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Minnesota Valley: [specimens] 5374-5412. No. 34 1884

Hall, C. W.

[s.l.]: [s.n.], 1884

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Hall, #9.

U. S. GEOLOGICAL SURVEY

FIELD NOTE BOOK

No. 34

C. H. Hall.

1884

Minn. Valley

5374-5412

5374-5412

Descriptions 5374-5412

Survey of the Pre-Cambrian Rocks of the N. W. States.

INSTRUCTIONS.

1. Devote at least two pages of this note book to one section. On the left hand page place a map of as much of the section as has *actually been seen*. Denote rivers, lakes, marshes, etc., by the usual topographical signs. Denote the ledges of rock, when no structure is made out, by cross-hatching, making the cross-hatching cover as nearly as possible the areas occupied by the exposures. If the rock is a massive one, but still more or less plainly bedded, use the same sign with a dip arrow and figure attached, showing the amount and inclination of the dip. Denote slaty or other very plainly bedded rocks by lines running in the direction of the strike, with figures and a dip arrow attached as before. 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 smaller spaces as 100 paces, each of the spaces between the red lines as 500 paces, and four of these large spaces as one mile, or 2,000 paces. Usually the southeast corner will be placed at the first red 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 down one space, or the map may be turned around and the north placed at the left hand side of the page.

2. On the right hand page place the notes descriptive of the exposures. Begin in each case with the number of the specimen, after which give in order the position of the ledges as reckoned in paces from the southeast corner of the section, and the dip and strike when observable, for instance: 4025; 250 N., 300 W.; *Strike, N. 6° E.; Dip, 50° E.* Then follow with as full a description of the exposure as possible. Very often the notes for one section will cover more than one page in which case pass to the next right hand page, *repeating the map on each left hand page* as long as the notes, with regard to one section, continue.

3. Collect a specimen from each separate ledge of rock, or whenever there is a change of rock on any one ledge. In case of trips made on foot or in canoes, for long distances, neighboring ledges, unquestionably of one kind of rock, need not be sampled, the position and extent of the ledge being marked on the map, with the note that it is of a rock identical with specimen so-and-so. Under the same conditions small sized samples will be allowed, but in all other cases *large sized trimmed specimens*, with chips for slicing, must be selected in accordance with § 3, chapter IV, p. 44, Regulations of the U. S. Geological Survey. All specimens are to have numbers painted on them, in white on a black background, in camp.

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, etc., etc.

5. Forward this note book, as soon as filled, as registered mail matter, to R. D. IRVING, U. S. Geologist, Madison, Wisconsin.

#34

Sec.

8

T.

114

R.

37 W

Minimata river

5374

Chiefly
Exposed
quartzite rocks

5374,

100 N; 1850 N.

This sample shows the mixed feldspar and hornblende of the mining location of Mr. Ellingson. This man has given a considerable amount of time apparently to excavating at this point for the discovery of gold. The reports from Granite Hall had excited him; he bought a tract of land (this tract) and a quantity of powder, drills & hammers and the last result is an opportunity to secure some good specimens from a depth of 6 or 8 feet below the surface & quite free from the discolored decomposition at the top.

The feldspar contains grains of quartz while the hornblende looks as if it would yield some points in the subject of decomposition.

Sec. 8 T. 114 R. 37

See preceding plat.
Also plat for 5368 in Book #8.

5375

100 N, 1850 W

Sec. 8, 114, 37

This sample is from the same locality as the preceding one and its general appearance is the same. Weathering has had the same effect upon the hornblende (?) portion as is seen in # 5374. — —

That is there is frequently a dark colored core with a lighter colored green rim around it.

This sample shows the rust of iron oxide which evidently results from a decomposition of pyrites.

Small specks of a pyrite looking like copper pyrite are occasionally visible to the naked eye.

Sec. 21 T. 114 R. 37 N.



 Two unsampled Exposures

North

20

Arch visible



data 5376



Creek

21

 5376
 5377

X

900 ft; 1850 ft.

Sec. 21, 114:37

A highly contorted gneiss of a very micaceous character, - or a hornblende Schist.

The strike - if the strike of a contorted gneiss can be determined - is about east-west.

Dip generally northward at all angles.

Along the eastern exposure are some beautiful faces to illustrate the infinity of veining in a Schistose gneiss.

Spots also show the coarse feldspar which has been seen in many an exposure thro' the valley.

Bands of granitoid are frequent. other bands are micaceous enough to be a Schist.

So while this is a ^(hornblende Schist) micaceous gneiss there is no regularity in the amount of ^(hornblende) mica present in the rock.

Sec. 21 T. 114 R. 37

See preceding plat

5377

900 N; 1850 W.

Sec. 21, 114:37

This was taken from a spot near the preceding on the same exposure.

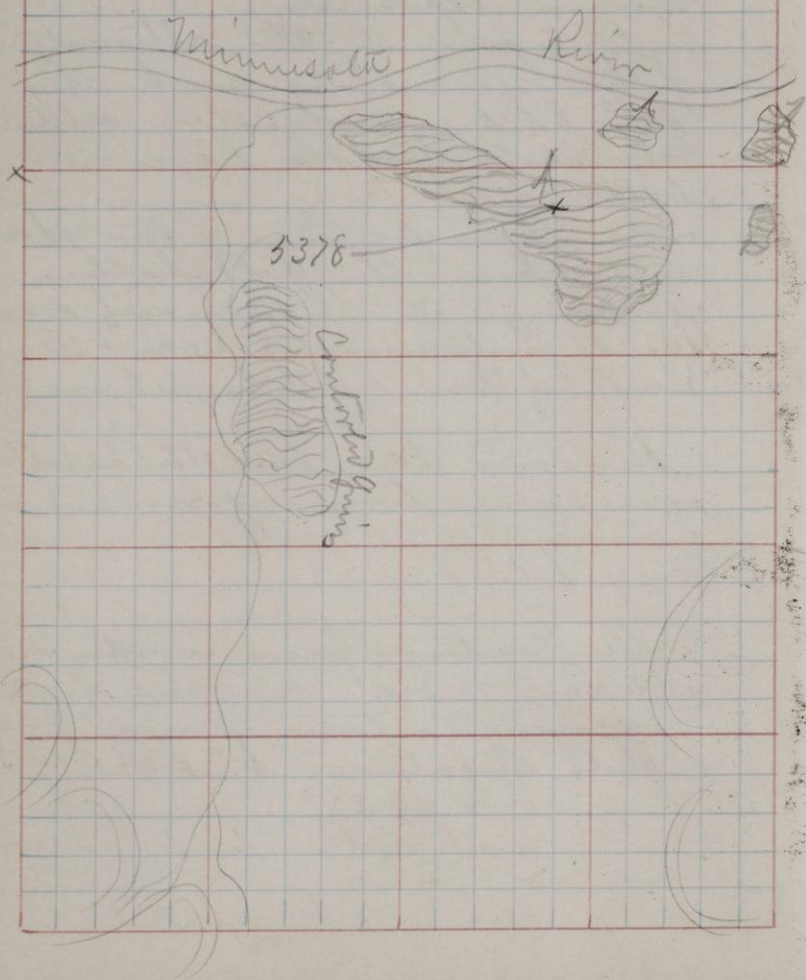
It represents the alternations of the micaceous with the feldspathic portion in quite regularly banded layers or belts.

