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Barron and Chippewa Co. quartzites: [specimens] 48029-48141. No. 411 Fall of 1904

Burling, L. D.

[s.l.]: [s.n.], Fall of 1904

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U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

9-891

LAKE SUPERIOR DIVISION.

INSTRUCTIONS.

1. Ordinarily at least two pages of this book will be devoted to one section. On the left-hand page, place a map of as much of the section as has *actually been seen*. Denote rivers, lakes, marshes, etc., by the usual topographical signs. Denote the ledges of rock, when no structure is made out, by cross-hatching, making the cross-hatching cover as nearly as possible the areas occupied by the exposures. If the rock is a massive one, but still more or less plainly bedded, use the same sign with a dip arrow and number attached, showing the direction and amount of the dip. Denote a shaly or other very plainly bedded ledge by right parallel lines, and a ledge having a secondary structure by wavy parallel lines running in the direction of the strike, with dip arrow and number attached as before. The greatest care must be taken to avoid confusing slaty or schistose structure with bedding, and in all cases where there is the least doubt about the true bedding direction, indicate it by a query. To each exposure on the face of the map attach the number of the specimen representing it. In mapping the section count each of the spaces between the blue lines as 100 paces, and twenty of these spaces to one mile, or 2,000 paces. Usually the southeast corner will be placed at the bottom of the page, or at the first black line above the bottom of the page, and at the right-hand side. If, however, for any reason, it is desirable to show portions of an adjoining section, the southeast corner may be shifted up, or the map may be turned around and the north placed at the left-hand side of the page. The ruling of the left-hand pages is also arranged so that, if desirable, a larger or a smaller scale can be used, eight inches, two inches, one inch, or one-half inch to the mile. With the two-inch scale, the squares outlined in black represent sections, and those in red, quarter sections and "forties," while the space between the blue lines is 200 paces.

2. On the right-hand page place the notes descriptive of the exposures. Begin in each case with the number of the specimen, placing the number on the left-hand side of the red line, after which give in order on the right of the same red line the position of the ledges as reckoned in paces from the southeast corner of the section and the dip and strike when observable, the latter always being expressed from the north; for instance 4025, 250 N., 300 W., *Strike, N. 78° E., Dip 50° S.* Then follow with a full description of the ledge. When topographical maps are used for locations this paragraph applies only in part.

3. Collect a specimen from every ledge, or wherever there is a change of rock on any one ledge, taking care to get fresh material, unless for a special purpose the weathered surface is desired. In case of trips made on foot or in canoes, for long distances, neighboring ledges, unquestionably of one kind of rock, need not be specimened. The position and extent of the ledges not specimened should be marked on the map, with notes that each is of a rock identical with specimen so-and-so. Under the same conditions small-sized specimens, trimmed to a uniform size of $2 \times 2\frac{1}{2} \times \frac{1}{4}$ inches will be allowed, but in all other cases *large-sized specimens*, trimmed to a size of $3 \times 4 \times 1$ inches, must be selected, in accordance with section 3, chapter IV, p. 44, Regulations of the U. S. Geological Survey. Specimens should not be placed together without protection in the collecting bag, as the fresh surfaces, important in determining the character of rocks, are thus destroyed. They should be damaged by no temporary mark, but the numbers should be at once marked in at least two places upon the inclosing paper or cloth bags. Specimens may be permanently marked in camp by painting the numbers upon them in white upon a black background, using Silver White and Ivory Black oil tubes for color, with turpentine as a diluent.

4. On the last twenty-five pages of the book give, as may seem desirable, a general account of the examination of the region mapped in the previous pages, correlation of observations, sketches, cross sections, etc.

5. Forward this note book as soon as filled as registered mail matter to C. R. Van Hise, U. S. Geologist, Madison, Wis.

Spec. No. 48029-48141

Notebook No. 411.

Barrou and Chippewa Co.
Quartzites

L D Burling

Fall of 1904

Entire time spent in field, in-
cluding days spent in moving
from section to section 21 days

Compass readings have not
been corrected for variation.

Arrived Rice Lake morning 16th.

Went to Haugen, rowed up Bear Lake, and visited exposure of Potodan in the eastern half of the SW & NW quarters of Sec 26 T37 R12. This is a concretary deposit of iron in the sandstone and persists for some distance in a bed 10-12 feet thick.

The pipestone mentioned in the following pages is a red interbedded shale. Wherever hachuring indicates rock outcrops in the following notes the rock is quartzite unless mention is made of pipestone. The pipestone where it does occur is in thin layers, up to 8 and 10 feet in thickness.

The location of all outcrops is given with as close accuracy as pacing would allow except those of Sec 31-35-9 and the other localities in 34-35-10 35-35-10

and 30-35-9. The location of these points was made by pacing along a stream course for 2 or 3 miles to a section

elsewhere, section lines are within easy reach

In addition to the magnetic lines run in section 25 a line was run across the center of 26 with readings of 5° variation $\frac{1}{2}$ a degree.

48029

48030

The exposure in the NW $\frac{1}{4}$ 26 shows the contact of the pipestone (48029) with the quartzite (48030). Dip observations could not be made except that the dip is a low one to the north west.

One specimen of loose pipestone from this locality shows minute jointing and fracturing from $\frac{1}{16}$ to $\frac{1}{8}$ of an inch apart. This was not observed elsewhere but, if present, would account for the differential movement that must have taken place in the shale when the region was folded. The fractures are spaced nearly equally and cross at right angles. Strike cannot be given as the specimen was not in situ.

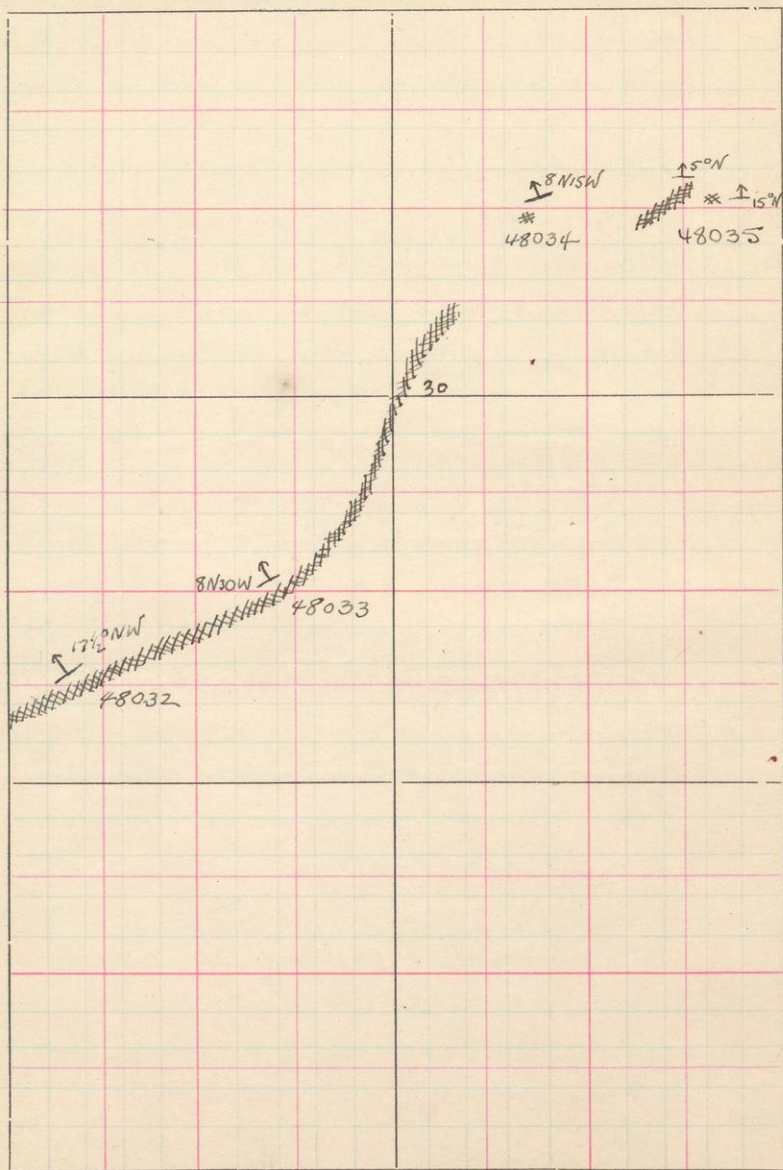
The exposure in NW $\frac{1}{4}$ 26 is a very dense red quartzite dipping 20° North. The exposure is very low (12-15 feet) and forms the eastern point of a drift covered ridge projecting westward. The drift is filled with angular quartzite blocks.

S. 30

T. 35

R. 10 W

9/17/02



This hill is from 3-600 feet high and is covered to the SE by a talus slope made of blocks averaging 2 feet in diameter. Rock in situ was found in 2 obscure places near the top as shown on map. A little northeast of the center of the section the talus slope gives way to a gradual slope strewn with quartzite fragments.

The exposure in $21E\frac{1}{4}$ $5W\frac{1}{4}$ $21E\frac{1}{4}$ Sec 30 is of pipestone and outcrops at the surface in a small exposure several feet across. Pits have been dug in this shale to a depth of 3-6 feet. This rock (48036) shows ripple marks, weathers white along joints, is soft when freshly exposed and hardens on exposure to the air. Quartzite could neither be found above nor below though the surface of the ground to the northwest is covered with quartzite in the drift. Joints strike and dip as follows:

$N75E\ 90^\circ$ $N15W\ 82^\circ$ $N70W\ 90^\circ$.

