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Quinnesec, Michigan, No. 2: [specimens] 11139-11196. No. 41 1885-07-13/1885-07-20

Williams, George Huntington, 1856-1894

[s.l.]: [s.n.], 1885-07-13/1885-07-20

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QUINNESEC, MICH.

July 13 - 20, 1885

No. 2.

U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

No. 41.

July 13 - 20, 1885.

Quinnesec, Michigan.

G. A. Williams.

11139 - 11196

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 $2\frac{1}{2} \times 1\frac{1}{2}$ 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 $\frac{1}{2}$ 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.

#41

SUMMER OF 1885.

GEO. H. WILLIAMS.

Field Notes taken on the
Menomonee River

July 2nd - 20th

1885.

No. 2.

July 13.

54

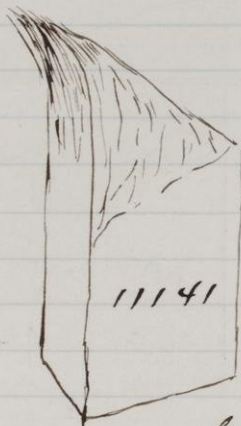
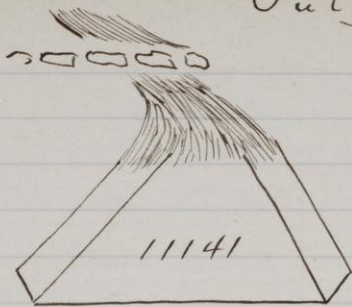
skirts the Wisconsin side of the river as far as the iron bridge is well exposed along the trail - It is identical with that above, at the upper Fall, i.e. divided into diamond shaped joints and traversed by numerous schistose bands

Michigan Side: Lower Fall.
(nd. p. 43)

At the sharp point just below the Falls and for a considerable distance farther down are finely schistose chloritic slates like those on the opposite side of the river. They strike S of E & dip 70° N. (11,139) At the head of the Fall the rocks are again diamond jointed and somewhat schistose; between the two, however, just at the falls is a well-nigh inaccessible wall of massive diorite which is irregularly and roughly jointed. (11,140.)

July 13.

55



11141 Jointed
pieces of mas-
sive diorite
from the face
of the high
wall. They
are curiously
frayed out
into schist
at one end.
They were
taken from
a place
which

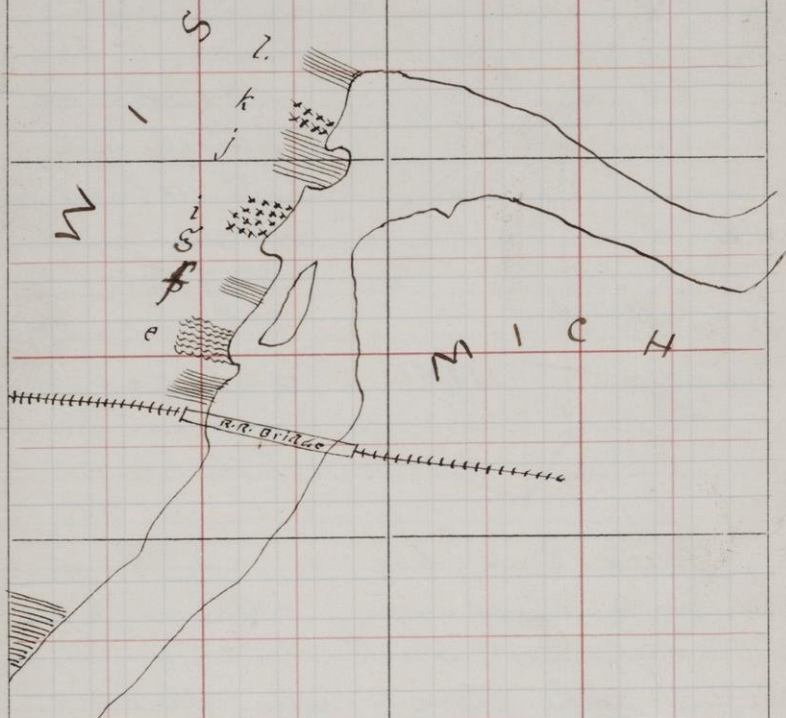
showed a
break and that
there had been a rubbing
and slipping of the pieces
against each other.