In those portions of the exposure where the feldspathic predominates there are occasional inclusions of schist — some of them of large size.

Here and there too the mica occurs in large grains or foliae.

The eastern face would be a good one for a view of a vein. Contorted gneiss from a photo negative.

Sec. 26 T. 114 R. 37



5378

4

1900 N 600 W.

Sec. 26 114137.

This sample was taken from the contorted gneiss & abundant in large cliffs in these 3 or 4 sections.

It is of a light color with a greenish tinge, due evidently to a decomposition now or has advanced.

It represents what has been often seen in this modification of the gneiss both in this neighborhood and elsewhere, viz the darker micaceous bands interlaminated with feldspathic rock poor in mica and to a certain extent resembling the vein feldspar seen in some of the granitic veins of the valley, rather than true granitic feldspar.

Strike in our place ~~N E + S W~~ N. W. + S. E.
Dip N E at 25° .

At another place strike swings round to E + W
Dip varies to horizontal.

(9-891.)
2930, 31, 32, 114
Sec. 5, 6 T. 113 R. 36
36

5379

1300 N; 1800 N.

Sec. 32, 114, 36

The rock from Vicksburg ferry for a mile or two towards the S.E. bends very perceptibly in its strike.

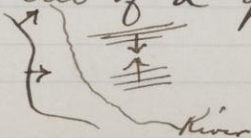
At the ferry the general direction seemed to be N.W. + S.E. with a northeasterly dip of from 25° to 50° .

At the brow of the bluff when the road - passing southerly - leads down to the first farmhouse from the ferry the strike is north and south with a dip of 30° to the East.

This is when 5379 was taken.

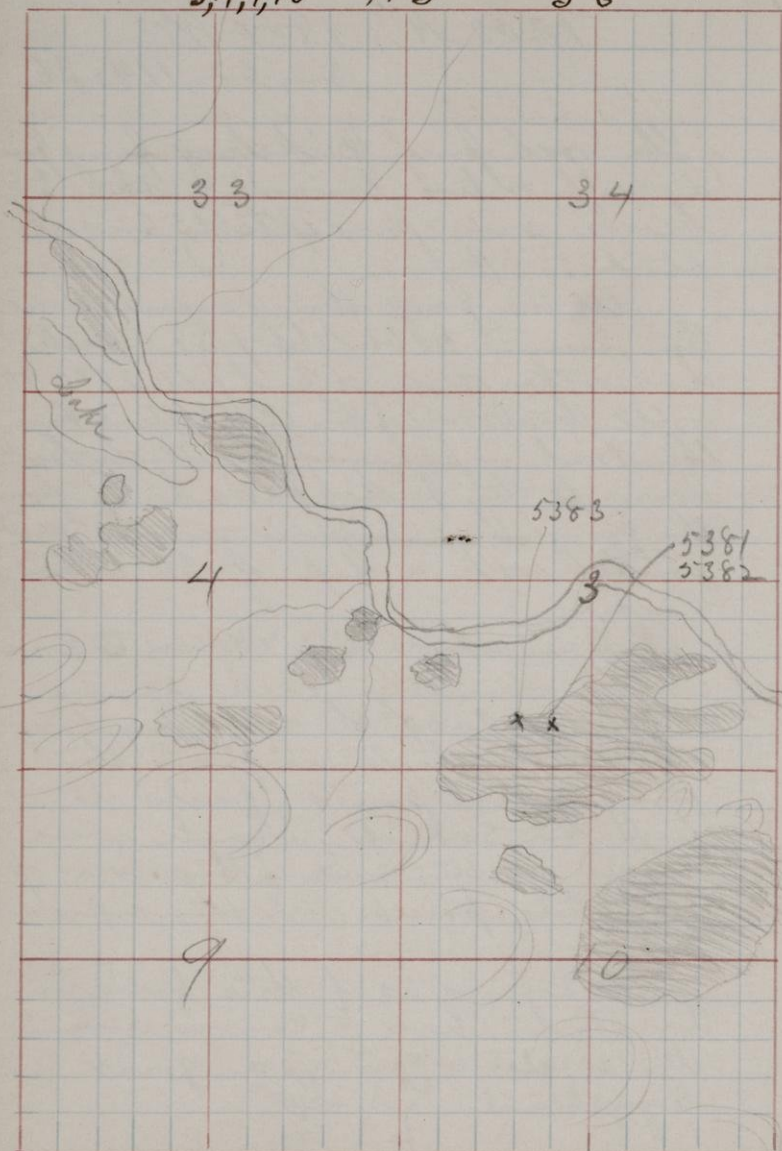
A very careful walking over the whole distance from the ferry to this point failed to find the schists which were passed on the N. side of the river opposite this point on the upward trip.

It seems as if this bend in the strata has curved around the western end of a great Synclinal



33, 34 114
Sec. 34, 9, 10 T. 113

36
R. 36 M.



5380

150 N; 150 W.

See 32 114 36

This sample shows an average
of the gneiss of this section vicinity
embracing several sections
e.g. 3, 24 & 5, 113, 36 and
20, 31 & 32, 114, 36.

As one could be found at
home to tell when these
rocks were so the exact
location was made by guess.
based on the condition of the
fields, location position of the
fences, etc.

Around the spot where 5380
was broken the rock seemed
to strike E 30° S with a dip
varying around 30° towards
the north.

The rock is highly feldspathic
with a small proportion of
weathered mica.

See plat app. #5379

Sec. 3 T. 113 R. 36

See plat opp. 5380

6381

7

150 N; 1200 W.

Sec. 3, 113; 36

At this point the strike varies from about due east & west to northwest and Southeast.

The dip towards the South varies from horizontal to as high as 75°

A high vertical wall faces the west on which can be seen the markings of the locality - the wavy outline of the layers, the attenuating thick & thin bed pattern & Schistose modifications

This member represents a rather finely granular condition of the lighter colored portions of the rock - in which the mica seems somewhat decomposed.

Sec. 3 T. 113 R. 36

See plat opp. 5380

5382

150 ft; 1200 W

Sec. 3, 113:36

This sample is from the same vicinity as 5381; it shows the appearance and condition of the darker colored rock which alternates with the foregoing member.

