Vicinity of Greenwood, Michigan Marquette district: [specimens] 17631-17741. No. 113 1891

Merriam, W. N.
[s.l.]: [s.n.], 1891

U. S. GEOLOGICAL SURVEY

FIELD SECTION BOOK

Book 113.

Vicinity of Greenwood, Mich.
Marquette District.

W. H. Merriam, 1891.

17631–17741.

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 page is also arranged so that, if desirable, a smaller scale can be used, two inches, one inch, or even 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, for instance 4025, 250 *N.*, 300 *W.*, *Strike, N.* 6° *E.*, *Dip,* 50° *E.* Then follow with as full a description of the ledge as possible. 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, but chips of them must be taken. 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 x 2½ x ¾ inches will be allowed, but in all other cases *large sized specimens*, trimmed to a size of 3 x 4 x 1 inches, must be selected, in accordance with section 3, chapter IV, p. 44, Regulations of the U. S. Geological Survey. In all cases collect chips for slicing. 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. It is desirable that specimens be permanently marked in camp by painting the numbers upon them in white upon a black background, using Silver White and Ivory Black oil tubes for color, with turpentine as a diluent.

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

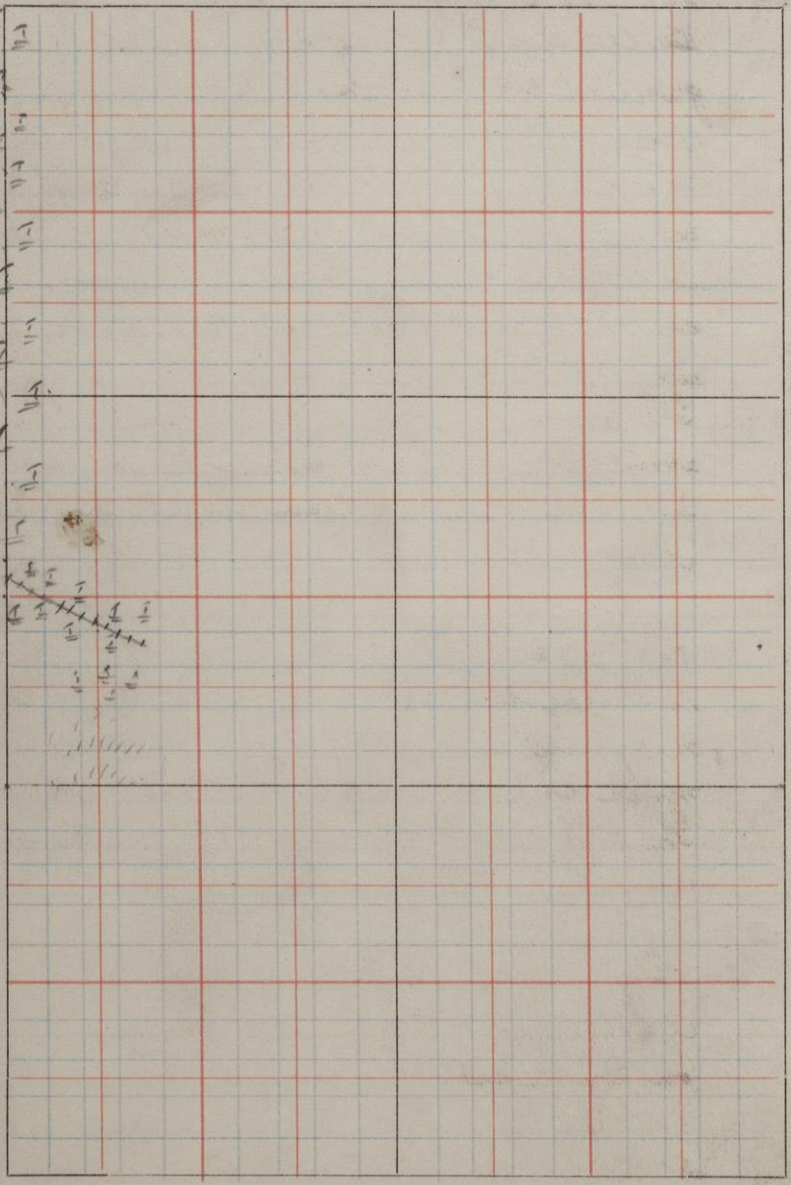
5. Forward this note book as soon as filled as registered mail matter to C. R. Van Hise, U. S. Geologist, Madison, Wis.

Not plotted
17641–17643; 17655–17659, 17667–70

#113

N. W. 1/4

Sec. 8. T. 47 R. 28 W. Mich.



17631 800 N. 1875 W. S.E. 8-47-28
On the north edge of a ridge this fine grained black rocks shows for a few paces when a greenstone comes in in contact with it and makes up the mass of the ridge The finer rock is much contorted and the strike could be made out only in a general way to be about E. & W.

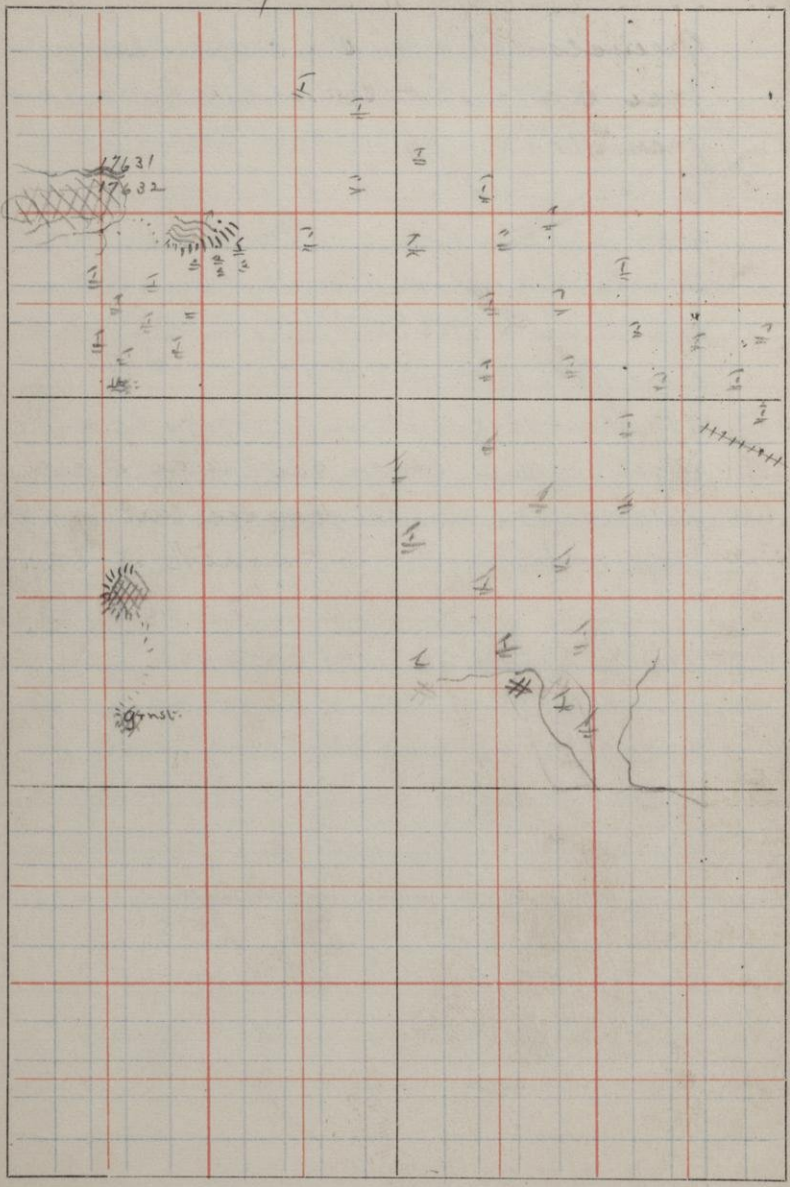
17632 The greenstone from above ridge is about 100 steps across when the same fine schist shows again on the south slope of the ridge

17633 700 N. 1725 W. S.E. 8-47-28
Similar to 17631 The rocks here are not quite so contorted but still too much so to get dip and strike accurately. The strike is N. of E. Dip N.E. at a low angle

17634 520 N. 1850 W. S.E. 8-47-28
A low ledge of Act. mag. schist on south side of swamp

250 N. 1875 W. S.E. 8-47-28
Large greenstone ledge (see notes of 1888)

S.W. ¼ 8 T. 47 R. 28



√17635 1800 N. 1875 W. S.E. 17-47-28
Greenstone from the abrupt south face of a large E & W. ridge of coarse greenstone

√17636 1325 N. 1600 W. S.E. 17-47-28
A large ledge of coarse greenstone similar to 17635

√17637 700 N. 1875 W. S.E. 17-47-28
Sameti- Mica schist (?) on east side of river
Biotite The rock is highly banded but much
Schist contorted Just south of this
in an east & west ridge is an
eruptive rock very like the tuffs
east of Champion

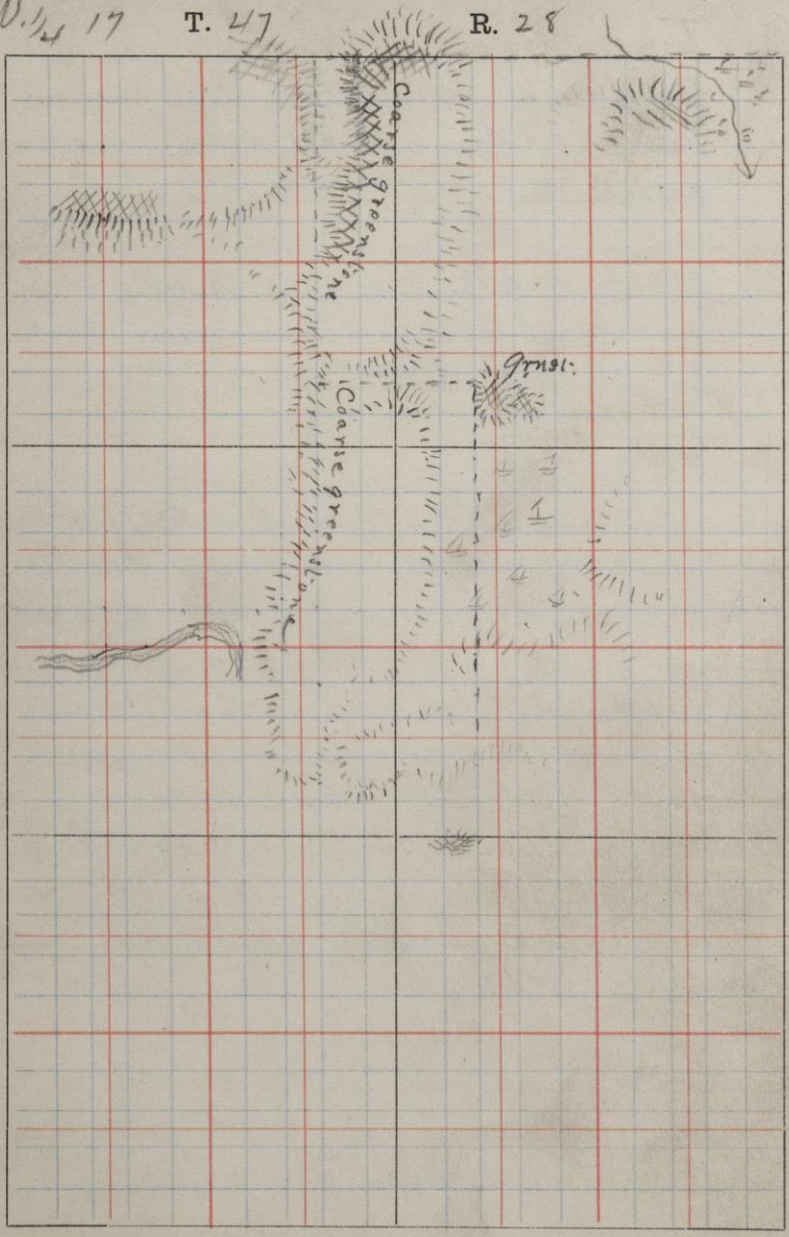
√17638 Is taken from the east end of this
Biotite Hornblende ridge 1600 W. 550 N. S.E. 17-47-28
Schist

√17639 350 N. 1600 W. S.E. 17-47-28
Hornblende like 17638
Gneiss

√17640 200 N. 1800 W. S.E. 17-47-28
Hornblende Greenstone Tuff highly banded
Biotite and contorted
Schist

Hb in large crystals) Thin sect. for Hb & Bi.

N. W. ¼ 17 T. 47 R. 28



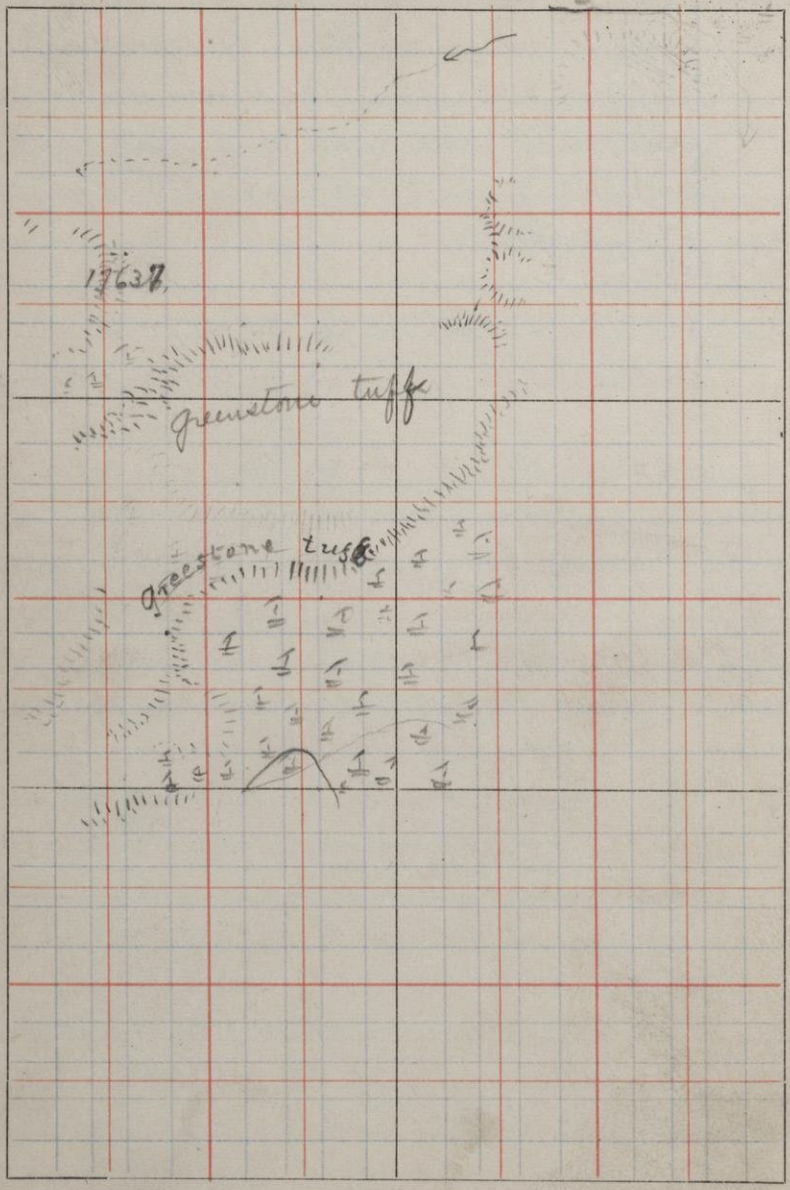
17641 2000 N. 1800 W S.E. 20-47-28
A finer phase of these greenstone Tuffs. Surface weathers in an irregular manner and very rough instead of in bands as in some parts of the tuffs.

17642 1350 N. 1800 W S.E. 20-47-28
A low ledge of the same greenstone Tuff

17643 1900 W. 850 N. S.E. 20-47-28
Biotite Granite On the south side of the Es. River a quite large exposure of grey granite

17644 220 N. 900 W S.E. 8-47-28
Altered Greenstone A large knob of greenstone conglomerate just S.W. of Shallow Lake
The conglomeratic character shows on the weathered surface, but is not plain on a fresh fracture. The fragments seem to be all of one kind and small. The rock is massive. Two of the fragments are shown in 17645 + 17644
17645 + 17646 The rock I think belongs with this general area of greenstones and greenstone tuffs.

P.M. 1/4 17 T. 47 R. 28



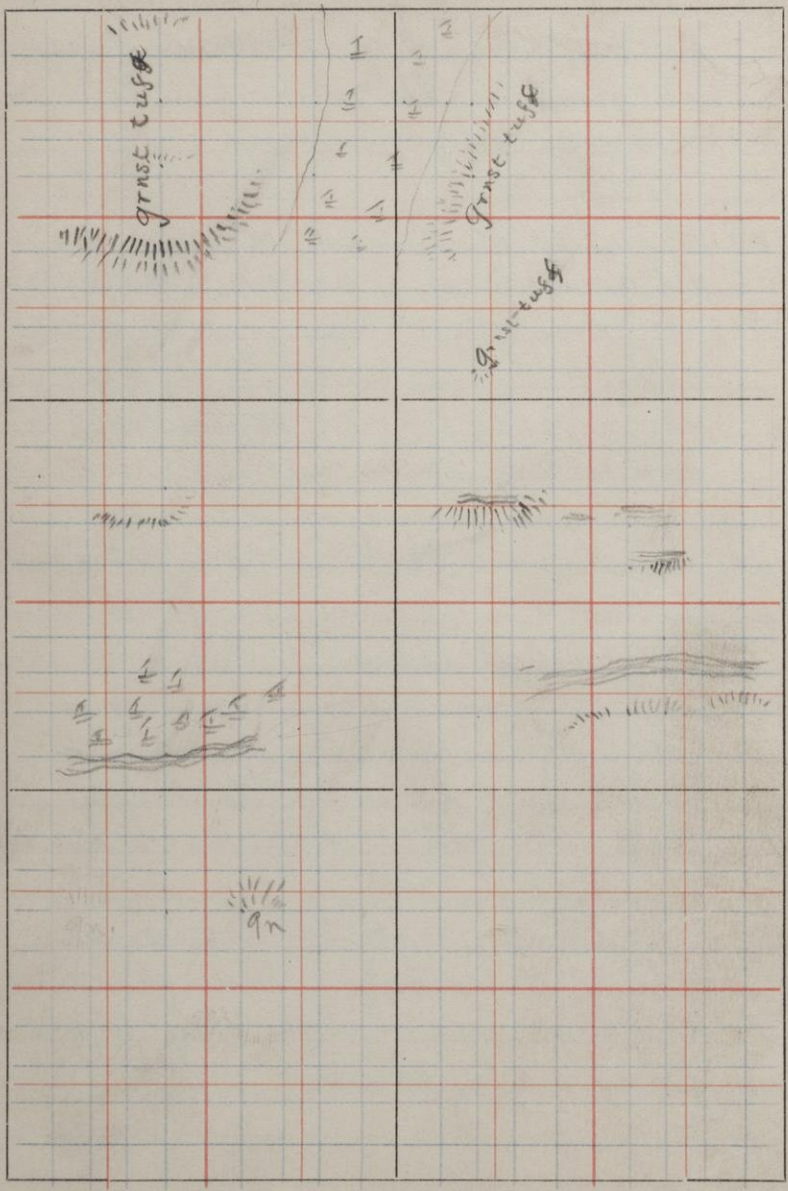
17647 850 W 1950 N. S.E. 17-47-28
A low knob of greenstone rising only a few feet above the low surrounding country

17648 00 N. 970 W. S.E. 8-47-28
At south base of ridge of greenstone conglomerate. The rock is grite schistose and contorted. The general strike of the bands being N. 65° W. Dip nearly vertical

17649 1960 N. 1150 W. S.E. 17-47-28
A rock very similar to 17648 in many respects. The banding is here however very regular and well defined varying from a fraction of an inch to nearly a foot in width. Strike N. 40 W Dip N. E°

Do these rocks belong with the greenstones? In places they appear as though they might be a phase of them

N.W. 1/4 20 T. 47 R. 28



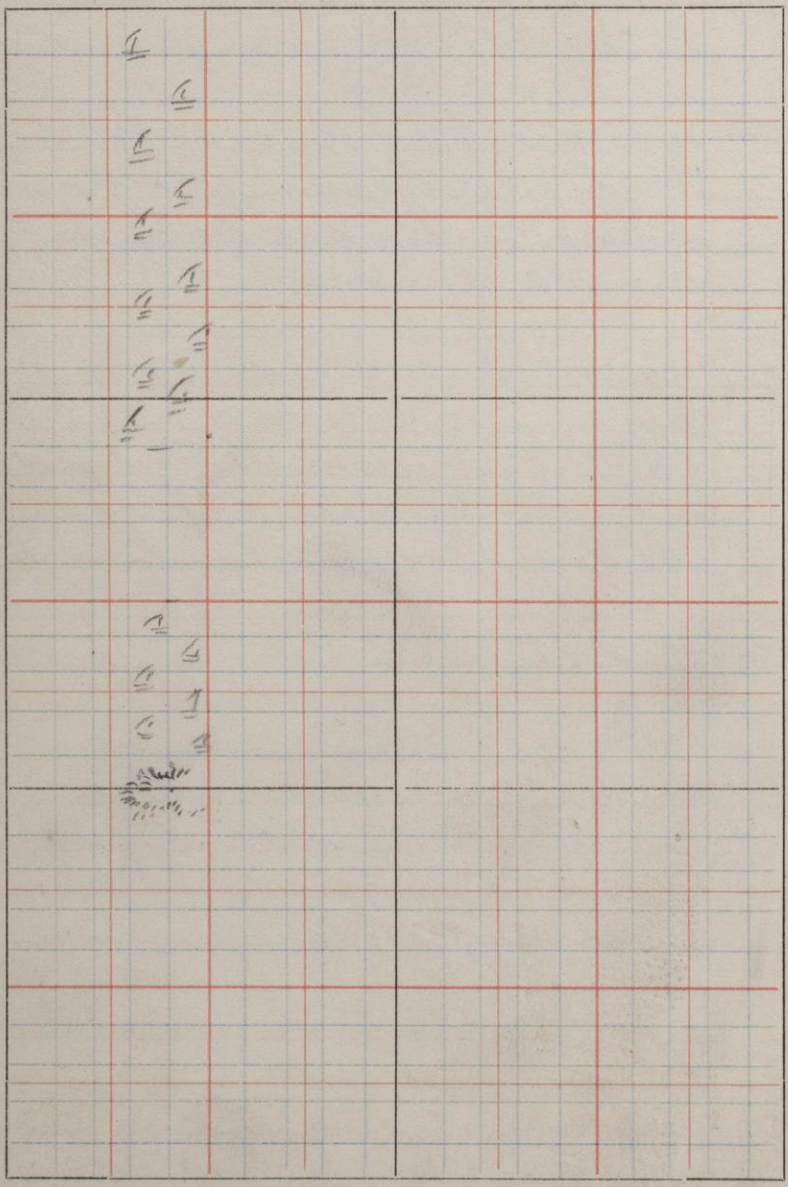
17650 1350 N. 125 N. S.E. 8-47-28
A low ledge of coarse greenstone

