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Marquette region, Michigan: [specimens] 20464-20642. No. 135 1891

Bayley, William Shirley, 1861-1943

[s.l.]: [s.n.], 1891

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U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

135
Marquette Region.
Michigan,
W. S. Bayley.

20464-20642

LAKE SUPERIOR DIVISION.

INSTRUCTIONS.

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

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

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

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

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

#135

In present instance have used instead of Hachures contour lines without definite contour interval. In this way have avoided covering page with black lines. As for extent of ledges outside of the quartzite ridge the extent of ledges is noted. The quartzite ridge is continuous ledge along the traverses made.

50 319-338
not catalogued.

swamp

swamp.

z

Swamp

swamp

SK Cor
M. W. Cor

Bel 33
Llu 41

15.30
#0464
sandy sl.

swamp

Swamp

Swamp.

July 11/92

Ran south on line 125 E of
W. line Sec 33 through swamps
while near south section line.

No rocks were seen until
reached south side of top of hill
where was discovered a small
ledge of sandy shale at

20464

285 E. 46 N of S.W. Cor. Sec 33

The bands are obscure but proba-
bly they dip north at an angle
varying between 25°-30°.

The next specimen was taken
from a heavy ledge on the south
side of a hill at

600 S. 125 E of N.W. Cor. Sec 4. T¹
47. R. 26.

The rock whose layers of arenace-
ous shale dip about 30° to the north
forms an E-W Escarpment on
the south side of the hill.

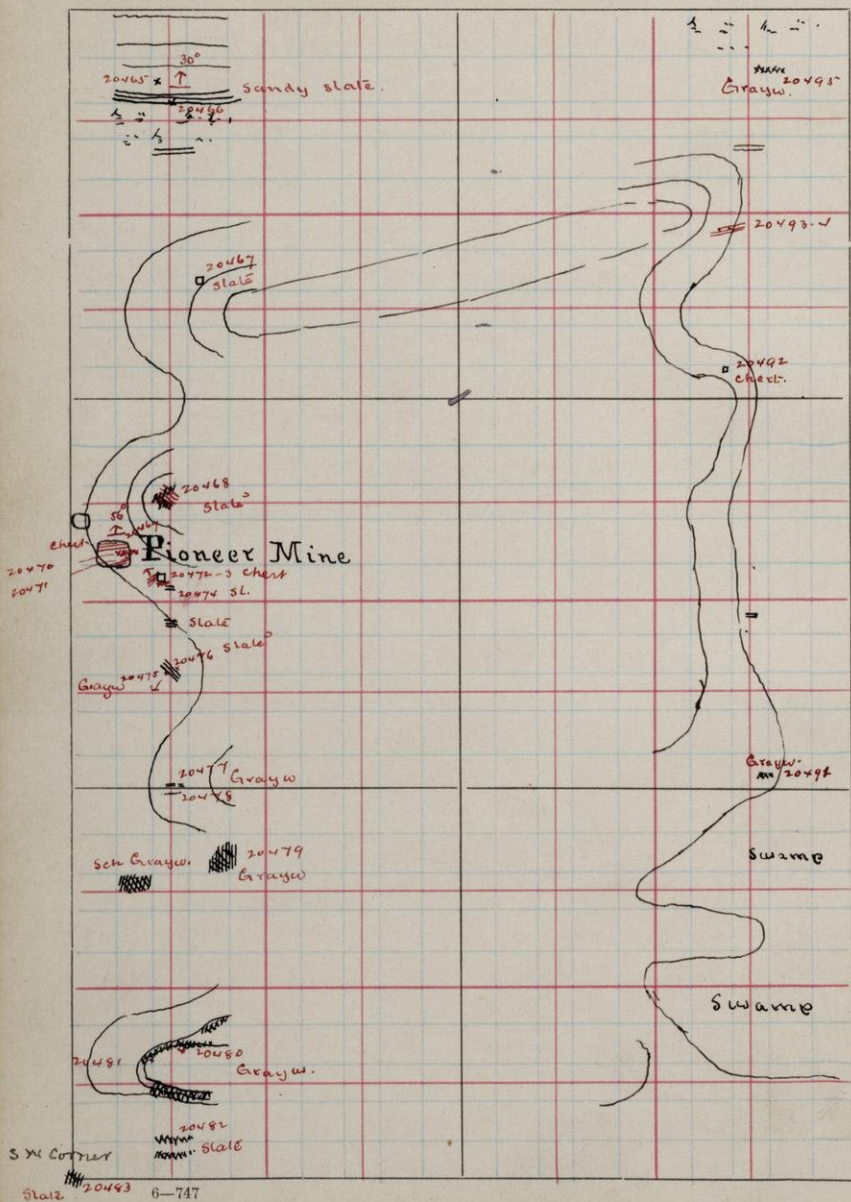
20465

570 S. 105 E of N.W. Cor. Sec 4 was
taken from top of hill and

20466

590 S. 125 E, from base of Escarp-
ment.

After crossing the road south of



2

this hill, began ascending another in which are a number of test pits^o in gravel.

20467 At 845 S. 170 E, however, is one whose bottom is in slate^o, whose dip and strike were of course not obtainable

20468 At 1125 S. 125 E of U.W. cor Sec 4.. is a rugged knob of slate^o striking 30° N of W

At 1165 S. 85 E is the East End of the Pioneer Mine pit. In this pit the rocks are the old iron cherts dipping 56° N and striking 5° S of W.

20469 On the north side of the pit the cherts are well banded. Some of them, well exposed in East end

20470 of pit is a dyke of chlorite^o forming a ^{20 ft} band dipping N. Cherts and iron ore form the south wall of pit.

20471 one, from under side of the chlorite dyke.

A little S and E of the main pit is a shaft which could not steady carefully. On its west side

20472 is a banded chert, dipping high to the NW and striking 20° S of W.

20473 The soil was consist^d of paint rock

20474 At 1215 S. 125 E and at 1285 S. 125 E are small ledges of black shale.

At 1336 S. 125 E in an old railroad cut are exposed in a single ledge two rocks. That on top is a banded shale dipping south at a low angle on the whole, but more or less contorted. Under this is a micaceous graywacke

20475 Graywacke

20476 Banded slate on top of graywacke.

At 1495 S are small ledges of schistose and massive graywacke on west side of a gradual slope, whose dip and strike were not obtainable

20477 Schistose graywacke.

20478 massive graywacke.

20479 A very large exposure of massive graywacke is at 1580 S. 145 E of N.W. Cor. Sec. 4 and at 1600 S. 115 E, one of the schistose phase.

Another is at 1800 S. 160 E of N.W. Cor. Sec. 4 on the north west side of a hill. The same rock occurs on top of hill forming a cliff looking toward the north - at

20480 1820 S. 185 E of N.W. Cor. Sec. 4

20481 1845 S. 105 " " " "

Some of these black slates are found at

20482 950 and 975 S. 125 E. They are both in small ledges showing no determinable strike nor dip.

At 2000 S went west 125 paces to find S.W. cor of Sec. but did not succeed. Where corner ought to be, and where there are

20483 Some cuttings indicating its presence, there is a large flat ledge of black slate, the strike and dip of whose layers were not obtained.

20484 At 390 S. 125 E of NW cor Sec 9 is a small ledge of sandstone on the south side of the top of hill.

20485 A very large ledge of graywack and quartzite interstratified is at 750 S. of NW cor Sec 9. Its strike is 30° N of W and dip 75° N.

20486 At 115 S. 65 E of W 1/4 part Sec 9 is an old pit on south side of hill sloping W of N.W. R.R. tracks. On the dump heap is graywacke or graywacke slate.

20487 The rock is well exposed in a small knob at 215 S. 10-30 E of

U.S. Cor Sec 9. Here the gray-
wacke is cut into ³, and its
bands are interstratified with
those of quartzite as rich as
so in thickness.

At 1250 S. ^{of Corner} west East 450 paces
to 875 E of west line of section,
finding massive gray wacke at
125-200 E and again at
500 E, in small ledge.

20488

20489

At 1200 N. 1125 W of S E cor Sec 9,
forming the south edge of a small
ledge is again a ledge of mas-
sive gray wacke showing spheri-
cal weathering.

20490

At 1800 N. 1125 W of S E cor. Sec 9
on the south side of a little
rise at the east end of the main
hill is a flat ledge of sandy
gray wacke whose ochreous
strikes E.W.

20491

Massive gray wacke at 520 N.
1100 W of S E cor Sec 4.

20492 Chest from old pit 1050 N. 1100
W of SE cor Sec 4.

20493 At 1226 N. 1125 W of SE cor Sec
4. is a flat ledge of schistose
graywacke with bands of very

20494 massive phase 1 1/2 in wide on
SE side of hill. Strike 10° N of E.
Dip almost vertical.

