Vermilion district: [specimens] 29918-29956. No. 317 Summer of 1898

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.

29918-29956

Notebook ~~18~~ 317

Cont. from 316.

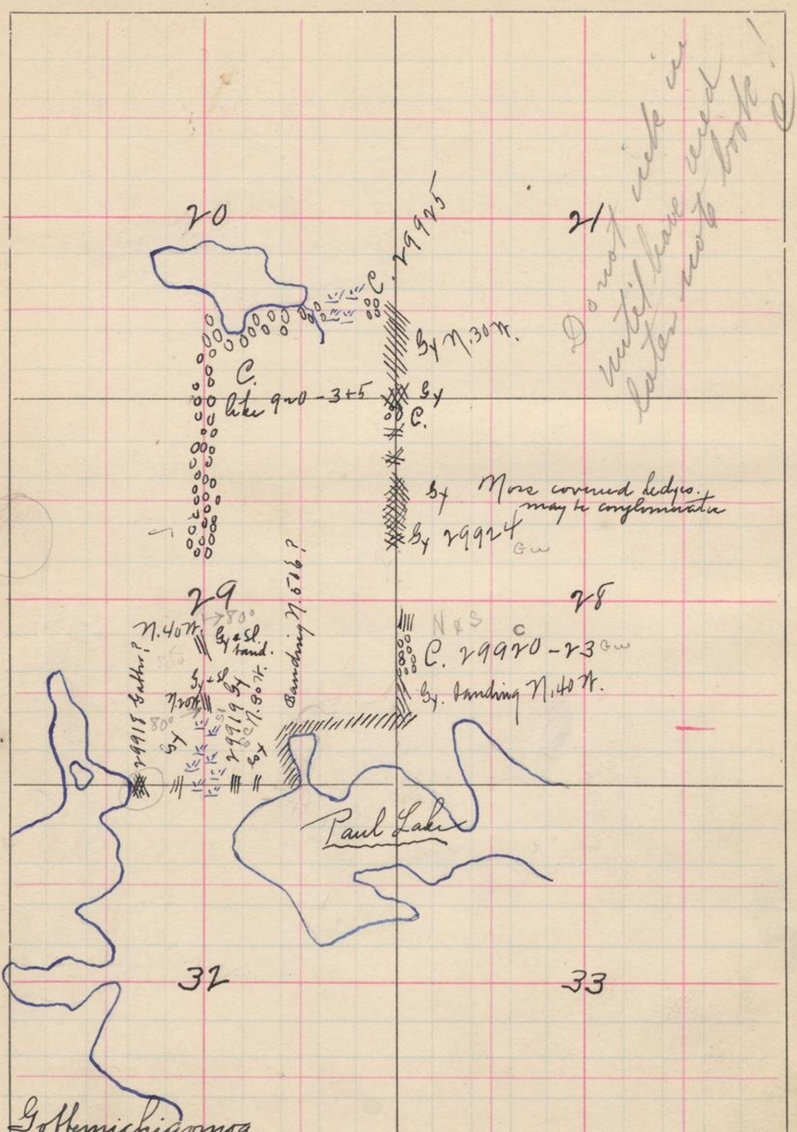
Vermilion district,

Summer of 1898

C. K. Leith

Ira Wells, Compassman.

S. T. 65 R. 5


20
21
C. 29925
Gy N. 30 W.
C.
like 920-3+5
Gy
C.
Gy More covered ledges.
may be conglomerate
Gy 29924
Gw
29
28
N. 40 W.
Gy & Sl. band.
Banding N. 60 E.?
N & S
C. 29920-23
Gw
Gy. banding N. 40 W.
29918 Gabbro?
Gy + Sl
N. 20 W.
80°
Gy
29919 Gy
N. 80 W.
Paul Lake
Do not write in until have used later note book!
32
33
Gottemichigomog.

Sept. 9, Vermilion district.
1898.

Ran east on the south line of 29 from Gobbemichigomog, to the east line of 29, then north to 500 N. in 20, then west 1000 paces, and back on the quarter line to the south line of 29.

29918. At the shore is a hornblende feldspar rock. Gabbro? Similar to 29915. The shore is 600 E. of the SW corner of 29.

This material continues to 750 E.

