Township 47 north, ranges 34, 35, and 36 west, specimens 31554-31600, 31901-31903. No. 261 1891

Finlay, J. R.
[s.l.]: [s.n.], 1891

261

LAKE SUPERIOR SURVEY

Finlay

Index

LAKE SUPERIOR SURVEY.

INSTRUCTIONS.

Topography.—On the left-hand page map as much of the section as has actually been seen, counting each of the spaces between the blue lines as 100 paces, and 20 of these spaces to one mile, or 2,000 paces. The scale is four inches to the mile, and the heavier blue lines, outlining one inch squares, mark forties. Denote streams, lakes, swamps, marshes, etc., by the topographical signs annexed.

The geologist will consult with the compassman, and describe as accurately as possible, the timber traversed. When pine is found, give its proportion; tell whether good or poor, and indicate kind—white, norway, jack. If hemlock is found, note the relative amount. In hard wood districts, designate as good or poor, heavy or light, and indicate predominant kinds, oak, maple, birch, etc. Cedar swamps, spruce swamps, tamarack swamps and meadow swamps will be always discriminated. Outline burnt timber.

Each day, just before leaving camp, the geologist will compare his own and the camp aneroids, and the reading of each, with time, will be recorded. At work the aneroid will be read on gentle slopes at intervals of 200 paces; on steeper slopes at intervals of 100 paces; also at all maxima and minima. When minima are streams the map and notes will indicate this, showing width and character of streams. When a stream has made a cut of importance, aneroid readings will be made where the banks break off and at water level. If instead of an abrupt break, the stream valley has steep slopes, aneroid readings will be made with sufficient frequency to show this character.

At reading points the compassman will stop, read the dial compass, and remain until the records are complete. The readings will, as fast as made, be placed upon the map at the right-hand side of the line traveled, and in the notes, the numbers being inclosed in parentheses, basing the work upon the bench-mark which served as a starting point. At bench-marks the absolute reading of the aneroid and the altitude as shown by the bench-mark will be recorded to serve as a base for subsequent readings. For instance, aneroid 29.13 inches; altitude on bench- mark, 275 feet. At each subsequent reading, by setting 275 on the altitude circle at 29.13 on the fixed dial, altitudes may be directly recorded. When the next bench-mark is found at two miles distance, the difference between the aneroid reading on the basis of the first bench-mark and the second bench-mark will be recorded. At intervals of a half hour during the day the time will be attached to the aneroid readings. Upon reaching camp, after the day's work, the geologist will record the readings of his own and the camp aneroid, and also the time. Interpolations will then be made, based upon the bench-marks and times (not distances) if the day has been one of no abnormal atmospheric disturbances, or upon both bench-marks and camp aneroid readings if there have been unusual disturbances, and the corrected numbers, less a constant of 4 feet, will be placed upon the face of the map at the left-hand side of the lines of travel, and in the notes without parentheses, but the parentheses numbers will not be erased.

At each aneroid reading the trend of a horizontal contour line will be indicated upon the face of the map, making the length of the line correspond as nearly as may be with the actual distance seen. In passing directly up or down a slope, the contour lines will be at right angles to the direction of travel. In passing up a hill diagonally the contour lines will intersect the lines of travel at various angles, which can be estimated and plotted with sufficient accuracy by an appreciation of the north and south direction.

The course of travel will be always north and south. In starting from a quarter or a sixteenth post, the work will be plotted on the assumption that the true course is followed, but upon reaching the next section line the geologist will remain in the position at which the line is struck by the compassman until the latter finds the adjacent bench-mark. The intervening distance will then be paced by the compassman, and the point of intersection of the section line marked. From this point to the starting-point, a right line will be drawn as the actual course of travel. The positions of the contour lines, aneroid readings, etc., will not be changed.

Geology. – In running the north and south lines, the compassman will, if possible, determine the course by the dial compass. At the time the geologist reads his aneroid, the compassman will determine the magnetic variation, which will be given to the geologist and recorded in the note-book. Each morning the watch of the compassman will be set to apparent time (corrections being made for the equation of time and for longitude), so that he will need to make no correction in reading magnetic variation. On cloudy days, and at times when the sun is too low for the use of the dial compass, the course run will be by needle upon the supposition that the magnetic variations indicated on the township plats are right when corrected by deducting 3° if the variation is east, or by adding the same amount if the variation is west.