The break was filled
with quartz. (vid. fig. on
p. 43.)

T.

R.

Four Foot Fall.



Tuesday, July 14th 1885

Four Foot Face at the Railroad
Bridge over the Menomonee River.

Section on the Wisconsin side above
the bridge - Upper exposure at the
bend in the river.

- 11142 Chlorite schist Brooks' "l"
Covered
- 11143 Massive greenstone " "k"
- 11144 Gray slate " "j"
- 11145 Fine grained somewhat
schistose greenstone " "i"
- 11146 Compact harder greenstone " "g"
- 11147 Greenstone schist " "f"

This may be a small distance
farther south than Brooks' f
as it is nearly opposite the
S. end of the upper island.
It is apparently imbedded in
contorted schist.

- 11148 Contorted carbonaceous ochrey schist
Brooks' "e"
- 11149 Light gray silvery schist.
- 11150 Rather compact irregularly splitting
dark colored greenstone schist.

July 14th 1881 -

57

11.151 Light green earthy much weathered schist near the ledge.

11.152 From the outcrop of slate south of the ledge, Wis. side. These are silvery, blue or gray. Finely but irregularly bedded. No parallel bedding planes. They are Brooks' "a" - called by Dr. Wichmann "phyllite".

Day so very wet & rainy that we were obliged to stop work here

Afternoon of Thursday July 16th.

Visited Four Foot Fall again and worked along the Michigan side. The rocks are here exposed much further up the river than on the Wis. side.

11175 Last outcrop - not massive as stated by Brooks but very schistose Str 10° S of E.

After the first two outcrop the rocks become quite massive again

July 16.

58

11177

and only one other quite narrow band was found above the bridge - (11177.)

11176

Near this the typical massive gneiss (11176) from an outcrop projecting into the river. This is finer grained and like all the rest about here.

11178

Beyond the Wis side of the railroad bridge are some fine outcrops giving excellent exposures of these rocks. The rocks are very fine grained massive gneisses - apparently fine grained and of a light green color. They are probably much altered (11178)

There in places have been very much crushed, rubbed & jointed - These bands run nearly 15° S. of E. Dip nearly vertical

11179

The massive rock is everywhere much jointed and filled with quartz & calcite. (11179) - One very curious broad vein near the upper end is

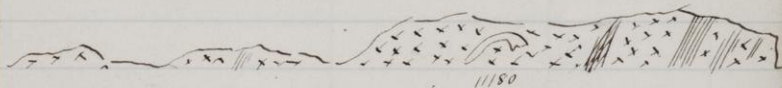
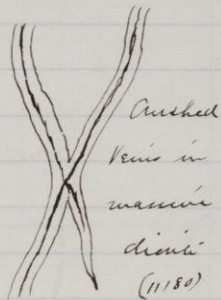
July 16.

59

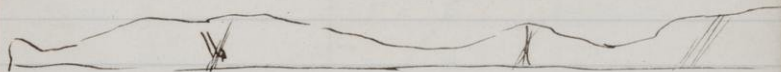
11181 light gray) and composed of a mass of acicular crystals. (11181)
(Only enough taken for chemical examination)

No 11179 is from a schistose band which has a wavy structure.

