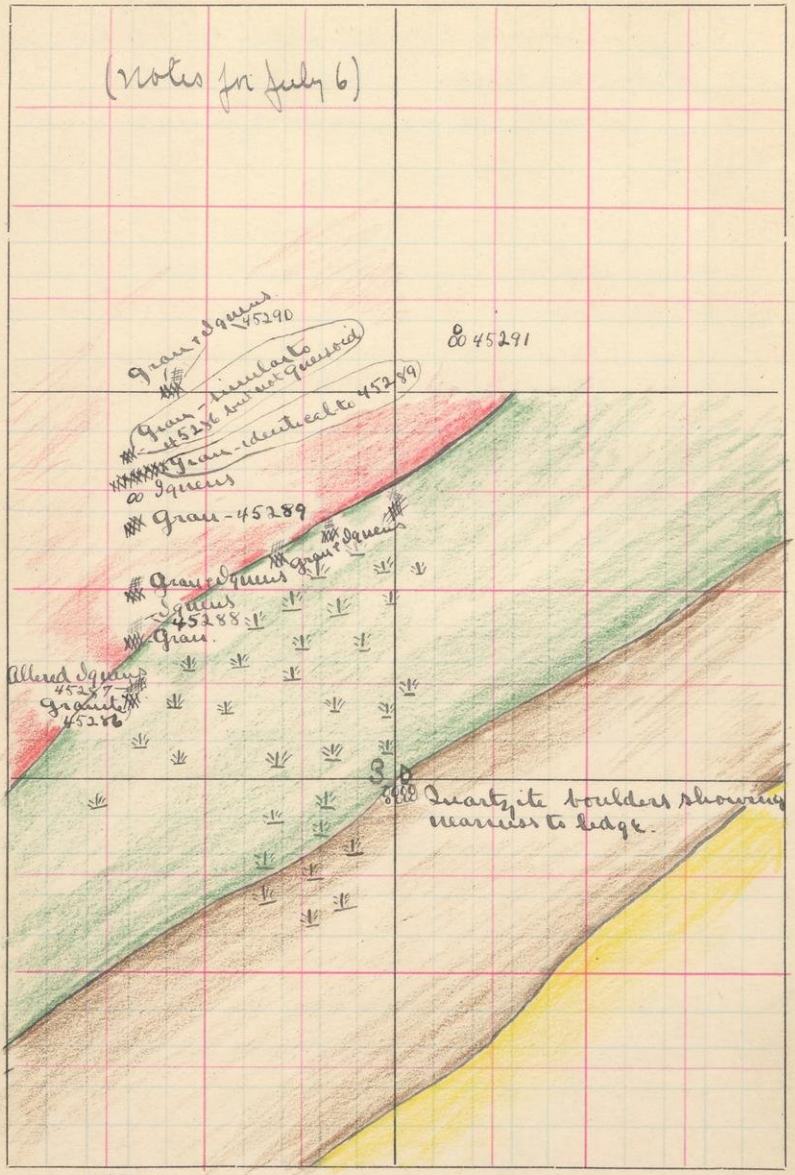
If this Granite is the one which is intrusive in the Lower Huronian, as seems probable, then this conglomerate is Upper Huronian.

Exposures of quartzite were found on the escarpment as laid at 700 W - 800 S - and 1250 W - 1100 S from N.E. cor 34.

July 5

Ran N along E line 21-57-22- - to cor.
Then W to N 1/4 part - Then S to road.
No out crops were found.

S.30 T.57 R.22



6—747

July 6.

Starting at S.W. cor 31-57-22, ran N along W line of 31+30.

At N. edge of swamp in 30 - about 300 steps E of line is an outcrop of granite containing patches of pinched out igneous rock.

45286 The granite which is gneissoid forms the greater portion of the exposure.

The direction of the secondary structure in the granite is about E. N.E.

45287 The pinched out igneous rock has a slaty cleavage which dips toward the N at about 65°. with a strike N 35 E.

The granite occurs, in addition to the massive ledge, as dikes, both large and small, usually following the cleavage in the igneous rock, but often cutting across it.

About 150 paces N of this outcrop is another but here the secondary structure in the ~~intruded~~ pinched out igneous

45288 rock is seen to a less degree

At 100 steps north of this outcrop is another in which the pinched-out-rock has about disappeared and the granite is but slightly gneissoid.

45289 Exposure of Granite 470 steps N of swamp 300 E of line.

At 500 N of swamp & 300 E of line floats of pinched-out igneous rock were found

At 550 N of swamp & 300 E of line is a hill along the southern escarpment of which at this point is a large exposure of Granite identical to 45289.

At 600 steps N of swamp & 300 E of line is outcrop of Granite like 45286, but less gneissoid - This exposure is at a lower horizon than 45289 by about 30 ft.

Ran E on N line 30 -

At 1600 W & 2000 N from S.E. cor 30 found
45290 an outcrop of igneous rock with 45289 - This last (45289) seems to be a large surface here

45291 Fine floats indicating nearness to ledge at 200 steps N.E. from N¼ post 30.

Ran S from ¼ post - At 300 S found outcrop of pinched out igneous rock in Granite - similar to that found when running N along W line.

This formation follows escarpment at N edge of swamp in a N.E. direction and is continuous between the two points mentioned -

At 1000 S found quantity of roughly broken quartz indicating nearness to ledge

July 8.

Starting at S¼ post 36-57-23-, ran W to cor - Thence N to NW cor 25 - Thence E to N¼ post Sec 25. Thence S to S¼ post 36.

At 1700 steps W of SE cor 36 - just N of line is a test pit in Taconite

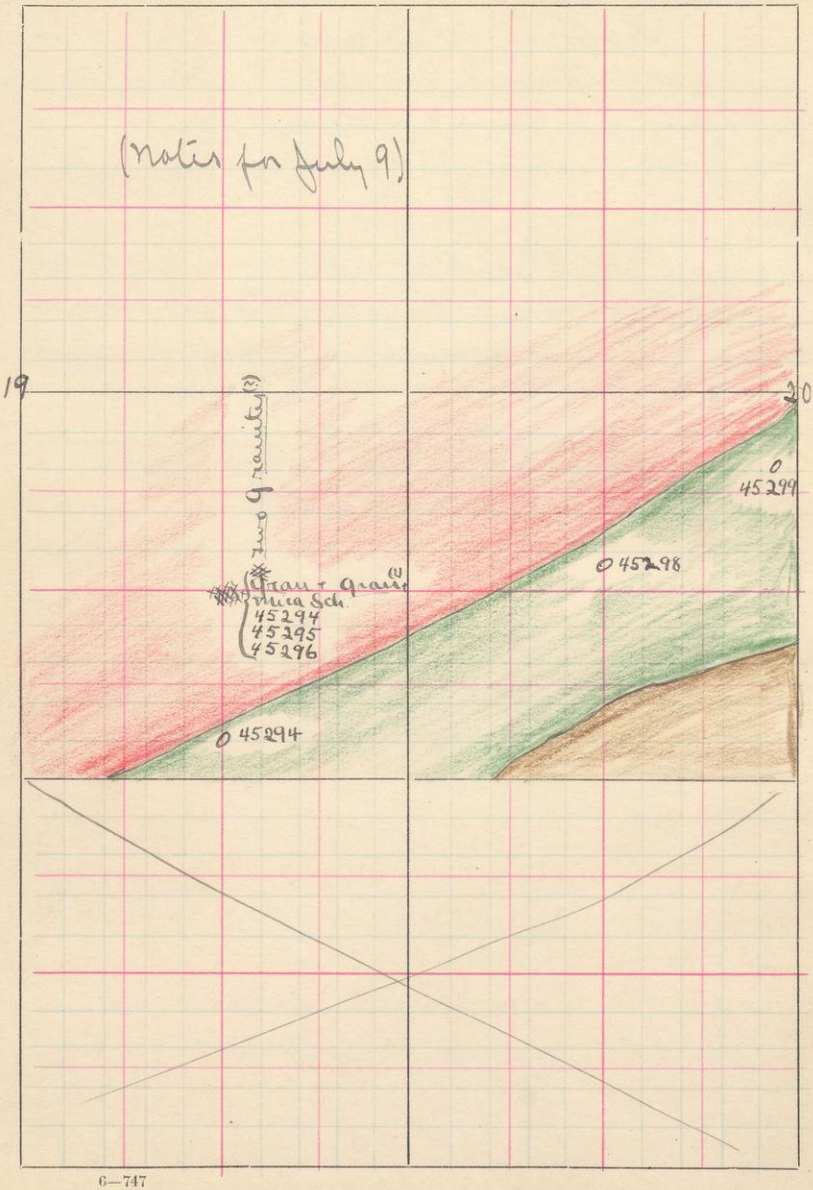
45292. The out crops of Granite reported to be on N & W line of the NW¼ of the NW¼ of 36 were not found

The exposures of Green-st reported to be at center of 25 were not found

45293 From Quartzite float found at 400 steps S of center of 25.

Part of

S. 19 & 20 T. 57 R. 22



6—747

July 9 –

Ran N along w line 29-20-57-22 beginning at SW cor. 29.

At 500 W & 100 N from SE cor 19-57-22 was found a float of wbat appears from
45294 the rounded sand grains to be sediment.

