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Michigamme district III: specimens 23765-23769, 23811-23824, 23826-23869. No. 180 1895

Clements, J. Morgan (Julius Morgan), 1869-
[s.l.]: [s.n.], 1895

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

180

✓

Michigamme

District

III

1895

J. Morgan Clements.

No. 23765-23769

No. 23811-23824

No. 23826-23869

Legend

- Wagon Road
- +++++ Rail Road
- Stream showing direction of flow.
- Y Lines over which and direction in which traverses were made.
- Contour lines when present are 20 ft. apart.
- Scale 4 in = 1 Mile except where otherwise specified.

See map accompanying note books for map of western continuation of Felch Mt. trough and for Calumet, Hecda and Hancock Mine trough.

S. 30/29 T. 41

R. 27

← To Forton City

Cor

6-747

30

29

for Spec. 23814-19

See large scale,
and farther on!

Cor

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

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28

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30

31

32

33

34

35

36

37

38

39

40

Cor

23811 N360 W0 SE Cor. Sec. 30-41-27

Shaft about 30 ft. deep through
very white friable sandstone. This
lies in horizontal beds as well
as can be seen from mouth of pit.

S. 31/32 T. 41

R. 27

Cor.

0-747

Cor.

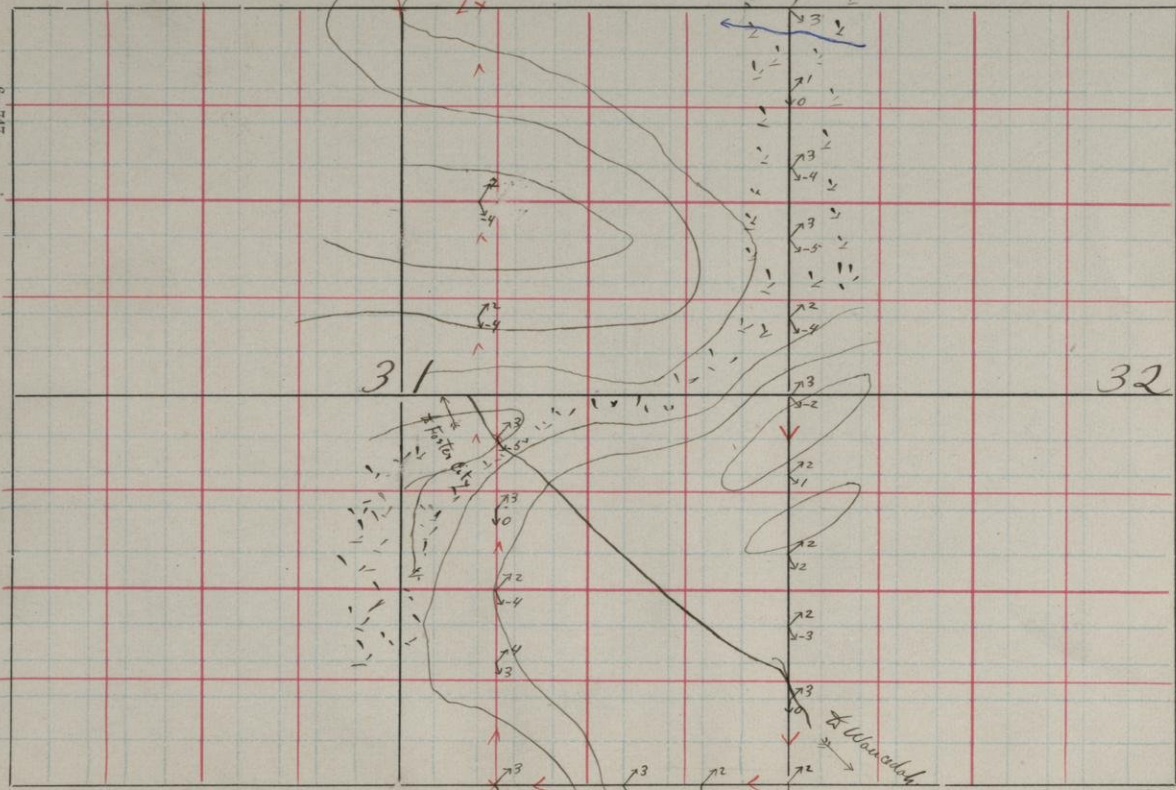
31

32

Cor.

Cor.