It occurs usually in alternating bands though frequently in nests of large & small size.

The rock is of medium coarseness for a schist and appears to have but few inclusions of accessory minerals.

The strike & dip are those of the preceding member
i.e. E & W strike
dip ~~so~~ southerly horizontal
to ~~from~~ 75°

Sec. 3

T. 113

R. 36

Sw. plat opp 3380

5383

300 N; 1400 W

Sec 3, 113; 36

This is a layer of considerable thickness of hornblende schist taken from an edge standing up not far from the large ~~massive~~ exposure which is the leading figure of the section.

This like the others had to be located by guess.

Its strike was $E 10^{\circ} S$

Dip 30° Southward.

This exposure is one of a series along the strike named. The rock is a rather fine grained schist very regular in direction and the freshest one of the vicinity.

Sec.

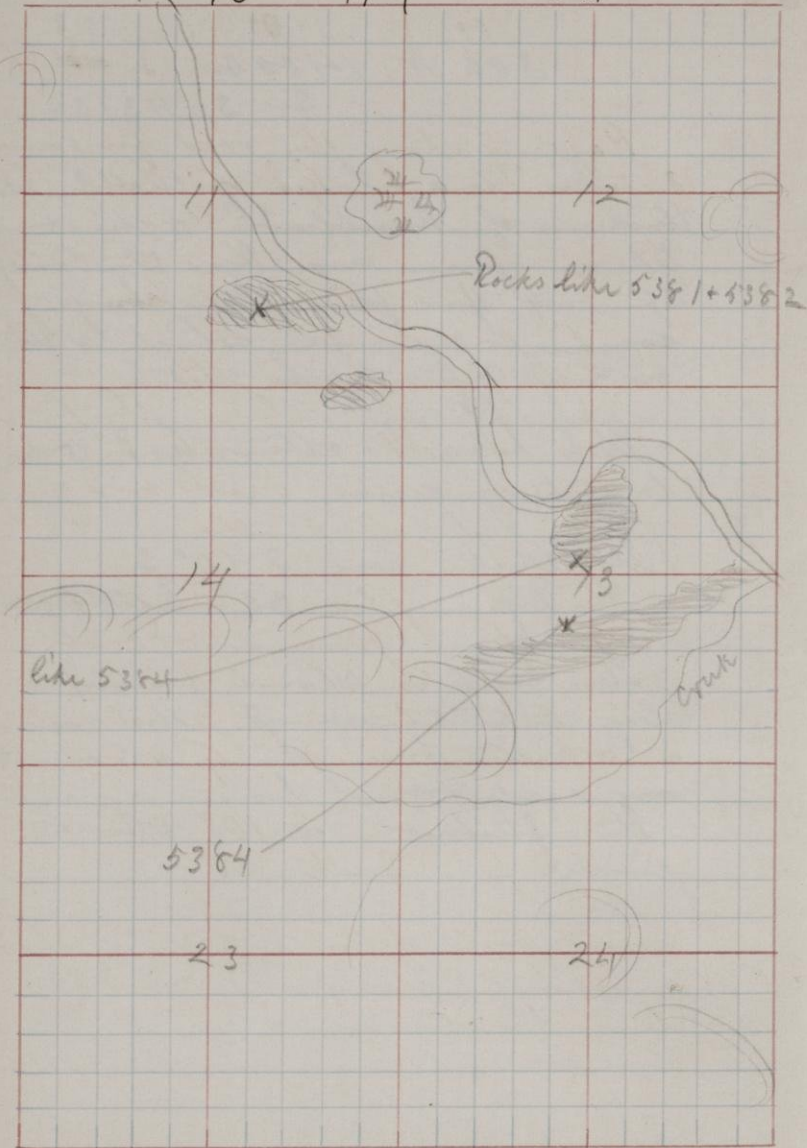
13

T.

113.
##

R.

36



5384

10

700 N 1100 W 113
 Sun, 13, ~~113~~ 36

Passing along the road for some distance towards Redwood Falls the rocks appear now and then in points protruding above the surface. Some of the exposures however are of considerable size while on the other hand there are many places where the presence of rocks can only be conjectured from the dead or dying grass upon the knolls.

This samples a knoll of a rather fine grained reddish quartz. It is clearly stratified. The beds stand up pointing northward and of very regular strike.
 The strike is $E 10^{\circ} N$ (true)
 Dip South 30°

Some parts of the exposure show a more decomposed condition than the others.

Sec. $\frac{29}{32}$
 $\frac{3}{3}$

T. 113

R. 38

20

21

W. Lake of

the

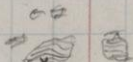
Words

29



Not oriented

28



5385

32

33

5385

1700 N; 150 W

See 32 113; 38

The exact position of this or other exposures could not be determined because no one knew the bounds of the sections & we did not have time to look up the corners.

Then are several exposures within an ^{radius} ~~area~~ of a half mile or less in Secs. 29, 32 & 33

The rock masses are small & do not stand up more than four or five feet above the level of the prairie and most of the area is about at the same level - some indeed only indicated by the dead grass around the central knob.

A small lake - Lake of the Woods - lies a mile or so to the north of this locality.

The prairie in all directions is quite level altho some rolling towards the north.

Many sloughs abound but they are narrow & mostly dry enough to produce a good crop of grass which can easily be secured.

5385

12

Continued

The rock at this series of exposures is a gneiss of varying color texture + mineral composition. The laminae are not straight altho it is not as contorted as in some neighboring localities.

The specimen broken is a rather fine, and somewhat finely laminated of a reddish color and fairly rich in quartz. Other spots show a coarser rock; others inclusions of schist - one or two very large; still others the veined condition when the feldspar is very coarse + quartz + mica are subordinated.

There seemed to be no regularity in the direction of these inclusions and vein-like aggregations.

The strike was $N 80^{\circ} E$ (mag.)
dip varying but evidently towards the N. & N.W.

Glacial Stria^{from} $N. 65^{\circ} W$ (mag.)

