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Marquette district: [specimens 24738-24779]. No. 158 1893

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

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U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

9-891

158

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

24750 ~ 1

158

Notes
on

The Marquette Range

Chas Perry
Compassman.

J. Morgan Clements
1893.

+

Notes
on

A small area at

Clarksburg
S 30-48-28

J. Morgan Clements Genl.
H. F. Phillips Topog.
Sept 1893.

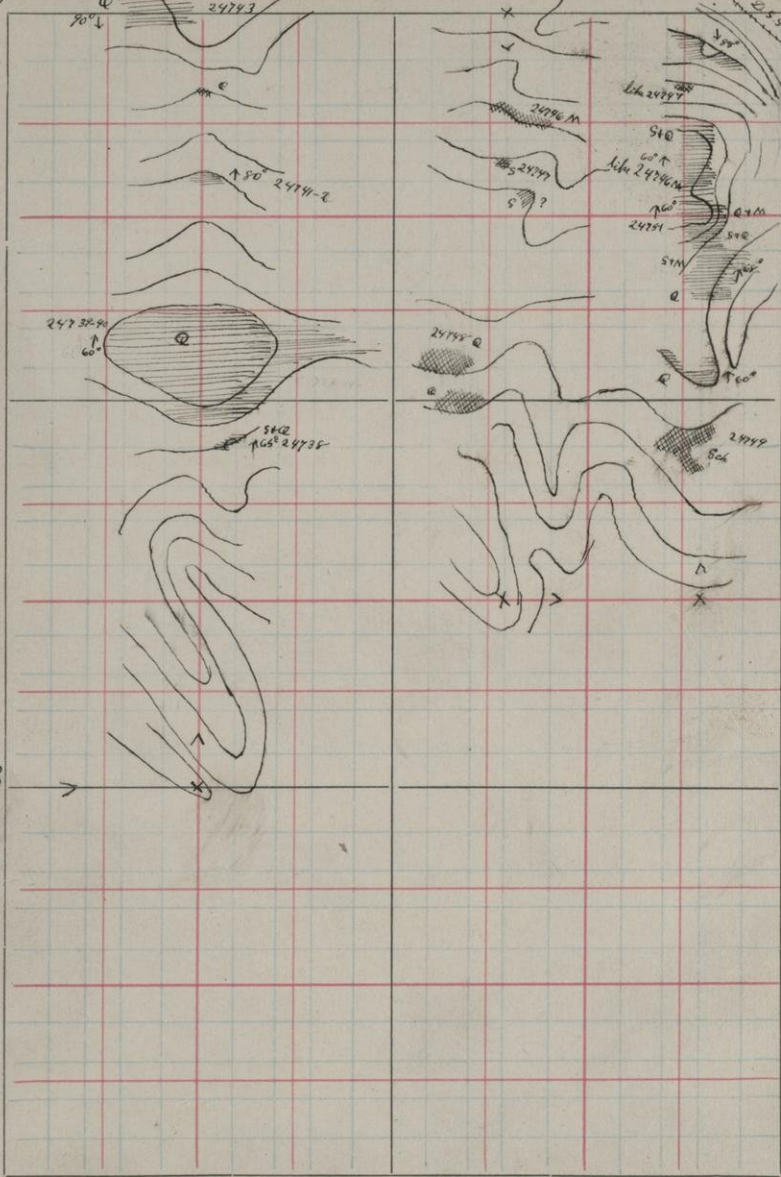
Chas Perry
Compassman.

I S. / S T / 47
N $\frac{1}{4}$ P

NE $\frac{1}{4}$

R. 25

Cor



Map I

From N1000 W 750 from SE Cr. S1-47-25 to run N.

Started among the sand hills of the Chevalay ~~valley~~ plain and ran N ascending gradually. At

24738

N1450 W 730 at foot of quartzite knob find outcrop of more or less cherty slates with ^{purple} quartzite beds among them.

Strike E. Dip 65° N. There is a test pit in these slates. At

24739

N1450 W 750 there are several test pits in dark purple ferruginous quartzite. Strike slightly N of E. Dip 60° N. Overlying this is a heavy bed of light reddish cellular quartzite. The walls of the small holes through the quartzite are covered with small quartz crystals ^{usually} frequently covered with iron. It is apparently the iron deposited in the small cracks and ~~holes~~ ^{holes} which gives the rock its color.

Strike on these beds E, dip 60° N. This is overlaid by thinly bedded white quartzite showing in places false bedding very nicely.

24740

N1600 W 750. This is the top of the knob and far above the thinly bedded white quartzite we get a white quartzite showing no signs of bedding and with irregular purple beds & bands in it.

Leaving the quartzite capping the hill we descend and find at

24741-2

N78°15' W 750 a ledge of yellowish slates with bed of calcareous sandstone in them.