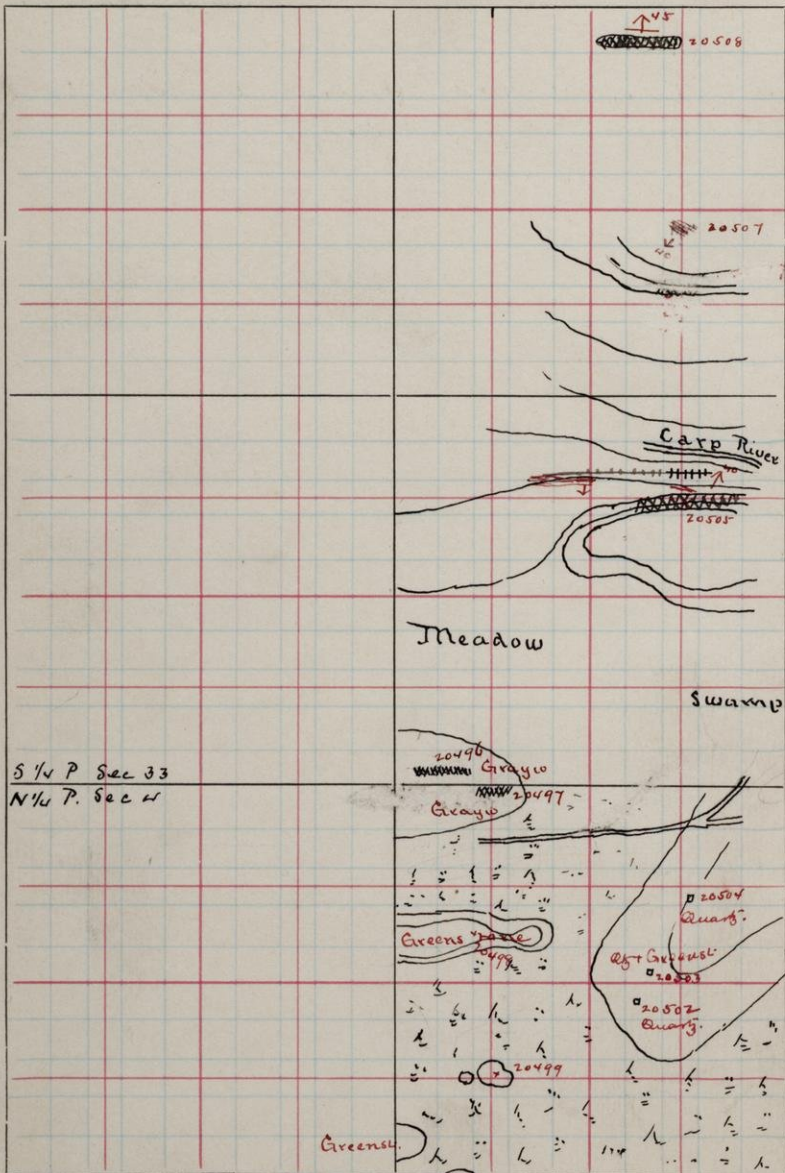
20495 Schistose graywacke 1420 N. 1155
W. of SE cor Sec 4.

No other rocks between this
point and Osooda RR near
ETW 1/4 line of Sec. 33. H8-26

S. 33
4

T. 48
47

26
R. 26



S 1/4 P. Sec 33
N 1/4 P. Sec 4

July 12/92

Ran south from point 625 E
of $\frac{1}{4}$ post Sec 4.

20496 At 510 E. 15 N of this $\frac{1}{4}$ post are
ledges of schistose graywacke ris-
ing from a meadow.

20497 At 30 S. 625 E. on south side of
hill are other small ledges of
same rock in which the dip
seems to be high to the north. The
rocks are cut by veins of quartz
parallel to the bedding.

20498 A massive greenstone hill rises
at 160 - 216 S. 625 E of this $\frac{1}{4}$ post.
The hill is narrow. It runs east
some 100 paces and west 150 or
more.

Specimens from top of hill 180 S. 600
E of $\frac{1}{4}$ post.

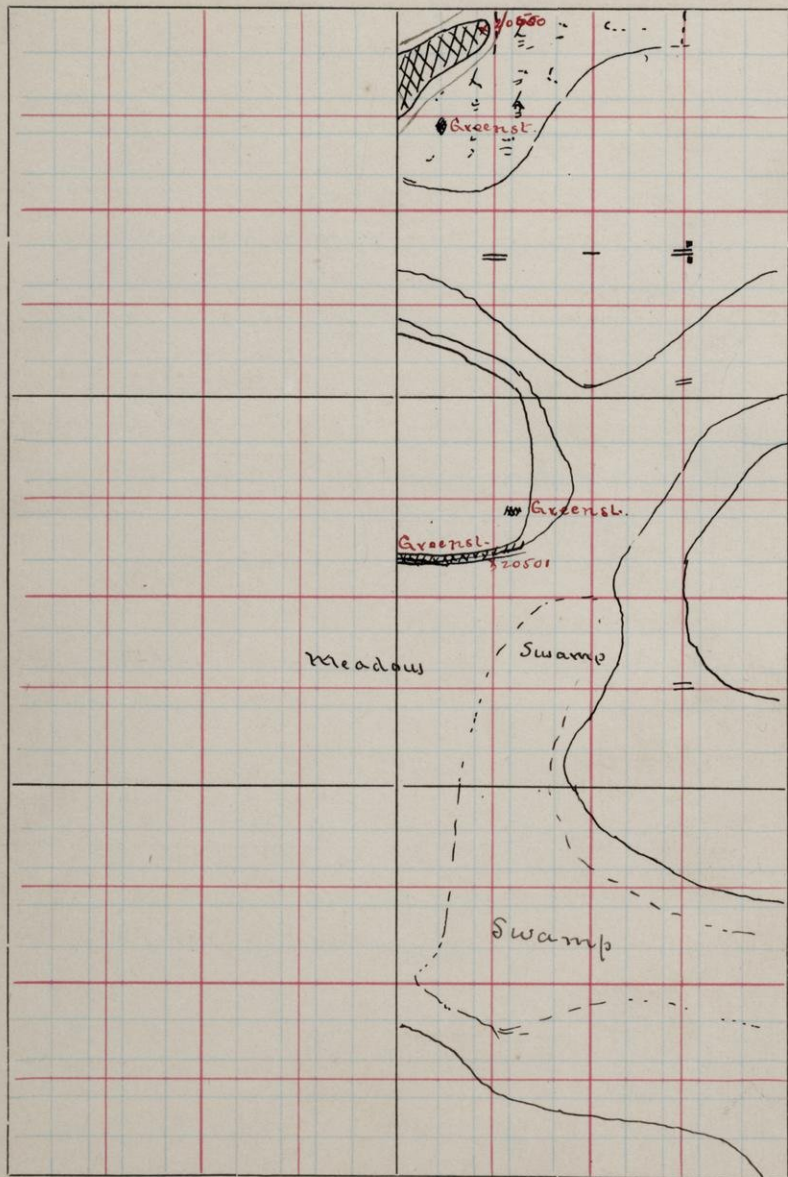
South of this are several other
knobs of the same rock, all of
which are located on the map. Three
specimens are at

20499 392 S. 605 E of $\frac{1}{4}$ post Sec 4.

S. 4

T. 47

R. 26



20500 550 S. 565 E of 2 1/4 post Sec. 4.

After crossing the E.W. 1/4 line of the section begin to ascend a hill whose north side is covered with boulders. In its south side at 1200 S. 625 E of 2 1/4 post

20501 is a cliff of greenstone, that extends as a cliff some distance west. at S. line Sec 4, west East 250 paces and north -

20502 Quartzite and }
20503 greenstone } from small pits at 1735 - 1755 N. and 783 - 850 E of S. 1/4 post Sec 4, in plain in top of hill.

20502 from southernmost pit 1735 N. 783 E.

20503 from 1755 N. 850 E.

20504 Another pit at 1810 N. 900 E of S. 1/4 post Sec 4 has in its dump heap very gray quartzite or gray wacke

No other rocks were seen until reached top of hill at 425 N. 125 W of S.E. cor. Sec 33. Here, in its

20505 North side are schistose scales whose strike is 10° N of W and dips 40° N. The schistosity dips 80° N.

20506 The same rocks are exposed in the railroad cut at the base of the hill, at about 1225 W.

The cut is 300 ft long. The rocks are nearly horizontal at its west end, and gradually dipping there and more strongly till East end is reached, which end is located as above.

At 1625 at foot of large hill on north side of the river (Carp) are no rocks, but at its top

20507 1715-1754 N. 125 W of S.E. cor Sec 33 are exposed large layers of scale, dipping about 40° S and striking 20° N of W.

20508 Slaty rock dipping 45° N. Striking about E of W. From same base (kew) in swamp at 1975 N. 125 W of S.E. cor Sec 33.

July 13/92

From N $\frac{1}{4}$ part Sec 33 ran 500 E,
150 S. 200 W. 350 S. 200 E. 500 S. 100
W. 100 S. 100 W. 100 S. 450 E, 200 N
and 375 E to W $\frac{1}{4}$ part Sec 34,
thus finding this $\frac{1}{4}$ part 125 paces
further west than it should have
been. The original bearings were
found, so that if field notes
show the $\frac{1}{4}$ part to be in correct
position the locations given are
correct, for the rock ledges were
referred to it.

The N $\frac{1}{4}$ part Sec 33 is an iron
stake that may or may not be
in its correct position.

20509 No rocks were seen after made
first turn south until the point
100 S 800 W of E $\frac{1}{4}$ part Sec 33 was
reached. At this place, on the
top of the only hill in sight is
a ledge of schistose graywacke
trending 30° N of W and apparently
dipping high to the south.

15 paces further south the rock

20510 changes to quartzite[?] and at 156 S. into massive graywacke. To the west of 20510 lies the main mass of the hill where the rock is of the same nature, viz: graywacke schist, quartzite[?] and massive graywacke interstratified, all dipping generally to the south, but always more or less easterly.

20511 At 180 S. 700 W of E 1/4 post Sec 33. is one of a number of exposures on the south side of this hill. It consists of schistose graywacke striking 10° N of W.