17651 1500 N. 00 N. S.E. 8-47-28
High ledge of coarse greenstone rising 75 or 100 feet above the swamp to the north

17652 1000 N. 1400 W. S.E. 17-47-28
Very similar to 17648-49.
A schistose rock much contorted
Dip seems to be high to the south
These rocks look in places very much like a mica schist. Do they belong with the greenstones

17653 1400 N. 625 N. S.E. 17-47-28
Greenstone lava or conglomerate
The rock weathers with a very rough surface the fragments standing out in very pronounced manner
They are vary in size from those but a fraction of an inch in diameter to those several inches in diameter
They are nearly all of one kind though some of the larger ones weather to a flesh color and seem to be porphyritic

N.E 1/4 8 T. 47 R. 28



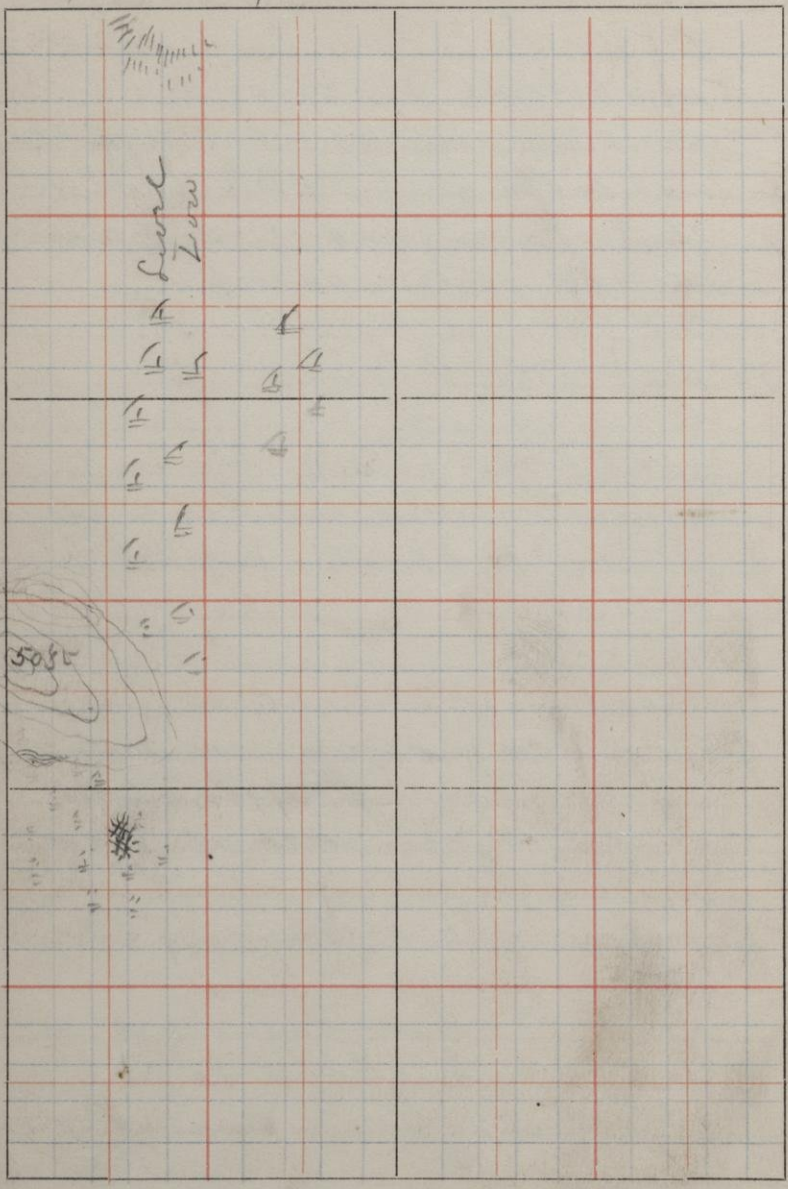
17654 From one of the larger fragments

17655 1400 N. 1800 N. S.E. 20-47-28.
From this same greenstone tuff showing in a ridge running N.E. & S.W. on the east side of swamp and rising 20 to 30 ft. above swamp.

17656 1400 N. 1375 N. S.E. 20-47-28
A banded rock like those to the north (17648-49-52) The banding is here contorted but has a general strike of N. 5° to 10° W. Dip about vertical

17657 1300 N. 1150 W. S.E. 20-47-28
17658 A banded fine grey rock with cherty bands up to 3 or 4 inches in width This rock lies just north of the granite about 175 steps and nearer to it than any rock seen so far
Strike E & W. as nearly as could be determined. Dip about 20° N.
The chert is also in lens shaped masses. The rock is quite contorted

S.E. 1/4 8 T. 47 R. 28



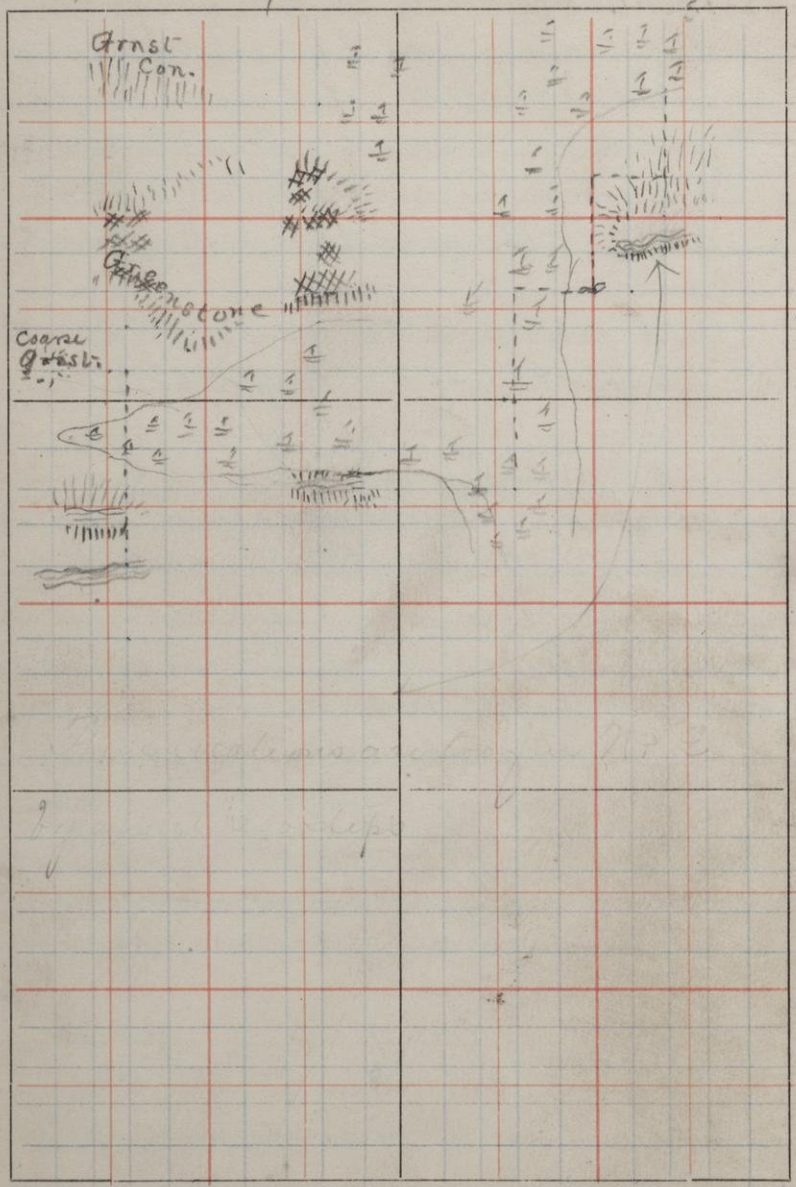
17659 1150 W. 1350 N. S. E. 20-47-28
A banded rock that belongs probably with 17657-58 although no chert bands were seen. The Knob rises up from the river about 30 or 40 feet. The granite is but a short distance to the south.
Attraction at this point - 40° W.
Strike 8° S of W. Dip 50° N.

17660 850 W - 1500 N. S. E. 17-47-28
17661 Greenstone conglomerate or tuff similar to all those in this region
17661 pebble from this rock

17662 1200 N. 820 W. S. E. 17-47-28
A more massive or greenstone like phase of these agglomerates. They are exposed for 200 steps north and south, most of the distance showing more conglomeratic than the specimen

1000 N. 870 W. S. E. 17-47-28
A low Knob of greenstone very similar to 17662

N.E. 1/4 20 T. 47 R. 28



17663 900 N. 850 W. S.E. 17-47-28
The greenstone tuff comes in again in a ridge running E. 15° N. the strike I think of these rocks corresponds with this direction
The dip is to the south at an angle of about 55°

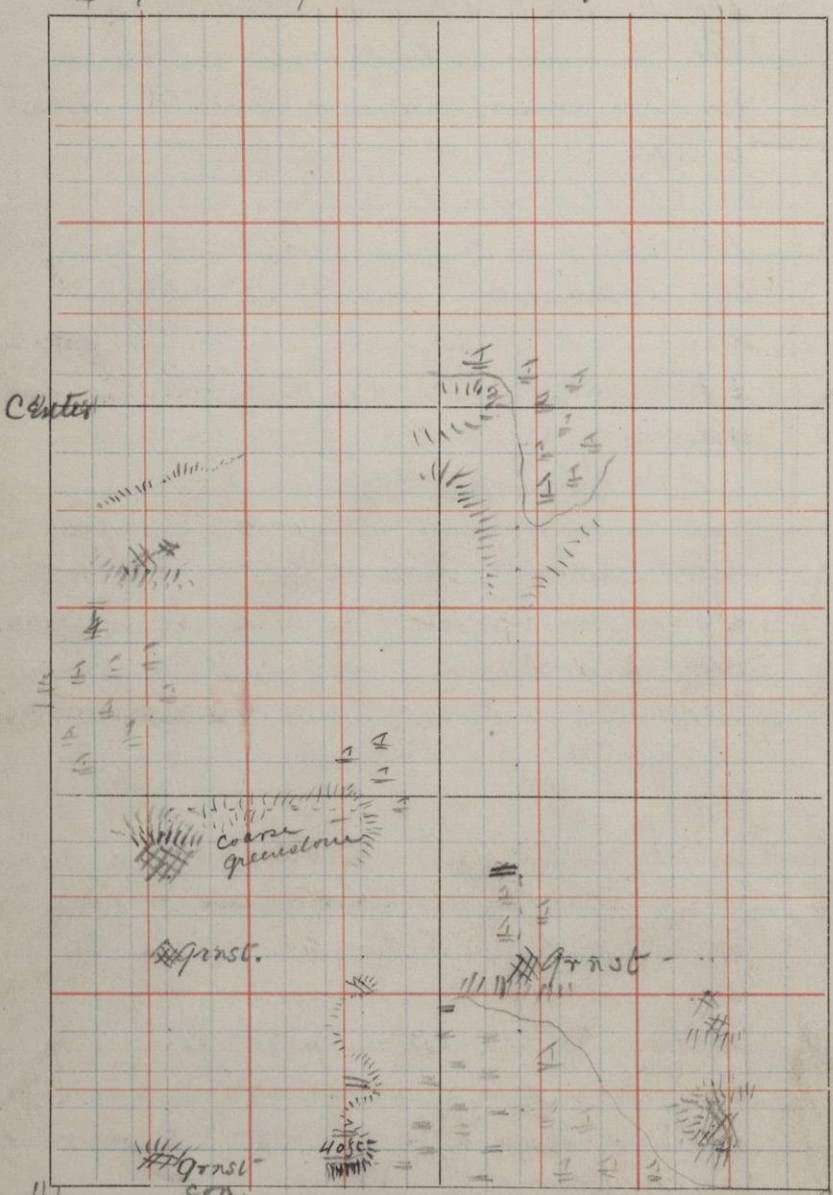
17664 475 N. 850 W. S.E. 17-47-28
Massive greenstone from large ridge running about E. & W.

17665 600 W. 250 N. S.E. 17-47-28
a more schistose phase of the conglomerate, the conglomeratic structure not being so pronounced
Strike 45° N of W. (?) Dip almost vertical

17666 600 W. 130 N. S.E. 17-47-28
The greenstone conglomerate shows in a small exposure at top of hill on west side of swamp.
Strike W. 15° N. Dip 75° S.

600 W. 100 N. S.E. 17-47-28
600 W 60 "
Exactly like 17666

D.E. 1/4 17 T. 47 R. 28



17667 1750 N. 600 W. S.E. 20-47-28
Coarse grunstone It seems to have a strike here of N. 10° E. and a dip of about 45° to the N. (?)

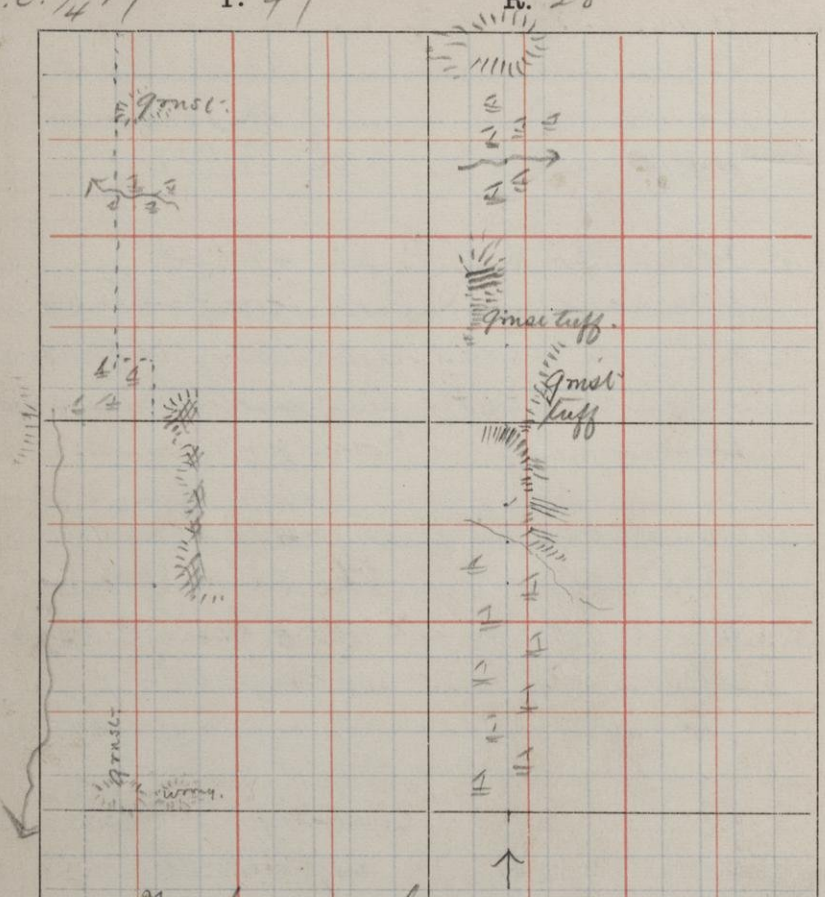
17668 1400 N. 55 W. S.E. 20-47-28
A banded rock like ~~17659~~ 17660-55-59 ~~17659-58-59~~
in fact a continuation of the same ledge as ~~17659~~ 17659 Dip and strike the same

17669 1640 N 25° W. S.E 20-47-28
Act. schist striking 20° E. of N.
About 40 steps south a small exposure strikes 40 E. of N. and dips 35° N.
The exposures are both only a few yds in area

17670 1700 N. 200 W. S.E. 20-47-28
The west end of a large range of schist similar to 17669
Strike 10° E. of N. Dip 35° N.
The banding is much contorted.
The weathered surface shows narrow lines and lines of small lense shaped areas which weather white

Corrected by GRH.
NB

N.E. 1/4 17 T. 47 R. 28



North end of this run about 50 steps too short

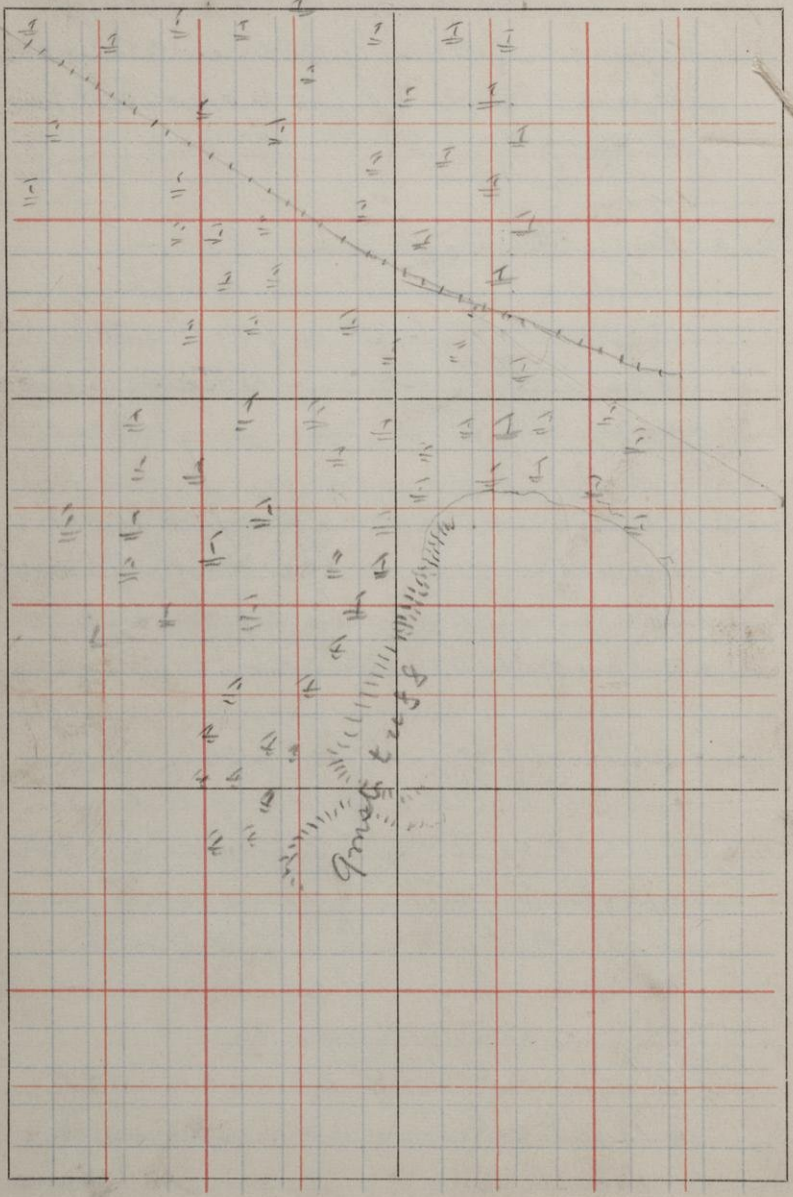
√17671 75 N. 150 W. S. E. 17-47-28
A large ledge of coarse greenstone rising about 60 feet above the swamp.

√17672 240 N. 150 W. S. E. 17-47-28
A ledge of greenstone conglomerate similar to those a few hundred steps west. The fragments are all small and the rock quite massive

400 N. 400 W. S. E. 17-47-28
Greenstone con. The strike seems to be E & W, and the dip high to the south, both are obscure.

√17673 840 N. 475 W. S. E. 17-47-28
Greenstone tuff striking a little south of west (?) Exposure small inside of bluff
740 N. 875 W. S. E. 17-47-28
The same rock show I am not sure it is in place however
This same rock shows north to 1030 when a swamp runs north to 1350

N.W. 1/4 16 T. 47 R. 28



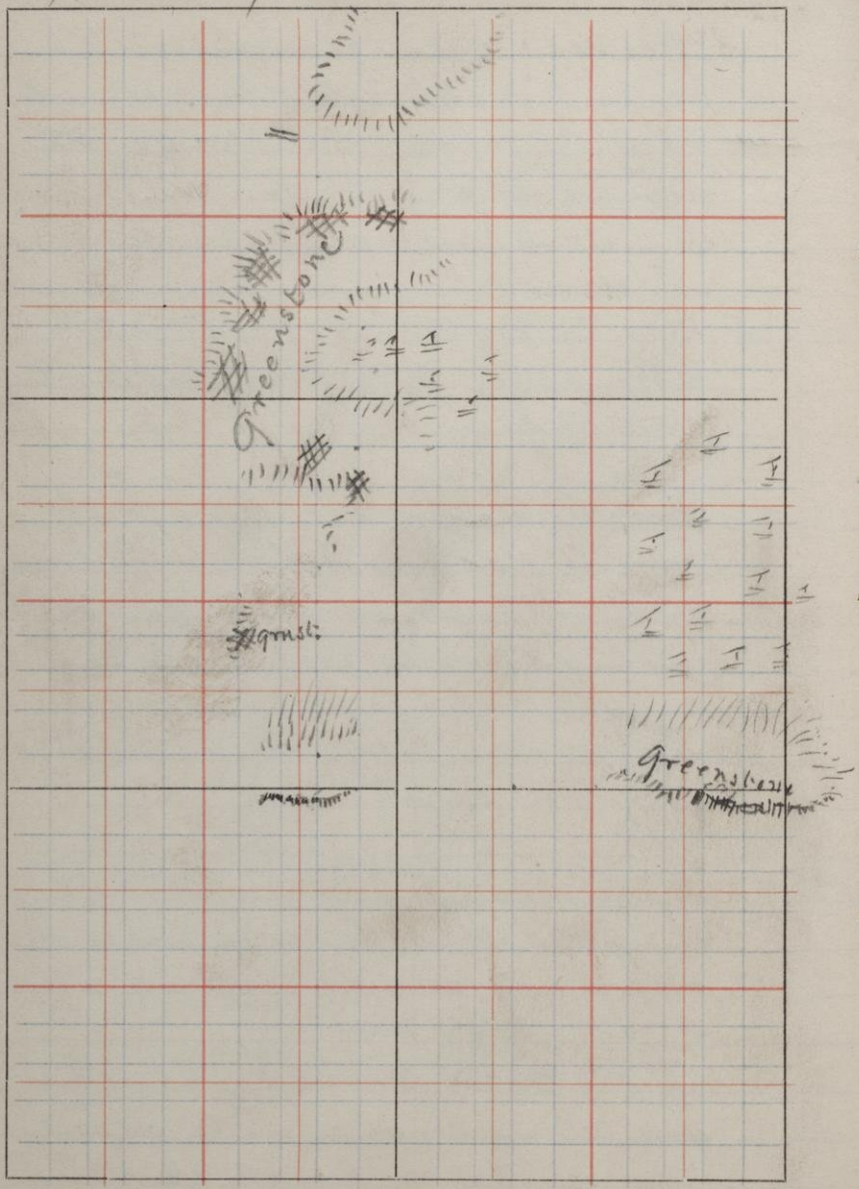
17674 1400 N. 400 W. S.E. 17-47-28
Greenstone conglomerate. The lines of fragments show plainly on this surface of this exposure running E. 20° S.
Dip about vertical

17675 1700 N. 400 W. S.E. 17-47-28
Greenstone tuff striking 20° S of W. and dipping 85° N.

