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## Marquette region east of Ishpeming, Michigan. No. 126 1891

Bayley, William Shirley, 1861-1943

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

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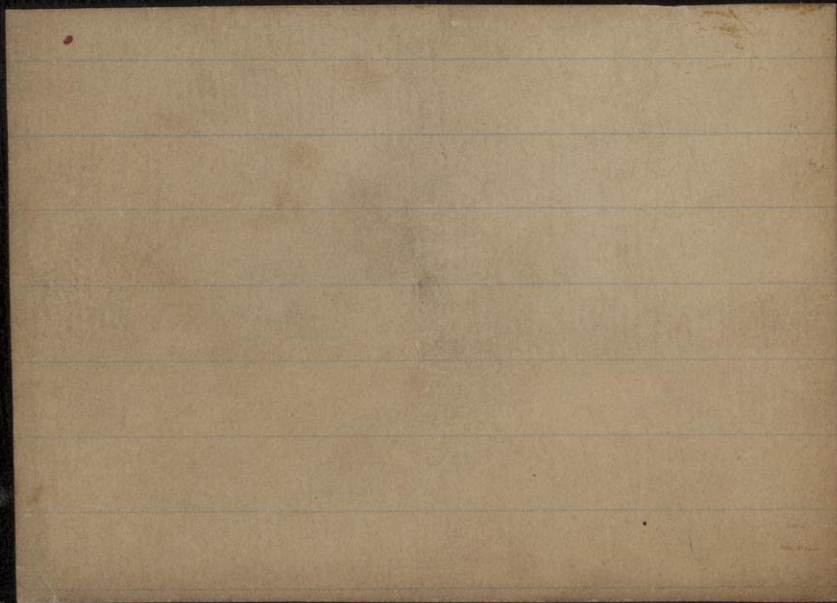
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Ishpeming  
No 6.  
Plane Table  
Notes

U. S. GEOLOGICAL SURVEY  
FIELD SECTION BOOK



# SURVEY OF THE PRE-CAMBRIAN ROCKS OF THE N. W. STATES.

## 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 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. In all cases where there is the least doubt about the true bedding directions, 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 as 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.

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.

3. The ruling of the left hand page is also arranged so that a smaller scale can be used. Each one of the black lines may represent a section line and the red lines quarter sections and "forties." The scale of the maps may thus be reduced, if desirable, to two inches to the mile (the ordinary town plat scale.)

4. Collect a specimen from each separate ledge of rock, or wherever 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 a note that it is of a rock identical with specimen so-and-so. Under the same conditions small sized samples, trimmed to a uniform size of  $2 \times 2\frac{1}{2} \times \frac{3}{4}$  inches will be allowed, but in all other cases *large sized specimens*, trimmed to a size of  $3 \times 4 \times 1$  inches, must be selected, in accordance with § 3, chapter IV, p. 44, Regulations of the U. S. Geological Survey. In all cases collect chips for slicing. All specimens are to have numbers painted on them, in white on a black background, in the field.

5. 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., etc.



#126



Plaine Table holes?

# Marquette Region

East of Ishpeming.

1891

W. S. Bayley

little distance westward, the  
eastern portion of the pit, and  
in fact its entire walls else-  
where are jasper and ore.

21093

Jasper and ore from south  
side of pit near contact with  
the dike.

(832)

(833)

(834)

(835)

(836)

Paints on surface of pit entirely  
in jasper.

(837)

In elevation

(838)

In station.

Sept 1/91.

(839)

W

end of greenstone ledge.

(840)

E

(841)

E. end north side of pit. Rock

21094

represented by specimen

(842)

N. E. corner of pit. From this

21095

point also took specimen.

(843)

N. side of pit

(844)

W. " " "

(845)

S. " " "

(846)

W. end of pit taken yesterday.

As before the rocks here dip  
about  $30^\circ$  N. To the south the

rock is conglomerate, immediately under which at west end of

21096

pit is quartzite, and south of this a schistose greenstone.

(847)

S. side of pit, where took a

21097

specimen

(848)

(849)

Parts in another pit, sur-

(850)

rounded entirely by schistose

(851)

greenstone.

(852)

(853)

West end jasper and ore ledge in knob. The bands are more or less contorted, with a general dip of about 15° with the S. and a strike along the line of sight?. The north side of the ledge runs all the way to the station.

(854)

Chert and ore in N.W. side of hill, toward top. Specimen.

21098

(855)

Chert and ore. Ledge runs back in hill about 10 ft, when replaced by jasper and ore.

(856)

Ledge chert ore

(857)

" " "

(858)

N.W. corner large ledge of jasper and ore, striking 50° N of



W. and dipping about 25° S.

- (859) U.W. cor. of pit.
- (860) Further E on edge of same pit. Jasper ore well exposed with bands quite regular and dipping low to the north.
- (861) Point further East, between this pit and another to the East.
- (862) S.E. corner of pit and N.E. corner [of another]
- (863) S.W. " " "
- (864) On the South side of the pit all the jaspers dip North or N.E. at angles varying from 10° at its west end to 45° at E. end.
- 21100 is specimen from west side of pit.
- (865) Station
- (866) NW
- (867) SW / Corner of pit, in jasper and ore dipping low to the north.
- (868) Top of hill. No ledge
- (869) " " " "
- (870) S. side triangular ledge of jasper and ore.
- (871) Point on open pit of Cleveland? Mine
- (872) ditto.

No rock is exposed here but some is in sight at bottom of shaft.

The material in the dump heap is jasper and ore. Under 871 is also a small exposure of jasper and ore, much altered, but with a general strike N.S. and a dip W.

N.E. corner of the true pit is 50 ft S. of (872). Its

(873) N.W. corner, and

(874) S.W. " are at (873) or (874)

(875) 40 ft. W. of (875) on the side of the road in a little cut, are bedded cherts, striking  $5^{\circ}$  S of E and dipping about  $40^{\circ}$  S.

(876)

(877)

} west sides of another pit.

(878)

S.W. corner of same pit. Rock

21102

Conglomerate<sup>2</sup>

(879)

(880)

(881)

} Points on East side of pit.