20512 At 160 S. 325 W. on the NW edge of another hill is a banded red and black shale dipping south at about 40°

From the E 1/4 post Sec 33 (W 1/4 post Sec 34) ran 250 E., 500 S., 600 E., 500 N., 250 E., 500 S., 200 E., 500 S., 400 E., 500 N. etc., find rocks only where indicated

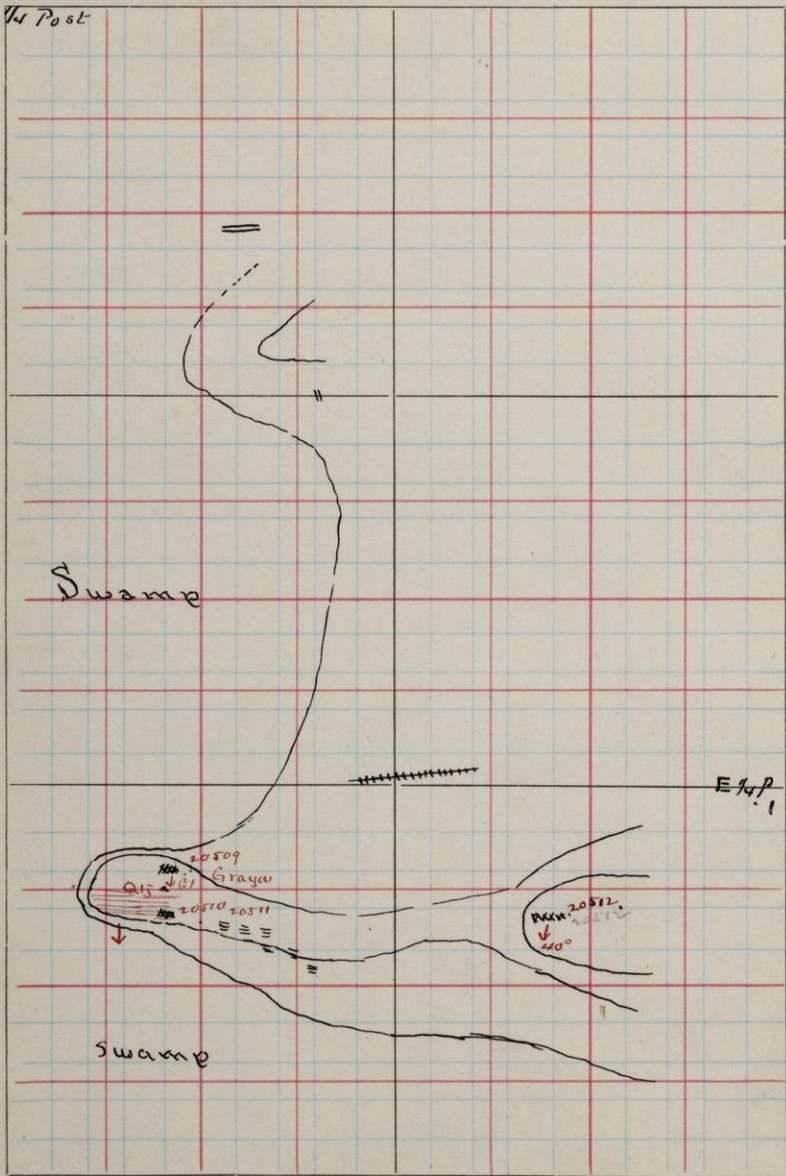
S. 33

T.

R.

NE Cor

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



20513 340 S. 280 E of W 1/4 post Sec 34.
 Slates dipping 40° - 45° S. Striking
 50° N of E.

On south side of hill the rail-
 road cuts it. Exposing again the

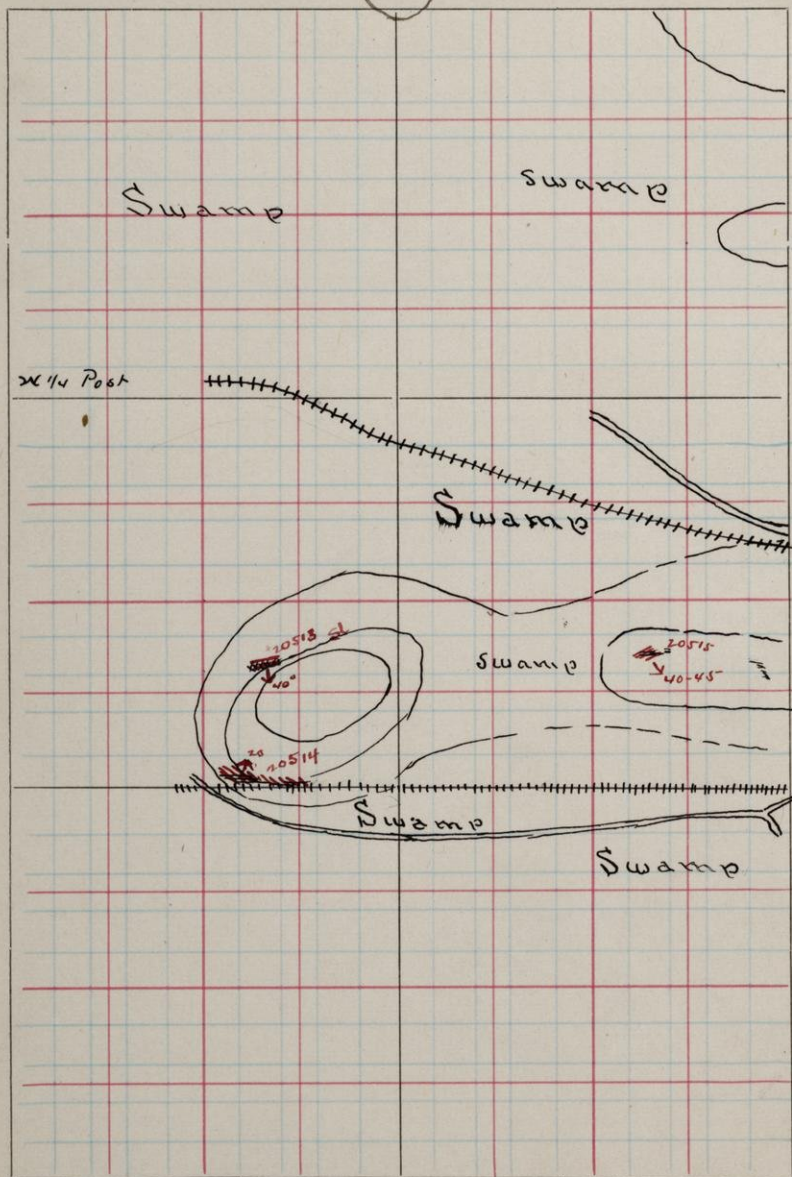
20514 Same slates, here dipping north
 about 20° and striking 20° N of W.

20515 344 S. 810 E of W 1/4 post Sec 34
 are again slates striking 20° N of
 E and dipping 40 - 45° S.

S. 34

T. 48

R. 26



The NW of the NW $\frac{1}{4}$ Sec 34 is covered with sand hills and plains in which no rocks occur, so far as was seen.

For other notes in this region see books of Phillips and Mathews.

Cascade Iron Range

The work done in the Cascade Range was of very much the same character as that done in the Marquette range. It was necessary to make use of dials continuously. As these had been used some six or eight weeks they were generally out of plumb, and so carried on most of their true courses. Since work was stopped after nine days only in the region the dials were not corrected.

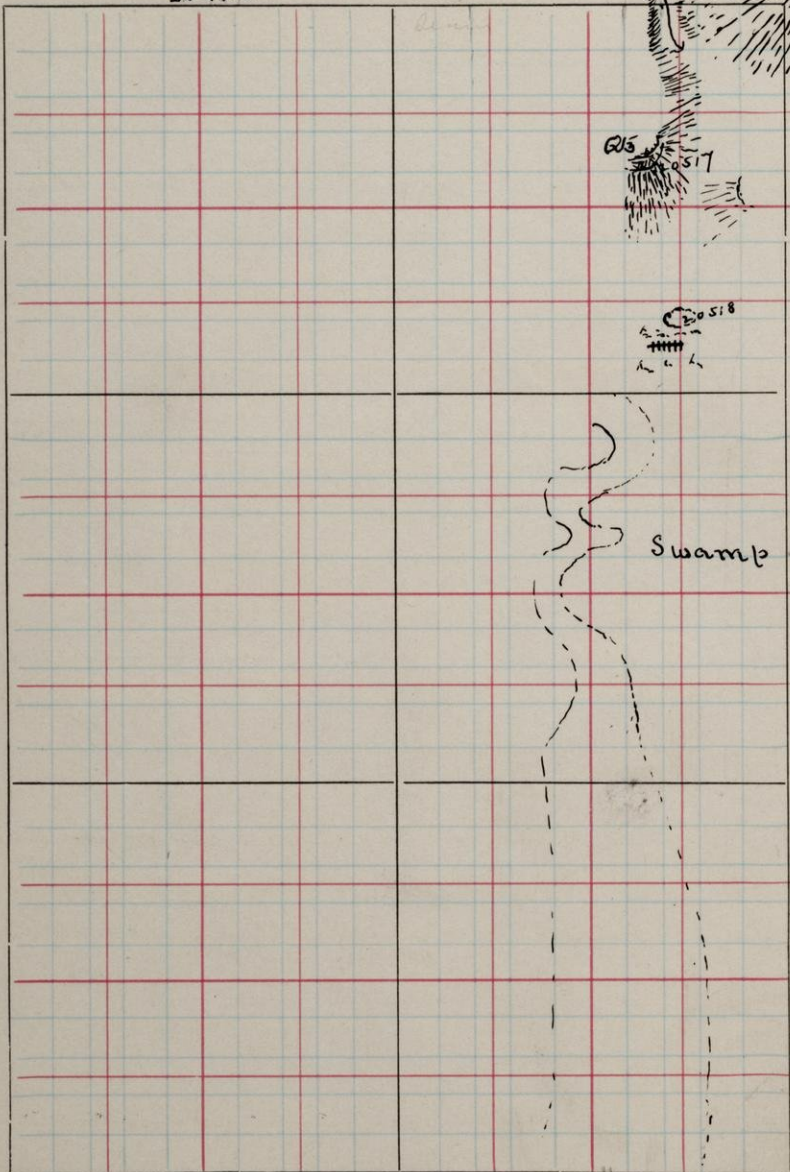
At every corner and quarter-point corrections were made so that locations as plotted in accompanying maps are about correct.