Not less than once per week the accuracy of the watch of the geologist in charge of a party (who will give time each morning to the compassmen), will be tested. This may be done, first, by obtaining correct time from a railway station by means of a packer when sent out for provisions. Such time will be mean, i. e., watch time for the nintieth meridian. Second, corrected time may be found by blazing out a north and south section line, preferably a range line, for some distance, setting a signal on the line and placing the dial compass duly leveled, in a north and south direction upon a Jacob's-staff just before mid-day, and setting the watch at 12 at the time the line strikes the noon hour. In a watch thus set all corrections are made.

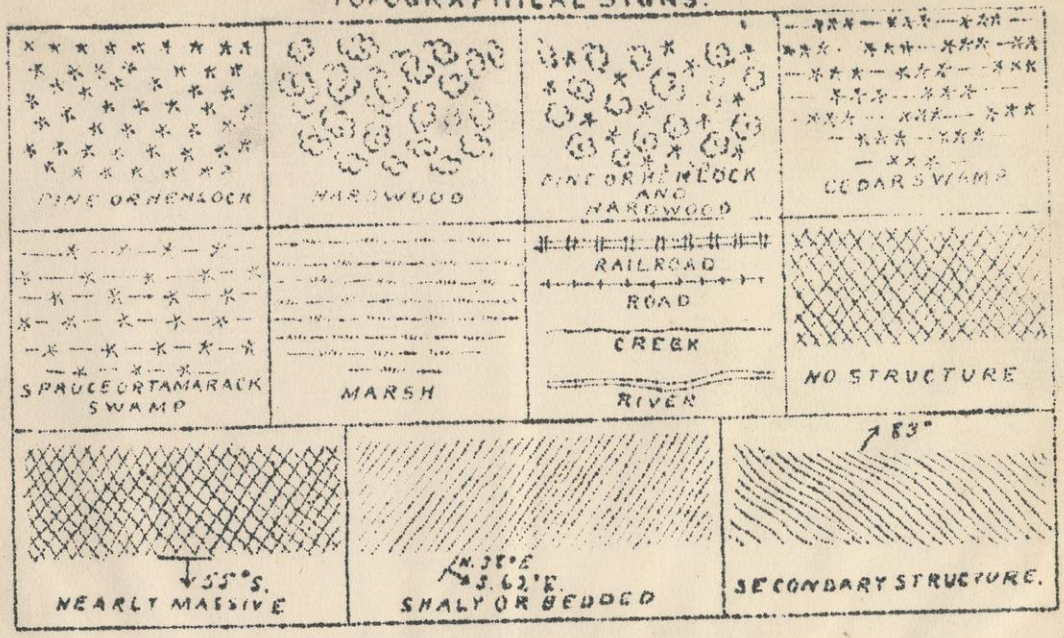
It will be the constant business of the geologist to search for outcrops. All hills within a reasonable distance of the course of travel will be examined. Oftentimes upon the steeper slopes of a hill a rock surface is covered with a coating a few inches thick of moss, leaves or vegetable mold and can be stripped with the pick. Where the exposure is small and there is the least possibility that it may be a large bowlder, indicate this fact in the notes and by a query on the map. All ledges off the line of travel of the compassman will be located by the geologist pacing to this line in an east and west direction, his course being determined by compass.

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, having strike line and dip arrow with numbers attached. 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 specimens representing it. 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, *No.* 437, 1226, *N.*, 353 *W.*, *Strike*, *N.* 47° *E.*, *Dip*, 68° *S. E.* Then follow with as full a description of the ledge as possible.

Collect a specimen from every ledge, and if the ledge exposes different kinds of rock, collect a specimen of all varieties. Take care to get fresh material, unless for a special purpose the weathered surface is desired. Where ledges are infrequent the normal size of specimens will be 3x4x1 inch. In case several specimens of the same ledge are necessary, and when ledges are numerous, specimens 2x2½x¾ inch will be allowed. In all cases collect chips for slicing. No two specimens will be given the same number. In the cases in which several specimens come from the same ledge, the different numbers assigned to them will enable an easy description of their relations. Specimens will be placed at once in paper bags provided, upon which shall be marked in at least two places, with a blue or red pencil, the specimen number.

