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Marquette district: notes on Marquette Range. No. 157 1893

Clements, J. Morgan (Julius Morgan), 1869-
[s.l.]: [s.n.], 1893

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U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

9-891

✓ 157

Marquette District

J. Morgan Clements

1893

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

Not plotted

~~44344~~

59

60

~~69~~

593

594

574

~~600~~

~~111~~

612 - 9

621

23

27

50

51

52

53

54

55

~~70~~

~~57~~

~~77~~

77

~~78~~

86

702

703

704

716

720

21

734 - 9

#157

Slides

L4686 1/2

706

736

Nos. 24544 - 24737

No 3

Nos. 24868-9-70-124 in No. 2.

Notes

on

The Marquette Range.

J. M. Clements

1893.

Comptroller
Chas. Perry.

I
W¹/₄ P S. 28 T. 48

R. 25-

C of S

SW¹/₄

old State Road To Marquette

Cov

24590
+ 90° ↓

S¹/₄ P

Map I

From W1750 N525 (On old State road) from
SE Cr. S28-48-25 - ran S descending hill
heavily timbered showing no outcrops,
cross narrow valley and get large outcrop
of quartzite. To N occurs a ~~shale~~ schistose
quartzite, this has recently broken off
and forms talus of cliff. Strike E. Dip
90° though am not absolutely sure of correctness of
determination. Following this E & S. is
heavy bed of ordinary quartzite. This is
apparently part of same quartzite as that
exposed just N of Mud Lake forming cliff there.
24540 N1900 W1750 is location of cliff. to where 24540 was taken.

Map II

24542

Crossing this ridge we begin to ascend a
hill in S33-48-25 with outcrops of cal-
careous sandstone + quartzite beds of marble series
N1900 W1750 from SE Cr. S33-48-25. Beds strike E
and are apparently an edge.

N1805 W1750 Edge of calcareous quartzite + slate.

Can't get strike + dip on ledge.

There are ledges of the same series which
outcrops E & W and forms high ridge E & S of
Mud Lake. Here the ground is quite level
and with very few outcrops. We get at
N1855 W1770 outcrop of the ^{fresh colored marble} flinty limestone +
which occurs so frequently in the series E & the
W of present location. Strike W5°S. Dip 82°S 5°E

II

Cor

S. 33

T. 48

R. 26-

NW 1/4 P

NW 1/4

29542

Marble Series
begins

↓ 80°

29542

W 1/4 P

Co of S

Map III

We now continue S over sand hills, with no outcrops showing, cross Little Corp. River + track of D. S. S. + A. R. R. in SW $\frac{1}{4}$ S33-46-25

Map IV

24543

and come to Corp. River in NW $\frac{1}{4}$ S4-47-25 at N1720 W1750 from SE cor. S4-47-25-

Here we find the steep banks of the stream formed to N + E of slate (24543) which to the S + W the marble + quartzitic beds of the marble series outcrop. Slates outcrop here in bed of river also forming rapids. There is a Cleavage in the slate striking N15°W dipping to E 85°, another striking E dipping 40°S.

On S. bank of river prospect holes have been made in the ^{beds of the} marble series evidently following a ferruginous bed (24544) which underlies the slates at

24544

N1690 W1800 strike W 30° N(?). Very doubtful of correctness of this as exposure was so poor.

About 175 paces to W of line occurs falls in the river. Going along river to them we pass quartzite + slates of marble series. At falls there are very evidently small rolls in the strata. General dip of rolls W 30°S.

Ascending hill to S of river find large outcrop of white quartzite at N1570 W1750. We now continue S over very rough ground country but with no

III

W/4P

S. 33

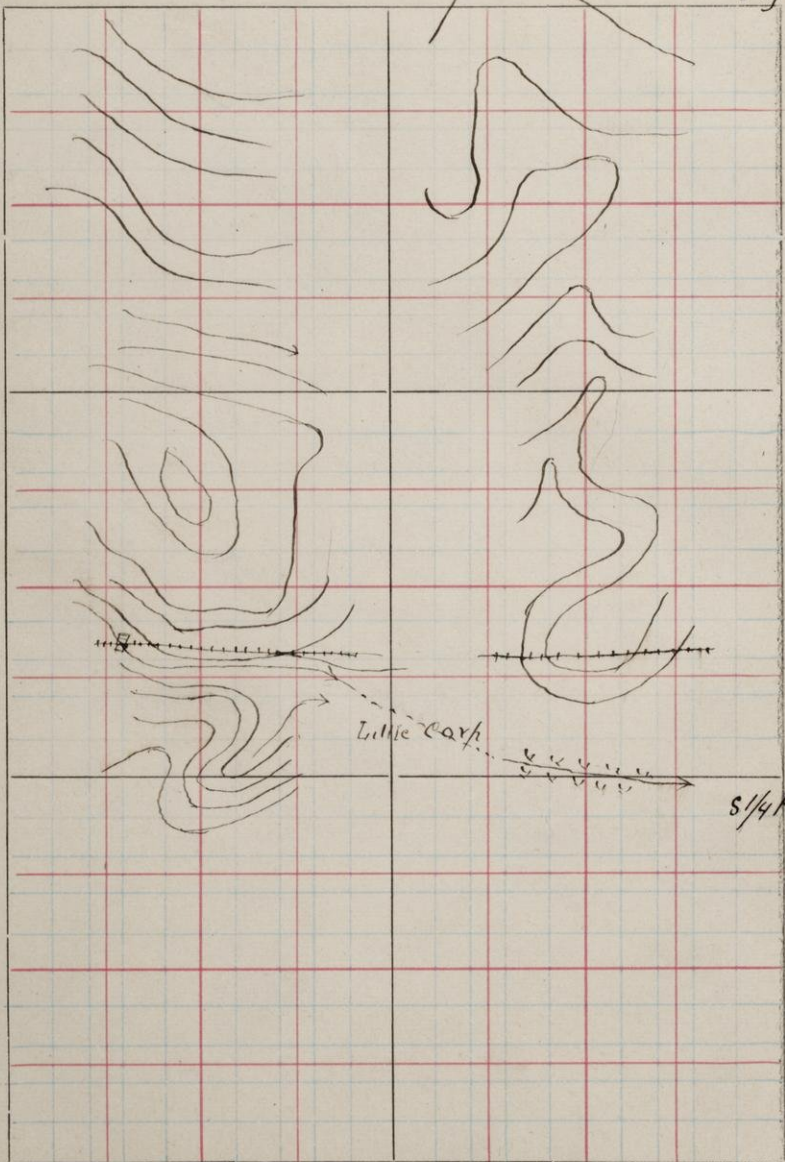
T. 48

R. 25

C of S

SW 1/4

Cor



Map V

ledges showing. Hill is well covered with hardwood. at

24545

N675 W1695- get outcrop of white quartzite and same occurs again at N690 W1750. I find little farther S & W at

24546

N620 W1775- a ledge of congl. (24546) which as well as I can tell from exposure seems to be only a local bed of congl. in the white quartzite. Higher up on hill at

24547

N575^{W1750} we come to pinkish quartzite lying higher on hill than the white quartzite and itself overlaid by a still coarser grained pink quartzite. Strike N. Dip 20° slightly S of W.

N400 W1250 Small lake.

I now run E, getting no ledges, to W1250 then S to S. line then ^{500 ft. more} N on same line.

N0 W1275 Ledge of quartzite underlain by calcareous sandstone (24527-8) of Map XXXII Book 2 Strike slightly E of N. Dip 30° little S & W of S.

Outcrop runs S & N for about 75' from the end of hill top. Get no outcrops running N until we get to

N590 W1250. Here we find white quartzite outcropping. It extends over 500' S & N but I can't get strike at any place. To N of quartzite get small ledge of purple

IV

Coy

S.

4

T.

47

R. 26-

N¹/₄PNW¹/₄

Coy River

W¹/₄P

Cofs

calcareous slates of marble series at.

N65°W/125°

N66°W/127° Very small outcrop of calcareous quartzite and slate.

N68°W/129° Slate + calcareous sandstone. Can't get strike.

N75°W/125° Quartzite + calcareous blue slate.

N81°W/127° Outcrop on steep hill side of slates of marble series. continues around hill to N86°W/125°. Was unable to get strike on any of the outcrops given just above.

Map IV We continue descending hill covered with hardwood which slopes down to Copps River.

N140°W/125° Here find small ledge of purple quartzite at head of small valley. It is sticking out of sand and I am not sure of its being in situ.

24548 N168°W/125° Here we reach Copps River with slate ~~from~~ outcropping in bed and on south bank. Can't get strike + dip. In river bed at N72°W/127° + are to W. outcrop limestone and quartzitic beds + slates in small ledge on N bank. Strike on slates N25°W, dip 53°W 25°S

Undulations show in the strata in river bed.

Map III Cross a low hill and come to Little Copps River N15° from W/125° from SE Cr. S33-48-25°.

N145° in S33 D. S. S. + A. R. R. We now ascend

V

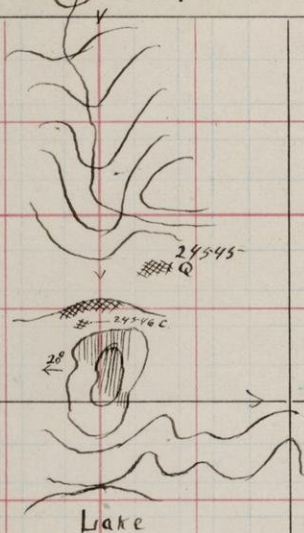
W 1/4 S.

4 T 47

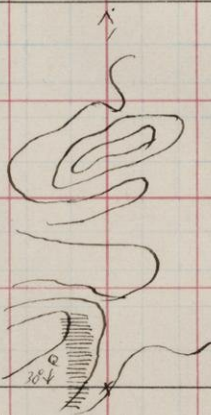
R. 25-

C of S

SW 1/4



Cor



C Map XXXII

24527-8

S 1/4 P

Map II

24549

sand hills and keep on to the our name
which however are well covered with
timber and expose no outcrops in SW $\frac{1}{4}$

S. 33 and only one in NW $\frac{1}{4}$ at
N 18° W 125° from SE cor. S 33-48-25. This is
a white quartzite, Strike E, dip 80 S.

Specimen shows ripple marks quite nicely.
Get no outcrops between here + end of
run at our old state road in S 28-48-25-

VII.

C of S

S. 33

T. 48

R. 25-

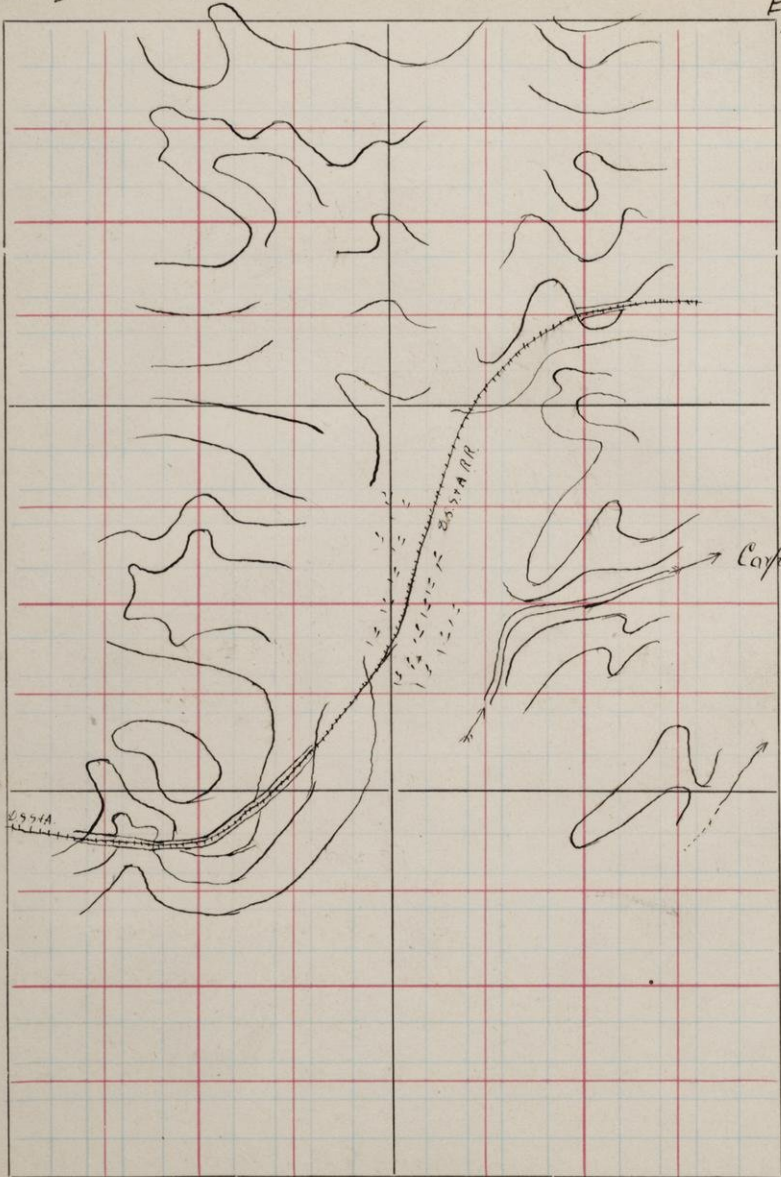
 $E^{1/4} p$

SE $\frac{1}{4}$

5 1/4 p

Cor

Cape River



Map VI

From N 0 W 750 from SE Cr. S 33-48-25 run
 it over drift getting no outcrops until

Map VII

24550

I get into the NE $\frac{1}{4}$ S 33. Here at
 N 165 W 750 begins to outcrop the pink
 cherty marbles + purple limestones of the
 marble series found to W. S of Mud Lake and
 at Morgan furnace. Strike is E. Dip
 I think is δ S but is more 90° that I can't
 be sure. We now pass over a level
 stretch of woods and then begin descending.

24551

N 735 W 700 Here is a large ledge of quartzite,
 predominantly white, with schistose
 quartzite (24551) of 24571 layers in it.
 Strike E 10° N. Dip $85^\circ \delta$ S.

W face of quartzite ledge is exposed, in a
 little valley which goes around it to N, δ
 N 810 W 610.

24553

N 830 W 600 There is a ledge of quartzite and
 slates (24553) at above location. Strike
 E 15° S. Dip $87^\circ \delta$ S, W 15° at

24552

N 830 W 615 Dike of diabase (?). No contact.

N 825 W 750 Linn comes here to large
 low cliff of quartzite with layers of
 schistose quartzite in it. Strike E.
 Dip 80° - 85° S. Cf. 24551, 24571.