At 490 N & 500 W from cor. is outcrop consisting of two kinds of granite[1] –

45295 (A). A dark greenish looking Granite – (Similar to that found at 30)

45296 (B) ~~The~~ light grey granite similar to the darker granite found at 30 but not gneissic

45297 (C) A mica schist –

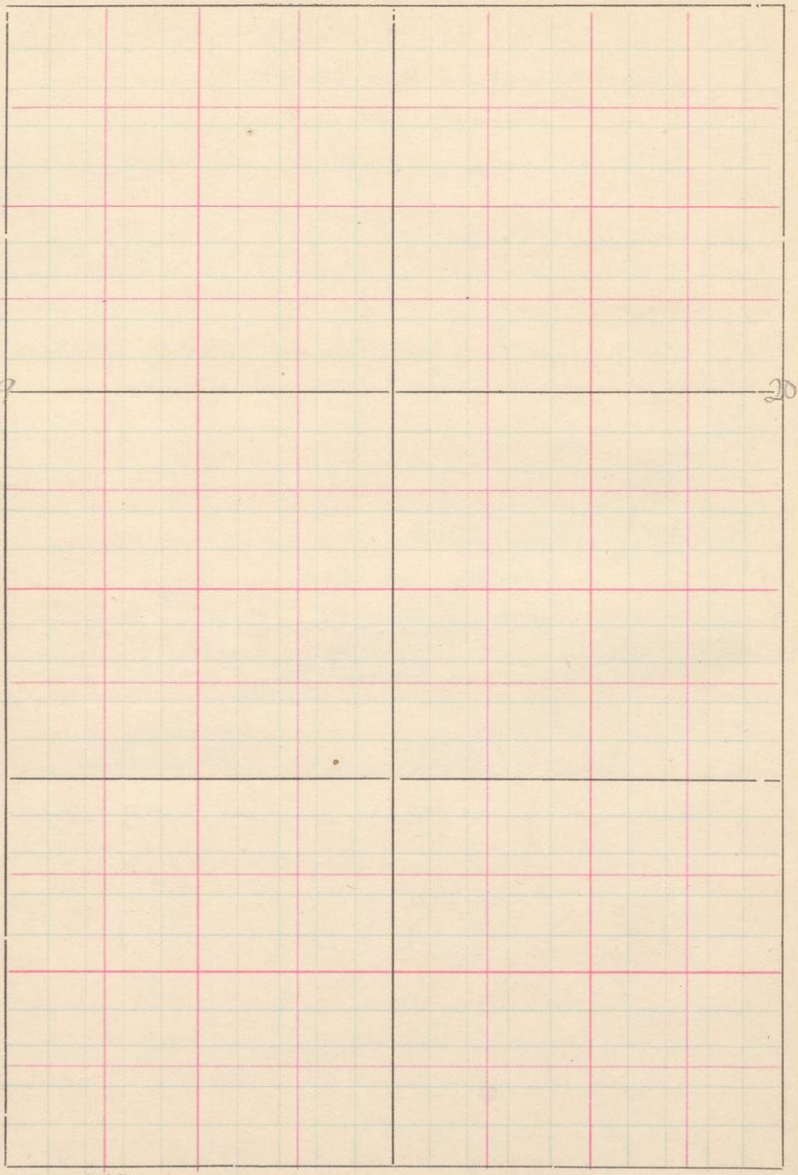
In the mica schist, the dip of the schistosity is about 70° to the N – Strike about N 30 E –

The granites are intrusive in the Schist as is seen in the manner in which the dikes have forced themselves along ~~the~~ parallel to the secondary structure and cut across it

That the light granite is the later intrusive is seen in the irregularly shaped blocks of the darker granite included in it.

The darker granite forms the major part of the exposure – The Schist next

S. T. R.



6—747

and the light colored granite the least.

At 500 N, 430 W in 19 - is another exposure of the two last mentioned granites - The schist being absent here.

45298 From float found 1570 W, 580 N from S.E. cor. Sec. 20 -

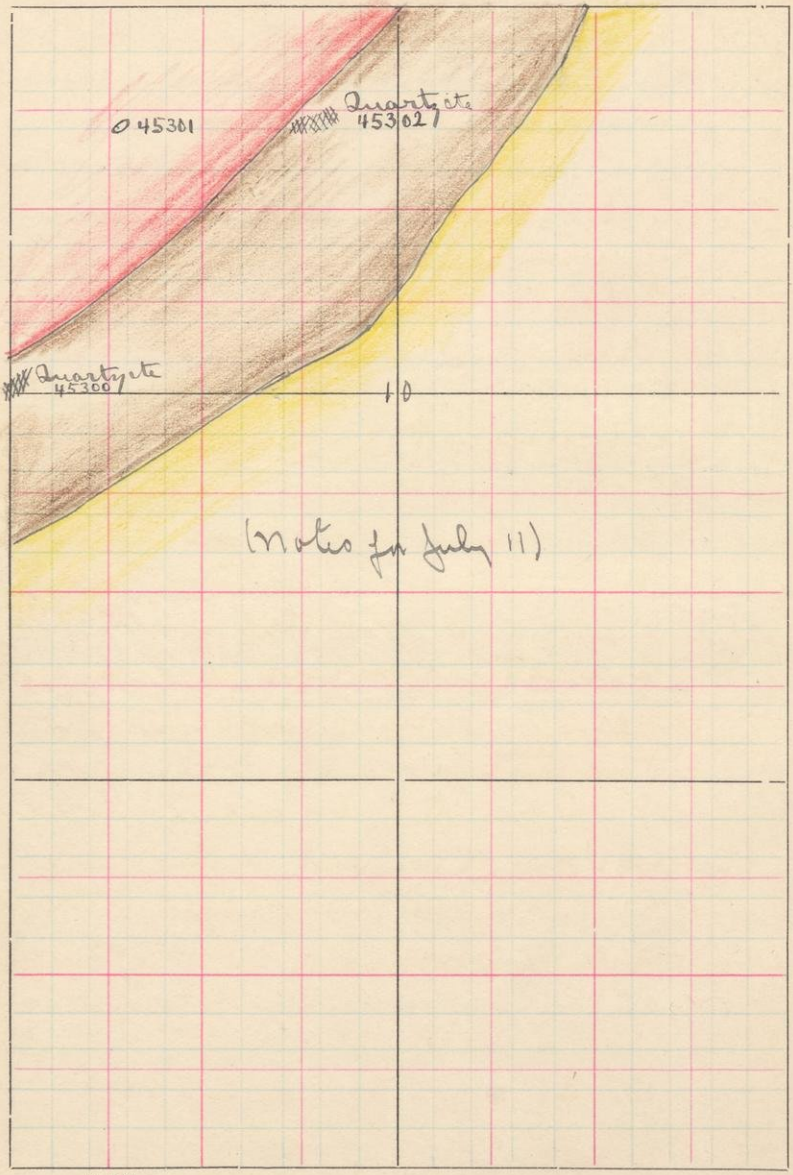
45299 From float found 1050 W, 800 N from S.E. cor. Sec. 20 -

From SW cor. 20., run 500 E - 800 N - E to 1/4 line - Thence N on 1/4 line to road -

July 10 -

Starting at SW cor 21-57-22, ran to N.W. cor - Then E to 1/4 post - Then S along 1/4 line to road. No exposures were found - A few floats of both dark and light colored granite were found

S. 10 T. 66 R. 23



July 11 - Starting at S W cor 15-5E-23 run N to 1700 steps on 10.

45300 At 1000 N in 10's out crop of quartzite Dip 15° to the S. Strike - N 60 E

A secondary structure has been developed in a series of parallel cracks running about N 30 E and dipping at about 60° to the N.W. There are other systems of joints meeting this set at varying angles but this set is predominant. The quartzite varies in color from almost pure white to a deep red. The stain is probably iron - oxide - In many places the quartzite is mottled with red.

The stains occur mainly along the cracks which indicates that after the fracturing of the rock iron oxide was deposited by water along the cracks - or the iron in the rock already was exposed in these places to atmospheric agencies and thus oxidized

From here run E to 1/4 line

45301 From float 272 E - 1700 N from SW cor At 1200 W 1700 N from SE cor 10 is

45302 exposure of quartzite - Dips 15° to the S. Strike N 60 E. This exposure is less stained with iron than

the one on the W line of this section

The principal secondary structure with form of cracks studies about N 65 E and dips about 60° to the N.

Ran S along 9/4 line to section line.

S. 5 T. 56 R. 23

5

(Water for July 12)

granite boulders indicating Ledge

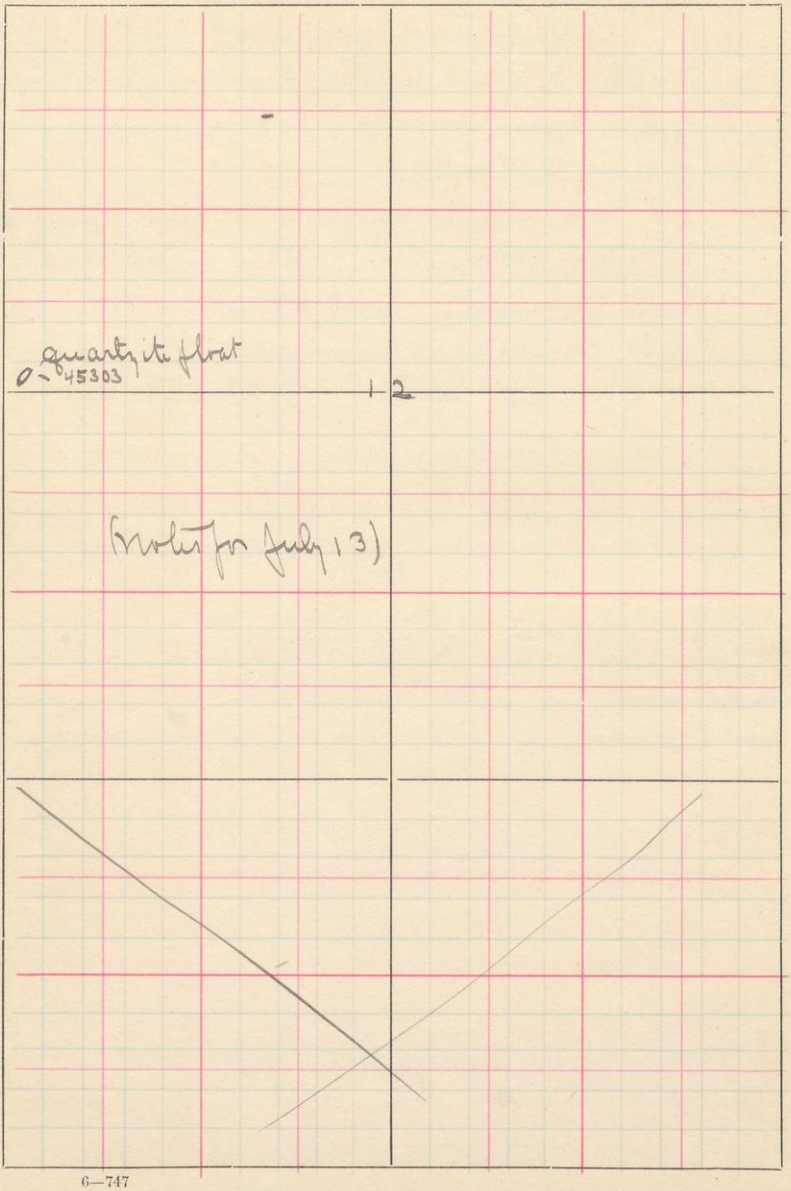
6—747

July 12 –

Starting from N 1/16 post on E line 17-56-23, ran N along E line of S to NE cor of S – Then west to 1/4 post – Thence S along 1/4 line to road –

The exposure of Granite reported to be at about 100 N & 100 W of SE cor of S. was not found. but at 200 W & 140 N of that corner was found a broken mass of Granite which appears to be a ledge.