17676 2000 N. 400 W. S.E. 17-47-28
A fine grained mica or chlorite schist exposed in a knob rising 30 or 40 feet above the level to the north
Strike of schistose structure N. 45 W
Dip 80° & 85° N.

17677 1400 N. 1400 W. S.E. 16-47-28
A hard rather coarse greenstone exposed in a ridge rising about 30 feet above swamp
A few feet to the south the greenstone conglomerate or tuff shows the bandings striking 25° E. of N. and dipping N.W. 70° to 75°

D.N. 1/4 16 T. 47 R. 28.



17678 1200 N. 1500 W. S.E. 16-47-28
Greenstone conglomerate or tuff

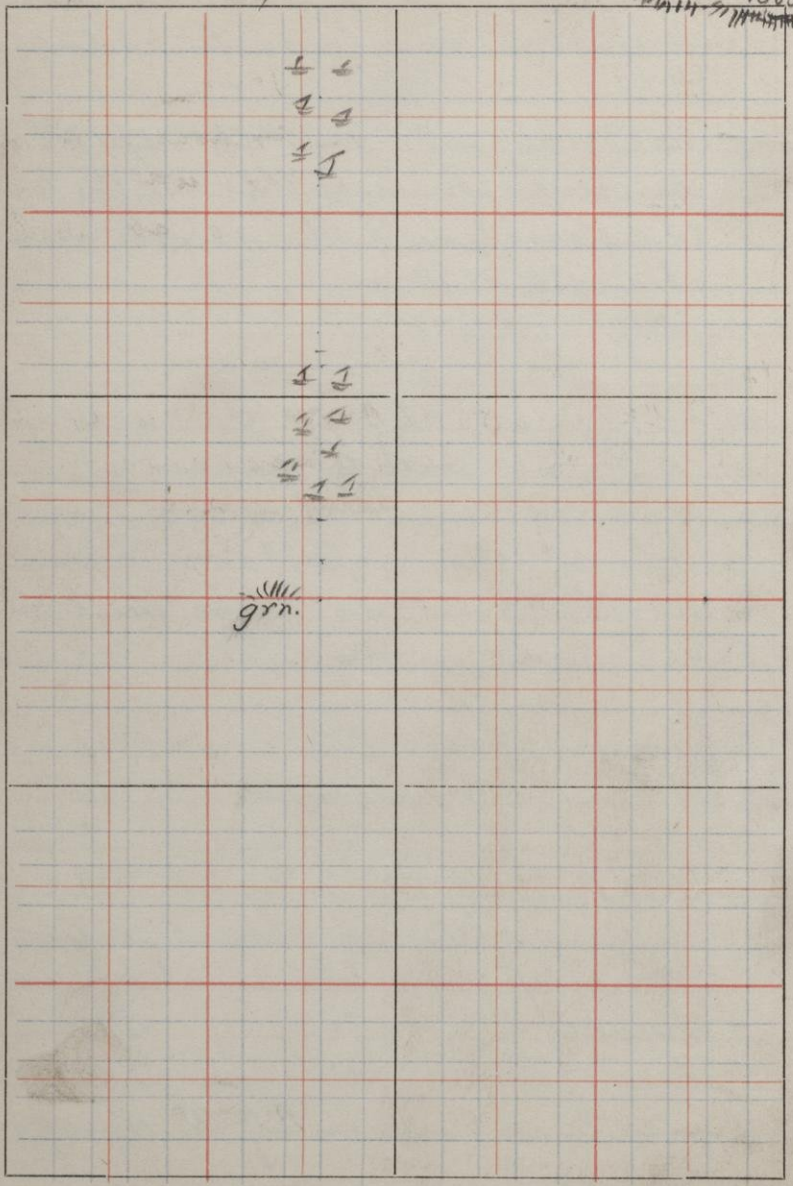
17679 950 N. 1650 W. S.E. 16-47-28
Small exposure of tuff nicely banded
the direction of the strike is here
changed to W. 10 N.
Dip 55° S.

17680 750 N. 1600 W. S.E. 16-47-28
A large knob of massive
greenstone
The greenstone tuff lies to the
north about 30 rods in low
exposures

17681 400 N. 1600 W. S.E. 16-47-28
Massive greenstone

17682 1970 N. 1600 W. S.E. 21-47-28
A large ledge of schist rising
abruptly from the south to a
height of 750 or 800 ft. It is
exactly like that to the west
Strike in general N. of W. a few degrees
Dip 65° N.
South of this the country is low and

N. W. 1/4 21 T. 47 R. 28



flat as far as the river

17683 1240 N. 1650 W. S.E. 21-47-28
Pink granite in an exposure 20 or 20 feet high just south of swamp
The granite seem to run about E & west along here

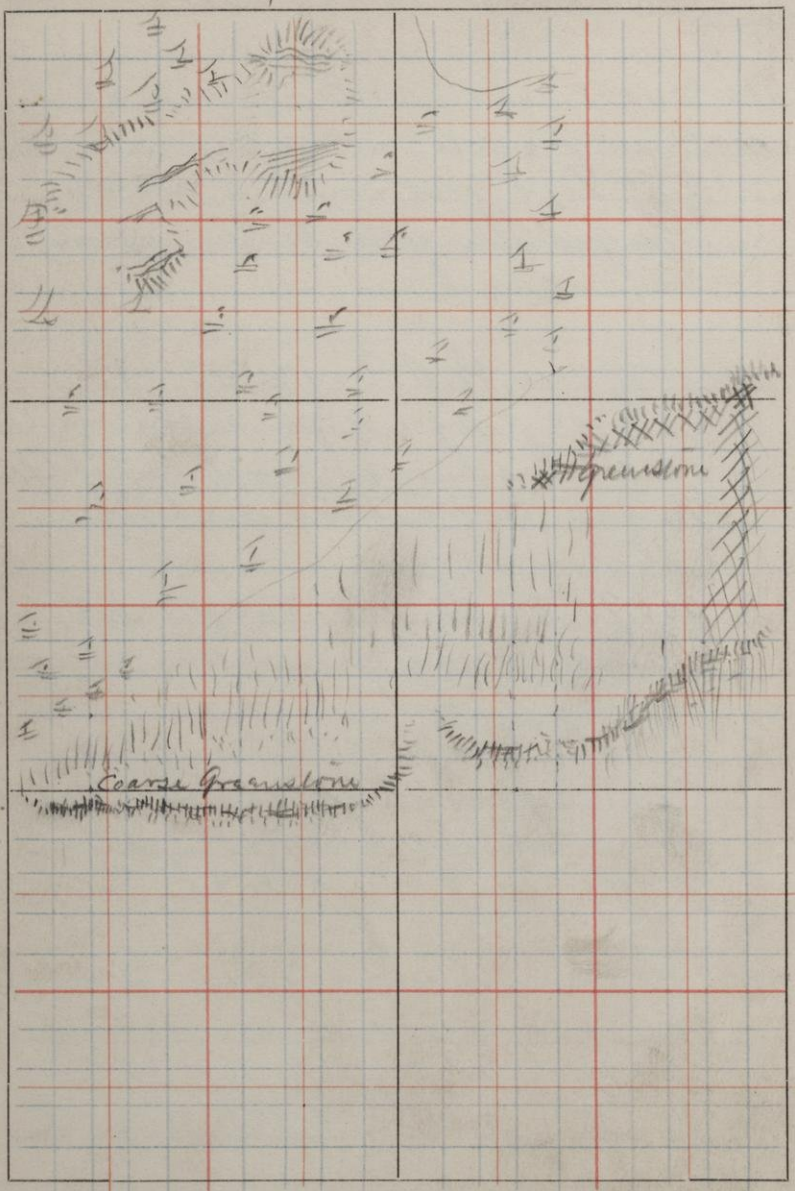
17684 00 N. 1100 W. S.E. 16-47-28
A large ridge of greenstone fully 100 ft high running a little N. of W. for a long distance

17685 200 N. 800 W. S.E. 16-47-28
Same large greenstone range

17686 1300 N. 600 W. S.E. 16-47-28
Coarse greenstone, the same rock shows also a short distance to the west and to the north

17687 1150 N. 600 W. S.E. 16-47-28
A highly banded much contorted schist The general strike is 20° N. of W. Both N. and S. dips were observed

S.E. 16 T. 47 R. 28



950 N. 600 W. S.E. 16-47-28
✓ A high knob of schist - vaulty like
17687 prevailing dip is to the N.
17688 The strike on the south side of this
knoll (850 N) is N 25 E. The bandings
here being quite regular
Dip to north at high angle 65-70°

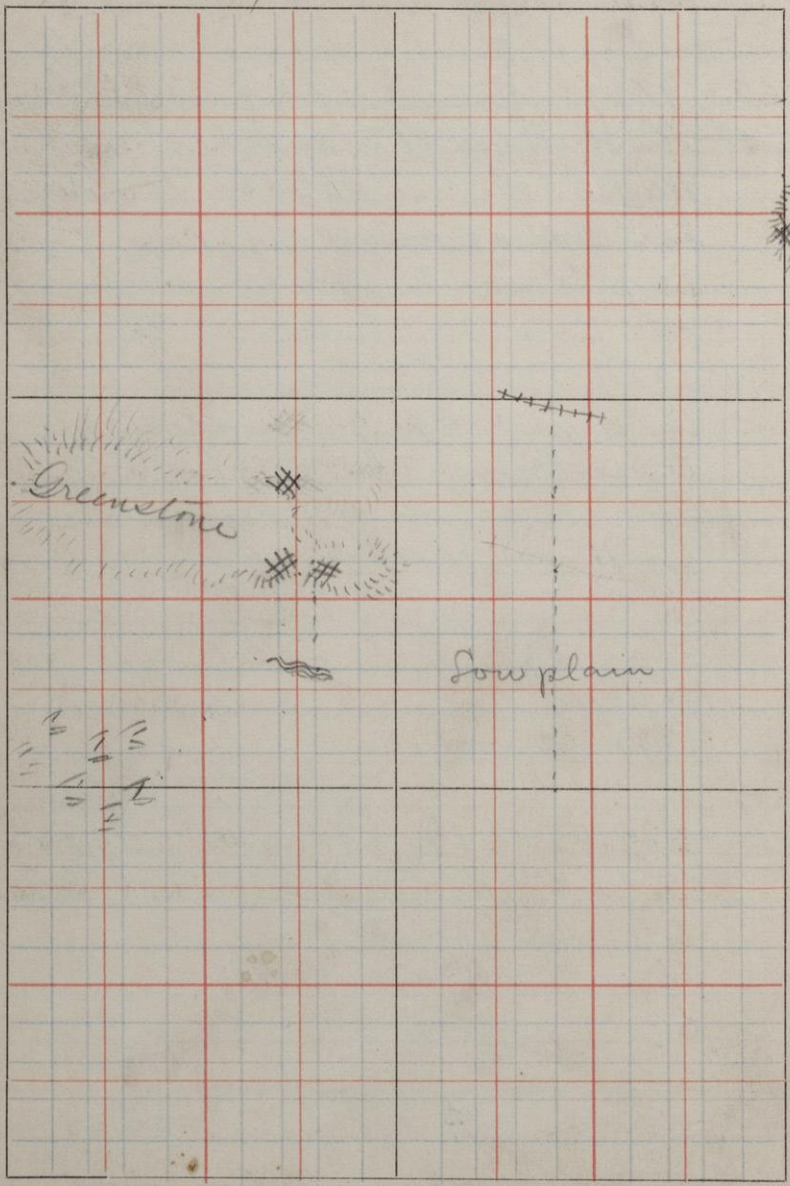
✓17689 525 N. 350 W. S.E. 16-47-28
A large ledge of greenstone. A con-
tinuation of that to the S.W

✓17690 600 N. 1000 W. S.E. 16-47-28
Greenstone somewhat finer grained
than that to the south west but
exposed in the N.E. continuation of
that range

✓17691 300 W. 470 N. S.E. 15-47-28
A low ledge of somewhat schistose
greenstone

✓17692 640 N. 1840 W. S.E. 23-47-28
A low ledge of grey granite
300 steps N.W. the granite shows again
in low outcrop
900 N. 1650 W. Drill hole, said to

N.E. 1/4 16 T. 47 R. 28



Strike a few feet of ore

17693 780 N. 1170 W. S. E. 14-47-28
An. Act. Sch. (?) in large exposure of finely banded rock. Like some of the schist taken farther west
Strike E. & W. Dip N. 55°

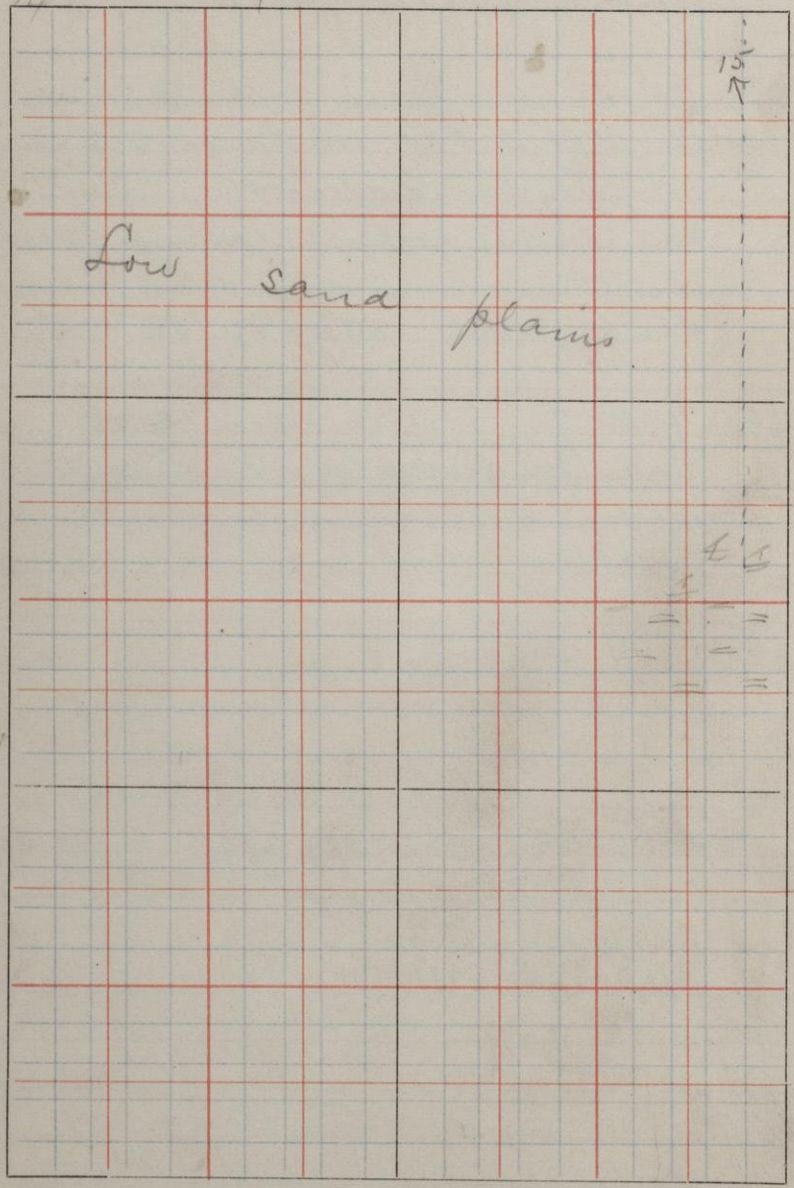
17694 700 W. 750 N. S. E. 14-47-28
Massive greenstone rising in a knob 50 to 60 feet above swamp to south

17695 750 W. 400 N. S. E. 14-47-28
Low ledge of massive greenstone

17696 40 N. 1710 W. S. E. 5-47-28
Schistose greenstone (?) in knob rising 30 or 40 feet above general level
Strike E. & W.
Dip 70 S.

17697 40 N. 1580 E. S. E. 5-47-28
From east end of above knob.

N.E. 1/4 21 T. 47 R. 28



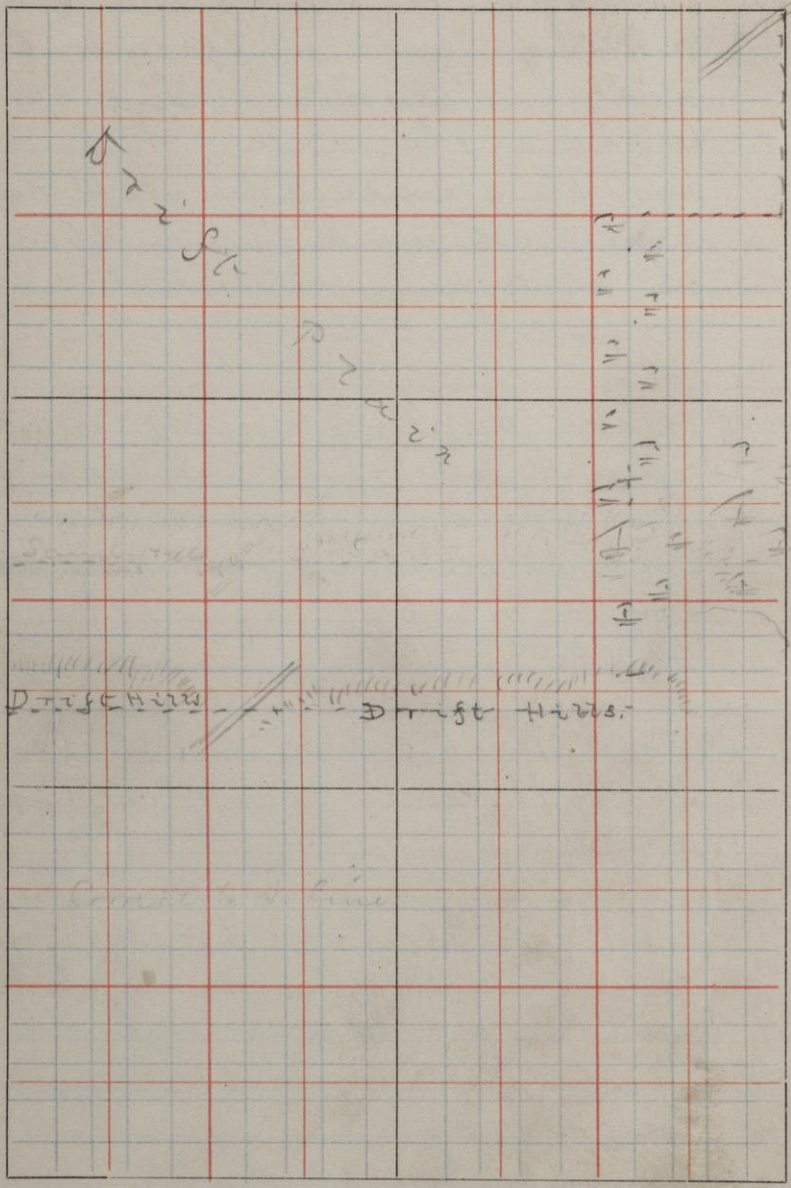
The hills in the N.W. ¼ S.W. 5-47-28 do not show rock in place but from the numerous slate fragments as well as the strike of the hills and the position of the slate to the west lead me to think that the slate runs through to this point.

17698 1410 W. 1340 N. S.E. 5-47-28
A small outcrop of black slate like that found to the west. It contains a large quantity of pyrite
Strike E. 20 S.
Dip 85° N.

