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Marquette Greenstone belt, Michigan: [specimens] 11804-11864. No. 57 July and August, 1886

Williams, George Huntington, 1856-1894

[s.l.]: [s.n.], July and August, 1886

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U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

No. 57.
July and August, 1886

Greenstones, Marquette.

G. H. Williams.

11804 - 11864

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 $2 \times 2 \frac{1}{2} \times \frac{1}{4}$ 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 $\frac{1}{2}$ 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.

57

Field Notes of Geo. H. Williams

Air. Geologist U.S.G.S.

and W. S. Bailey assistant

Marquette & Negaunee Mich

July 12 - Aug 6th

1886

Book II.

Numbers of Microscopic Sections (cont)

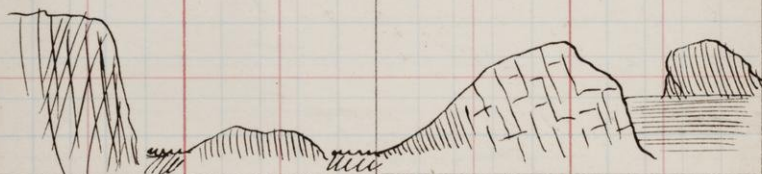
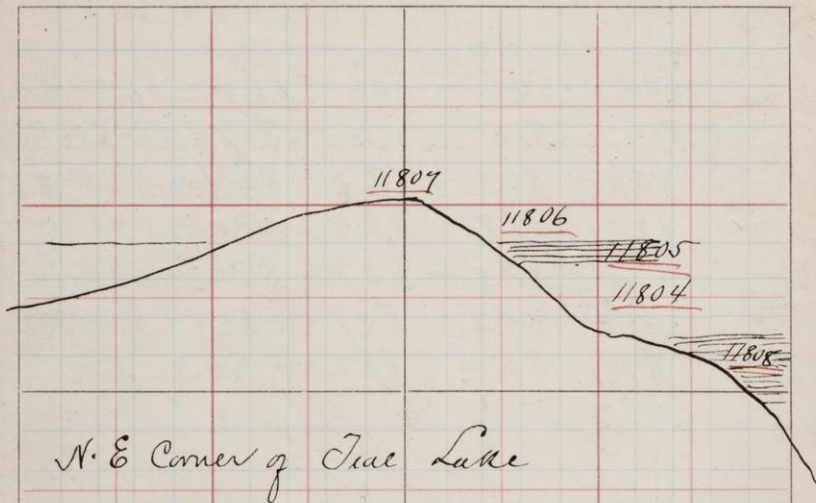
804 - 805 - 806 - 809 - 810 - 812
814 - 815 - 816 - 817 - 818 - 819
820 - 821 - 823 - 824 - 825 - 826
827 - 828 - 829 - 830 - 831 - 832
834 - 835 - 837 - 838 - 839 - 840 -
841 - 842 - 847 - 848 - 849 - 850
851 - 854 - 862 - 863 -
40

115
40

155 sections.

T.

R.



Section

Greenshale
11807

barred

11806

corrid

11805

11804

11808

Saturday July 31st

On the first Bay
in the N.E. corner of Tral Lake
we have reddish ferruginous
quartzite dipping S in thick

11804

beds. Behind (north) in the
same ledge this becomes banded
& more slaty (11805)

11805

Back of this there is a deep
gully full of woods & beyond
it a high bluff of greenstone.