When this has broken away I get on face of slate strike 10° N of E, dip 80° N(?)

N1924 W 750 find here a small ledge of pink quartzite. At foot of hill at

24743-4-5

N1985-W750 we come upon a large outcrop of quartzite with beds of novaculitic schist + schistose slaty chert. Strike ~~E 5° N~~ ^{N 85° E} N. The beds are on edge or so near 90° that I can't be sure of their inclining to N or S. Outcrop extends from N1985-W750 in 91° ⁴⁷⁻²³ to N70 W750 in S36-48-25.

At first (to the S) we have about 40 ft of a dirty white quartzite followed by 20 ft of novaculitic quartzite (24743) (cf 24720) with very thin layers of ~~very~~ ^{very} schistose quartzite (cf 24721) between. False bedding is very faintly shown in the novaculitic phase. Strike of beds N 85° E. Dip 90° .

Next come interbedded yellow + gray slates ²⁴⁷⁴⁴ + thin quartzite beds about 20 ft thick.

Strike on these is N 85° E. Dip 90° .

A bed 20 ft thick of white quartzite then follows with, to the N of it, same novaculitic quartzite

II
C of S

S.

36

T.

48

R. 26-

SE $\frac{1}{4}$

Lake Superior.

Sand



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

Sta 20192 @ $\frac{1}{10}^{\circ}$



Co

and slaty chert (24744) as ^{found} ~~encountered~~ & S of us. This bed is about 10 ft thick. Strike N85°E, dip 90°. Last exposure is of ²⁴⁷⁴⁵ ~~white~~ greyish ~~white~~ quartzite 50 ft across, in places slightly schistose. Strike same as on other beds, N85°E, dip 90°. Common ^{the surface of} on this bed but not on the others is the occurrence of small ²⁴⁷⁴⁵ concentric circles. I have noticed these before and especially on the boulders in the bed of the Lake. These rings seem to be due to dolours which the quartzite has received as I could produce similar ones with my hammer and have noticed the same ^{produced} on agate when struck.

The exposure of these beds is not absolutely continuous but with only a few feet here and there separating one outcrop from the other.

We run on out to the lake shore getting no outcrops.

Map II From lake shore run S on W 350 from SE Cr. S36-48-25- and at foot of hill at
 like 24743 N70 W 350 from SE Cr. S36-48-25- come to outcrop of same kind of novaculite quartzite as 24743 found to the West at N1980 W 750 from SE Cr. S1-47-25.
 The beds which to the West of us were

Going to the N of this bed have here been eroded away and but to the S we get the same heavy bed of dirty white massive quartzite.

Strike on mica schist bed is $N 80^{\circ} E$, dip $70^{\circ} S 10^{\circ} E$

Map I

24746

Ascending hill I find at

$N 190^{\circ} W 35^{\circ}$ from SE Cor. S1-47-25 a small outcrop of pink quartzite ~~fold~~ (like that also found to W or run to W of this) followed to S by a bed of Cherty limestone. ²⁴⁷⁴⁶

Can't get accurate strike & dip. Strike approximately E.

24747

$N 182^{\circ} W 35^{\circ}$ here we find a small rounded outcrop of greenish slate (24747) Can't get strike, etc.

$N 178^{\circ} W 33^{\circ}$ At this location there is an outcrop of slightly bluish ^{quartzite} slate with bed of rather calcareous sandstone (quartzite). Am not at all sure of dip. Strike nearly S W (?). We have now reached the N. brow of the hill and pretty soon begin descending. At

24748

$N 155^{\circ} W 41^{\circ}$ on the S edge of hill we find a large ledge of purple quartzite showing no traces of bedding. At

$N 151^{\circ} W 41^{\circ}$ just to S + somewhat very slightly lower than above ledge we find a large outcrop of dirty greyish quartzite with irregular purple patches in it + irregular purple streaks through it. No bedding.

Map I

Leaving these ledges of quartzite we get no more outcrops to S but are going over sand hills. Ran to N 1300 then E and N on W 100. from E section line.

24749

Ascending over sand we get our first ledge at N 1425 W 100 from S E Cor. 51-47-25. This is an outcrop of very much crumpled mica schist 24749 apparently or very micaceous quartzite schist perhaps.

Direction of foliation is E + W as well as I can determine. Can get it in relation with no other outcrops.

N 1525 W 100 Here we reach southern edge of exposure of purple ferruginous quartzite followed to N by beds of white + purple quartzite. Strike N 80° E, dip 60° N. At

like 24747

N 1645 W 100 we get purple quartzite - in places presenting a becciated appearance - followed by yellowish + greenish slates (cf 24747) and cherty purple limestone + calcareous sandstone (quartzite) beds. Strike E, dip 68° N. At N 1720 W 100 the calcareous sandstone (or quartzite) beds get heavier and the slates thin out ~~to~~ ^{to} ~~more~~ become very thin layers between the beds.