The courses run are 200 paces apart.

S. 27

T.
N¹/₄ P

R.



July 15/92

From N.E. Cor. Sec 27. 47-26.
ran west 400 paces then south
to granite?

Upon correcting up at the
S. line of section found our-
selves 144 paces too far west.

20516

at 237 W. 50 N. of N.E. Cor.
Sec 27. is the west end of a
quartzite bluff whose East
end Washers examined. The
rock is a broken and gashed
white quartzite with brecciated
portions

20517

at 400 W. 200 S. there are out-
crops of what seem to be a dark
quartzite, schistose in places.

20518

Black quartzite on north side
of railroad forming small hill.
The strike of the schistosity is
20° N of E.

436 S. 375 W of N.E. Cor Sec 27

S. $\frac{27}{34}$

T. 47

R. 26

§ 1/4 P. Sec 27

→
□
20519
check. 2.

20520
at
20521
Lpaw.

Granite
Granite

Chlor. Sch
20520

20522 check

20524
Gran.

20523 Schist

20524 schist

20529

h
h
h
h
h
h
h
h
h
h

Granite

Granite
20527
20525
20526

- 20519 400 N. 70 S. N.E. Cor. Sec 34, T
47. R. 26.
From chert^s from little pit. Rock
dips about 40° N and strikes
10 N 7 W (?).
- 20520 400 N. 180 S of N.E. Cor Sec 34.
Black quartzite^s from little
ledge, on north side of hill.
- 20521 240 S. 430 W of N.E. Cor Sec 34.
Probably gray wacke. Looks like
recrystallized granite.
- 20522 At 493 S. 430 W of N.E. Cor Sec
34, reach the top of the hill which
have been ascending all the
way from the north line of the
section. Here are several
ledges of chert, colored red by
iron oxide, except in lenticle-
lar and lozenge shaped areas
where the color is lacking.
On the weathered surface there
areas look like pebbles.
The surface of this rock exposed

is about 75 paces long and 10 or 15 wide. To the west of it, apparently in the same ledge, are some granite[?] exposures, but they may not be in place.

On the south side of this same hill at 550 S. 430 W of NE cor Sec 34, is a large exposure of a schistose rock that looks

20523 not unlike a rocted gneiss, and again at

20524 658 S. another ledge of the same kind.

20525 At 985 S. after crossing swamps, find ledges of fine grained pink rock that may be granite[?]. The ledges are moss covered so that they are difficult to study. If they are truly granite[?], 20523 and 20524 may be gneiss.

20526 1100 S. is a ravine whose north side is bordered by the same red granite[?].

At 1100 S. go west to $205 \frac{1}{4}$ line
of sec and north.

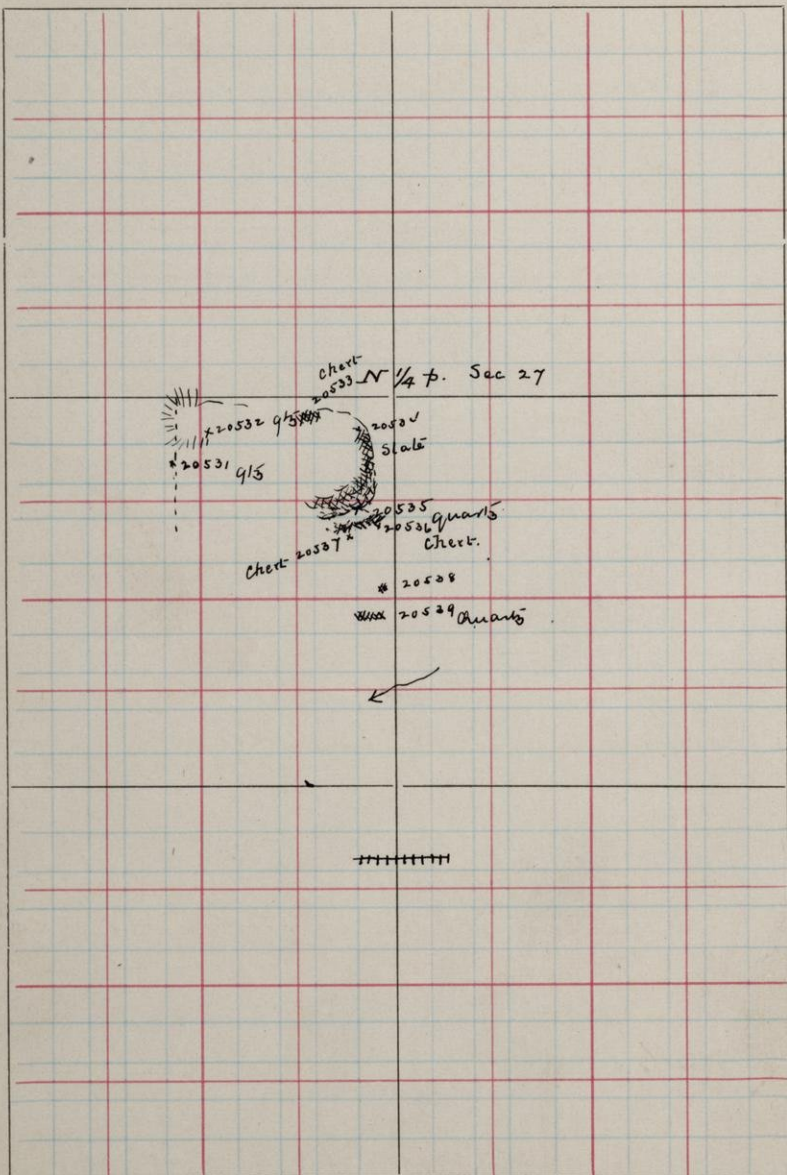
When reached a line of sec 34
find ourselves 135 E of $\frac{1}{4}$ post
and only 870 paces north. In
other words the running is vile.
However the bad running will
affect the work but slightly as
my granite was found in the
north run. as follows.

20527 1100 S. 527 W of NE cor Sec 34.
at 900-1000 N. 1000 W of SE. Cor Sec
34 cross another hill of granite.
At 1270 N. 900 W of SE cor Sec
34 is the foot of another granite
knob from top of which took
20528 Specimen of hornblende schist
that looks like a narrow dyke
in the granite.

On the north side of this hill the
prevailing rock is hornblende-
schist, while the dyke is granite.
(1350 N)

20529 1425 N. 900 W. of S.E. cor Sec 34.
Granite.

20530 1550 N. 900 W of S.E. cor Sec 34.
white weathering chlorite-schist.



July 16/92 -

Ran north from railroad to
N. Sec line of Sec 27 - on line
280 W of $\frac{1}{4}$ line. No rocks were
met until reached a
point

- 130 S. 1280 W of N E cor Sec 27,
where on the south slope of a
20531 large hill is a good exposure of
quartzite and near top of the
20532 same hill another

Ran east to N $\frac{1}{4}$ post Sec 27,
then south.

- At 1980 N. 1125 W of S. E. cor. Sec 27
near the top of a hill is a red
20533 chert ledge

- and at 1960 N. 1070 W. on the
N. E. slope of the same hill a
20534 black slate exposure extending
S. E. to 1865 N. 1045 W.

- at 1865 N. 1045 W. the slate is
20535 replaced by a schistose quartzite

at 1850 N. 1015 W of S. E. cor Sec 27
the ledge on the south side of the

20536 Same hill consists of chert that looks in places like conglomeratic.

20537 1840 N. 1070 W of SE cor Sec 27. from the continuation of ledge 20536, is a green chert.

20538 Several small exposures on the south slope of the hill may be cherty quartzites. Their location is 1755 N. 1000 W of SE cor Sec 27.

20539 At 1722 N. 1025 W. is a large ledge of quartzite.

20540

20541

20542

} seem to have been overlooked.

WLB

July 18/92

Ran north from R. R. along
line 400 E of W. line Sec 27

20543 At 1950 N 1637 W of S.E. cor Sec
27 is a small ledge of gray-
wacke in the side of the great
quartzite hill whose slope we
skirted while running north

At north line of section went
west to N.W. corner, ascending
little hill at 200 E of this cor-
ner and remaining in it until
reached corner post.

20544 The East end of the hill, at
1820 W of N.E. cor. Sec 27 is
composed of massive graywacke

20545 At 1850 W. is another exposure
of graywacke, and

20546 at 1900 W. a large one of schis-
tose graywacke.

The corner is on the west end of
the hill, where the rock is a slate
conglomerate, already several
times specimened.

The conglomeratic structure is

20547 best seen on the north side of the hill. On the south side the pebbles are lacking, and the rock is a slate. The strike of the schistosity is 30° N of W.

Continued to 200 W of corner and ran south from here crossing west end of great quartzite hill.