On the lower side are several such schistose bands which run into each other and sometimes pinch out altogether below - These are filled at their center with a fine grained almost flinty black rock. (11180)



upper side



anchored
vein

lower side

R. R. Cut.

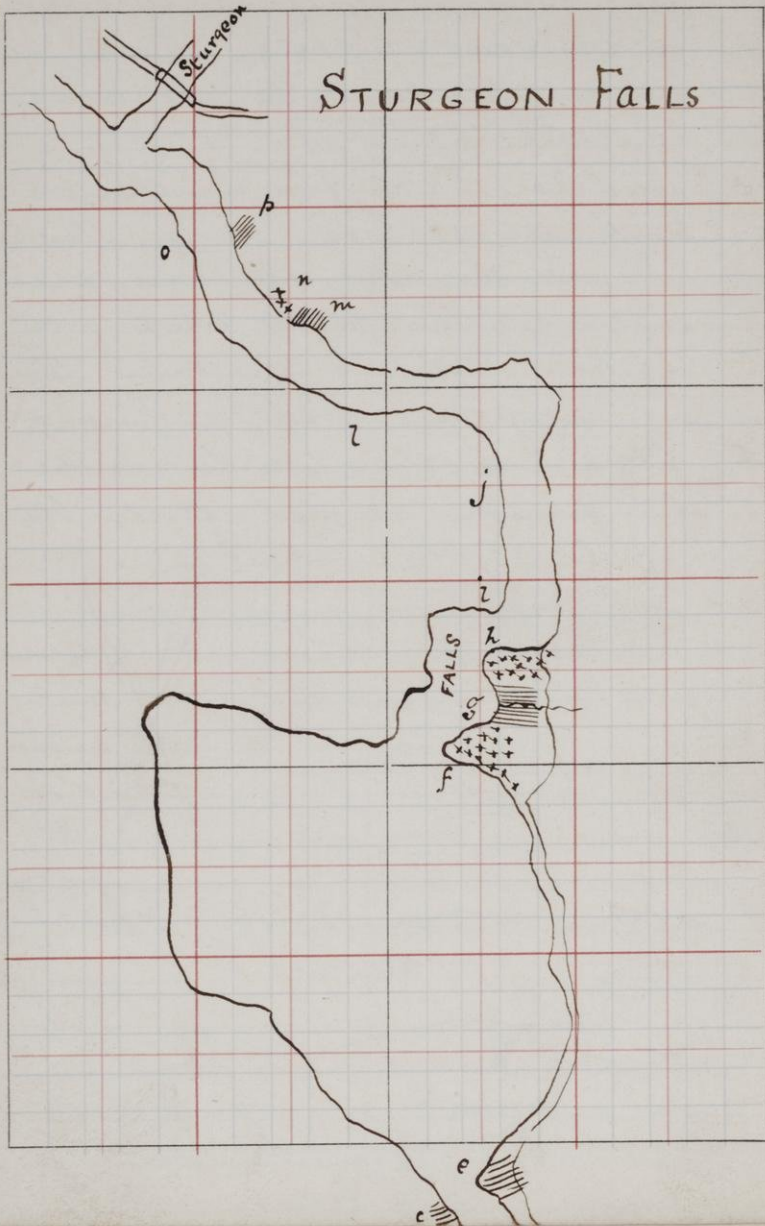
N.Y. Farm.

T.

Riv.

R.

STURGEON FALLS



Wednesday, July 15th 1885.

Sturgeon Falls.

Mich. Side.

"e" Lowest outcrop - lower end of the large
basin below the Falls. Massive greenstone
but jointed with a decided cleavage
20° S of E. Frequently contains
11153 crystals of red feldspar. (11153)
This is Brooks' "e."

"f." The projecting point just below
the falls is massive greenstone.
in huge blocks, very much
jointed and very difficult to work
into good hand specimens. This
rock is sometimes, but very rarely
a fresh diorite with white feld-
spar and green hornblende. (11162)
Generally both minerals are
much altered and approach
a light green color. The rock
has frequently veins & stringers
running through it which are
apparently the beginning of a
schistose structure. (11154 +
11155 11155)

Brooks' "f."

July 15.

61.

"g"

A "g" there is a small basin formed by the lesser resistance of certain slaty rocks occurring there. The

11156

massive diorite at "f" becomes gradually of a uniform light green color and decidedly schistose along its upper edge. The exact contact is covered but certain

11157

greasy, decomposed silvery schist succeed (11157) The transition back to the massive diorite at "h" is much plainer, and an interesting series exhibits it. The specimens were taken hardly more than a foot from each other along a continuous ledge.