Sec. 30 T. 113 R. 39

III
II
III



5386

5387

5386

13

1000 ft; --- W

Sec. 30, 113, 39

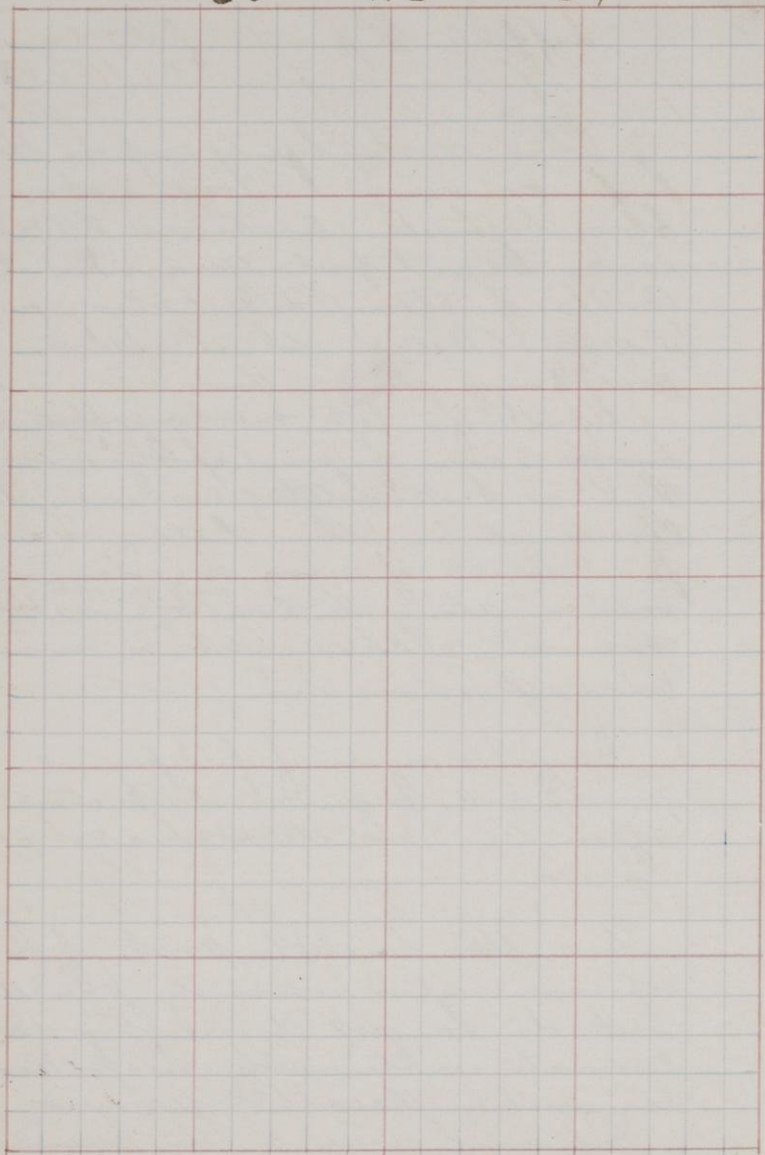
This rock lying upon the
line or very near the
line between sections 29 & 30
is a beautiful granitoid
mass of strong red color &
coarse texture than the
preceding number.

Upon the top & ~~along the~~
~~south side~~ of the exposure
there is but little evidence of
lamination, this little is a
few streaks of more micaceous
rock: along the south ^{and north} side the
gneissic character is much
more pronounced.

Rich in mass of feldspar &
quartz an fragment especially
upon the south & west
sides

Thro' the middle part of the
exposure and nearly parallel
with its longest direction are
several noticeably deep and
smooth glacial grooves
Different ones to the same on

Sec. 30 T. 113 R. 39



5386

Continued

in different parts of its course are from a few inches to two feet or more in depth. They seem to follow the line of some deep seams along which the material was run easily eroded.

The direction of these grooves & of the striae which cover the surface of the exposure altho to some extent obliterated by weathering, is $S 64^{\circ} E$ mag. This direction agrees very closely with that observed at the last locality visited as well as with ~~many~~ others at various points above and below this in the river valley proper.

The country around this exposure is more rolling than in the township to the east but even here the knolls are not high.

Several lakes, some of them beautiful sheets of water are in the neighborhood i.e. within two or three miles of this exposure.

Sec. 30 T. 113 R. 39

See plat opp 5386

5387

15

1000 ft; - - - W.
 Sec 30, 113:39

This sample was taken from the same locality as the preceding number.

It was broken from the south side of the exposure and shows more clearly than the preceding number the definite arrangement of the granules.

Several ^{quartz} masses of quartz have been opened by some one and the crystals ~~to~~ evident-ly broken off + removed.

The veins which occur at this locality have but little uniformity of direction and contain chiefly quartz + feldspar with an occasional folia of mica.

The direction - the strike - of this locality is N. 65° E. May. with a northerly dip of 65°.

Sec. 30 T. 112 R. 38

5388

211

211

211

211

111

211

211

211

211

211

5388

1700 N; 700 W.

Sec. 30, 112:38

This is a contorted gneiss with no certain direction, line of Strike not uniform dip.

The glacial Striae which cover the surface of this exposure run 373° E (mag.)

The rock is generally dark colored rather than light in color, yet we see on this surface

- 1 a mediumly dark colored rock, banded;
- 2 a lighter colored rock also banded, also
- 3 an inclusion of Schist.

The exposure is 20 paces long & $1\frac{1}{2}$ do wide with a generally E & W direction of the bands.

Sec. 6 T. III R. 38

5389

5389

17

800 N ; 400 W (estimated)

N $82\frac{1}{4}$ E $32\frac{1}{4}$ S. 6, 111:38

This is also a highly contorted
quartz.

The general direction of the
~~the~~ laminae is N 76° E Mag.
Glacial Striae cover the surface
and have the direction N 67° W
(Mag.)

Grains + masses of feldspar
in material were seen running
thru the rock in the general
direction of the laminae, ~~and~~

This rock seems to be strikingly
ly similar to that at Montpelier
or Beaver Falls.

This exposure is ^{slightly} below the
surface of the ground:— being
on a slope of a moraine
mass of gravel + so near
the surface that grass could
not grow + form a soil the
rains have washed this spot
only a few paces across, en-
tirely bare + it is a singularly
fresh + bright bit of rock.

Sec. 12 T. 111 R. 38

- Sec. 1

Sec. 111 R. 38
Bridges Place

5390

1100 N; 200 W.
 Sec. 12, 111; 38

Reaching Bundy's place ^(SW 1/4 Sec. 6, 111; 37) and
 passing over the prairie towards
 the South for 24' N mag. for
 1650 paces over a running
 ridge extending nearly East & West
 and beyond a small lake in
 a slough this mass of rock is
 reached. It is 75' paces
 N.E. + S.W. + 50 paces N.W. + S.E.
 Its height is not more than
 10 or 15 feet above the level of the
 slough which lies to the north of it.

The rock is a contorted gneiss
 quite firm of syenitic darkness
 and marked lamination in
 some of its portions.

General direction of strike N 70° E mag.
 Dip 30°-40° towards S.E.

Glacial Striae upon this ex-
 posure are found to run about
 S 75° E (mag.)

Sec. 12 T. 111 R. 38

See preceding plat

5391

19

1100 N; 200 W.

See 12, III:38

This is from the same locality
as 5390

It shows a very white variety
occurring upon the top of the
ledge and apparently inter-
laminated with 5390 but not
sharply separated from it.