The west side of the pit consists largely of conglomerate<sup>2</sup> (21102), at southern end is schistose greenstone. The southern side of the pit is in



- 21104 banded jasper and ore, almost vertical in dip, but with a varying strike  
The East side is largely schistose greenstone and chert.
- 21105 At (880), for instance, is chert. No strikes and dips of this were taken because of the uncertainty regarding them.
- (882) Front side of hill. Center of Jasper ore ledge
- (883) E. end of ledge (882)
- (884) North side of big greenstone dyke north of Cleveland Lake shaft.
- (885) Center of large ledge of greenstone running E & W. along hill.
- (886) S. side of pit about 100 ft. from its west end, where is exposed jasper and ore, striking 35° S of E and dipping 65° N.
- (887) E end of pit.
- (888) Station
- (889) Near west end of front of hill. Jasper ore.
- (890) Bottom of cliff of jasper, lower. Ledge here 40 ft E & W. 20 ft N & S. 70 ft N of (890).



- (891) Bottom of cliff, near center.
- (892) Top of three foot knob of Jasper.
- (893) Bottom of dints near road.
- (894) Road, bottom of slope.
- (895) Bottom of knob of Jasper ore.
- (896) Top of same knob.
- (897) E. end of knob at bottom.
- 21106 Jasper and ore from hill. Taken from ledge at Station (888).
- (898) Top of knob. Jasper and ore.
- (899) Ledge of Jasper and ore on side of hill. Ledge measures 40 x 40 ft. On S.E. corner of the hill is also a ledge of the same rock.
- (900) Bottom of little cliff of Jasper, continuous with 899.
- (901) Top of cliff, on its north side. Rock all the way to the bottom, and back to all side.
- (902) West end of ledge, running to (888). Rock strikes along line of sight and dips 20° N. On the south side of this hill, which is also quite steep, are also rocks, requiring 20 ft. S. of all side and running soft down

the hill, with average length of outcrop 100 ft. E.W. The rocks are much corrugated, but have a general dip to the North.

(903) E } of pit in jasper and one  
(904) W }

(905) N } ends of another pit in same  
(906) E } rock. Jasper and one also covers the ground between the two pits?

(907) S.E. corner of larger pit

(908) S. side of same pit

(909) N.W. corner .. ..

(910) S.W. .. ..

at (910) the rock is cherty and jasper, or more properly speaking, a jaspery chert, while at

21107

(904) it is more nearly chert and ore.

(911) E. end ledge of jasper and one 10 ft wide and 20 ft. long.

(912) Small ledge of same rock, in which layers dip S.

(913) Another small ledge.

(914) E } ends of pit in jasper and

(915) W } one. The ledge extends north of pit some forty ft.



- (915) is also the S.E. corner of the next western pit.
- (916) N.W. corner this pit
- (917) S.W. " " pit, opening in road. The general dip high to N.
- (918)
- (919) Top of little knob of greenstone running 100 ft. E & W. and 50 ft. down hill. Several other ledges of the same greenstone are about 50 ft. west.
- (920) Center of ledge of greenstone some 60 x 40 ft in dimensions
- (921) Small ledge of greenstone.
- (922) 20 ft. S.W. of small ledge of greenstone in road.
- (923) Foot of little cliff. 60 ft long.
- (924) W. end foot of greenstone cliff.
- (925) 1/4 part.
- (926) E end base of cliff, where west end is (924)
- (927) Center of little knob of greenstone. Another small ledge 50 ft. west.
- (928) N. side of greenstone ledge that runs 20 ft. E. then about 30 ft. S.
- (929) Center of greenstone ledge 60 ft E & W.



15 ft N.S.

(930) Top of little greenstone knob meas-  
uring 70 ft E.W x 15 ft N.S.

(931) Valley between hills.

Small ledges of greenstone oc-  
cur at distances of 8 paces, 10 pa-  
ces & 23 paces N of (931). That dis-  
tant 23 paces, measures 10 ft  
N.S. and 25 E.W.

50 ft. W. of last mentioned  
ledge is still another small one.

(932) Little ledge of greenstone in valley.

(933) W. end little knob of greenstone

(934) Top of knob.

(935) E. end at bottom of this knob

21108 Specimen from (935)

The knob is only 30 ft. wide at  
its western part (933) tapering  
in conical fashion at both  
ends.

(936) In valley.

(937) Ledge of greenstone on hill. Ledge  
is a large one, running about  
50 ft. along line of sight.

(938) Smaller ledge of same rock higher  
on hill. 25 paces further in  
line of sight is another ledge in

The south side of the hill.

(939) W. end of ledge of greenstone 30 ft. long.

Another small one is 50 ft. N of this latter.

(940) Valley at foot of hill.

(941) Center of little ledge of greenstone since 50 ft long E.W.

12 paces N. is the E. end of another ledge of the same rock 20 ft. long.

(942) S.E. end of another ledge of greenstone that practically runs to the top of the hill to the west

(943) Center of top of greenstone ledge. 30 ft E.W. 15 ft N.S.

(944) S. side of a greenstone bluff, with over ledge to top of hill.

(945) } Two points at base of bluff

(946) } The entire face of this bluff is an exposure of greenstone.

(947) E. end of little knob of greenstone.

(948) W. end, top of same knob.

(949) W. end another knob, further south. ledges are on East side

(950) on road.



(951) S. E. corner of old pit in Jasper  
hill, sum 50 ft. wide and 100  
long E. W.

(952)

(953)

(954) Station.

[King] Sept. 2191.

(955) W. end of spur of hill.

(956) Eastern extremity of ridge of

21109 greenstone

(957) East side of hill. Top of cliff of  
greenstone.

(958) East end of cliff, nearer top of hill.

(959) East side of top of hill.

(960) Middle fringe.

(961) Highest point in hill.

(962) West end of top of hill.

(963) Small test pit near west side  
of Jasper spur.

21160 Specimen from pit.

(964) West eastern exposure of Jasper  
spur.

(965) Pit in this spur.

(966) Head of cut into Jasper spur.

(967) West end of greenstone ridge at  
foot

(968) West side of hill at foot of 20



ft high cliff of greenstone.