In one place in this gully
very near the banded quartzite

11806

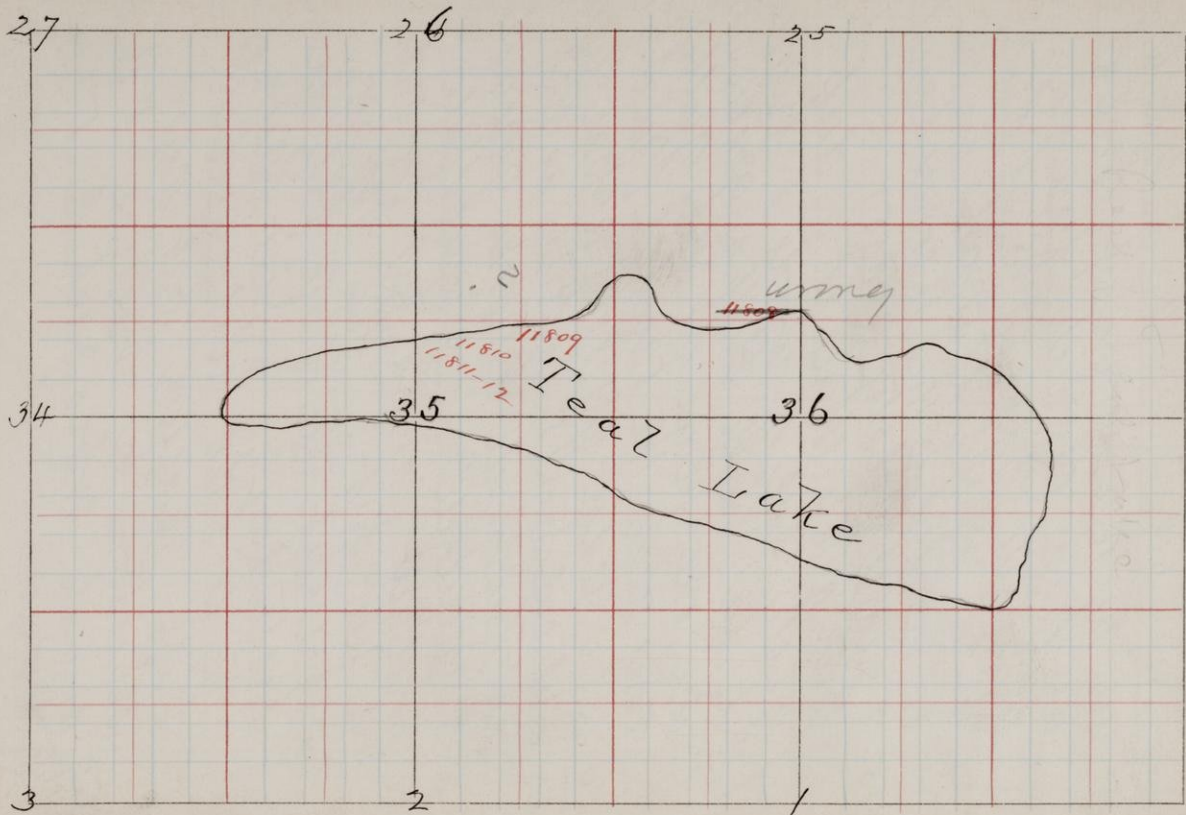
is a ledge of (11806) apparently
vertical rock & looking as tho'
intermediate between greenstone
& quartzite. Immediate

contact could not be seen for only
a few feet. This may
represent the slate beds seen
yesterday.

Just beyond
this is the high greenstone
bluff, massive but very
schistose by pressure & very

11807

much cross gashed &
broken



I. 48

R. 27

11808

West South of the Quartzite on
the east point of the little bay
is a ledge of Black Slaty
(Rominger's Armacross slaty
group) in conformable position
(11808)

11809

P.M. Rowed to the west end
of Seal Lake where the quartzite
again appears - It is here
spotted & mottled with
red (11809) - East of here
along the north shore a section
is exposed - Succeeding to
the quartzite are rather thickly
bedded & folded & puckered
hard micaceous rocks,
probably equivalent to the
Schistose quartzite seen this
morning -

11810

This is also red & yellow
spotted (11810) - This forms the
shore in high bluffs for some
distance - but its contact
with the greenstone is not
visible

They are separated by a deep valley. The greenstone here is receptionally slaty or schistose; sometimes purplish or very argillaceous (11811) More normal greenstone from near by is also very slaty (11812)