S. 12 T. 56 R. 24

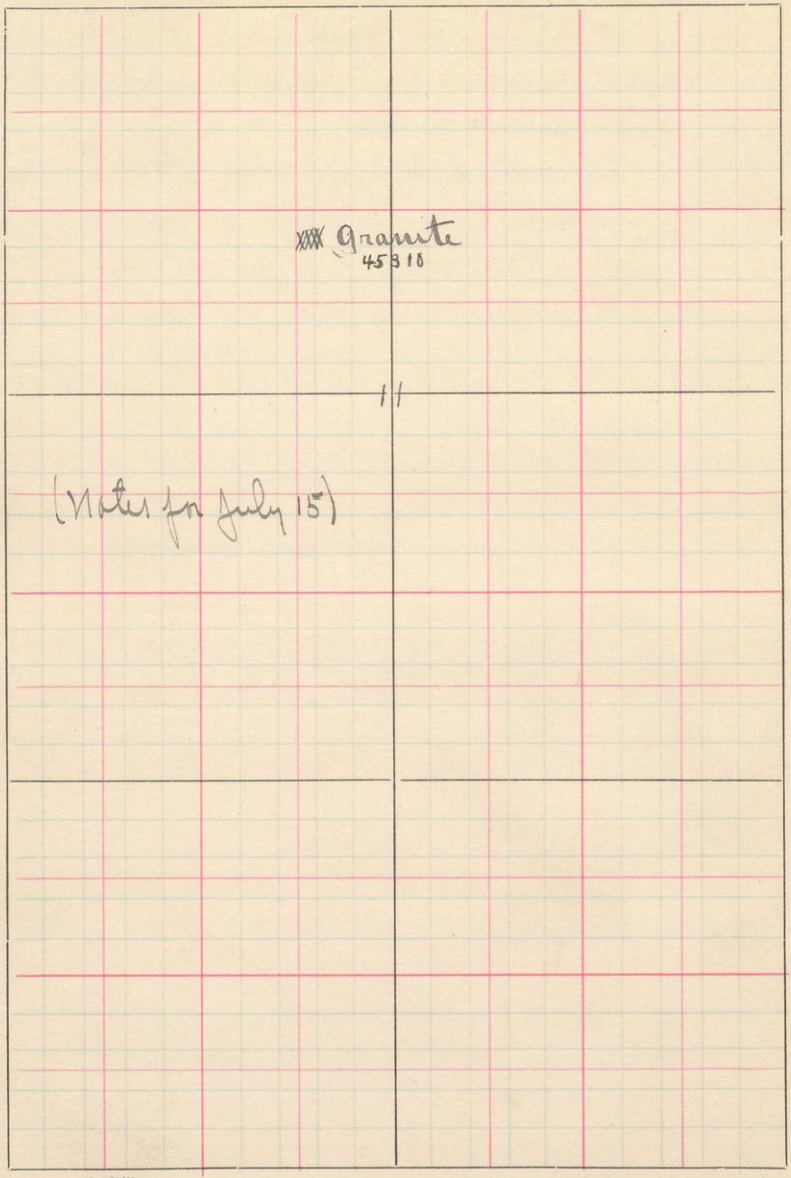


July 13 –

Starting on road, run N along W line Sec's. 13 & 12 and on 1 to W¼ post – then E 500 steps and S to road.

45303 Quartz ita from water worn boulder found at 1030 N 2½ 1950 W from SE cor 12.

S. 11 T. 56 R. 24



July 15 -

Starting at center of 14-56-24, ran N along ¼ line to N ¼ post of 11. Then W 500 steps and S to road.

At 1400 N & 1219 W from S E cor 11 is exposure of Granite

45310

The exposure of Granite reported to be ~~at~~ near the N ¼ post of 11 was not found.

July 16-

Starting at E¼ post 15-56-24, ran N 25000 steps - Then W 500 steps ⁹⁰/₉₀ S to road.

At 1900 N ⁹⁰/₉₀ 550 W from SE cor. 15 - was found a much rounded boulder of

45304 quartz etc. — — —

45305 Taconite from Southern most pit Diamond Mine

45306 Ore from dump at Diamond shaft.

45307 Ore from dump at Diamond shaft. This ore found larger part of dump.

45308 Ore from dump at Diamond Shaft.

45309 Taconite from Northern most pit of the Diamond Mine -

July 17.

Starting at S.W. cor 15-56-24, ran N to W ¼ post 10 - Then E to center 10 - Then S to road.

The exposure of granite reported at center of 10 was not found nor that of quartzite reported to be on N & S ¼ line just S of center 15 -

At end of bay, at west side of lake in 14-56-24 - at about 70 rods N and 5 50 W of SE cor 14 rods found a float of conglomerate.

45311

4

July 19 - - At Prairie River Falls -

45314 Coarse red Taconite from Southern most exposure on W bank of rapids - Rock shows rough banding of cherty and ferruginous layers.

Specimen is moderately ferruginous phase containing grains of iron and light colored chert and reddish grains resembling jasper.

45315 A coarse and slightly brecciated phase from about 20 paces N - The banding is exceedingly irregular and the rock is full of cavities giving it a sugary appearance.

45316 About 20 paces farther on, the Taconite shows peculiar grooved and weathered surface similar to specimens collected E of Musaba Station

On breaking the rock seems to be exceedingly siliceous and the banding is similar to flowage structure in a lava - This is a phase which Sherwin thinks always comes at the base of the formation.

A few steps on the same material

contains nodules of a hard siliceous iron ore - A close examination of the weathered surface shows a slight brecciation in places.

45313 On W bank about 50 steps S of bridge a phase similar to 45314 is seen - Here, however, the quartz, iron & jasper particles are distinctly rounded and lie in a white matrix of chert.

45312 A very similar phase just N of the bridge.

45317 More of the contorted highly siliceous facies.

45318 Slightly conglomeratic or brecciated phase, about two feet from contact with quartzite just N of bridge

45319 Specimen showing actual contact of quartzite & facies.
Note abundance of iron particles associated with the quartz.

45320 Quartzite a foot or two below containing in addition to quartz grains, iron grains well rounded -

45321 150 ft of bridge on W bank is seen massive quartzite, very much indurated and showing few or no iron grains.

It differs from the quartzite on the S in both these particulars.

In places on the flat upper surface of this quartzite is a film of quartzite conglomerate.

At about 70 paces to the S and a little to the W are some very large boulders of the same.

45322 45323 Specimens 45323-45322

An abundance of slate and gray wacke fragments are shown, some of the former being clearly chloritic. On weathering they clearly would yield iron colored slated fragments so frequently seen in similar conglomerates.

The quartzite is considerably jointed making it weather into regular blocks. The master joints have a direction of about N 60 E, and these are cut by another set and scarcely less important with a direction of N 45 E.

45324 East of the creek, about 150 ft of the bridge (See map for location) is a large flat exposure of massive white quartzite

Near its upper portion, it shows beautiful dark banding and false bedding - At the S.E. cor. of the cut where the rock is exposed is an exposure of slaty and micaceous

45325 quartzite - This is finely and evenly bedded and much broken but does not break out in pieces larger than the specimen and the cleavage is not much better than is shown in specimen — From its position this might be a basal portion of the formation or an upper portion of the quartzite - From its similarity to the bedded portion of the quartzite it is classified with the quartzite for the present.

Close at hand are numerous boulders of conglomerate, evidently not removed far, containing quartz and slate - The slate fragments seem too small to have been derived from the slate adjacent but still they may have been -

45326 Jacorita from E banks of bridge

The study of the contact of the lime-formation with the Quartzite makes it highly probable that-ture is a thickness of at least several feet of Quartzite and conglomerate belonging at the base of the lime-formation itself.

July 20.

Visited upper falls of Prairie River. The river here cuts through Granite which appears in massive exposure along entire length - Also both E and W exposures are numerous -

45329 The Granite forming more than nine tenths of the mass is rather fine-grained, grayish mica or hornblende-Granite -

This in places becomes coarser

45330 45331 and appears like 45330 & 45331 -

Cutting this Granite are a considerable number of dikes of a coarse

45327 red Granite or Pegmatite - This is commonly associated with a considerable amount of quartz - In one or two instances this quartz seemed to follow the center of the dike like a vein. This brings to mind the abundance of quartz in the red granite cutting the Upper Huronian in the E part of the range

45328 Hornblende-Mica-Schist is found in the Granite in small and irregular areas as in Quinnis

The marked joints in the granite

runs about N 70 W — Another system scarcely less important runs about N 15 E.

Dips of Quartzite between 100 & 200 steps N of bridge, at upper Cascade of The Lower Falls of Prairie River.

8° to the S.S.E.
5° " " "
5° " " E.S.E.
7° " " S.E.
15° " " E.S.E.

At contact of Quartzite and Iron-Formation just N of bridge —
4° to the E.S.E.

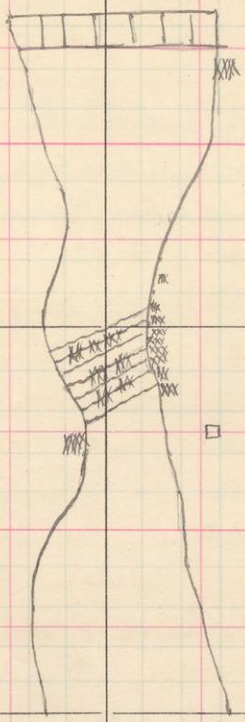
Jacnite at about 50 paces S of bridge —
10° to the S.E.