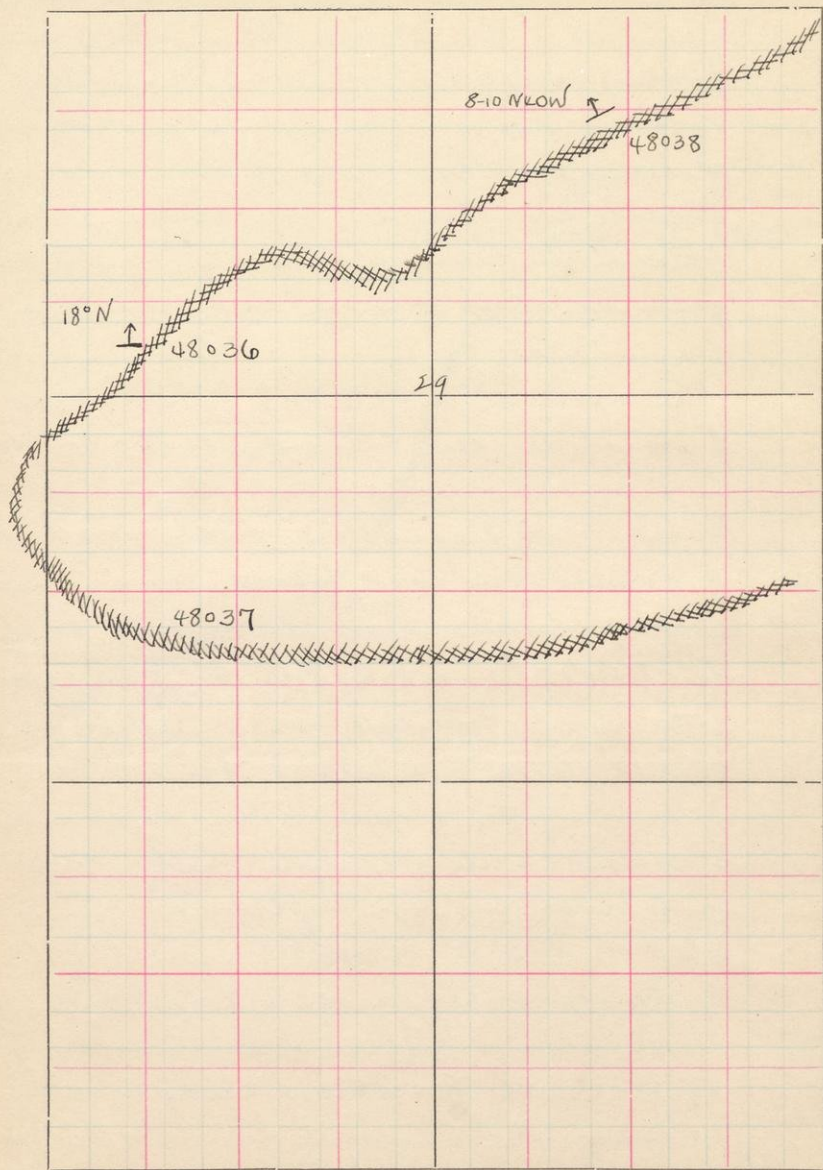
The exposures in $21E\frac{1}{4}$ $21E\frac{1}{4}$ Sec 30 are at elevations differing from each other by 70-80 feet, the eastern being lower. The ridge at this point is not as high as it was to the southwest.

S. 29

T. 35

R. 10

9/17/06



48038

This ridge which rises 2-300 feet at its eastern end has a northern slope which coincides with the dip of the strata and a southern slope which is covered with talus without ledge outcrops.

48036

In the SW $\frac{1}{4}$ NW $\frac{1}{4}$ of the section where there is talus the strata dip in the direction of the slope of the talus and the beds have been exposed at one place (48036) by the removal of building stone near the base of the bluff.

The old Court Oreille Indian Trail follows along the NW slope and exposes the rock in many places. Joints strike and dip at 48038 as follows:
N75W 90° N78W 90° and S80W.

S. 31

T. 35

R. 10 W

9/18/00

road
*48045
a48044 31

048043
48039 (3) 48040
~~48040~~ 48041
~~48041~~ 48042

See opposite page for structure.

The exposures in the center of this section are clustered on a knoll rising 50-75 feet above the plain.

48039 The little exposure marked $\otimes$ shows on the surface of the hill, is ripple marked, and dips $30^{\circ} N 20^{\circ} E$ (48039).

48040 The quartzite shows up to the southeast as 2 parallel ledges. The longer northern ledge (48040 & 48041) dips $30^{\circ} N$ at its eastern end and is apparently continuous with the small outcrop previously mentioned.

48041 The short ledge to the south dips 28° a little east of north. The ledge is about 4 feet high. There is a shear zone in this ledge a few inches wide. (48042)

48043 $\circ$ This exposure is of pipestone but no dip observations could be taken (48043).

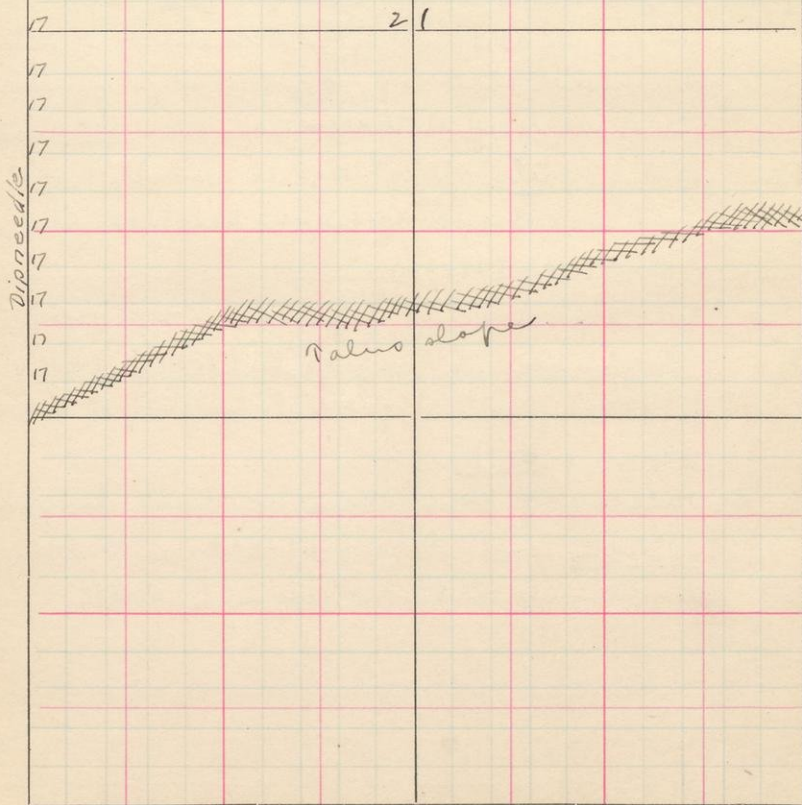
48044 $\square$ Small exposure of white quartzite (48044) dipping $35^{\circ} N$.

48045 $\times$ Outcrop of pipestone in road dipping $30^{\circ} N 10^{\circ} E$ and 30-40 feet below $\circ$ referring elevations to the horizon. (48045)