11158

Rather compact grayish schist with reddish spots and streaks.

11159

Same apparently slightly more altered.

11160

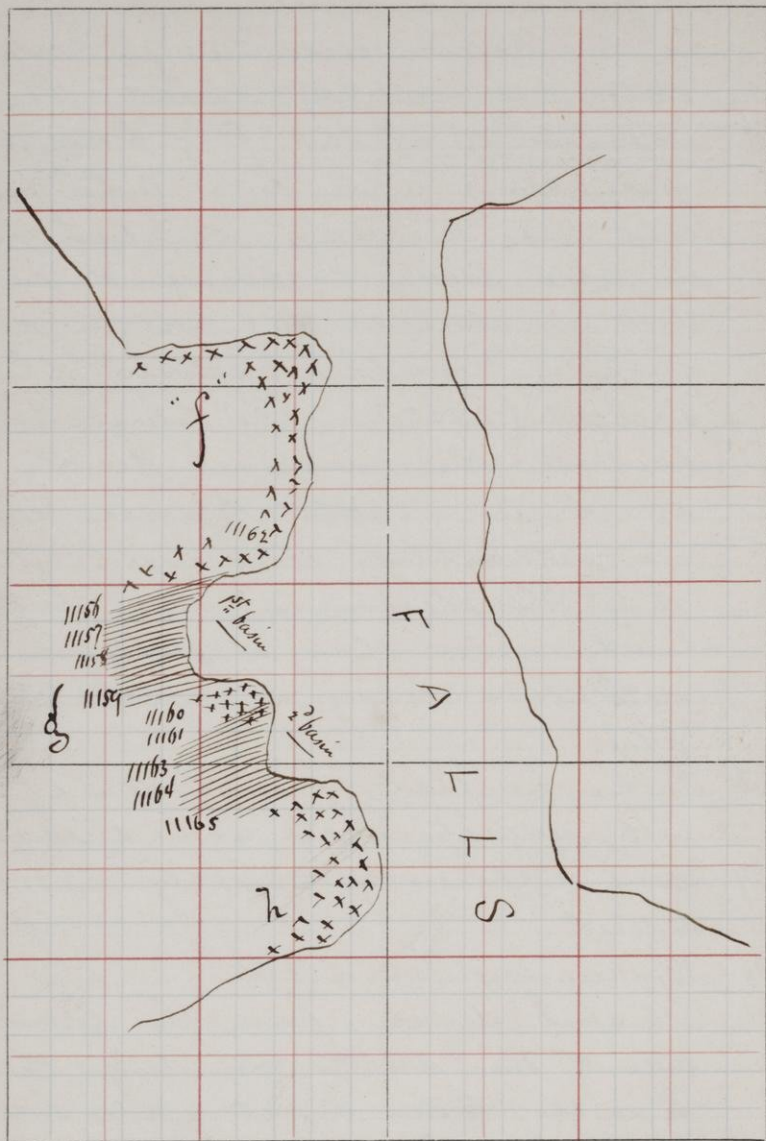
Harder greenish slate.

11161

Schistose diorite from the lower side of the wall bounding the small basin on its upper side. This rock shows all the minerals of the diorite including red Feld-

T.

R.



July 15.

62

spat and yet it is very schistose
cleaving readily into plates parallel
to the bedding of the slates - It
is in many respect like 11159
and yet cannot be separated
from the massive diorite -

11162 Fresh diorite from f.

11163 Above this square basin is another
in which the same transition
is repeated. A schistose rock
without bedding or cleavage - It
breaks with equal readiness in all
directions parallel to one line into
rod like pieces.

11164 } are schists on the upper side of

11165 } this second basin, immediately

11166 } under the massive diorite. They
grade into it by rocks like 11166.