The first rock found was a large ledge of the slate conglomerate at the base of the hill, at 1900 N, 200 W of S.E. cor Dec 28

20548 at 145 S (1855 N) struck base of higher ridge, and here found what I supposed to be the red Jasper conglomerate. The east wall is well exposed, showing the conglomeratic nature of the rock quite plainly. To the south

20549 it becomes finer grained, until finally it is replaced by the banded Jasper

just above this, on top of the hill (at 275-300 S) are quartz-

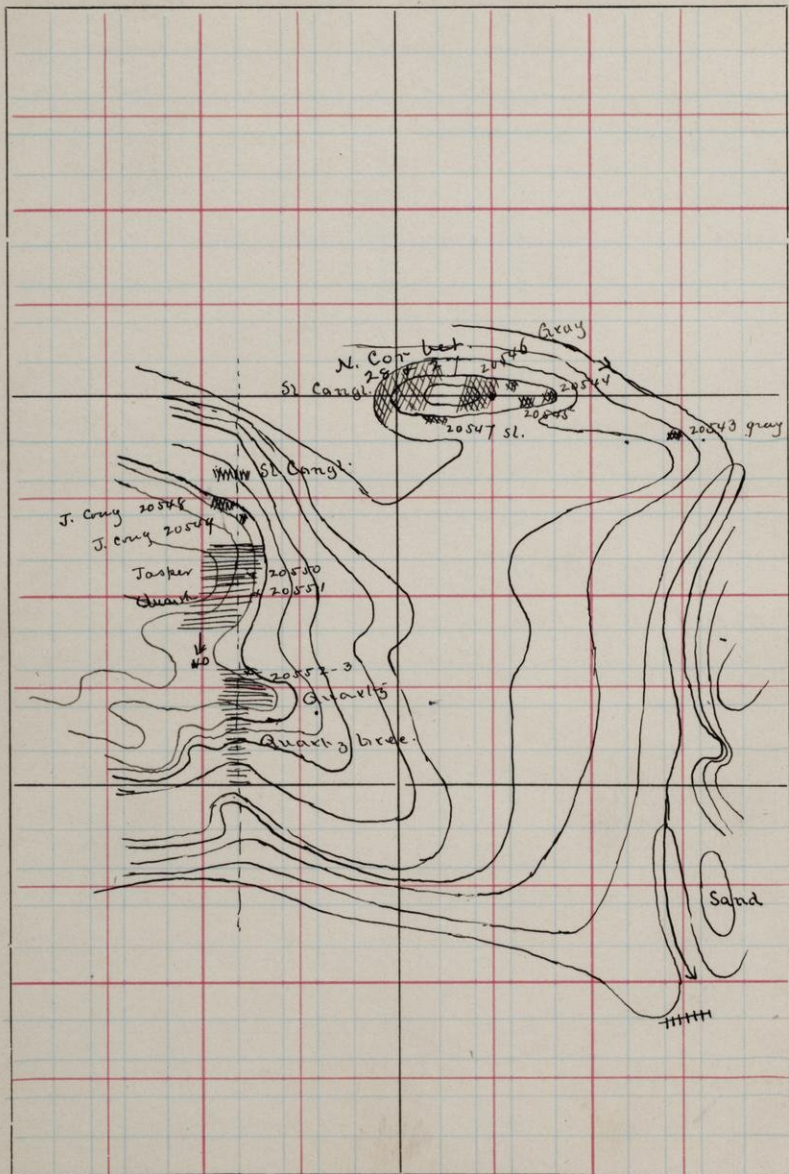
- 20550 ices^d, which took north are dark
 and spangled with scales of kema-
 title, and to the south white^d and
 20551 mottled; both possessing a good
 dip of 40° S and a strike 10° N of
 W.

N.B. The relation of these con-
 glomerates, jaspers and quartz-
 ites are difficult to explain.
 Evidently the quartzite^d is the
 same as that above the up-
 per conglomerate in the Mar-
 quette region. Above it is white^d
 and below dark. It grades
 below into a quartz-jasper
 conglomerate^d, which becomes
 coarser as the series is descend-
 ed. But between this con-
 glomerate and the dark quartz-
 ite^d, the observations seem to
 show that the jasper occurs. This
 ought to be below the quartz-
 conglomerate^d.
 On the other hand, below the
 the quartz-conglomerate is a
 slate conglomerate^d. This slate^d

S. $\frac{27}{28}$

T. 47

R. 26



6-747

1805

++++

conglomerate may possibly be the lower conglomerate, though at the corner it is associated with gray wacks which seem to be younger than the quartzite above, unless we may assume the existence of two gray wacks, and of this we have not yet any proof.

The slate conglomerate might be explained by overlap, but for the occurrence of a 100 ft. high quartzite ridge just above it.

The relations puzzle me at present. Had intended to make a complete study of the hill, but was prevented by the stoppage of field work.

At 350 ft. on the South side of the big quartzite hill the white quartzite presents a wavy contact with the overlying dark red brown variety. at the contact is a four foot wide

20552 layer of conglomerate? composed
of a groundmass of the dark
rock and pebbles of the white
one.

These quartzites extend as far
south as 500 ft. without change
of character. They are brecciated
locally all the way.

20553

20553 seems to be lacking

20554

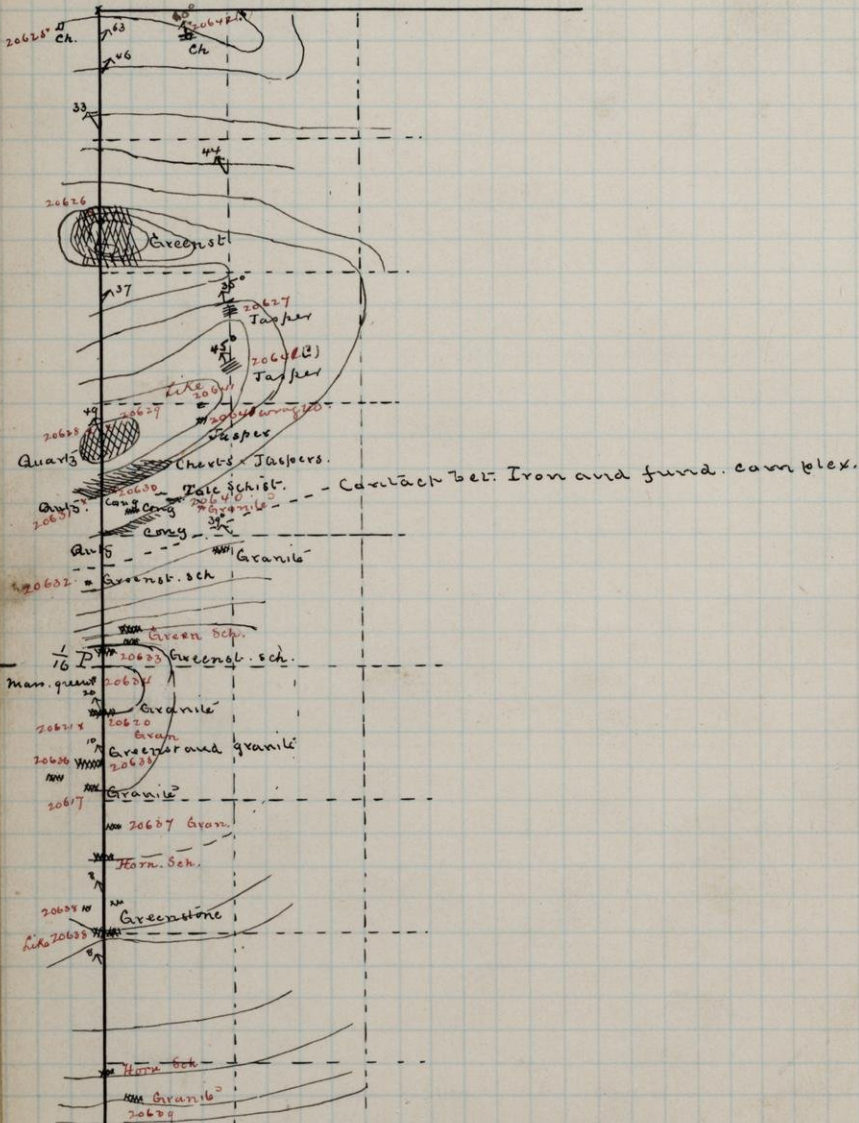
to

20624

See seven pages further.

24

N.W. Cor Sec. 33



in the morning of the last day in the field a very careful examination of the contact between the now bearing rocks and the schists and granites work south was begun, but was very just begun when work was stopped. The region in the N.W. corner of Sec 33 was examined in blocks of areas 100 paces square.

Beginning at the N.W. cor Sec 33 and running south. two pits were discovered, one at

- 20625 10 S. 26 W of N.W. cor Sec 33
 20642 and the other at 25 S. 62 E of same corner

In both new checks were found.

- 20626 at 150 S of N.W. cor Sec 33. struck north side of knob of greenstone (Diabase), rising from the gradual slope as an E-W trending, high bare ledge.

at 365 S. is a large exposed

S.

T.

R.

20627

230 S. 100 E of NW Cor Sec

33. Ledge of iron-ore strat -
ing 30° S of W and dipping 35°
N.W.

ledge of cherts and iron that appear to be of the lower formation. This forms a cliff facing south. Above it at

3100. is the north side of a knob of quartzite from which two specimens were taken.

20628 }
20629 }

The contact between the quartzite and the cherts was not seen. In the chert or jasper exposure the iron and jasper are more or less controlled. Where the banding is regular it strikes about 12° S of E, and has a vertical dip.