S. 21

T. 35

R. 10 W



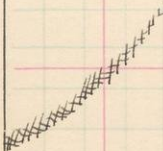
Palms no structure possible

S. 22.

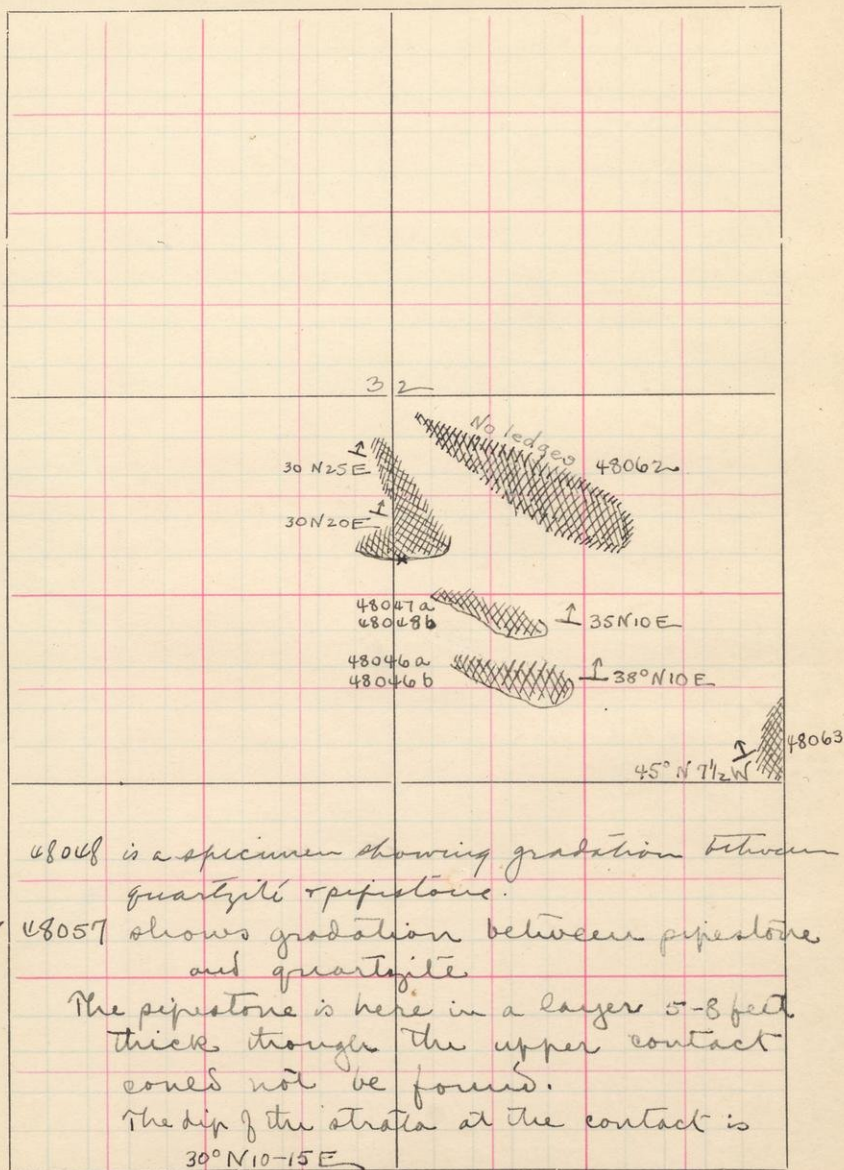
T. 35

R. 10 W

2 2



Palms no structure possible.



The three exposures in SE $\frac{1}{4}$ of Sec 32 are quite similar in appearance, have the same strike, and rise to about the same level from the plain (30-40 feet). The north slope is parallel to the strata and the south slope of each is vertical with a small accumulation of talus. They suggest faulting?

48047 a

48047 b

The middle outcrop shows ripple marks. (48047 a & b)

48046 a

48046 b

The south outcrop is composed of a red quartzite (48046 a) which gives way in places to a whiter phase (48046 b).

The rock of both ridges is pretty well fractured.

The elbow shaped outcrop to the northeast shows the contact (x) between the pipestone and quartzite.

48049

48049 is quartzite 4 feet from contact.

48050

48050 " 2 feet " "

48051

48051 " showing contact face

48052

48052 pipestone " " "

48053

48053 " just away from contact

48053 fits onto 48052

48054

48054 pipestone 6 inches back

48055

48055 " 2 feet back

48056

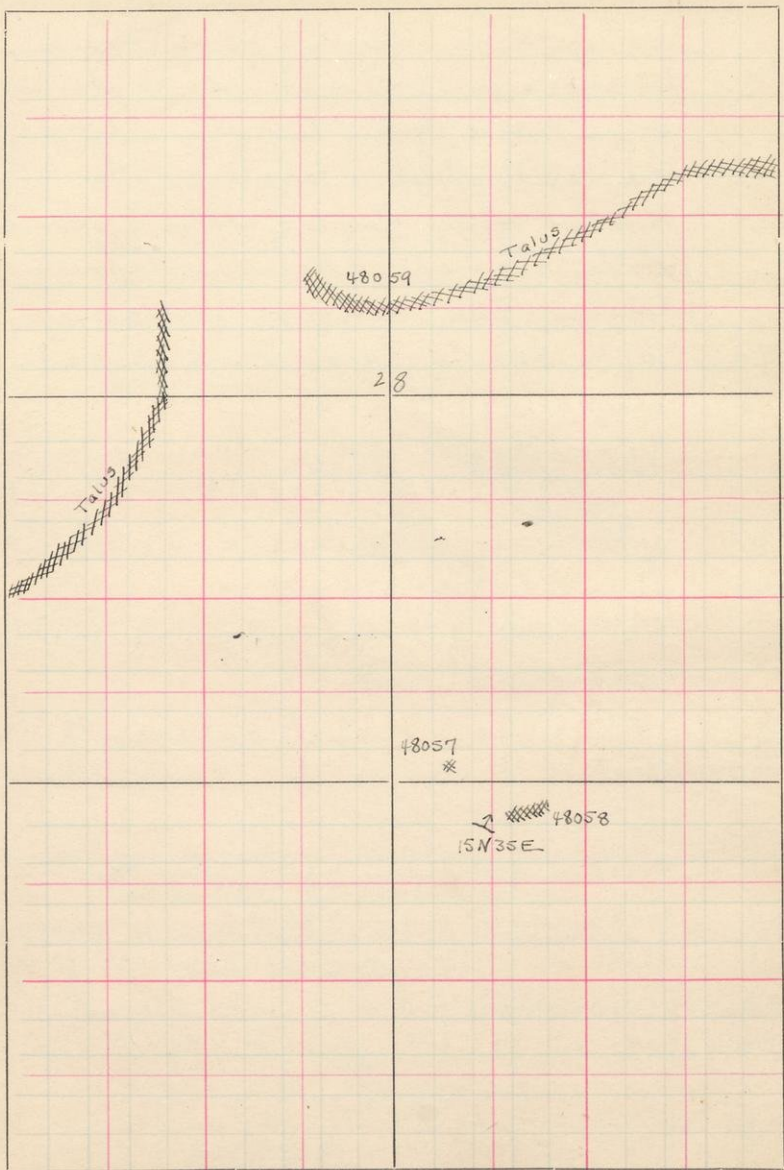
48056 Phase in the pipestone (near top)

S. 28

T. 35

R. 10W

9/20 00



48058

The exposure (48058) is of pipestone and occurs in a ledge trending NW. The rock shows a white streak. Only eight feet of the rock was exposed but the thickness appeared to be much more. Quartzite was found neither above nor below. The exposure to the northwest of this pipestone is very small and friable because of the presence of considerable iron. It in fact looked more like Potsdam than quartzite.

48057

48059

(from Colus - see map)

S. 4

T. 34

R. 10

9/21/04

20° N 20° W

48060

4

48060

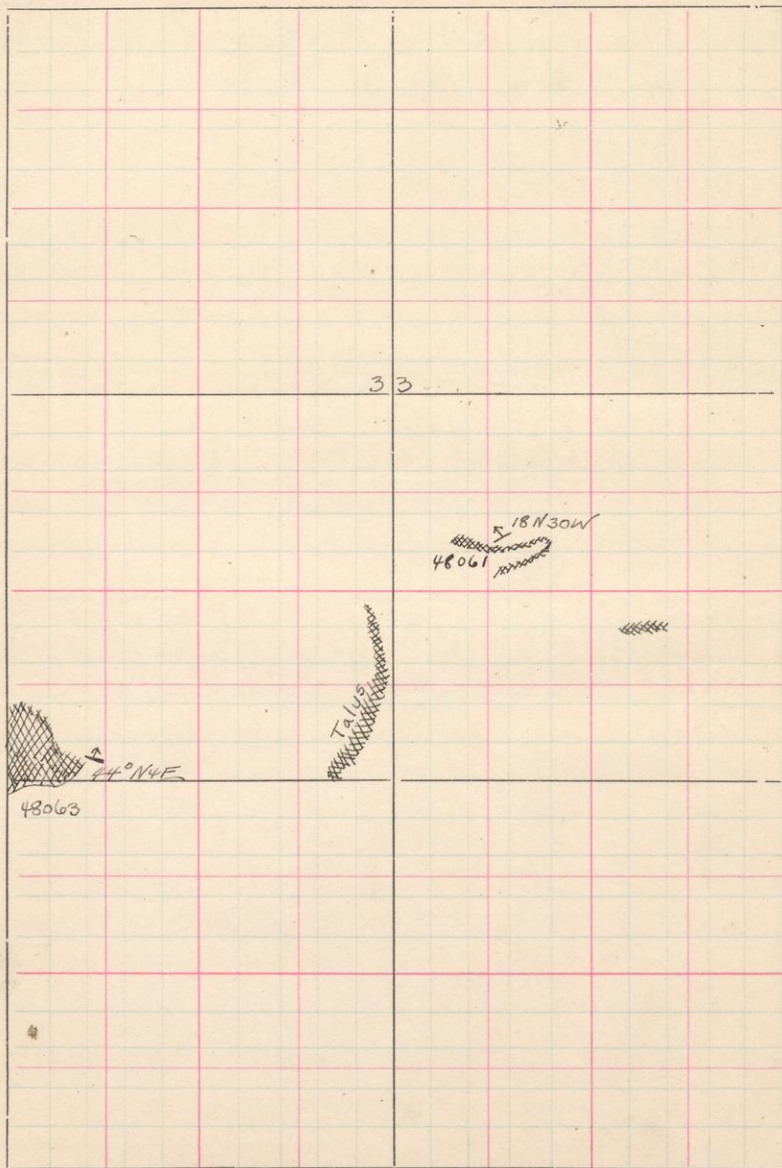
From a ledge dipping 20° N 20 W
in NE $\frac{1}{4}$ sec $\frac{1}{4}$ C-34-10

S. 33

T. 35

R. 10 W

9/21



48061

In the ravine in N W $\frac{1}{4}$ SE $\frac{1}{4}$ sec 33 again
found lower contact of the pipestone
and the quartzite. (48061)

The exposed thickness was 8 feet.
One specimen (48062) shows contact
of pipestone with quartzite. It is
here chert cut.

48062

Joints run N 70° W and dip 90°
See 3 pages back 32-35-10.