800 E. is graywacke, like 29919. Moss covered, no strike.

29919. 1350 E. o is graywacke. Moss covered ledge. Could discover no banding. The schistosity strikes N. 30 W.

1440 E. same thing, same strike.

1630 E., strike lake. Here are large exposures of the same rock.
Offset lake, as indicated on plat, and found same rock around shores.

1740 E., 275 N. on the north bank of the bay, is a large bare knob of graywacke, some of which is cherty. Here there is ~~typical~~ doubtful banding which strikes N. 50 E. The dip is 15 S.

This material continues east to the section line.

At the line is the first typical banding I have seen during the day. The strike is here N. 40 W., and the dip east.

This rock continues to 525 N, with same strike. Here is a large knob of conglomerate.

29920
29921. This conglomerate is very similar to the greenstone conglomerate of Moose lake. There are no jasper nor granite fragments. The fragments are mainly of various kinds of greenstone. The predominant fragments are of a dark porphyritic rock, in which hornblende phenocrysts stand out on a lighter colored background.
29922, one of these fragments. Similar material also forms a large part of the matrix. Some of these porphyrite pebbles remind me of the porphyrite knob south of the east end of Knife lake, north of Kekequabik.

One or two undoubted black chert fragments were seen. Certain of the dark hornblendic pebbles on weathered surface look like gabbro.

A little farther north, undoubted banded slate and chert pebbles are seen.

29923 is an average of the matrix material perhaps.

Just beyond the conglomerate is interbanded with banded slate and chert, and graywacke. The strike is almost due N and S.

The banded slate and graywacke now replaces the conglomerate, and continues to 850 N.

29924. 1300 N. Graywacke. This continues in rather rare exposure, moss covered, to 1950 N. At one or two places, I thought I could discern a banding, but of this could not be sure.

At 1950 N. is conglomerate. This has yellowish-weathering pebbles, which are entirely greenstone, so far as I can see. Similar to 29920-22. However, the exposure is very small and moss covered, and could make little out of it.

2000 N. is what I would call a greenstone, but still it is similar to the rock showing pebbles a little farther back. 50 paces farther on, apparently the same rock turns out to be a decided graywacke, so first one also graywacke.

150 N. in 20 is typical banded graywacke and slate, striking N. 30 W..

Typical graywacke continues to 500 N., sometimes rather coarse, and approaching a grit.

29925. At 500 N., and 35 W., is a conglomerate. Good exposures,s similar to those to the south (29920-3) No granite nor jasper fragments are seen. Can this be a fragmental form of the porphyrite seen on the s run south from West Gull lake?

Continues to 250 W.

The conglomerate appears again at 300 W.

Continues west to the quarter line. The continues south as far as 850 S. in 29, in very frequent, but moss-covered exposures.