Wanadish

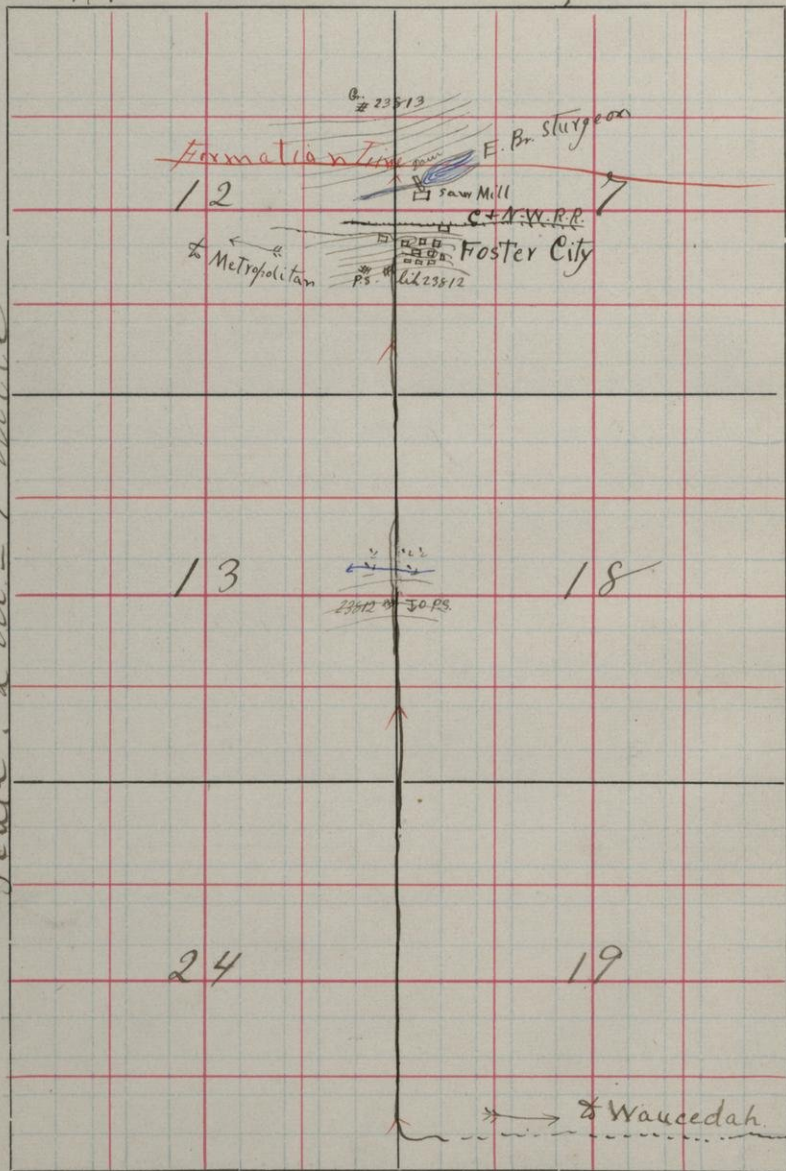


S. $\frac{12}{3} \frac{17}{18}$
24/19

T. 41

R. 28/27

Scale: 2 in. = 1 Mile



6-74 R 28

R. 27

23812 N95° W20 SE Cor. Sec. 13-41-28

A ledge of buffy calcareous quartzite is here exposed in and on W. side of road. This quartzite is very firm and hard when fresh but on weathering becomes very friable. It then very much like a young sandstone.

Bedding is apparently horizontal. Exposure is so poor that I can not get bedding very well.

23813 N15°40' W19°0' SE Cor. Sec. 12-41-28

Ledge of coarse grained red granite exposed on hill on N. side Sturgeon, just across from Forter City.

Scale: 8 in = 1 Mile.

C. of Sec.

E 1/4

S.

30

T.

41

R. 27

SE Cor.

6-747

to Foster City.

from Skale

Hancock Mine.

base

to Waukegan

S 1/4

23814 N320 W 630 SE Cor. Sec. 30-41-27

Hancock Mine.

at this point there is a shaft with most of the rock on dump like 23814. The rock varies in amount of iron it contains chiefly. Shaft is sunk at an angle of 60° N apparently following dip of ferruginous bed.

23815 N320 W 605 SE Cor. Sec. 30-41-27

This rock is seen in situ in sides of caving in test pit. Impossible to get accurate strike and dip.

23816-7 N320 W 690 SE Cor Sec. 30-41-27

Exposure of thinly bedded ferruginous quartzite 23816. Strike $N45^{\circ}W$, dip $45^{\circ}NE$. It is overlaid to N. by similar rock 23817 in which however the quartzite is a little thicker bedded.

23818 N200 W 620 SE Cor. Sec. 30-41-27

This is in situ in pit. Can't get strike and dip.

23819 N200 W 820 SE Cor. Sec. 30-41-27

Pit with slate like 23819 on dump.

Cor.

S. 26

T. 42

R. 28

Cor.

26

Cor.

M. E.
23820-4

Quarry

Ct. N.W. R.R.
spur from
Spence.

Cor.

33-

23820-1 N 150 W 1000 SE Cor. Sec. 26-42-28

2-3-4 Quarry in white marble 23820. In places the marble has a pink tinge 23821. This marble is cut by a red granite dyke about 3 ft wide, 23822. In the marble I find in patches, here + there, a buff limestone(?) 23823 and in one place it seems to be cut by a narrow granite dyke 6 in wide. Spec. 23824 shows contact of granite and limestone.

I am strongly inclined to think that the marble is due to the granite dyke. In other words the marble is a limestone crystallized, that is become coarsely crystalline as a result of the heat + pressure from intruding granite. If 23823 is a limestone and 23824 is really granite I can't explain why that limestone was not also metamorphosed.

Quarry is owned by a company from Fort City and has been in operation about 2 years. In that time 100 car loads have been shipped. The marble does not show any signs of bedding.

Cor. S. $\frac{17}{20}$

T. 41

R. 29

Cor.

17
C of Sec.

Cor. Sec.

#

Lib. 233224

Gr. M. #

233225

#

Gr. M. #

#

Gr. M. #

#

Formation line

Gr. 233226

Cor.

74

Sand hills.

Cor.

20

23826 N375 W1925 SE Cor. Sec. 17-41-29

After crossing over drift hills,
chiefly sand, we come to high
hill on SE + S face of which
a somewhat gneissoid granite
is exposed.