48063

From a ledge in SW corner of 33-35-10
dipping 44° N 4 E

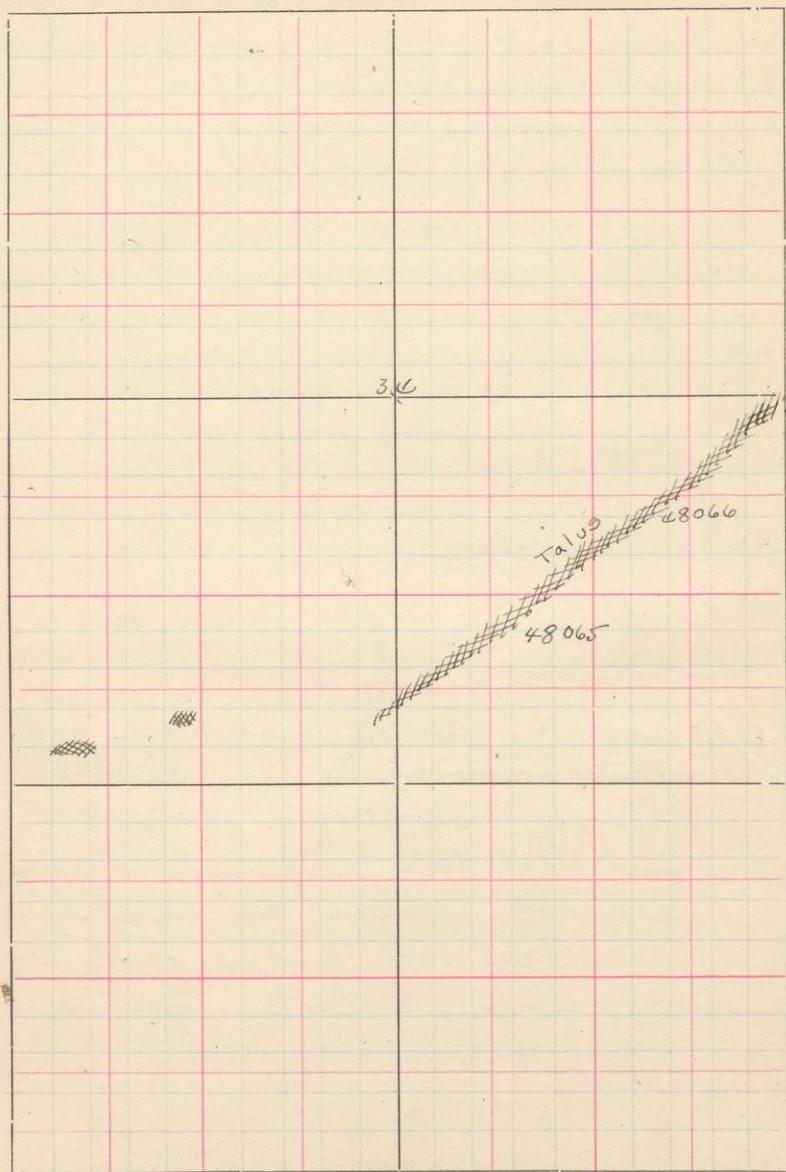
Aunt Arneson was with me in
reconnaissance of 33-35-10 (SE $\frac{1}{4}$)
36-35-10 35-35-10 30-35-9
and 31-35-9. If my locations
are not correct he can point
the ledges out and a party with
more time at their command
could locate them.

S. 34

T. 35

R. 10 W

9/21



48067 At the locality 48067 apparent pebbles were seen in the bedding surfaces of the rock. Surrounding these and flowing around them were white bands alternating with red. In places white areas of quartzite were surrounded by similar bands. For the pebbles see the specimens collected on Woon's Bluff (48077).

48065 Collected in Calus - see map
 48066 " " " " "

S. 35

T. 35

R. 10 W

9/21



35

48068

From ledge dipping 10° N35W

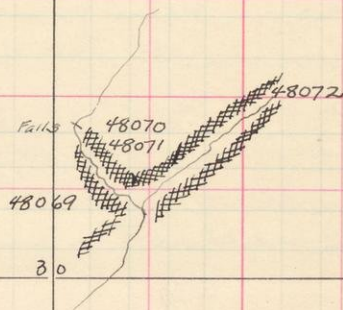
From this point started for section 30 35 9 and crossed 26 and 25-35-10 going up several ravines and over talus covered hills but didn't see a ledge until I reached the falls.

S. 30

T. 35

R. 9

9/21



High hill (400-500')
with talus slope to
the south

48069

Specimen 48069 is a typical specimen of the quartzite in this locality.

The strata dip in general at angles of 10-12 degrees to the north though cross bedding and minor variations occur.

48070

At the end of the ravine or canyon trending north west is a waterfall 20± feet high with rock like 48070 at the top. This canyon is narrow (10-15 ft) with vertical sides and exposes near the top a layer 16 inches thick of pipestone 48071. This layer is 4 feet below 48070.

48071

Joints are vertical and run N 60 W. In the canyon trending NE (50-100' wide) are exposed lenses of pipestone which decrease in size toward the bottom of the vertical section. At the NE point of the canyon (here 40 feet high) is exposed a rich red pipestone somewhat different from the pipestone elsewhere.

48072

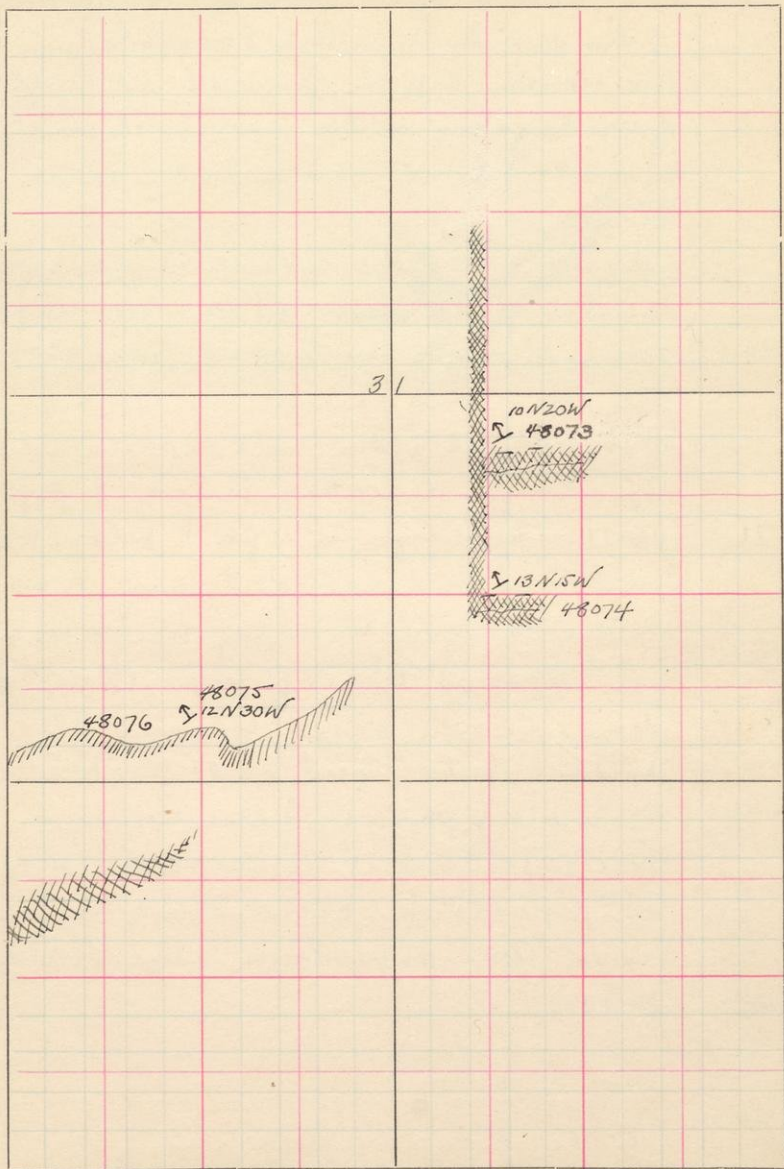
(48072)

S. 31

T. 35

R. 9

9/21/04



The ravine trending E+W in NW $\frac{1}{4}$ 48E $\frac{1}{4}$ of the section is wild cat Canyon a V shaped gorge of talus blocks (in other words 2 talus slopes just meeting at the bottom and rising 60-75 or more feet high on either side where they pass into drift. Ledges were found in both this ravine and the one to the south near the mouth

48073

48074

Specimen 48075 is from a ledge where numerous well preserved ripple marks of all sizes were to be seen. Joints run N 15° E & N 70° W and dip approximately vertical.

48076

Specimen 48076 is from a ledge several paces west of the ledge in which the ripple marks showed up so well.

Getting dark so bad to make a bee line for headquarters 6 or more miles away.

This reconnaissance ^(9/21) was made so rapidly that while the relative position of the falls, wild cat Canyon etc is nearly correct the location as a whole may be out of the way.

S. 36

T. 35

R. 10

36

Quartzite takes shape
~~XXXXXXXXXX~~

S. 6

T. 34

R. 10

6

48077
48078
48079 Talus
48083

48082 48081

The elevation in the SW $\frac{1}{4}$ of 6.34.10 (Moon's bluff) contains or is in part composed of a massive red quartzite which exhibits on the surface of the layers angular whiter fragments from 1-2 inches in diameter. These generally weather heavier than the matrix.