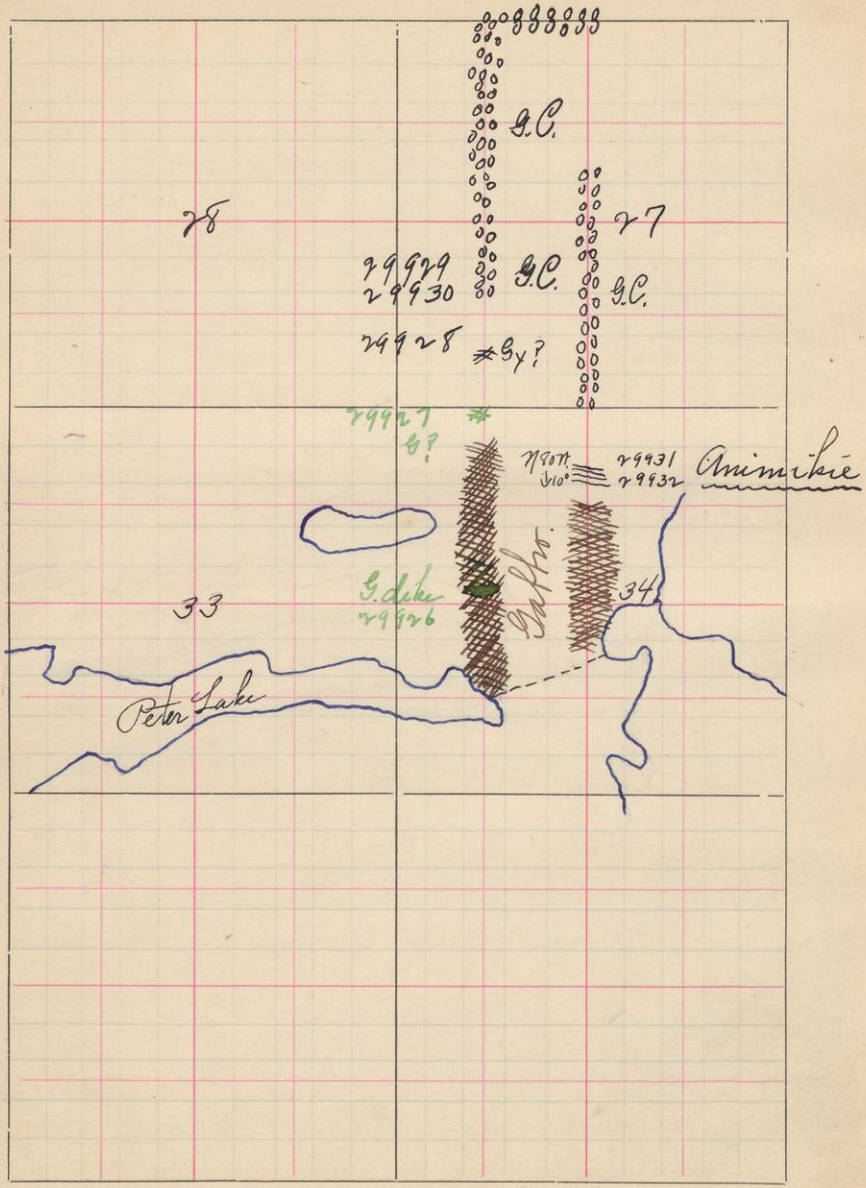
Taking this conglomerate as a whole, it is identical with the conglomerate to the south (29920-23), except that at the north end the dark extremely basic fragments are apparently lacking. It looks to me as though this is a basal conglomerate which has here derived most of its detritus from the greenstone and green schist to the north, i. e., that lying south of West Gull lake. This seems plausible, as it comes against the green schist and greenstone (here a porphyrite), and contains no granite pebbles, while to the northwest it comes against the granite, and there contains granite pebbles.

At no place was the bedding of the conglomerate decided enough to afford satisfactory strikes.

At 1250 S. is typical banded graywacke and cherty slate, striking N. 40 W., and dipping about 10° E.

1520 S. in typical banded graywacke and cherty slate. Strike is N. 20 W., and the dip 10° E.

S. T. 65 R. 5


G.C.
78
77
79929
79930
G.C.
G.C.
79928
Gy?
79927
G?
N 80° W
S 10°
79931
79932
Animikie
Gabbro.
G. dike
79926
33
34
Peter Lake

6—747

Sept. 12.

Ran north from the portage trail at the east end of Peter lake, north in 34 and 27 to the north line of 27, offset east 500 paces, and back south to the east end of the same portage trail.

At the trail is the gabbro in massive exposure. This continues to 1300 N.

29926. At 615 N. of the portage trail is a dike of basic fine-grained greenstone in the gabbro, 6 inches wide, and of uniform width. Strike is N. 80° W.

The gabbro continues to 1300 N. Then after a deep valley is crossed, we reach a high hill of massive exposures of

29927, greenstone? or ffagmental? Forms high hill running to 1500 N. where we strike section line.

29928. At 375 N. in 27 is a low moss-covered exposure of graywacke.(?)

This rock continues to 550 N. in frequent exposure, presenting in most exposures the aspect of a massive greenstone.

Later work to the east raises the question whether these rocks are not a continuation of the Animikie. If so this carries the Animikie much farther to the west than it has been supposed to go.

29929. Greenstone conglomerate. This is apparently a continuation of 29928. I can discover no break. Seems to be a conglomerate phase of the same formation. The fragments are nearly all of greenstone, but there are also a few undoubted white-weathering chert fragments, 29930.
29930.