Jacnite at about 200 W & 150 S of bridge
11° to the E.S.E.

Jacnite 20 paces S W from above
11° to the S.E.

Jacnite to 20 paces S.S.W from above
12° to the E.S.E.

S. T. R.



(Notes for July 21)

July 21 -

Dips of Quartzite at Portage and Falls -

10° to the S. E

12° " " S.S.E.

10° " " S.E.

45332 Represents the average quartzite close to the falls. It is disintegrated and iron stained and can properly be called a sand-stone.

Near the dam blasting has thrown out many fragments of the unaltered Quartzite. This is a greenish

45334 Gray rock which toward the weathered surface becomes reddish. The rock in turn gives way to the soft Sand-stone -

At the place indicated on the opposite map is fine grained Quartzite

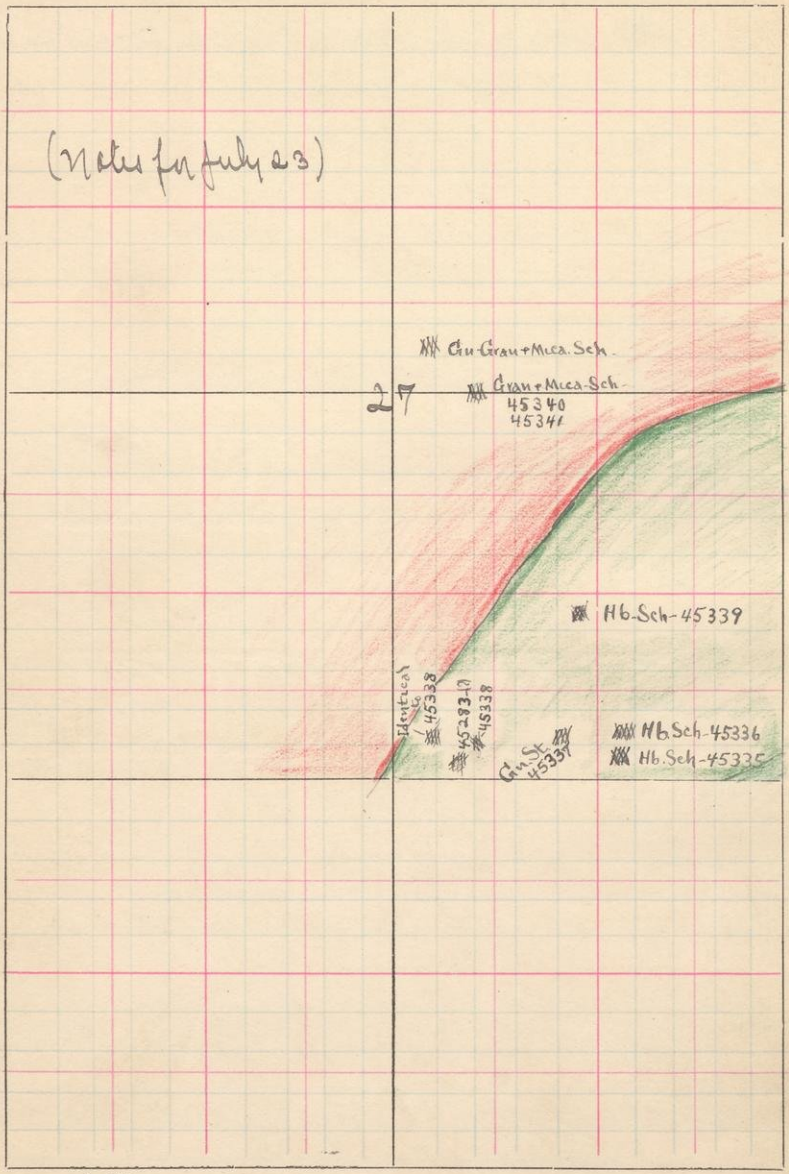
45333 Conglomerate containing fragments of a reddish slaty material.

This seems to form a film on the massive Quartzite — However, the dip of this film would seem to carry it under the sand like material at this end of the falls — However, no conglomerate is seen below the sand-stone and it is

it necessary to assume that the conglomerate was laid down on an even surface

S. 27 T. 58 R. 21

(Notes for July 23)



July 23 – Starting at S.E. cor 27-582 ran W 600 steps.

45335 At 487 W 40 N is outcrop of Hornblende-Schist containing some quartz veins.

45336 At 487 W 183 N of line is another outcrop of Hornblende-Schist. The structure of this exposure is not so schistose as that of the one just S.

45337 At 600 W 106 N is exposure of Green-stone.

45283 At 755 W 50 N is exposure of a basic crystaline rock closely allied to Green-stone. The surface of this outcrop is polished and grooved by glacial action.

This rock appears to form the core of this hill for exposures of it are to be seen on both the north and south sides – and it further appears to have the relationship of a dike to the surrounding rocks for on both sides of it – on the N.E. slope and N.W. slope of the hill – is a rock very similar but very noticibly of a more finely crystaline texture. The specimen

45338 which is of this last mentioned rock, was taken from the N.E. point of the hill at about 800 W 120 N from S.E. cor of sec.

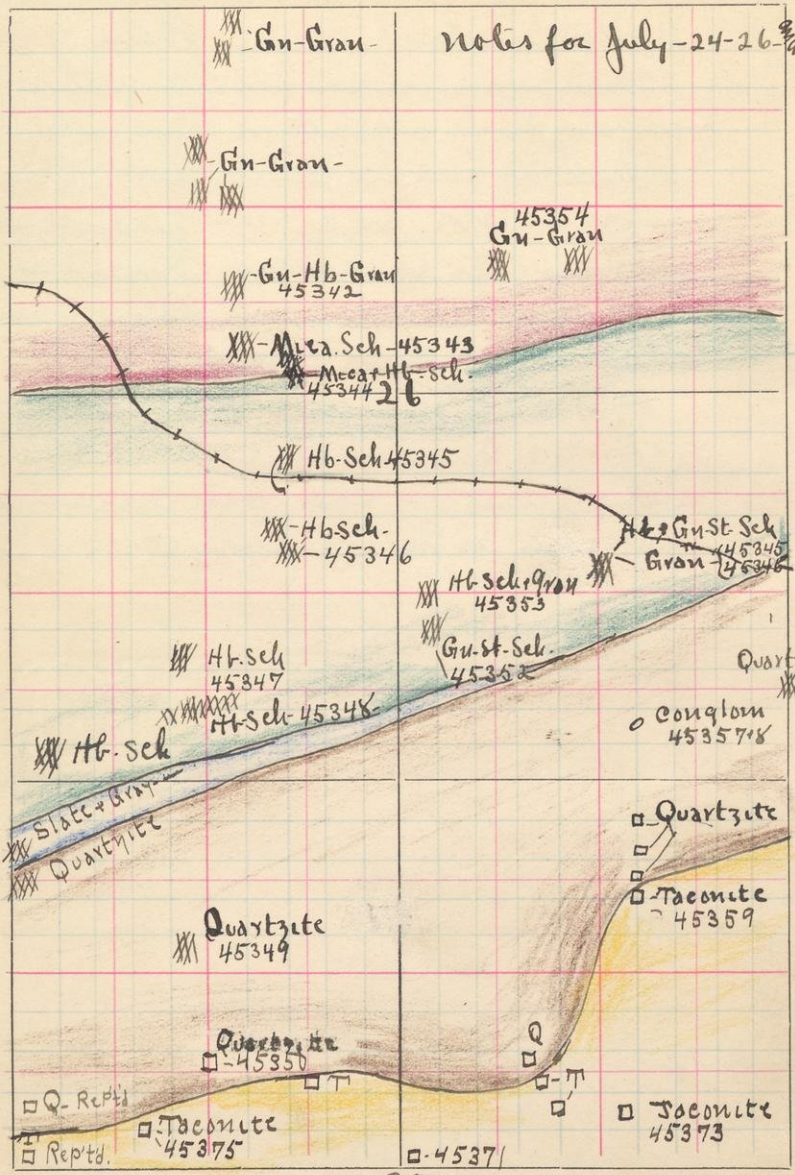
The contact of the two rocks was not found.

Hbl. Sch.

45339 At 525 W & 446 N is exposure of Hornblende Schist
The dip of schistosity 78° N. Strike N 50 E.
This exposure shows alternating layers
varying from a fraction of an inch to
several inches in thickness, green and
brown in color, and very persistant
following the secondary structure -

Diorite
45340 At 1000 N & 800 W is out crop of Granite,
45341 Mica Sch containing scattered fragments of Mica-Schist -
At 1130 N & 900 E in bottom of R.R. cut is
out crop of Gneissoid-Granite containing
mica-Schist - This rock is similar to
that seen in the exposure at 1000 N & 900 W.

S. 26 T. 58 R. 21



6—747

35

July 24 – Starting at 500 steps E of the N.W. Cor. 26-58-21 ran South. Outcrops of gneissoid granite are numerous until 750 S & 620 E is reached – Here is an exposure
45342 of hornblende-gneissoid-granite having a slightly pinkish color.
At 870 S & 690 E is an exposure
45343 of mica-schist – The schistosity is about N 65 E and dips at about 90°
A little to the S.E. (900 S + 710 E) is another similar outcrop of Mica-schist, and hornblende schist. The mica-schist forms the larger part of the exposure, the
Hb-chl. Sch 45344 hornblende schist ~~dips~~ lying on the southern side of ledge.
At 1129 S & 700 E in RR cut is an
Hb+chl. Sch 45345 outcrop of hornblende-schist – The schistosity strikes about N 60 E –
At 1326 S & 675 E is exposure of Hb. schist
45346 " 1400 " " 700 E " " " " "
45347 " 1675 " " 425 E " " " " "
and this is intruded by a gray Granite.
Hb+Mica Sch 45348 At 1810 S & 475 E is an exposure

of Hb-schist. Into this exposure which runs for about 200 paces along the ridge is intruded a fine-grained gray granite.