48077 48077 shows a slab of this conglomeratoid surface, the pebbles appearing more like impressions of angular fragments as the apparent pebbles do not extend far below the surface.

Among the talus blocks were numerous specimens of a ~~conglomerate~~ quartzitic sandstone similar in all respects to the Lake Superior sandstone (48078).

48078

48079 A specimen containing a small lens of pipestone (48079) was also found.

48080

48080 is a specimen of the quartzite from a very small outcrop in the woods dipping 12° N $35-38^{\circ}$ W.

48081

48081 and 48082 are from near the

48082

top of the ridge from a low cliff in which the quartzite dips 10° N $40-45^{\circ}$ W.

34-10W

This low cliff (48081 + 2) is broken up and displaced or separated along directions trending N 83-85 W N 5-10 E N 48 W N 30 E and N 40 E. Frequent instances of cross bedding are here seen, though they seemed confined to a few feet laterally and to be separated from adjacent ~~uncrossbedded~~ strata by jointing or as this would indicate slight faulting.

The top of the cliff has however been eroded evenly.

48083

48083 is a typical piece of the moon's bluff quartzite.

S. 8

T. 30

R. 10

48084 #

* 48085
48086

8

48080

48080 is a specimen of sandstone (probably Potsdam) which occurs here in a hole in the ground from which it has been taken for the making of grindstones. No dip observations taken.

(This locality is near the house of an eccentric man by the name of Hoffman)

48085

48086

A little to the southeast and on the hill side in a test pit occurs an interesting conglomerate (48085 and 48086). Though exceptionally indurated in places it readily breaks down in others and the fields and ^{entire} country between this and the Sumner locality 31-34-10 is strewn with the quartzite pebbles.

The relations are such as to suggest a slight dip to the north for the conglomerate formation as a whole which is of considerable thickness?

S. 31

T. 34

R. 10

31

08087
comp.
XXXXXX

08088 # Y 14 N 42° E

quartzite

The base of the conglomerate exposed in 8-3610 was found as indicated and rests on quartzite which has a dip of 10° N 42 E.

Strong (Geol of Wis) says no quartzite was found and doubts the Potsdam age of the conglomerate. This quartzite ledge which lies a little to the north of the road southeast of Summer (see map) seems to prove that we have here the base of the Cambrian. Actual contact not seen.

48087

Conglomerate

48088

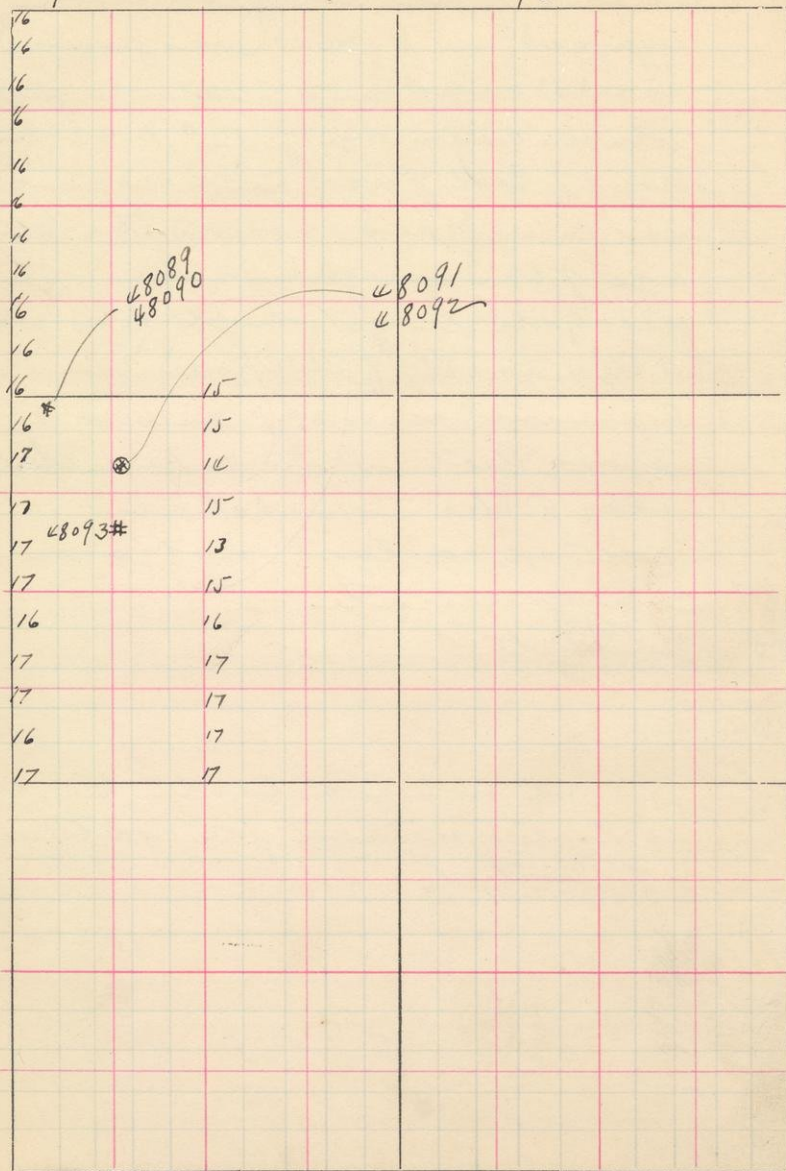
Quartzite

Time not available to explore Southeast for continuation of quartzite.

S. 14

T. 35

R. 10



48089 & 48090 are from a test pit
near the road. (The similarity of
this material (48090) to the material
in the fracture zones (or dikes)
in the rail road cut (481376)
south of Coudersville is worth
attention. 48089 is a much
fractured pipestone.

⑦ is a shaft (sunk by Kaapye Stout Co). Around this shaft is exposed in the dump a typical diabase (48091) with reddish more or less decomposed frag-

48091 diabase (48091)
more or less
48092 - mints (48092)

Man who sunk shaft claims
he struck a foot wall after
descending through this diabase
and that the dike (?) dipped
slightly to the north. Was
unable to find an outcrop of this
diabase but 48093 was taken
from a small test pit south
of the shaft (145 paces) where the
quartzite is apparently flat
lying and unmetamorphosed.
Its character is such as to indicate
that the diabase is in the form of a dike

S. 15

T. 35

R. / O

48094

Talus slopes on a small creek beginning on the SW of Little Hill. of where the road crosses the creek (see map)

48095

48094 48094 was from the northern talus
slope of the creek bed, a short
distance NW of where the road
crosses the creek (see map)

48095 48095 from the southern talus
at the point as far east as I
ascended the creek in search
of ledges.

Dip observations could not be taken on the outcrop in SW $\frac{1}{4}$ SE $\frac{1}{4}$ 16

(46321) 48096 48096 is a specimen of soapstone

48097 48097 " " of quartzite

(46322)

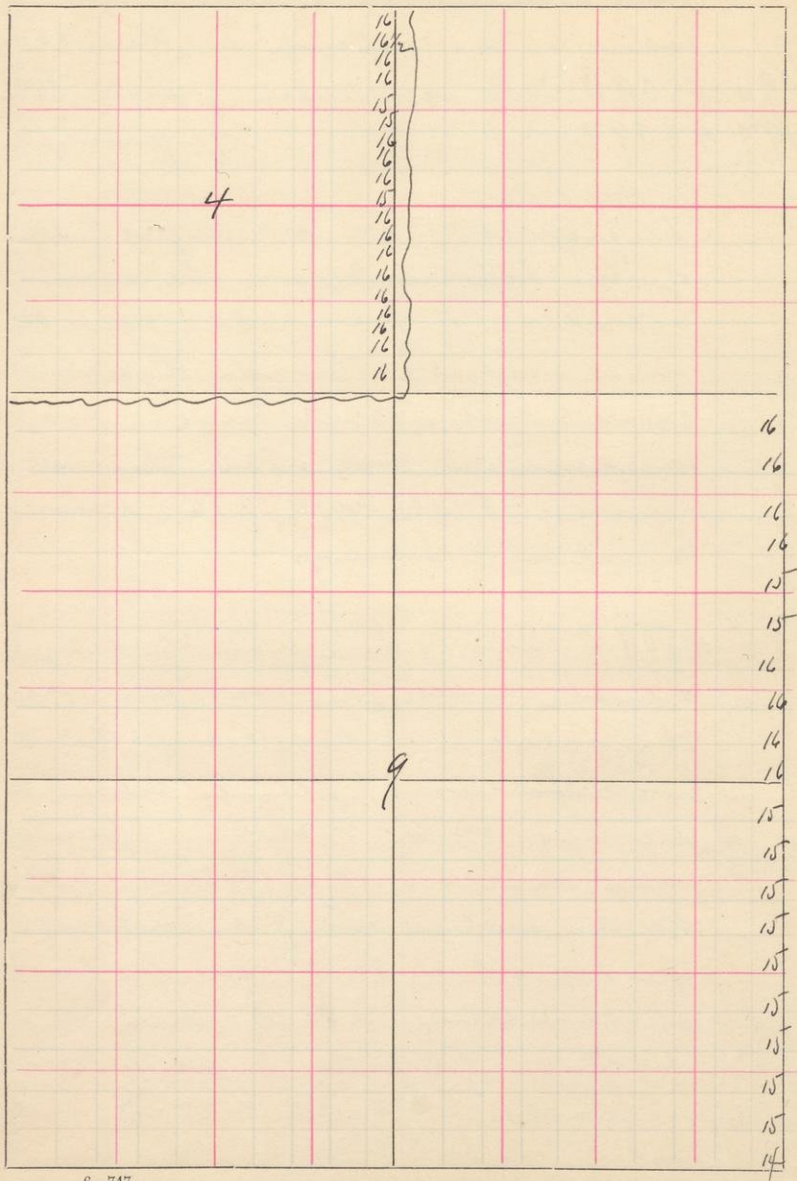
The figures 15 etc are angles of dip of the dip needle. The normal vibration of the needle was ~~20~~ 8 in 20 seconds though it usually came to rest in that time. No undue uneasiness was noted though at one place SW $\frac{1}{4}$ NW $\frac{1}{4}$ of 16 it came to rest in 2 swings.