TOPOGRAPHICAL SIGNS.



EQUATION OF TIME FOR 1891.

Day	Min.	Day	Min.	Day	Min.
		JUNE.			
		Add to watch time.			
1-6	2	7-11	1	12-16	0
		Subtract from watch time.			
17-21	1	22-26	2	27-31	3
		JULY.			
		Subtract from watch time.			
1-6	4	7-13	5	14-31	6
		AUGUST.			
		Subtract from watch time.			
1- 7	6	8-13	5	14-18	4
19-23	3	24-26	2	27-29	1
30-31	0				

SEPTEMBER.

Add to watch time.

1- 2	0	3- 5	1	6- 8	2
9-11	3	12-14	4	15-17	5
18-19	6	20-22	7	23-25	8
26-28	9	29-30	10		

OCTOBER.

Add to watch time.

1	10	2- 4	11	5- 8	12
9-12	13	13-16	14	17-22	15
23-31	16				

NOVEMBER.

Add to watch time.

1-13	16	14-19	15	20-23	14
24-26	13	27-29	12	30	11

Geological and Topographical notes by J. R. Finlay

#3

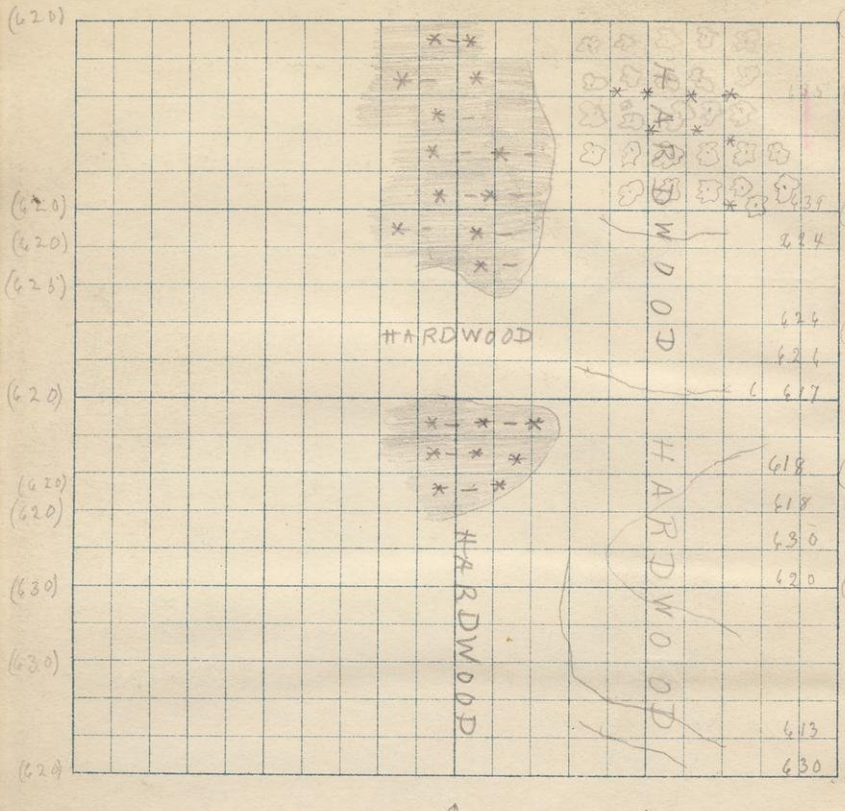
SPECIMENS: 1554–1600
1901–1903

TOWNS — 47–34
47–35
47–36

NOTE — 1904 appears to have been stripped
E.R.M.

2 Sept 6th 1891

S. 18 T. 47 R. 34



E 1/8 line

E Sec. line.

8. AM

Going S on E line Sec 18

B.M. 636.73 100 = 29.1 in
200(635) Hardwood, scattering Pine
500(635) "
600(620) Hardwood
800(620) "
900(620) Fine Pine, Hemlock, Hardwood
1000(610) 8.48. AM " "
1200(610) Hemlock
1269(610) Var, 5° E. Hardwood, Hemlock
1400(620) Fine Hardwood
1500(610) " "
1900(600) " "
2000(615) " "
2029(610) Sec cor 9.40 AM