20630

is a specimen of the jasper. South of the jasper and a few paces to the west, were seen at the base of the ledge is a conglomerate that resembles strongly the lower conglomerate of Wadsworth. On top of the ledge and west of the jasper (20630) a few paces is gray

20631

quartzite. No distinct contact was seen here, but the quartzite may nevertheless be unconformable upon the jasper.

Across the valley whose bottom is at 425 s. rises a high hill in whose north side is greenstone schist. Further up the hill the schist is more massive, and in places it contains lenticular red granite masses.

At 541 s. 10 W of NE cor Sec 33 is a ledge showing a coarse whitish pink granite dyke, cutting hornblende schists. The schist is here typical; it contains lenticular ages of white quartz, and is more or less contorted.

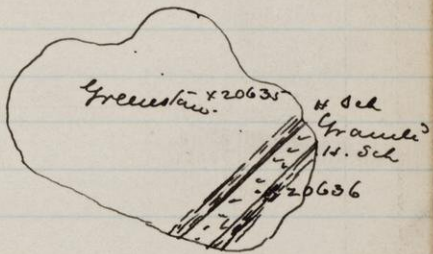
Very 10-15 paces west of the schist is an exposure of schistose greenstone but the relations of the hornblende schist to the greenstone schist was not learned.

20634 570 s. 10 W of NW cor Sec 33. Massive greenstone.

20635 at 574 s. 30 W of NW cor Sec 33 is another ledge of greenstone, cut by a 12 in granite dyke. At a distance of 10 ft. from the dyke the dark rock is the

massive greenstone, but near
the contact it is typical

20636. Hornblende schist.



20617 At about 10 paces further South
at 585 S. 30 W of NW cor Sec 33
is a 20 x 20 ft. face of granite;
and south of this all the ex-
posures as far south as the
44 post are likewise of granite
or schist.

20618 590 S. 20 W.

20619 562 S = Hornblende schist strike-
ing 30° E of U. and dipping about
75° N.

620 - 640 S. Small ledges of Horn-
blende schist and granite
20637 Granite from 620 S.

20638 680 S. 10 W. Massive greenstone

20639 825 S. Ledge of hornblende schist cut

by granite^s and containing
 Ages of this material, and
 which the schistose - beds.

U. B. If the schistose green-
 stones are of the same age as
 the lower rim series, and the
 hornblende schist grade into
 the schistose greenstones, as
 is certainly the case, and the
 hornblende schist is cut by
 granite, then so far as I
 can see there is no funda-
mental complex.

From this point returned to
 valley and ran East on line
 Hoo 1 of U. line of sec 33.

on the south side of the northern
 line, well down toward its bot-
 tom found a poorly defined con-
 glomerate at 15 E and 375 S.
 of NW. cor of sec. The conglome-
 rate contains quartz pebbles
 and some sharp fragments of
 jasper.

20640

370 S. 50 E of NW cor Sec 34 is a small ledge of schistose talc rock with its schistosity vertical.

At 100 E run north with the new schists at

20641(?)

310 S. 75 E of NW cor Sec 33.

Wray
W.S.B

Here is an exposure of banded iron and cherts, some what contorted but striking generally Ca. N.S. and dipping at various angles to the west. Subalternated with and app. above 20641 is quartzite

20641

at 266 S. 110 E. of NW cor Sec 33

are well banded iron and jaspers with a strike 65° S of W and a dip 45° NW.

At 227 S. 100 E. another large ledge of the iron and jaspers occurs. This is well banded and strikes 10° W of N and dips W.

At 218 S. and at 200 S. 100 E are other ledges of the same rocks. More quartzite is seen here than

in the neighborhood of more
scrubbed ledges.

The ledge at 200 S is cut by
small facets against which
the quartzite abuts, cutting
off little stringers of the iron and
jasper.

20642 (?) Iron slates striking 10 S of W and
dipping 60° N.

To E. 25 S of NW cor Sec 33.

S_W 6^{1/2}
N_W 6^{1/2}

S.

T.

R.

U.B. Howe was instructed not
to name the rocks, but sim-
ply to locate the ledges as ac-
curately as possible.

W.S.B.

July 19

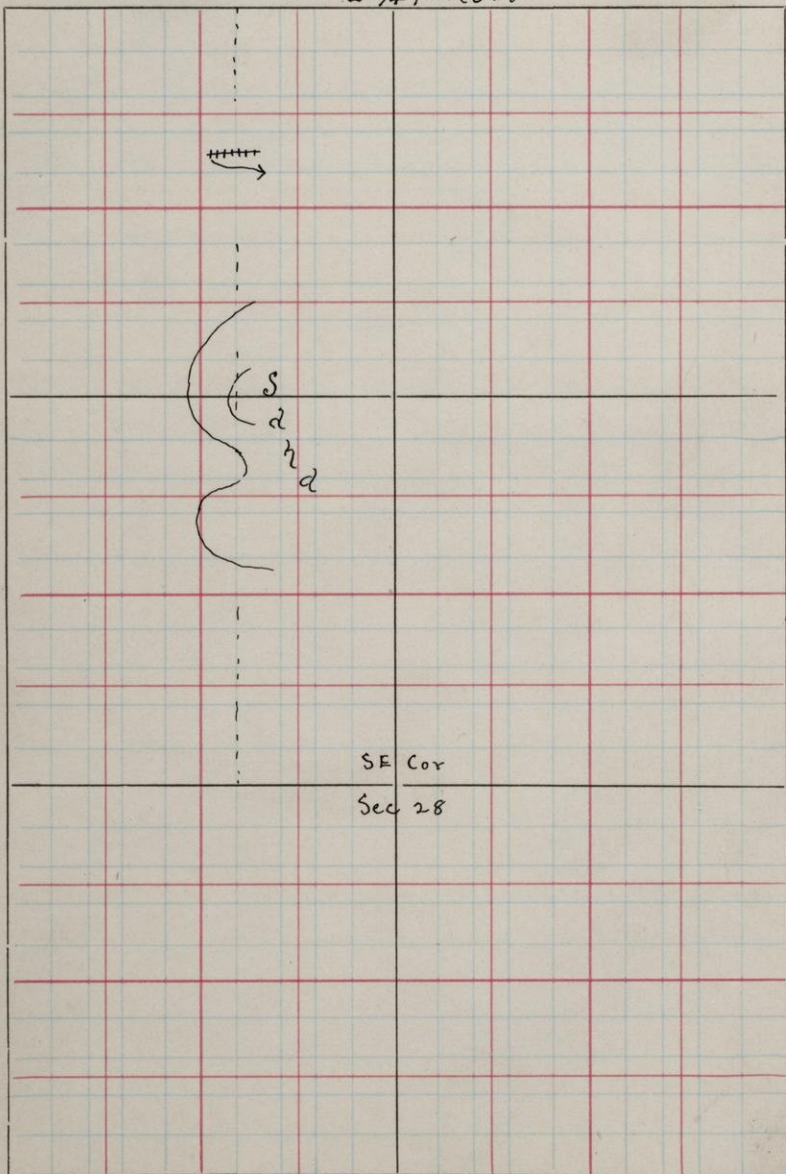
Notes by Horve

- Ran south from 200 W of E 1/2 sec
 part Section 28 crossing sand
 hills but finding no exposures
 till crossed south line of section
 when they became numerous.
- 20554 230 S. 200 W of U.G. Co Sec 33.
 Small exposure of on north
 side large hill.
- 20555 250 S. 200 W. ledge of
 extending along side of hill.
- 20556 260 S. 200 W. Small exposure
 of
- 20557 295 S. 210 W. }
 20558 295 S. 190 W. } Small Expos.
 were near top of hill.
 The top of the hill is all rock.
- 20559 300 S. 200 W Small exposure
 of cut by quartz vein
- 20560 300 S. 210 W. From crest of hill.
- 20561 350 S. 200 W. From north slope
 of next southern hill.