- (969) At foot of hill.
- (970) Top of spur jutting from center of hill.
- (971) Foot of ridge near East end.
- (972) Near East end of hill, at foot.
- (973) East end of cut into Jasper  
The rocks thrown out from the cut are.
- 21111 Soap rock (schistose greenstone)
- 21112 Point " ( " " )
- 21113 Banded Jasper.
- (974) West side of same cut.
- (975) West end of spur jutting from East end of ridge.
- (976) Highest point of rock (greenstone) in ridge.
- (977) Little knob on S. side of pit.
- (978) Top of this knob.
- (979) In front of house.
- (980) Low ground S. of railroad.
- (981) Most southerly exposure of Jasper.
- (982) Low ground.
- (983) Road.
- (984) Most western exposure of greenstone.
- (985) West side of top of hill, where

- 21114 (986) took specimens of greenstone  
Western end of highest knob  
on hill.
- (987) Half way between (986) and  
highest point of hill.
- (988) On little terrace like level  
on hill.
- (989) Highest point on hill.
- (990) At base of this highest knob.
- (991) East end of this knob.
- (992) " " at base of this knob.
- (993) Road, 5 ft East of west Eastern  
Exposure of ridge.
- (994) Road
- (995) West northern exposure of ridge,  
Exposure in road.
- (996) 4 ft north of (996) is flat ledge  
21115 in Swamp.
- (997) 20 paces south of greenstone ledge  
thought to be west southerly ex-  
posure of ridge.
- (998) Low ground
- (999) Ledge of greenstone
- (1000) West end of ridge of greenstone  
21116. at base.
- (11) Top of ridge, west end.



- (2) East end of large greenstone ridge  
whose West Eastern Exposure is 16  
paces East of (2).
- (3) Half way up East side of ridge
- (4) Kind of precipitous ledge of green-
- (5) ) stone.
- (6) Another point on edge of precipice.
- (7)
- (8)
- (9) Base of west end of ridge
- (10) Near extreme west end of ridge,  
at edge of precipice.
- (11) Top of this elevation whose face  
is the precipice.
- (12) Greenstone precipice on hill:
- 2117 Specimen.
- (13) East side of greenstone ridge
- (14) Top of hill, just west of (13). Green.
- 2118 Stone as before
- (15) Top of hill, little further west.
- (16) N.E. corner of hill
- (17) Top point of northern extremity  
of hill.
- (18) N.W. cor. of hill, precipitous to  
west and south.
- (19) West of (18) at base of precipice.
- (20) On road.



- (21) Base of precipice.
- (22) Base of steep rock slope. Greenstone exposed all along slope.
- (23) Bottom of hill, in valley
- (24) North Eastern exposure of greenstone, at base.
- (25) Foot of greenstone precipice
- (26) In valley. Also base of precipice.
- (27) Base of precipice at foot of hill.
- (28) Base of precipice, further East.
- (29) Foot of hill, at center.
- (30) Eastern end, foot of Hill
- (31) Valley.
- (32) Lowest point at Eastern end of spur of greenstone.
- (33) Most eastern exposure of greenstone in hill.
- (34) Greenstone ledge west of (33)
- 20119 Specimen.
- (35) 70ft. East of most western exposure of greenstone on ridge.
- (36) Most northern ledge of greenstone in this vicinity?
- (37) Test pit, in which no rocks were seen.
- (38) East end of slope of little ridge, none of larger one.

- (39) Base of little ridge, near center.  
 (40)  
 (41) }  
 (42) } Points in edge of swamp.  
 (43) }  
 (44) Foot of hill. North western exposure  
 of rock at base.  
 (45) Base of S.W. end of hill.  
 (46) N.W. corner of hillcock.  
 (48) Valley  
 (47) Top of hill.  
 (49) Southern end of hill.  
 (50) Highest point in hill.  
 (51) Western exposure of quartzite  
 (52) Trencher end of test pit at south-  
 ern base of hill. Pit 40 ft long,  
 20 ft wide and 20 ft deep.  
 (53) In top of ridge of Jasper and  
 ore, S.E. of (52).  
 (54) North western exposure of banded  
 Jasper in ridge.  
 (55) North side of little hillcock.  
 (56) Highest point of this hillcock.  
 (57) North side of hillcock at foot  
 (58) West side foot of hillcock  
 21120 Specimen from this point.  
 (59) Lowest point of field.



(60) East side gneiss.

(61) Station

Sept 4/91.

(62) 1/4 post.

(63) Pit. Rocks in place dipping S.

21121  
H.F.P. at about 20°

(64) In plain

(65) " "

(66) Base of hill of schistose greenstone.

Sept 5/91.

(67) Pit, with rock in place. No dip  
nor strike could be determined

21122 Rock is

(68) Little ledge of contorted cherty  
material.

(69) Swamp.

(70) Extension of ledge (68) up hill.

21123 Rock gneiss, etc.

(71) Foot of little greenstone ledge  
at East base of bare greenstone  
spur.

Two other small greenstone  
ledges are 30 or 50 ft. N of (71).

(72) Small greenstone ledge at base  
of hill.

(73) W. end of little ledge of greenstone



10ft wide and 20 ft. long.

- (74) S. side same little rise. There ledge 30ft E-W. 5ft wide.
- (75) S.E. foot of hill. No rock.
- (76) Little ledge of greenstone on E. slope of hill.
- (77) Center of ledge on North side of hill. Rocks is greenstone. Exposure measures 80ft E-W and is 20ft wide at East end, and 40ft at west end.
- (78) West end of greenstone ledge 30ft. long, 10ft wide.
- (79) W. end ledge of greenstone, 40 ft E & W.  
Another ledge begins 5 ft. west of (79), runs 30 ft. further west and has a width of 10 ft.
- (80) Base of hill at whose top is greenstone
- (81) Top of this little greenstone hill.  
2124 Specimen. Still all greenstone W.S.E.
- (82) Little ledge of greenstone on top of hill.
- (83) " " " "
- (84) Front face of greenstone cliff.

- (85) S. out slope of hill, near bottom.
- (86)(?) Top of same hill.
- (86) East end little of greenstone hill. Ledge of greenstone all the way from (86) to (87).
- (87) West end to same hill.
- (88) On west slope of hill.
- (89) Base of hill in front.
- (90) Test pit 40 ft. East of (90), in which chert and schistose green stone are abundant. No strike or dip were taken in account of lack of time.

21125  
21126

} from this pit.