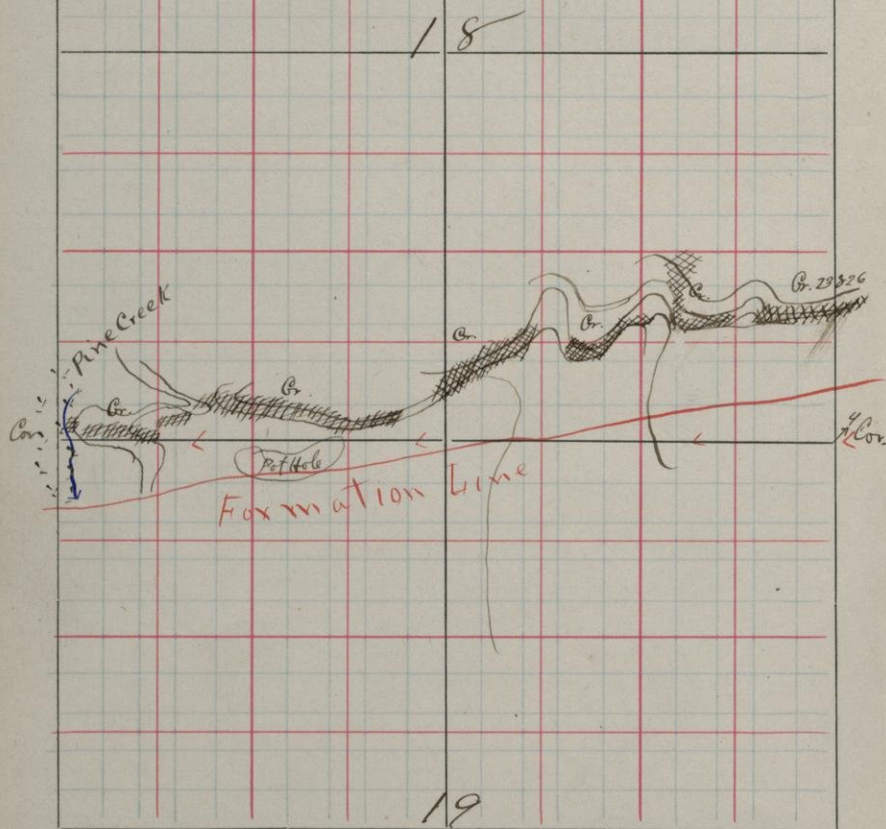
This is the watershed between
Pine Creek to W. and W. Br. of
Sturgeon to the E.

Con S. $\frac{18}{19}$

T. 41

R. 29

Cor.

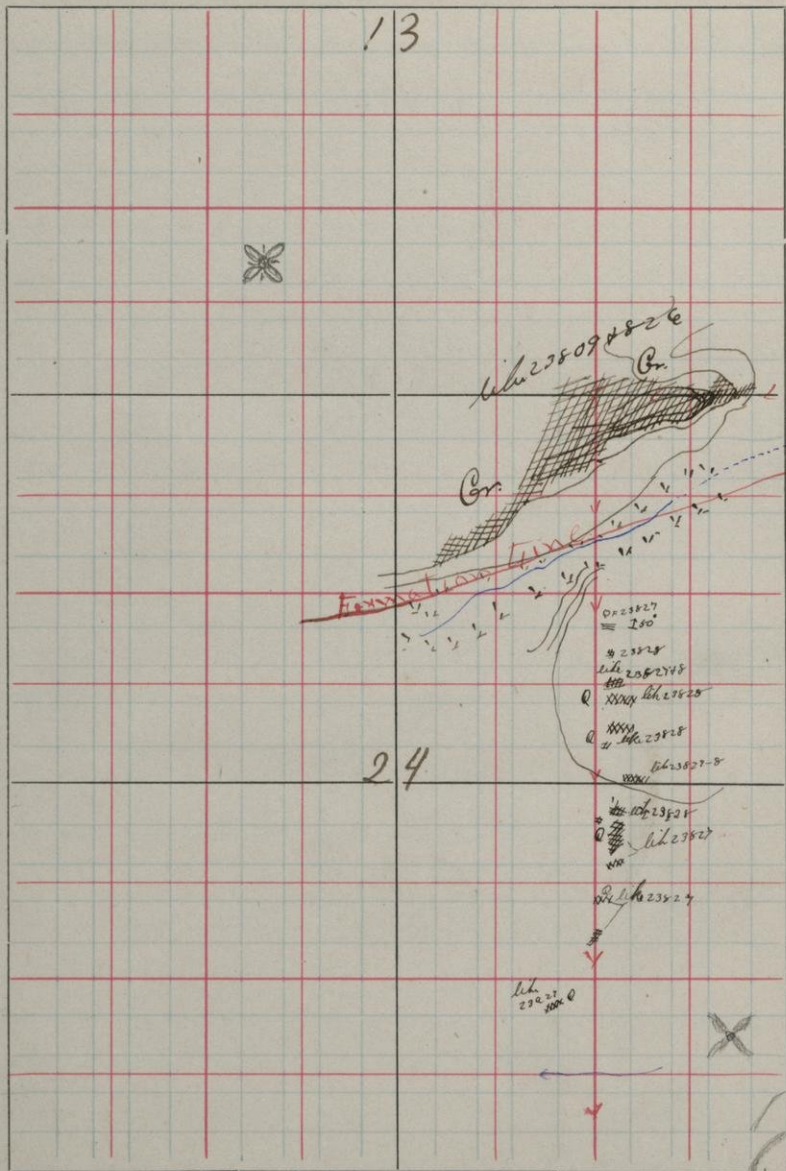


S. $\frac{13}{24}$

T.