17699 800 N. 1350 W. S.E. 32-48-28
From the south face of northern granite

17700 800 N. 1185 W. S.E. 32-48-28
Dike about 25 ft. wide in the granite. It stands about vertical
17701 3 inches from contact with granite
17702 At contact
17703 Granite from contact

N. M. 22 T. 47 R. 28



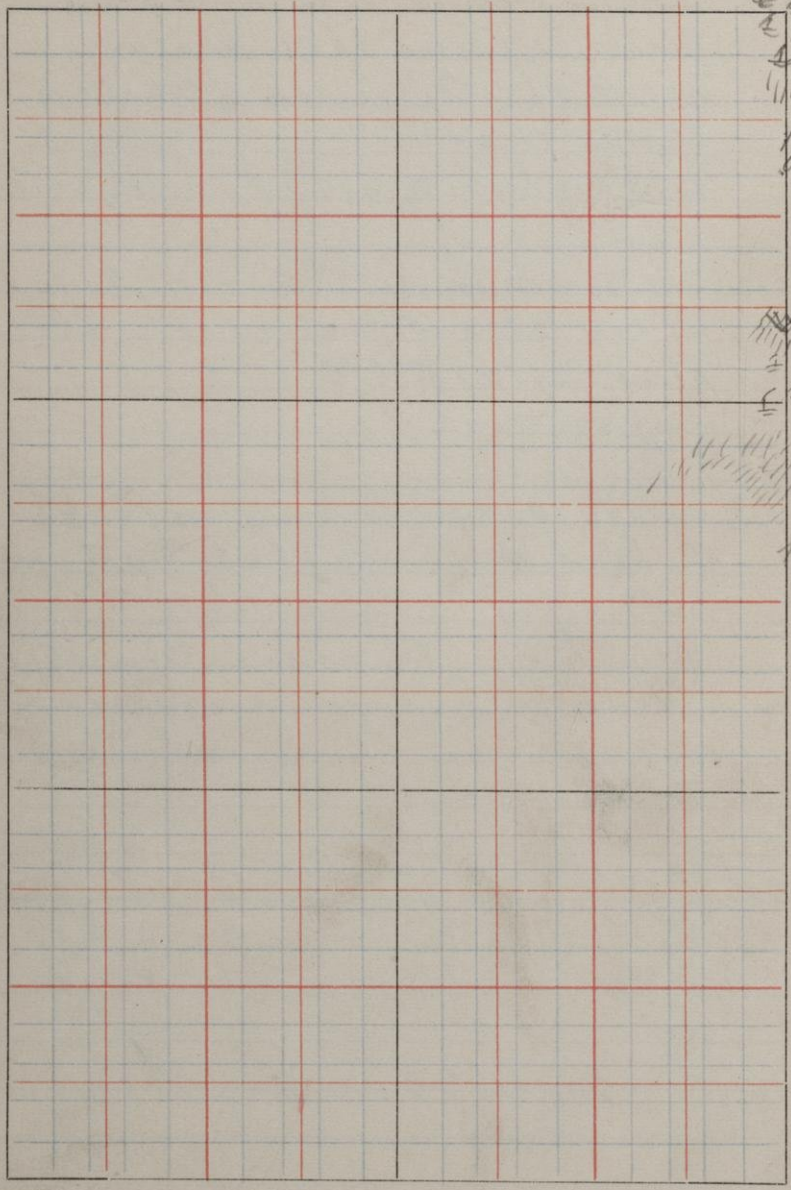
17704 1800 N. 580 W. S.E. 5-47-28
Quartzite like that overlying the ore at the American Mine
Strike E. 20 S.
Dip very high to south (nearly vertical)

17705 900 N. 580 W. S.E. 5-47-28
A low edge of fine black slate striking 20 S of E.
Dip vertical

17706 500 N. 900 W. S.E. 5-47-28
A high knot of slate striking 25 N. of W. Dip vertical
One of the triangulation stations
From the strike it appears to belong with the graphitic slate to the west

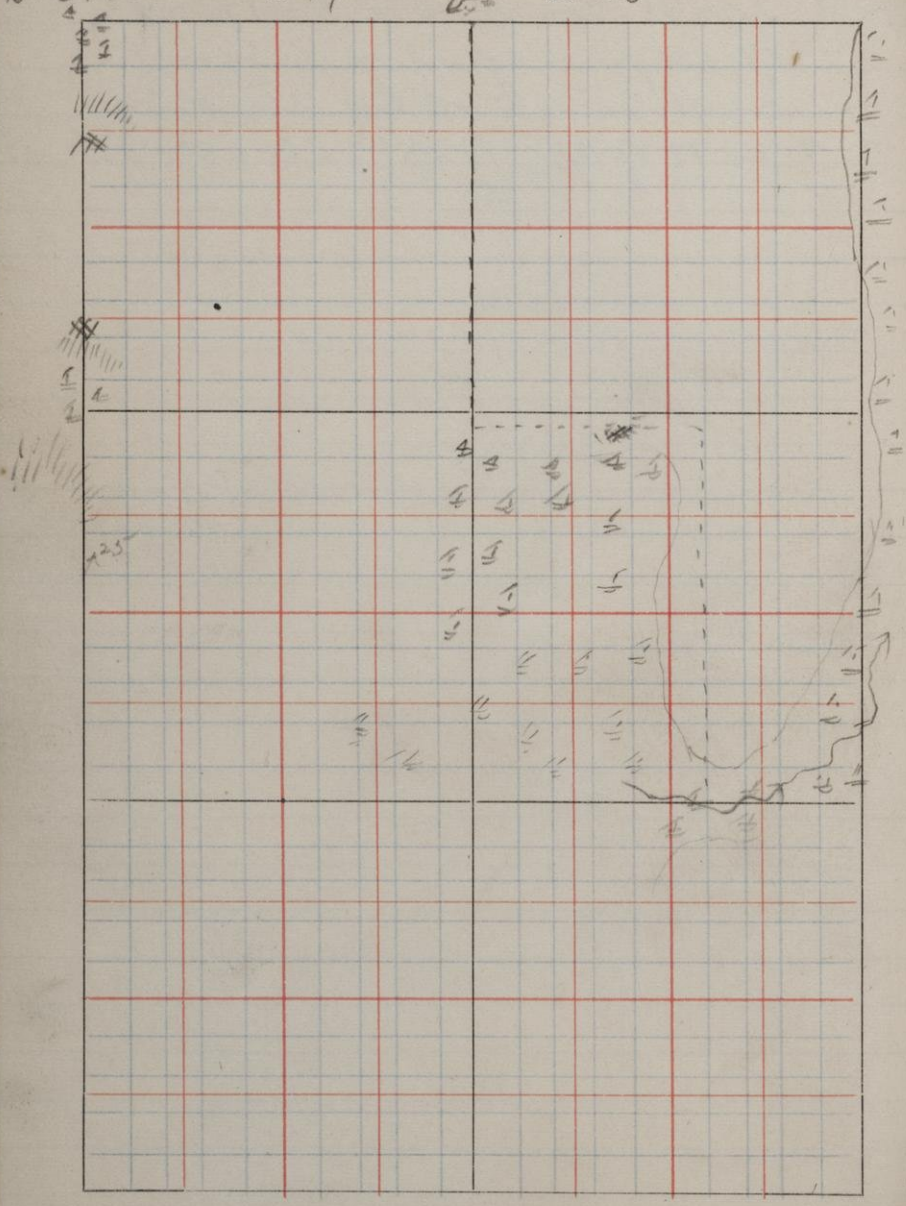
17707 700 W. 00 N. S.E. 5-47-28
Knob of slate about 20 ft high
Slate is exposed on the south side
Strike W. 20 N. Dip 50 N.

P.W. 15 T. 47 R. 28

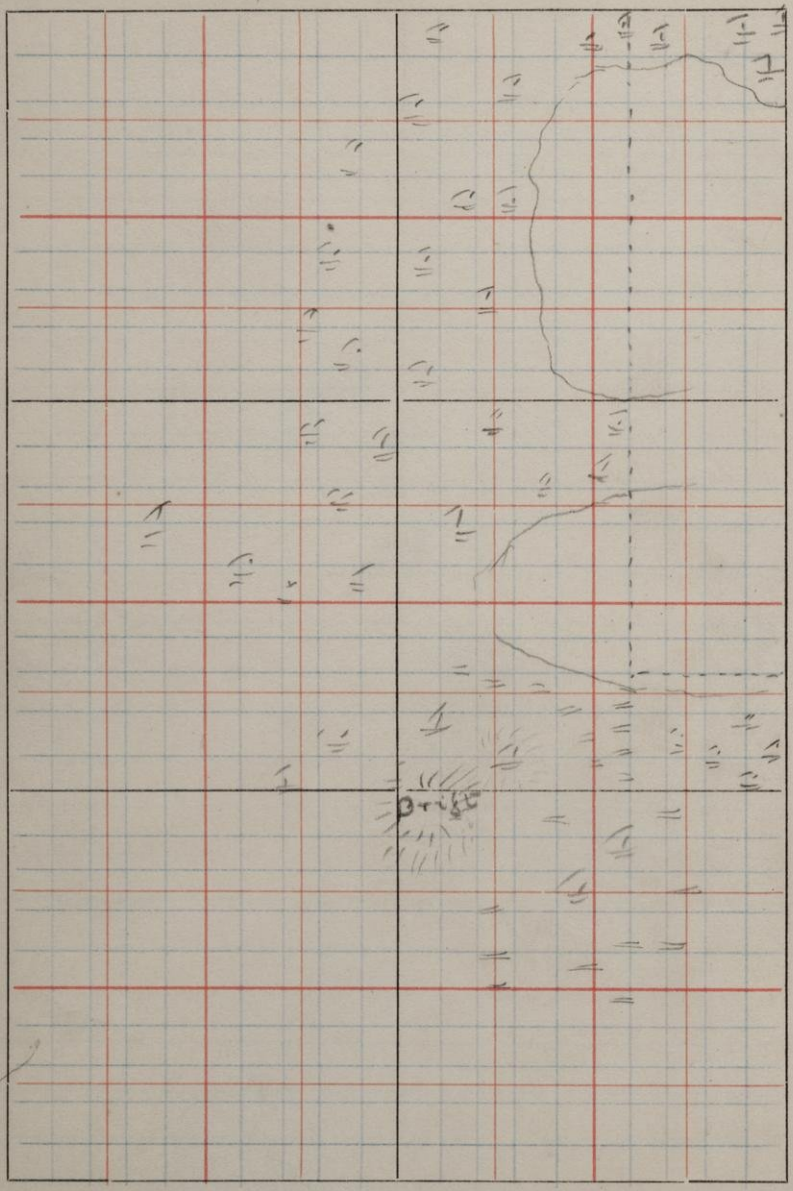


√17708 1000 N. 800 W. S.E. 8-47-28
a large ridge of greenstone
conglomerate & tuff striking
20 N of W Dip 70 to 75° N.