- (91) Top of little soil escarpment on hill.
- (92) E. end and top of escarpment. Here a small ledge of greenstone outcrops.
- (93) W. end next installment of escarpment.
- 21127 Here again a little ledge of greenstone.
- (94) Ledge 30 x 30 ft. in wt. of escarpment.
- 51198 <sup>41</sup> (95) another ledge of greenstone



- (96) E. end of ledge of greenstone measuring 30 ft. long. This is apparently a breccia of large pieces of greenstone cemented by schistose greenstone.
- 21129 Cementing schistose greenstone
- 21130 Fragments.
- (97) Bottom of hill, in plain.
- (98) Slope of hill. No rock.
- (99) Small ledge of greenstone on slope.
- (100) Small ledge greenstone on slope of hill. Ledge 20 ft. E.W. 10 ft. N.W. Another ledge measuring 5 x 5 ft. is 40 ft. East.
- (101) Test pit in field. No rock seen in place.
- (102) Top of little rise in field. About 100 ft. East of (102) is a test pit, in drift into this rise. In it are exposed cherts, etc., striking a little N. of E and dipping about  $70^\circ$  N.W.
- 21131
- (103)
- (104) Water course on road.
- (105) In road.
- (106) Top of little hill on S. side of road.



No rocks are exposed, but the hill is riddled with test pits.

- (107) W. base of hill.
- (108) E. base of next hill.
- (109) S. side of hill. Center of greenstone ledge 40 ft. long, 20 ft. wide.
- (110) W. end ledge at top of hill. Extends 80 ft. E. and is almost continuous with (108). Its shape is thumb-nail, it being 10 ft wide in center, and only a few feet in width at the two ends.
- (110) 60 ft. S of (110) is another small ledge 10 x 10 ft.
- (111) Small ledges on north side of hill, with another 20 ft. S of (111).
- (112) Top. front side of hill. Small ledge of schistose greenstone.
- (113) W. end ledge of greenstone on side of road.
- (114) E. end same ledge.
- (115) Schistose greenstone at base of bluff.
- (116) Plain
- (117) Large greenstone Exposure, extending 40 ft. south, with a width of 10 ft. S end another ledge is

- 42
- (117) 10 ft. N of (117)
- (118) N. end this more northerly ledge.
- (119) Top of hill, for station.
- (120) Center of ledge of greenstone, num-  
bering same 50 ft SE of N.W. Speci-  
men.
- (121) North slope of hill. No rock.
- (122) Ledge in saddle. 10 x 10 ft.
- (123) Ledge in saddle 30 x 20 ft.
- (124) W. end, ledge in saddle. 20 ft.  
E.W. 10 ft. N.S.
- (125) E. end ledge in which alidade  
stands
- (126) W. end same ledge  
The entire south slope of the  
hill is one bare ledge of green-  
stone.
- (127) Ledge in E. side of hill. Runs  
20 ft E. and is 15 ft. wide.
- (128) E. end greenstone ledge in S.  
slope of hill.
- (129) Little ledge of greenstone in S.  
side of railroad track.  
Other ledges occur in the track  
at the immediate base of the al-  
idade hill.



- (130) Little ledge of greenstone 10x10 ft.
- (131) old shaft surrounded by cherty rocks, from dump heap of which
- 21134 took specimen
- (132) W. end ridge of greenstone, measuring E. 60 ft
- (133) W. end next worked dump, steep on both sides, forming outlying spur of larger ridge
- 21135 Specimen from this spur.
- (134) Slope hill.
- (135) On w. slope near end of little ridge.
- (136) Plain at bottom hill.
- (137) W. end of ledge at bottom. Practically the whole hill is a ledge.
- (138) In valley, at S. base of big greenstone bluff.
- (139) W. end top of greenstone bluff.
- 21136 Specimen from (139)
- (140) Front side of cliff of greenstone
- (141) " " " "
- (142) " " " "
- (143) W. side, on top of next hill east.
- (144) " " " " this hill.
- (145) Corner.
- (146) Station



- (147) E. slope of hill, north of Union Park.
- (148) S. base of bluff. Rock (greenstone) all the way to bottom.
- (149) Base of greenstone ledge on hill.
- (150) W. slope of hill. No rock.
- (151) Top of hill. Large greenstone ledge.
- (152) Jointing joints of greenstone on top of hill.
- (153) Plain.
- (154) W. slope of alidade hill. No rock.
- (155) N. " " " " No rock.

Sept 6/91.

- (156) End of greenstone cliff, in which rock is like specimen
- (157) North side, in the middle, of highest portion of hill. The crest is about 50 paces in diameter, with its southern half exposed greenstone.
- (158) Middle of bluff on top. The form of the hill is a series of greenstone precipices too small to be indicated on map.
- (159) West end of bluff.

- (160) 15 ft. from extreme eastern end  
of bluff of greenstone.
- (161) Large ledge of greenstone, run-  
ning to bluff on one side and  
to plain on other. Width about  
10 ft.
- (162) Plain at bottom of slope.  
25 paces  $30^\circ$  E of. From (162) is a  
test pit so timbered that could  
not see within. From dump took  
specimens of chlorite, etc., schist
- 21160 Paint rock.
- 21161 Chlorite? schist.
- (163) Foot of main bluff of greenstone
- (164) Timbered test pit, from whose  
dump heap took specimens of green-  
stone schist.
- 21162
- (165) Test pit, containing lean ore  
and chlorite schist in dump  
heap.
- 21163 Lean ore
- 21164 " "
- (166) Test pit, in whose dump heap is  
nothing but "paint rock."
- (167) Station on test pit, from whose  
dump heap took
- 21165 Lean ore, and



21160  
(168)

Paint rock.  
West Southern test pit of lot.  
Hard one and paint rock in abundance.

21161

Hard one.

(169)

Test pit with very old dump heap showing only hard one and paint rock.

(170)

Test pit, whose dump heap contains much quartz, beside.

21168

Hard one, with veins of chert?

21169

and hard one in quartz.

(171)

Large test pit filled in.  
Dump heap contains chert?  
schist and paint rock, with small amount of hard one.

(172)

Test pit; like (171)

(173)

Plain at base of cliff.

21170

Specimen from cliff.

(174)

S.W. corner of large pit, about

(175)

N. & 75 paces long and 30 wide  
In it are banded cherts etc, with a strike 35° S of W and a dip 22° N.

21171

banded chert and ore

21172

paint rock

21173

chert schist

dump heap.