41

R. 30



Cor.

24

Cor.

6—747

Cor.

23827 N1400 W470 SE Cor. Sec. 24-41-30
Outcrop of micaceous quartzite
similar to 23804. Strike E-W, dip 50° N.

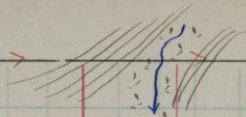
23828 N1350 W450 SE Cor. Sec. 24-41-30
Grey non-micaceous quartzite
with which 23827 is interbedded.

Co. S. 23/30 T.

41

R. 30-29

Co.



Pine Creek.

Cor

V

Cor

25

30

S. $\frac{20}{29}$

T. 41

R. 29

20

Cor. >

23829-71

F.W.T.
1850

Gr. 23832

C.

H6-Sc
23833

29

Cor.

29

Cor.

Cor.

23829-301 N 2000 W 1970 SE Cor. Sec 29-41-29
 Coming from the west we touch
 at above location the W. end of
 large ledge of quartzite forming
 hill. The S. edge of outcrop is made
 up of quartzite like 23829 - looking
 somewhat like a recombined granite -
 and is followed to N by 23830
 and then 23831. Here I could not
 find a dividing line between
 these varieties. They grade right over
 into each other. In 23831 there are
 found slightly different colored
 bands, which strike E-W + dip 85° S(?)

23832 N 1990 W 1640 SE Cor. Sec. 29-41-29
 Here I find genuine granite 23832
 but can neither get in any sort of
 contact with ~~the~~ quartzite, about
 50 paces distant & N-W, nor can I find
 a conglomerate between them.

23833 N 330 W 1380 SE Cor. Sec. 20-41-29
 Large exposure of hornblende schist
 on N. face of hill. Can get no relation

Cor.

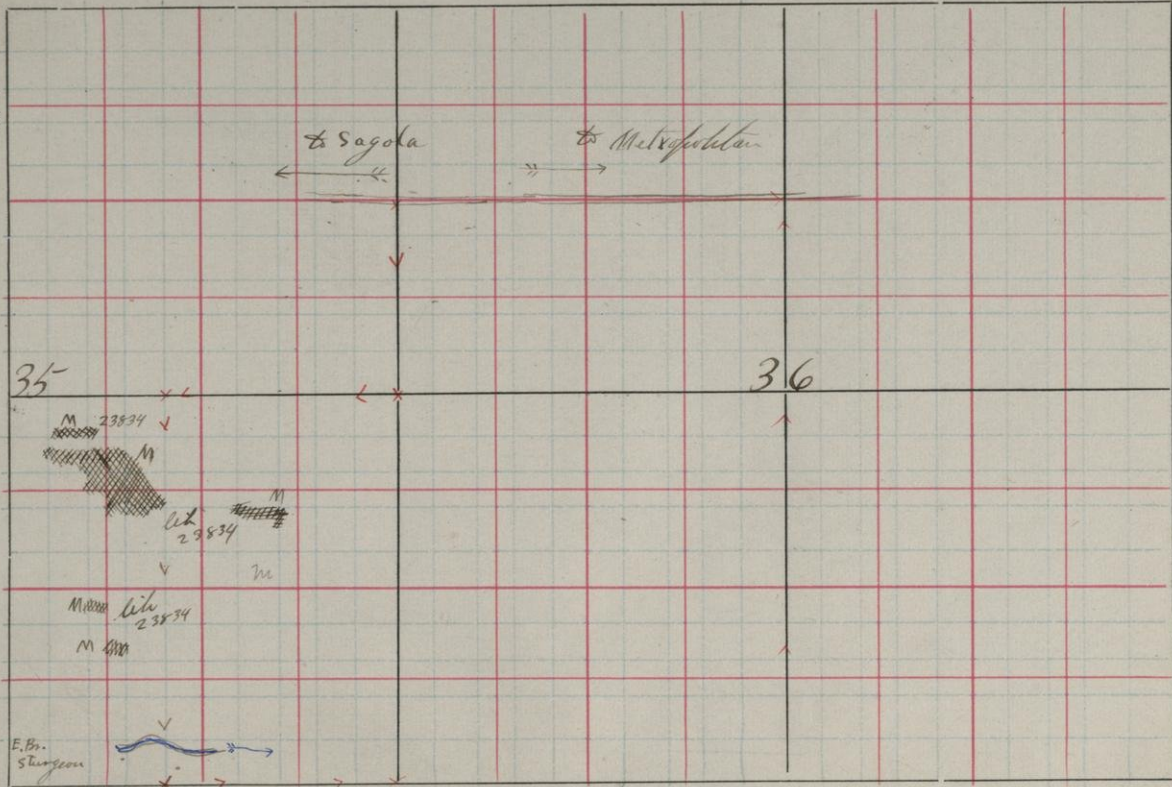
Cor.

S. 35/36 T. 43

R. 29

Cor.

0-747



23834

N 925 W 800 SE Cor. Sec. 35-43-29

Large ledge of pink marble. It breaks up very readily, fractures aplanitic follow the fine veinlets of chert which traverse the rock in all directions.