This is rare quartzite which was seen at
 Mud Lake and has been crossed in traverses

VII

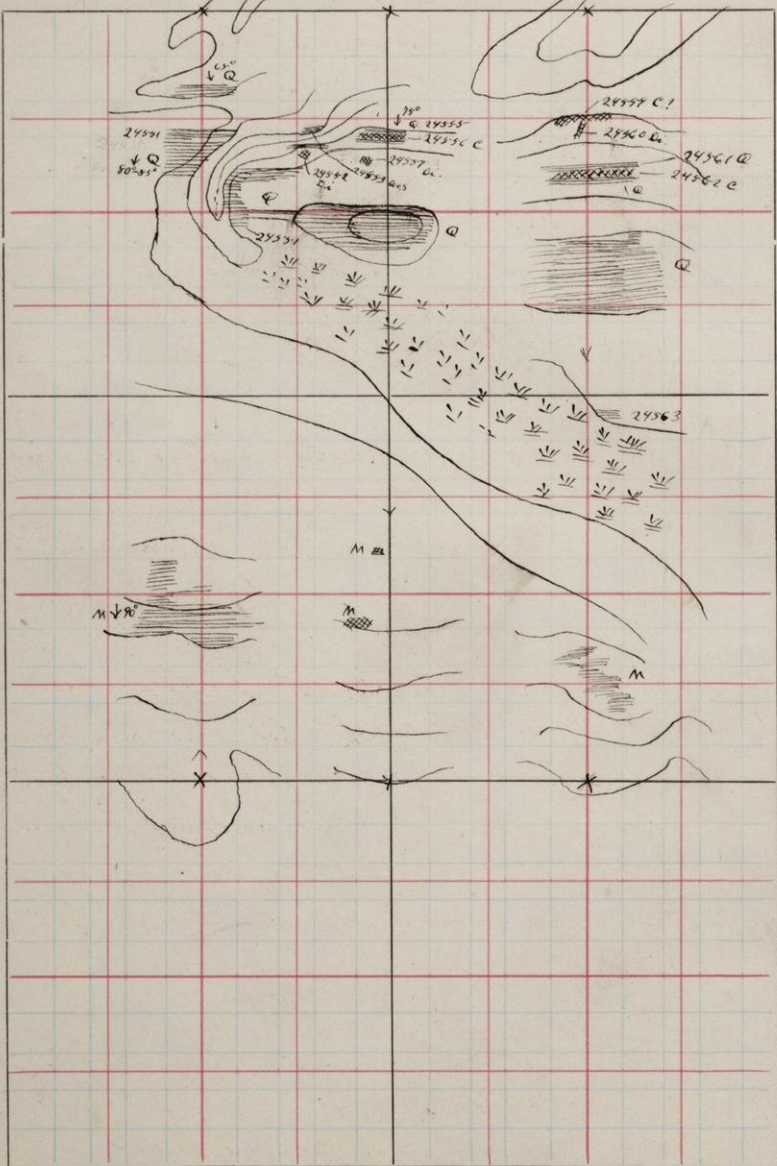
S. 33

T. 48

R. 26-

Cov

NE 1/4



Cof s

E 1/4 P

between here + there.

N 927 W 750 Quartzite ledge

Strike E. Dip 65° S.

Map VIII

Next outcrop is one of greenstone at
N 435 W 715 from SE Cr. S 28-48-25.

N 635 W 750 old state road to Morgantown.

Run now E ^{250 ft} along road to W 500 and then S.

Get small greenstone outcrops at
N 600 W 550 from SE Cr. S 28-48-25 and

N 350 W 425 and again at

N 330 W 480. No more outcrops occur in S 28.

Map VII

24555

at N 1860 W 530 from SE Cr. S 33-48-25 I

find a bed of quartzite extending to E
along hill side. In this quartzite (24555)

24556

at N 1855 W 535 get bed of conglomerate (24556)

about 3 ft thick here. Strike of beds E 10° S
Dip 75° or 10° W. (Not to be relied on as absolutely correct.)

24557

N 1830 W 545. Dike of diabase outcrops. Another ledge

24558

at N 1835 W 710 (Think location must be wrong.)

We continue to around the hill and at

N 1760 W 500 come to foot of large cliff (40 ft

high) of ordinary white quartzite with
beds in it of schistose quartzite (of 24557 & 24571)

Strike E Dip 85° S. This ledge extends to W

and joins ledge located at N 1735 W 700

Crossing north to S of quartzite knob we begin

to around gentle slope and get outcrop at

VIII

C of S

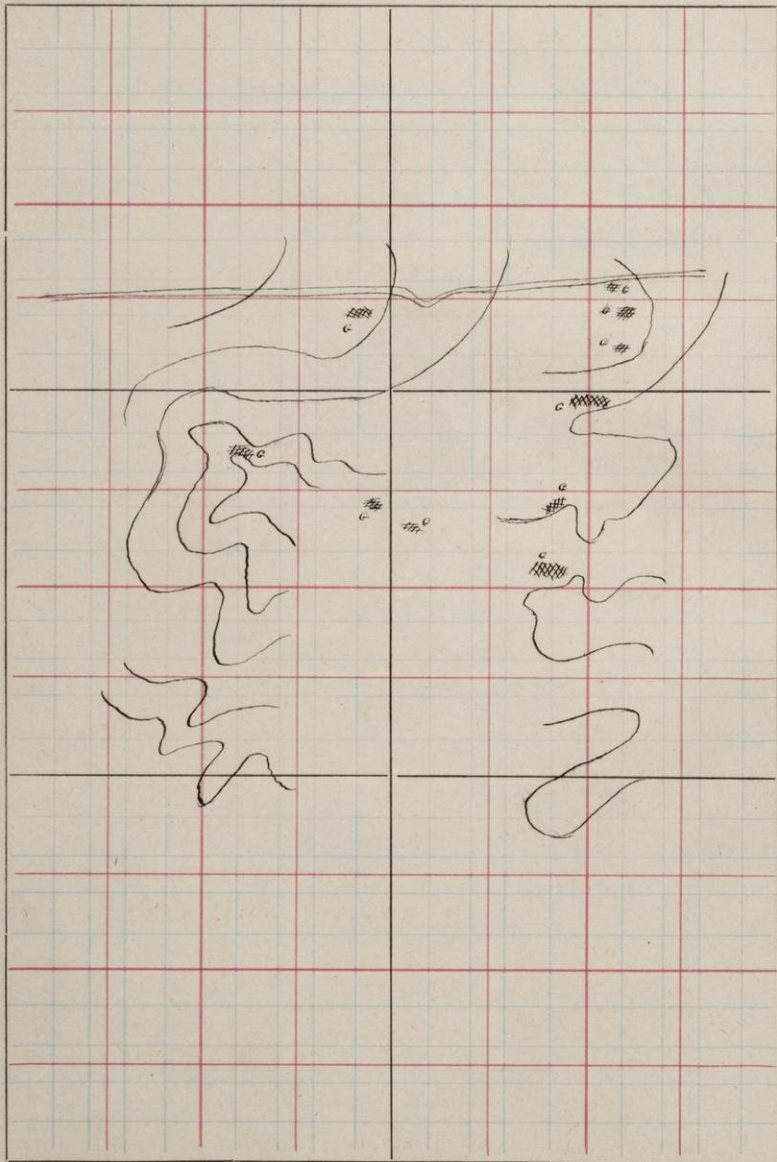
S. 28

T. 48

R. 25-

E 1/4 P

SE 1/4



S 1/4 P

Cor

N7315^{W500} of pink marble. Another ledge of marble outcrops just on S bow of hill at N1210 W550. This same series of marble outcrops in larger + more numerous ledges & W about 200 paces.

Map VI

We continue south down slope of hill over quite rough ground but all drift. End run at D. S. S. + A. R. R. at N180 W 500 from SE Cor. S 33-48-25.

Map VIII

From N650 W 250 from SE Cor S 28-48-25 to run S starting point is on old state road & Marguette. We descend over rough country with here + there outcrops of massive granitoid, at
 N645 W 220 Small ledge
 N600 W 200 " "
 N555 W 210 " "
 N475 W 250 Cliff of granitoid
 N350 W 300
 N275 W 300 all ^{located} from SE Cor. S 28-48-25.

Map VII

We begin now to ascend the main ridge which lies between the old state road and the Corp River, and which seems to extend from S of Mud Lake to the E of this point, as far as my map has shown me,

without breaks and with the schistose quartzite + ordinary quartzite beds lying to N followed by marble series to S, and these beds forming the highest and roughest portion of the ridge. Southern slope is heavily covered with sand from under which no outcrops show.

Strips of above mentioned beds E + dip very steep to S.

Map VII
S GDI
24559-60

N 1870 W 250 from SE ~~to~~ Cr. S 33-48-25. Here we come to foot of cliff 30 ft high of a slate in places looking ^{somewhat} like a conglomerate (24559) cut through by a dike of diabase (?) 24560. At

24561-2
* Quartzite
Matrix with
pebbles of slate
+ quartz.

N 1800 W 250 we come to another cliff of ⁽²⁴⁵⁶¹⁾ quartzite this one with bed of *congl. in it (same as bed to W 24556) ⁽²⁴⁵⁶²⁾ This bed extends to E + W about 200 paces on each, with but few interruptions. At N 1710 W 125 (space intervening between this + last outcrop more or less covered with quartzite blocks) we come to beds of ordinary quartzite with schistose quartzite beds in it to N. (cf 24551-71) Leaving this quartzite knob we descend and just on ^{NE} edge of ramp at
24563 N 1480 W 242 get small outcrop of blue slates.

IX

S.

4

T.

47

R. 25-

Cor

N $\frac{1}{4}$ PNE $\frac{1}{4}$

Carp

Carp River

Cofs

E $\frac{1}{4}$ P

I could not get good strike and dip
on ledges located above but general
strike is easterly & dip probably S.
south though beds are very nearly wedged.
The top of hill get outcrops of marble
and purple limestone (same as those D.W.).
N1165-W250 Here they begin and outcrop with
here and there a few feet of soil intervening.
& N1085-W220.

Map VI We now go over rough sand hills &
N630-W250 D.S.S. & A. R.R. and continue
descending to Cape River at N250-W250.
Along river is exposed red Potsdam Congl.
We leave river and begin ascending a

Map IV high ridge very rough but with no
outcrops in NE $\frac{1}{4}$ of S4-47-25. However at

24564 N745-W305 we get granite outcrop and
Map X the granite now outcrops very few
paces down to section line where I send
my man south. Continuation of this
line S is also our granite.

N900-W300 Granite

24565 N720-W245-Granite ⁽²⁴⁵⁶⁵⁾ cutting granite
N775-W275 Gr.

N680-W270 Gr.

N550-W300 Gr.

N525-W340 Gr.

X

C of S

S.

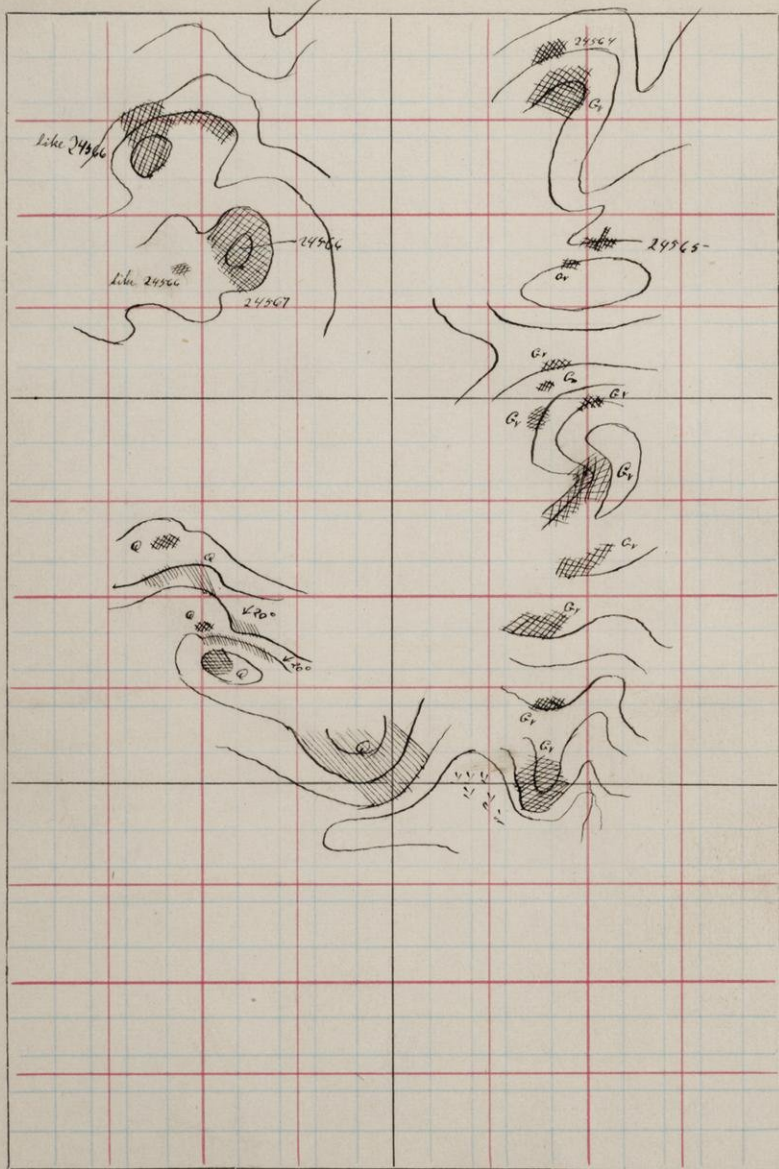
4

T. 47

R. 25

E 1/4 P

SE 1/4



S 1/4 P

Cor.

N 500 W 250 Gr.

N 475 W 325 Gr.

N 400 W 250 Gr.

N 300 W 250 Gr.

N 200 W 300 Gr.

N 100 W 300 Gr.

N 0 W 300 Gr.

From N 0 W 250 from SE Cor. S 4-47-25
now run W crossing granite hill at
N 0 W 50 and then across marsh.

at N 0 W 500 we come to high bluff
of white quartzite, forming high knob
just N of line. Dr. Bayly ran to this
point so I did not work it off of line.
Dips to SW apparently.

Map X

From N 0 W 750 from SE Cor. S 4-47-25
run N. The quartzite mentioned just
above runs along line to W 600 and then
bends around to N. at

N 150 W 750 we come to large bare face
of white quartzite ~~striking~~ ^{striking} to SE and at
N 120 we come to ledge of quartzite extending
around hill to E about 80 paces.

Strike NW. Dip 20° SW.

N 200 W 750 small ledge of white quartzite.

N 200 W 700 Quartzite cliff extending around
face of hill. It is a lower bed of quartzite

than those located just before. This is the same bed outcrops again at N290 W 750. Strike NW. Dip 20° SW.

N325-W800 Small quartzite ledge.