} from do



- (176) East end of bluff of greenstone is 20 paces S of 176.
- (177) West end of bluff of greenstone on next hill.
- (178) Foot of bluff at middle point.
- (179) West end of greenstone bluff.
- (180) Cut into hill, in rocks with a dip 22° N and strike 15° S of E.
- 21174 } Specimens from this cut.
- 21175 }
- (181) In valley between knobs on hill, and at same time on brink of greenstone precipice.
- (182) Top of hill. Bare ledge of greenstone
- 21176
- (183) Middle of valley
- (184) Top of next hill, near west end. Large greenstone ledge 15 paces in diameter. Hill rocky on north side and nearly free from exposures on south side.
- (185) Highest point in hill, where another exposed ledge of greenstone.
- (186) Extreme eastern top of hill, where rock again exposed. Precipitous to south and east, where very

rocky; north and north-east.  
 After a precipitous descent of  
 10 paces, slope becomes gradual.

- 21177 Specimens from (186)  
 (187) Shallow valley between two green-  
 stone ridges, at point (187) is  
 large greenstone ledge.  
 (188) Highest point in ridge. Large  
 ledge greenstone  
 (189) Near top of ridge, where took  
 21178 Specimens of greenstone  
 (190) Highest point in next hill. Top  
 almost bare rock.  
 (191) S.W. end of ridge in top. Green-  
 21179 stone  
 (192) Valley. Small one between  
 knobs of hill.  
 (193) Near west end of ridge,  
 (194) 40 paces E of flag in top of hill.  
 (195) Little hillock in hill.  
 Entire top of this hill practic-  
 ally bare greenstone ledge.  
 (196) Point in same ridge  
 (197) Foot of ridge  
 (198) " " " further south.  
 (199) North end valley.  
 (200) Extreme western end of small



Ridge at bottom.

- (201) Highest point in this ridge. North and south sides precipices of greenstone.
- 21180 Specimen of greenstone from this point.
- (202) Western end of ridge
- (203) At bottom of ridge in railroad track.
- (204) on slope
- (205) Center of hill, about 25 paces back from precipitous bluff of greenstone. Entire top bare rock.
- (206) on Eastern slope.
- (207) Edge of bluff.
- (208) " " "
- 21181 Specimen of greenstone from (208).
- (209) Foot of hill.
- (210) " " " , on county road.
- (211) West end of valley between county road and railroad.
- (212) R. R. track.
- (213) Swamp.
- Sept 7/91.
- (214) Station
- 21182<sup>1</sup>) From ledge at this point (?).
- (215) Slope of hill, near its foot.



- (216) S. foot of hill  
 (217) Top of slope, south side of hill.  
 (218) Road, bottom of hill  
 (219) Edge of plateau  
 (220) Bottom of slope  
 (221) Little rise  
 (222) East slope of hill  
 (223) Swamp level  
 (224) N. E. slope of hill.  
 (225) Near top of north slope  
 (226) Top of steep portion of N. slope.  
 (227) N. W. end greenstone ledge,  
 21183 Specimen.  
 (228) N. E. end same ledge.  
 (229) S. E. " " "  
 (230) S " " "

The west side runs from 10 ft west of station to (230).

- (231) Little valley  
 (232) S. W. end of ledge of greenstone, extending N. E. 50 ft., and with a width of 15 ft. The ledge forms the S. E. side of a valley separating the next hill north, which is like wise greenstone.  
 (233) N. E. end of ledge.  
 (234) is north side of hill to north. The

greenstone ledge here is precipitous and forms the boundary of the valley in which lake lies.

- (235) Swamp, 20 ft. S. of S. bank of stream
- (236) Stream
- (237) W. end at bottom of greenstone ledge upon which Nequamme Concentrator is built.
- (238) Base of bluff, about its middle point.
- (239) East end, at base of bluff. Rock on south side to within 50 ft. of (239).
- (240) E. end top of bluff.
- (241) Top of bluff; rock only on south side.
- (242) N. E. slope of same hill.
- (243) W. slope, between sand hills.
- (244) Top of sand hill.
- (245) S. E. corner of greenstone hill, on top.
- (246) Top of hill. Greenstone ledge between (245) and (246), and on the S. side to about  $\frac{1}{2}$  way to base.



- (247) W. end top of hill. Small ledges all the way along the south side
- 21184 Specimen from (247)
- (248) Valley
- (249) Foot of west hill west
- (250) 20 ft. E. of west end of rock on hill
- (251) W. end same ledge.
- (252) 20 x 30 ft. ledge of greenstone near top of same hill. The hill is precipitous all along its south side, exposing throughout its length an almost continuous ledge.
- (253) Point of little shoulder running S.E. from this point and extending backward to top of hill.
- (254) Top of eastern knob of hill, separated by little gully from knob west in which gully are no rocks.
- (255) S.E. end of shoulder of greenstone, running from here to top of hill.
- (256) Top of hill, to which ledge extends.
- (257) Top of precipice.
- (258) West end, top of hill. The entire top of hill is greenstone.

- (259) W. end <sup>of hill</sup> at East side of valley. Here  
precipice of greenstone.
- (260) N.W. end of hill. Ledge all along  
this East side of valley.
- (261) In gap between this hill, and  
next western one. No ledge.
- (262) 20 ft from E. end next west-  
ern hill.
- (263)
- (264) S.E. from of this hill, on top of Rock  
(greenstone) forms precipice street  
climbing to bottom.
- (265) Foot of ledge in this hill.
- (266) Foot of hill.
- (267) Edge of lake.
- (268) Base of rock, at foot of bluff.
- (269) " " , further East.
- (270) " " " "
- (271) Top of little ridge, running  
S.E. from W. side of gap.
- (272) S. side of slope of this little  
hill.
- (273) Top of East slope of this ridge.
- (274) Bottom of slope of this ridge.
- (275) East and precipice of greenstone.
- (276) West " " " "
- (277) 1/4 post.



- (278) Saddle between hills
- (279) Near south side slope of hill.
- (280) Little ledge of greenstone 15 x 15 ft.
- (281) Top of slope
- (282) Road bottom of slope.
- (283) East end of ledge of greenstone on S. slope of hill.
- (284) West end of same ledge, which is 30 ft. wide, at widest part. viz: in center.
- (285) W. end ledge of greenstone.
- (286) E. "
- (287) Specimens from W. end.
- (288) West end of another ledge of same rock.
- (289) East end same ledge.
- (290) U. E. end of another ledge, running along N. slope of hill.
- (291) S. W. edge another greenstone ledge, running E. 40 ft and with a width of 15 ft.
- (292) S. E. corner another greenstone ledge 25 ft. wide
- (293) E. end same ledge.
- (294) End of gully (west end).
- (295) " " west gully south.
- (296) Top of slope of plain, near E

side of Union Park.