48098 48098 was taken from a ledge a little south of the road and north of the creek in a low ledge trending north^{east}ward, plainly bedded and dipping 20-22° N 35° W. Joints run N 42° W N 18° E N 86° W & 57° W. At the eastern end of the outcrop the dip is less (2-13°) and the direction more westerly N 50° W, this in a distance of 50 feet. At the western end the dip is 14-15° N 35° W. At the eastern end 2 new joint directions were noted: N 18° E dip 80°; 58° W vertical.

S. 9

T. 35

R. 10



S.

T. 35

R. 10

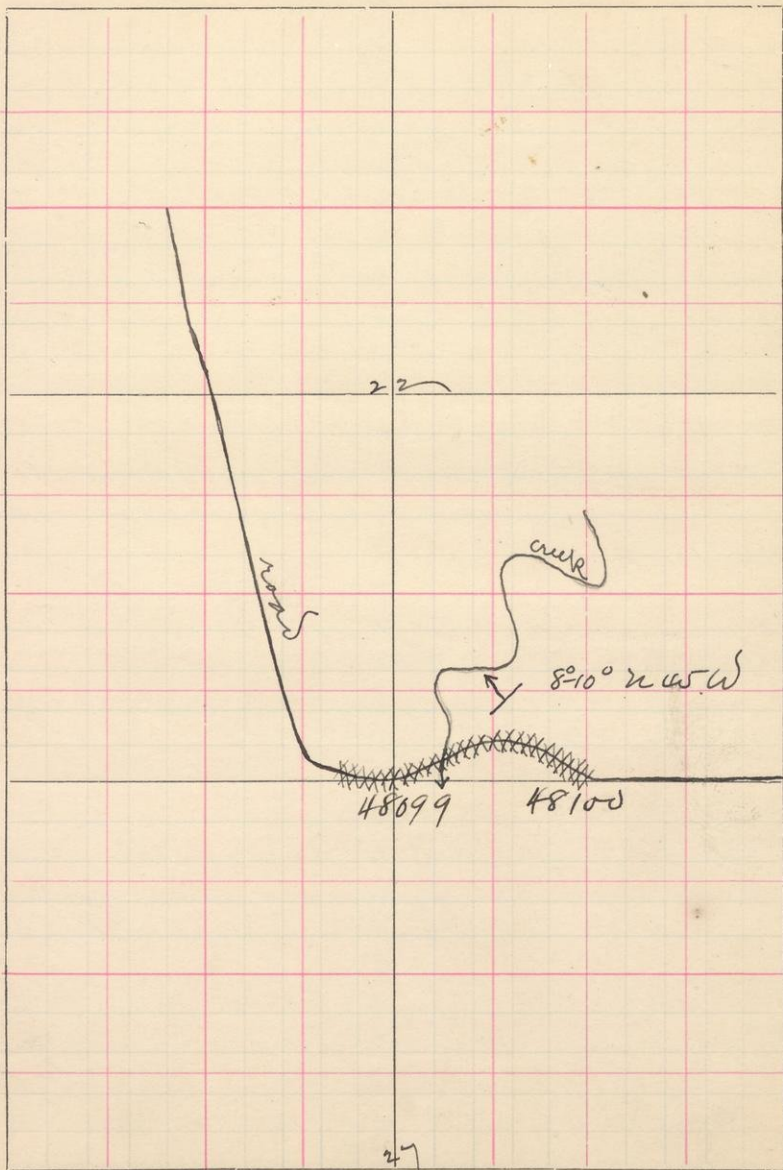
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16				16				16
16				16				16

S. 22

T.

35

R. 10



(46324)

48099

48100

(46325)

26

The ledges from which these specimens were taken outcrop by the side of the road.

The celebrated indian quarry of pipestone lies $\frac{1}{4}$ of a mile to the south of the point where the creek crosses the road. A smaller quarry lies nearly a mile to the southeast of this one.

Pipestone fragments cover the surface at intervals along the east line of section 27. One

48101

(46327)

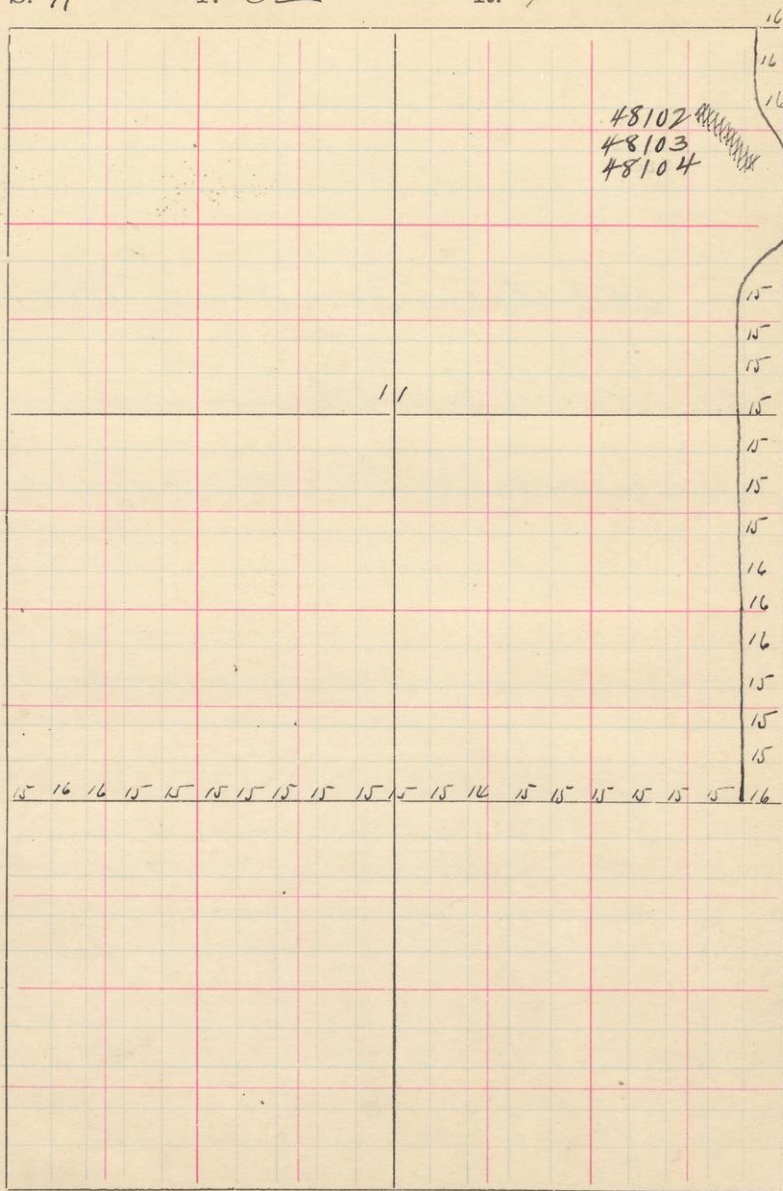
specimen (48101) was picked up showing successive ripple marks.

At the Bend in the
Chippewa

S. 11

T. 32

R. 7



(46329)

48102

48103

(46330)

These specimens are from the exposure in 26 1/2 of 11

The exposure in the 26 1/2 26 1/2 11-32-7 is conglomeratic in places, having rounded pebbles of white quartz. The rock is also shot through with numerous quartz veins. Joints run

560 W, 80° dip; 260 W, dip 80°;

55 E, vertical; 572 E, dip 37°;

E, 43°; 550 W, vertical; 55 E, 45°

I was at first inclined to regard this latter direction as bedding but later (on second visit) decided that the bedding had a strike of 275 W and a dip of 85° N 20-30 E. Bedding very obscure. Specimen 48104

had a dip of 35° E for the flat surface. The determination of bedding was made after seeing the exposures in section 6-32-6

This ledge forms the eastern end of a long ridge trending westerly for a mile or so where it passes into the main range whose eastern end lies in 6-32-6 and whose western end is in 9-32-7

48104

(46331)

S. 1

T. 32

R. 7

46332

*

46333

1

48106

107

48108

4

48112

48113

48114

48105

(46332)

(46333)

97-1.

The little exposure in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec 1 is very small, covering but a few square feet in the woods. Bedding obscure, likely 25° S 42 E (?). One series of joints trends S 75 E and is vertical.

48106

48107

48108

The exposure in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ and continuing into 6 is in a ledge 15-20 feet high with bedding distinct near top (geologically). Bottom is intersected by white quartz veins, rock is very dark colored.