Then quartzite outcrops forms terraces on N slope of Hill. Passing now over quite level ground we get no more outcrops between the quartzite and the red granite at

24566 N680 W 720 Here there is a quite a knob of granite showing at

24567 N640 W690 a peculiar greenish variety.

24568 Small outcrop of granite at

24566 N675 W 775 and then about

N800 W825 we come to another large mass of granite. I looked carefully all around the granite for a contact between it and the sedimentary rocks but could find nothing.

Map IX

We now descend the hill getting no outcrops but when we reach Corp River at N1810 W750 we again the red Potsdam Congl. exposed in bed and along bank. Ascend sand hills to R.R. and end run here.

XI

S. 34

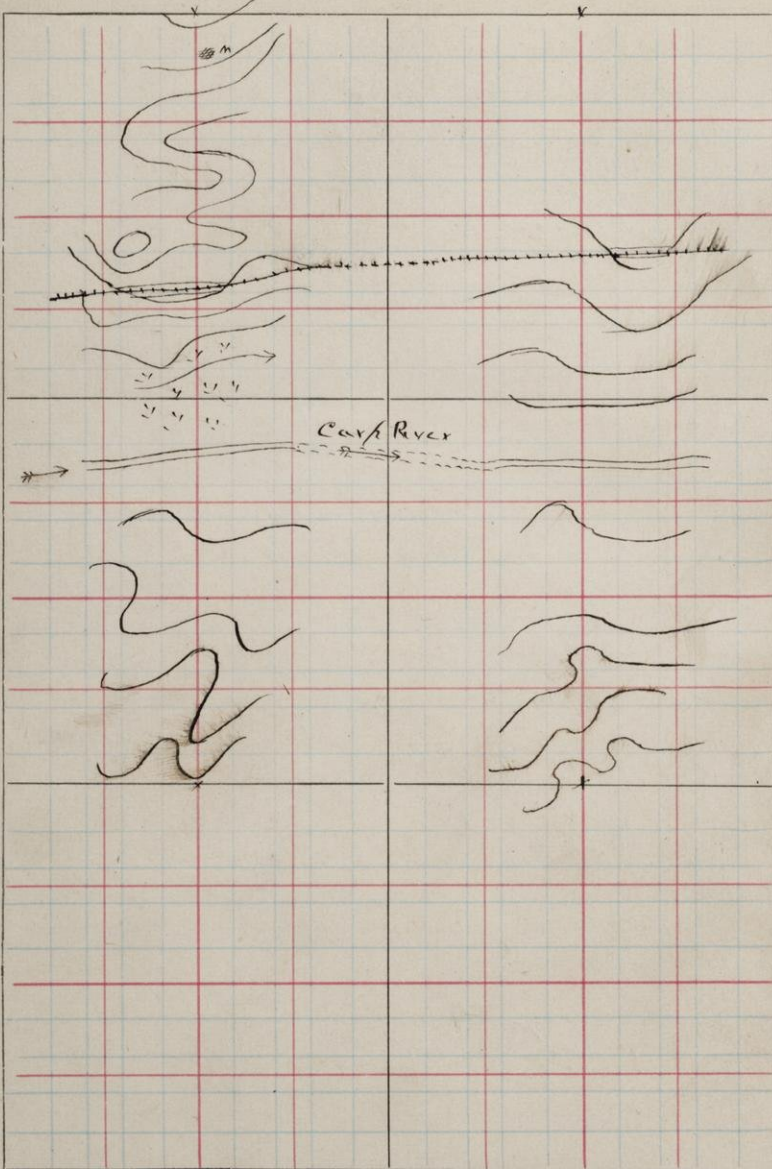
T. 98

R. 25-

Cof S

W 1/4 P

SW 1/4



Cor

S 1/4 P

Map XI

From N 660 W 1750 from SE Cr. S 34-48-25-
min S. Location is on D. S. S + A. R. R
and was given by Dr. Bayley.

Ran south descending drift hill to
Coff River at N 440. Potsdam sandstone
and Congl. nicely exposed in river.

Map XII

24572

Going south from river we ascend very
rough hills with only one small ledge
N 1836 W 1750 from SE Cr. S 3-47-25 of quartzite
showing. No other outcrop was found

Map XIII

24573

until I came to the granite at
N 500 W 1750 from SE Cr. S 3-47-25.

Ran no farther S. in granite but now
went E 500 paces, along over granite
outcrops as indicated on map, to W 1250.

Map XIV

From N 500 W 1250 from SE Cr. S 3-47-25 then N
N 515 W 1250 Granite ledge. Last outcrop until
N 775 W 1250 where I come to ledges of ^{blue & gray} slates
& ^{reddish} marble outcroppings on S + S. E side of hill.

The ledges are very much broken up so that I am
not sure of strike. Exposure continues around
E side of hill and is almost continuous to
N 853 W 1200 where we get it again now
outcropping on NE + around to N side of hill.

Map XV

We cross narrow valley and begin to ascend
the highest point of the range S. of Coff
River. Ascending hill we pass blocks of marble

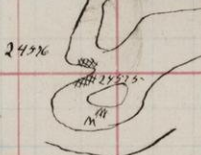
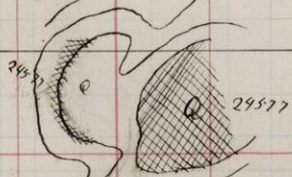
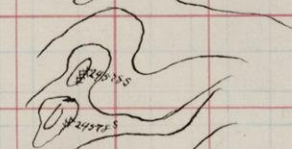
XII

Cov

S. 3

T. 47

R. 25-

N $\frac{1}{4}$ PNW $\frac{1}{4}$ W $\frac{1}{4}$ P

E of S

and limestone but are not run of an ~~insite~~
outcrop until I reach

N190 W1280 Here get workable ledge in situ.

24576- N1250 W1300 Limestone outcrops here. At

24576 N1260 W1300 we get calcareous quartzite ledge.
Can't get a certain strike on any of these
ledges.

24577 N1375-W1200 We are now at the edge of large
knob of white quartzite which forms the
summit of the mountain. From top,
at triangulation station (located by
Dr. Bagley on his run to the E 250 of mine)
can overlook Marquette, Mt. Mansard and
surrounding hills for quite a distance.
Highest mountain in the range.

Same ^{kind of} quartzite outcrops a little lower
down around edge of hill at

N1400 W1275. Descending hill we get at

24578 N1655-W1300 a small outcrop of slate and at

N1600 W1320 the same. Can't get strike. At

24579 N1835-W1275 we come to high cliff of white
quartzite extending around ~~to~~ both to E+W
for about 150 paces.

Map XI We descend still in SW $\frac{1}{4}$ S34 & Cosh River at
N425-W1250 from SE Cr. S34-48-25 then around
& D. S. S. & A. R. R. at N. 690 W1250.

We now go back to our starting point

XIII

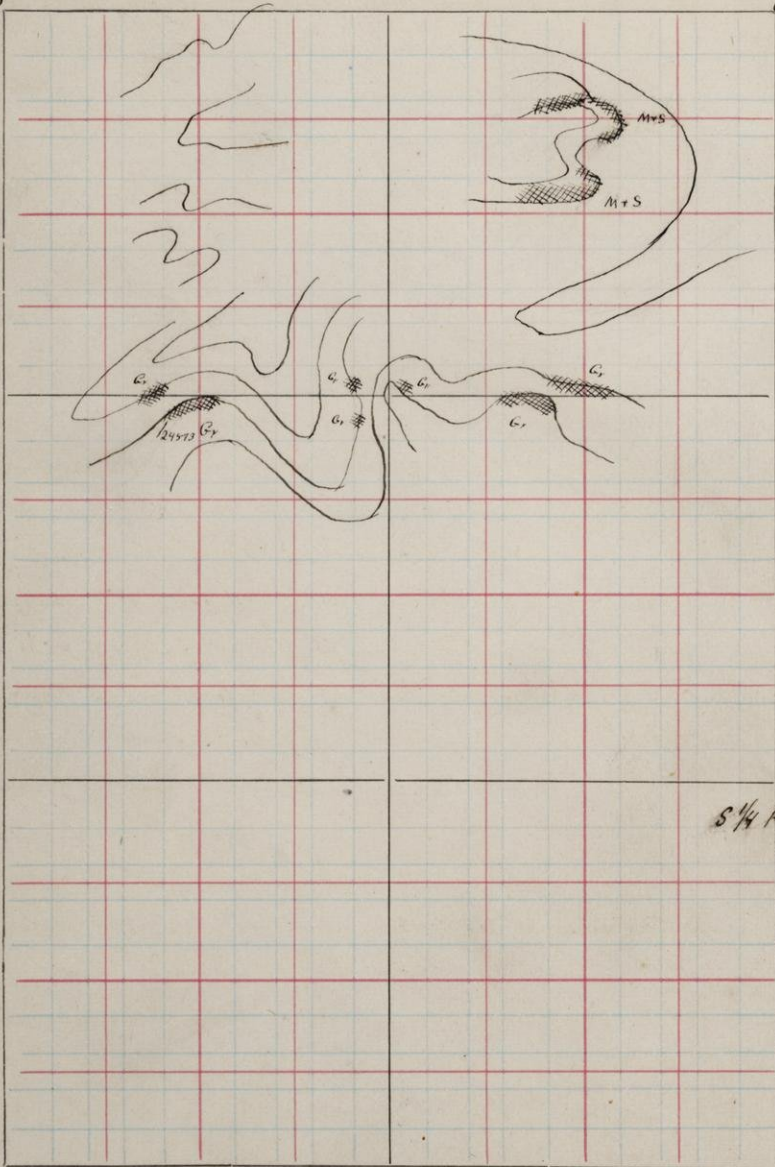
S. 3

T. 47

R. 25-

W $\frac{1}{4}$ P

CofS

SW $\frac{1}{4}$ 

Coy

S $\frac{1}{4}$ P

Map XI

of the morning on the R.R. and run N
At first we are going over rough hills but
with no ledges. At

N 960 W 1745 we come to small ledge of
marble and purple limestone. Higher
up hill the outcrops become more
frequent and we are evidently nearing
the top of the ridge.

N 1070 W 1750 Ledge of purple limestone
and pink marbles.

24580 N 1110 W 1700 Purple limestones and marbles.
Strike E. Apparently an edge.

24581 N 1315 W 1750 Large outcrop of beautiful
pink marble (24581) overlaid to N by
purple slates. Strike $E 15^{\circ} S$. Dip $85^{\circ} N, 18^{\circ} E$.
Outcrop forms cliff on N side of hill and the
strata may have slipped. and

N 7375 W 1780 We come to small ~~hill~~ of marbles
and slaty limestones of same marble series.

N 7415 W 1750 On N slope of hill get ledge of
reddish quartzite.

Crossing a swamp 150 paces wide we
come upon an outcrop of ^{schistose quartz (?)} slates 24583 at

24583 N 7625 W 1780 very much broken up and
followed to N by white quartzite which
is gneiss strikes $E 10^{\circ} N$ + dips $82\frac{1}{2}^{\circ} N 10^{\circ} W$. at

24582 N 7670 W 1720 we find in the quartzite

XIV

S. 34

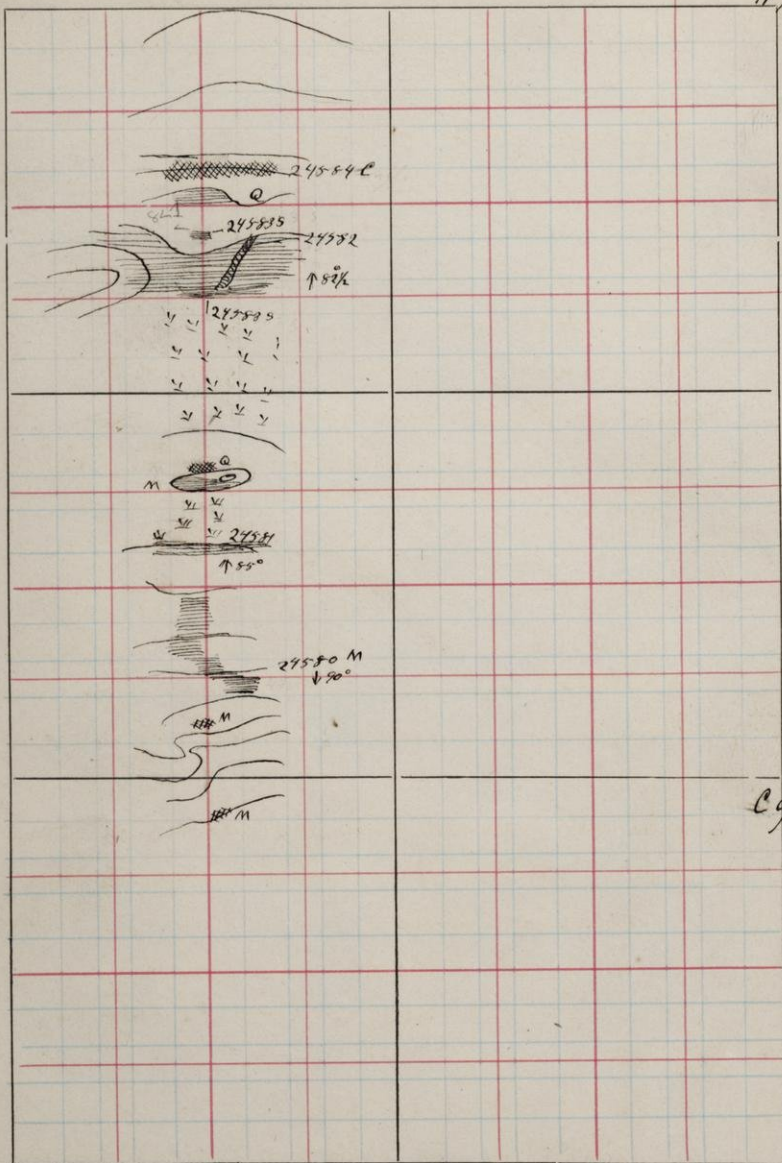
T. 48

R. 25-

Cor

N 1/4 P

N 1/4



W 1/4 P

C of S

78

a trench running N+S evidently
eroded out of a rock which cuts
the quartzite in same direction. It
looked like it might be a dike
of some kind & yet the rock
does not look like an eruption.
The quartzite continues to outcrop
for some distance to N and runs
beyond my line to E+W. At

24583 N715-W1750 occurs another small
outcrop of same, ^{yellowish} schistose (Chert?)
quartzite as 24583

N750-W1750 White quartzite again.

24584 N795-W1750 Here we come to bed of
conglomerate about 15 ft thick
and extending to E+W along hill.
Quartzitic matrix with fragments
of quartz & schist, the whole much
sheared and quite micaceous and
also quite ferruginous from
infiltrated iron. This is same
Congl. bed which was specimened
further to W. (cf 24556 & 24562).

Map XV

We descend hill with gentle slope
and come to ledge of greenstone at
N415-W1800 on S. side of small brook.