- (296) Edge of same slope
- (297) Low rise in plain
- (298) Top of hill, S of road.
- (299) Saddle between hills
- (300) Top of hill, small one without edges.
- (301) Saddle
- (302) Low ground
- (303) Top of hill. No rock.
- (304) Bottom of hill, in front.
- (305) East end, bottom of hill.
- (306) Station.
- (307) S.W. corner pit.
- (308) S.E. " "
- (309) E " "
- (310) W side pit.
- (311) " " pit.

The pit just outlined is one of the old ones, belonging to the Jackson Company<sup>(?)</sup>. On its W. side, especially W. South

21187 is exposed a breccia conglomerate. On the East side the rock appears to belong to the old formation. On the North side beginning 30 ft. E. of

21187  
21186



the alidade and running East-  
ward is Schistose greenstone.  
North of the conglomerate on  
the west side, are banded cherts  
and ores that strike about 50  
N 70 E and dip 60° N.

(312) Valley

(313) E. end greenstone hill; south  
end of valley.

(314) W. end, top of hill.

(315)

(316) } Points on top of hill. No rock.

(317) Edge of steep portion of hill.

(318) ditto

(319) Ledge around front of hill, only  
at points given, except between  
(314) and (315) where continuous.

(319) Bottom of slope at N.E.

(320) Little greenstone ledge 5 x 5.

(321) Conglomerate ledge. 20 ft E & W.  
15 ft. N & S.

(322) Cherty conglomerate ledge 10 x  
5 ft.

21188

(323) Base of greenstone hill

(324) Small ledge of greenstone.

(325) Small ledge conglomerate.

- (326) Ledge of greenstone 25 ft W. & 25 ft W. The rock here weathers like a sandstone. It is cut by quartz veins, some of which carry hematite, and some fragments of ore.
- 21189 like a sandstone. It is cut by quartz veins, some of which carry hematite, and some fragments of ore.
- (327) W. end at bottom, of little rise.
- (328) West end ledge of cherty conglomerate in which has been dug a small pit.
- (329) Small ledge of schistose greenstone (paint rock) on side of road.
- (330) Small ledge of cherty conglomerate in road.
- (331) Small ledge schistose greenstone running 20 ft S.W.
- (332) Curved chert and ore. (332) is at middle of west end of ledge, 10 ft wide and 30 ft long.
- (333) West end ledge of chert and ore, 25 x 25 ft.
- (334) West end ledge curved chert and ore, 30 ft wide.
- 21190 and ore, 30 ft wide.
- (335) East end same ledge.
- (336) Little ledge brecciated chert



and ore.

- (337) South side ledge of banded  
chest and ore, dipping about  
300 N. Strike not determinable.
- (338) Foot of ledge extending all the  
way to pit. Contorted but gener-  
ally dipping north. Rock like  
(337).
- (339) East end of same ledge. Here  
apparently more or less con-  
glomeratic.
- (340) Breccia.
- (341) W. end small ledge of chest  
and ore 20 ft long and 7 ft  
wide.
- (342) West end ledge contorted  
chest and ore.
- (343) East end same ledge.
- (344) Small ledge of Breccia
- (345) " " contorted gneiss  
and ore.
- (346) Station
- 21192 is Dr. Weusthuis' rock, dis-  
covered by Magellouelle  
in See

- (347) North slope of large hill of greenstone north of the same concentrator. Greenstone precipice.
- (348) 7 ft. wide test pit in slope of same hill: Pit now bounded up, but from its dump heap the following specimens were taken:
- 21193 Chlorite schist.
- 21194 Paint rock.
- 21195 Banded chert.
- (349) On railroad at foot of hill. Several other test pits occur between (348) and (349), all containing same rock as is in (348).
- (350) 10 paces S. of old test pit, some 45 ft. deep. In dump heap are same rocks as in dump heap of (348).
- 21196 Banded chert.
- (351) Center of large flat hill.
- (352) Test pit, with same rocks as noticed above.
- (353) Center of broad flat hill.
- (354) N. E. edge of the hill.
- (355) Top of spur.



- (356) Edge of bank of Teas Lake.
- (357) Foot of hill, whose top is (355).
- (358) Plain at foot of hill.
- (359)
- (360) 40 paces N. of old test pit, filled with rock. Banded chert and chlorite schist in dump heap.
- (361) Edge of steep slope of hill (357).
- (362) Test pit.
- 21197 Banded chert.
- (363) High ground, no rock.
- (364) Valley.
- (365) West edge of main hill.
- (366) Valley.
- (367) Valley.
- (368) Valley.
- (369) Head of spur enclosing valley.
- (370) Extreme N.E. exposure of greenstone hill.
- (371) Small exposure of greenstone.
- 21198 Specimen.
- (372) Saddle.
- (373) Large bare ledge of greenstone.
- (374) Small exposure of greenstone.
- 21199 Specimen
- (375) Top of next ridge.

- (376) In saddle
- (377) Top of next knoll.
- (378) Extreme Eastern Exposure of Jasper ridge.
- (379) Further west in ridge.
- (380) In valley between Jasper and greenstone ridges.
- (381) Further west in valley.
- (382) On Jasper ridge. Cut into this ridge expresses rocks dipping  $56^{\circ}$ - $64^{\circ}$  S. and strike varying from E and W to  $5^{\circ}$  N of W.
- 21200 Specimen from the cut.
- 21207 " " surface near cut. Rock banded Jasper & chert.
- (383) Top of hill, near western slope.
- (384) Extreme western Exposure in hill.
- (385) Center of valley.
- (386) Top of "nose" (outlying ridge, W.F.B.)
- (387) Top of slope.
- (388) Point west of (386).
- (389) Center of valley.
- (390) Western end of ridge.
- (391) In little valley.
- (392) In main valley.
- (393) Eastern end of ridge, separated



From main ridge by valley (391).

(394)

Another point in main valley.  
Steep slope of greenstone ridge  
30 paces N. Sand roll top, 8  
paces South.

(395)

Center of valley.

(396)

Top of roll.

(397)

" " "

} "sand ridge" (403)

(398)

Center of valley.

(399)

In valley.

(400)

East end ridge.

(401)

East end, top, of ridge south of  
Jasper ridge.

(402)

Valley.