24751

N 1755 W 100 Here the slates have disappeared and we get heavy beds of ^{pink} calcareous

sandstone (or quartzite) and pink
quartzite. Strike E. dip 60° N. At
 like 24746 N1800W100 find few beds of cherty pink
 limestone (like 24746) among the quartzite.
 N1872W100 Here we find some narrow blue slates
 + cherty limestone beds among the prevailing
 rotten quartzite. Dip westerly. Strike about E.
 N slope of hill is quite steep and covered
 with small growth of hardwood so that
 outcrops do not appear so frequently or
 cover as much space as to the S of us.
 N1925-W100 Greenish slates like 24747 in a
 small outcrop.

N1975-W100 Slates with narrow bands of
 quartzite in them. Exposed very well in old
 quarry at foot of hill near wagon road.

Strike N 85° E, dip 85° S, 5° E.

This is the N side of the syncline over
 which we have just passed. The road
 from Morgantown to Chocolatey goes around
 the E end of the ridge and there we
 see a beautiful section across the
 syncline. Dr. Bayley told me it was
 not necessary to work it as it had
 been sketched + photographed frequently
 and carefully described several times
 already.

Specimens No. 24752-24779

Clarksburg

S. 30-48-28

17th - September

Clement + Phillips
Sept. 1893.

Chas Perry
Corn Prossman

Sept. 9, 1893.

Began work at NE Cor. S 30-48-28.
This is plainly marked in a hardwood
grove. Ran S along section line
passing over very light colored
apparently quite acid granite with
couple of dikes of diabase to W. of line
as located on plat. At about $\frac{1}{4}$
N 1375-W 0 the granite hill ends and
we begin to cross a narrow valley about
300 paces wide.

N 1295-W 0 Wagon road running through valley.
This valley is for the most part quite
level with drift spread over greater
portion. The valley widens out
considerably to the W. A small
stream flows at the foot of the hills
on the S side of the valley through a
considerable meadow and empties
very near the W Section line of S 30 into
one of the branches of the Escanaba. At
N 1100-W 0 we cross the stream flowing W.
We soon begin ascending, passing over
reddish + lighter colored grayish granite.
Could not find E $\frac{1}{4}$ foot.
Continue ascending passing occasional

granite outcrops. Hill is thickly covered with second growth of hardwood. N1700 is near the highest part of hill. Descending to the S we cross little marsh and come to ridge running out into the marsh from the E. This low ridge is about 40 ft. high and consists of a greenish somewhat sheared looking granite (2475-2).

- 2475-2 N400 W0 Here we come to ^{stuck} N side of ridge. At
 2475-3-4 N350 W0 we find on the southern face of the ridge several patches of a conglomerate lying on the granite. The conglomerate (2475-3) has pebbles of white quartz in a quartzitic + feldspathic, more or less sandy, matrix. Ripple marks show very prettily at one place in the sandy portion. This 1st average dip 40° about 10° W of S. Stuck N80° W At another point on finely bedded matrix get dip 40° ~~little~~ W of S. Specimen 2475-4 shows Congl. lying directly on granite or else in matrix of recombined granite. At
 Lk 2475-2-3 N350 W100 get same Congl. (2475-3) lying on the granite (2475-2).

We leave this ridge cross a narrow piece of marshy ground and around and come at

N 250 W 25 to very small outcrop of quartzite.

Continue ascending and at
^{from SE Cr. S 30-48-28}
 N 100 W 0 get into granite again
 (chiefly light colored acid granite) and
 continue in it to

N 1875-W from SE Cr. S 31-48-28 at

N 1905 ~~from~~ SE Cr. S 31-48-28 we get a large
 diabase dike which runs to SW and
 has evidently caused the valley further.

It branches and we get it running

N of W at N 1900 W 100 from SE Cr. S 31-48-28.

We now run N on line 100 paces W of section line.

Pass over granite outcrops until we reach

N 200 W 100 from SE Cr. S 30-48-28. Here we come
 to pinkish + white quartzite forming ridge
 to S of marshy ground.

On N 250 we ran W marking every
 100 paces so as to have something to
 correct on. Thought this line would
 take us over south edge of mountain
 in plain but it took us along the ridge.

Connected at SW Cr. and began to
 traverse the mountain from this end.
 End of hill extends about 250 paces over west
 Range line into S 25-48-29.