11167 The massive diorite at "7" looks
quite like that at "f."

This rock, which Brooks
calls "gabbro" is occasionally
11168 quite coarse grained (11168)

July 15-

63

11169. At times its grain changes very suddenly.
The freshest of this rock from just over the falls looks as though it really contained diallage. (11170)

This rock is often veined and more or less schistose. A large calcite in one place - Feldspathic and hornblende patches often alternate.

As there was no boat obtainable at the New York Farm it was impossible to get on to the Wisconsin side of the River. The rocks could be distinctly seen at the falls where the river was narrowest, and did not appear to be in any way different from those on the Michigan side. Brooks also asserts that they are identical.

Above the falls there are two exposures on the Michigan side below the Sturgeon River. These are lettered

July 15-

64

by Brooks:-

- 11171 "m" talcose greasy schist.
11172 "n" massive fine gr. greenstone.
11173 "p" like "n" but more contorted.

On the old Quinnesec Road above the New York Farm are some slates which Mr. Bucee asserts to be in position.

11174. All that we could find seemed to me to be undoubtedly boulders in the drift. (11174-)

Friday, July 17th 1885 -

Horse Race Rapid above the
Upper Suinnesec Fall. Mich-
igan side.

The rock high up on the bluff
near the lower end of the rapid is
amazingly mottled with rounded
feldspar crystals lying in laminae.
Resembles a "foralceustine". Looks
as tho' it might contain pyroxene.
Weathers along the joints which
appear as though coated with light
green talc.

11182

Mottled rock - fresh -

11183

Fresh weathered (with talc) together

A short distance beyond this
place the ridge descends into a
cross ravine. Here near the
water edge are beautiful porphy-
ritic acid rocks which occur
apparently as dykes in gneiss.
Their direction is quite irregular.
Their width also varies continually.
They contain a deep red feldspar,
a white feldspar, quartz in porphy-

July 17.

66

ritic crystals, pericite and biotite. They show the effect of pressure very finely. The porphyritic crystals form "Augen", around which the groundmass bends - Porphyroide (?). The direction of the banding when it is well marked appears to be parallel to the walls of the dykes. The "Augen" run irregularly. When much red feldspar the rock appears very red. This is sometimes absent and the rock has a gray color. Both varieties often occur in the same specimen.

Farther up the rapids some very fine specimens of the coarse grained diorite or gabbro were found. They also locally change to talc.

11185 fresh rock corresponding to No. 11182
11186 " weathered rock. " " " " "

11188 At the head of the horse race "biotite-quartz" occurs: Str. 10° N of E. This is one solid continuous wall

July 17.

67.

11189

passes into hornblende gneiss with red feldspar. (11189) and this into a fine grained diorite. All these minerals appear quite massive. The minerals of the gneiss are arranged in parallel layers but there is no very easy cleavage. The hornblende gneiss has lath-shaped feldspars.

Just opposite the outcrop of the great dyke on the W. side (Nos. 11089-90), where the specimens Nos 11185+86 were collected, is a greenstone apparently impregnated with some red granite material. (11187)