About 50 feet S. of above ledge there is a large knob of a very similar marble. On fresh fractures the rock is same but on weathered surface it is more cream color than pink like 23834. Ledges extend in E-W direction + this may indicate the general strike of beds. Can find no sign of bedding on the exposures.

The E-W dip between the two ledges may indicate the position of a bed of rock which weathers ^{more} sandy than the marble.

23835-

N1500 W 1930 SE Cor. Sec. 1-42-29

Here, following marble like 23834 we find a slaty calcareous quartzite 23835 bed about 20 ft thick, striking N45°E and dipping 70°SE. Following this S SE comes then limestone like 23834 again.

23836-7

N1440 W 1900 SE Cor. Sec. 1-42-29

At this point there begins an exposure of fine conglomerate 23836 overlaid S E by beds of grey quartzite, ^{alternating} with thin slate and fine conglomerate beds. Strike N75°E, dip 63°S. Beds are somewhat crumpled.

At the NE end of this ledge there is a small patch of limestone with fragments of the congl. 23836 in it. Was the limestone formed near edge of cliff as reef perhaps? Can't get it bedded with the Q + congl.

23838

N1380 W 1760 SE Cor. Sec. 1-42-29

This ridge is made of a gray slate 23838 grading into a slaty limestone of about same color. On NE + SE side of ridge occur limestone like 23834. ~~There is~~ Can't get relations of Sl. + L. over strike and dip owing to broken condition of exposure.

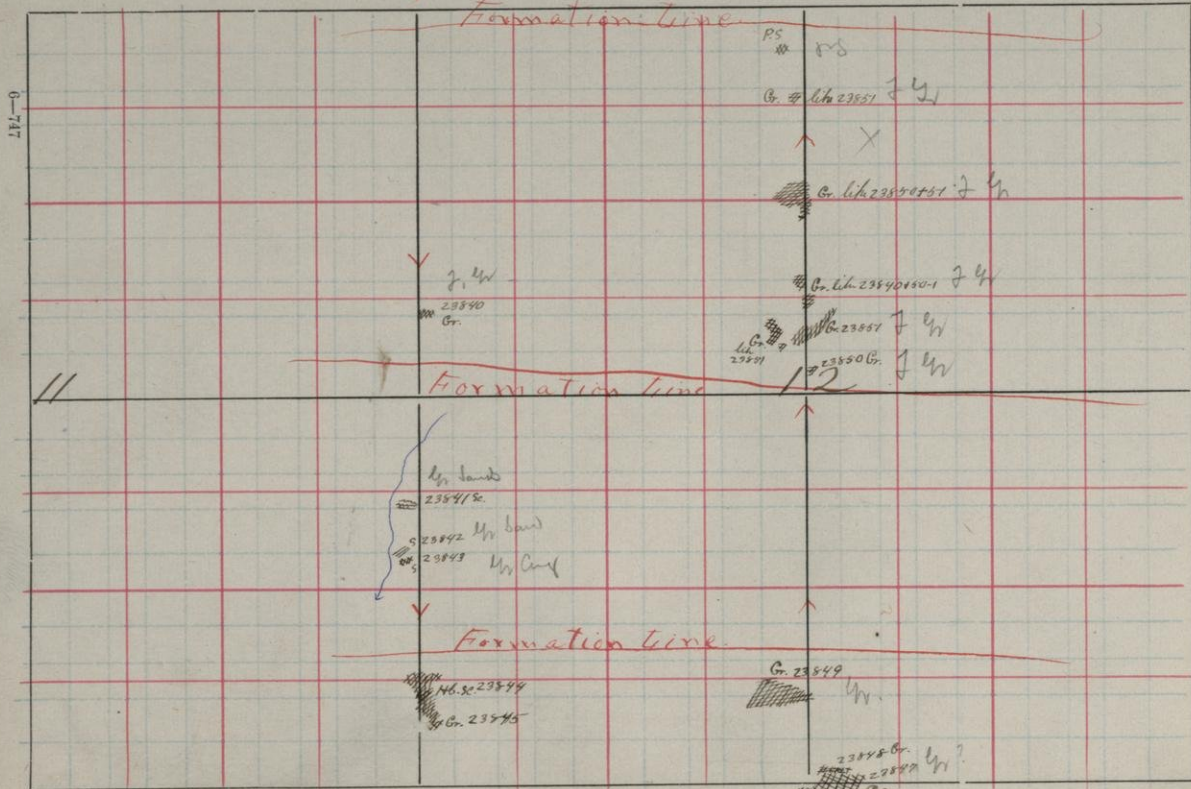
Cor.
V

Cor.

52.

T.

R. 29



Cor.

Co

- 23839 N1180 W 1700 SE Cor. Sec. 1-42-29
 Large hill of massive white quartz
 limestone. No bedding to be seen.
- 23840 N1220 W 0 SE Cor. Sec. 11-42-29
 Small knob of peculiar red very
 feldspathic granite.
- 23841 N700 W 25 SE Cor. Sec. 11-42-29
 Small exposure of micritic schist.
- 23842 N600 W 50 SE Cor. Sec. 11-42-29
 Rock good deal like 23841 but apparently
 finer grained, more slaty and
 somewhat calcareous. Strike N80°E, dip 85°N.
- 23843 N570 W 50 SE Cor. Sec. 11-42-29
^{Conglomerate or Arkose}
 Schist ^{containing} about E40, dipping 85°S.
 c
- 23844 N240 W 0 SE Cor. Sec. 11-42-29
 Ridge of hornblende schist. Exposure
 continues on some distance S. and at
- 23845 N160 W 1860 SE Cor. Sec. 12-42-29
 I find red granite again. Whether cutting
 it or including it I can't say.