M

From $N200 W 200$ from SE Co. S 25-48-29 run
 N. Line carries us just at foot of steep
 cliff forming W. end of hill. At about
 $N225$ rock begins to show. It is a reddish
 granite in places gneissoid with
 irregular foliated schist. patches in it. At
 $N305 W 200$ we come to contact of the
 granite with a pink feldspathic
 quartzite, the latter lying under the
 granite. That is it appears as though
 a folding had taken place of
 which folding had ^{folded} the
 granite up over the quartzite.

Dip of contact face $60^{\circ} SE$.

This quartzite outcrops for some distance
 to the E with the granite overhanging it.
 Not in direct connection with the
 quartzite, in a small valley, we get at
 24755- $N355 W 170$ from SE Co. S 25-48-29 a large
 ledge of a bluish-black schistose
 sandy rock. Dip of schistosity 55° about S.
 Strike little S of E. I think the Schistosity agrees
 with the bedding. At

$N440 W 220$ we get outcrop of pink
 feldspathic quartzite again. It is exposed
 on road which goes around end of hill. At
 $N470 W 200$ we come to a more bluish sandy

schale showing false bedding very
faintly. Strik E. Can't be sure of dip.
24755 1/2 N485-W185- Here we find large blocks of
sandy slate (24755 1/2) lying around, but
contact of slates + quartzite is covered.
Plain + Wash to N.

Ran S on W 50

~~N504~~ W50 from SE on S25-48-29

Returning south we ascend a short
distance over drift and then at
N504 W50 we get outcrop of light
pinkish feldspathic quartzite
with small beds of rough pebbles of white
quartz. Shows false bedding. Dip on face
showing ripple marks at N485 was 60° ^{3' W} dip N
On another face 75° N, strike N 60° E.

Next outcrop to S now is at
N465-W20, here we come to talus of
cliff of a dark gneissoid granite cut
by dikes of red granite + with patches
(Schlieren) of dark schistosity. At

24756 N430 W50 we find apparently a dike of
altered gneiss with large porphyritic
crystals of ^{quartz} in it. At We now start
across small valley running slightly S of W. At
N380 W130 we get pinkish feldspathic quartzite
(like that at N504 W50) with fine bedding.

Strike slightly S of E. Dip 60° S. At
 N 360 W 130 we get outcrop of interbedded
 pink quartzite and schistose micaceous beds
 Strike N 80° W, dip 65° S 10° W

This is overlaid by heavy bed of 2475-5;
 and followed δ S by pink ^{feldspathic} quartzite,
 in very small outcrop, & then by granite.
 We now are on ridge of gneissoid granite
 the south face of which drops down in
 a steep cliff to plain.

On line 1950 W from E S-line of 530-48-28

Recross granite ridge and then valley.
 Quartzite does not continue this far up
 valley. Crossing ridge N of valley (it is
 composed of a light greyish somewhat
 schistose granite with Schlieren of
 dark schist in it in irregular patches)
 the granite outcrop ends at
 N 490 W 1840 and at

N 500 W 1860 we find a very small outcrop^(?)
 of pink feldspathic quartzite. It is a very
 small outcrop and may not be in situ.

We now descend over drift to plain & N.

Returning on W 1800 we pass over
 numerous blocks of quartzite at in

ascending hill, so numerous that I think it must be in situ below the soil. At

N 15° 00' W 1760 find small pink quartzite ledge within 3 paces of granite & S. but no dip or strike on quartzite.

Very small ledge.

Granite continues to outcrop with interruptions here & there on down to plain & S.

Run N from plain on W 1700 crossing granite mountain and as we begin to descend on N side we find at N 50° 5' W 1700 ledge of pink quartzite with no strike or dip showing, possible to be taken. At

N 59° 5' W 1700 we are in a small valley with granite to NE only a few paces and on S side of valley quartzite. Quartzite is very much broken up. I get dip 35° nearly SW.

N 62° 5' W 1680 outcrop of light colored reddish granite. The small valley cuts around west end of granite and quartzite is scattered all over bottom of valley in blocks and outcrops in places on W side. At foot of hill in valley which becomes almost a

N 47° 5' W 1700
Contact of Gr.

Coat

ravine we find an outcrop of somewhat contorted ^{NW}slaty gneiss. Strike SW. Dip 30°

As we run S on W 1600 we find at N 825 W 1540 just at edge of timber (can be easily seen from road) get an apparent outcrop of bluish feldspathic quartzite. Fake bedding very good. Get a dip of 40° SW.

I am doubtful as to this quartzite being in situ. We now begin to ascend a hill covered with slabs of granite and reach ledge at N 670 W 1600. We now get into a valley on top of the mountain with granite ridge to N + S. And at N 565 W 1600 we find after crossing the valley a ledge of pink feldspathic quartzite dipping 60° S. The ledge is badly broken up and is now in blocks, consequently the dip may not be quite correct. Then occurs at N 500 ^{W 1600} quartzite again; no strike.