45349 At 420 E and 435 S from N.W. cor 35-58-21 is outcrop of quartzite.

45352 At 400 N and 95 E of S 1/4 post 26 is an outcrop having the surface weathering of green stone - The rock is green stone schist.

45353 At 500 N and 990 W from S E cor sec is outcrop of fine grained light colored granite and Hornblende-schist

45354 At 1370 N and 750 E is exposure of pinkish, gneissoid hornblende granite and is the southern most outcrop of this granite found here.

45350 - Pit in Dacite. See map for location

July 26 — Ran S along 16 line at 500 W of E line 26 - beginning at 1000 N -

45355 At 1460 S and 500 W from NE cor is exposure of horn blende schist with intrusions of light colored granite. In this exposure are patches of green stone with the same light colored granite intrusion - the

45356 specimen 45356 shows both the granite and the green stone schist.

At 1825 S and 400 E from NE cor was found a conglomerate at float.

45357 Specimen of conglom

45358 Pebbles from " -

At 1900 N and 400 W from SE cor 35 is ~~45359~~ ~~but~~ put in quartzite.

At 1700 N and 400 W " " " " "

45359 put in Jasperite - Between these two pits are two others both in quartzite.

~~At 1500 N and 400 W~~

Starting at the S.E. corner 26 ran N - Just N.E. of corner in 25 is an exposure of quartzite.

At 230 N of corner is outcrop of quartzite.

On 25 at 1525 N and 1780 W from SE cor is an exposure of a pinkish colored quartz-feldspar Hornblende Granite.

At 1380 N and 1580 W of SE cor of 25 is 45360 outcrop of quartz-feldspar-hornblende-gran.

At 1425 N and 1500 W is another outcrop of granite similar to 45360.

At 1300 N and 1450 W is exposure 45361+62 of Granite and mica schist

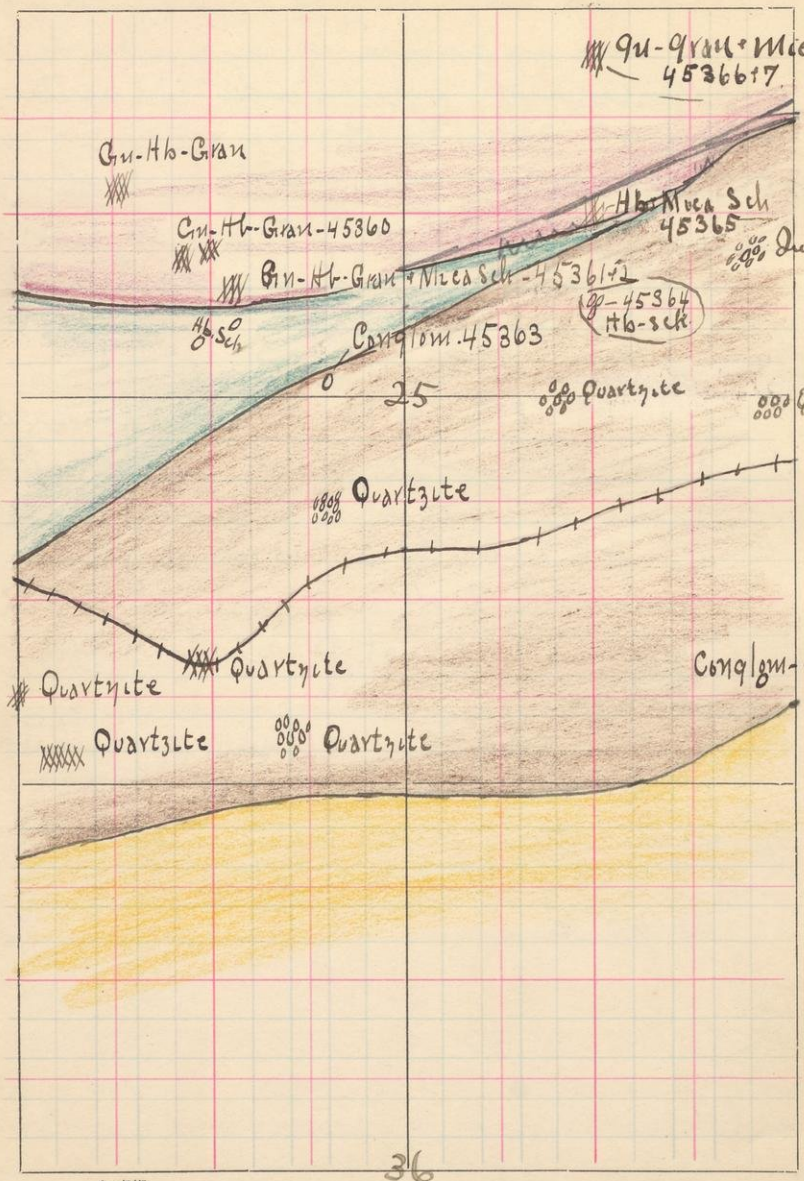
At 1050 N and 1200 W is found a conglomerate float - evidently from the base of the quartzite.

45363 At 720 N and 1200 W is a mass of roughly broken quartzite boulders which are not far removed from ledge.

At 140 N and 1300 W is another mass of roughly broken quartzite blocks indicating ledge.

Magnetic variation here is N 45° E.

S. 25 T. 58 R. 21



36

6—747

July 29 - Starting at RR tracks near middle 25, Ran S along ¼ line.

At 936 N and 570 W from S E cor 25 is a mass of broken quartz ite boulders indicating nearness to ledge.

45364 From float at 1292 N and 500 W from S.E. cor.

At 500 W and 1600 N is outcrop of Hornblende and Mica Schist

45365 At 1900 N and 500 W is exposure of

45366 45367 pinkish gneissoid - granite and Mica Schist The granite forms larger part of the exposure -

At 2000 N and 500 W is exposure of granite identical to 45336

At 1410 N and 190 W from S E cor is a broken mass of quartzite boulders.

At 800 N and 100 W drop found a

45368 conglomerate float.

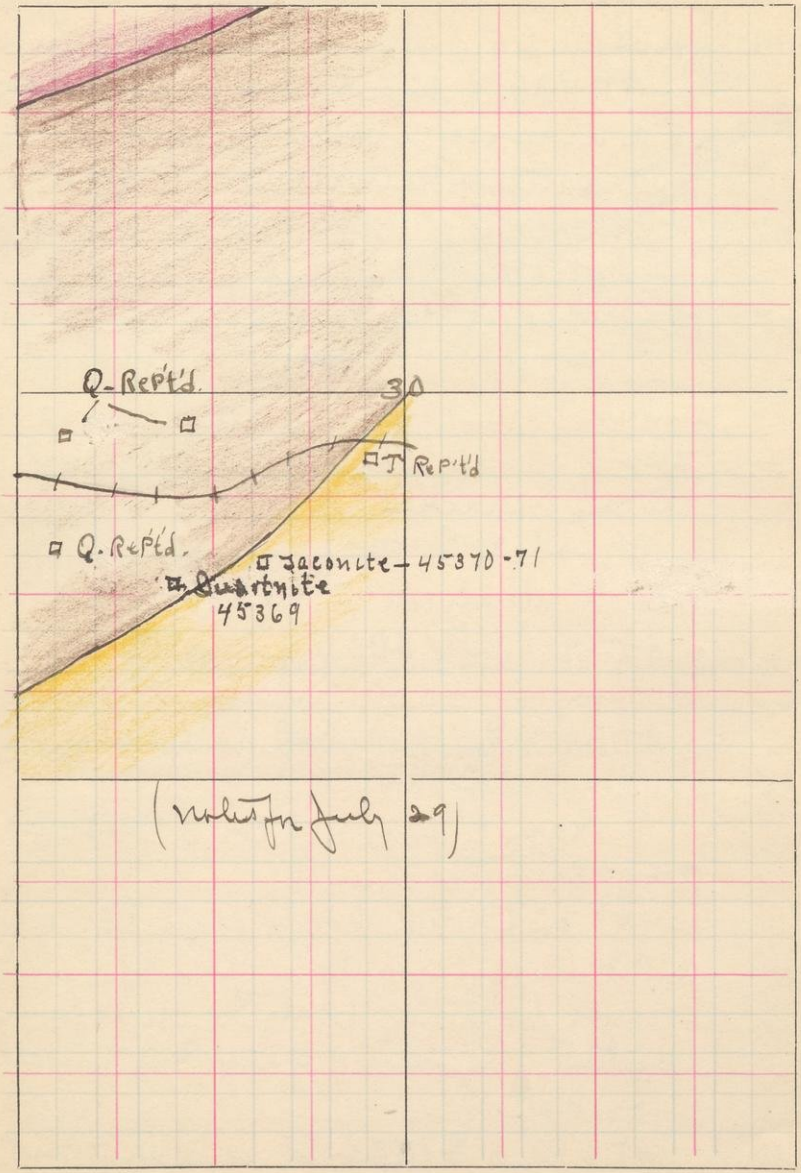
Ran E from S.W. cor. 30-58-20 to 500 steps and then N.

At 625 N and 1620 W from S.E. cor 30 is

45369 a pit in quartzite - The quartzite shows both the slaty and massive varieties, the being grey and unaltered by oxidation.