XV

S. 27

T. 48

R. 25-

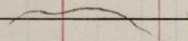
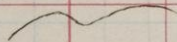
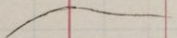
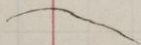
CofS

NW 1/4 P

SW 1/4

Old State Road

?



Cor

S 1/4 P

Same greenstone outcrops again at
N 45° 0' W 1775 and we get massive
greenstone (coarse grained) at
N 52° 5' W 1775 in a small knob.

N 846 Wagon road. (It was so late
that I did not take time to come up.
Fear I may have been a little over the
line to H.)

XV

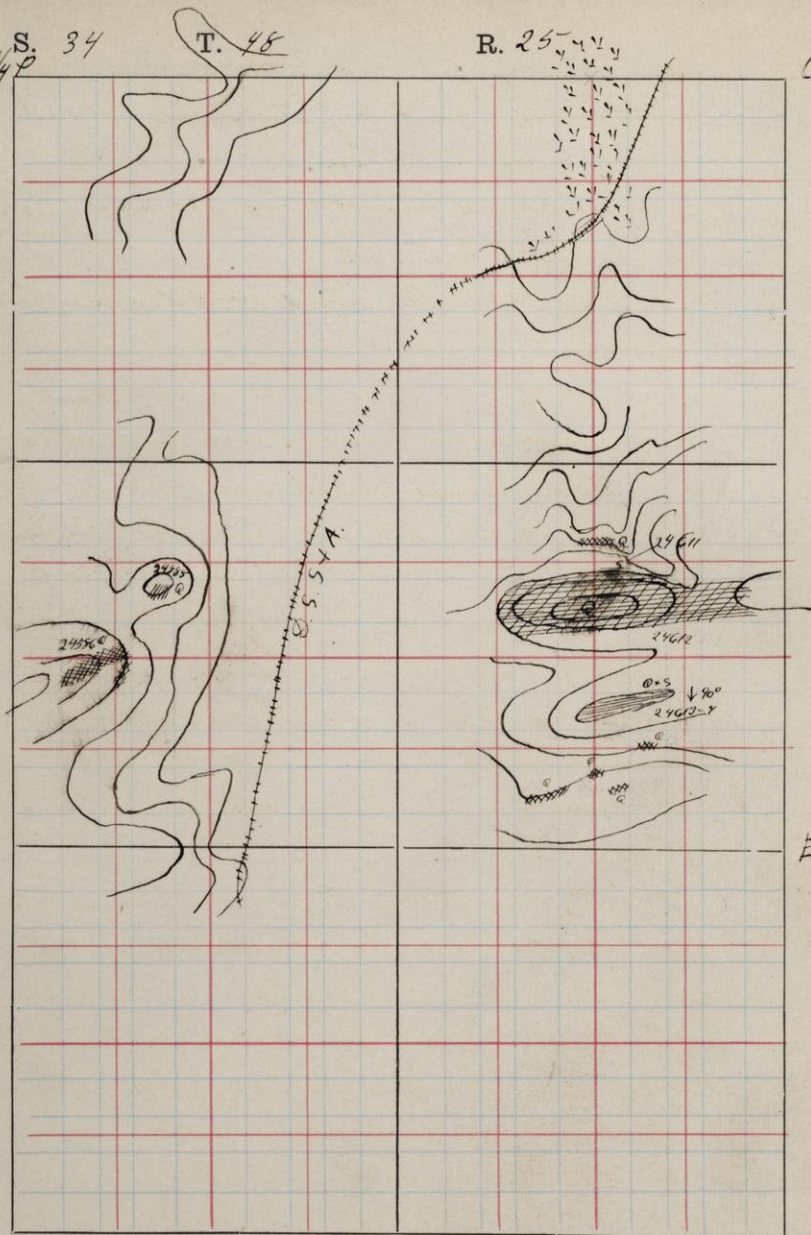
S. 34

T. 48

R. 25

Cor

NE 1/4



Map XV

From N 2000 W 760 from SE Cr. S34-48-25 to run S

Start from field S of Uicance Ground. The fence is on the surface. We go through hardwood and our rolling ground with low ground to E. At

24585 N 1350 W 830 we find small quartzite outcrop and at

24586 N 1225 W 890 we come to large outcrop of pinkish schistose quartzite. Can't get sticks, etc.

Map XVI

We now continue south over sand hills cross D.S.S. & A. R.R. at N 645 and still descending come to Corp River at N 313. Here the ^{red} Potsdam Congl. with thin beds of ~~arenaceous~~ ^{red} sandstone outcrop in river bed & on S bank.

Ahead of us there is a high hill which we begin to ascend, and in bed of brook at

24587 N 95 W 735 from SE Cr. S34-48-25 we find small outcrop of red slate.

24588 N.O. W 850-1000 A ferruginous quartzite outcrops in ledges & blocks along above location.

Map XVII

At N 1925 W 840 from SE Cr. S3-48-25 we get large knob of white quartzite. Can't get sticks & dip.

24589 N 1806 W 765 Small greenstone outcrop

N 1760 W 750 Same kind of greenstone.

N 1205 W 750 Same again.

24591 N 1630 W 810 Here I come to large outcrop of

XVII

C of S

S. 34

T. 48

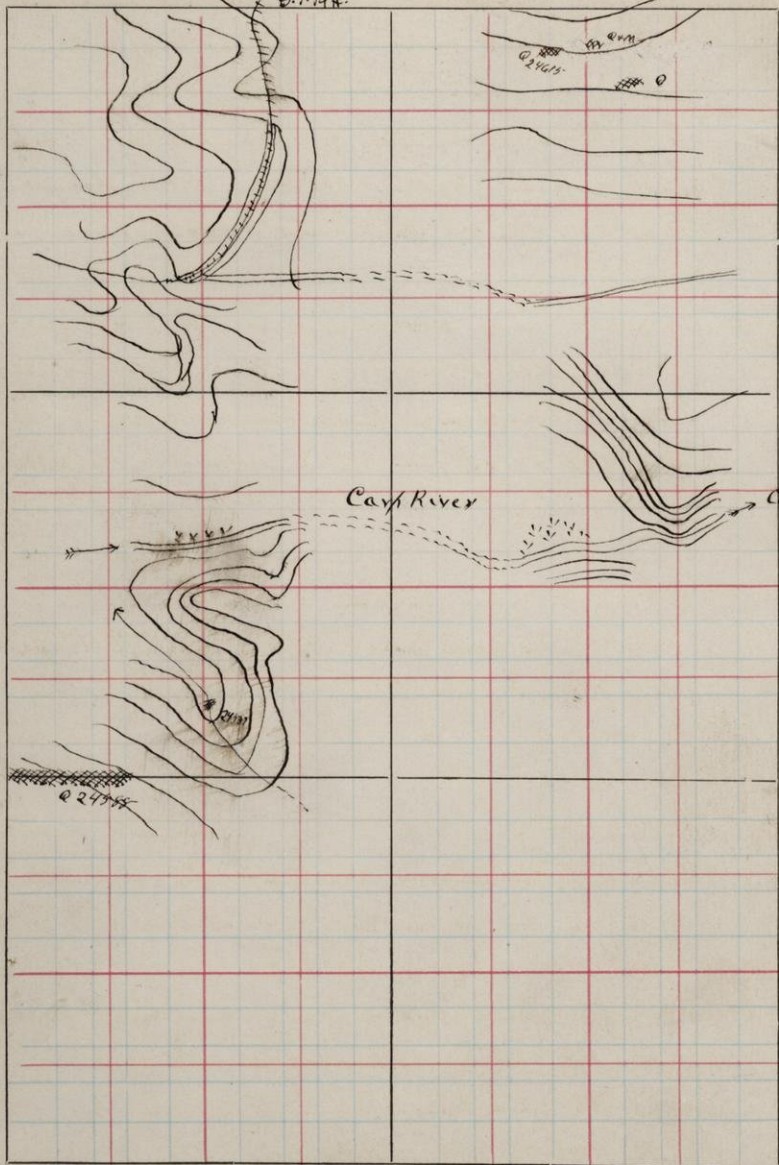
R. 25

E 1/4 P

Q 554A

SE 1/4

S 1/4 P



Cor

greenish smoky rock (diabase) which extends to W over 125 paces. Line crosses the same ledge further S. Crossing a narrow valley we get an outcrop of interbedded quartzite and slaty cherts striking E + dipping 80° S, at

245-92

N 1535 W 750. The slates are yellowish + greenish.

Slight undulations are apparent in the slates.

We have been ascending on the east slope of a high knob, we now cross a valley and begin to ascend another range of hills. ^(the along & same high range off river)

Map XIX

At N 945 W 760 from SE Co. S3-47-25 we come to first outcrop since leaving the slates + quartzite. This is a small ledge of calcareous sandstone. It appears at N 925 W 780 again, striking E + dipping 20° N. To S follow some more small ledges of same ^{kind} calcareous sandstones or quartzite of the middle series at

N 870 W 720

N 865 W 790

~~N 830 W 760~~

N 830 W 725 Calcareous quartzite + in one place the cherty marble shows. Can't yet strike.

N 730 W 750 Small marble ledge

245-

N 715 W 775 small ledge of rotten greenstone

245-95

N 625 W 810 Ridge of rotten calcareous quartzite and very little marble. At

245-96

N 475 W 750 we cross cliff of purplish quartzite in place quite like a

XVIII

N $\frac{1}{4}$ P

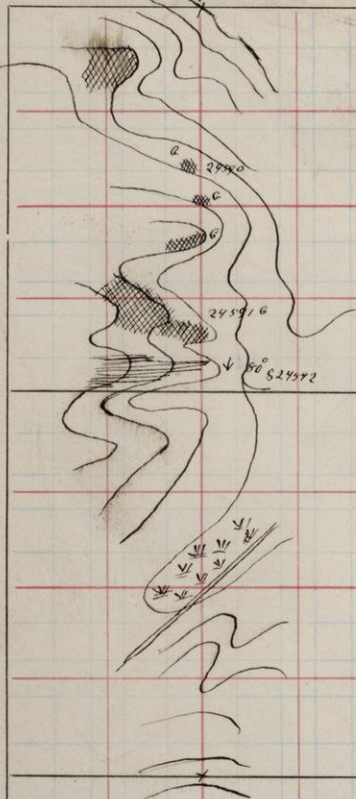
S. 3

T. 47

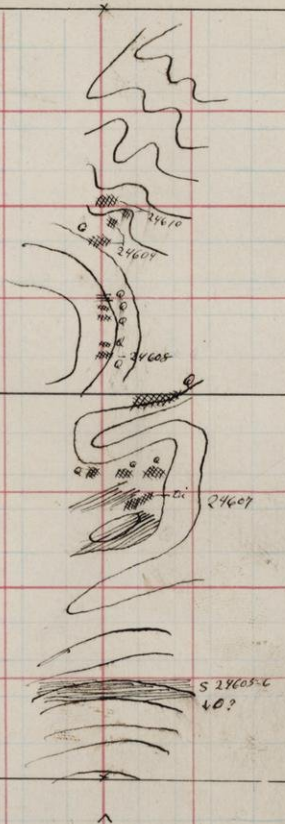
R. 25-

Co

NE $\frac{1}{4}$



Co S



E $\frac{1}{4}$ P

congl. with pebbles of white quartzite
in a purple quartzitic matrix.

- 24597 N 425 W 775 Here we get first outcrop of
the granite. This ledge is a peculiar
greenish color and this seems to be
the characteristic border phase of
the granite. (Cf 24523 from N 1205 W 1540 from
SE Cr. 59-47-25).

- 24598 N 400 W 730 Ledge of diabase (?). No relations.

Red granite continues to outcrop to S.

Could not get contact between quartzite
and granite though ran E along line
of contact. At

24601-2

24603

N 445 W 640 We get an outcrop of quartzite
and at

- 24599 N 440 W 640 we have granite outcropping.
Between these two outcrops appear some
ledges which are not absolutely con-
tinuous but usually only a few inches
of soil intervene between them.

Following specimens were taken from
the ledges beginning at the S.

- 24598 from rock just to N of granite followed
by 24601 & then comes 24602 and next the
quartzite 24603.

Ran E along the south side of the hills
with no rocks outcropping to W 250 from
SE Cr. 59-47-25.

XIV

C of S

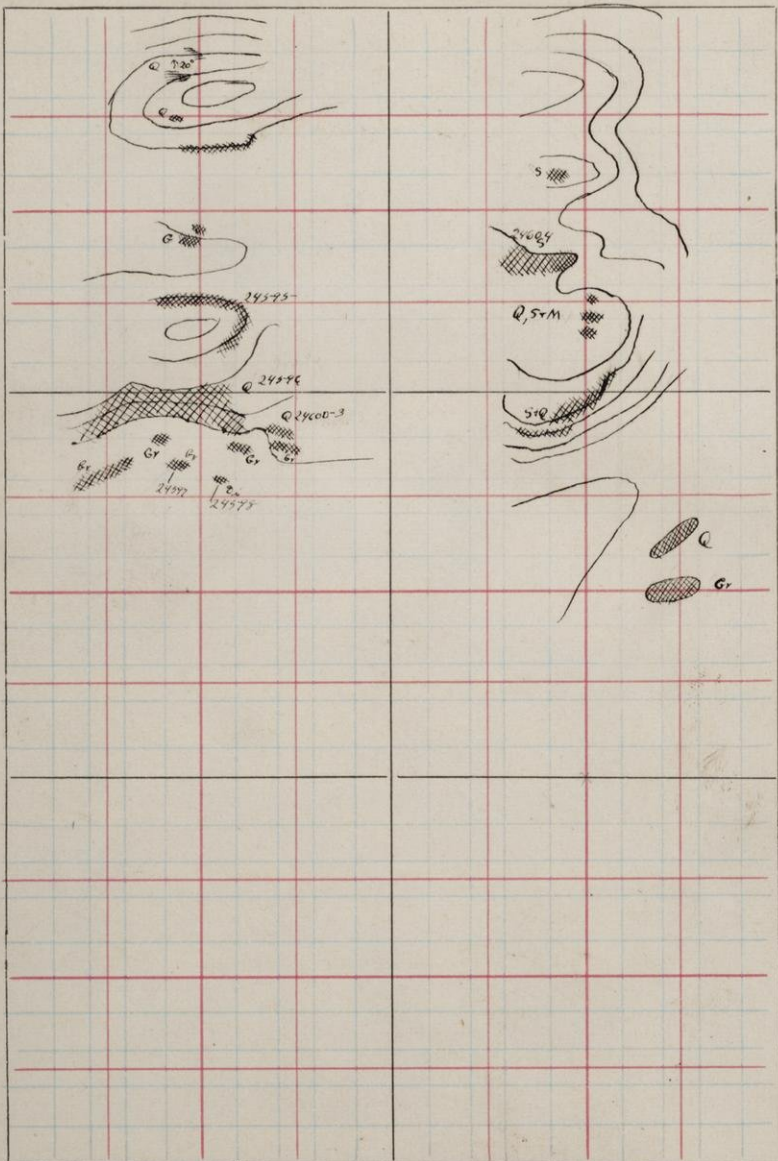
S. 3

T. 47

R. 25-

E 1/4 P

SE 1/4



S 1/4 P

Cor.