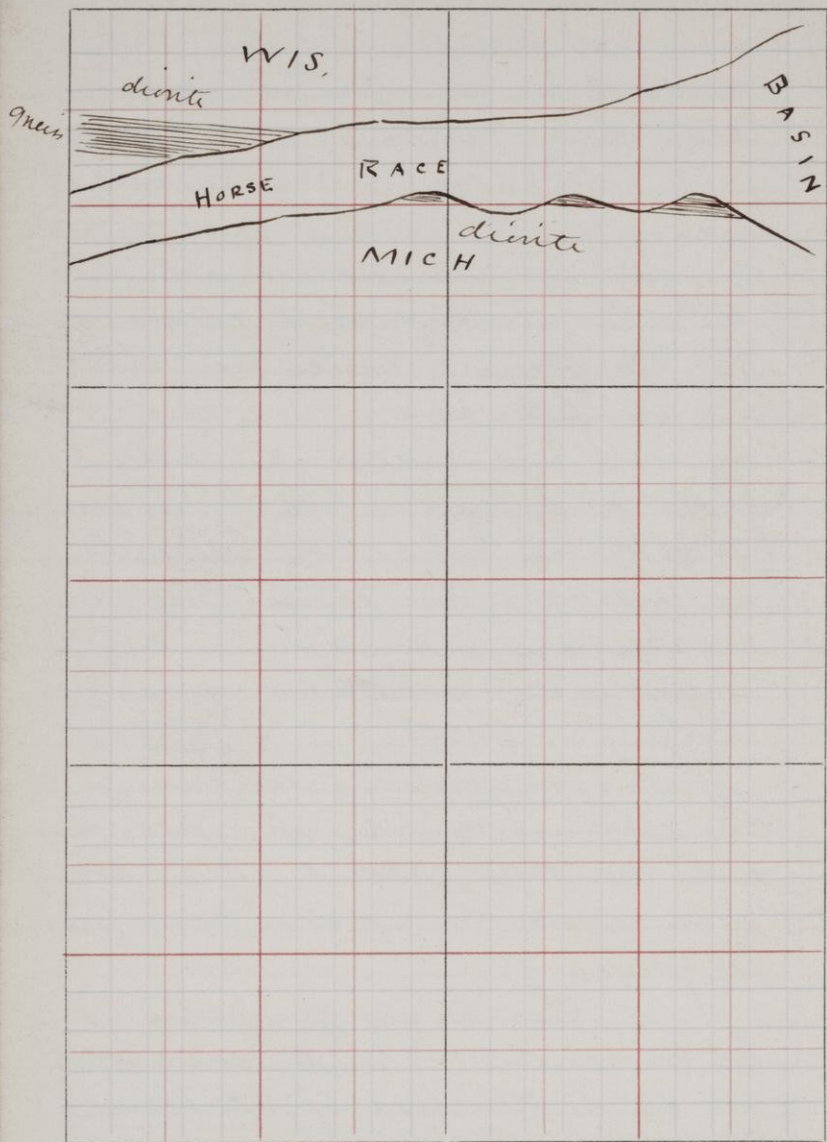
11187

The greenstone are along here contains much red feldspar and weathers reddish, often looking on an exposed surface like granite or gneiss.

The outcrops of gneiss on the two or three points above this as far as the head of the Moose Lake Fork as though they were continuous - along the strike, with

T.

R.



July 17.

68

the exposure on the Wis. side - (11089)

The acid rocks - granite and gneiss seem softer than the diorite and easily weather out of it.

That of the diorite along the Mich. side of the Stone Race is very coarse grained. Sometimes there are abrupt variations from fine to coarse. Much of it near the granite or gneiss appears as though impregnated with the finest stringers and shreds of granitic material.

About the middle of the Stone Race - Mich. side - is an outcrop of biotite granite with no apparent bedding. It contains large porphyritic crystals of feldspar weathered out upon its surface. It stands on the water's edge and is surrounded on every side by diorite Str. little N of E. (11190)

11190

Just below this also at the water's edge is a coarse greenstone with a wavy chloritic schistose band. Str. N 30° E.

11191

(11191) This shows its original banded

July 17.

69.

and structure in places.

[The most instructive feature of the gneiss on the N.W. side of the Horse Race is the change of its humbende to talc]

Higher up on the hill at this place is considerable gneiss like 11190. One especially prominent mass strikes 20° W of S.; with the outcrop on the water. No connection could be traced and it is doubtful if any exists between these two rocks, since diorite appears to occur between, tho' all contacts are covered.

11192 Near here a very coarse grained block of diorite was found. (11192)

70

Saturday, July 18th 1885

Drove to the Mich. Side of the
Basin at the head of the Moore
Race.

Evidence of the eruptive nature
of the so called "gneiss" is here
very convincing. The conditions
seem to be almost exactly as on
the edge of the "Kuronian Granite"
where dykes of this rock penetrate
the hornblende or actinolite schist.