At 650 N and 1390 W is a test pit bottomed in quartzite - It may be

S. 30 T. 58 R. 20


Q-Rep'td.
30
T Rep'td
Q. Rep'td.
Jaconite — 45370-71
Quartzite
45369
(not in for July 29)

that a thin layer of Taconite rests above the Quartzite - The specimin
45870 was taken from what may have been a water worn boulder.
45871 A few slaty fragments were found on the dump

July 30 - Starting on N-S 1/4 line at R.R. track near middle of 30-58-20. Ran N to middle 19 - Thin W to 1/16 line then S to R.R. track -

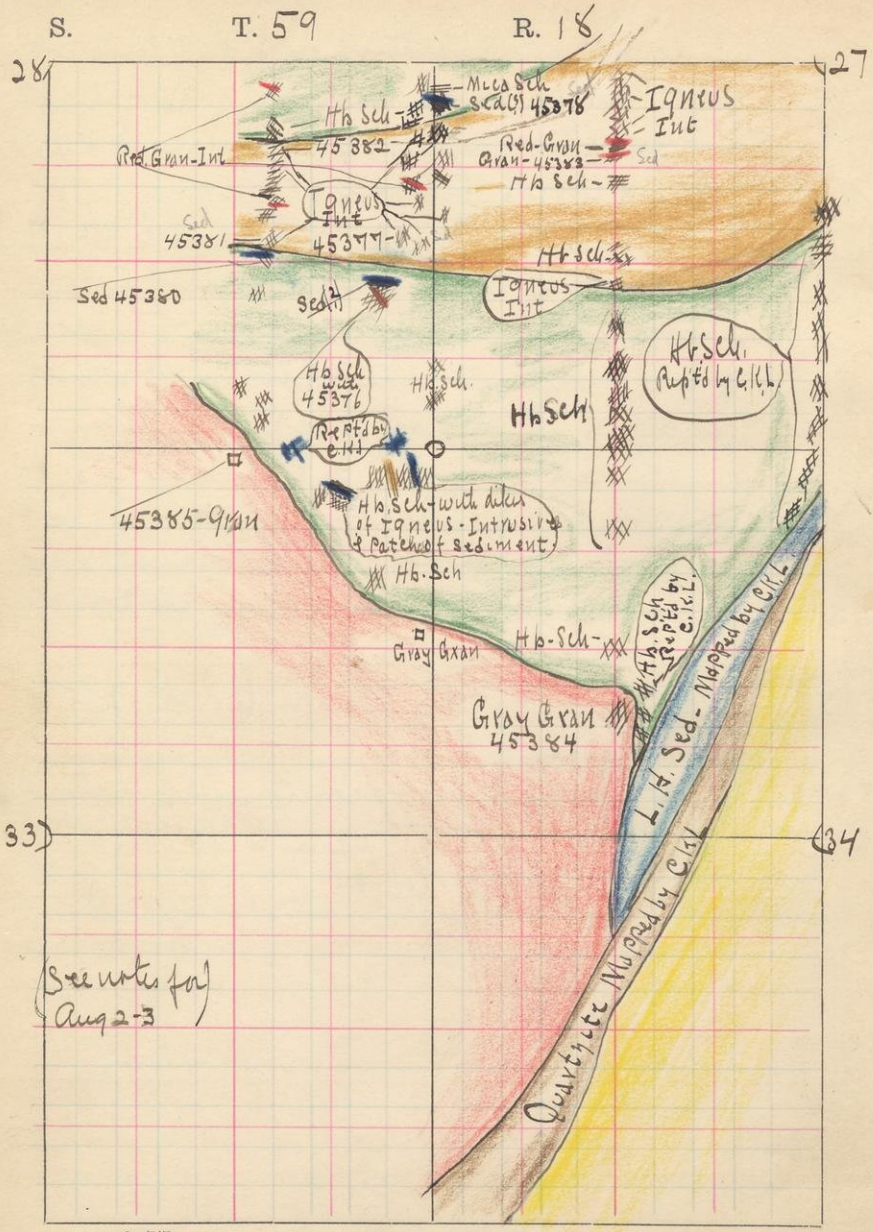
At 615 N and 1000 W from S.E. cor 19 is outcrop of quiescoid - Hornblende - Granite - This does not have the pinkish tinge seen in the granite found in 25-26 just W of here -

Starting at N.E. cor 35-58-21. Ran S 500 - W 500 - S 500 and W to 1/4 post - Magnetic variations from 0 to 120° were noted in crossing this section.

45373 From pit in Taconite at 1170 N and 410 W from S.E. cor.

45374 From pit in Taconite near center of 35

45375 From pit in Taconite at 1690 W and 900 S from N.E. Cor. 35 -


S.
T. 59
R. 18
28
27
33
34
Hb Sch - 45382
Mica Sch Schist 45378
Igneous Int
Red Gran-Int
Red-Gran Gran - 45383
Hb Sch
Igneous Int 45377
Sed 45381
Sed 45380
Schist
Igneous Int
Hb Sch
Hb Sch with 45376
Hb Sch
Hb Sch Ruptd by G.I.L.
Ruptd by G.I.L.
Hb Sch
45385-Gran
Hb Sch - with dikes of Igneous - Intrusive & patches of sediment
Hb Sch
Hb Sch Ruptd by G.I.L.
Gray Gran
Hb Sch
Gray Gran 45384
L. H. Sed - Mapped by G.I.L.
Quartzite Mapped by G.I.L.
See notes for Aug 2-3

Aug 2 - Starting at SE cor 33-59-18
Ran N two miles.

At 1625 N & 130 W is a pit in light gray Granite similar to that found in the rocks West of here.

At 1690 N & 140 W found outcrop of Ht Sch.
" 1910 " " 134 " " " " " " " "

This outcrop runs east & here in a series of exposures for about 150 steps
At about 1910 N & 100 W is exposed what appears to be a dike of fine grained quartoid granite - This exposure is surrounded on all sides except the S by Ht-Sch -

At about 1905 N & 90 W is exposed a small patch of sediment, enclosed in Ht. Sch -
It has the peculiar white weathering, characteristic of the Lower Huronian sediments here, and a very pronounced bedding The cleavage follows the bedding planes and is marked by a development of mica. The rock contains rounded quartz grains - Strike - N 37 W - Dip 42° to N.E.

At 1893 N & 230 W is an exposure of the gray, intrusive, granite found a few hundred paces east - I think this would not be called a granite

S. T. ~~5 N~~ R. ~~1 E~~

2-3

21

22

Hb, sch - with - Red Grain - Int -

45888(?) Meta-sch Acid-Igneus

Hb-Sch.

Hb-Sch

Acid-Igneus 45389

45379 - Sed(?)

Hb-Sch

Igneus - Int

25

27

6—747

exactly - probably the term Acid Igneous would be more accurate - It is different from the granite found in the pit to the S of here and from the granite found W of here - It is much more finely crystalline - About this rock is found Hb-Sch and resting upon the Hb Sch is a patch of sediment - The bedding in this Sed. is well shown it being noticible even from a distance - The weathering has removed the softer layers at the surface and the the alternating ridges and depressions thus formed, leave no doubt as to the character of the rock. - Black mica is developed along the bedding planes.

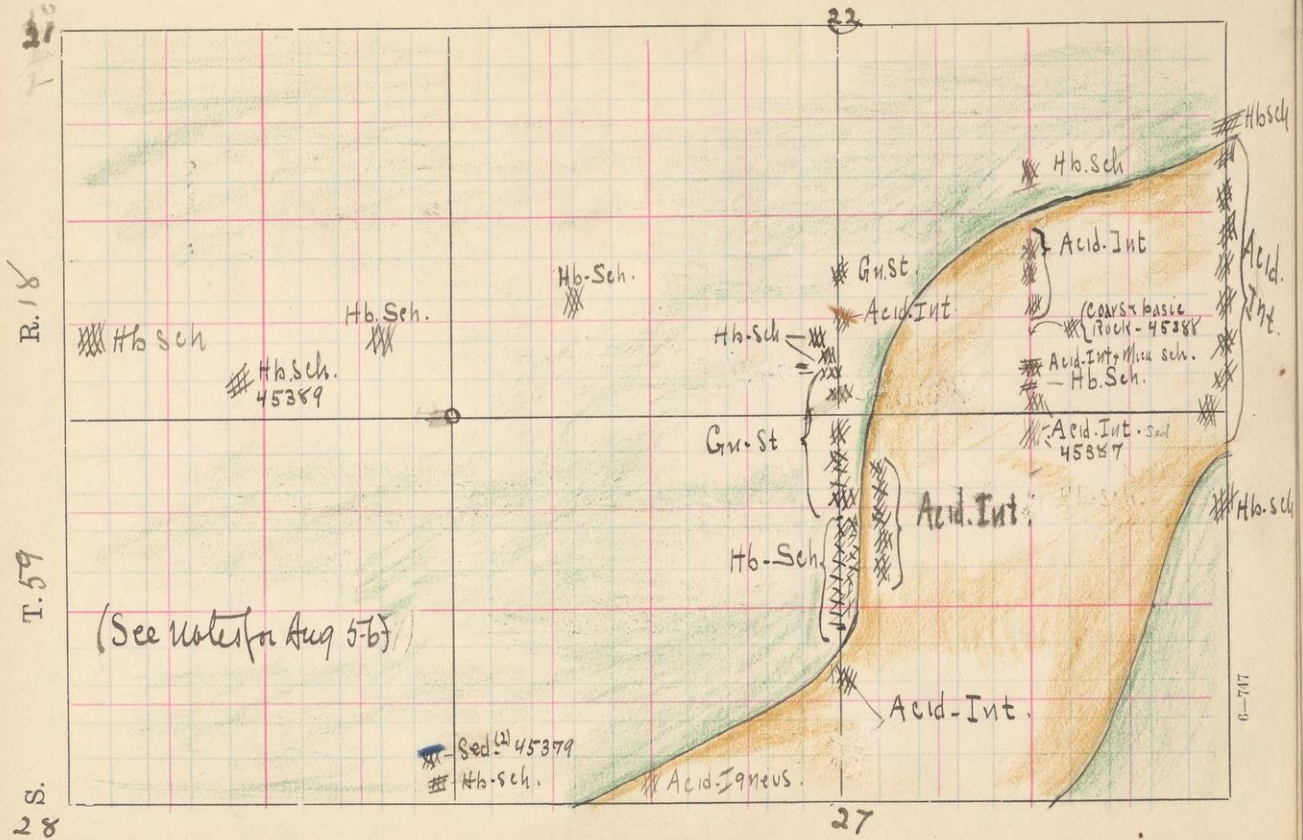
At 1895 N 250 W is exposure of Hb. Sch
At 1691 N 0 W from SE Cor 28 is exposure of Hb Sch
" 400 " " 120 " " " " " "

Sed 45376 through which cuts a dike of Acid Igneous rock

This dikes forms the crest of a ridge along the flanks of which is the Hb. Sch.