N 465 W 1600 Here begins cliff of reddish somewhat gneissoid granite.

We ran over granite to N 250 & then ran E ¹⁰⁰ & N again.

N on 1500 W.

Granite outcrops almost contin-
uously along line to N 450 At
N 475 W 1440^{in descending} we come again to same
granite ledge found to W of this point
on run South. It follows the
south side of the valley. No strike or dip.
N 500 W 1500 Here we get ledge of pink
feldspathic quartzite found to W. also.
Crossing swamp we ascend at
N 600 W 1500 a gradually sloping
low face of acid granite which
forms ridge to N of swamp. It drops
in a steep cliff on N and we then
run over talus and gradually sloping
hill side out to plain.

Running back S we reach N face
of cliff on W 1400 at
N 755 It is here about 50 ft high
We go over this low granite
ridge, cross swamp and at
N 460 W 1425 we get outcrop of
white feldspathic quartzite. Cannot
get strike or dip. At
N 490 W 1330 we get granite outcroppings,
and it continues on to the south.

At N250 W1425 we find quartzite again on S. side of the mountain. Worked outcrops on N250 from the south. See later notes!

24757 Made traverses of northern half of mountain from N250 on W1300, W1200, W1100 + W1000. At N260 W1100 there is a high cliff of granite with a mass of dark schistose rock (24757) adhering to S face. It may be just a mass of dark ^{micaceous} schist or possibly a portion of an altered greenstone dkt.

On these traverses we were crossing outcrops of the prevailing light colored, acid granite, more or less schistose; outcrops shown on plat, but found no traces of quartzite.

Running S. on 1/4 line we reach end of schistose acid granite at N290 and then at

N285 we come to outcrop of light pinkish feldspathic quartzite.

Strike N85°E. Dip 60°S 5°E. We continue

24758

south ~~with~~ through a valley with a
 broken cliff of quartzite & E &
 N 175° W 930 Here we get it in contact
 with granite (somewhat schistose).
 The contact face is irregular and
 dips to the N. At contact we get
 a conglomerate quartzite (24758),
 the pebbles lengthed apparently
 in the direction of the schistosity
 of the granite. Matrix of Congl.
 is micaceous. At contact of the
 quartzite + granite the passage
 is usually sharp but in places
 the quartzite seems to have become
 slightly micaceous. Direction of
 schistosity in granite is N 85° W, it
 agrees approximately with long
 direction of pebbles. Looked all along
 the cliff for bedding but could not
 find any traces. On what is
 possibly a bedding plane got dip 20° N.
 To the south of the quartzite the
 granite continues until we
 come to small side valley running
 nearly E and across this at N
 N 75° W 1000 we begin to ascend
 ridge of quartzite, on which $\frac{1}{4}$ post
 stands.

S.E. Cor. Sec. 30 48-28

This ridge, or long more or less rounded back of quartzite, continues ~~lies~~ to the south at the foot of the granite mountain extending for quite a distance to E & W. It drops quite abruptly to the plain on the S. This ridge is made up of a series of, for the most part, light colored, white and pinkish feldspathic quartzites with beds of bluish feldspathic quartzite here & there. Conglomerates between ⁱⁿ the beds are quite frequent. False bedding is very common but it is not easy to get a continuous bedding plane. In places we get a bed of schistose dark quartzite (grey-wacke.) Specimen 2475-9 was taken at N 8 W 90° ^{SE 60° 30'-45'-25'} from a congl. bed with dark relictive greywacke to S and pink feldspathic quartzite to N. Pebbles of quartz + slate + blue quartzite matrix.

2475-9

Strike N 80° W, dip 80° S 10° E. Taken near congl. bed above. Strike was taken again at N 196° W 84° S from SE 60° 53'-48'-25'. Strike NW. Dip 60° SW. (?)

Running E we go along quartzite ridge then into a narrow valley, quartzite ridge bends down S. of E and at N 0 W 800 from SE Co. 530-48-28 we have to south of us quartzite hill and to the N we begin to ascend hill of red + lighter colored granite. At

N 170 W 800 we get last gr. outcrop on S side of a valley and then about middle of the valley at N 250 W 800 we come to outcrop of pinkish feldspathic quartzite and again at N 295 and at N 280 W 850 On this outcrop got strike E slightly N, dip 49° with E of S.

In places this quartzite shows small beds or rather patches of congl. Pebbles of white quartz. N 295 W 885. Here we find the quartzite, with dip of 55° S, strike E, near the granite at N 300 W 885. This light colored acid granite continues on to N descending to plain.

The valley, in which the quartzite outcrops above mentioned are lying, has granite ridge to N + S.