Map XIX

at N260 W220 from SE Cr S3-47-25 outcrops
red granite in a small knob.
Nearest outcrop to it to the N is a
ledge of white quartzite at
N300 W220.

We begin to ascend a steep hill with
small outcrops of bluish slate + quartzite block
at N450 W300 and get a large face
at N475 W250 of quartzite + schistose cherts.
Can't get stake or dip. Form cliff on
S brow of hill.

We cross some small ledges of slates and
marbles but get no stake. Locations are at
N580 W250 slates + marble

N600 W250 slates + quartzite.

N635 W250 Quartzite. At

24604 N675 W275 we get quite a bluff of green
slaty rock and at

N785 come to a small slate outcrop.

Can't get stake or dip.

Map XXVIII

24605-6

Continuing to descend we come at
N1100 W250 to a very steep descent about
50 ft high with an olive green slate
outcropping. In the slate are a few
irregular cherty beds or rather beds of
chert nodules (24606). Judging from these
beds (which however may not agree with

the regular bedding of the slate) the slate lies about horizontal. We now cross a small valley and on N side at N1325-W250 come to bare back of ordinary white quartzite. Strike E 30° N. Not sure of dip.

24607 N1360 W 205 Here I find dikes of diabase (?)

Cutting the quartzite.

Small white quartzite ledges occur at N400 W 260; W 225; W 175 and a larger outcrop at N425-W 200.

We now get into a heavy undergrowth through which it is difficult to make our way. I find small ledges at

24608 N1555- Black quartzite

N1565- Small ledge of schistose quartzite.

N1600 Quartzite

N1615- Quartzite

N1630 Schistose quartzite. Strike 10 S of W. Can't get dip.

24609 N1700 Here I find first granitic ^{diabase?} outcrop in small rounded face. Find others at

24610 N1730, W34, N1732 W 238, N1760 W 250. Descend over rough ground with no outcrops to

Map XVII Corp River at N 305 ^{W 250} from SE cor S 34-48-25.

Potomac Congl. + sandstone exposed here along river.

Map XVI

From N2000 W250 from SE Cr. S34-48-25 to run S.

This run begins in a small swampy
cross railroad D.S. S + A and ascends
rough hills with no outcrops until it
reach the foot of steep knob forming
summit. It carries us over the western
shoulder of Mt. Wessard. At

N1405 W250 I come to first outcrop of
white quartzite on steep hill side. Ahead
can be seen ^a the steep cliff of quartzite

24611-12 N1360 W230 Here are large ^{blocks} pieces of blue
slate which are folioid to S by white quartzite
(24612) forming base ~~foot~~ of summit of hill.
The blocks of slate are lying with quartzite
to S + N. and form the part of the talus
of cliff. They have evidently ~~to~~ broken
off some from their original position.
General strike is easterly. Can't get dip,
it is however quite steep, apparently nearly 90°.
Crossing the white quartzite which caps the
hill we come at

24613-14 N1265 W175- to an outcrop of slate &
quartzite beds. Slate lies to S. Strike about
10° S of W + on edge as near as I can tell.
The bluish grey slates are in places very
rich in chert nodules varying very much
in size. Descending we pass small

ledges of quartzite at
N1125-W125 Q

N1080 Q

N1075-W280 & W225- Q.

note

Map XVII

24615- We come finally now to the calcareous sandstone or quartzite of the marble series at N945-W290 and at N960-W250 we find the calcareous quartzite and marble.

24616

N920-W200 Pink calcareous ^{marble} quartzite or sandstone. At N625- we cross old R.R. grade running up to Potsdam sandstone quarries on Mt. Mansard. N305 Corp. River with outcrop of Potsdam Congl. and sandstone along it.

Map XX

Ran E along river over high sand hills to W1750 from SE Cor. S35-48-25. N265-W1750 from SE Cor. S35-48-25. Corp. River.

It flows here between high banks of Potsdam Congl. with thin beds of red sandstone in it in places. Ran N from above location ascending over rough hills of drift.

N640-W250 Old R.R. grade. Same again at N880-W250. At

N880-W1650 there is a large quarry in mottled red + white Potsdam sandstone. To the N of the quarry and higher up on

ΣΥ

S. 35

T.

47

48

R.

25-

C of 5

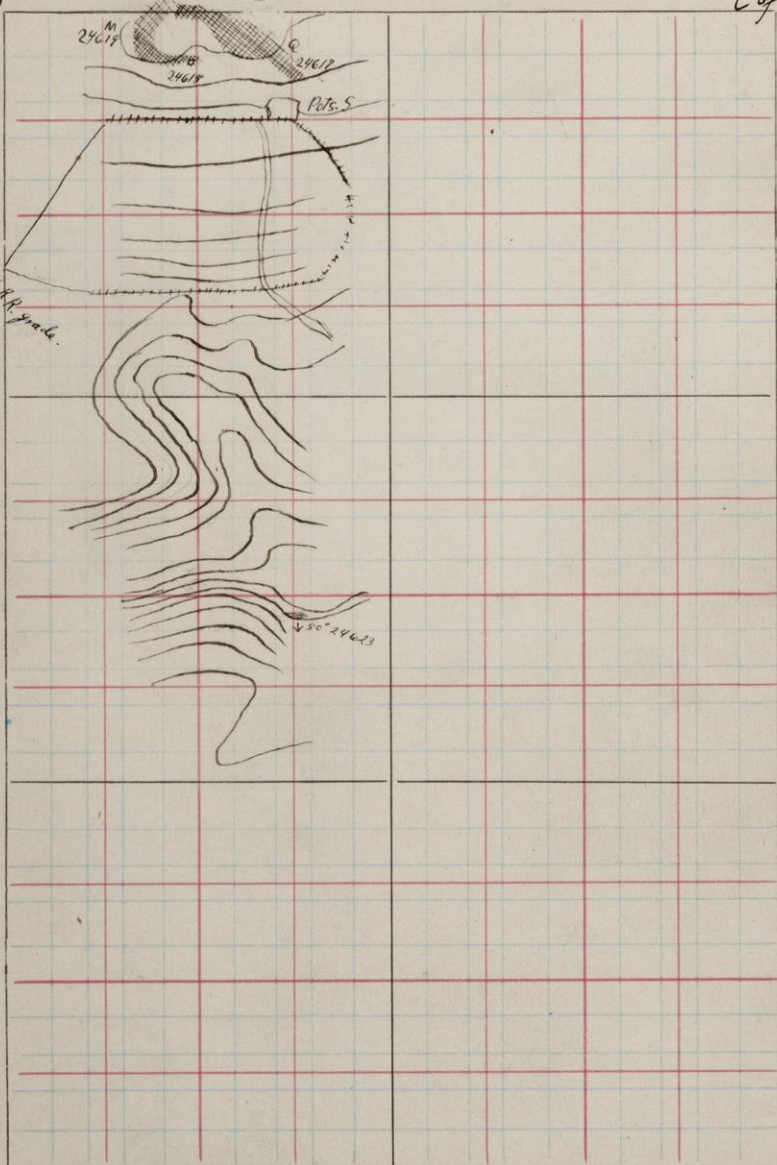
W¹/₄P

SW $\frac{1}{4}$

Old R.R. Grade

Cor

$S \frac{1}{4} P$



24617

side of mountain outcrops at
N930 W1620 a ledge of purple cherty
quartzite with bands more or less
irregular of white chert in it. These bands
are on edge here with general strike E.
A little farther to the W. the quartzite
forms a high cliff at

24618

N940 W1750 we come to ledge of a ^{brownish} ~~reddish~~
^{slightly} ~~fine-grained~~ chert in which a pit has been
mined. Following it to W we come to

24619

where it is in contact with at N950 W1790
with a pink cherty marble. The marble
is very much contorted and through it
are veins of this same brown chert.
It has cuts across and across in places
with the bedding of the marble.

A narrow ^{dissemination} ~~vein~~ or separates this pink
marble from the purple quartzite 24617.

At N1000 W1788 there is only a distance
of 10 ft between the outcrops. Can't get
their relations to each other.

Map XXI

24620

To the north we find in the quartzite (24617) at
N1025 W1730 bands of bluish slate with
reddish chert nodules in it. The bands
are very much contorted so that I can't
get certain strike or dip. At
N8835 W1705 ends the purple quartzite and

XX7

XXV S. 35-

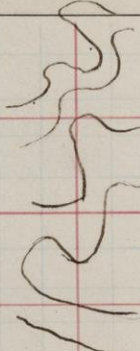
T. 48

R. 25-

Cor

N^{1/4}P

NW 1/4



W¹/₄ P

Co 5

N1035 W1200 begin marbles again

N1035 W1675 - Here outcrops on top of hill a white quartzite with beds of calcareous sandstone or quartzite. They are quite contorted but generally dip about 45° slightly W of NW. at

N1075 W1690 occurs an outcrop of slates with cherty nodules in them, and calcareous sandstone.

M
24621

N6050 W1780 Here there is a ^{test} pit which exposes a marble striking $E 10^{\circ} S$ and dipping $N 60^{\circ} 10' E$. To N of it is white quartzite in large bare face.

The same quartzite begins to outcrop at N1150 W1675 and continues to N forming cap on N side. Could not get strike.

We descend hill now and at

24622

N1450 W1750 find large blocks of discolored(?) scattered over hill side in such number as to lead me to think that they are some either in situ or have been moved only a short distance. Descend over rough drift sand hills to N section line of S35 where I end run.

Map XX

N 265-W 1750 from SE Cr S 35-47-25 is the location of N bank of Cap river. From this point starts south. at Potsdam Congl. with thin beds of a shaly sandstone in it, outcrops in bed + along banks of river. At N 230 W 1625- I find in bed of river near S. bank a small outcrop of light greenish grey slates, (of the Worls series I think), strike E, dip 50° S. They are overlaid by the above mentioned Potsdam Congl. + sandstone lying horizontal. The unconformity is very pretty shown. South of the river we ascend steep hills of clift, quite rough near the river.

Map XXII

From N 2000 W 1750 from SE Cr S 2-47-25 to run S. Cross old road at N 1830 and stream at N 800. We now begin to ascend steep hill side over quartzite talus. Mr. Phillips was with me on this run.

24624-5

N 1645 W 1650. Here we are at N face of white quartzite which caps the hill. To the N we have quite frequently very rich ^{a more calcareous phase} quartzite (24625) beds lying in the ordinary white ^{vitaceous} quartzite.

XXV

Cor

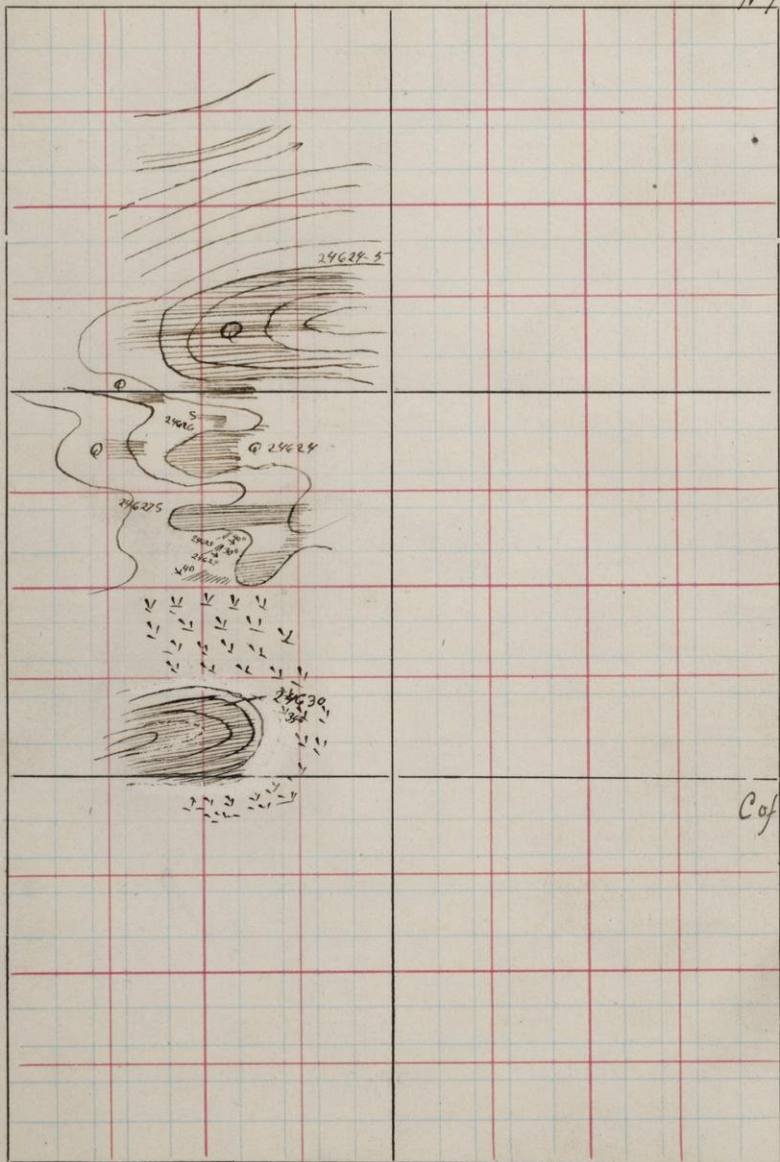
S. 2

T. 47

R. 25-

NW/4 P

NW/4



W/4 P

C of S

- 24624 which forms the mass of the outcrop. The strike is $E 15^{\circ} N$ and dip is $80^{\circ} S$. Bedding and schistosity agree. Crossing this quartzite outcrop we descend and find a small ledge of very rotten grey slate striking E as well as I could tell on the very poor exposure, Could not get dip.
- 24626 N1465 W1750 is the location of ledge which runs farther to the south and is almost in contact with small knob of white quartzite.
- Lk 24624 N1440 W1750 from SE to S2-47-25. Not quite as schistose as 24624. Strike about E . Dip $80^{\circ} S$.
- S
24627 N1365 W1750. Here we begin to ascend a steep ridge of blue slate. Ridge runs $E+W$. Slate is very much broken. One slaty parting runs $W 25^{\circ} N$ and $75^{\circ} S N$. Another runs $E+W$. Am not sure of bedding. At
- 24628 N1325 W1705 we find a small ledge of cherty marble lying on the slate. Strike taken on it gives is $N 75^{\circ} E$, dip 40° to $S, 15^{\circ} E$.
- 24629 At N1310 W1735 we come to same kind of marble (24628) overlaid by calcareous sandstone (quartzite) bed. Strike about NE . Dip $30 SE$.
- N1260 W1700. Large ledge of same blue slates as 24627. Lies higher than quartzite & marble ledges.