S. 28

T. 47

R. 26
E 1/4 p. Sec 28



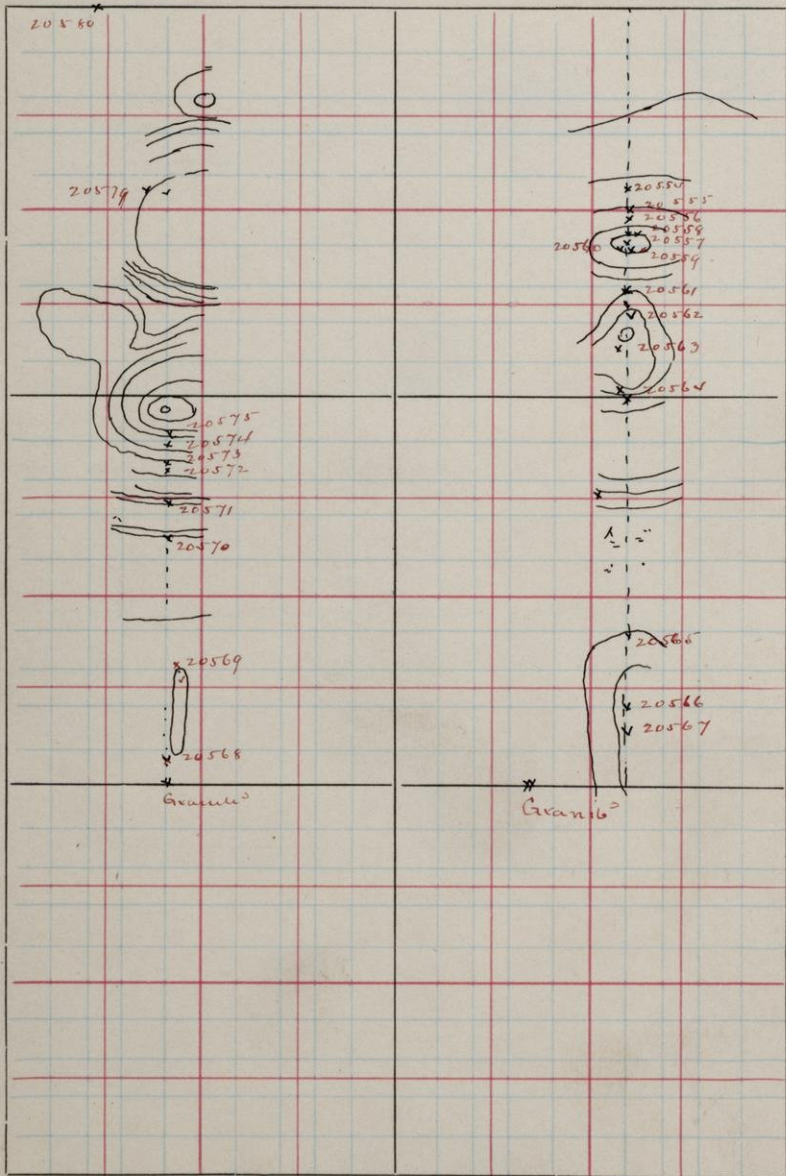
- 20562 392 S. 210 W. Large exposure
of
U of W (?)
with strike 12°
- 20563 425 S. 215 W of NE cor Sec 33
Here, on the S. side the granite
(20563) occurs just north of a
schistose rock (20564)
- 20564 490 S. 210 W of NE cor Sec 33
The two rocks are intermingled
as elsewhere in the complex
and ledges are very numerous.
The schist dips from 20° to 45° N.
and strikes about 6° S of W.
- 20565 815 S. 200 W. Granite
- 20566 900 S. 200
- 20567 915 S. 200 W. Hornblende
Schist.
A number of ledges of granite and
were found on run from 1000 S.
200 W of NE cor Sec 33 to
1000 S. 500 W.
At this run north -
- 20568 950 S. 500 W. Large exposure of
granite on S.E. slope of hill.
Another ledge runs as a ridge

S. 33

T. 47

R. 26

NE Cor



for 100 paces north on East
side of course of travel.

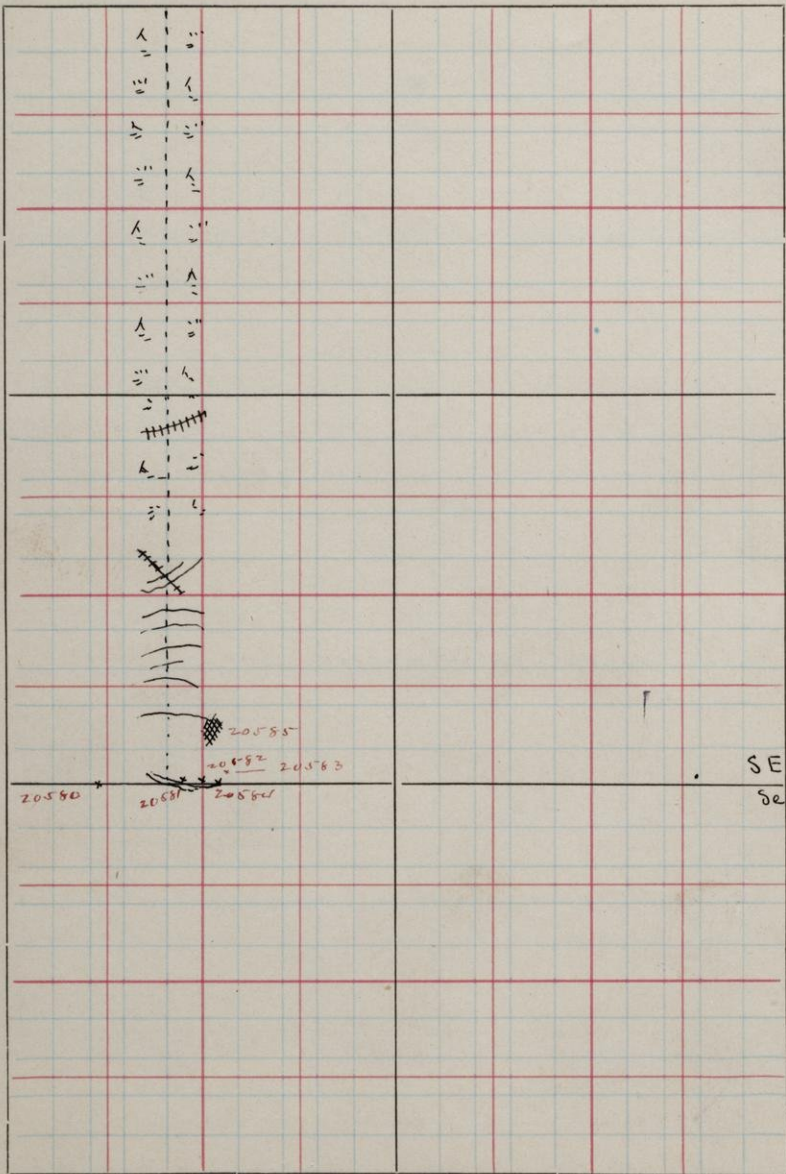
- 20569 530 S. 800 W of N E Cor Sec 33.
Gneiss.
- 20570 666 S. 800 W of N E Cor Sec 33.
Ledge on S. slope of hill.
- 20571 634 S. 800 W of N E Cor Sec 33.
at 590 S. 800 W. is a high cliff
of cut and gashed
by seams of quartz.
- 20572 575 S. 790 W of N E Cor Sec 33
- 20573 3 steps north of 20572.
- 20574 570 S. 790 W of N E. Cor Sec. 33
- 20575 565 S. 790 W

N.B. I presume these various
specimens from this cliff repre-
sent types of schist and granite
that are intermingled (W.F.B.)

S. 28

T. 47

R. 26



SE Cor
Sec 28

At 360 J 800 W another bluff
of the same kind is met. From
this a series of specimens was
taken as before

20576 } 250 S. 800 W of NE Cr Sec 33

20577 }

20578 345 S. 800

20579 150 J. 820 W

20580 893 W of NE Cr Sec 33

Small exposure in pit

20581 15 N. 760 W of SE Cr Sec 28.

Ridge of iron cherts that has been
worked for ore. Dip 56° N. Strike
about 36° N of W.

20582 12 N. 750 W. From same hole

20583 15 N. 730 W. Soapstone.

20584 10 N. 785 W. Crystalline hematite.

20585 40 N. 740 W. Another pit with
cherts dipping 46° - 56° N.

July 20

From S. sec line Sec 28 7 am
N. on line 500 W of E line,
crossing R.R. at 460 N.

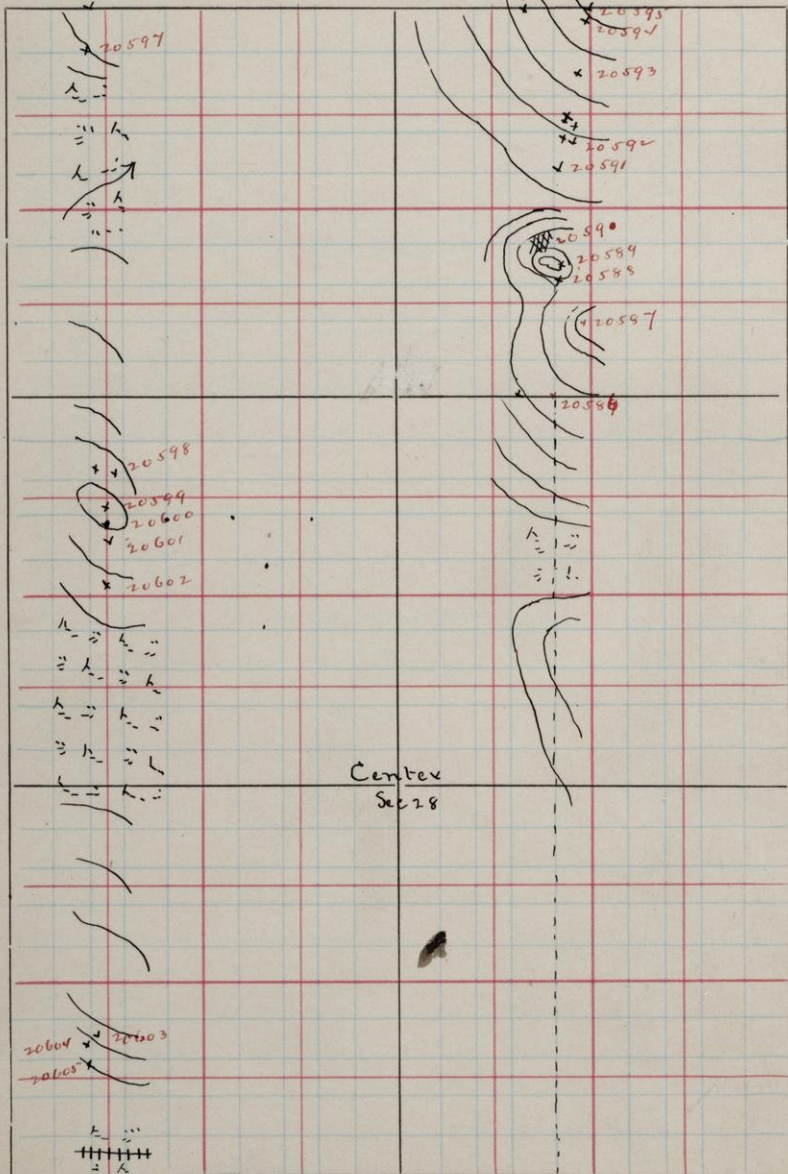
- 20586 At 1510 N. 500 W. is a large ex-
posure of on S. slope of
hill
- 20587 at 1581 N. 760 W. of S.E. cor Sec
28 is ledge of brecciated quartz-
ite?
- 20588 At 1663 N. 500 W. of S.E. cor Sec
28 is another ledge of brecciated
quartzite?
- 20589 1687 N. 500 W. of S.E. cor Sec 28
- 20590 1705 N. 500 W. of S.E. cor Sec 28
Upper conglomerate containing
jasper and quartz pebbles.
- 20591 1860 N. 750 W of S. E. Cor Sec. 28.