Its composition chiefly of
feldspar & quartz can be
quite distinctly seen in the hand
specimens.

5392

1100 N; 200 W

See, 12, III:38

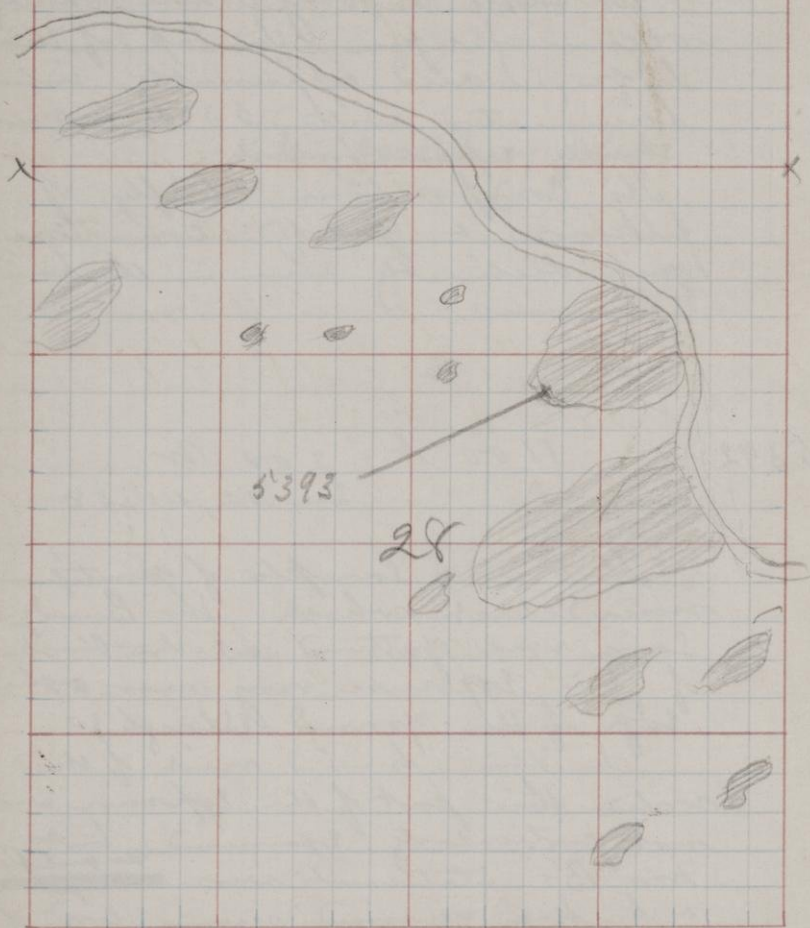
This is a sample of garnetiferous
mica schist which Mr Bundy
says was obtained at the back
of the exposure very near to the
edge of the ground (slough)

In the hurried visit of the
writer this part of the exposure was
not particularly examined, but
Mr B's statements were ~~unqualified~~ ^{unqualified}
& he has examined many cords of
stone at the spot.

Sec.

T.

R.



5393

70

1400 N; 650 W.

Sec. 28, 113:35

Here the contorted gneiss of many shades from dark + schistose to light + feldspathic is seen.

It is strikingly similar to that at Morton

The strike is NE + SW at varying angles
The dip is to the Southeast

In many places the rocks badly shattered; the jointing almost completely hides the strike and bedding of the rock

No dikes were observed on any of the exposures of this neighborhood

The freshness of this rock is very noticeable as compared with the decomposed + kaolinized material along the granites of Sec 29 this township

Sec. 31 T. 113 R. 35

See plat pp. 5406

5394

5395

Three numbers were gathered
in the city limits of Redwood
Falls

Their location was not
more definitely given by Mr
Manchester who broke them
than that they were taken from
the east bluff or rocky wall
of the river just below the
falls

These seem to be the ordi-
nary products of decomposition
- the former of the ordinary
dark ^{to light} colored, irregularly
textured and the latter
of the latter of the uniformly
textured dark colored gneiss.

Location cannot be far from 500 ft.
1800 ft. Sec. 31, 113; 35' N.

Sec. 30 T. 112 R. 38


 5396

21

21

11

21

21

21

21

21

21

21

21

21

21

21

5396

22

1700 N; 700 W

This number is selected as an associate with 5388 as the representative rock in this section named or at least of this exposure

Quite possibly the most noticeable difference our two viz the difference in color is a result of the weathering to which the rock has been exposed taken in connection with their slight differences in texture and mineral composition.

The two numbers 5388 + 5396 are not sharply defined, but they are interlaminated with but little regularity of thickness of bands or precise character of the ingredients.

Sec.

30

T.

FF2

R.

38

See preceding plat

5397

1700 N 700 W

See 30, 112, 38

This number represents an inclusion in number 5388

The inclusions are not of large extent, this one was from the South Side of the exposure

The dark portion seems to be composed of both mica and hornblende

There was no regularity of position in the two or three small inclusions of this character observed on this small exposure of only a few pieces in area.

Sec. 15 T. 112 R. 34,

Minnesota River

5398

5399

Lake

Unsampled

5398

24

1900 N; 600 W.

Sec. 15; 112; 34

This is a highly decomposed reddish gneiss,

It crumbles to such a degree that it is difficult to secure good hand specimens or those that will show fairly how the rock looks in the mass.

It weathers in large concentric granitoid masses which are much fresher within their masses.

This concentric weathering has obscured the lamination to such an extent that the strike and dip cannot be stated with a feeling of certainty without further observation. It can however be seen that this spot is a rounded knob some 15' or ²⁰ more feet high.

Sec. 15 T. 112 R. 34.

See preceding plat.