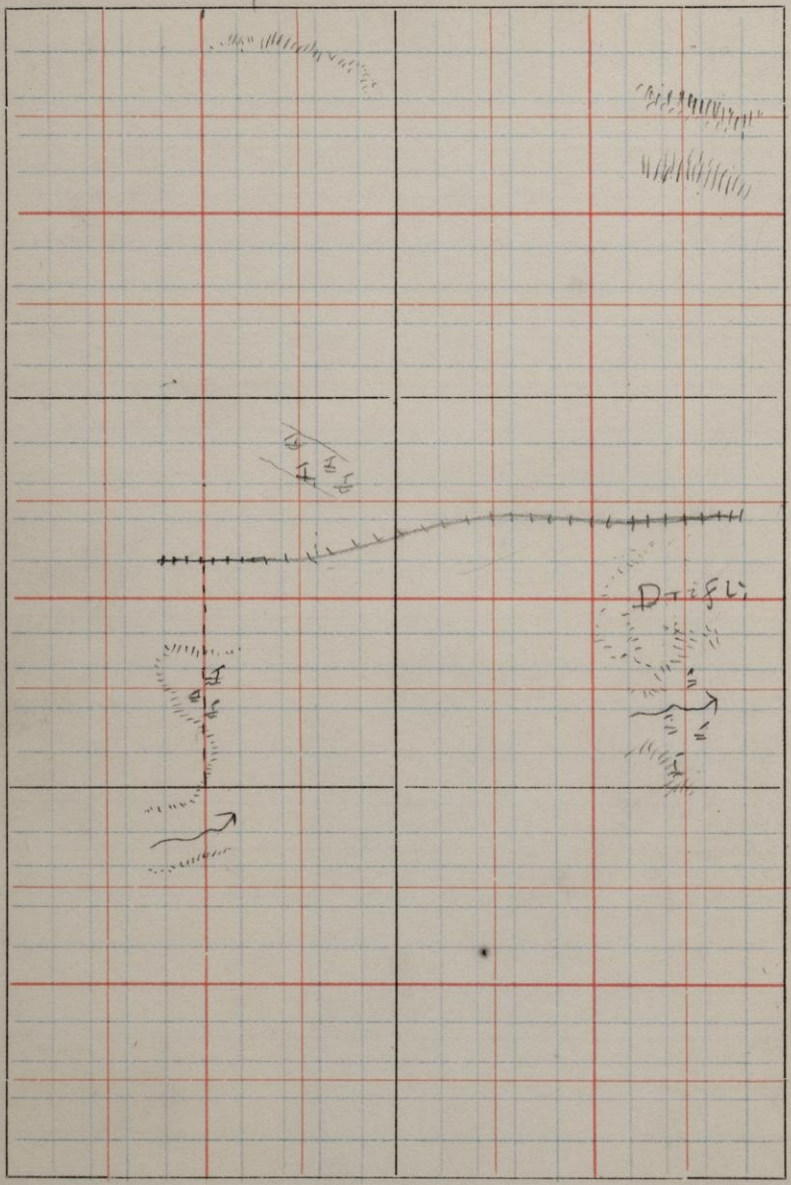
N. E. 15 T. 47 R. - 28



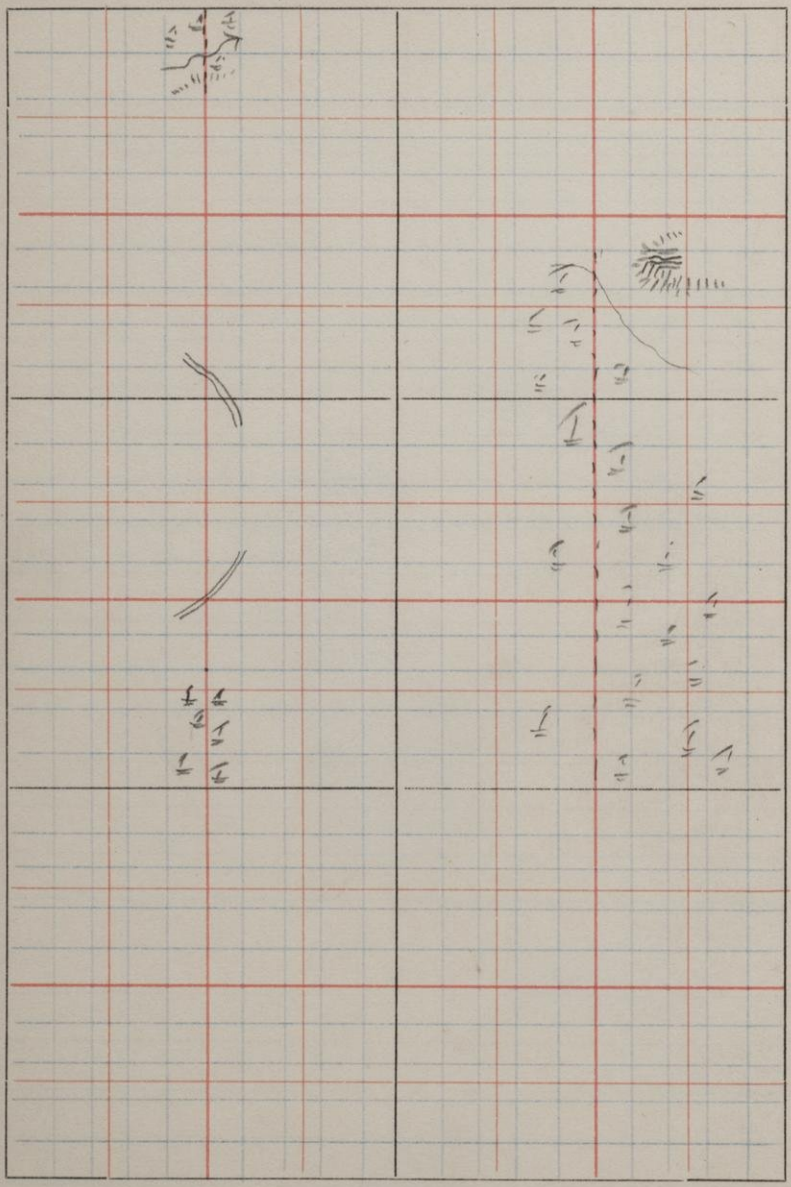
N. E. 22 T. 47 R. 28



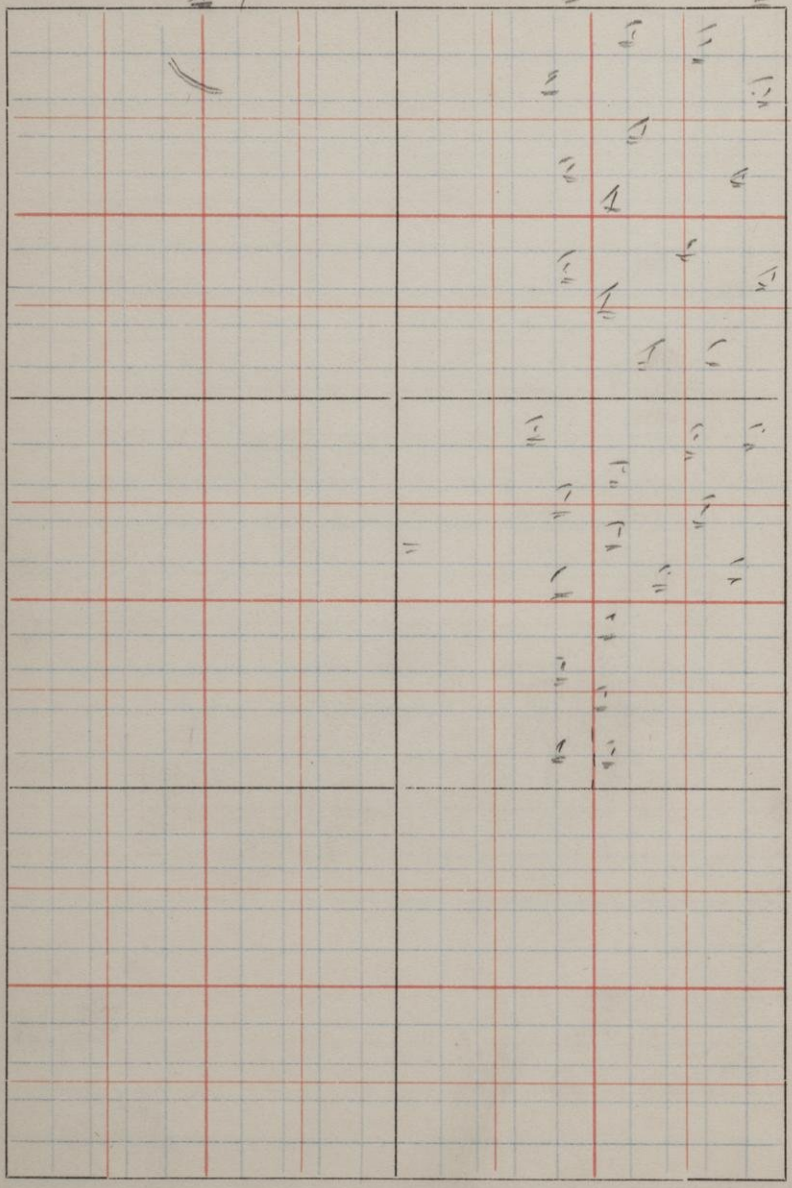
N. M. 14 T. 47 R. 28

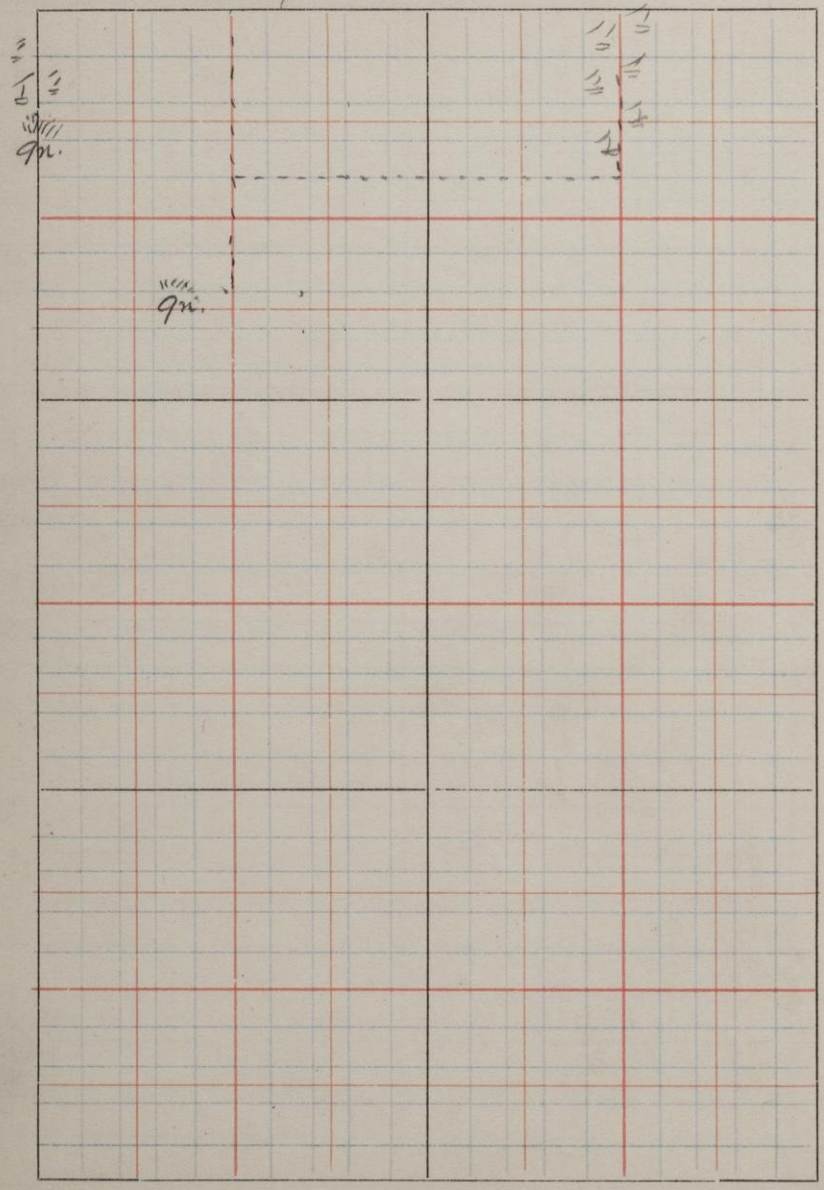


D. M. 14 T. 47 R. 28

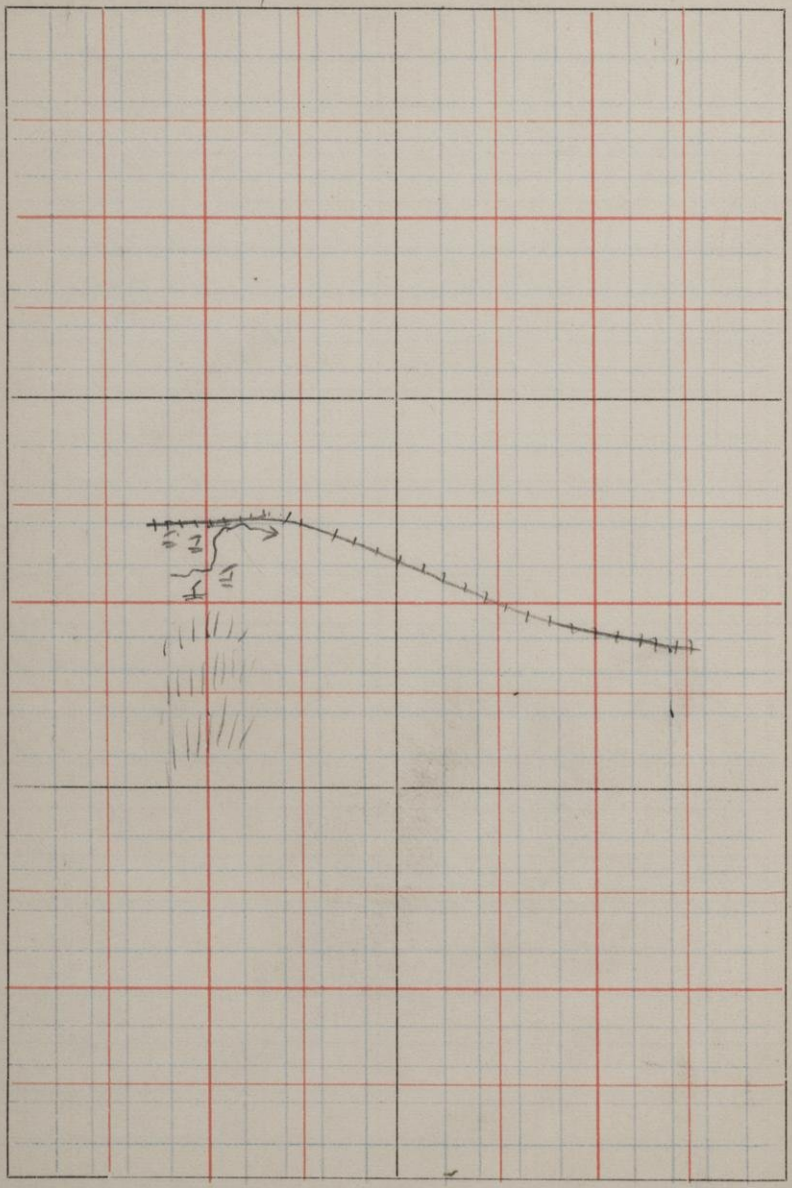


N. M. 23 T. 47 R. 28

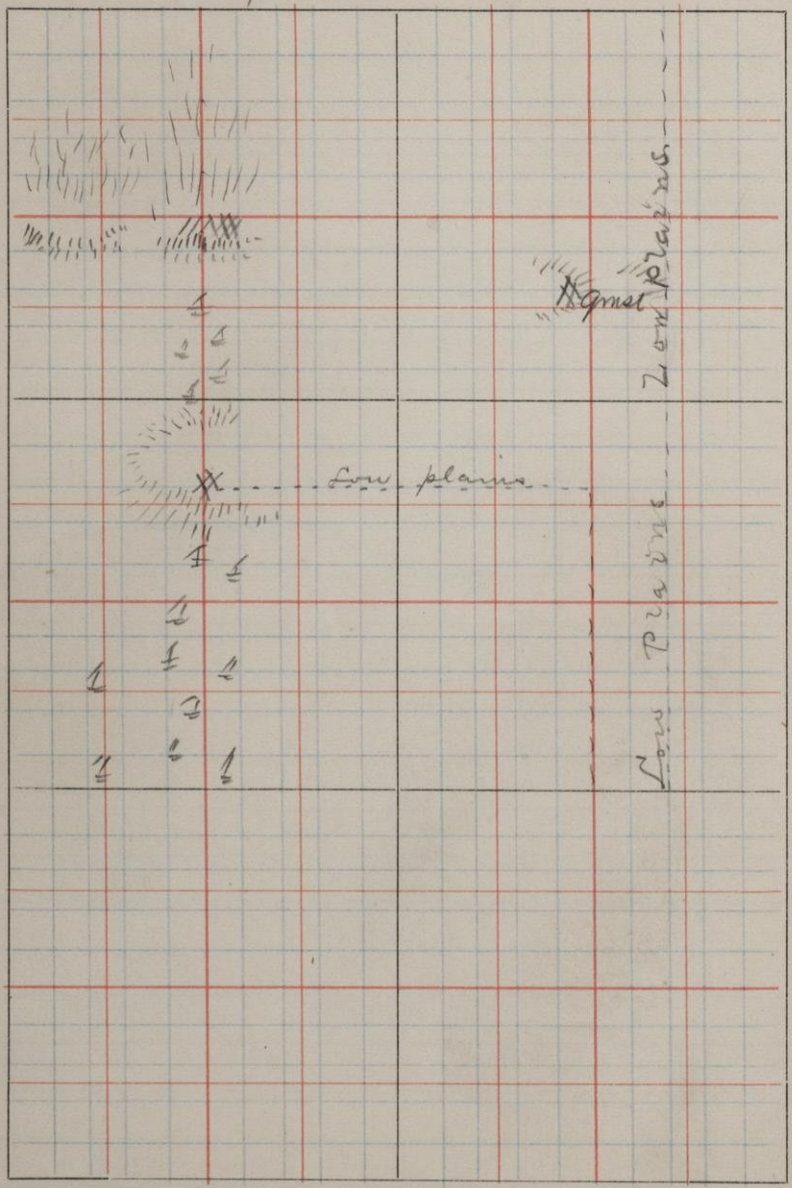



N. W. 23
T. 47
R. 20
9n.
9n.

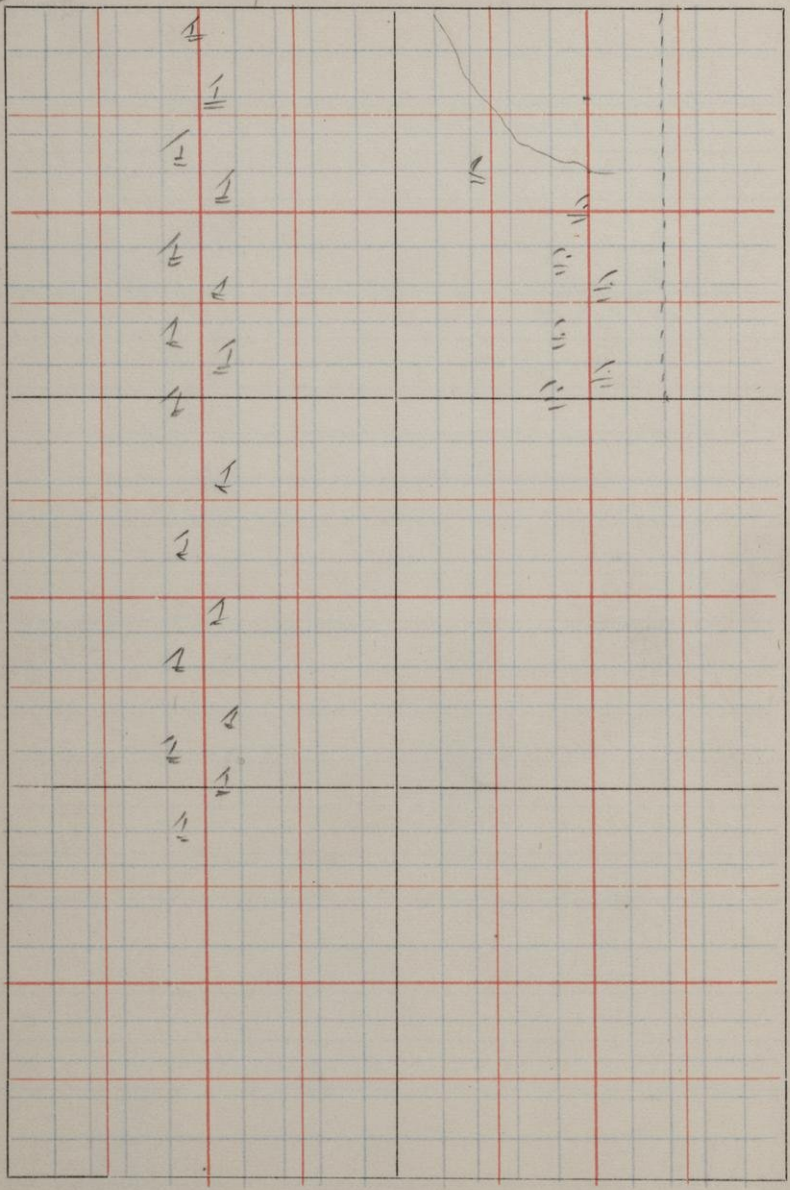
N. E. 14 T. 47 R. 28



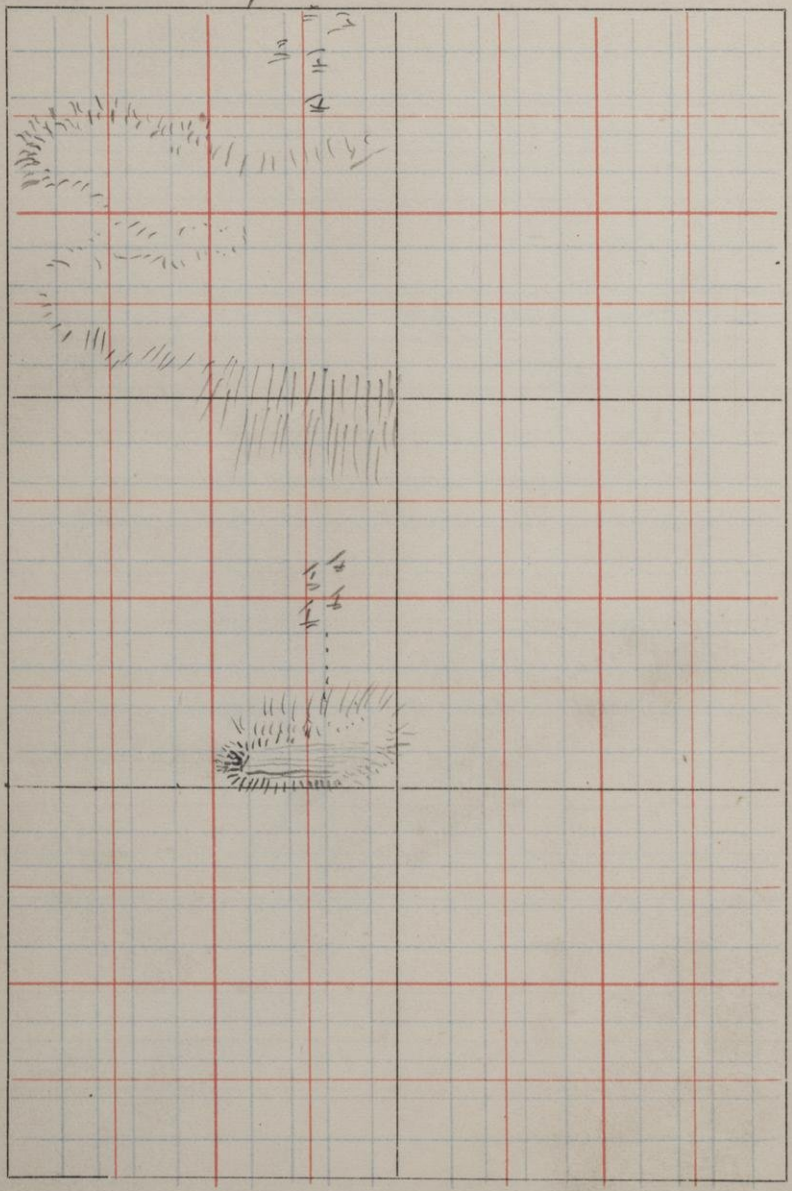
P. E. 14 T. 47 R. 28



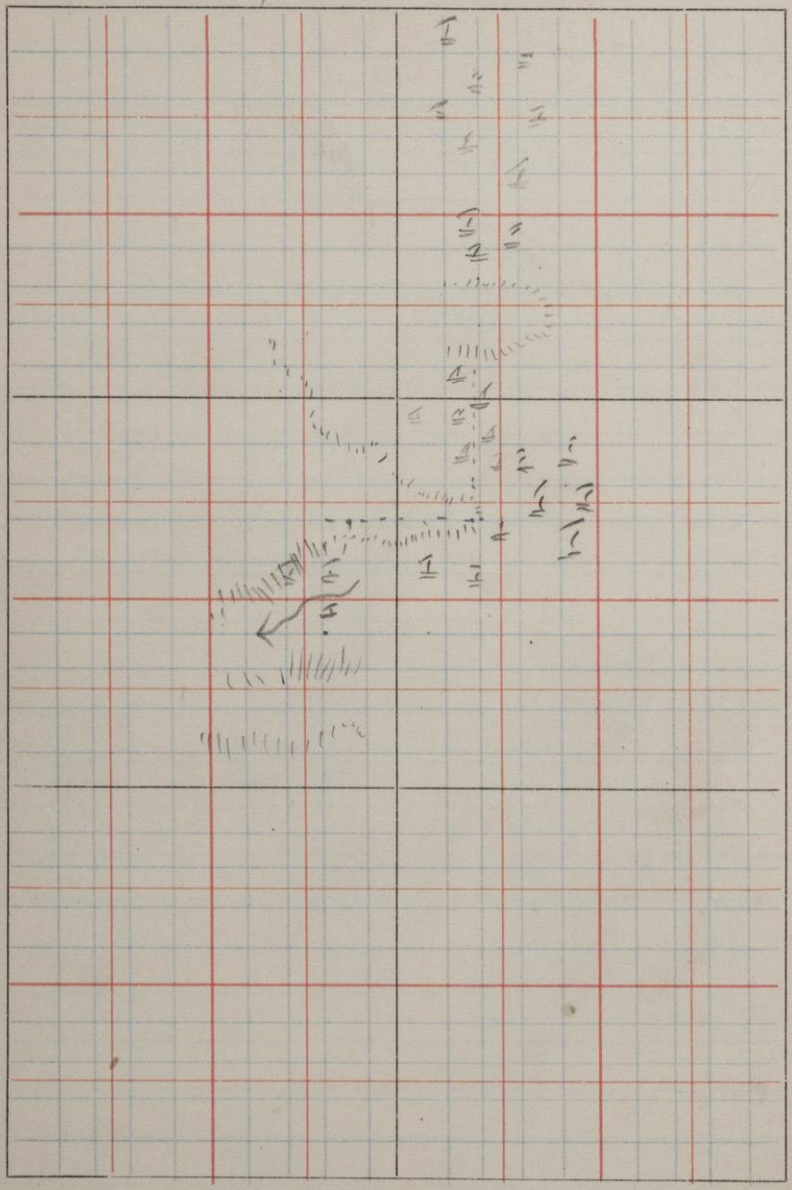
N. E. 23 T. 47 R. 28



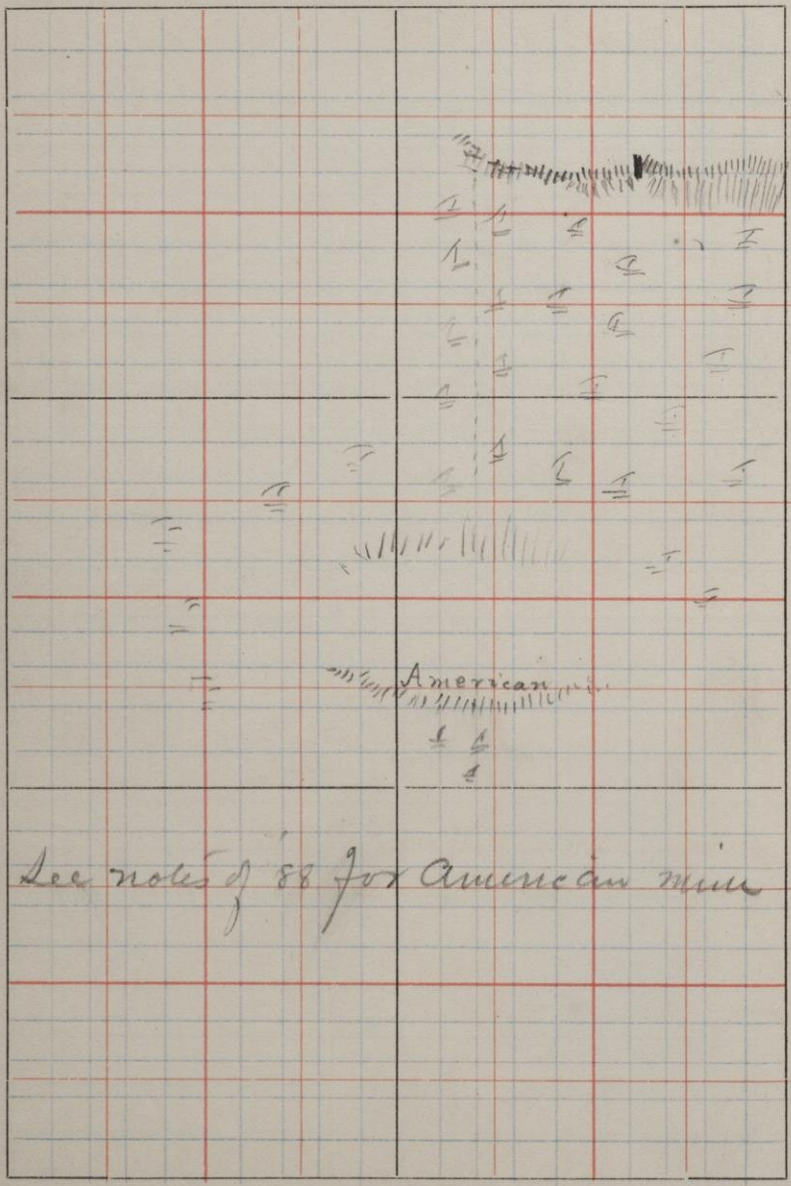
D. N. Sec 5 T. 47 R. 28



N. M. 5 T. 47 R. 28

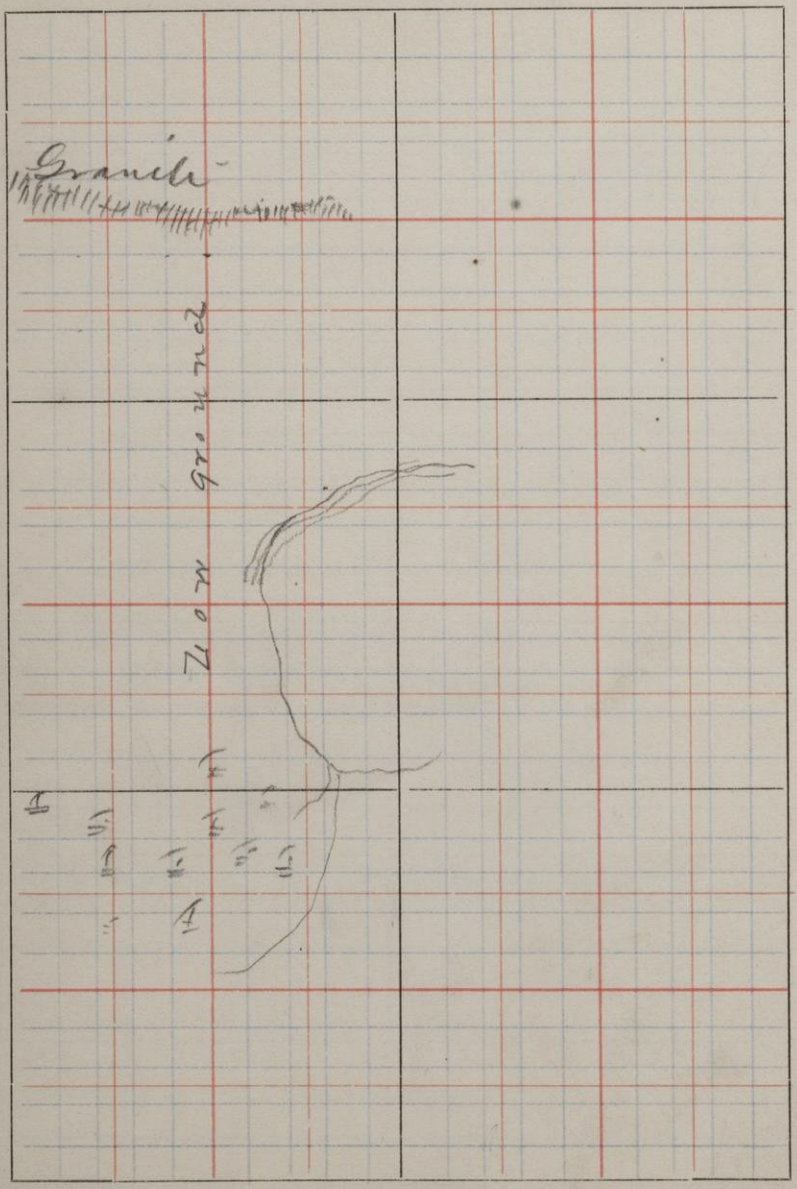


N. H. 32 T. 48 R. 28

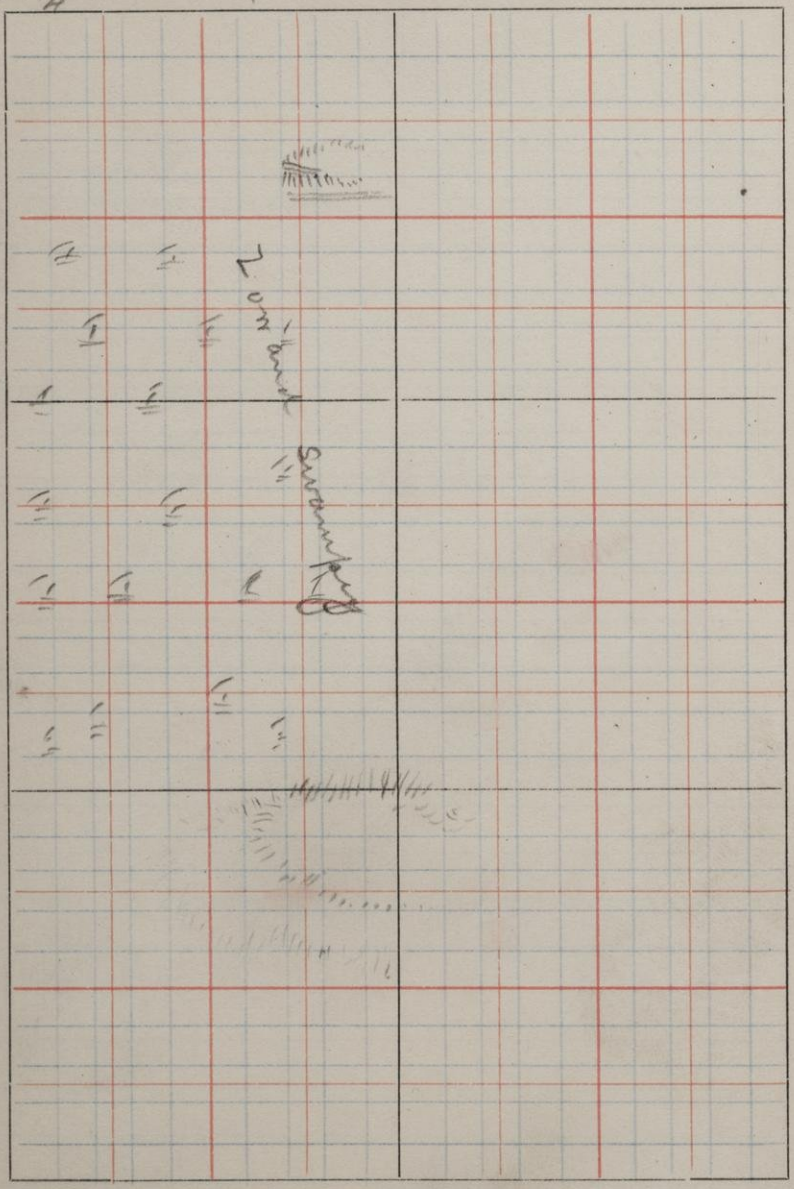


See notes of 88 for American mine

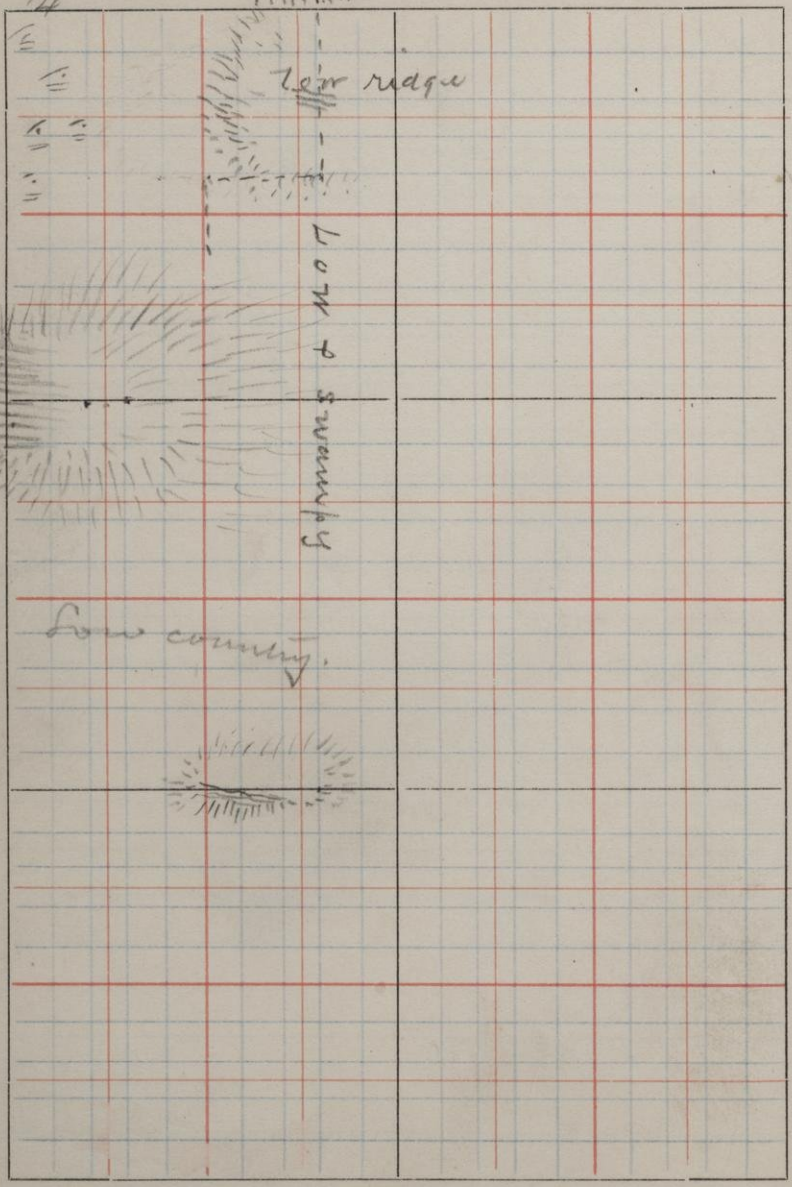
S.E. 32 T. 48 R. 28



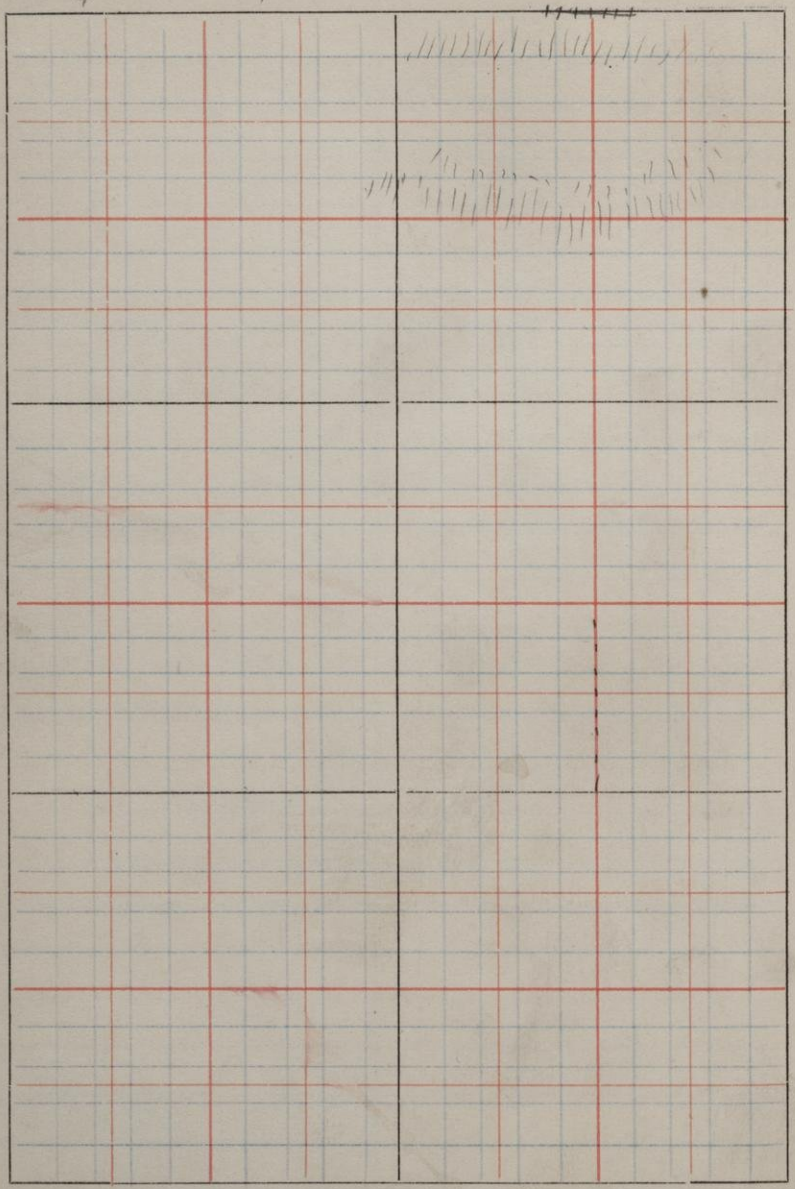
N. E. 1/4 S. T. 47 R. 28



S.E. 1/4 S. T. 47 R. 28



N. W. ¼ of T. 47 R. 28



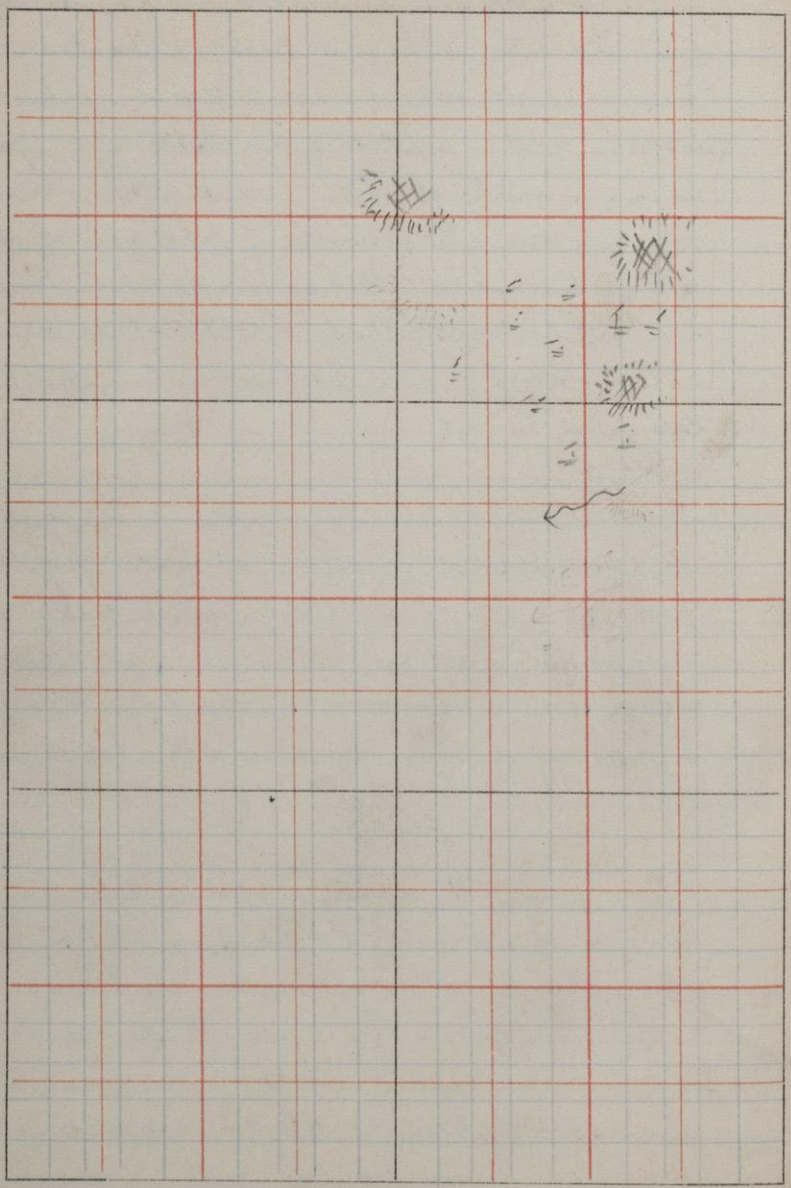
No exposures were noted in the N.W. 1/4 of 4-47-28 The surface is all low and level except one small ridge in the north side which from test pits seems to be mostly drift. It is however about on the strike of the quartzites of the American Mine and those to the east.

The S.W. 1/4 of 4-47-28 is nearly all swamp; the portion not swamp is low and level

17709 47°N. 120° W. S.E. 33-48-28
A granite from round knob rising 25 or 30 feet. The large granite ridge which has been running so prominently E & W. breaks down here into lower rounded knobs.

17710 490 N. 250 W. S.E. 33-48-28
From a large dyke in the granite. The granite at this point is in low knobs and the dyke seems to run north and south through them. Only one actual contact was seen but from the relative positions of the rocks

D. H. Sec 33 T. 48 R. 28



and from the nature of the gneiss at the contact, it being here much finer grained and schistose, it is taken to be a dike. In one place it includes a fragment of the granite 4 or 5 ft. in length. Small granitic veins were also noted in it. About 50 steps west the same rock and granite are in contact although the actual line of contact is covered. It may be that this is the line of junction between these serpentine rocks and the granite instead of a dike. If so the serpentine seems to be the later formation.

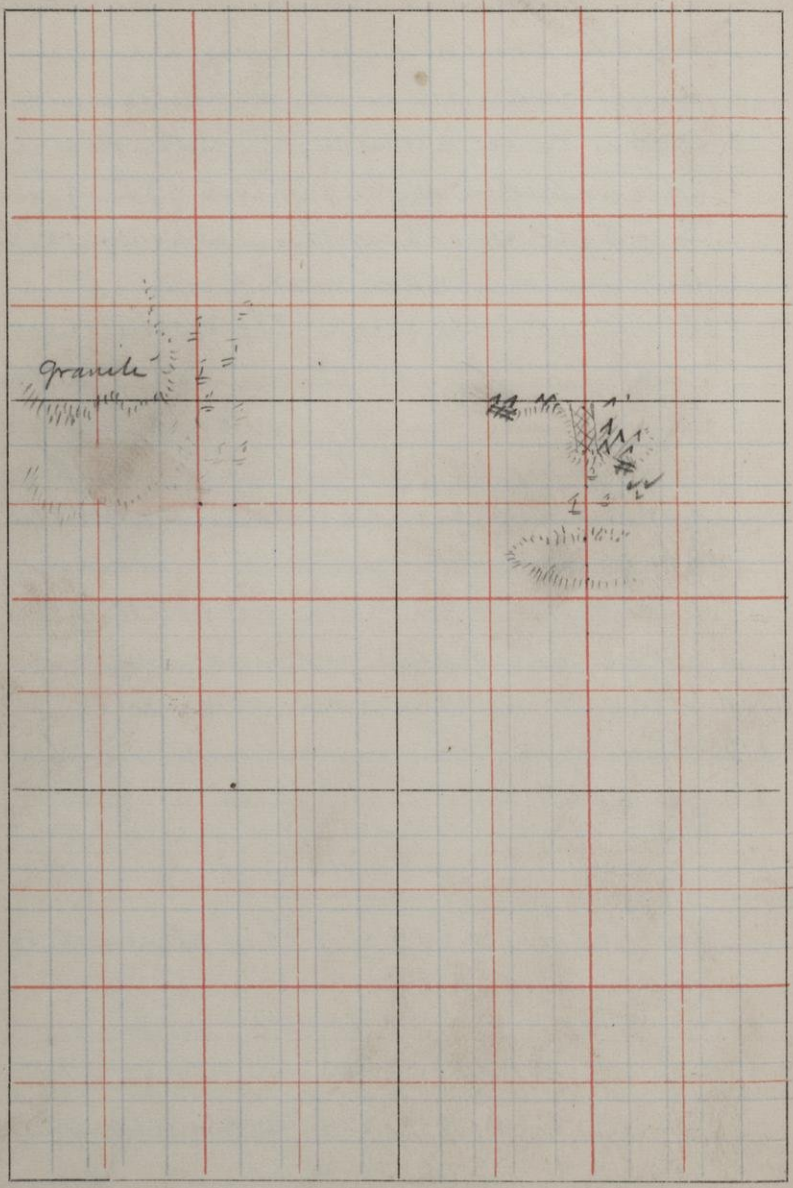
✓17711 Near contact with granite