Running S or W 700 we find no quartzite until we reach

the south side of the valley. Here
 we come to steep cliff (20 ft high) at
 24760 N 215° W 700 of quartzitic conglomerate
 which lies upon a light colored
 slightly schistose granite. Dip of
 face is about 75° N

Strike slightly N of E.

Congl. consists of white quartz pebbles in
 light greyish feldspathic quartzitic
 matrix. This Congl. continues to W to
 N 200° W 775 - + to E runs over into next run.

We go over granite descending to
 S and crossing sec. line find at
 24761 N 195° W 725 - from SE Cr. S. 31-48-28
 schistose granite (24761) forming
 a high cliff on south edge of mountain
 and lying on its face is a patch of
 Congl. We see a bed of comparatively
 small gr. conglomeratic feldspathic
 quartzite overlaid by coarse Congl.
 with pebbles of white vein quartz
 (and really a piece of slate) in a quartzitic
 matrix with but little mica and feldspar.
 Strike about 10° S of E N 80° W, dip 55° S 10° W
 Separated from the granite hill
 by a narrow valley is the quartzite
 hill (on which 74 feet stands) and

24762-3

which is here bending down to
SE. On this quartzite hill at ~~W~~ E end
N1870 W 625 from SE Cr. 931-48-28
I find interbedded with the un-
mistakable quartzites a bed of a
fanciar rock 24762-3 into which
a deep pit has been sunk.
These beds are very nearly on edge and
strike about E as well as can be told on
exposure.

24764

30 paces south in 931 on W 500
we pass a broad greenstone dike(?)
running E-W.
Here the granite cliff descends sharply
to sand plains which extends to
south. Running N on W 500
we pass over granite and just
on ridge on south side of valley we
find at
N240 W 500 we find small outcrop of fine
pinkish quartzite, with here and
there patches of congl. in it, lying on
the robust granite. Same congl.
as that to W of us at N215 W 200 of 24760.
N280 W 460 here under a windfall in the
valley we find large patches of quartzite.

congl with smooth surfaces lying on a light colored relict stone granite-like 24752 Can get no strike & dip but the congl. seems to be lying flat or nearly so.

N350W500 Another small ledge of quartzite with conglomerate but can't get strike & dip.

N310W500 Small outcrop of congl. on the gr.

These Congl. ^{Int.} outcrops have formed a spine of high ground in the valley and to N ~~E~~ it gets still higher in a small knob of granite.

We cross narrow cut at N375-between the quartzite and the ridge of acid greyish granite forming N side of valley.

From wagon road N1060W600 on plain & north of mountain start to run S. N7075-W700 from SE Cr. 530-48-28 here in the open fl. valley & N of wagon road is an isolated knob of reddish granite, about 20 ft high. Running south we cross stream at N880W600

We very soon begin to ascend passing over outcrops of granite as on flat We cross a small valley running SE into

24765-6

mountain and on south side at N 65° W 500 get a ledge of 24765- with granite (to S of it). It seems to be I followed the ledge to W 380 where it gave out or rather disappeared under the soil. After a close examination I became quite sure that it was not a quartzite of the kind in this region at least but rather vein material. It is interbedded with some light ^{schistose} or ^{gneiss} granite, which predominates on the mountain. Specimens 24766 are from same bed. The gneissoid piece can be traced farther south where it takes up more mica and becomes darker and can't be told from the predominant gneissoid granite.

24767

We continue over granite in ascending hill & ridge bordering N side of valley. Now we cross swampy valley and on S side at N 200 W 600 we come to cliff of greenish gray ~~massive~~ ^{rather} gneissoid granite with large patches of quartzite congl. lying on its face. Contact is irregular but as well as I can tell dip of bed is about 35° W of N. Continue S over gr. to sec. line then E 200 ft. acc.

N on W 400 from E sec. line 30-48-28

From S. sec. line go over granite to N 200 W 400 here we begin to descend granite cliff on south side of valley. at N 208 W 400 we get bed of congl. on face of cliff. Matrix in places looks very much like the granite immediately underlying it (probably the uncompacted gr. forms the matrix part at bottom). Pebbles and almost boulders of white quartz & in some places a bluish or amethystine quartz.

N 225 ^{W 400} Here we get the congl. again with the granite under it. Congl. lying on the cliff face, inclined some to the N.

N 285 W 420 Here we are near the middle of the valley and under windfall we see a large polished and rounded face of congl. Pebbles of white vein quartz & some few cherty pebbles. In places the granite on which it lies (24752) shows through the quartzite bed. Congl. seems to be lying pretty nearly horizontal though I could not get any bedding on which to determine it exactly.