The conglomerate strikes me as identical with that seen on the NE end of Lake Gobbe-michigomog in my previous run.

This conglomerate containes in frequent, almost continuous, exposure to the north line of 27, where we turn east for 500 paces
It is everywhere very massive, and in no place were we able to get a satisfactory strike. The ridges seem to trend in a general N and S. direction.

The conglomerate continues east on the offset 500 paces.

Ran south.

780 S. is massive exposure of the typical greenstone conglomerate.

Continues in frequent exposure to the section line.

330 S. in 34 is a high, south-facing ridge of greenstone conglomerate, fine grained. In fact but little coarser than 29928.

29931. At 370 S., just across the valley there is a ridge of banded ferruginous material. (Discovered later to be Animikie material) The strike is N. 80 W. and the Dip is 10° S.

29932. . The coarser bands are very quartzose. 29931 shows the banding of the coarse material and the ore. 29932 shows the coarser quartzose material. The ore is magnetite with probably some nickel in it. On weathered surface the quartzose material is white, and looks like quartzite. Continues for 100 paces.

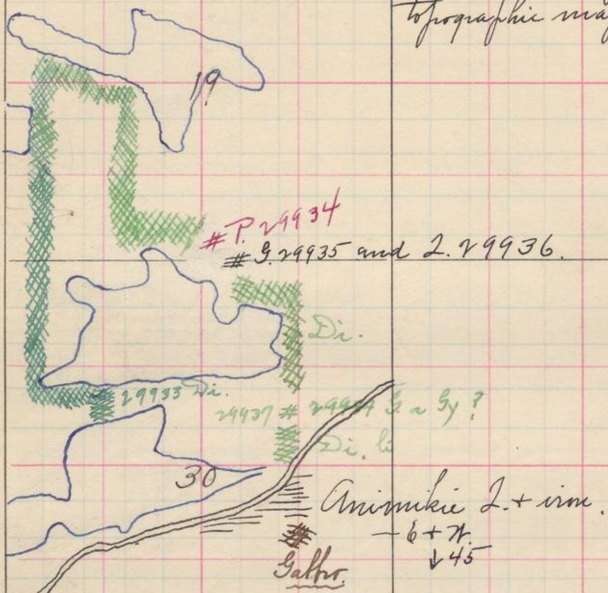
The entire exposure ~~is~~ lies between the greenstone-conglomerate on the north and the gabbro on the south.

At 550 S. is undoubted coarse massive gabbro.

The gabbro continues to end of run, at east end of portage trail, 1280 S.

S. T. 65 R. 4

Lakes taken from topographic map.



Sept. 13.

In 30-65-4 ran north on about the west eighth line, to cut off Animikie series.

29933. At the shore is massive diabase.

For the entire run, as indicated on the map, down to the south line of 19, there are almost continuous exposures of massive diabase, varying in texture. Some are very fine grained, and others coarse and ophitic The fine grained phases are in places like 29937, which is probably a greenstone, but which I think possibly may be a fragmental. However, such phases rare.

From the south line of 19 south to the wagon road the variations are marked on the map. Here are several undoubted exposures in which graywacke is associated with the diabase.

The undoubted Animikie is found first on the south side of the log road. The strike is N. 80 E, and the dip 45 S. The gabbro is found 140 S. of the road.

29934. Porphyry. 1000 N., 500 E. of the starting point. No relations, but apparently cuts diabase.

29935. At 865 N., 565 E. of starting point is greenstone (35) apparently interbanded with
29936, quartzite? The banding is indefinit

but has a general strike of N. 70 E. No dip could be made out.

29937. Greenstone or graywacke. 125 N. 900 E. of the starting point. The strike in almost exactly east and west. This is schistosity.

From here to 2400 S. are frequent exposures of diabase, mostly fine grained, like 29937.