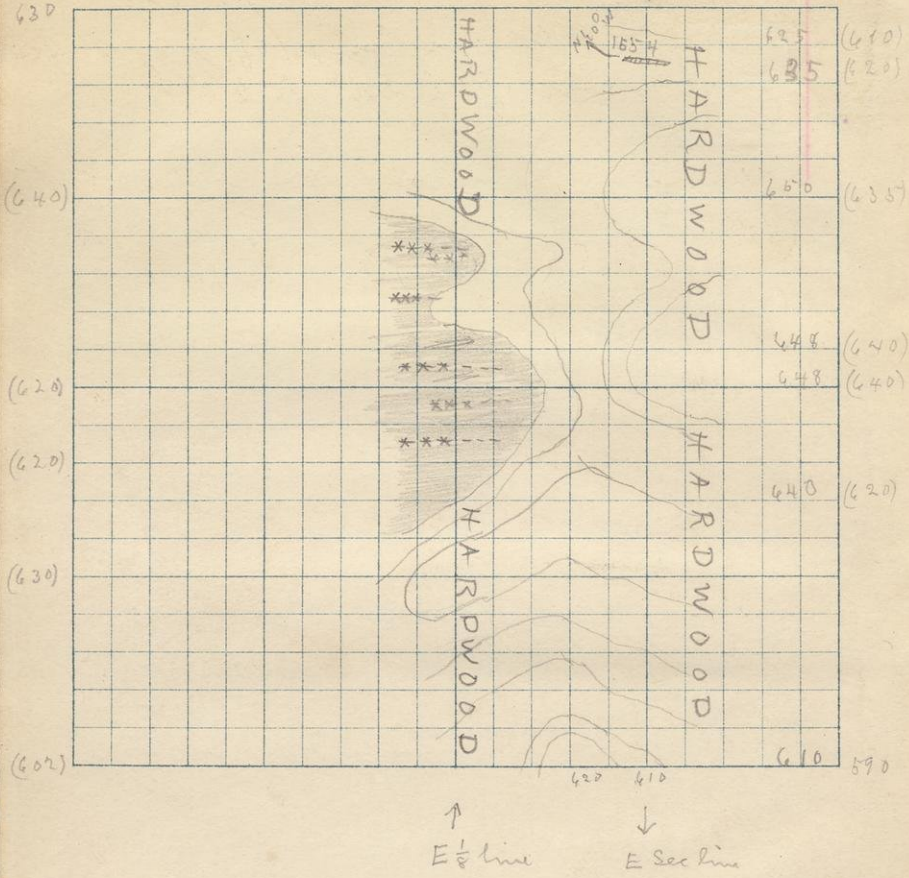
Going N on E 1/8 line Sec 18.

0.620) Hardwood
300(630) Very fine Hardwood
500(630) " " "
700(620) Fine Hemlock, Birch, Pine, Cedar.
780(620) Edge of Tamarack Swamp
1000(620) Pine, Cedar, Hemlock, Hardwood
12. M.
1300(625) Hardwood
1400(620) Cedar swamp
1500(620) Tamarack swamp
2000(620) " "

B.M. 619.30

4 Oct 6th 1891

S. 19 T. 47 R. 34



Going S on E line Sec 19

100 (610). Hardwood

150 (620) Obscure ledge of graywacke

Trend of ledge N 60° W

Spec 1554

500 (635) Fine Hardwood

900 (640) " "

1000 (640) 10.15 A.M. " "

1300 (620) "

2000 (590) 10.30 A.M. " "

B.M. 610. HH.

Going N on E ⅛ line. 10.56 A.M.

B.M. 661.64 3.00 = 28.9 Var 5° E.