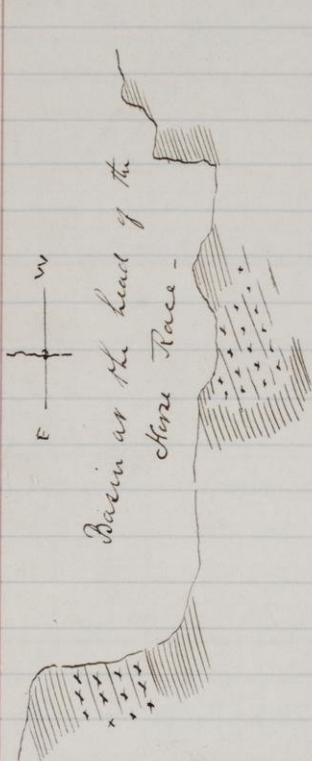
The prevailing rock near the
center of the basin is a fine-
grained hornblende schist. This
strikes nearly E-W and dips in-
termediate. The gneiss here is biotitic
and of a light gray color. It is
also very porphyritic. The por-
phyritic crystals form little
"Anger". They are often rather
granitic than gneiss. Nevertheless
a schistose structure, due to the
parallel arrangement of the mica
is often apparent, which always
conforms to the schistose structure
of the hornblende schists, con-

NB

July 18.

71

when the gneiss runs into the hornblende rock abruptly on its strike, as is shown below.



The contact between the gneiss and hornblende rock is abrupt, a wedge shaped or lens shaped portion gneiss being quite surrounded by schist. (11193)

The hornblende schist is quite completely filled with a network of fine granitic veins - which branch off from a mass of gneiss and cross each other in every direction. (11194)

July 18th

72

11195 The hornblende schist is only
a much pressed finegrained
granite (11195)

11196. The typical biotite gneiss
from this place is beautifully
wavy structure; the biotite
lamellae, secondary (?), pass-
ing around the porphyritic
diptals (11196.)

Revisited the gneiss locality
1/2 way down the Keene Race when
No 11190 was collected. The
gneiss above this on the hillside
appears to be an isolated oval
or lens shaped patch in the
diabase. Only one ledge was
found in situ. Str. 10° S of E.
Along this strike my course
diabase is in position within 10 ft
of the gneiss in either direction.
Nothing could be seen of this rock
on the other side of the river nor
was it found to be connected with
that on the water's edge. It must
be an isolated area whose bedding
has nothing to do with its direction.

July 18.

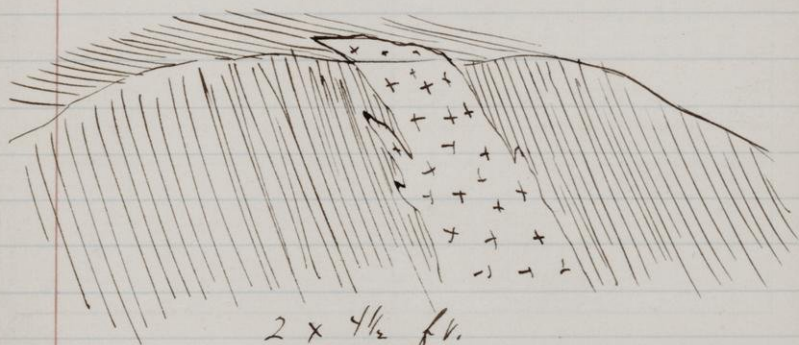
73

but only conforms to the general schistose structure of the diorite.

All the way west of this point on the summit of the ridge there is evidence of the the eruptive nature of the gneiss in the numerous veins of granitic material found everywhere in the diorite.

At the head of the Horse Race the gneiss is massive and grades slowly into hornblende schist.

The same gneiss occurs back from the river on exposed rock surfaces. It seems to be surrounded on all sides by diorite. Str 30° S. of E.



2 x $4\frac{1}{2}$ ft.

Basin - Head of Horse Race

Sunday July 19th

Left Limerick at 9:30 A.M.
reached Marquette at 4 P.M.
Left then Tuesday morning at
6 A.M. by Lake boat "Japan"
for Duluth.
Arrived in Duluth Wed-
nesday July 21st at 4 P.M.