✓17712 From granite fragment in the gneiss

✓17713 325 N. 220 W. S.E. 33-48-28
A large ridge of this gneiss running E & W.

✓17714 From a vein about 12 inches wide in 17712 wall sharply defined with a distinct schistose structure in the gneiss

S. 2 33 T. 48 R. 28



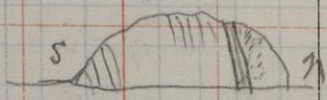
17715 1825 N. 500 W. S E. 4-47-28
Slate from last pit
Dip about 55° S. of slaty cleavage

17716 These rocks were taken in order
17717 from S. to N. across a small knob
17718 in the S. E. of S. E. 4-47-28
17719 The south side of the ridge is
1400 N. S. E. 4 The strike
is about E & W. a little N of W
if anything Dip high N work
for the first time in these
quartzites

17720 1570 N. 1400 W. S. E. 3-47-28
17721 A ledge of Lean banded ore
chert & jasper This is the first
exposure of these iron rocks seen
Strike W 10 N.
Dip vertical

17722 1400 W. 150 N. S. E. 34-48-28
A ledge of rock similar to 17713
This rock is exposed at intervals
to within a short distance
of the granite

N.E. 4 T. 47 R. 28



√17723 720 N. 1440 W. S.E. 34-48-28
A small granite ledge on west side of road

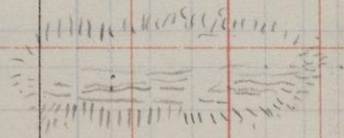
√17724 600 N 1240 W S.E. 34-48-28
Same serpentine rock exposed on south side of road. Explorations for gold made here

√17725 600 N. 1200 W. S.E. 34-48-28
Iron dike about 2 ft wide in the serpentine rock(?)

√17726 1340 N. 1050 W. S.E. 3-47-28
Ore from the West shaft of the Dexter Mine

√17727 Quartzite about 15 ft south of above shaft. South of this shaft the Quartzite is exposed in a high knob in large fine exposures
Strike 15° S. of W.
Dip 50° N.

N.W. 3 T. 47 R. 28



The S. W ¼ of 3 is all low level ground Road crosses 50 rods west of the S. ¼ post

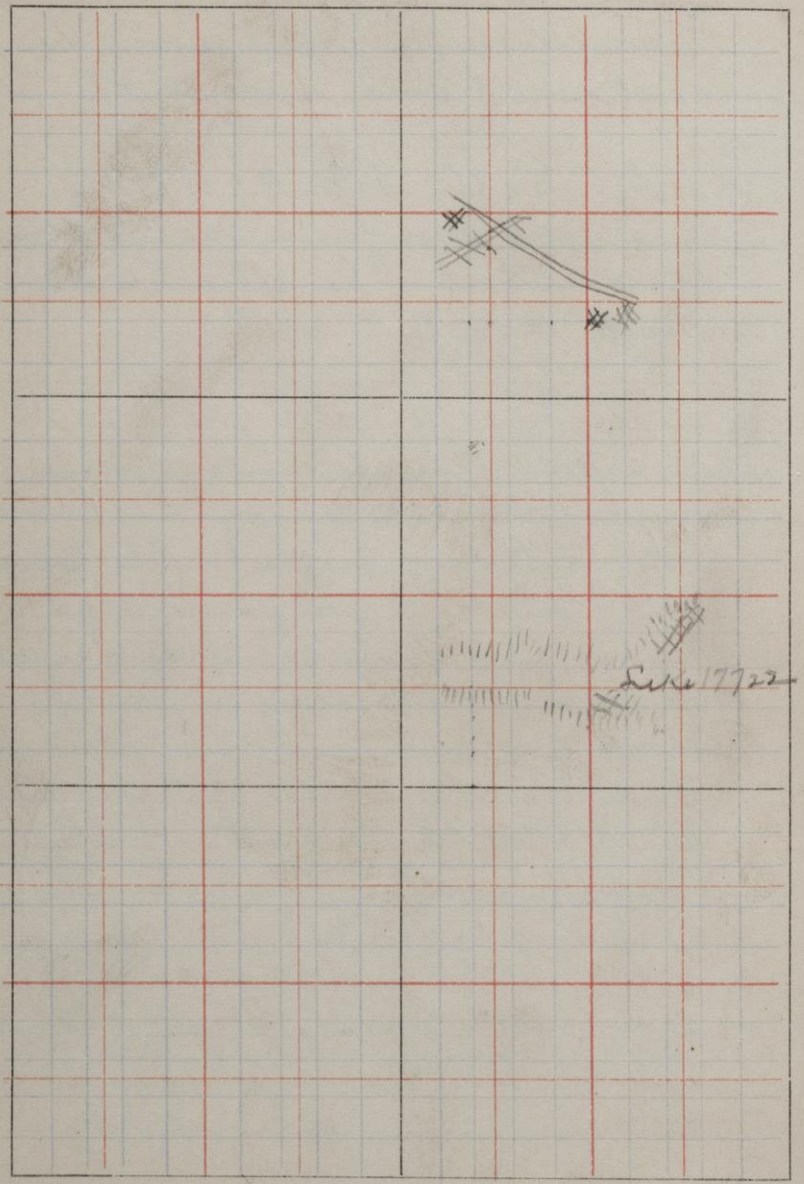
17728 1720 N. 00 W. S.E. 16-47-28
A small ledge of greenstone on east side of north and south ridge

17729 100 N. 250 W. S.E. 9-47-28
A coarse band in the black slate series. The strike is 20° N. of W. (Mag) Dip N.

17730 125 N. 1450 W. S.E. 10-47-28
17731 A ledge of slate and quartzite on the south slope of high bluff. This I think is the south limit of the slates both from the topography of the country as well as from the quartzite which seems to occur near the south limit of the slates in several places to the west.
Strike 20° N. of W.
Dip high to N.

17732 1200 N. 1100 W. S.E. 15-47-28
Strike E. & W.
Small ledge just N. of Ry.

N ½ 34 T. 48 R. 28



17733 1150 N. 1430 W. S.E. 15-47-28
A small ledge of greenstone exposed in Ry. cut.