1850 N; 600 W

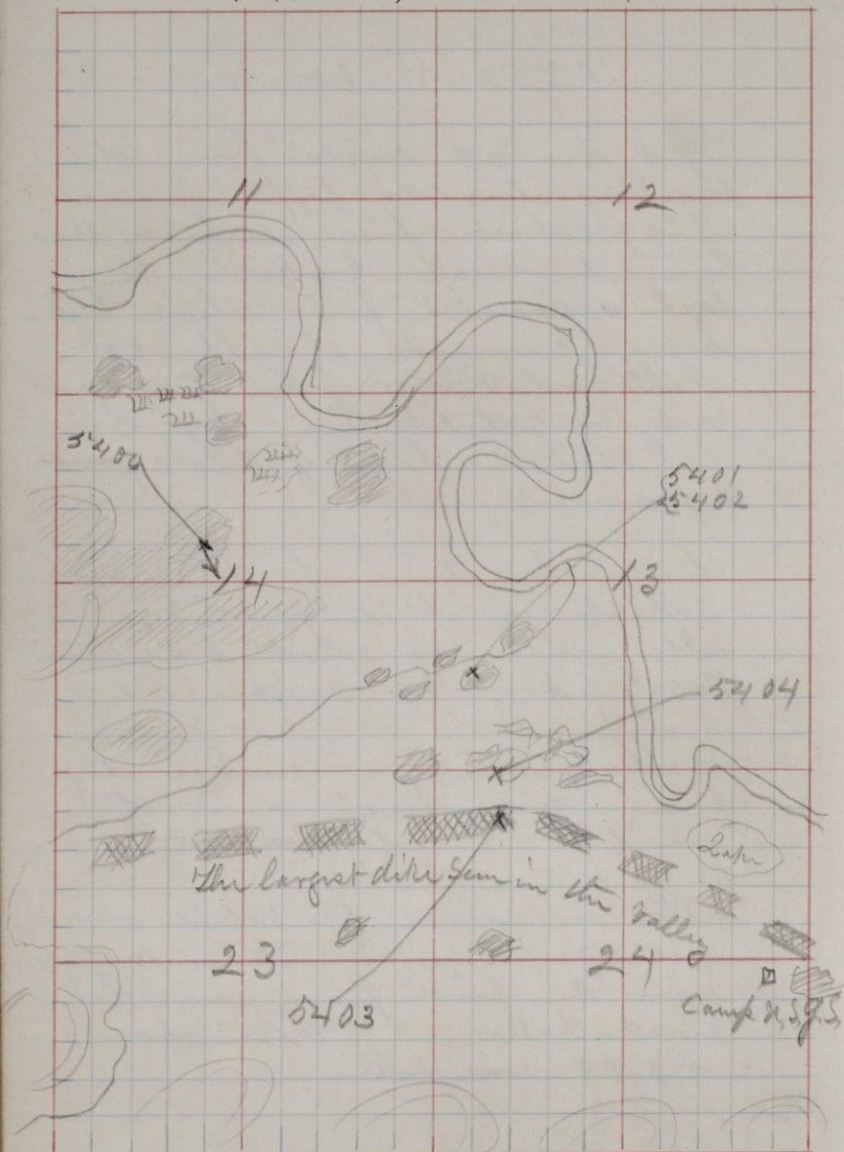
Not over 50 paces from the preceding lies a low mass of Schist from which this number was broken. It is low separated from that higher by a covered stretch so the relations of the two could only be established by the strike & dip of this small exposure.

The direction of this ~~rock~~ Schist is N W and S E, Its width is not less than 25 feet. Dip southerly.

This Schist is mediumly fine, quite fresh and of uniform color & texture.

This occurrence of a Schist within contorted gneiss is similar to that near the first ferry above Redwood Falls. ~~Number~~
5399 was taken

Sec. 14 T. 112 R. 34



57100

1200 N; 1200 W.

Sec. 14, 112; 34

In the central part of Sec 14, there occurs an extensive belt of coarse hornblende rock.

It seems considerably contorted upon the surface, but it has a general northeast + southwest direction with a southeasterly dip of 80° or more, tho' this dip was not ~~common~~ universally apparent on the exposure.

The general direction mentioned above for the locality, when this sample was broken holds good for the whole section so far as it was observed.

Inclusions of a feldspathic rock were noticed in a few places — they are not frequent like the dark inclusions in lighter gneissic rocks in other parts of the valley. e.g. in the neighboring Sec. 15.

Sec. 13 T. 112 R. 34

See plat app. 52400

32401

27

600 N; 1950 W.

Sec. 13, 112:34

The gneiss of Section 13 at least that part of the section lying next the river on its Southwest side is fairly represented by this ~~Section~~ sample.

It is a gneiss somewhat weathered showing pink or flesh colored feldspar to a large percent and bright black shining scales of biotite.

The general direction is N.E. & S.W.

The dip could not with certainty be determined; at places it appeared to be perpendicular.

Sec. 13 T. 112 R. 34,

See plat app 52400

600 N; 1950 W.

See 13, 112: 34/.

This specimen from the same locality as the preceding shows a vein stuff enclosed in the veins of several spots near where the preceding was broken off.

There is much diversity in the direction and width of these veins but all of them are quite similar and consist of the constituents of this sample, feldspar + quartz.

The feldspar occurs in large + very complete crystals including the quartz. The largest crystal seen was an orthoclase about $3\frac{1}{2}$ inches across; others equally perfect but smaller were seen.

Sec. 24 T. 112 R. 34.

See plat app. 5400

1800 N; 1650 W

Sec. 24, 112:34

A dike nearly 60 paces wide stretches ~~along~~ the several sections here standing up in huge windows along the valley.

The spot where this number was broken is near a slight bend change in the course of the dike. The course ^{must} ~~was~~ was $NE\ 50^{\circ}\ E$ (true) ^{East} ~~and~~ it was $E\ 20^{\circ}\ S$ true.

This dike is the largest one yet seen in the valley and to my recollection the widest one ever seen in the State. Its texture is not especially coarse; nor were there any unusual mineral constituents observed.

A well pronounced slickensides was seen with green faces.

Sec. 24 T. 112 R. 34

See plot opp 57100

5404

2000 N 1650 W

See 24 112 34

This sample was taken some 200 paces north of the dike sampled by #5403

It seems to be a more massive modification of the gneiss of this part of the valley.

The trend of the rock at this spot could not be well be determined owing to the broken condition of the mass, especially at the surface.