Ar.
S. 14/13 T. 42

R. 29

Cor.

Cor.

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

23888
5.00
23844

23888 cm^2

23844

4

13

14

0-747

Cor.

23846 N1680 W0 SE Cor. Sec. 14-42-29

Ridge of granitoid.

23847-8 N0 W975 SE Cor. Sec. 12-42-29

Large hill of diabase in places amygdaloidal 23847. Forms a high knob to E & SE of S $\frac{1}{4}$ of 12-42-29. On the N. face of the hill there is exposed some schistose granite 23848. Probably a shear plane of the granite to N. 23849.

23849 N190 W1000 SE Cor. Sec. 12-42-29

Large ridge of coarse grained granite.

23850 N1050 W975 SE Cor. Sec. 12-42-29.

Small ledge of peculiar very red feldspathic granite. Compare with 23840 $\frac{1}{4}$ mile to west.

23851 N1150 W1000 SE Cor. Sec. 12-42-29

Granite ledge very much like 23850. Outcrops are frequent for about $\frac{1}{4}$ mile to the north.

Potterdam S. 8th N1900 W1050 SE Cor. Sec. 12-42-29

Small outcrop of brownish friable sandstone.

23852 N7060/1000 SE Cor. Sec. 1-42-29
 Small ledge of slate very much like
 23841 to the W of this point. Ledge is
 all fractured so can't get strike or dip
 of schistosity and see no trace of bedding.

23853 N600 W 1040 SE Cor. Sec. 1-42-29
 Exposure of slate in small book
 bed. To the S. of this point and
 at slightly higher horizon the Potsdam
 sandstone is seen. It is probably
 horizontal and overlies this slate
 though can't see contact.

23854 N690 W 1000 SE Cor. Sec. 1-42-29
 Ledge of light colored friable sandstone,
 apparently Potsdam. Seems to
 be in horizontal beds but exposure
 is poor that can't be certain.

Cor.

Cor.

S.

33/34

T.

43

R.

29

33

← Sagola

→ Waterpocket.

34.



Cor.

Cor.

23855-6 N 86° W 1500 SE Cor. Sec. 34-43-29

In banks of E. Br. of Sturgeon are
exposed a graywacke 23855 with
a clay slate ²³⁸⁵⁶ overlying it 23856.
River gives section through these rocks
and makes the strike seem to be
N 35° W, dip 50° N

It appears to me however that
the true strike is about N 85° E
and dip 40° S.

Cor.

Cor.

52

 $\frac{4}{3}$

T

42

R.

29

Con.

6-747

4

3

23857 G. like 23840+50
G.
23857

G. like 23854

Q. 12
2385-7

Q 23860

4/10/2004 6:23:59

23857 N1280W1500 SE Cor. Sec. 3-42-29

Knob of red granite 23857 very much
23858 see next like 23840 & 50-1

page!

23859 N480W0 SE Cor. Sec. 4-42-29

Exposure of schistose rock, sheared
granite it looks like.

23860 N930W0 SE Cor. Sec. 4-42-29.

Ridge of greenstone.

Cor.

Cor.

S. 9/10

T. 42

R. 29

Cor.

V

6-747

9

10

Q 23858

with w 2

Cor.

23868 N 725-W 1480 SE Cor. Sec. 10-42-29

Outcrop of quartzite. Ledge exposed
is small but I believe it is situ.

Cor.

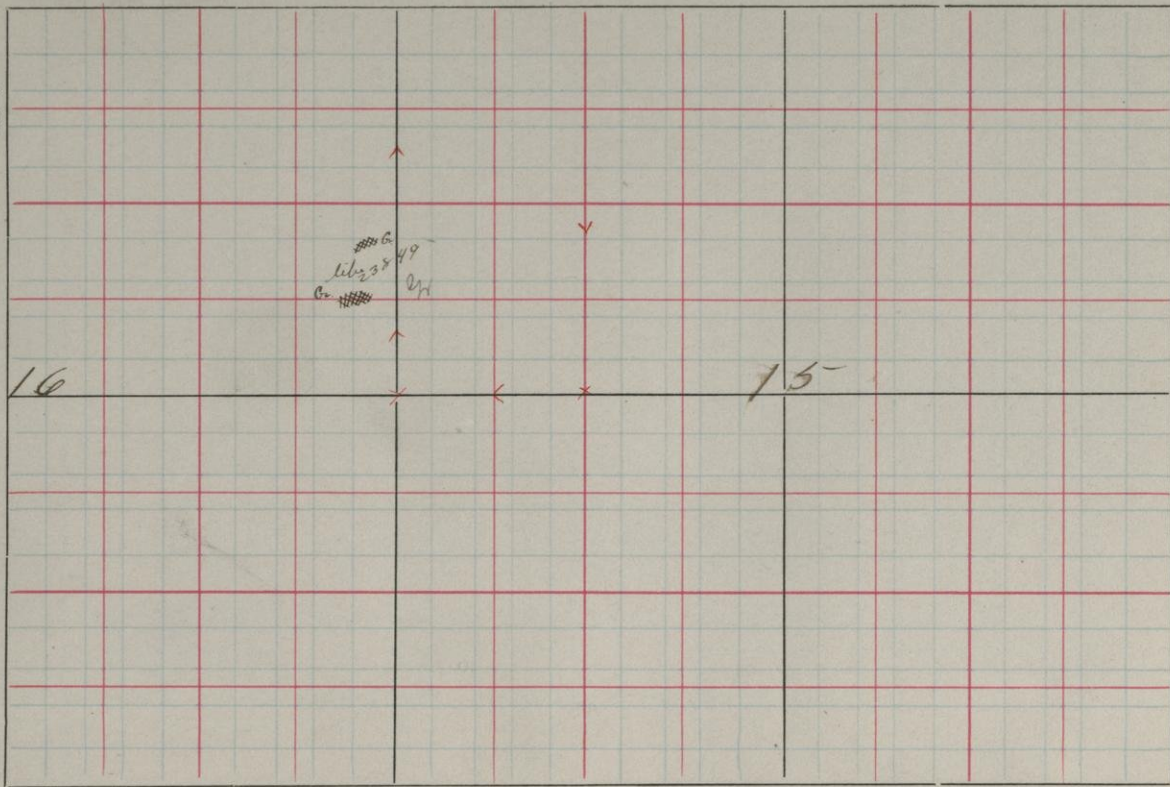
Cor.