17734 E. & W. Corner Sec 11-47-28

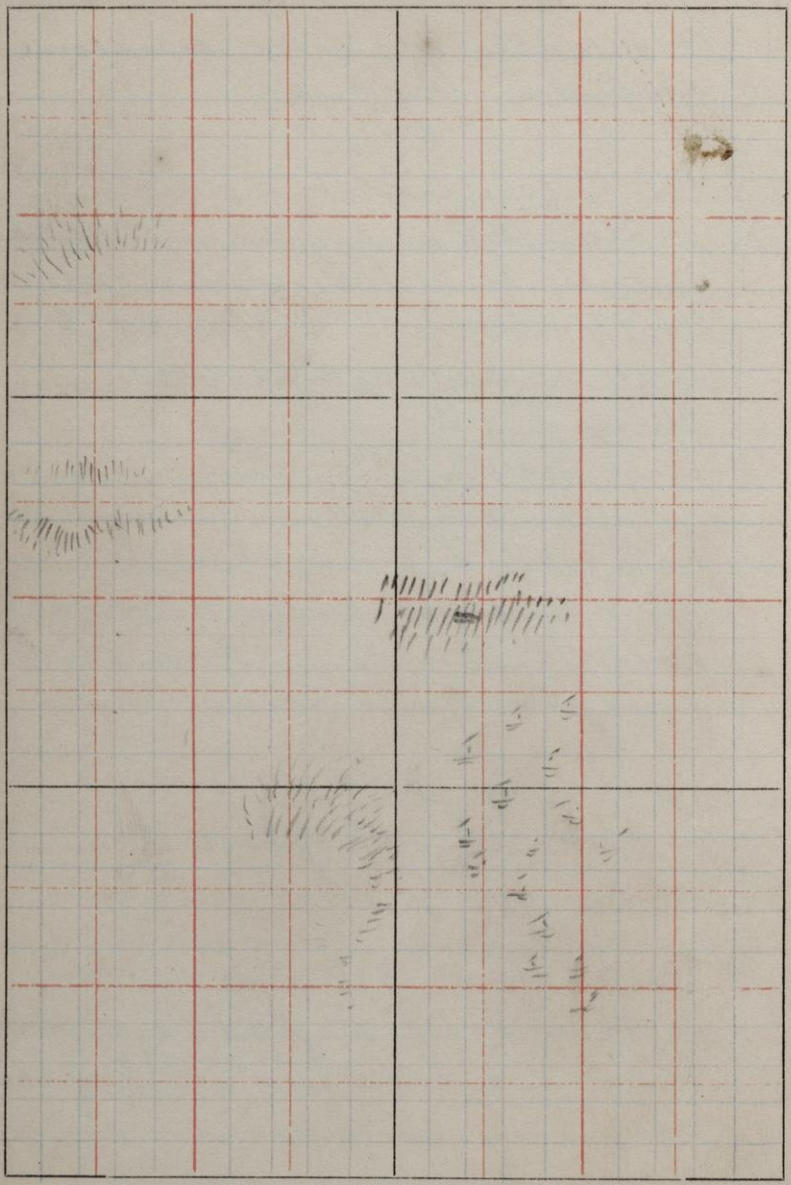
17735 Slate and quartzite in south facing bluff. The slate overlies the quartzite. Similar to that exposed ½ mile west.
Strike E. & W.
Dip 48° N.

17736 100 W. 150 N. S.E. 34-48-28
Large knob of serpentine rock just north of C. & N.W. Ry. From the south side of these rocks

17737 100 W. 225 N. S.E. 34-48-28
A more schistose phase of these rocks

17738 320 N. 100 W. S.E. 34-48-28
A white weathering band or dike it was is exposed for a width of about 8 ft.

N.W. 1/4 10 T. 47 R. 28

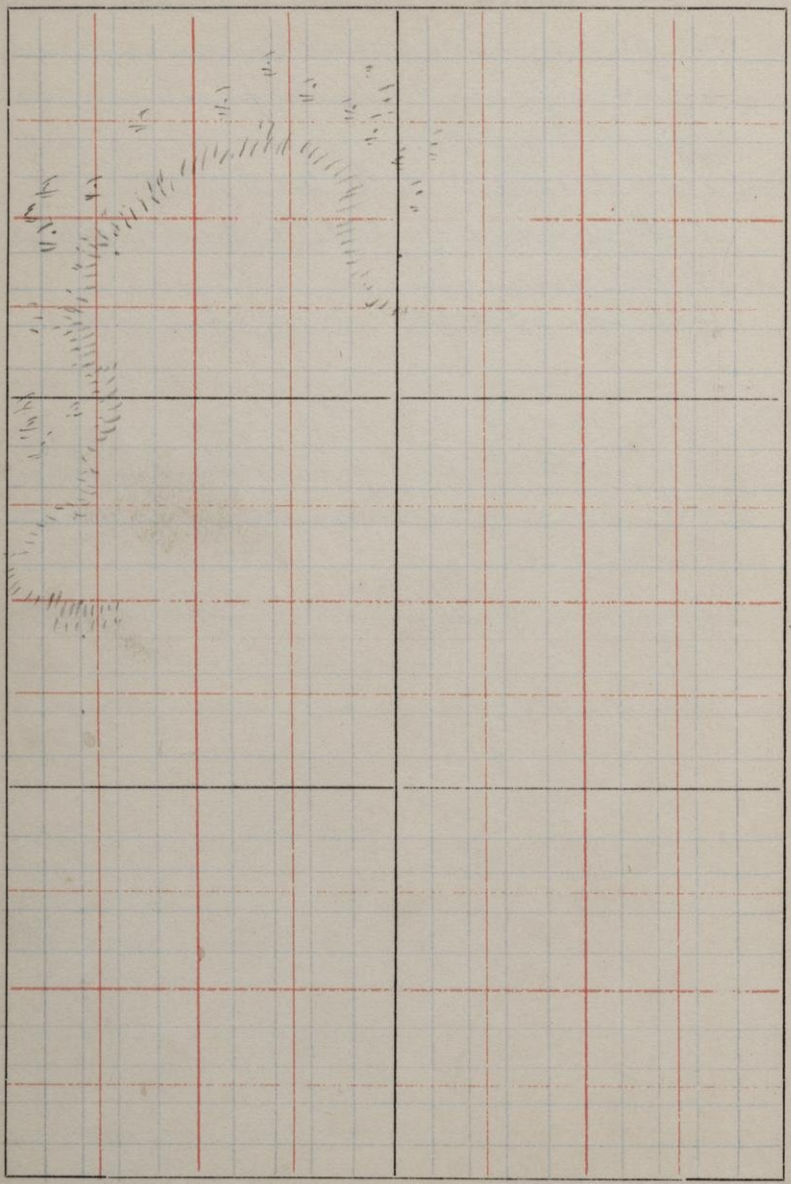


17739 700 N. 600 W. S.E. 34-48-28
A small ledge, just rising above the surface, of thin serpentine rock

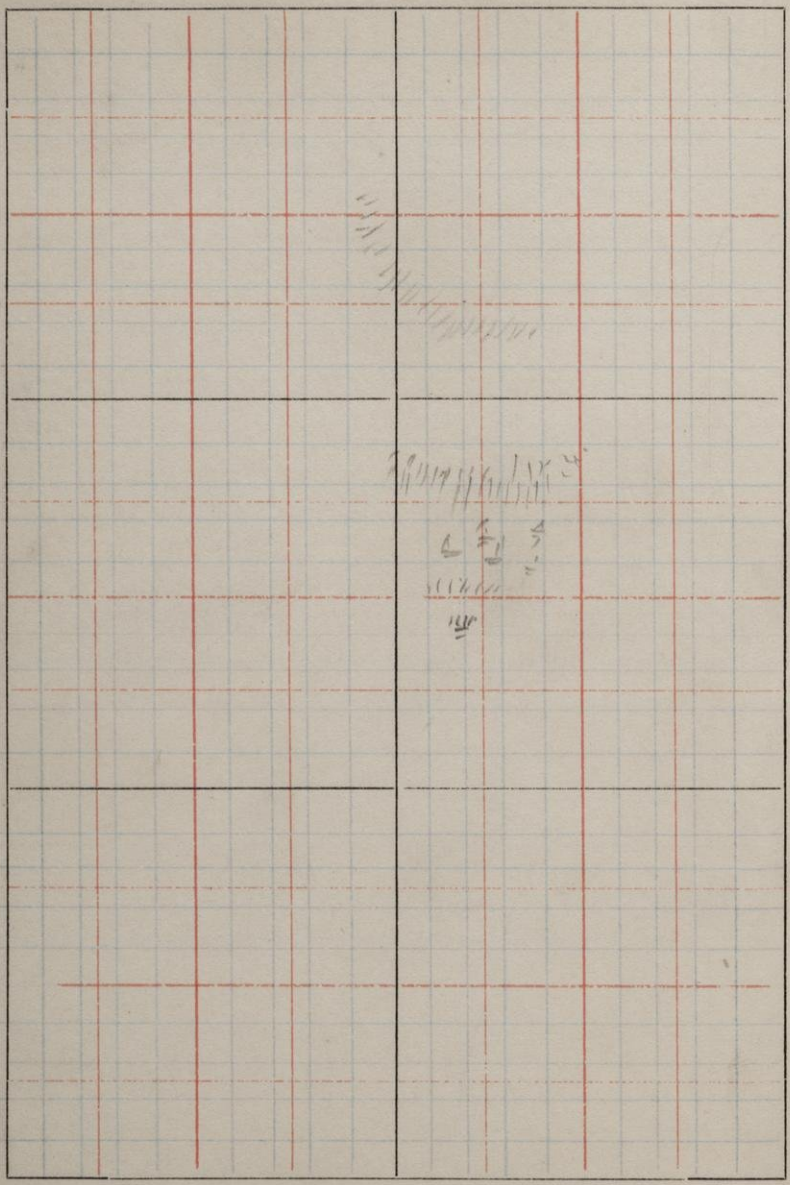
17740 1500 N 1800 W. S.E. 2-47-28
A low ledge of slate exposed at side of wagon road
Strike 10° N. of E. Dip about 90

17741 10 N. 1060 W. S.E. 35-48-28
A small knob of jasperite similar to those rocks found to the west in this range

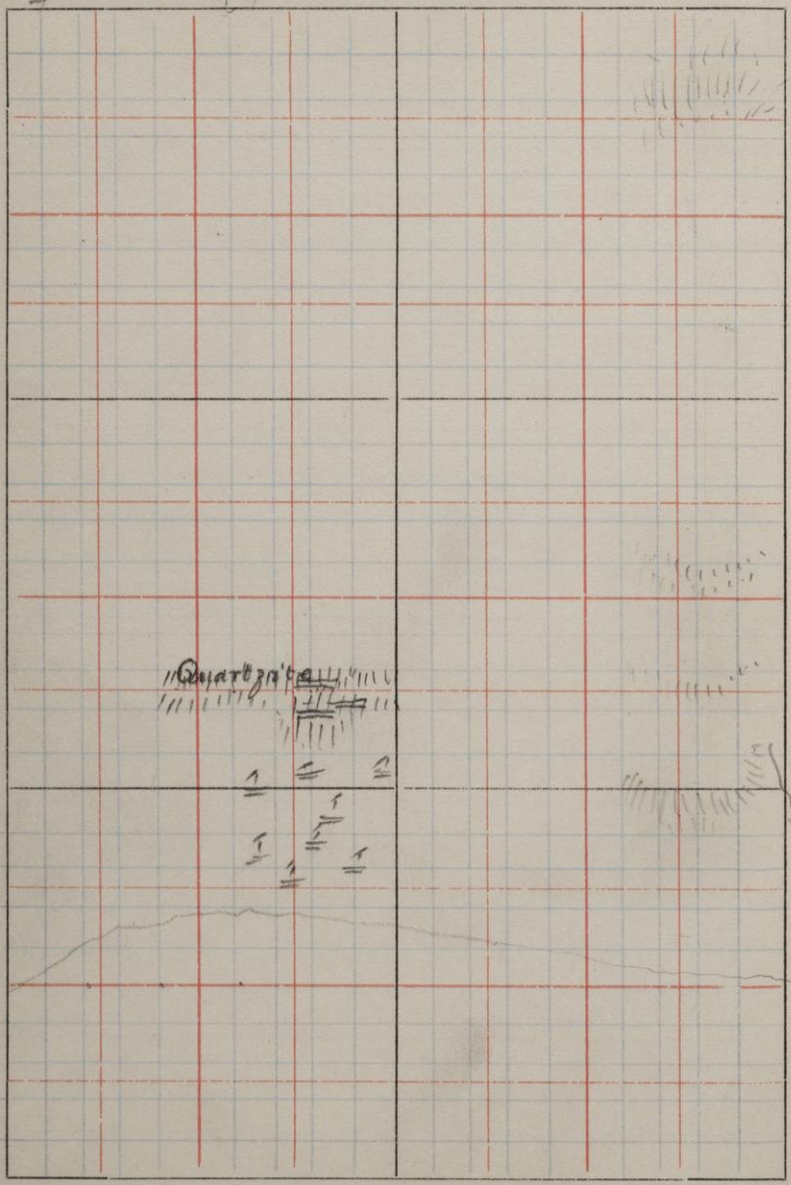
N. W. 10 T. 47 R. 28



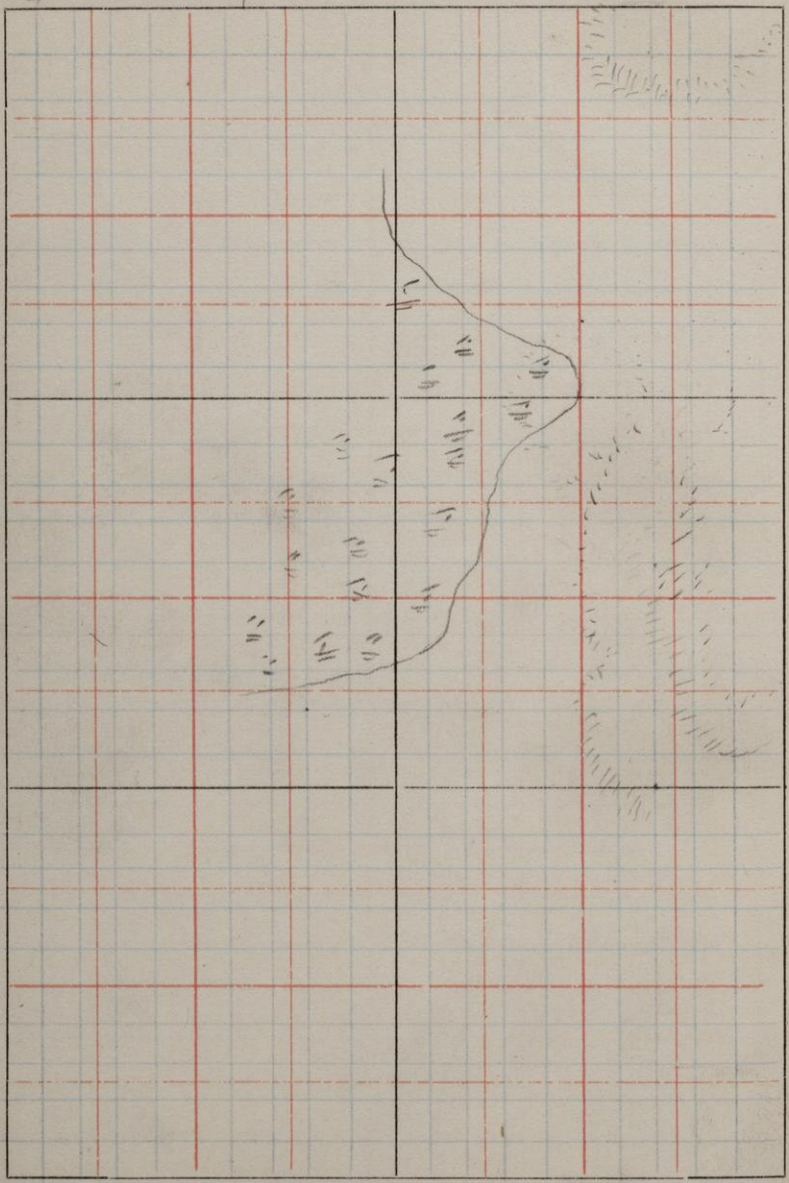
N. M. 15 T. 47 R. 28



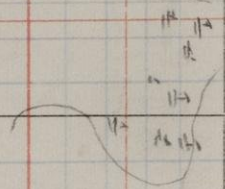
D. E ¼ 10 T. 47 R. 28



N.E. ¼ 10 T. 47 R. 28

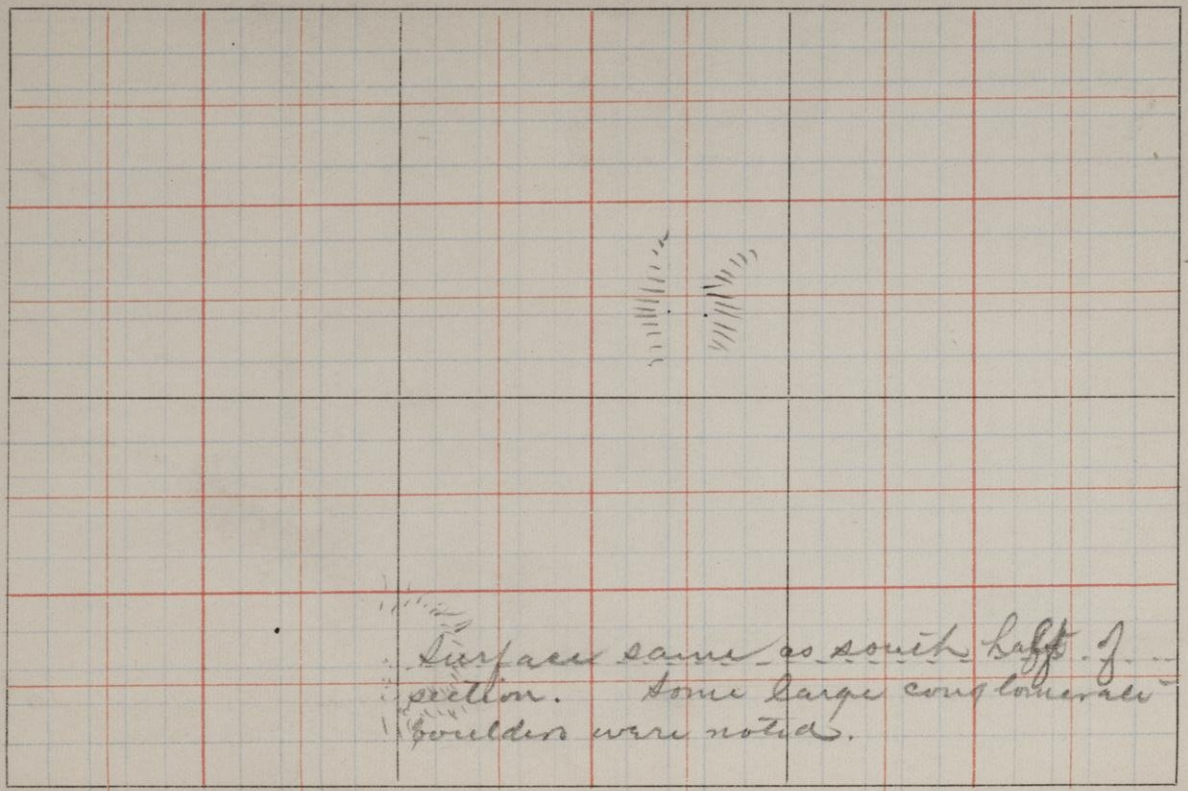


D.E. 43 T. 47 R. 28

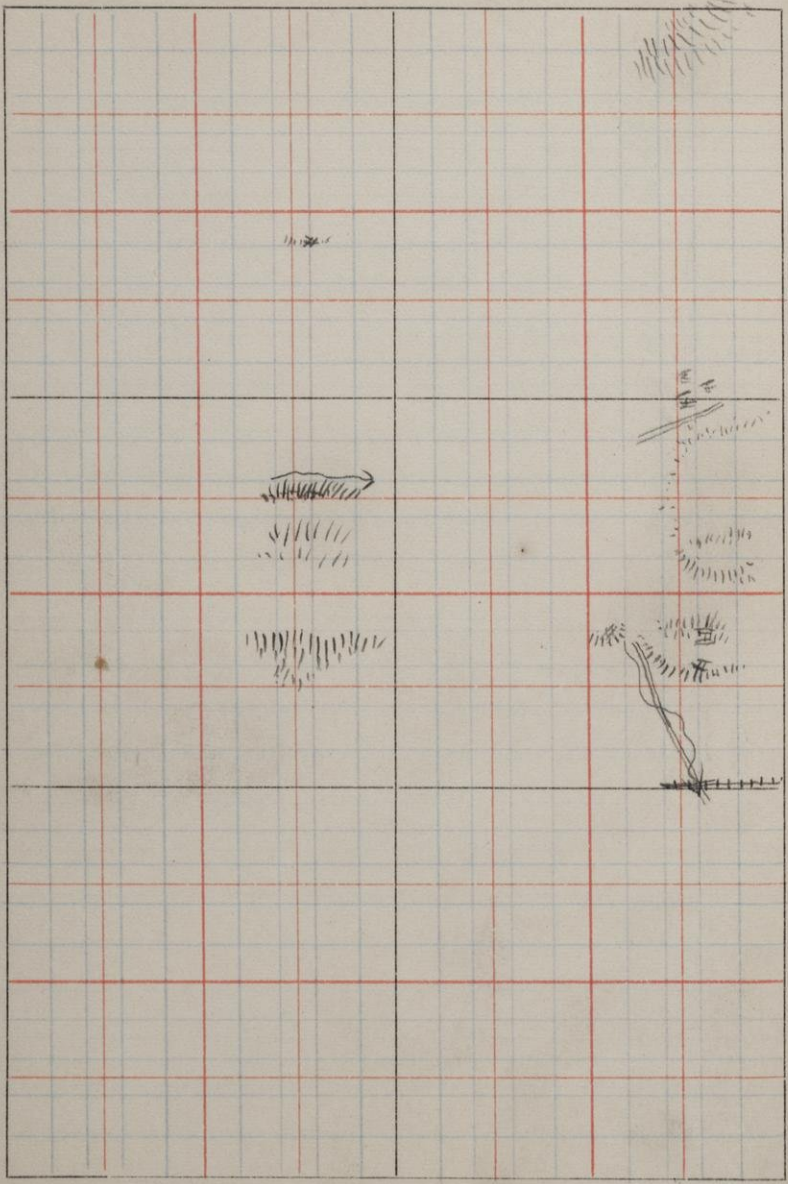


The surface along this line is rough heavy drift hills timbered with dense 2d growth No exposures seen