N1265-W1750 Here occurs a ledge of
^{Calcareous} same quartzite as 24629 with here
 lenticular beds of marble in it. Strike N85°E
 Dip 40° to S. Following the quartzite to
 S is a little yellowish slate.

We now cross swamp 150 ft. wide and
 ascend a steep hill with S face covered
 with soil, here & there blocks of rock sticking
 through, and no outcrop until we get
 near top where we get at

24630 N1085-W1750 a blue slate ledge
 with cherty nodules in it in places (cf. 24629)
 Strike E 10° N. Dip 34° S, 10° E.

Continuing S over hill we cross the
 edges of ^{blue} slate and ^{reddish} quartzite (more or
 less calcareous) beds with an average
 strike of E 10° N + dip of 40° S, E 10°.

24631 N1035-W1750 top of hill. In places
 in the calcareous quartzite beds are
 lenticular masses of marble or at
 least lenticular masses very much
 richer in Ca CO₃ than the main
 mass of the rock. S face of hill is
 bare. Descending we come to narrow
 swamp which we cross and then
 begin to again ascend a hill with
 outcrops over it of marble, slate, & ^{Calcareous} quartzite.

Map XXIII

XXIII

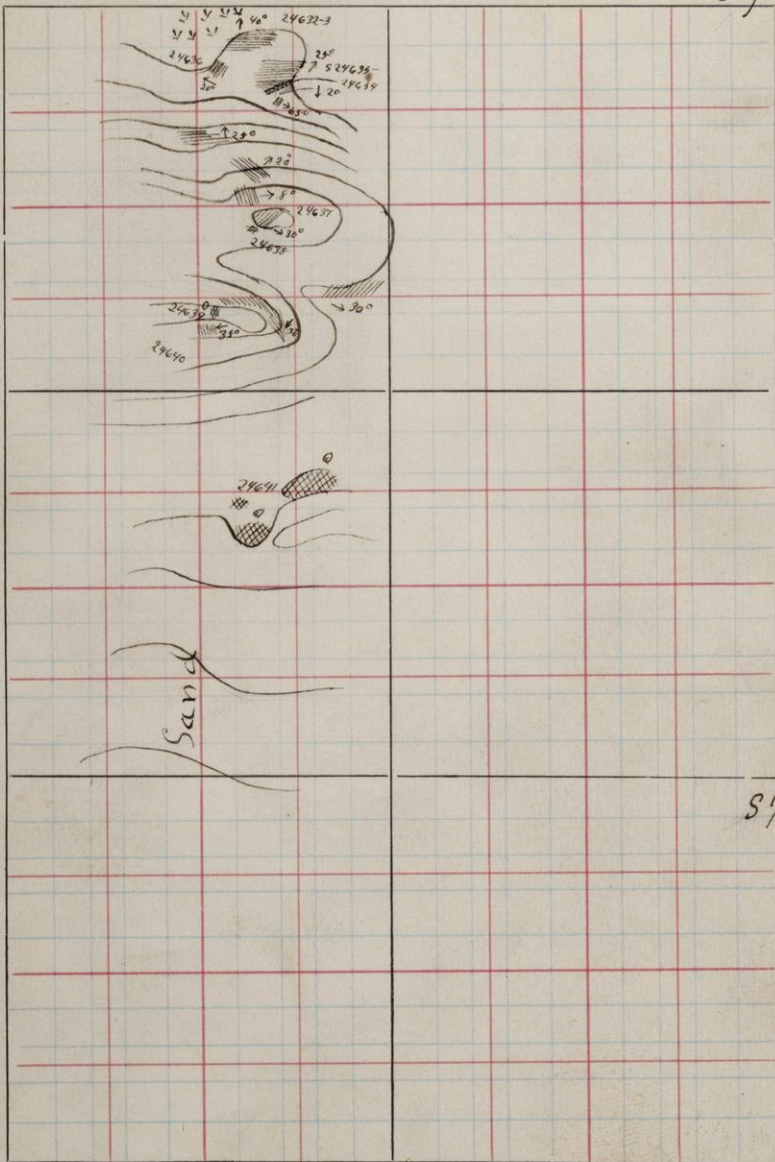
W 1/4 S. 2

T. 47

R. 25

Page 5

SW 1/4



Cor

SW 1/4 P

We now seem to be ascending the S side of a synclinal valley. To the N we have the strata dipping to S. Here the strata are dipping to N.

Map XXVII

24632-3

N 960 W 1700 Edge of hill with outcrop of purple limestone (24632) overlaid by slate + calcareous sandstone (argued) ²⁴⁶³³
Strike E 5° N Dip 40° N 5° W.

24634

N 910 W 1645. Here we find a dike of green eruptive rock (now very much altered). It shows for about 30 paces running to S W. This has pushed up through the slates and we here have them dipping away from the dike.

24635

N 910 W 1645- Blue slate in contact with the eruptive. Strike E 8° S. Dip 25° N, 8° E

24636

N 920 W 1720 Calcareous slate (blue) Strike NE. Dip 20° NW.

N 895 W 1645- Slates with strike E 10° N. Dip 20, 10° E

N 885 W 1645- Strike about NE. Dip 65° SE.

The dike did not affect the strata to the W. We now continue on up hill passing large bare faces of ^{calcareous} slate and limestone inclining to N. at about the same inclination as the dip of the beds. Narrow cuts in them and exposures on ridges allow dip to

be taken.

N 845-W 1750 Slates. Dip 25° little E of N.

Strike slightly S of E.

N 795-W 1710 Large bare face of slate.

Dip 20° nearly NE. Strike about SE.

N 775-W 1685 Edge of slate + Cherty marble.

Dip 8° E 15° N.

24637

N 745-W 1680 Knob of slate with ^{pink} calcareous sandstone or quartzite. Dip 30° SE.

It seems to be near the summit of an anticline the axis of which runs about E and which dips to the E but very slightly. But at

24638

N 740 W 1680 I find an outcrop of pink slaty rock 24638 apparently standing on edge (?). We begin to descend now and at

N 630 W 1575 get blue slates and

calcareous quartzite dipping 30° SE. Strike NE.

N 630 W 1675 Along side of hill outcrops slates, calcareous quartzite (sandstone) and very little cherty marble. Marble beds seem to be giving out the further E we go. These beds are more or less contorted but give dip of about 30° SW Strike SE.

24639

N 615-W 1725 Pink calcareous quartzite below top of knob.

Descend over slates + calcareous quartzite
located above at N 63° W 1675' and
outcropping again here at

24640 N 58° W 1750'. Here I get dip of 35° lit. 9 of W.

We ~~cross~~ in descending, especially at
one point, numerous blocks of a
coarse diabase but don't see ledge.

Cross level ground after leaving hill
24641 to N 35° W 1700 where we get outcrop of
white quartzite and at

N 33° W 1690 there is a large knob of same
and farther E still more of same rock.

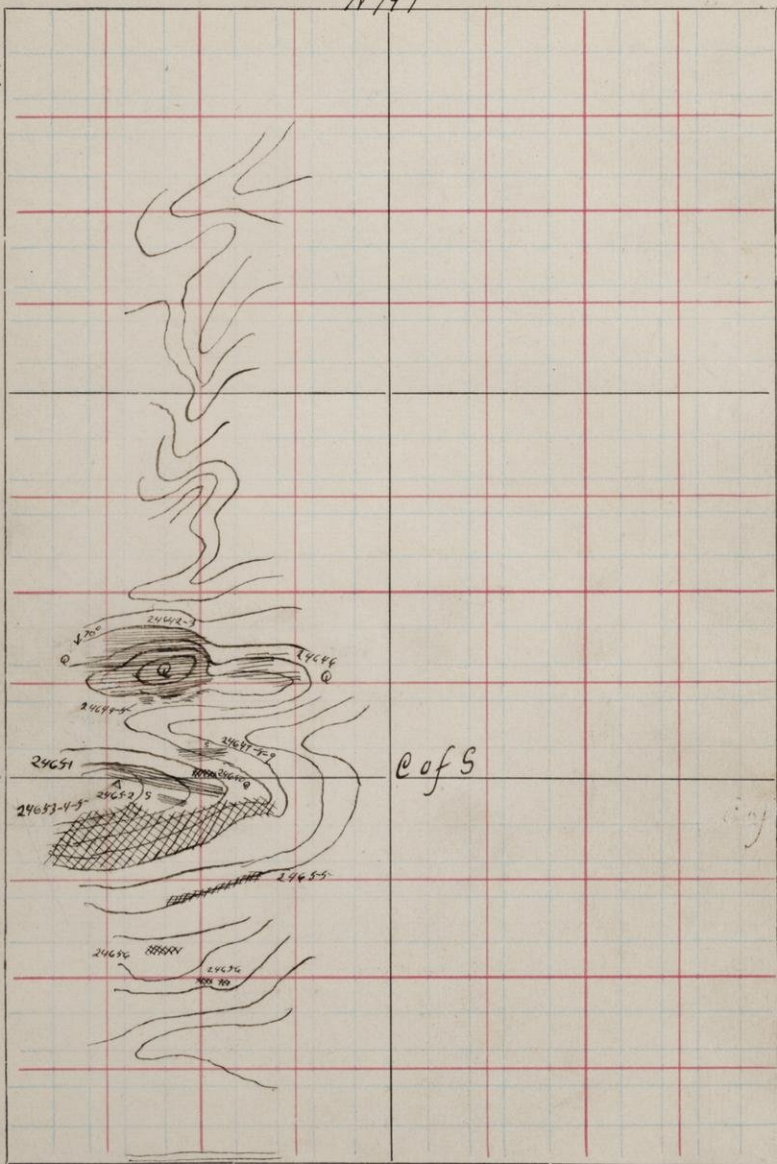
It is hardly like the other white quartzite
of the region but it may be same but
very near the granite.

Run on to S section line, over sand hills, and
then end run.

XXIV

S. 35-

T. 48

N $\frac{1}{4}$ P R. 25-NW $\frac{1}{4}$ NE $\frac{1}{4}$ 

C of S

SW $\frac{1}{4}$ SE $\frac{1}{4}$

Map XXIV

From N200 W 125° from SE Cr. S35-48-25°

D run S & Camp River.

Starting from fence we ascended over sand hills covered with low growth of hardwood and at °

- 24642-3 N1200 W 1275° come to foot of knob of quartzite on Mt. Weard. This is a ritinous white quartzite with beds of a novaculitic phase occurring chiefly to N. (24642) Strike E 5° S, dip 18° S, Schistosity of the aggrs with the bedding.

- 24644-5 N1100 W 1325° Here I find a small remnant of a bed of schistose (24644) with small beds of quartzitic bluish rock in it (24644) Strike E dip 85° S as well as I can get it.

- 24646 N115° W 1215° Here on N edge of cliff find beds of yellowish slate (24646) in the novaculitic quartzite. Beds are quite contorted part way. Strike N 80° E dip 85° N, W 10° N. Beds lie on the ritinous quartzite 24643.

- 24647-8-9 at N105° W 1250° beds of yellowish blue slates (with bands of cherty nodules in them) and calcareous sandstone or quartzite. Strike about 5° S of E. Cannot run of dip, as the beds are so near our edge & exposure poor.

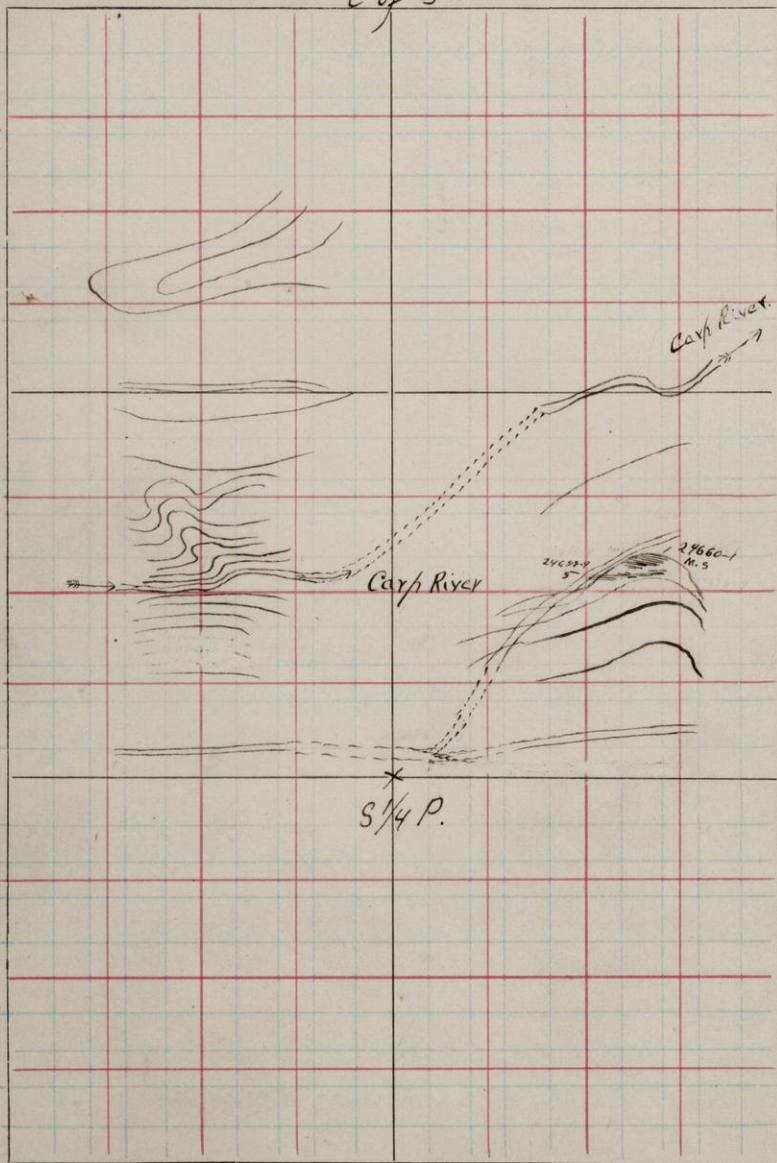
XXV

S. 35-

T. 48

C of S

R. 25-

SW $\frac{1}{4}$ SE $\frac{1}{4}$ 

M

24650 N1085 W1250 Here outcrop beds of calcareous quartzite bed. Broken up into blocks so that I can't get strike + dip.

Q

24651 N980 W1250 which forms crest of ridge. Strike 10° S of E. Triangulation point was located at N995 W1366.

S

24652 N980 W1345 cherty ^{blu} slates. Strike about 15° S of E. Can't get dip on these beds as I only get surface exposures and the beds are very nearly if not on edge.