11811

11812

Beyond, on the shore the novaculitic slates appear again & tho' it could not be seen with certainty it looked as tho' they graded imperceptibly into the schistose slaty greenstones

§9-

T. 48 N.

R. 26 W

§4

1816-18 Rocky Ridge

200 Kilns.

x 819-20

x 821

11821

Dip 60°

11823

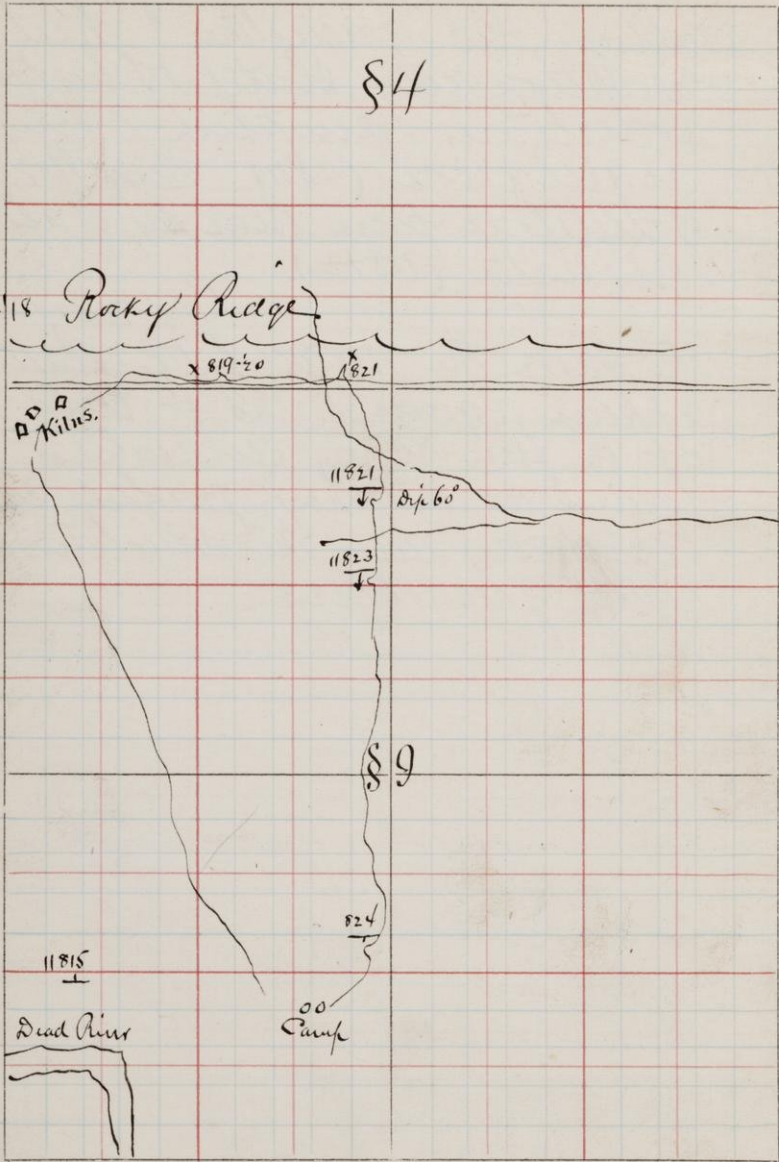
§9

824

11815

Dead River

00
Camp



Tuesday, Aug 3rd 1886. In camp ⁴
in § 9. T 48 N. R. 26 W.

Falls of the Brad River in the
arenaceous slate group in the
SW corner of § 9. 300 steps of
the S.W. corner of § 9

11813 Rock here is a thinly bedded
slate. Str: 15° N of W. Dip
nearly vertical. Perhaps an
inclination to S.

Upper part of the fall inclined
at an angle of about 45°

Lower 25° - 30° from a clear fall
occasionally by several trap
dykes running nearly E-W

11814 These are coarse grained, fresh
& rather porphyritic (11814)

Walked 500 steps N & 150 W &
met large outcrops of white
massive & very slaty greenstone
Looks like a clay slate.