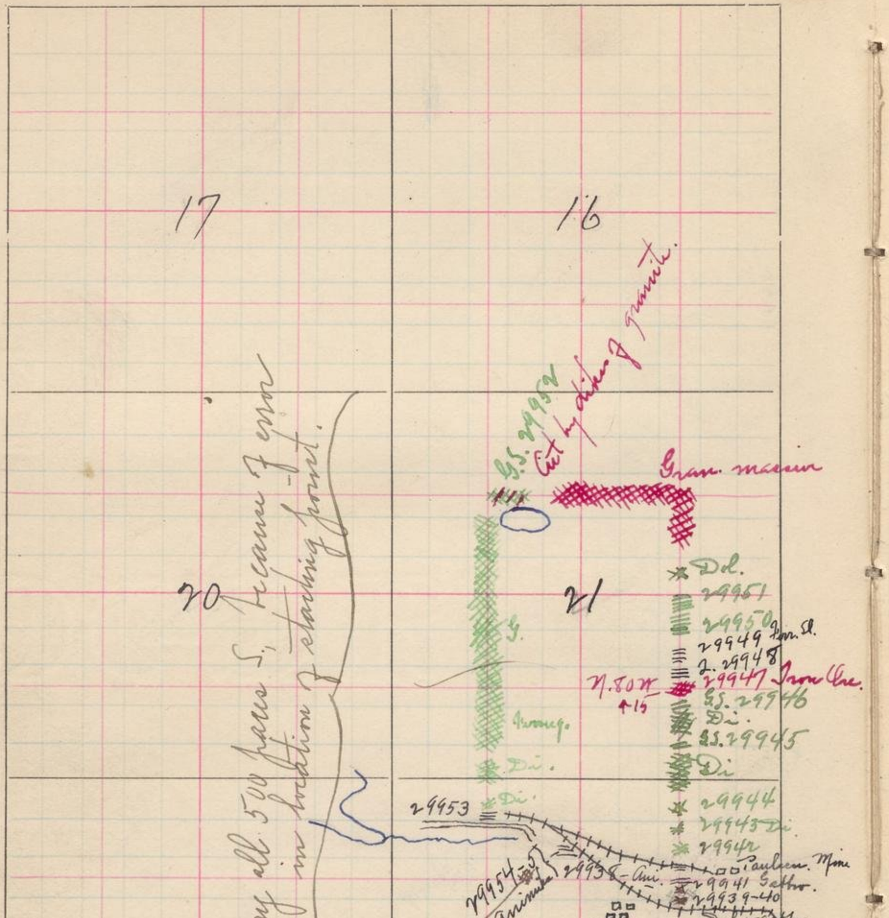
During the day we struck a great number of small lakes which we could not make jibe with the lakes indicated on the map. Having no good correction to start with we did not attempt to locate them. Will have to be inserted from Bebb's map.

---~~29938~~.

Au 29938. Specimen of perhaps the typical banded ore and quartzitic material, from the dump of the Paulsen mine.

The specimen shows perhaps too small a proportion of the quartzitic material. The mine is 1550 N., 300 W. of the SE corner of 28.

S. T. 65 R. 4



17
16
G.S. 29952
Cut by dikes of granite.
Gran. massive
Carry all 500 paces S. because of error in location of starting point.
20
21
Dol.
29951
29950
29949 Iron Sl.
2.29948
N.80W. +15
29947 Iron Ore.
G.S. 29946
Di.
G.S. 29945
Di
G.
Amyg.
Di.
Di.
29953
29944
29943 Di.
29942
Paulsen Mine
29954-5
Animikie
29938-Ani.
29941 Gabbro.
29939-40
Dol. + gabbro.
Campo.
29
28
Gabbro.

Sept. 16.

From the railway track in 28-65-4 ran north on the eighth line to cut off the Animikie series, and to strike the granite.

The starting point, as located from the quarter post is 1350 N., 500 W. of the SE corner of 28. This from compass-survey. Later work + topograph. map show starting pt. to be 850 N 500 W.

29939. At the track is a very coarse porphyritic dolerite, with large phnocrysts of feldspar 1 1/2 inches long. T This coarse material is interleaved with finer grained dolerite, which varies widely in finess of grain. Some of the finest would be called a gabbro. 29940.

29940. The contacts are not sharp, but there is a gradation within two or three inches. The rocks seem to lie in heavy layers, which dip to the south at 25°, and strike east and west. Exposure 30 paces N and S.

Next north of this, at 35 paces from the track, the dolerite or gabbro is impregnated with magnetite, and has a peculiar porphyritic weathering surface. 29941.

29941.