To the S of the slates begin at

24653-45 N975 W1375 a heavy bed of cherty purplish marble forming steep cliff on S brow of mountain. In places the chert predominates so that we get beds of chert (24655) and also beds of calcareous chert which on weathering give very rough cellular rocks. ²⁴⁶⁵⁴ There is also a good deal of vein quartz running through the beds. General strike I think is E. ^{W. by} Same as other beds.

N850 W1250 Gedge of chert again. 24655-

Continuing on down hill we get at

24656 N780 W1285 an outcrop of rotten calcareous sandstone (quartzite) + chert bed. Shows again at

N 745° W 1250 + N 745° W 1230.

N 510 W 1250 Wagon Road. We descend over
hard hills and reach at

Map XXV

N 255° E 1250 the Cash River. Here in
bed + on banks are exposed the
mottled Potsdam sandstone underlain
by Potsdam Congl. Beds are horizontal.
S of the river we ascend to wagon road at
N 45° W 1250 from SE Cr. S 35° 48-25.

Map XXV

From N 0° W 750 from SE Cr. S 35° 48-25-
see N of Cash River

N 69 Wagon Road. Descend hill and at

24658-9 N 275° W 750 get slate outcrop with cherty
marble to N. (24659) Strike E as well as Jean tell.
Can't get dip on exposure

24660-1 N 290 W 685 Blue slate (24660) strike about
10° S of E followed by cherty pink marble
bed. Can't be sure of dip. Beds are just
about on edge.

N 275 W 750 Wagon Road. ~~Get~~ outcrop on it.
Cross flat covered with boulders + here + there
few bushes before reaching Cash River at
N 500 W 750 from SE Cr. S 35° 48-25

XXV

S.

35

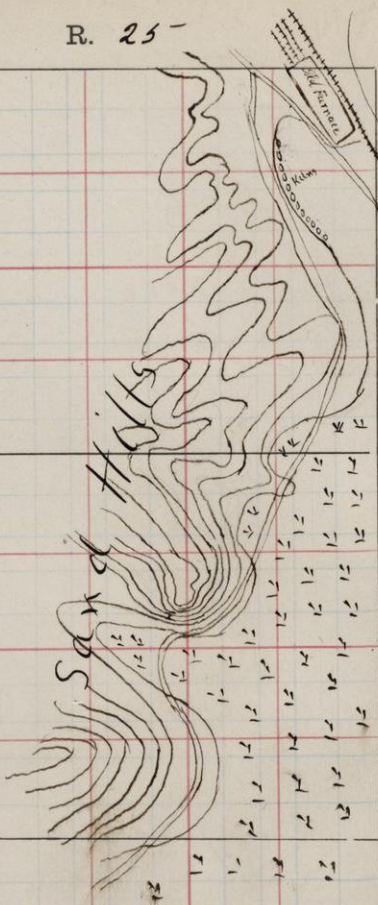
T.

48

R. 25-

N¹/₄PNE¹/₄Cor
Lake
S

Cof S

E¹/₄P

Map XXVI

From N2000 W250 from SE Cr. S35-48-25-
 ran S over sand hills just back
 from shore of Lake Superior. No ledges
 at all were found.

Map XXVII

24662

In the SE $\frac{1}{4}$ of S. 35- find to N of wagon road
 at N 880 W 365- a small quarry in
 metavolcanic granite. Strike N 80° E.
 Strata are so nearly on edge that
 I can find a dip of 5° or 6° either to
 N or S in different places
 N 675- W 250 Cross Corp River here and
 then ascend sand terrace go over
 gently rising sand hill to S section
 line.

24657

At N1985- W 500 from SE Cr. S2-47-25-
 find a small outcrop of gneiss and
 in that - there is more around to S.
 Am not sure as to the location being
 very exact. Dr. Bayley runs to this
 point and will check it.

XXVII

S. 35-

T. 48

C of S

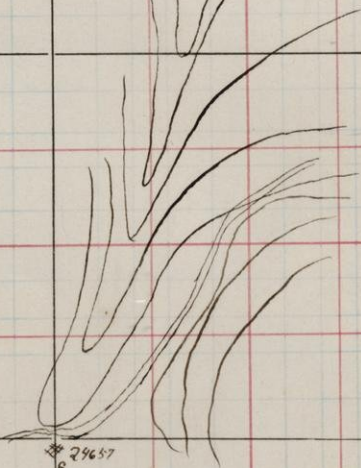
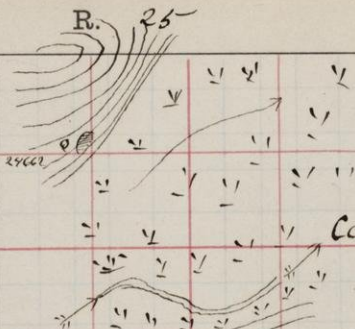
E 1/4 P

SE 1/4

Cayp River

S 1/4 P

Coy



29657

XXVII

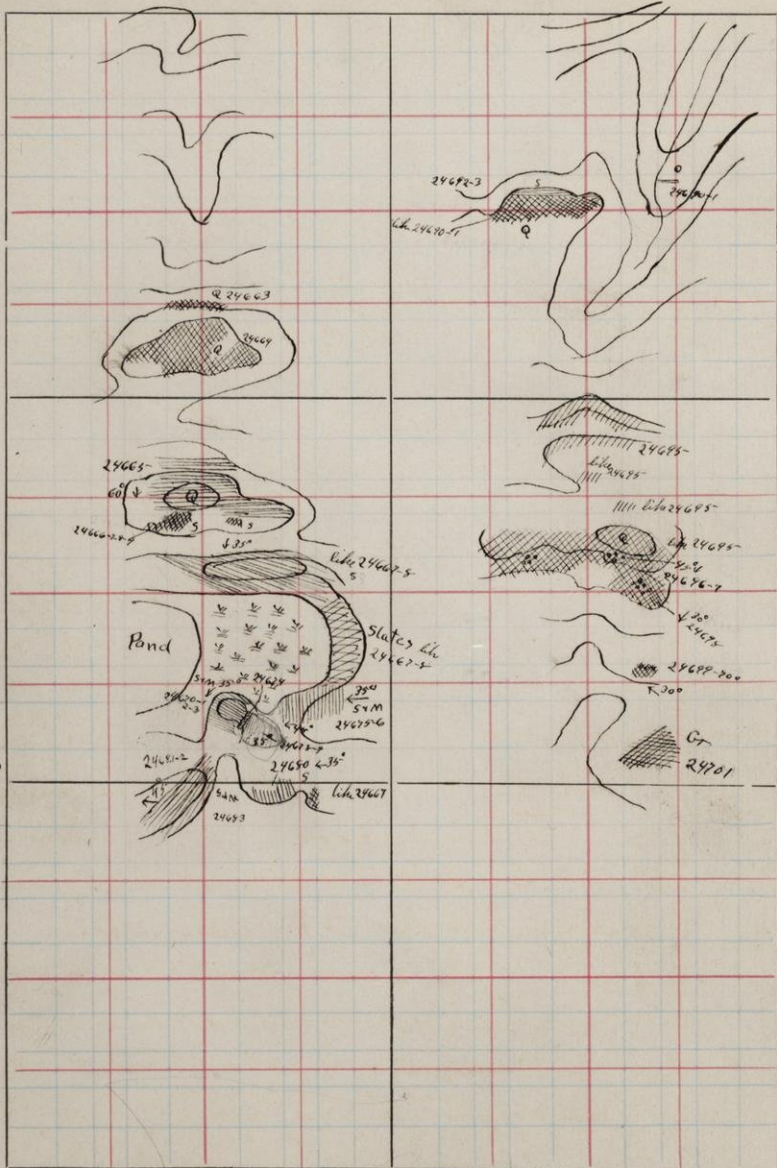
S. 2

T. 47

R. 25

Co

NE 1/4



C of S

E 1/4 P

Map XXVIII From N2000 W750 from SE Co. S2-47-25-
ran S. Mr. Phillips made the run with me.
We ascend at first hills covered with
hardwood and on which no outcrops
show. At

24663 N1628 W750 on steep N side of hill get
outcrop of a grayish more or less
discolored quartzite on which can get
neither strike nor dip. At the top of hill

24664 N1600 W750 we have ^{with large} a ^{large} area
with surface outcrops of white quartzite.
Leaving this knob we cross a depression
and ascend another white quartzite knob at
24665 N1425 W750. On this I get a strike of
about $E 10^{\circ} S$ + average dip of $60^{\circ} S$ 10'w.
Beds undulate slightly. At

24666-7-8-9 N1360 W720 we are at edge of quartzite ²⁴⁶⁶⁸
and slate (24668) with narrow bed of
congl. ^{or breccia} between (24666). Bed 2-5 inches thick.
This bed dip $60^{\circ} N$ + strike $10^{\circ} S$ of E as well
as exposure allows to be determined.
To south of the congl. comes blue slates
in places siliceous (24667-8).
Dip of schistosity is $68^{\circ} N$ strike $5^{\circ} S$ of E.
Can't determine strike on bedding in slates.
In one place it shows but is there very
much contorted.

- Not very widely separated from this outcrop of slates we come to a ridge at
 Lk. 24667-8 N1300 W750 of slates like 24667-8
 Dip of schistosity 76° N strike 10° S of E
 Dip of beds is 35° little W of S, strike E slightly S.
 Bedding is poorly indicated.
 Leaving slate ridge (which runs to E and then S for some distance) we cross marsh with pond to W and at
 24670-1-2-3 N1810 W730 reach foot of hill rising abruptly from marsh. It is made up of beds of calcareous ^{sandstone or} quartzite, pinkish quartzite (24670) and grayish slate (24671) capped by heavy bed of cherty pink marble (24672). Strike SE, dip 35° SW. (?)
 Near top of hill was small outcrop of yellow cherty slaty ²⁴⁶⁷³ chert folding around chert nodules but not forming heavy bed. Could not see relations to other strata
 24674 N1070 W700 small depression on hill caused by erosion of zone discon? dike cutting across beds NE
 24675-6 N1100 W615 Here we get blue slates (can be traced around and connected with ledge at N1300 W750, No. 24667) overlaid by a bed of cherty limestone (24675) followed by band of blue slates 24676. Dip of slates &

limestone 35° W strike N. Above the blue slates comes another bed of cherty limestone like 24675 followed by thin bed of quartzite, quite calcareous, and cherty limestone; Then thin yellow slaty chert bed 24677 and cherty limestone. Dip here 45° W. strike N. These beds all lie lower than the beds forming hill to SW of them (created at N 9100 W 730). Rt

24678 N 1060 W 640 on E escarpment of hill I find between quartzite + cherty limestone a bed of green quartzites rock (24678) $1\frac{1}{2}$ ft thick. Is it an ^{intrusion} sheet of an eruptive rock which has taken up a great deal of quartz?

Dip here 35° W. Strike N. Beds slightly contorted.

24679 N 1060 W 640 On the east face of hill I saw at one place this rock 24679. The beds were broken up and lying in blocks around a small tongue of this green rock which I thought might be an eruptive running with beds above. The beds showed no contortion where the blocks were away from the cliff so that I could see. at N 990 W 600 on a lower level than ledges on hill get outcrop of blue slates like 24667.

24680

40

N 99° W 625° Farther to W and higher than immediately preceding location I get an outcrop of calcareous quartzite overlaid by yellow slaty chert with (24680) malachite showing in places through them. Stakes here have been dug into evidently in search of copper.

Strike N 5° W Dip 35° W 5° S.

24681-2

Going back to line we continue S and at N 106° W 750 begin to ascend hill lying S of knob of marble at N 110° W 730. We pass over cherty green slate 24681 interbedded with more or less rotten calcareous sandstone or quartzite + overlaid by a green slate 24682. This cherty green slate is very much like 24614 found on Mt Mansard to S of quartzite and among the marbles. At

Map XXIX

N 99° W 750 we begin to descend cliff with the edges of same beds of calcareous sandstone + cherty slate exposed over which I passed in ascending hill of 24681-2. At

24683

N 95° W 755 we get a heavy bed of cherty pink marble ^{the same bed} which caps hill knob to N (cf. 24672) and overlaid by the slates + calcareous quartzites on which we have been passing. Dip of beds on this knob is 45° N of W.

XXIX

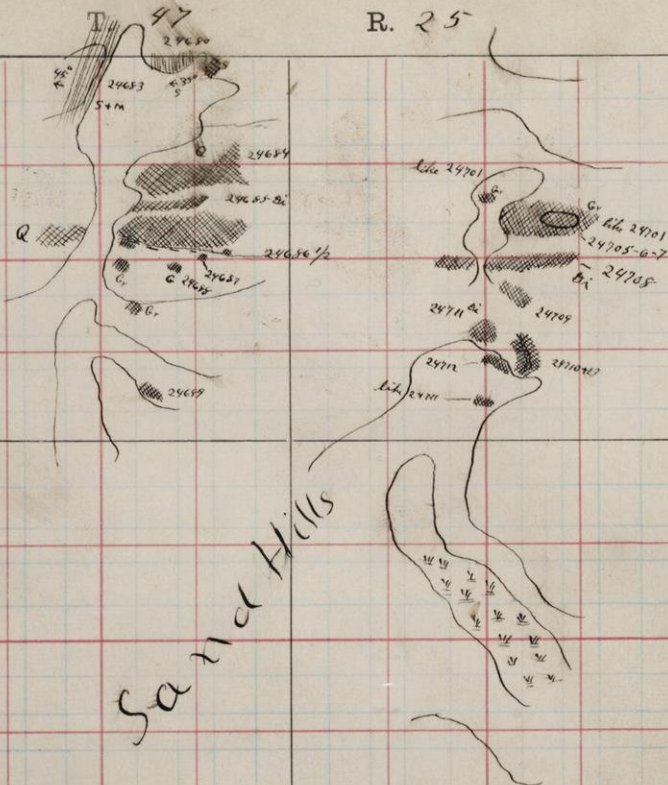
S. 2

C of 9

R. 25

E 1/4 P

SE 1/4



Strike slightly E of N.

We have here evidently a synclinal the axis of which dips to the W. The exact direction ^{and} dip I was unable to determine. See W. Phillips' notes with profile.

24684 Continuing S. down valley I get at N 860 W 690 western end of large white quartzite ridge extending to E. Towards the S. the ^{white} quartzite passes into a pinkish variety and at

24685 N 825 W 700 we get a large dike of coarse grained diabase running nearly E-W. Could not find contact exposed but think discoloration of white quartzite due to its action, that is action of the eruption on the quartzite.