11815 Str. E-W. Dip nearly vertical
May lean somewhat to N (11815)

11842

11841

11840

11839

11836-7-8

11834-5

11818-18

11819-20

11827

11823

11823

*Korns

11821

11822

11823

11856

11824

11855

11857

11858

11859

11816

9

10

11

11874

11850

11851

11852

*Camp
11815

11825

11826

11814

11813

11849

11846-7-8

11861

11863-4-5

11862

16

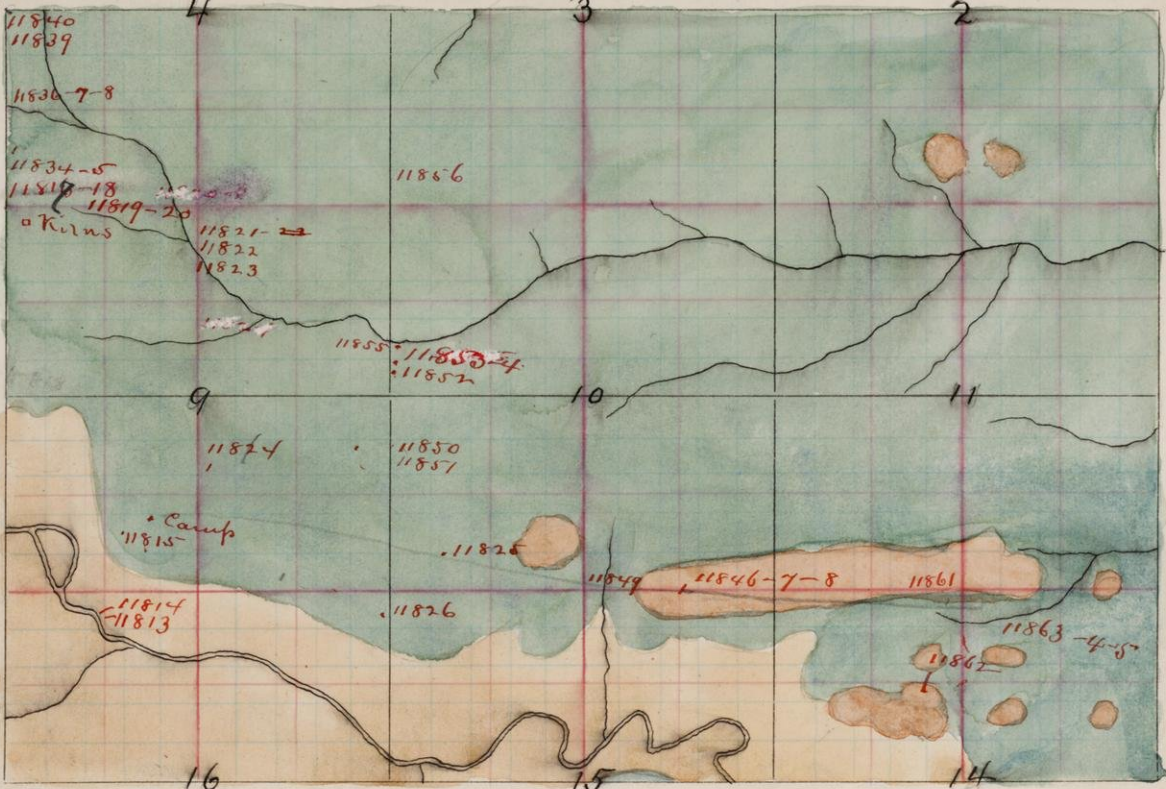
15

14

T. 48

R. 26

Barry's map



5

Walked to section line & traced
this north to the NW corner of
§9 without seeing any ledge,
only drift & boulders -
Just north of the north line of
§9 rock is so poor in abundance

A few steps NW of the quarter
post, is a ledge of a light
grayish green felsitic looking
rock which weathers quite
white (11816). Str. N 20 W
Dip 70 NE

11816

Intrusion in this is a
wide dyke of coarse diorite
This is so much altered that a
fresh fracture appears nearly
an iron dark green.