(403)

West end of valley

(404)

Top of sand knoll.

(405)

Swamp.

(406)

West end of Jasper hill.

21702

Specimen Jasper.

(407)

Western top end of hill.

(408)

Outcrop of Jasper on hill.

(409)

Large ledge of same rock.

21703

Specimen

(410)

Eastern end of

(411)

in slope of hill.

(412)

on another ridge of slope.

(413)

Top of third ridge of slope.

- (414) Top of a terrace on slope  
 (415) Valley.  
 (416) S. E. corner of hill.  
 (417) Foot of hill.  
 (418) Foot of detached portion of hill,  
 near center.  
 (419) Top of spur extending from main  
 hill.  
 (420) Foot of hill.  
 (421) Foot of spur.  
 (422) In shallow valley.  
 (423) On plain. S.W. of School House  
 in West. Nequamsee.  
 (424) Top of hill or ridge.  
 (425) On hill.  
 (426) Eastern part of high ground  
 (427) In swamp.  
 (428) In low land.  
 (429) Swamp. N. side of stream  
 (430) " " " " " "  
 (431) " " " " " "  
 (432) Foot of Jasper knoll at base  
 of Norris. From which took  
 21203 Specimen 21203  
 (433) Eastern end of small ridge  
 formed by long, steep slope of  
 Jasper ridge.



(434) In deep valley. The Jasper wall  
back of this valley is precipitous to  
the south and dips under sand  
here.

(435) Ridge of loose stones.

(436) }  
(437) } Other  
(438) } points  
(439) } on  
(440) } this  
(441) } ridge.

(442) Center of valley.

(443) Center of small ridge.

(444) West Eastern exposure of  
quartzite ridge.

(445) Slope of hill.

(446) on opposite slope of valley.

(447) Sloping ground.

(448) Shallow valley.

(449) High ground.

(450) Sloping ground

(451) " "

(452) " "

(453) Center of this shallow pit hole.

(454) East side of pit hole.

(455) Lowest point between quartzite  
ridge and bounding ridge of pit.

Lole.

- (456) In valley.
- (457)
- (458) Lowest point in valley
- (459) Eastern border of valley.
- (460) East side of valley running into lake.
- (461) Opposite side of valley.

Sept 9

- (462) Station
- (463) Near Engine House, on south side of westward of Jackson Mine's old open pit. This portion of the wall of the pit is bedded gasper and ore, dipping north at an angle of about 75°. Further west on the south side is schistose greenstone and at the extreme west end is again gasper and ore, which stretches around to the north side of the pit, but is here cut by many dykes of schistose greenstone that have been left as points extending into pit.
- (465) Point on S. side of pit.

21204

21205



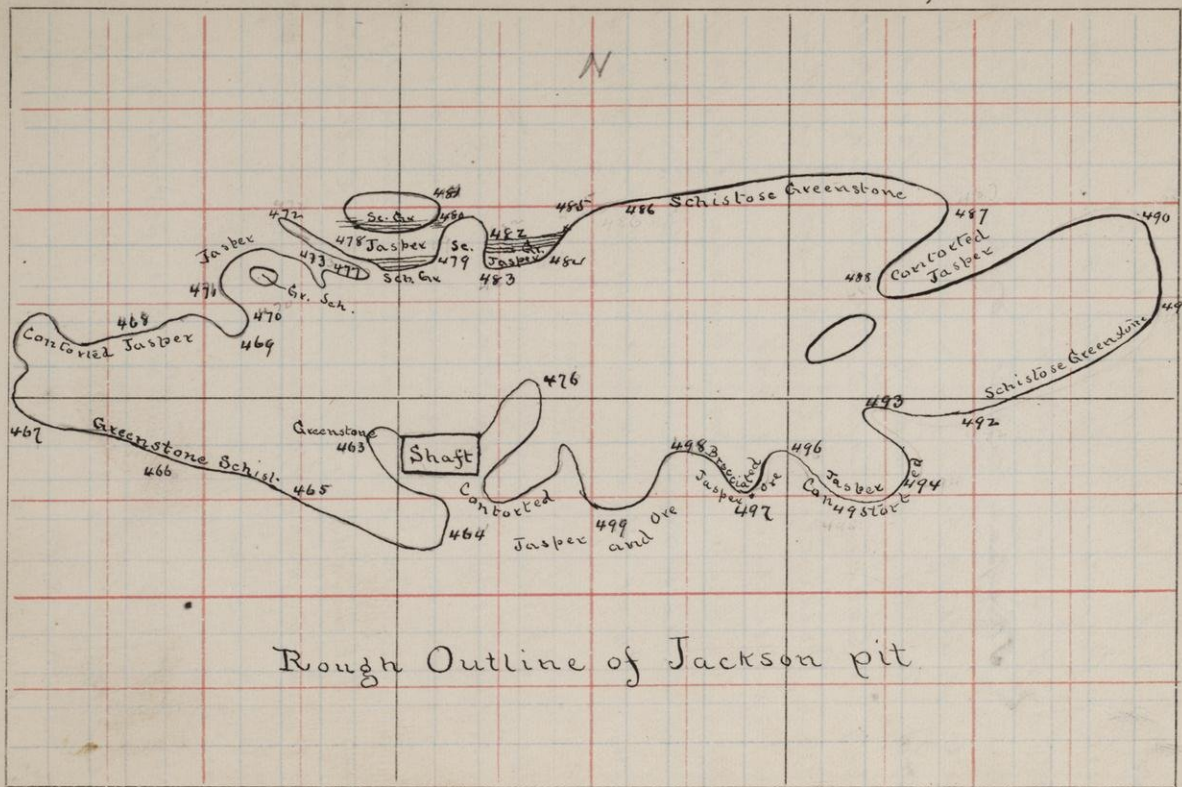
T.

R.