Continuing to N we ascend small knob of granite (like that underlying

the congl.) then cross little valley and are on the ridge of granite bounding North ~~side~~ ^{base} of valley and which continues S & W in a bare outcrop.

Ran E 100 paces on N 500 and then S.

S on W 300 from E sec. line 530-48-28.

The granite ridge bounding N valley on the N is not so regular but is here quite cut up and covered with soil & trees.

24768 N 360 W 300 Here I get first outcrop of the quartzitic congl. (24768). It is lying on granite & dips 30° slightly W of N as well as I can get it. Specimen shows congl. with granite or recombined granite which lies under it.

We now cross low ground and on south side of valley at

N 230 we come at foot of hill, to blocks of pinkish feldspathic quartzite.

Higher up ^{on hill} and under ^{N.E. to S of} the quartzite, we find the congl. lying on the face of the granite cliff. At

N 180 W 240 the granite bends around to the S, with mantle of congl. hanging S it and runs no farther E. The ridge is

however ~~continued~~ continued by pink + bluish feldspathic quartzite showing false bedding + with congl. here and there. The quartzite occurs only in a ~~great number~~ series of blocks showing that it is in situ but not allowing strike or dip to be taken. It is the same kind of quartzite as that composing the ridge on which S $\frac{1}{4}$ P is. Continuing south we run over granite & sec. lime. South of us the granite hill drops abruptly to plain. No quartzite occurs along the south face here.

(On west 300 ran out to plain to N of mountain pass over granite only. At N 575 + 675 - W 300 from SE Cor. S 30-48-28 there occurs quite a good deal of vein stuff in the gneissoid granite.)

Run E on sec. line to W 200 N 0 from SE Cor. S 30-48-28. Section line runs for quite a distance nearly $\frac{1}{2}$ mile along the south edge of the mountain which descends quite abruptly to the plain. There is a dip of about 2° which for some distance runs nearly

parallel with the sec. line and near W 200 we find it joining a large dike running NW the same one which was mentioned as having been observed the first day we began work here and ~~was then located~~ one portion of which was located at N 1900 W 1000 from SE Cr. 531-48-25.

Running N on W 200 we pass over granite, last outcrop at N 165 W 200. Higher up on low ridge we come to blocks of quartzite continuing SE and then at

24769 N 250 W 200 we reach cliff of quartzite, grey feldspathic, & bounding south side of valley. Can't get strike or dip.

Crossing narrow wash we come at
 Lk 24768 N 320 W 200 to a small rise and here we get
 Congl. Lk 24768 lying on granite. at

24770 N 340 W 178 I get on Congl. in quartzite
 strike little N of E, dip 10 little E of S.

Continuing N we cross a small tongue of low ground, then granite ridge, running only short distance SE and joining granite SW, then come to main hill of granite. Along this run E

100 paces and then S on W 100 paces E sec. line.
We cross marsh and come to ridge of
light colored schistose granite which is
here quite low but to E gets on sec. line
about 50-60 feet high.

On south slope of this we find at
N N 35-5-W 130 the same kind of
quartzitic congl. found to W and E of this
location.

24771

In the granite on which the congl.
rests noticed some small diverging
veins of 24751. Is it an altered
eruption of some kind. The veins
were only a few inches wide.

We now made several traverses in S 29
across this same valley in which the
congl. has been lying.
H

From N 150 W 1900 from SE Cr. S 29-48-28
ran N. We start just at foot of a
knob of granite and find shortly a
few boulders (but no run on top) of quartzite
on E extremity of ridge formed by quartzite to
the W. It runs down into a valley here at
N 300 W 1900 near to granite ridge with

slightly pinkish feldspathic quartzite with
ripples marks and congl. lying in patches
on it. Let dip $53^{\circ}S$.

N320 W1875 - Here on contact face of granite
and congl. get dip of 25° nearly SW.

Granite continues to N.

N320 W1875 - is the last outcrop of quartzite
found to the E of Sec. line 30/29.

Ran S on W1740 through granite and
across valley to granite. Found no
traces of quartzite on either side of valley.

Ran N on W1650 through granite. At

24772

N320 W1650 from SE Cor. S29-48-28

found in the gneissoid granite a bed
of rock which is here in my mind
undoubtedly vein material and which
is very similar to specimens 24765-6
It might be mistaken for quartzite.

We now started in to traverse
that portion of the mountain
west of the $\frac{1}{4}$ line + south of N250 in

S30-48-28

Section line runs along quartzite
ridge already described and to the W
several hundred paces runs down to the
plain.

N from N 0 W 1100 from SE Cr. S 30-48-28.

Left quartzite at
N 40 W 1100 and then rounded valley and
ascended granite hill and kept on over
granite to
N 250 W 1100 in a small valley running roughly E.