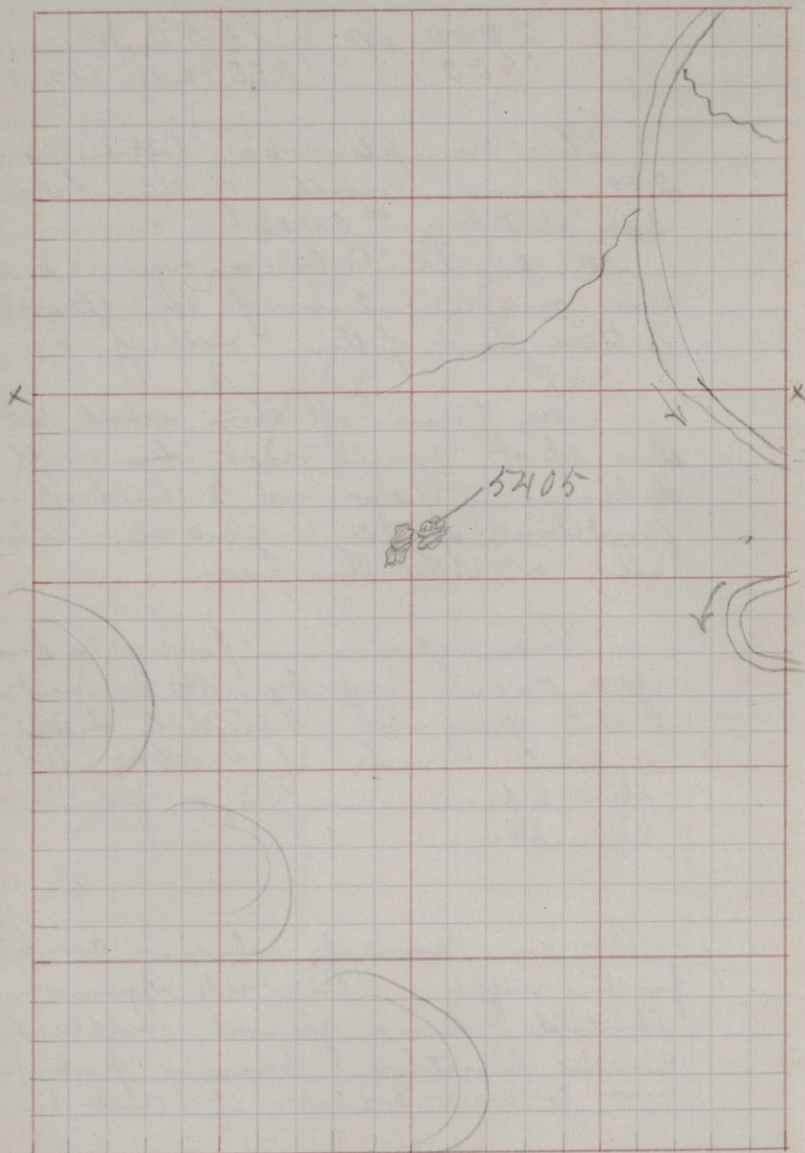
This exposure forms a knoll 200 paces long by 150 or wide of the gray + slightly dirty colored rock of which this specimen is a fair example.

At Rio Manzanales where we camped for the night the rock apparently identical has a general north & south direction bearing perhaps 100 to west & east of that line

Sec.

T.

R.



5705

31

Sept. 1, '84

1600 N; 1000 W

See 33, 112:33

This stands up in two round
knolls running SW and NE
about 250' from an east
west line

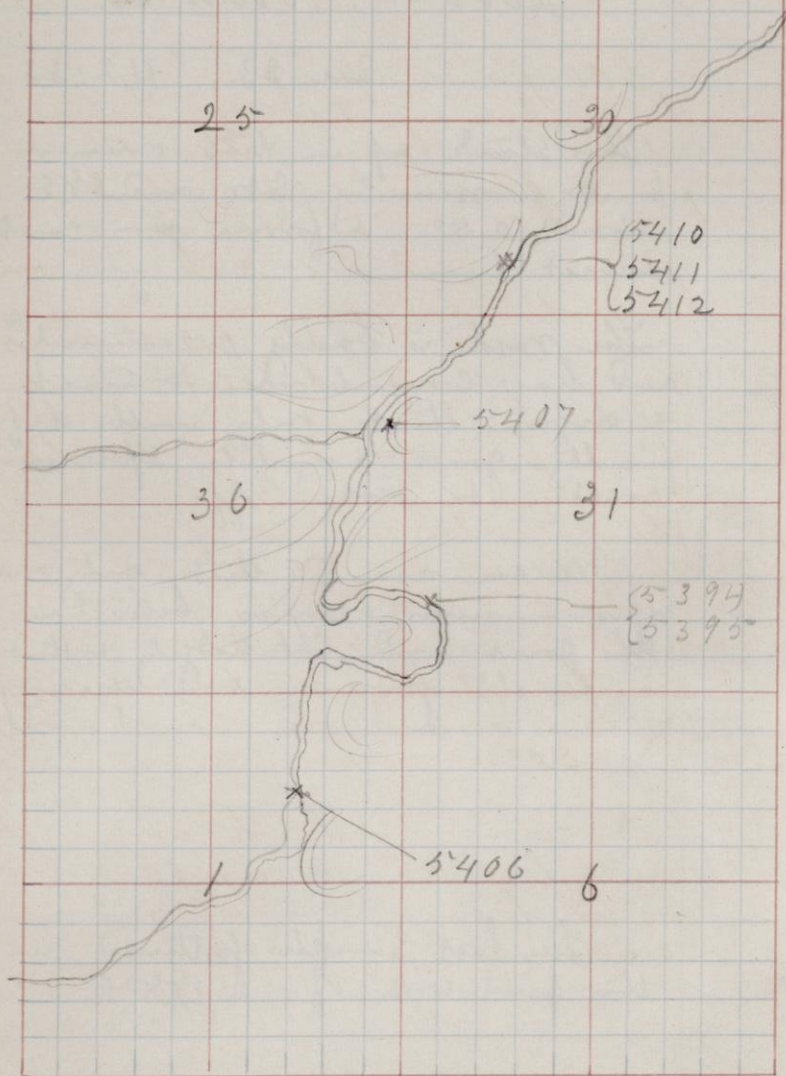
The rock is badly weathered
and has crumbled to such
a degree that only with dif-
ficulty good sized specimens
could be broken off.

We are assured that only one
exposure now occurs between
this point and Lk Ridgely & that
is an old government quarry.

The last sample obtained in
the field work of 1882.

25+36⁹⁻⁸⁹¹ Secs. { 30+31 T. {

R. {



52406

1500 N; 500 W

Su. 1, 112; 36

500 paces up the river from the bridge in Redwood Falls village a dam gutters the water for a flowing mill. Under this dam a decomposed gneissic rock lies exposed in nearly across the river.

The rock is full of seams extending in all directions.

But besides these seams which are a poor guide to the determination of any direction or dip there is a general direction to the feldspar and the dark colored constituents. These minerals give a northerly and southwesterly strike with a dip towards the southeast of 50° or more.

The color is reddish or brownish with here and there a spot of a lighter hue and more kaolinized material.