The structure is well shown in a
weathered surface where round
lumps of large hornblende crystals
lie in a white feldspar substance
(11817)

11817

Associated with this
is a fine grained green rock
different from (11816), much
broken & brecciated (11818,
These specimens 70 steps N & 30

11818

W of the SE corner of 95.

an almost continuous ridge of high rocky bluffs runs about 50 steps north of the south-line of 54.

11819 at one point of this ridge, 450 steps from the SW corner of 54 massive bluish rock - perhaps like 11816 but darker

11820 same but schistose.

850 step from same SW corner of 54, 60 steps from S north of line is a very high bluff of greenstone plunging to the same ridge - typical & much cross-jointed & broken. In places very schistose tho' it appears quite massive.

11821

265 steps south of the quarterpost on the north line of 59 is a small outcrop of a light stately rock dark greenish gray on a fresh surface, but light yellowish gray on weathered surface.

11822

Str'd E.W. dip 60° to S. (11822)

§10

T. 48 N

R. 26 W

§ 3

§ 70

§ 25

§ 71

Granite

475 steps south of the section
line at the quarantine on
the south side of the road
bordering the small stream
is a gray quartzite
Str. E.W. Dip 60° S. as before

11823 (11823)

1360 steps south of quarantine
11824 schistose greenstone (11824)

P.M. 518 steps east of 440
steps north of the SW corner
of § 10 is a long E.W. ridge
of greenstone somewhat
schistose (11825)

11825

On the road 100 steps south
of the corner of § 9-10 is an ap-
parent outcrop of gray coarse-
grained gneiss weathering
spheroidally & looking like the
Pigeon Point gabbro (11826).
This may be a boulder - but
is very large & is deeply
buried

11826

T.

R.

5

8

9

L7

Wednesday, Aug. 4th '86.

Walked by road from the camp to the north west corner of 39 when the hills are -

thence followed the southern line of 35 westward

at 455 steps on the line we met a high ridge of buff massive but jointed grey

11827 greenstone (11827)

A continuation of the ridge (which was followed along the south edge of 34 yesterday.)

On the same line is a medium grained syenitic rock composed as seen on a weathered surface of large 5 prill formed hornblende crystals (which are often hollow at the center) 5 prill feldspar

11828 This shown in (11828)

The fresh rock is uniform dark

11829 brown grey (11829)

This rock is at times jointed into parallel plates so as to almost resemble a slate. This syenite extends for perhaps

30 paces.

11830

At 700 paces there is abundant exposure of greenstone 11830 which is indeed almost continuously exposed all along the southern edge of the bluff which forms the south line of S 5. 11830 was taken on this line

900 steps west & 25 steps north of S 5. is a large ledge of very coarse reddish hornblende granite - Dark green hornblende in very long crystals - Feldspar Bd

11831

11831
With this there is a dark grey rock full of larger glistening black crystals which are more or less distributed through it 11832

11832

On the other side of the deep gully here, is a very high knob of rock similar '32, but schistose

11833

11833, Specimen from 80 steps
west of quartzite on the
line

10

P.M. Started north on the
line between 4 & 5

150 steps an eruption rock
like '32 with purple

11834

in the schistose greenstone (11834)
20 steps west of the line at 640
steps north there is the next
ledge composed of a gray
rock with a parallel ar-
rangement of constituents
(11835)

11835

Across the gully here, at 690
steps is a much finer-
grained schistose green-
stone striking E W (5)

11836

standing vertical (11836)

Across a brook & gully here
at a fir^{er} dam is a ledge
at 815 steps in which both
greenstone (11837) & granite

11837

11838

(11838) are exposed side by
side

912 steps a ledge of slaty
splintered rock very irregularly
parted & breaking in every
direction

11839 Looks more like a slate
than a greenstone (11839)
[This point is really 170 paces
from the quartzite post - Pacing
allows only 88]

11840 100 steps further on is a ledge
of the last in contact with
a banded schistose rock like
(11835) 11840

11841 180 steps beyond the quartzite post
a ledge of very slaty rock
sandy, cleavable & full of
pyrite (11841)

At 250 steps a
ledge of very compact blue
gray slaty rock begins here,
quite massive & continuous
for a considerable distance.
No specimen here.