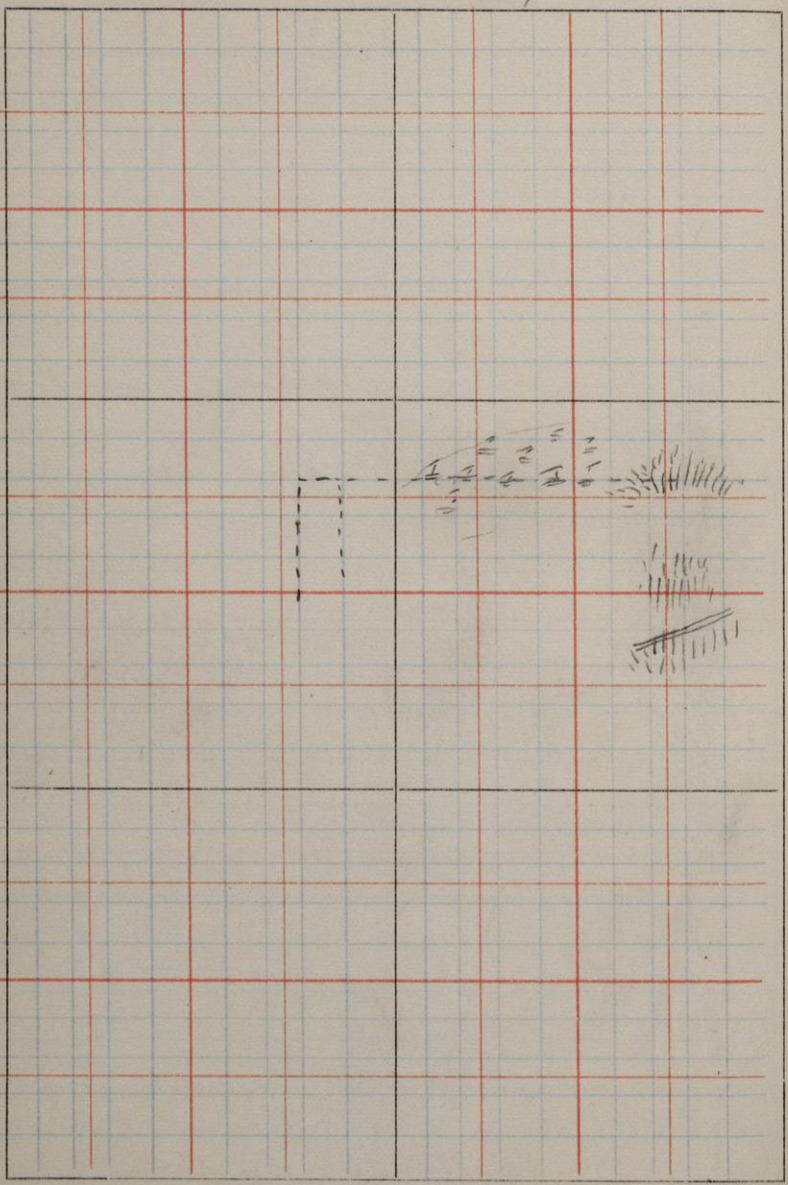
N. E 1/4 Sec. 3 T. 47 R. 28



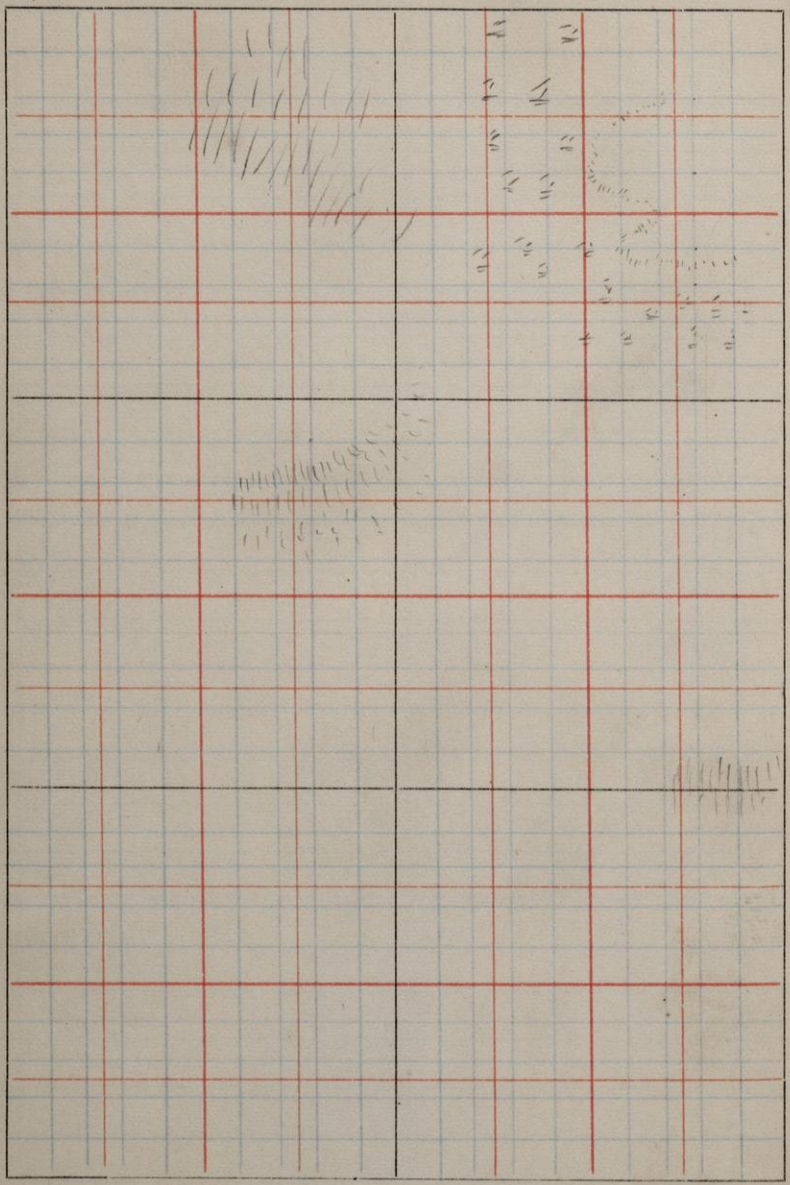
S. E. 31 T. 48 R. 28



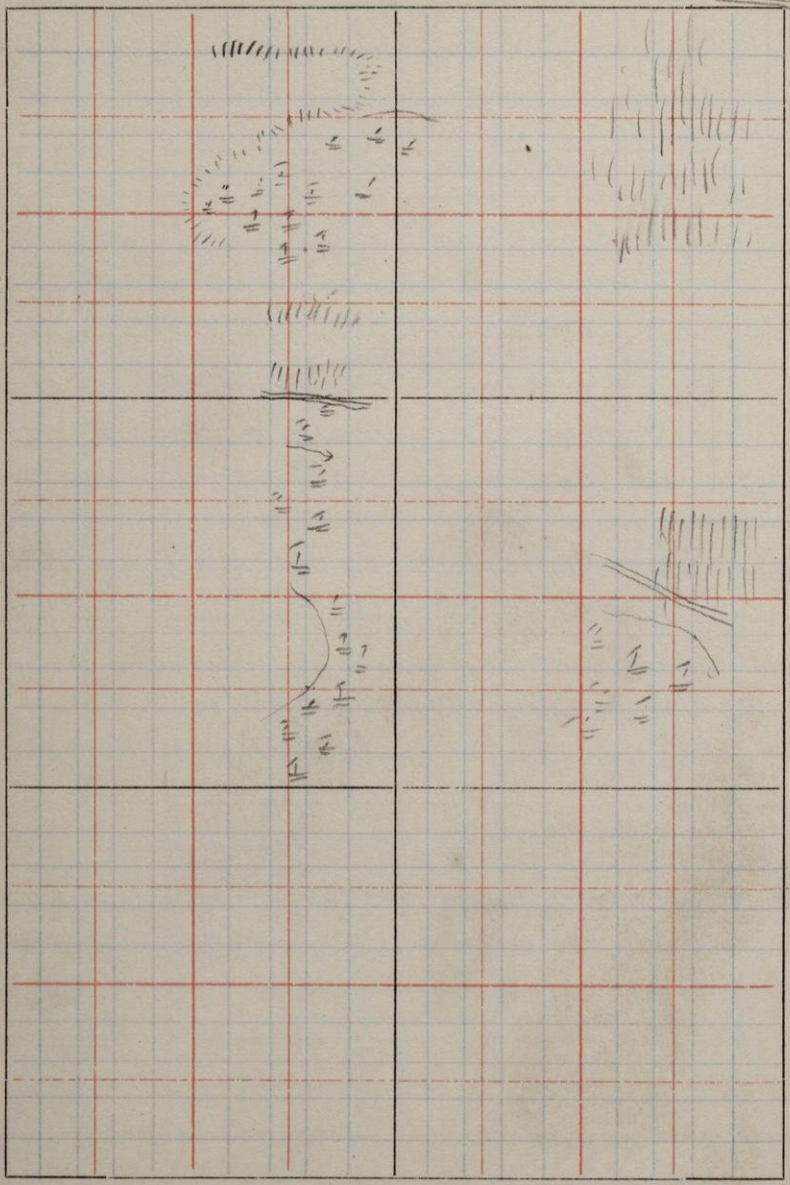
N.E. 34 T. 48 R. 27

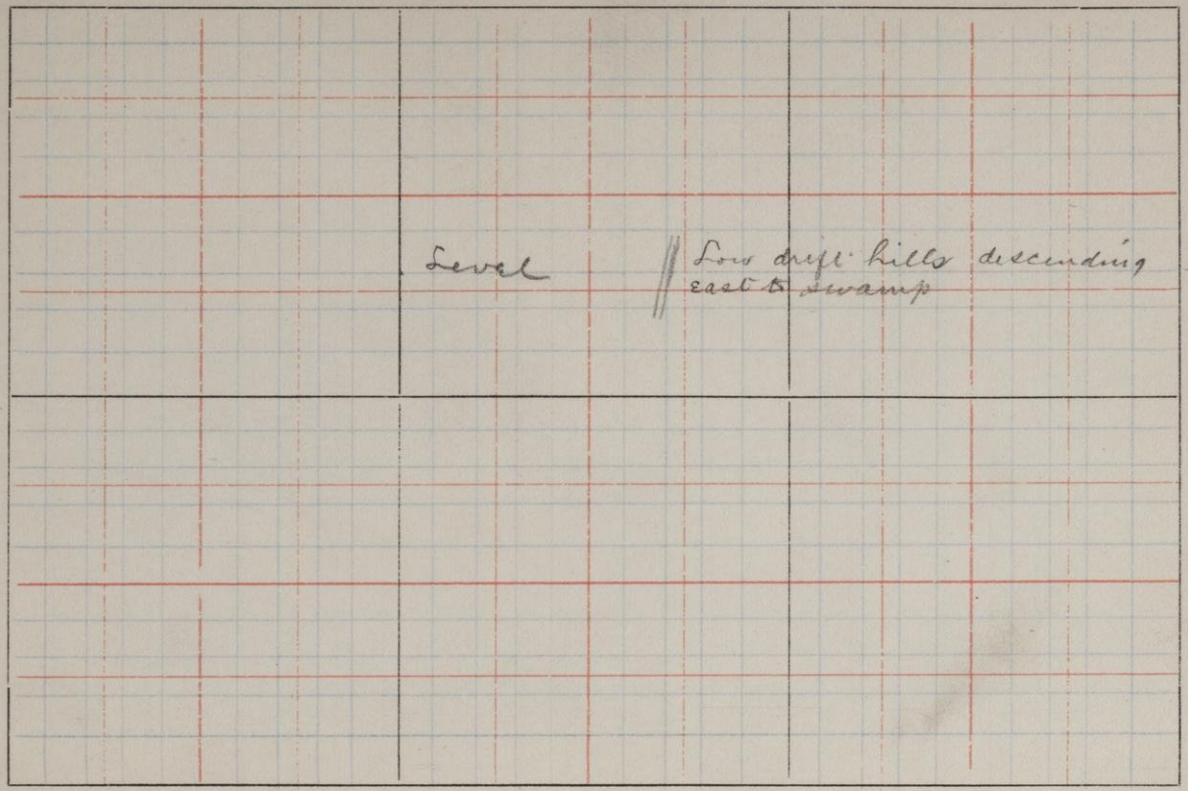


N. W. 14 T. 47 R. 28



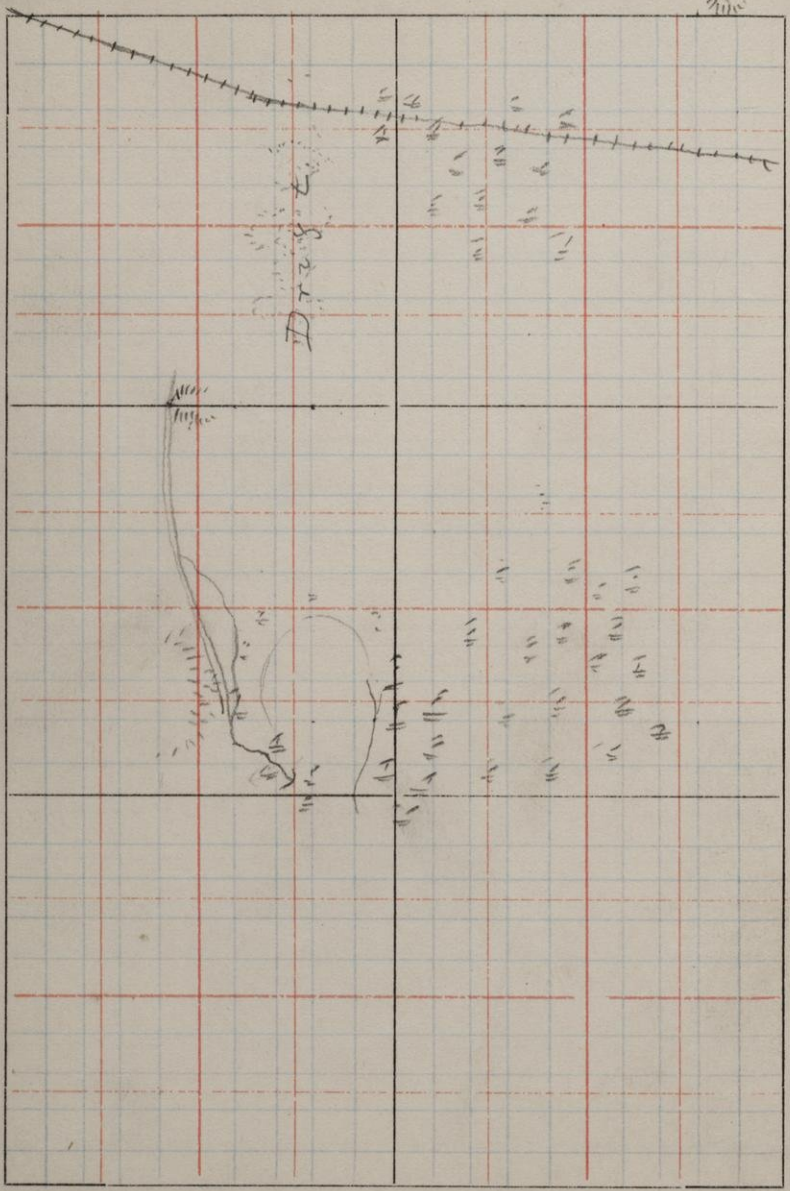
N. M. 11 T. 47 R. 28



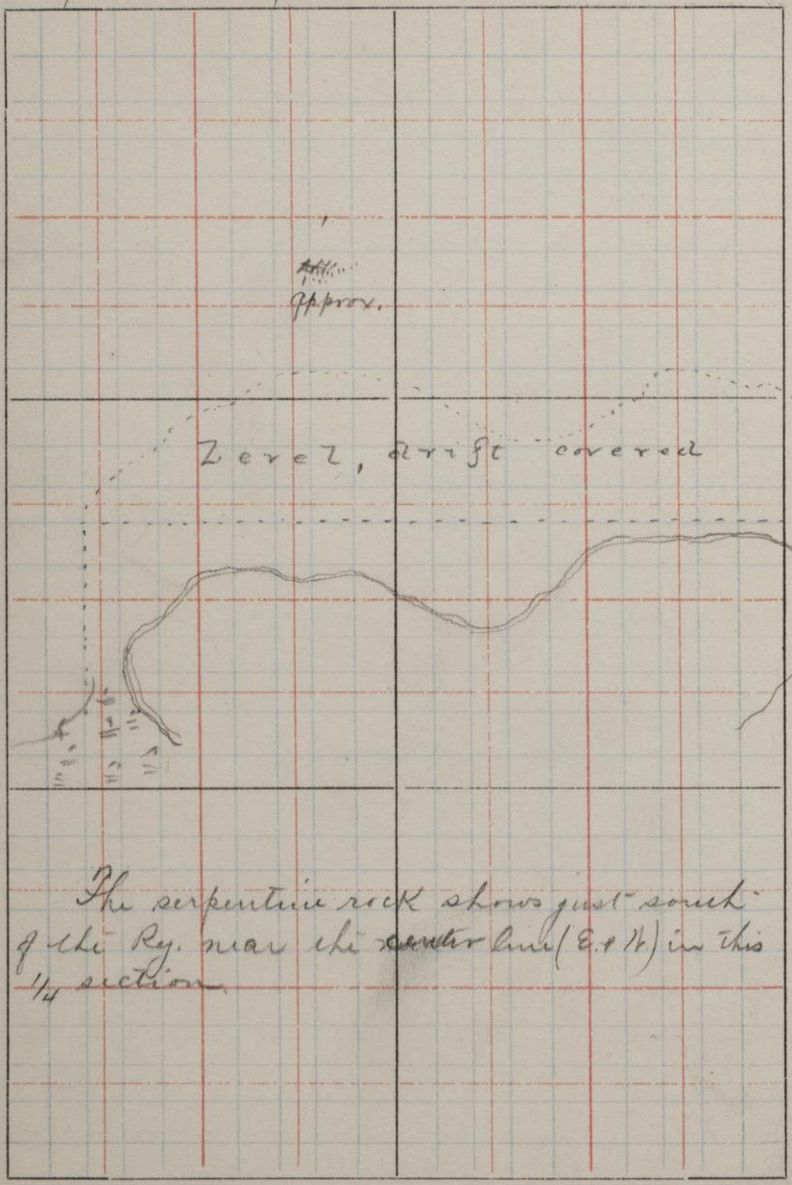


U.M. 2 T. 47 R. 28

N. M. 2 T. 47 R. 28

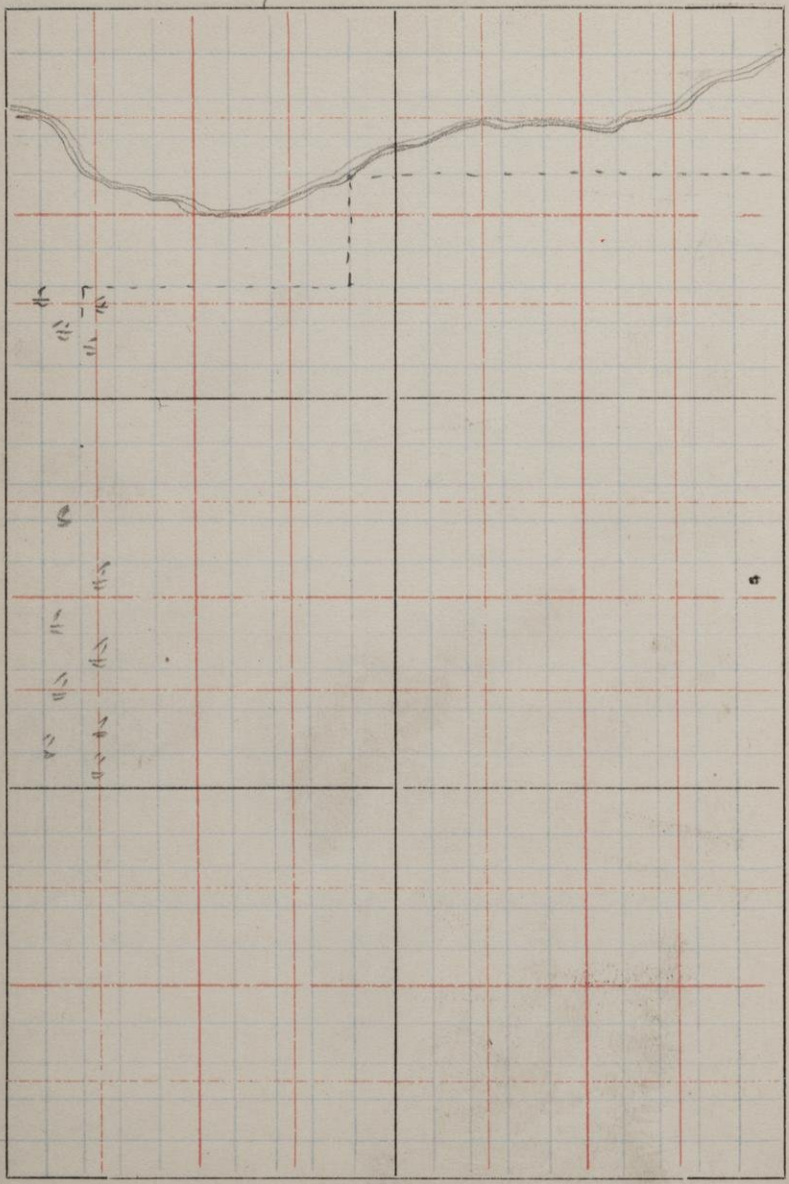


N.E¼ 2 T. 47 R. 28



The serpentine rock shows just south of the Ry. near the ~~center~~ line (E. & W.) in this ¼ section.

A. E. 2 T. 47 R. 28



52

735
735
1470

735
825
1560

660 E.
385 S.

W. N. Merriam
314 Langdon St.
Madison
Wisconsin