As you go up the rock becomes lighter and bedding plainer.

Toward west the quartzite becomes conglomeratic.

At east end strike of rock is N 10 W and dip 65° S 70 W. At west end (toward top of section) strike is N 38 W and dip 70° S 63 W.

48112

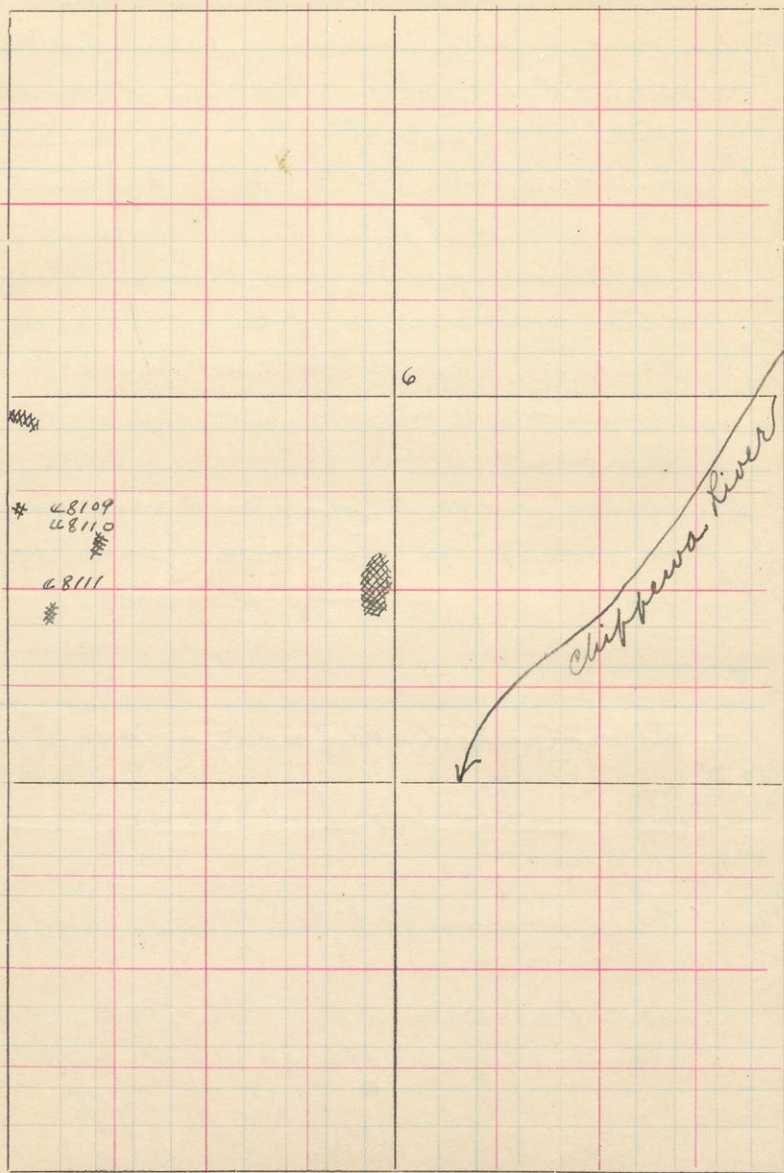
The exposure labeled 48112 and from which this specimen was taken is near the summit. The rock is conglomeratic in places with pebbles of red chert and white quartz.

Strike N 10 E dip 65° W. 100 paces NE and a little farther down the hill there

S. 6

T. 32

R. 6



the strata strike north and dip
 45° in the direction $S 80^\circ W$ (?).

There has been considerable
 warping here and local variations
 in dip were noted.

48113

48114

These were collected from the outcrop
 in $SE \frac{1}{4}$ $SE \frac{1}{4}$ of section 1 - no dip
 observations taken.

48109

48110

48111

These were collected from the ~~west~~
 eastern side of the main ridge,
 in the talus and from ledges which
 had been displaced and which had
 slumped to such an extent that
 dip observations were worthless.
 The position of the ledges has been
 indicated on the opposite page.

The oval outcrop in $SE \frac{1}{4}$ $NE \frac{1}{4}$ $SW \frac{1}{4}$
 6-32-6 rises about 100 feet from
 the level of the broad flat between
 the Chippewa River and the outcrop in
 question. The outcrop is approxi-
 mately 200 by 100 feet in area. The
 sides are abrupt except to the
 north where it is more gradual;
 the eastern side exposes the up-

S. 10

T. 32

R. 7

10

16 16 16 16 16 16 16 16 16 16 15 15 15 15 15 15 15 15 15 15

turned edges of the beds which strike $N15^{\circ}W$ and dip $65^{\circ}S80^{\circ}W$. The western slope is parallel to the bedding.

This isolated outcrop is interesting. The rock is a schistose conglomerate

48115

48115.

48116

48116 is a specimen showing a finer phase of the conglomerate and

48117

48117 is a specimen of the more or less sheared quartzite on the western side of the outcrop.

The rock is shot through with quartz veins at right angles to the bedding. The series of joints noted strikes $N77^{\circ}E$ and dips $74^{\circ}N$.

48119

(48119) A large piece of iron ore was picked up in the drift by the road which runs $E\&W$ through the west central part of section 6.

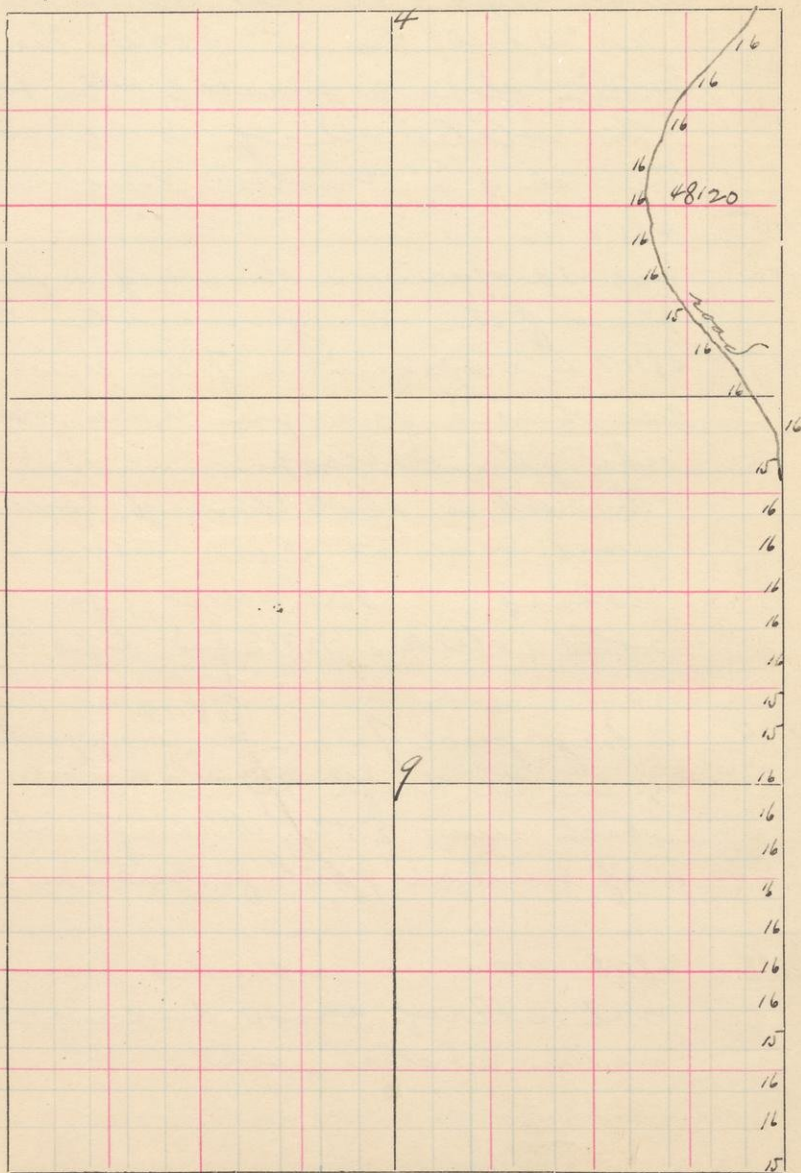
48118

48118 was collected from the oval outcrop above described, on the western side

S. 9

T. 32

R. 7



(Jasper)

32

48120

48120 are chert pebbles picked up in the drift at the westernmost end of the ridge. The westernmost outcrop of the quartzite found in the reconnaissance is that of section 2-32-7 (see ahead)

Explored 35-36 — 33-7 ; 31-33-6 ;
3, 2, and 1 — 32-7 ; and 6-32-6
pretty carefully as much as I
could in 4½ days.

The exposure in SW $\frac{1}{4}$ of $\frac{1}{2}$ is a ridge or ^{the} top of the main east and west ridge at the bend in the Chippewa. The cliff being exposed on the north as well as south sides of the summit, the southern being the greater in extent and height. The rock is very similar to that in Section 11, bedding obscure but strikes W and dips 45° $N 70^{\circ} E$, and the rock is traversed by numerous joints. The texture of this quartzite is markedly different from that east of Rice Lake. Here it is composed of immense masses, rounded and weathered,

east of Rice Lake the general size is smaller & the rock comparatively unweathered. 48121 was collected near the top on the south slope.