At 475 steps
a more crystalline very
compact rock breaking

11842 almost like trap, 11842,

12

At 7th steps on S line I chert
one greenstone full of granitic
11843 dykes

Came out on an old N-S Road
near the section corner
Here typical I chert green-
11844 stone (11844)

Section corner
not visible here then being
a small clearing
Just beyond last specimen
a ledge of reddish greenstone
apparently merging into
11845 diorite (11845)

T.

R.

10

17

Thursday, Aug 5th 1886.

13

Walked east to the corner of
S 5 10 5 11 5 then north for a
half mile without finding
any exposures

The camp road crosses
the south line of S 10. 500 steps
west of SE corner. Here on the
road is a large exposure
of very much decomposed
red granite, gray where
stained with white fine
grainy (11846)

11846

In places this is
obliquely sided & cherted by
pressure (11847)

11847

This granite
in a narrow EW belt follows
the south section line of 10
some distance west of here &
also, according to Fremont's
map, some distance east.
With this granite directly on
the road is a mass of coarse
grained diabase, which is
covered on the surface with
large irregular white spots.

14

There appear inside a large
light green areas, perhaps
11848 altered feldspar. 11848

Two hundred steps farther
west & only slightly north
of the line, on the west side
of the ravine made by a
small brook which the road
goes around — is a well
defined ripple marked
11849 slate (11849)

P.M. Started north on the
section line between 9 & 10
First exposure a finely bedded
Keweenaw slate at 775 steps
11850 (11850)

Similar slaty rock, somewhat
more fissile magnesian at
11851 750 steps (11851)

200 steps beyond the quarter
post is another ledge of a
slightly different slaty rock
11852 (11852)

312 steps a ledge of Bry
schistose fatty foliated rocks
11853 Some Turkish 11853; this
light yellowish gray or white
11854 (11854)

At 375 steps at the north
side of this ridge along the
road a Bryotten schistose
gneiss is exposed with Bd
11855 feldspar. (11855) This does
not appear in the larger
exposure a short distance
further east - There is only the
same slate as on the other
side of the ridge

250 steps north of the section
corner are schistose crystalline
greenstones - banded & in
all respects resembling
11856 those on Light House Point (11856)

16

Friday Aug. 6th 1886 Rain!

In the afternoon we went to the old logging chalet on the road just east of our camp. The location of this is in 59,800 steps north & 55 east of S.W. corner.

Behind this chalet is an exposure of very considerable width.

11857 On its north side are gray slates (11857). Then comes a very large trap

11858 dyke (11858). South of these west to the road we had brittle rocks of a blue color & plainly banded in distinct layers.

11859 They look like hard slates (11859) & (11860).
11860

Saturday Aug. 7th 86.

Walked east on the road from camp as far as the middle of § 11-14.

The road follows the south edge of a E-W granite ridge

11861

For over a half a mile through
 The south part of 11 (11861)
 Walked south on the line
 running through the middle
 of 514 - of 575 steps south &
 57 west is a large mound
 of red granite accompanied
 by trap - The former is usually
 like "861 (11862)

11862

250 steps south & 200 east of the
 quarantopost on the north side
 of 514 is a large granite
 Ruell well exposed on its south
 side -

11863

Here the granite is cut by all
 sizes of trap dykes. The
 smallest of these appear un-
 altered (11863) - but the very
 wide ones are now composed
 of rock like schistose gneiss
 This is light green & very
 schistose or slaty
 in places it is cross-gashed
 & twisted like the green
 schists - (11864)

11864