At 420 N 130 W is small patch of sediment - has very light color on weathered surface and bedding planes are plainly marked

At about 500 N and just W of the line is a hill composed of Hb. Sch & the Acid Igneous


22
27
28
R. 18
T. 59 S.
Hb. Sch
Hb. Sch.
45389
Hb. Sch.
Hb-Sch.
Gr. St.
Acid Int
Hb-Sch
Gr. St
Hb-Sch.
Acid. Int.
Acid-Int.
Acid-Int.
Acid. Int
coarse basic Rock - 45388
Acid. Int. Mica sch.
Hb. Sch.
Acid. Int. Sed
45387
Hb. sch
Hb. sch
Acid. Int.
Sed. (?) 45379
Hb-sch.
Acid. Igneus.
(See notes for Aug 5-6)
G—747

Sed
45377 Intrusive found S of here as dikes -
This is fine grained gray - The south
end of the hill is composed mainly
of this rock - Through the hill
are dikes of a coarse grained
pinkish Granite and it is cut by
veins of quartz -
At 900 ft N Side of hill is exposure of
Sed what may be sediment - This is in contact
45378 with Mica-sch - (Specimen is of the sediment)
Sed
At 1180 ft 80 W is outcrop of what may
45379 be sediment -
Ht Sch
From here on to corner is drift -

Aug 3 - Starting at 1/16 past 500 steps E of center 33 - 59 - 18 - Ran N -

45385 At 1990 N 9m W from SE cor is ~~pt~~ in a reddish granite -

At 80 N 9m W from SE cor 28 is ex poor of Hb Sch

" 110 " " 438 " " " " " " "

" 170 " " 500 " " " " " " "

" 400 " " 480 " " " " running almost due N on E side of ravine is an exposure for 500 steps of Hb. Sch - Acid Igneous Rock and Sediment. The Hb. Sch forms greater part of the exposure, the Acid Igneous rock which is intrusive next and the Sediment only a small part -

45380 At 600 N 9m W 415 W is the sediment - Sed The sediment rest upon the Hb. Sch. and the bedding planes are well marked -

Strike N 55 W - Dip 28° to N.E.

45381 At 570 N 9m W 430 W is an exposure of Acid Igneous Rock Hb Sch

45382 A large part of the northern end of the exposure is composed of this kind of rock

At 690 N 9m W 450 W is a large dike of the coarse red Hb Sch granite found only farther E -

At 840 N 9W/1450 W is exposure of Hb. Sch.
" 925N 9W/q " " " " (dike) of the coarse red granite (dike) found on hill to the E of here.

At 200 N 9W/q ~~Hb~~ 200 W in 21-59-18 is an exposure of Hb. Sch

At 300 N 9W/1700 W in 22-59-18 is exposure of Hb. Sch with red-granite intrusive.

At 1054 N and 1500 W in 27 is an exposure of ~~red~~ quartz rock similar to 45381 9W/45377.

Almost one continuous outcrop of this rock runs S for 300 paces - with this are patches of Hb. Sch. - at some points they seem almost to grade from the one into the other.

At about 870 N 9W/1570 W this is cut by a dike of coarse red granite, similar to that found on hill further west.

The Hb. schist is becoming more plentiful -

45383 Sediment.

At 754 N 9W/1570 W is exposure of fine-grained greenish-quartzoid gran which weathers to a pink.

At 700 N 9W/q 1500 W is Hb. Sch with the Red Quartz Rock Intrusive in it.

At 670 N the Red Quartz Intrusive rock is found again and continues in a

series of outcrops to 5240 N. Here it again seems to grade away into Hb Sch.

At 3380 N and 540 E is exposure of coarse Hbl Quartz Diorite.

At 3330 N & 1570 W is outcrop of Hb. Sch

" 2230 " " " " " " "

" 1720 " " " " " " "

" 1140 " " " " " " "

" 500 " " " " " " "

" — " 1500 " " " " "

At 1876 N & 1570 W in 34 is exposure of Hb Sch

" 1800 " " " " " "

" 1500 " " " " " "

" 1326 " " " " " Gray

45384 granite. This is similar to the granite found on the western end of the Range.

Aug 4- Dips in the Mt. Iron. Open pit.

At lowest level, on east side of pit going South.	At second level on east side of pit going North.
8° to S.	19° to S.E.
1° " "	3° " N.W.
5° " "	5° " N N W.
10° " S S W.	11° " S.
7° " S.E.	20° " S.E.
3° " S.	40° " "
30° " S S W.	6° " E
6° " S.	39° " S S W
4° " N.	44° " "
4° " "	4° " E.
9° " "	6° " N.W.
8° " S.	0° ——
8° " S.	6° " N.W.
5° " N.E.	5° " "
10° " N.N.E	7° " S.W.
6° " S.	20° " "
22° " "	8° " S.E.
36° " N	15° " W
20° " "	20° " W
2° " E	
0° ——	
11° " S E	

Aug 5 - Starting at 500 steps W of S.E. cn 27-59-18 Ran N - 3373 Steps Starting from N W cn 27 - Ran N 1500 steps - W 500 - starting from N.W. cn 27 Ran W 1000 ag/q S to P R Track.

At 4701 N ag/q 455 W in 27 is exposure of Hbld

Sediment 45387

At 1950 N ag/q 500 W in 27 is an exposure of Acid Igneous Rock similar to that found 1/2 mile S ag/q 1/2 mile W of here - The Quarter party this hill is covered by glacial drift, this being the only outcrop visible, but it is believed that the whole Western slope of this hill is underlaid by this Granite as is the hill just N in SW -

At 2000 N ag/q 500 W is outcrop of Acid Igneous Rock, similar in many respects to that just S of it, but showing indications of gradation into Hbl Sch as was noted on the hill 1/2 mile S ag/q 1/2 mile W.

At 5400 N ag/q 500 W from SE cn 22 is exposure of Hbl Sch - One place was noted in which the relations of this to the Acid Igneous Rock was that of the former intruding the latter.

At 100 N ag/q 500 W is the Acid Igneous Rock with some mica-schist.

45388 Hf Sch

At 210 is exposure of coarsely crystaline bluish basic igneous rock.
At 261 N is exposure of acid intrusion
" 370 " " " "
" 400 " " " "
" 610 " " " "
Ran N to 1372 in 22 - Still in drift.
Starting at NW cn 27. Ran N to 1500 N Emg 100 W of corner - Here is is an exposure of a coarse bluish rock similar to 45388.

45386 Hf Sch In 28 - 750 N Emg 450 W

Aug 6 – Starting at S.E. cor 27-59-18, run N 2700 steps, W 1000, thence S 2700. At 650 N in 27 E/W 15 W from cor is exp of Hb Sch
" 1750 " — " " " "
At 2000 N E/W 30 W is the same Acid Igneous Rock which was found to the W and SW of here – The gradations between this and the Hb. Sch, noted then is apparent here also
At 645 N from S.E. cor 22 is exposure of Acid Igneous Intrusive – Between the outcrops and the one near the corner is one almost continual exposure of this Rock. This contains in places patches of Hb. schist.
At 700 N is exposure of Hornblende Schist.
At 350 N of Sec cor 22 E/W 1000 W is exposure of Qu. St.
" 250 " " " " Acid. Int
" 220 " " " 1050 " " Hb. Sch
" 178 " " " 1030 " " "
" 112 " " " 1010 " " Qu. St.
" 95 " " " 1050 " " Acid Int
Extending from 60 steps N of N 1/4 post in 27 to 220 steps S is an almost continuous exposure of greenstone
At 1828 N E/W 925 W from S.E. cor 27 is Acid Igneous Rock. This runs

runs in a series of exposures parallel to the ~~ground~~ quartzite here E-W almost due South - Near the contact is a fine ly crystaline Hb. Sch.

From 1760 N to 1480 N is an almost continuous exposure of Hb. Sch.

At 1440 N the Acid Igneous Rock comes in again..

At 1300 N E-W 1100 W in 27 is exposure Acid Igneous.

" 800 The Acid Igneous rock forms N side of Cañon - The South side of the Cañon (530 N) is of Hb Sch - and contains some Red Rock.

At 457 N on ¼ line is Hornblende. Schist.

" 367 " " " "

" 328 " " " "

" 300 " " " "

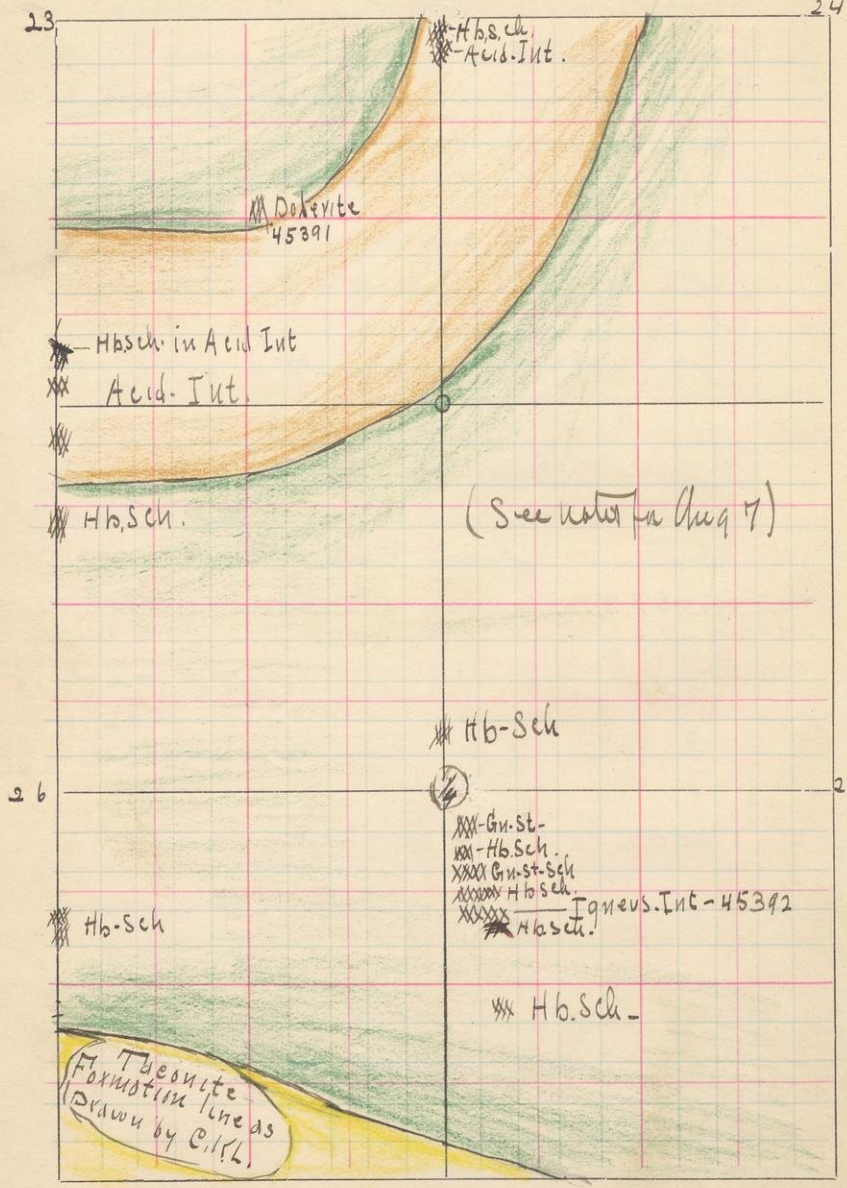
" 227 " " " "