N 800 W 700 Here we are again on quartzite and crossing it we get very close to its southern edge but ~~not~~ ^{with 24686 1/2 between} ~~go to~~ contact and certainly with no local change with it at

24687 N 760 W 615 a granite

24686 1/2 N 780 W 720 Here I find in the quartzite very slide near its southern limit a bed 10 ft thick of schistose rock. Strike is E 20° S taken on edge of between quartzite + schist. Schistosity agrees with above strike. Dip of schistosity near 90°. Rock is at W. end quite rotten. It

outcrop is not absolutely continuous but with
very short distances ^{interruptions} 42
continues to E_N & at N 765-W 575- we get
it fresh and looking like a residual granite.
Is it not the same greenish phase of
granite found between granite and
quartzite farther W? (Cf. Nos 24523+24597)
Quartzite outcrops to N of it but not to S
except for a short distance at point located.
From the quartzite ridge we begin to descend
hill. At

*
24688 N 745-W 665- I find a small outcrop of
schistose granitoid (?) 24688

N 750 W 720 Red granite with some of the
same schistose rock as 24686 & N of it.
N 680 W 700 Red granite.

24689 N 575-W 690 Small ledge of very light
hornblende granite.

We get no more outcrops now but
run out into the sand plains of the Chocolate

*
Possible explanation of this is that
the original cap of quartzite has been eroded
off & here the granite (altered more or less)
shows through. Strips of schistosity agree with
the general strike of the beds & of the region & with the
folding which has taken place. The ~~process~~
which caused the folding might easily have
invaded the schistosity in the granite.

Map XXVIII

From N 2000 W 250 from SE Cr. 52-49-25
to near S.

Ascending hill covered with hardwood
I find near head of valley ledge of vitreous
gray quartzite (24690) with patches of slate 24691
still hanging to face. General strike of
ledge is $E 10^{\circ} S$ + as well as can be told
from the patches of slate adhering to uneven
surface the strata must be nearly an edge.
If inclined at all it is to the N. Location is
N 1790 W 180.

24690-1

24692-3

~~24692-3~~

N 775 W 250 Here we come to N edge of large
outcrop of slate and quartzite. To the N
we get bed of slate like 24691, 10 ft thick
with irregular thin quartzite beds in it
followed by grayish quartzite like 24690
and thinly bedded schistose quartzite (the
muscovitic schists) 24692 and following
all this to the south the white quartzite
24693 which makes up the main portion of
the outcrop.

Strike on the slate 24691 is $20^{\circ} N$ of E . Dip $63^{\circ} N$
 $20^{\circ} E$. Beds are evidently contorted for to W about
20 paces get dip of 85° to 70° to S. At
N 765 W 350 we see the muscovitic schists
folded + in one place can get dip ranging
from $80^{\circ} N$ through 90° to $82^{\circ} S$.

Quartzite of knob is ²⁴⁶⁹³ white, traversed by numerous fine cracks plainly marked ~~with~~ by iron oxide.

24694 N1500 W 250 Here there is a large bare face of quartzite on N side of hill. Quite schistose. Strike of schistosity E20N dip 55° S 20° E.

Am not sure of bedding.

24695- N1440 W 250 Higher up on hill at location is a ledge of white quartzite with red spots through it. Schistosity not developed and can't get bedding. Outcrops again at N1400 W 250. + N1360 W 225.

See 24695-

24696-7 N1304- W 200 Here the ~~former~~ ^{red} spotted quartzite 24695- forms a knob and here we find it is overlaid by a greenish quartzite ²⁴⁶⁹⁵ with in places along the contact a conglomerate bed about 6 inches thick. The pebbles are white quartzite + iron chert in a quartzitic matrix 24697

Strike SE, dip 45° SW, taken at contact. The congl. shows in ^{small} patches here and there on the quartzite face. At

24698 N1272 W 170 we find remnants of a sandy greenish quartzite with "congl." at base lying on the white quartzite. Strike taken at N1255 W 165 was SE dip 30° SW. The greenish

quartzite gets apparently more sandy towards top as ^{it is} ~~the~~ weathering causes it to appear so. Lying on top of this sandy quartzite we find here & there ^{very small} patches of a greenish slate (24698).

From the knob at N 1305 we have been descending a hill overlooking the Chocolate sand plains to S.

24699-100 N 1140 W 175- Here I come to a small ^{edge of} ~~ridge~~ of py quartzite showing to N bed of Congl. 24699 more or less ferruginous. Some one has been prospecting here for iron. Following the Congl. to S (and I think underlying it) is a white quartzite 24700. Edge is badly broken up and covered with blocks so that it is difficult to see relations. On a face about 3 ft long, below the Congl. got strike slightly N of NE, dip 30° NW.

24701 N 1075 W 150 Here begins a rounded outcrop of greenish redish brown rock which in places weathers red like the ordinary red granite of the region. Compare with this greenish phase specimens No 24523 & 24597 from farther W.

I could not get the accurate direction and dip of the synclinal axes

which we have just framed but
as was observed on yesterdays run
also it must be about W I judge.
No slates outcrop on our run today
but we see last outcrop to W on
Dr Bayleys run.

See Mr. Phillips notes for ^{+ description} location of
ledges to W of line.

Map XXIX

We have now framed the sedimentary
rocks and are in the granite area.

Lk 24701

N 82.5° W 2.5° Ledge of greenish rock.

Lk 24701

24705-6-7

N 81° W 200 Here we come to small knob
of greenish rock (24701) which towards
the south gets ²⁴⁷⁰⁵ reddish, and in it we
have dikes of a fine grained green rock
24706 and a fine grained red granite 24707.

Could not get relations of 24706 & 7.

24708

N 74.5° W 1.8° Outcrop of diabase (?)

South of the diabase we come upon ^{the} green
schistose rock (24701) which frames at

24709

N 71.5° W 2.15° into a granite

24710 & 13

N 64° W 210 Gneiss (diabase ?) dikes cutting
through granite (24713). Runs little W of N.

24711

N 64° W 250 Small knob of diabase.

Just at foot but not in contact with it is at

24712

N 60.5° an outcrop of white light granite 24712

which can be followed almost to within
contact of the granite 24713 through
which (24710), the dike cuts.

Ln 24711

N 56.5° W 250 Small diabase ledge.

This is last outcrop and we now
continue over sand hills to the section
line, then run E and run N
from N 0° W 1750 from SE Cor. S 147.25°
over.

XXX

S.

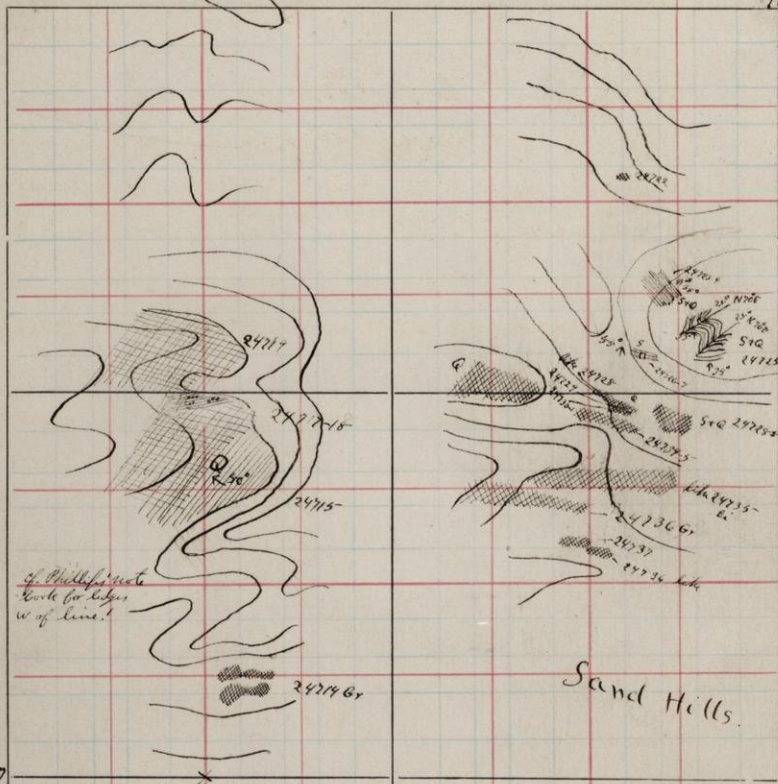
T.

47

R. 25-

N 1/4 P

NW 1/4



W 1/4 P

C of S

SW 1/4

Sand Hills

From NO W 1750 from SE cor. S1-47-25-
ran N.

Map XXX

The SW $\frac{1}{4}$ of the section is in the sand hills
and we found no ledges until we
had passed the $\frac{1}{4}$ line which is almost on
the watershed between the Chocolate &
Cofre River basins.

24714

N 1100 W 1700 Granite outcrops in rounded
boulders.

To the W. of the line Mr Phillips gets
the quartzite + granite within about
thirty or forty feet of each other but
could find no direct contact nor any
signs of a sand congl. At

24715

N 1345 W 1750 the line comes to a large
knob of white quartzite with in places
somewhat coarser brownish beds in it.
Schistosity + bedding app. strike NE,
dip 50° NW. The quartzite covers a
large knob here and continues to
the N for over 200 paces. Going to the
N from above location the quartzite
becomes more of a greyish and
loses its schistosity and at

24717-18

N 1480 W 780 we find small patches
of a ferruginous congl. 3-6 inches thick
lying in the grey quartzite. Pebbles are

XXX S. 36

T. 48

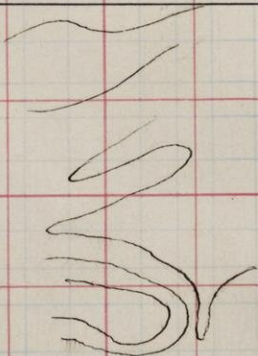
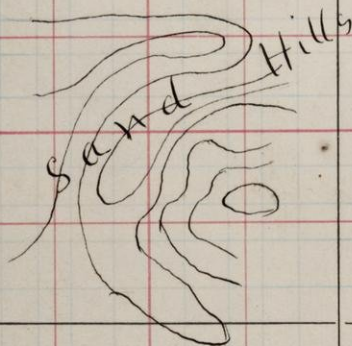
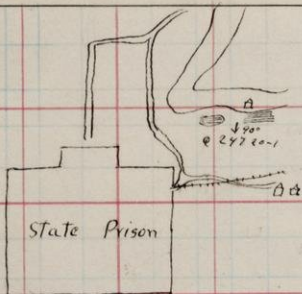
R. 25

C of S

W 1/4 P

Lake Superior

SW 1/4



Ln

S 1/4 P

of quartz. Beds are very small and continue for a short distance only and then give out. Dip on ^{one} ~~only~~ place where I could get it was 60° little W of N. Strike about E. In another bed I got strike NE dip 62° N.W. Crossing small ~~valley~~ ^{nearly filled} ~~filled~~ with quartzite boulders we reach another part of the knob but here we have a white quartzite with red spots through it. Can't get strike or dip.

24719 N 15-35 W 1750 is point where specimen came from. We now descend hills with no ledges exposed, come up at Cor. and then continue on N in S 36.

Map XXXI N From NO, W 1750 from SE Cor. S 36-48-25 run N over sand hill through Prison field. Just to NE of Prison at N 86-5 W 166-0 + W 156-5 are outcrops of poraculitic quartzite beds with thin layers of very ochreous quartzite, more or less yellow in color 24721, up to 2 inches in thickness between them. Strike E perhaps $2-3^\circ$ of E. The beds, as a mass on edge that I can't say whether they stand at 90° or dip N or a few degrees. No more ledges outcrop to N. We go over sand to the mouth of the Cap.

Map XXX

From N 25° W 1250 from S.E. Cor. S 86° 48' 25" -
 an S. Starting point was on shore
 of Lake Superior, Cross R.R. + wagon road
 and continue over sand to
 N 85° W 1250 when we find a quarry
 in a smooth rounded knob of microcline
 schist like 24720-21. Strike E. Beds on on
 edge. Small ledge of same exposed to E at
 N 85° W 1675-. We go over sand hills on
 our way south and get ~~no~~ no other outcrops
 in S 86.

Map XXX

From N 200° W 1250 from S.E. Cor. S 1° 47' 25" -
 we ran S ascending high ridge, watershed
 between Cosh + Chocoma Rivers.

24722

N 78° W 1200 Here I get a small ledge of
 purple calcareous sandstone (quartzite).

Near top of hill at

24723-4

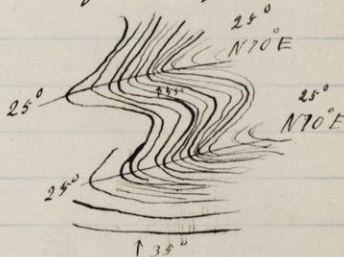
N 163° W 1160 I come upon a large exposure
 of interbedded dark purple thinly bedded
 quartzites + purplish slate 24723 with
 yellowish green slates or gray slates 24724
 Strike SE, dip 35° NE. At

24725-

N 15° 90° W 1110 on W. end of hill is a
 rounded outcrop chiefly of quartzite.
 This is near the W end of a synclinal
 dipping to NE about. The crumpling
 is very evident. Dip of axis of fold is

25° to $E 20^{\circ} N$. On edge of hill to S where beds are well exposed get a dip of $35^{\circ} N$ at foot of exposure higher up nearer the axis the dip is $55^{\circ} N$. See Mr. Phillips notes for dips farther to W.

Sketch of exposure on top of hill.



In the exposure we have on top slates 24723 with below them the blue slates 24724 + purple quartzite + underlain by a heavy bed of cherty breccia 24725. Below this we get again interbedded purple quartzite + blue slates.

Descending hill to S we pass over small ledges of purple quartzite and at

24726-7

N15-40 W 1165- come to dip feet in bed of yellow slate lying in the quartzite. This bed of slate is exposed around ^{SW} end of hill + has pits in it. Slate contains some Copper.

Strike $N 8.2^{\circ} W$; dip $55^{\circ} N 10^{\circ} E$. Continuing we pass quartzite ledges +

bluish slate and at

24728+32+33

N1480 W1160 we get the slates (24733) in contact with a white quartzite 24728. In places at contact we find a somewhat ferruginous congl. ²⁴⁷³² Occurrence very small. Contact very irregular so that I can't get dip.

24728, 9.30.31

N1480 W1200 here we have the same quartzite 24728 followed to S by thin bed of slate 24729 separating it from a bed of quartzite with beds of congl. in it (24730-31). Congl. in places quite ferruginous. Entire bed of quartzite has ferruginous streaks through it.

Strike & dip as indicated by slate band were, strike N 85° E, dip 70° N 5° W. At

24734-5

N1470 W1175 we find outcrop of greenish schistose unit ²⁴⁷³⁴ with a dike of fine grained gneiss in it. 24735-

like 24735-

N1400 W1245 here we get a large outcrop of rock like 24735 & followed to S at

24736

N1360 W1250 a fine grained red granite ²⁴⁷³⁴ cut by dikes of same gneiss as 24735.

24737

N1305 W1250 Outcrop of a green hornblende schist (or altered gneiss perhaps) followed

like 24736

at N1300 by red granite like 24736.

Now continue south over sand hills with no ledges showing to N1000 ^{W1250} from SE or S 1-47-25 and run E 500 paces on this line over sand hills.