Fine cedar and Hardwood

500 (630) Hardwood

800 (620) Fine cedar swamp

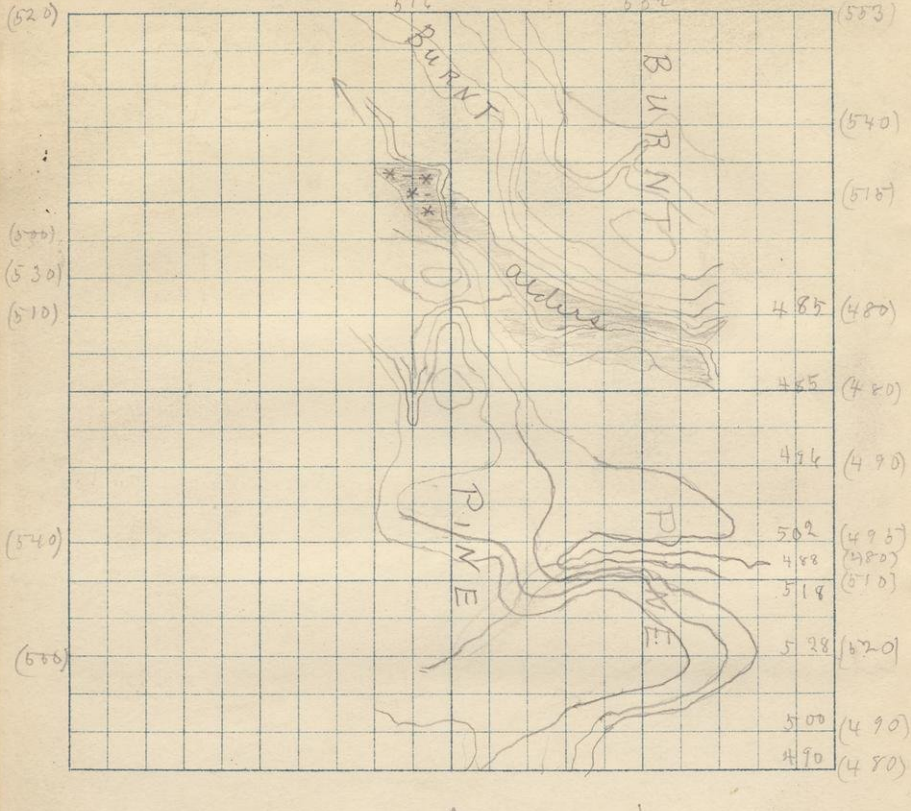
1000 (620) 11.08 A.M. Cedar Swamp

1000 (640) Fine Hardwood

2000 (630) 11.30 A.M. Fine "

6 Oct 7th 1891

S. 13 T. 47 R. 36



W½ line

¼ line

Going S on ¼ line Sec 13
8. A.M.

B.M. 552.71 D = 29.2

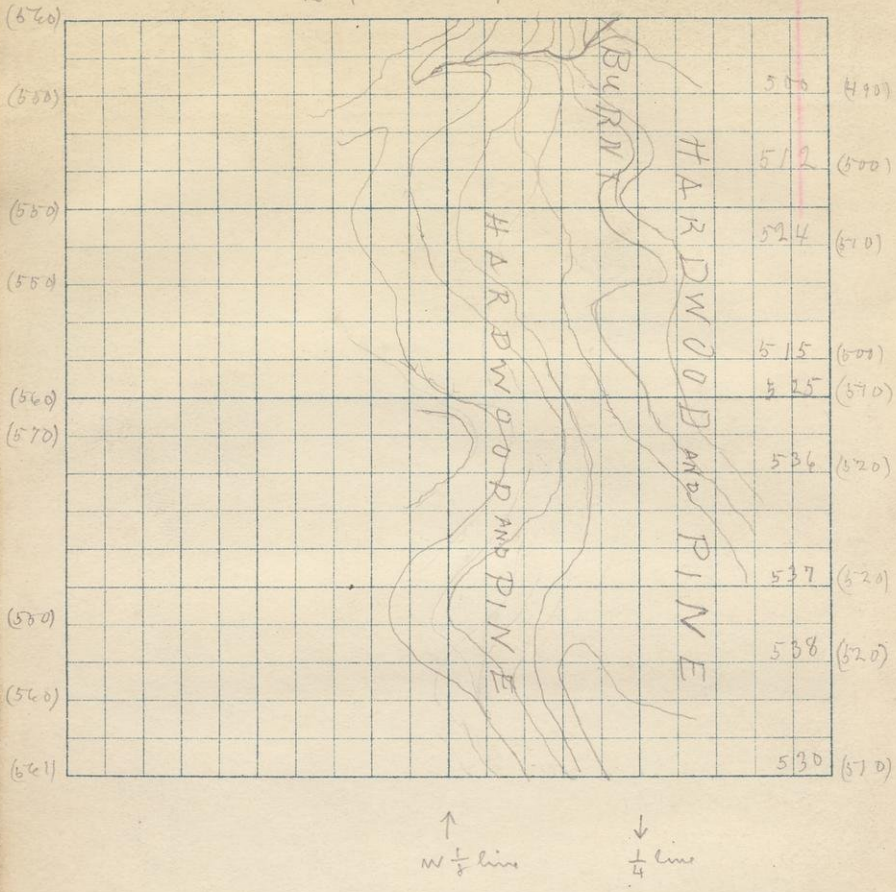
Burnt.