This is followed at 400 N., 525 W., by a ridge of the normal gabbro, or dolerite, like 29940.

This at 425 N., gives way to the typical banded ferruginous material of the

Animikie ,- the banded magnetite and quartzitic material. Specimens already taken The strike is here N. 85 W., and the dip is 45° S.

This continues to 450 N., for this distance being interleaved with several gabbro flows.

At 530 N., on the north slope of the large hill is a steep exposure of the typical banded ferruginous and quartzitic material Same strike as before. It is on the continuation of this ridge, though on the north slope, 200 paces east of this point, that the Paulsen mine is situated. (See specimen 29938, taken at the mine

Strike spur of track at 1570 N.

29942. At 1650 N., on the north slope of the next hill, is dolerite? No relations.

29943. This is followed at 1700 N., by typical massive dolerite or diabase.

29944. 1815 N., Dolerite, another phase.

Beginning at 1900 N., typical massive diabase comes in, and continues in frequent exposure to 150 N. in 21. Varies somewhat in grain.

At 150 N. in 21, the greenstones com-

mence to be rather fine grained, and to have a pronounced flowage or schistosity in an E and W. direction. It looks like a flowage structure, but is rather regular. Is the rock possibly a fragmental?

29945

29946. Material like 29945 occurs interbanded and associated with the typical coarse diabase to 340 N. Here comes in another phase of the greenstone?
29946. The schistosity strikes E and W. and the dip is to the S., as nearly as I canjudge, almost flat.

This is associated with the typical co coarse diabase, and continues to 450 N.

At 500 N., just across the valley, is a ledge of schistose iron ore, which looks like specular hematite.

29947. It has strong magnetic attraction. The strike is N. 80 W. The dip is 15° N.

This is followed 25 paces to the north by banded quartzitic material similar to that at the Paulsen mine. Moss covered
29948. No dip. Strike is E/ and W.

590 N. is
29949. An exceedingly fille banded ferruginous slate or graywacke. Possibly a ferruginous green schist?

The dip is obscure, but is apparently very flat to the south, 5° from the horizontal. The strike is N. 85 E.

Banded material like this, and also somewhat coarser, like 29948, continues to 750 N.. The dip gradually increases to the north, at 750 N., being N. 40° S.

29950. At 800 N., is green schist, very fine grained, striking east and west, and dipping to the south 25° from the vertical. In going north the rock is seen to be a typical green schist, with rough weathered surface, and with a very slight 29951 banding on the weathered surface striking about N. 70 W. The specimen was taken at 1000 N.

Green schist, in moss-covered ledges, continues to 1125 N.

At 1150 N. is coarse massive dolerite.

1300 N. is massive gneissoid granite, striking E/ and W. This almost immediately gives way to coarse massive granite.

29952. The granite continues to ~~1130~~ 1500 N., and west to 1130 W. of the east line of Sec. 21 . Then strike swamp, and at 1330 W. is a green schist, 29952.

The rock is in places cut by several planes of fracture or schistosity, but in most places one set controls, and the rock

is an exceedingly fissile typical green schist, striking N. 70 W., and dipping 25° S. This green schist is cut by several dikes of massive granite, and it is evident that we are here close to the contact with the granite on the north.

The green schist cut by granite dikes, some of them 15 feet acros, continues to 1500 W.

Turning south at 1500 W. of the line, the green schist continues south, without granite dikes, to 1380 S. of the N. line of the section. The strike and dip are unifor

Continues to 1600 S.

At 1600 S. the green schist becomes rather ferruginous, though still coarse and schistose. Here has a strong magnetic attraction.

1925 S. and 2000 S., are moss-covered ledges of massive dolerite.

100 S. in 28, the same thing.

29953. 175 S. Impure quartzite or graywacke.

200 S. strike road and creek. End of Ry Begins 50 paces east.

At 1270 W. and 1800 N. ran south to the gabbro, which was found at 1520 N., 1270 W.

an 29954-5. From the Ry. cut 300 paces west of the camp buildings at Paulsen mine. These are fresh specimens of the typical banded quartzitic and ferruginous material of the Animikie.

F.P. 29956. Porphyritic feldspathic schist from Ry. track N. of Gunflint lake, in east end of bay 5 miles from west end.