Sec. 36 T. 113 R. 36

See preceding plat

5407

1400 N; 100 W

See 36

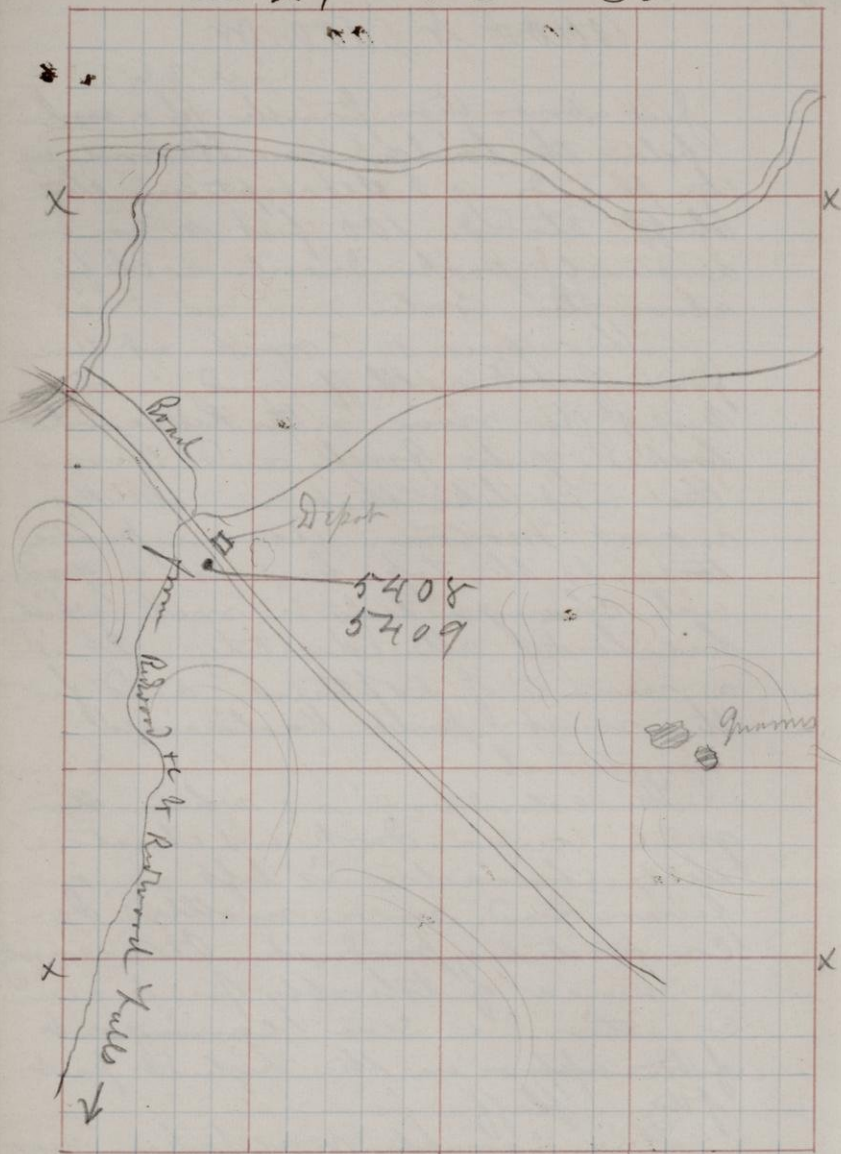
Just about three fourths of a mile below the bridge mentioned in the preceding description the bluff stands 100 feet or so in a nearly perpendicular cliff above the water.

The gneissic rock at the foot of this cliff and in the bed of the river - the Redwood-looks quite fresh and firm tho' not like that in the Ry cut at Morton. As one passes towards the top he sees a gradual change into a rock which has lost all identity. It is a mass of softened and for the most part kaolinized material.

The color varies; when the gneiss was dark + schistose that character is left in a finer and more mottled decomposition product. Occasionally a mass of tolerably fresh vein matter is seen coming out of the upper in the highest part of the bluff.

This sample was taken near the top

Sec. 29 T. 113 R. 35



1000 N; 1600 W

See 29 113.35'

At the new station Redwood on the Minneapolis & St. Louis railway just below and out of the gorge thro which the Redwood river passes from the falls to the railroad bridge the railway Company has sunk a well for a water supply for the depot masters family. The well is 130-150 feet deep and passes thro rock for ~~all~~ the ~~very~~ whole depth.

Three upper portions were very soft and so decomposed that the material could be removed with scarcely the need of a pick or crow-bar but passing down the rock towards the bottom approached the texture and hardness of the sample given this number.

The depth of this piece was about 12 or 13 feet. It represents what must have once been the Dark Schistose gneiss.

Sec. 29 T. 113 R. 35ⁿ

See preceding plat

1000 ft; 1600 W.

See 29

From the same well as
the preceding number

The depth was about
the same as the preceding

The sample shows the coarser
and more feldspathic parts of
the rock similar to what
was found last summer in
the quarries only a short
distance from this spot

It is believed this represents
what was a coarse feldspathic
mineral stuff while the rock was
in its fresh, unchanged
condition.

This and the preceding number
were taken to show ~~that~~ that
the decomposition has
been considerable some
under what was once the
bed of the Minnesota river

It seems evident that
change has been going on
since as well as before
the change in the river's course.

Continued.

There are two or three decomposition products in these last four (4) samples.

One is an oxide of iron seen on the pieces represented by 5409. In places flakes or ^{flattened} lumps appear to adhere to the feldspar; elsewhere it seems to be in finer particles and in spherical or ~~globular~~ irregular lumps instead of in flakes.

Another is the poorly white flakes seen in the samples of decomposed gneiss at the bluff below the falls, # 5407. It is a foliated mineral suggesting talc and is so distributed thro' the soft rock as to suggest its origin in the breaking up of the original constituents of the rock.

A third is the dull light green material scattered thro' the reddish rock found at the dam above the bridge # 5406. It is evidently a mixture of two or three minerals.

30 113 35th N.
Sec. ~~36~~ T. ~~113~~ R. ~~36~~ W.

See plat opp 5406

300 ft; 1500 ft

see 30

This is the common rock in which the ochreous ~~the~~ material, the Paint occurs at Redwood Falls.

Altho taken from the base of a bluff 80 to 100 ft high it shows a condition far from fresh and undecomposed.

On the other hand it is not so soft and utterly without character as is the rock at some localities in the valley within a few miles of this point.

It is suspected that this is a modification of the original rock showing a less tendency to decompose than the section portions of the quartz.

Sec. 30 T. 113 R. 35 N

See plat opp. 52106

52/11

300 ft; 1500 m.

Aug 30

Associated with the foregoing number is a green decomposition product.

It is soft & greasy to the feel and of considerable uniformity of texture.

But there are here & there in the very finest & clearest specimens ~~a~~ bits or granules of quartz & quite likely other minerals.

Also are noticed streaks of a lighter color, gray or drab which are very fine and quite near together in some portions.

Sec. 30 T. 113 R. 35

See plat pp 5406

300 N, 1500 W

Sec. 30.

The material which some years ago was quarried here as red paint.

It was formerly used by the Indians ~~others~~ ^{there} the first known. Ten or twelve years ago several houses in Redwood Hall were painted with this material and the coat has lasted unusually well. Efforts have been made at several times to develop an industry here: those before the railroad was built failed for evident reasons: those since have not been prosecuted for want of capital & energy & possibly because of an unevenness in the quality of the material dug out and ground for the market.

Three samples show the character of the ochreous material — and they seem to be even above the average of that near the surface at least.