~~21205~~ ~~June 24.00~~ ~~comp~~ ~~3/10~~  
~~but~~ ~~from~~ ~~what~~ ~~exact~~ ~~fruit~~  
~~but~~ ~~know.~~

- (466) } Quartz in S. side of pit; in  
 (467) } schistose greenstone  
 (468) } Quartz in north side of pit in  
 (469) } Jasper and ore.  
 (470) } Jasper and ore in north  
 21206 side of pit  
 (471) } N. W. side of pit. Rock  
 21207 specimened. Apparently brecciated.  
 (472) } Junction of greenstone dyke  
 with wall of pit.  
 (473) } W. end ledge brecciated, Jasper  
 like (471).  
 (474) } Point for station (traverse)  
 (475) } " " " "  
 (476) } Station. At  
 At (476) the rock is again  
 banded Jasper and ore striking  
 N. 12° E and dipping 40° N.  
 (477) } Near (473), in fault extending  
 21208 into pit. Specimen.  
 (478) } N. side of pit  
 (479) }  
 (480) } Quartz in small pit, north of large  
 (481) } one. Only schistose greenstone visi-  
 ble in it.  
 (482) } Dyke schistose greenstone  
 (483) } Banded Jasper and ore, striking





Rough Outline of Jackson pit

- 21209 30° S of E and dipping S. at 70°.
- (484) Centred Jasper and ore
- 21210 Specimen
- (485) Schistose granular
- (486) } Other
- (487) } Points on
- (488) } North side
- (489) } of Pit.
- (490) }
- (491) E. end of pit.
- (492) Schistose granular dyke 10ft wide running all the way from 491 and 40 ft. further west.
- (493) Success point on S. side of pit
- 21211 } Specimen from
- 21212 } this point
- (494) } The South side, East end of
- (495) } the pit consists of a series of
- (496) } points and embayments, of which
- (497) } the principal ones are outlined by
- (498) } these signs.
- 21213 is specimen from (496)
- 21214 " " " (497)
- (499) Banded Jasper and ore, striking nearly E-W and dipping generally by north.
- (500) Rock extends 20 ft S of 500



- (501) S. end of ledge banded jasper and ore.
- (502) N.W. cor of another large pit where there is exposed considerable schistose greenstone.
- (503) S. side of pit, west end. Schistose greenstone.
- (504) E. end, south side. Schistose greenstone.
- The north side of the pit is in jasper and ore, which is also exposed continually between the two pits.
- (505) Curved jasper and ore, on hill side S. of pit.
- (506) Middle of schistose greenstone ledge 35 ft long (N.E.) and 10 ft. wide.
- (507) Foot of greenstone bluff.
- (508) W. foot of bluff.
- (509) S.W. side
- (510) E. side, on top.
- This little knob is separated from another one north by a little valley, in which are no rocks.
- (511) N.W. cor. of southern knob.

- (512) Top of knob, very steep, W.S.
- (513) Bottom at East end.
- 21215 The entire knob is base green-  
stone of which specimen taken  
from (513) is a sample.
- (514) Bottom, East end, of northern  
knob.
- (515) E. end of knob south.
- (516) Little ledge of schistose green-  
stone.
- (517) Schistose greenstone, crossing  
W. end of small southern fir.
- (518) } Little ledge of contorted jasper and  
(519) } one
- (520) } W. end fir
- (521) } } Contorted jasper  
(522) } } and  
(523) } } one.
- (524) } W. end ledge contorted jasper  
and one.
- (525) } E. end same ledge.
- (526) } Center ledge of jasper etc. 40 ft  
long and 20 ft wide.
- (527) } Edge of fir
- (528) } " " "

Very thin layers of schist. near  
East from here.



(529) Edge of fir.  
 21216 From west face of little tongue  
 running north from point E of  
 (529).

(530) 30 ft S.E. of end of point

(531) South side of ledge running N.  
 40 ft, then East to edge of fir.

(532) } Points in

(533) } edge of fir.

The ledge here has been strip-  
 ped for 50 ft. S. exposing well  
 bedded jasper and ore. The en-  
 tire fir is in this rock, the  
 sides consisting of it unless  
 otherwise specified.

(534) Edge of stripped ledge

(535) Practically, division between  
 this fir and the one East.

on the north side of the fir,  
 just about opposite this point  
 is a little schistose greenstone.

(536) 10 ft. W. of W. end next fir

(537)

(538)

(539)

} Edge of fir

All these points are in jasper and  
 ore. But about 20 ft. S. of (539)

a greenstone dyke 20 ft. wide  
cuts the wall of the pit.

(540) W. end small pit.

(541) Side of pit, practically zone  
E. end of large pit. The end of  
the pit is 60 ft. further North

(542) E. end small pit, whose west  
end is (540). Entire pit is  
jasper and ore.

(543) W. end ledge of jasper and ore.  
on top of hill. A few small  
schistose greenstone dykes are  
observed cutting it.

(544) W. end ledge of jasper etc, run-  
ning W. by E.

(545) Center jasper and ore ledge.  
20 ft. N. 50 ft. E. W.

(546) W. and well banded jasper  
and ore, running 60 ft. in the  
direction of its strike, which  
is 10 S. 7 E. Dip 65° N.

(547) E. end of ledge (549)

(548) Small ledge at the west end,  
21215 <sup>near</sup> the bottom of the hill.

(549) W. end of ledge (547) Hard, red, jasp-  
per and ore.

(550) In station.



- (551) In valley. A small greenstone ledge begins 10 ft N of (551) and runs 25 ft. Northward.
- (552) Station
- (553) S. end of the arm of a pit. The east side of the arm is schistose greenstone, and its west arm, except the extreme northern end is jasper and ore. At the end of the pit is again schistose greenstone.
- (554) Little pit making into pit.
- (555) At valley. Here again schistose greenstone
- (556) Pit in pit
- (557) Near East end of little pit running about 100 ft. in direction of sight.
- (558) E. end of old pit, with rock along E side only.
- (559) } Pools in edge of pit.
- (560) } " " " " "
- (561) } " " " " "
- (562) East side of pit. Schistose greenstone
- (563) Contrasted jaspers and iron in pit.

(564) Edge of pit.  
(565) " " "

The little pit in which is (562) etc., shows well the relations of the various rocks. On the East side is a Breccia and on the west side a quartzite dipping about N.W. at 30°-40°.

21218

21219

Under the quartzite is a brown rock that was first taken for a green tuffe schist, but which upon second sight appears to be rather an altered, ferruginous quartzite.

21220

21221

Jasper and one occurs in the little area at (555) (?) and at the station the rocks are contorted cherts.

21222.

(566)

S. E. cor. of contorted chert ledge, running all the way to the aliade and beyond 20 ft.

(567)

Middle of ledge of same rock 30 ft. E.W. 20 ft. N.W.

(568)

Pit in chert

(569)

Edge of hill.

(570)

Down E slope of hill

(571)

Middle of ledge of chert 50 x 30 ft.