S. 16/15 T. 42

R. 29

Ch.

Cor.



6-747

Cor

Cor

6-747

S. 32/33 T. 43

R. 29

32

33



Cor

Cor

Cor.

Cor.

V

S. 5/4 T. 42

R. 29

6-747

5-

4

V

2347
Cor. 6625561

V

V

Cor.

Cor.

23861

N25°W 1600 SE Cor. Sec. 4-42-29

Gedde of greenstone like 23860
outcropping on hill just S. of
swamp

S. 8/9

T. 42

R. 29

Cor.

Y

like
Co. 29839

Y

Y

6

Y

Y

Y

Cor.

0-747

Cor.

Cor.

S. 17/16 T. 42

F. 29

Cor.

V

Cor. like 23899

17

16

0-747

Cor.

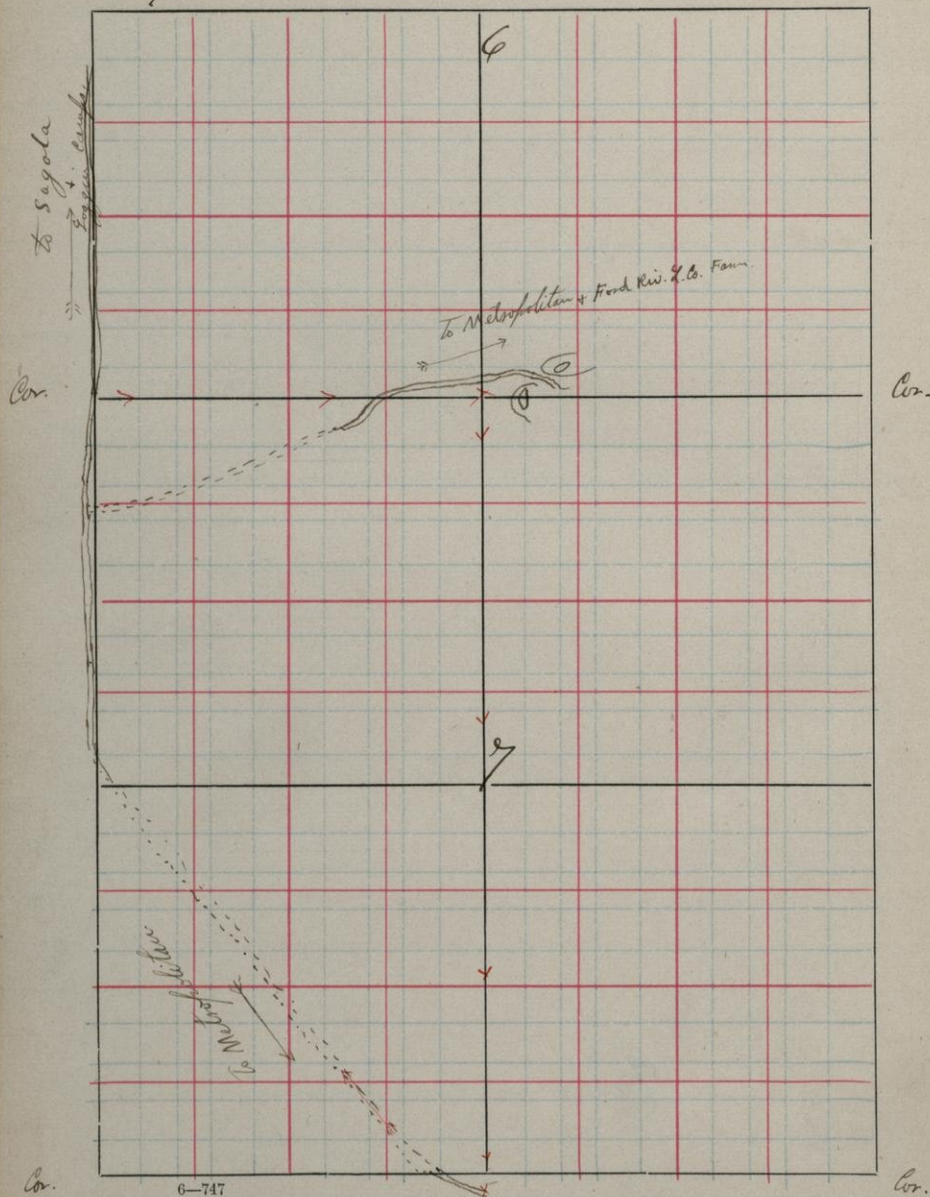
Cor.