300 (540) "
500 (515) "
800 (480) alders
900 (480) Pine, Hardwood & mixed
1000 (480) Fine Pine 8.30. A.M.
1200 (490) Scorched Fine Pine
1400 (495) " " "
1426 (480) Small stream
1500 (510) Fine Pine
1700 (520) " "
1900 (490) " "
2000 (480) 9.30 A.M. Burnt Pine

Going N on W ⅛ line Sec 13,
300 (550) Creek. Hardwood + Pine
600 (540) Pine
1200 (510) " Creek
1300 (530) Fine Birch & Pine
1425 (500)
1988 (520) 1.30 P.M. Bench line.
B.M. 514.43

8 Oct 7th 1891

S. 24 T. 47 R. 35



Going S on $\frac{1}{4}$ line Sec 24

200 (490) Fine Pine
400 (500) " "
600 (510) " "
900 (500) " "
1000 (510) 10. A.M. " "
1200 (520) Heavy Pine & Hardwood
1500 (520) " " "
1700 (520) " " "
2000 (510) 11. A.M. " " "

B. M. 529

Going N. on W $\frac{1}{8}$ line Sec 24

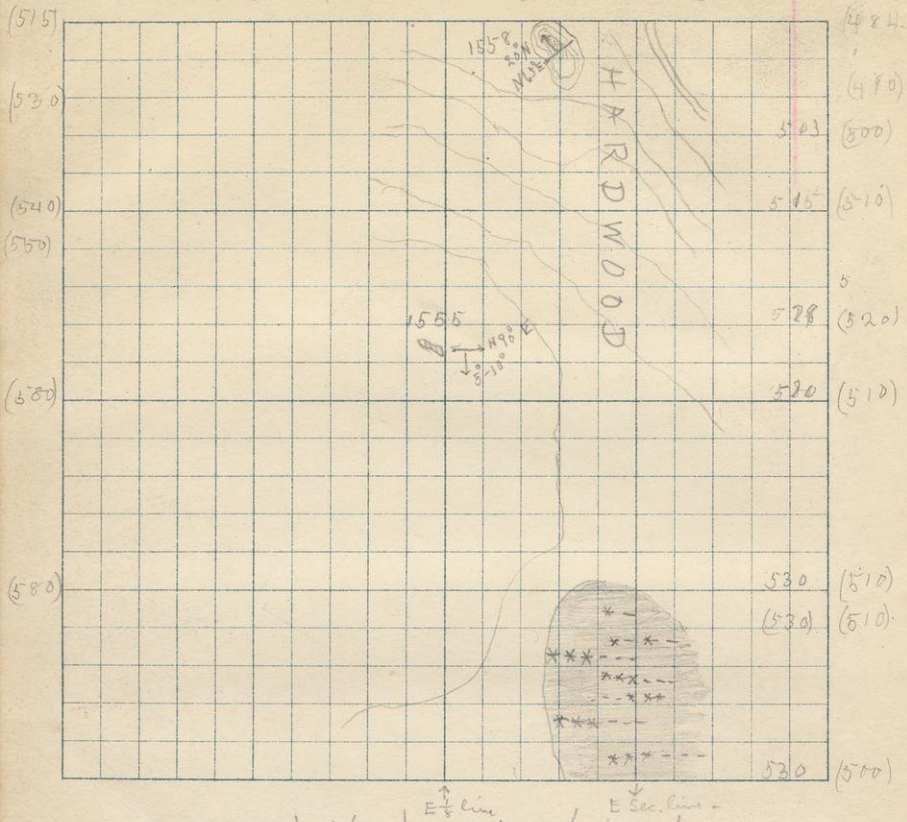
B. M. 561.28 900 = 28.2 in. 11:10. A.M.