Returning on W 1200 we come at
N 250 W 1200 to small outcrop of pink and
bluish feldspathic quartzite. Could
get no dip nor strike.

N 55 W 1200 here we are at foot of
granite cliff and at
N 50 W 1225 quartzite beds begin to outcrop.
Dip 65 S. These are the same kind of
beds as those to the E. Pink + greyish
feldspathic quartzite with here +
there beds of conglomerate and
even blue quartzite in it. At W 180
S 25 - get Sec. 31 get dip of 40 SW on quartzite.

Now W 1300

Pass over quartzite dipping S. Gort.
outcrop occurs at
N 80 W 1350. First granite ledge at
N 100 ^{W 1300} N. Ascending hill we get near top at
N 180 W 1300 granite followed at
N 182 W 1300 by quartzite in following

succession grey, pinkish then blue
feldspathic quartzite, the same kinds
as those on ridge at foot of hill.

Contact between granite & quartzite
does not show conglomerate but
we have there the ordinary quartzite of
the region. Contact face dips to S.

At one place in quartzite on what
might possibly be false bedding
got a dip of 80° S. Strike E slightly N.
N 240 W 1300 small quartzite outcrop on
which got dip 60° S.

To the west of last location at
N 250 W 1337 we find a large face
of quartzite giving Strike N 80° W &
dip 75° S 10° W. The quartzite lies right
above granite but the immediate contact
is not exposed. At

N 260 W 1443 we find the quartzite and
granite very close to each other again.

At head of little valley got dip 60° S.

Strike E on a firm slightly pinkish
feldspathic quartzite.

24773

N 230 W 1400 Here we come to a bed of coarse
blue quartzite (24773) with local
conglomerate patches in it. Pebbles of white quartz.

24774

N180 W1400 Conglomerate bed (24774)
in the blue quartzite. Blue quartzite
bed here with white & pinkish
streamers through it. ~~Set~~

24775

N155 W1420 We pass the blue quartzite
and pass then pink, blue and last
greyish quartzite followed by a narrow
bed of greyish slate (24775) and then
by granite. Exposure is poor and I can't
be sure of exact dip but it is to the S.

N155 W1420

N120 W1400 Here we are at the foot of the
granite cliff and at

N82 W1400 the quartzite ridge begins & ends at
N10 W1400 where plain begins.

The quartzite ridge extends to
N120 W1490 and there ends. We now begin
to ascend granite talus and at
N180 W1500 we are at the granite cliff.

N190 W1485 Here we have the quartzite
(blue bed, with streamers of white & pink
quartzite in it, predominates) lying to
the N of the granite, the granite being
on a higher level than the quartzite.
Exposure is bad for getting strike & dip.
An & Congl. bed get dip 20° slightly W of N190
but doubt its being correct.

N240 W1500 We now have reached S. side

of narrow valley which began about
N 250 W 1400 & runs W.

Here we get outcrop of quartzite
beds, the predominating with
pinkish quartzite to N. Strike N 85° W,
dip 65° S 5° W.

N 250 W 1500 Quartzite still. At
N 255 W 1500 on north side of valley we
get granite outcropping.

N 250 W 1570 Here the quartzite is well
bedded and we get strike E dip 60° S.

We now run S on W 1600 and pass
along western end of the mountain
& the south of the little valley
mentioned above. To the W & S extends
sand plain.

Quartzite outcrops along this west end
and at

N 220 W 1575 we get the quartzite closely
followed & S by granite. Can't get
strike or dip along this end.

The granite continues for a short
distance &

N 125 W 1600 & here the sand plain
begins.

In the NW $\frac{1}{4}$ of S 31-48-28 south of hill we have just been traversing are a few isolated knobs. I made a run S to them to see what they were. At

24776 N 1640 W 1400 from SE cor. S 31-48-28 we came to rounded back of 24776

South of this we come to a ridge 24777-8-9 N 1525 W 1400 and at above location at N. foot of same to ridge we find a vitreous greyish quartzite overlaid by a quartzitic breccia (?) 24777) colored with iron. Strike of quartzite W to S of E, dip 50° S.

Overlying the quartzite + breccia is a greenish schist 24778 (cf. specimen 24763). Overlying the green schist comes the granite (24779) which forms the main part of the ridge.

Test pits have been sunk along the bed of breccia, in search of iron & pyrites.

In S. 30-48-28, to the N of the mountain which we have been traversing, there is a wide level valley which to the W. becomes wider and extends out into a plain with several small streams running through it. On the north side of this valley, in the northern portion of the section, we get high granite hills again. I made several runs in there in order to see whether there were any quartzite areas caught up in the valleys. I found no traces of quartzite at all, the rock being grey and reddish granite with dikes of very fine grained red granite and diabase (?).