" ~~2100~~ E-W 1075 W from SE cor is " "

45390 at 1100 W E-W 1900 N in 27

Distance

S. T. 59 R. 18



6—747

Aug 7- Started at S 1/4 post 26-59-18-
Ran N 2 miles. E 1/2 mile Thence S 2 1/2 miles.
At 625 N of SE cor 26 E/q 1000 W is exp of Hb Sch.
" 674 " " " " " " "
" 1700 " " " " " "
" 1910 " " " " " Acid Out.
" 55 " 28 " " " "
" 131 " " " " " "
" 152 " " " " " Hb Sch.
" 165 " " " " " Acid Out.
" 620 " " " 480 E exposure

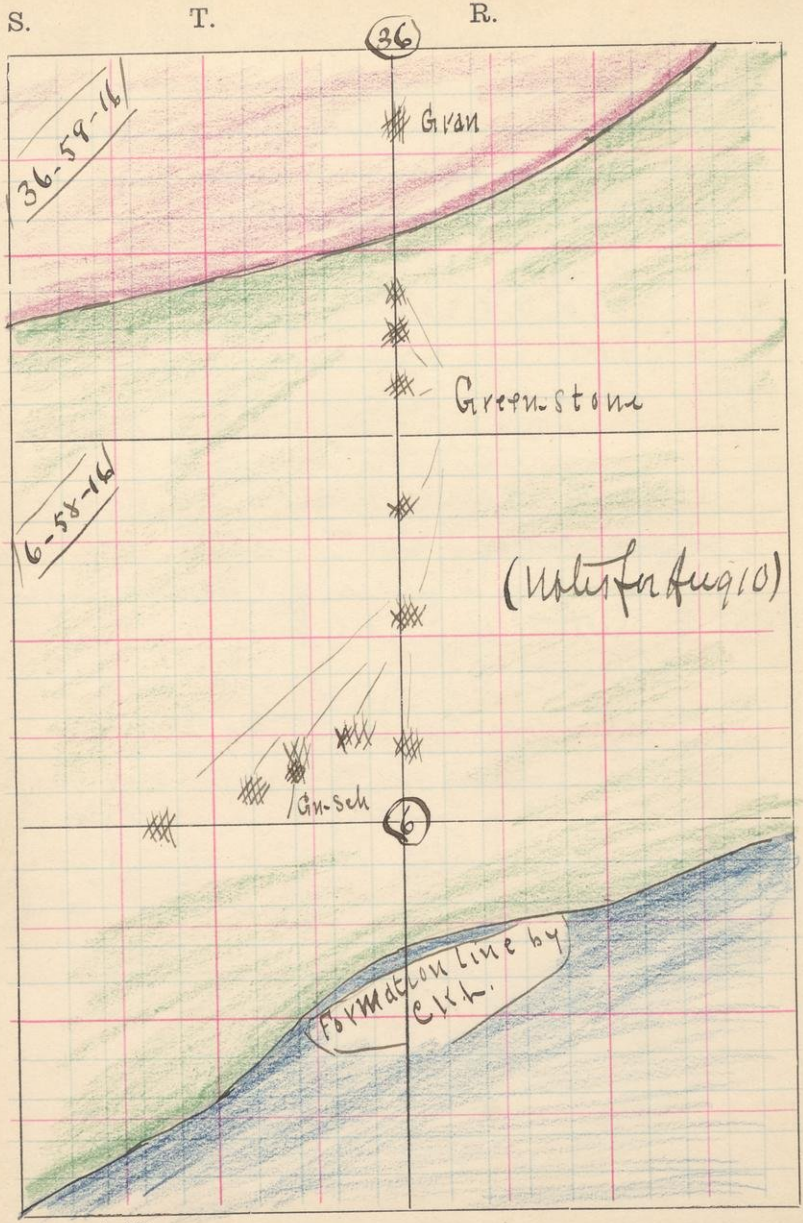
45391 of Dolomite in which is intruded a
Camptonite pinkish acid granite.
At 944 N from SE cor 23 is exposure of Hb. Sch
" 929 " " " " " Acid Out
" 1125 " " " " 26 " " Hb Sch
" 950 " " " " E/q 250 E " " Quartz.
" 859 " " " " " " " Hb Sch.
" 801 " " " " " 100 " " Quartz Sch
" 744 " " " " " 125 " " Hb Sch
" 700 " " " " " 150 " " outcrop

45392 of an igneous intrusive rock
At 680 N E/q 150 E of SE cor 26 is an exposure
of Hb Sch. with an acid intrusive.
At 465 N E/q 150 E from SE cor 26 is Hb Sch
At about 200 E and 300 N of SW

45393 } corner sec is fine grained acidic
45394 }

Aug 8 - Ran S. & E. line 9 3/4 16 - 58 - 17.
Quartzite and Qtz-schist were crossed as indicated on map.
New exposures were found at
1505 + 30E in Sec 15
6505 + 30E
45395 8005 + 30E - Pt.
45396 9005. exposure.
45397 1205 pat.
Returning via D. & R.R.R. and Victoria branch D.M.N. - Good exposures of Dam formation are seen forming E facing escarpment of
45398 the hill just S.E. of 11 1/4 post 16 -
The rock is very massive and consists of interbanded chert and diorite, both of them in very massive beds.
The dip was not measured but was estimated at 80° to the W.

S. T. R.


36
36-59-16
Gran
Greenstone
6-58-16
(Note for Aug 10)
Gn-sch
6
Formation line by
C.K.L.

Aug 10 - Starting at N.W. cor 6-58-16-
Ran S 1000 - E 1000 - N 2000 - W 1000 - S 1000

At 1570 W & 1000 N from SE cor 6 in exposure of qu-st.
" 1400 " 1100 " " " " "
" 1300 " 1240 " " " " qu-st-sch.
" 1190 " 1250 " " " " qu-st
" 1000 " 1220 " " " " "
" 1000 " 1525 " " " " "
" " " 1820 " " " " "
" " " 160 " " Sec 36-58-16 " " qu-st
" " " 282 " " " "
" " " 370 " " " "
" " " 805 " " " qu all

Gran-
Gran
sed. rocks by C.I.L.
Sed
46011
Gran-
Gran
rocks by C.I.L.
35
36
Taconite
Taconite
#5399
Gn-st-sch-
Gn-St
80
110
100
R.17
T.59
S.
6—747

Aug 11 - Starting at S.E. Cor 35-59-17
ran N 950 steps -

45399 At 580 N from corner is pit in Ta conite -
A few rounded boulders of quartz ite were
found on dump -
Located pits in Taconite as shown on Map.
Ran 250 W agg S to E 200 N agg 250 W of cor -
Here the needle showed variation
of 11-10-E.
Ran W 250 steps agg N 1300 steps
At 500 W agg 200 N needle showed
N 11 E
At 500 W agg 820 N from cor needle
shows N 9 E -
Ran W 250 agg S 600
At 750 W agg 1600 N is exposure of Granite.
Ran W 500 agg N 500
At 1500 W agg 1631 N from corner is Granite.
At 1500 W agg 620 N from cor is exposure
of quartzite schist -
Ran N to road -

Aug 12. Located pit in 33-59-17

The pit at 1196 N Aug 1210 W from SE cor 33-59-17 is based in a slaty

46000 micaceous quartzite. This is the last thrown out of the pit and forms a large part of the dump.

Above this harder quartzite is

46001 found more which is apparently the same the more decomposed and fissile.

The two above mentioned quartzites phases form the greater and the newer part of the dump.

A few small scattering pieces of Iron-formation are found on the

46002 part of the dump first thrown out.

Aug 13 - The last pit at NW cor 10
58-14 passes through a small thick-
46003 ness of Iron-formation and is bottomed
in quartzite - Between the two
formations is a very limonite
The Iron Formation shows the
banded type of the area.
The quartzite is the massive
siliceous type and is stained
red by iron oxide.
At 150 E and 200 N from SW cor 3 is
pit in quartzite - The quartzite
is massive and of a reddish
color. No indications of
Iron formation are present.
At 300 N and 350 E a pit appears
to pass through much weathered
46004 quartzite (stained red and brown
by iron) and is bottomed in
banded red ore.
At 620 N and 220 E a pit which
passes through Iron formation
and is bottomed in basal conglom-
of that formation.
At 520 N and 150 E a pit bottomed
in quartzite.

At 965 N 330 E is pt in banded quartzite - No indications of Iron-Formation

46005 At 1350 N 525 E is pt in qtz-stockwork.

Aug 13 –

Dips from Open pt at Virginia

Going W to
mouth of
pt – S. side
9° to the NW
7° " "

Across syncline at
upper end of pt.
from S to N:
21° to NE
9° " "
19° " SW.

12° to SSW (going W on
35° " " N side
30° " "
20° " "
15° " W
40° " SSW

The S slate above the mine dips at
15° to the West.