Cor.

S. 6

T. 42

R. 29



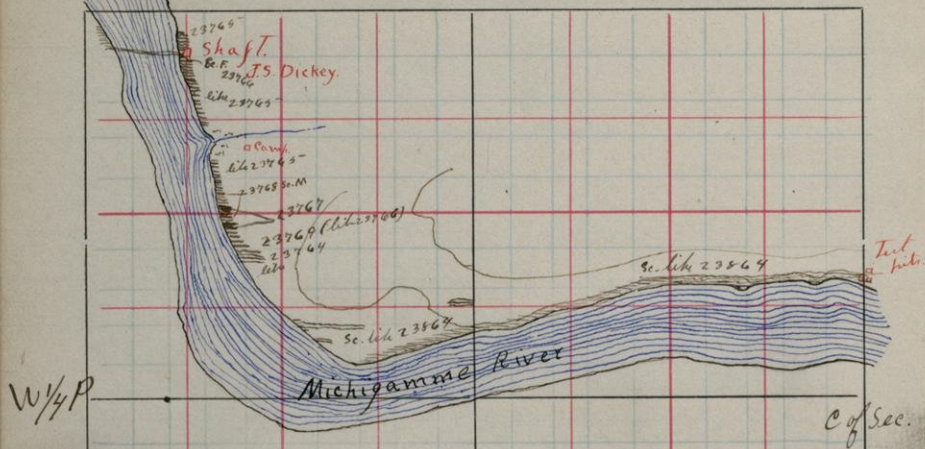
23862-3 N 275° W 440 SE Cor. Sec. 15-42-31
Here begins exposure of ^{Hb. se.} muscovitic
quartzite 23862 which strikes N70° W and
dips 90°. Schistosity agrees with bedding.
At N440 W 606 and at N480 W 440 it is
cut by dykes of granite 23863.

23864 N 610 W 775 SE Cor. Sec. 15-42-31
This is just at the foot of Norway
rapids. The rock is a quartzite very
much like that 23862. Strike E-W, dip 70° S.

23865 N 980 W 850 SE Cor. Sec. 15-42-31
Bank of river here begins to get lower
and consequently outcrops disappear
away from river, appearing only in
the bank itself. At this point
there occurs a chlorite schist bed
about 40 ft. wide which is derived
I think from a coarse grained basic
eruption. Specimen is farthest I could
get.

23866 N 990 W 860 SE Cor. Sec. 15-42-31
Actinolite schist begins to outcrop here.
This forms a wide band cut
at

S. 15 T. 42 R. 31



Scale: 8 in. = 1 Mile

SW
Cor.

6—747

$s \frac{1}{4} p.$

23867 N1000 W860 SE Cor. Sec. 15-42-31
by a dyke of diabase $3\frac{1}{2}$ ft. wide.

23868 N1040 W875 SE Cor. Sec. 15-42-31
Bed of mica schist 30 ft. wide
in the actinolite schist-23866.
This schist 23866 keeps on to
N1100 W920 where 23868 begins again in
bed of river; it ends at
N1125 W950 and schist like 23864
begins. In this schist there ^{are} at
N1150 W1000 several test pits
from which some very ferruginous
rock has been taken. It is probably
an altered ferruginous phase of the
schist. So rotten that it showed nothing as
it had already crumbled.

The Michigamme bends here and
for some distance runs nearly E-W,
exposing schist like 23864+6 in bank.
The bed of river seems to be formed of the
early weathered soft mica schist beds
like 23868.

The northern portion of the section
was made earlier in the season
and was worked from the north,

hence the use of different ^{series of} numbers.

23765-6 N1460 W1775 SE Cor. Sec. 16-42-31

Here begins to outcrop along the low E. bank of Michigan river a green rotten chloritic schist

23765- perhaps are altered micaceous quartzite. ^{of schist like 23864} In it there is found a 20 ft. thick bed of faint rock - ferruginous phase of the schist. Strike N70°W, dip 20°S. Dip given by Mr. J. S. Dickey who is exploring in this bed.

He has found fair grade of ore about 40 ft. below surface but in very small quantity & is drifting further.

23765 keeps on outcropping along the river to S. and is followed by the following rocks as shown on map.

23768 Mica schist (like 23868(?))

23767 Bed of very hard quartzite schist.

^{also} 23768 N1250 W1875 This begins again here & ends at

23769 N1200 W1850 where the actinolite schist 23769 (like 23866?) begins.

Cor. S. 36 T. 44

R. 32

Cor.

C. of Sec.

C. of Sec. 36
23059

36
23059

C. of Sec. 36
23059

Cor.

Cor.

~~22689~~ N460 W 230 SE Cor. Sec. 36-44-32

~~23770~~ Ledge of dense granitoid. No
23869 relations.

This specimen was collected
while looking up spec. 32700-4
(see note book 284). Porphyry ledges
are not flat on this map. For them
See Wernan's map + notes in Note book 294.