On the northwest outcrop the most common parting (and a plane which agreed with the plane of several flat pebbles which were found 48122) is striking west and dipping 80° N. Taking the surface of the red layer (of which 48123 shows a portion) we obtain a strike of $N 80^{\circ} E$ and a dip of 48° $N 10-20^{\circ} W$.

48121

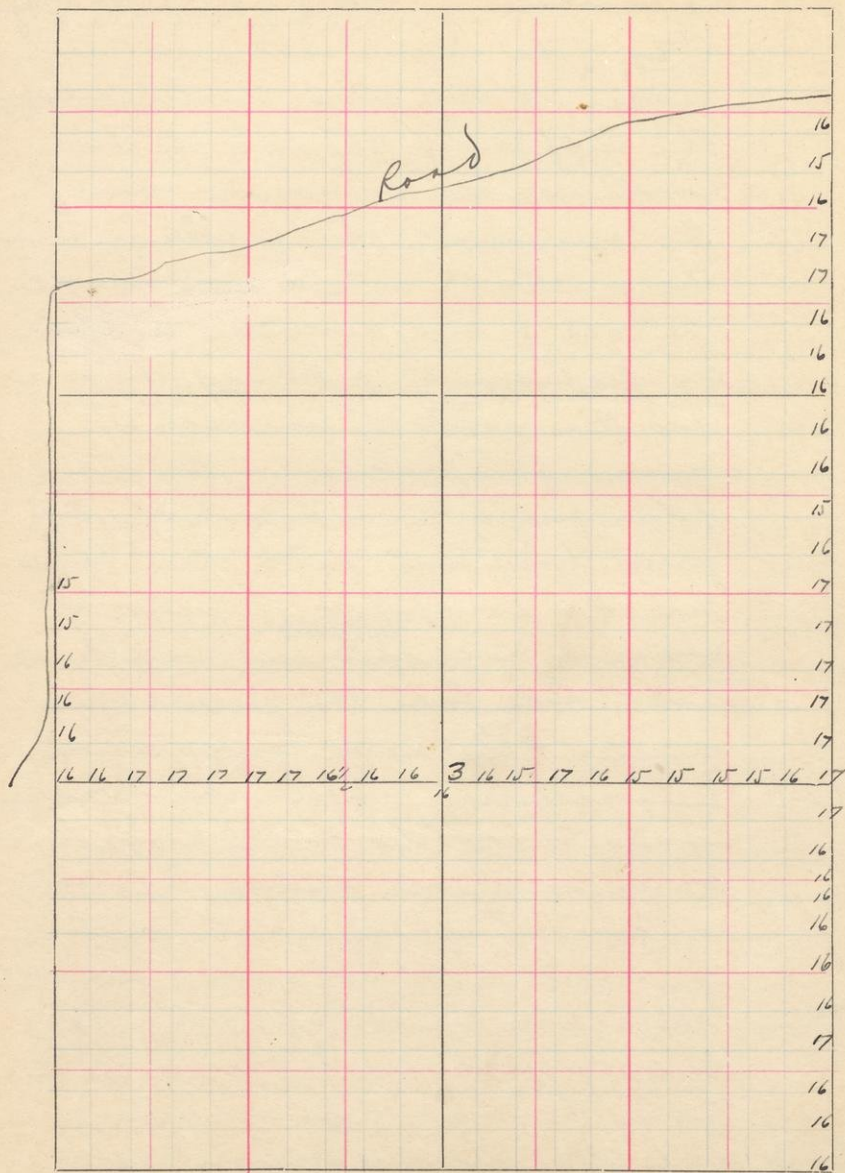
48122

48123

S. 3

T. 32

R. 7



No planes of parting follow this direction, however. one series of joints strikes south and dips $60^{\circ}E$.

At the eastern end of the outcrop there is a dip of $60 N 20^{\circ}E$ with a strike of $N 80 W$ with joints dipping $50^{\circ} S 30 E$.

4812C

4812C was taken from the eastern most outcrop at the summit of the ridge.

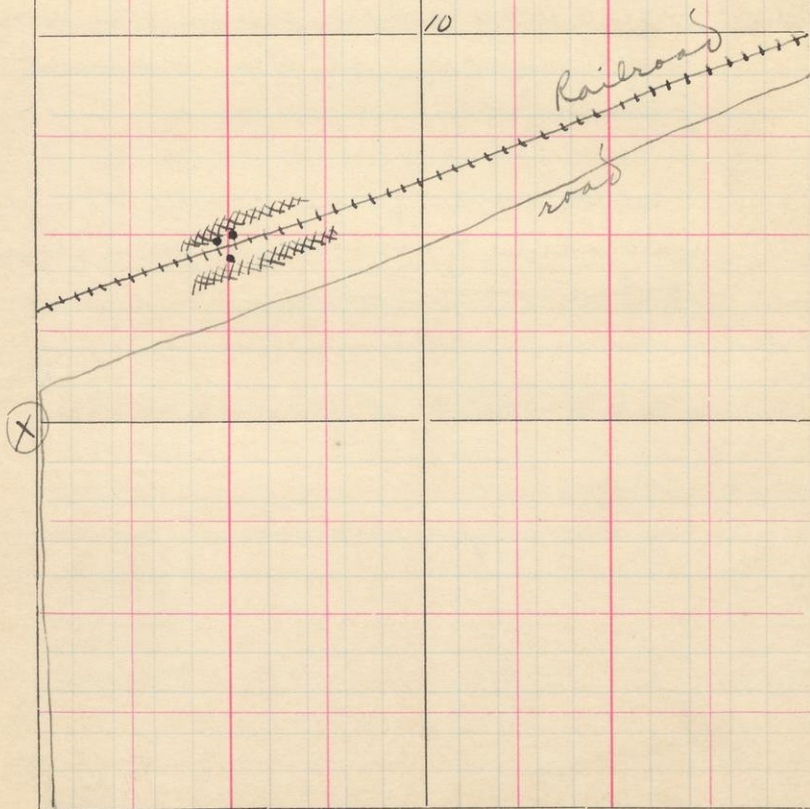
Went south of here $\frac{1}{2}$ mile to 1 mile in search of outcrops but failed to discover any.

S. 10

T. 34

R. 8

Weyerhaeuser outcrop.



This is the quartzite reported in the Geol. of Wisconsin to occur on Maple Creek but which was not visited.

Three shafts have been sunk on the Railroad right of way at this point (near Weyerhaeuser see map accompanying thesis) Their location is shown by $\therefore$ on opposite page.

Bedding obscure but suppose it to be $25-30^{\circ}$ N 40° W.

I was unable to get down in the shafts and the following specimens were taken from the dump around them.

- 48125 = Typical quartzite.
- 48126 Phases of quartzite + iron formation?
- 48127 "
- 48128 "
- 48129 "
- 48130 "
- 48131 "
- 48132 "

(X) is an outcrop of sandstone, very friable, no relations deduced.

outcrop north of Bruce

48133



This outcrop is on Elder Creek just south of the road in the bed and banks of the creek where it has been quarried. I referred it to the Potsdam.

It is flat lying and has joints trending
N 45° E dip 68°

S 50-55° E dip 90.

48133 is a specimen of the sandstone which is quite friable.

Outcrop near Conderay 36

For the location of the outcrop between Conderay & Yarnell on the Railroad see map accompanying thesis. It is in T. 38 R. 8 but the section in which the outcrop occurs (as shown on the map) may be slightly in error. Outcrop was located from railroad map, knowing that its northern end was 4 miles and 1500 feet from Conderay. The railroad cut is comparatively low but affords a perfect section of the rock for about 1000 feet. The top is uniformly level and affords no clue to the origin of the fault zones(?) (ahead) is a specimen of pipestone. This was picked up in the drift south of the outcrop but clearly shows that the pipestone which occurs east of Rice Lake also occurs north of the locality from which it was derived.

48134

Worked the section from the north and here it is:

48135 is a specimen of the quartzite at the beginning of the exposure where the dip of the strata is 15° N 80° W very near this end a small shear zone in which the quartzite was arranged in slabs showing very little alteration. This shear zone had a strike of N 18° E and dipped 80° NW. This quartzite continues for 35 paces where it gives way to a belt 15 paces wide of quartzite like 48136.

Next come 35 paces of same quartzite as before with vertical joints trending N 50° W. Here a more massive phase of the quartzite begins and continues for 30 paces where 2 faults striking NE and dipping 80° NW were encountered. There was quite a development of talcose material in these zones. Throw could not be determined as the rock is fractured into fragments 1-2 inches in diameter and the surface of the ground

above on each side of the cut gave no clue as it had been eroded level. The faults continue on the opposite side of the cut also.

53 paces farther there is another fault zone, a specimen or specimens of the schistose material occupying these fault zone was taken (481376)

481376

48137a

48137a is a specimen of the quartzite immediately adjoining the metamorphic zone.

98 paces farther south along the track was a zone 3-4 feet wide like 48140.

48140

48138

48138 is another specimen of the schistose material and

48139

48139 the adjoining quartzite.

48 paces to another fault. The rock is here more massive, but throw could not be determined.

48141-2

48143

48141

48142

48141a

White Kaolin material 48141-2-3 1a-1b occurs with the talcose schist in the fault zones.

At the southwest end of the

48141C

~~48146~~

railroad cut the dip is 48141C

50 N 90° W

Specimen 48146

was here collected.

48141d

~~48145~~

48145 is a specimen of the quartzite
from the middle of the cut or
section