S. 28

T. 47

N. 1/4 P.

R. 26



20592 1875 U. 775 W of SE cor Sec 28

20593 1925 U. 760 W " ..

20594 1960 U. 760 W " ..

Quartzite breccia

20595 2000 U. 760 W. of SE. cor. Sec 28.

20596 2000 U. 830 W " ..

20597 1925 N. 1400 W of SE cor Sec 28

20598 1410 N. 1410 W. of SE cor Sec 28.

20599 1360 N. 1400 W of SE cor Sec 28
Strip of large and small ex-
posures.

20600

20601 1330 N. 1400 W of SE. cor Sec 28

- 20602 1260 N. 1400 W. of S.E. Cor Sec 28
- 20603 682 N. 1400 W. of S.E. Cor Sec 28
- 20604 665 N. 1410 W. of S.E. Cor. Sec 28.
- 20605 650 N 1410 W. of S.E. Cor. Sec 28.
- 20606 269 N 1450 W. of S.E. Cor. Sec 28.
- 20607 125 N 1500 W. of S.E. Cor Sec 28.
Dip 51° - 52° NW.

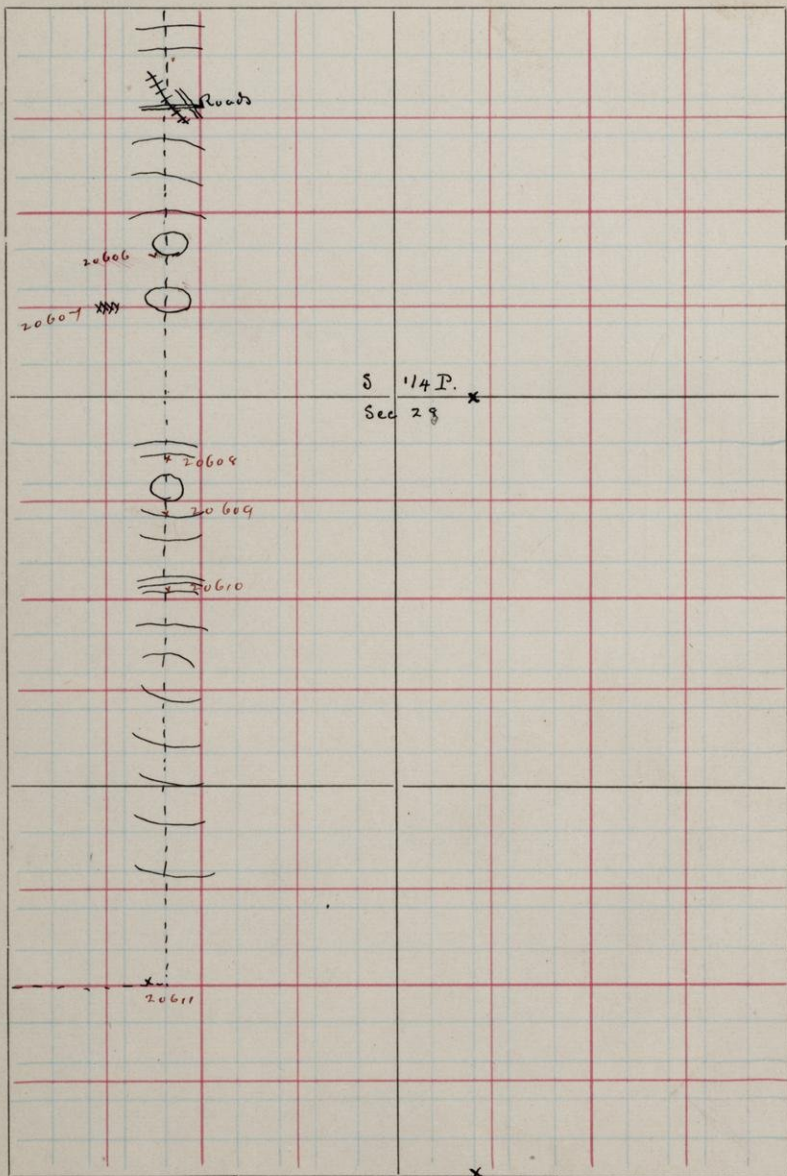
at south line of Sec. were
at 1975 instead of 2000 S. and
1443 W, instead of 1400 W.

- 20608 1924 N. 1400 W of S.E. Cor. Sec 33.
- 20609 1855 N. 1400 W of S.E. Cor Sec 33
- 20610 1780 N. 1400 W. of S.E. Cor. Sec. 33.
- 20611 1270 N 1415 W of S. E. Cor. Sec. 33
Franklin

S. 28

T. 47

R. 26

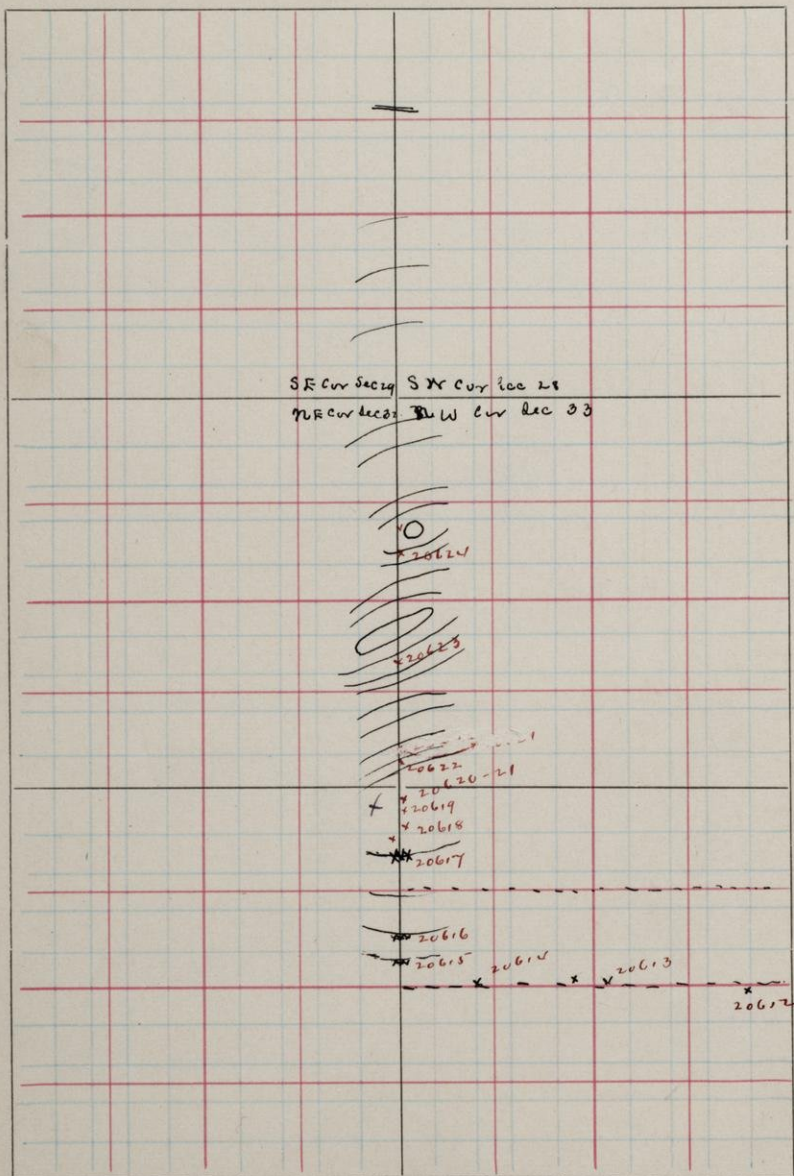


- 20612 1240 N 1553 W. of S.E. cor Sec 33
Small Exp. of granite?
- 20613 1260 N 1725 W. of S.E. cor Sec 33
- 20614 1250 N. 1900 W. of S.E. cor. Sec 33
- 20615 1285 N 2000 W of S.E. cor Sec 33
- 20616 1315 N 1990 W of S.E. cor Sec 33
- 20617 1420 N 2000 W of S.E. cor. Sec 33
- 20618 1425 N. 15 W of S.E. cor Sec 32
- 20619 1452 N. 1985 W of S.E. cor Sec 33
- 20620 } 1469 N. of S.E. cor Sec 32
20621 } Granite forming E. half and
Schist west half of ridge.
- 20622 1526 N. of S.E. cor. Sec 32
- 20623 1650 N. of S.E. cor Sec 32
- 20624 1800 N of S.E. cor Sec 32

S.

T.

R.



Upon reaching North line 7
Section were found 50 paces
to far west.

July 21/92

Handwritten scribbles at the top of the page.

Handwritten scribbles in the second row.

Handwritten scribbles in the third row, including a small sketch of a bird or animal on the right side.

Handwritten scribbles in the fourth row.