Heavy pine and hardwood

200 (540) Hardwood. Pine scattering.
400 (550) " " "
900 (570) " " "
1000 (540) 11.40 A.M. Fine Pine & Hardwood
1300 (550) " " "
1500 (550) " " "
1800 (550) Hardwood, cedar, scattering pine.
1880 Small stream
2040 Sec line. Hardwood Scattering Pine
Aneroid 560.

10 Oct 8th 1891

S. 14 T. 47 R. 35



14 00 (550) Hardwood + first pint.
15 00 (540) Cedar and & Hemlock
18 00 (530) Hardwood and Pine.
20 00 (515) Hardwood

B.M. 513.92. 1.35 P.M.

Going S on E line Sec 14
7. A.M.

B.M. 484.54 200 = 28.9

200 (496) Hardwood
300 (500) "
500 (510) "
800 (520) "
1000 (510) 7.20 "
1500 (510) Balsam & Spruce
1600 (510) Spruce swamp
2002 (500) 8.05 AM. Cedar swamp

Going N on E ⅛ line Hardwood
500 (580) Hardwood, hemlock, pine.
1000 (580) 11.35 A.M. Hardwood, pine, hemlock.

Sec Sake D

1554

1135 Sec 14 765 feet N. 500 W.

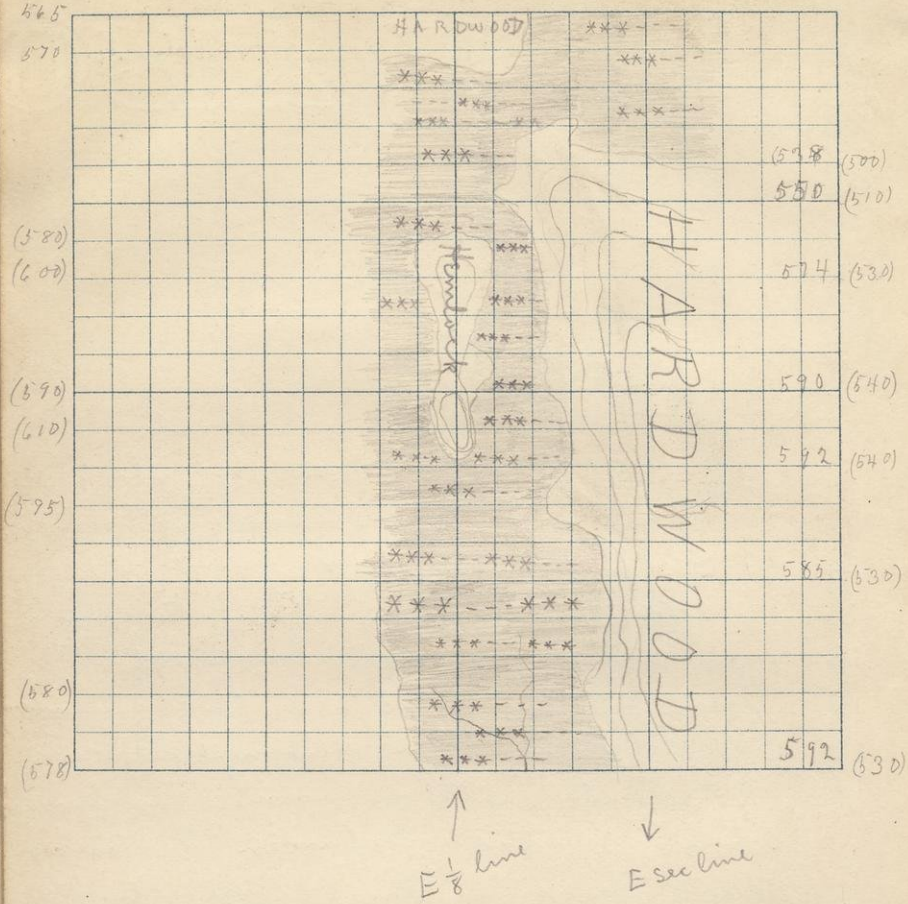
1554 Obscure ledge of siderite schists
1555 and slate. Very well banded.
1556 Some of the rocks very ferruginous.
1557 Some of them show decomposition of siderite into hematite. Specimens show contacts between the various beds seen on the ledge. The formation here is nearly horizontal.

Strike N 90° E
Dip 5°-10° S

Cleavage Strike E & W
Dip 45° S.

12 Oct 8th 1891

S. 23 T. 47 R. 35



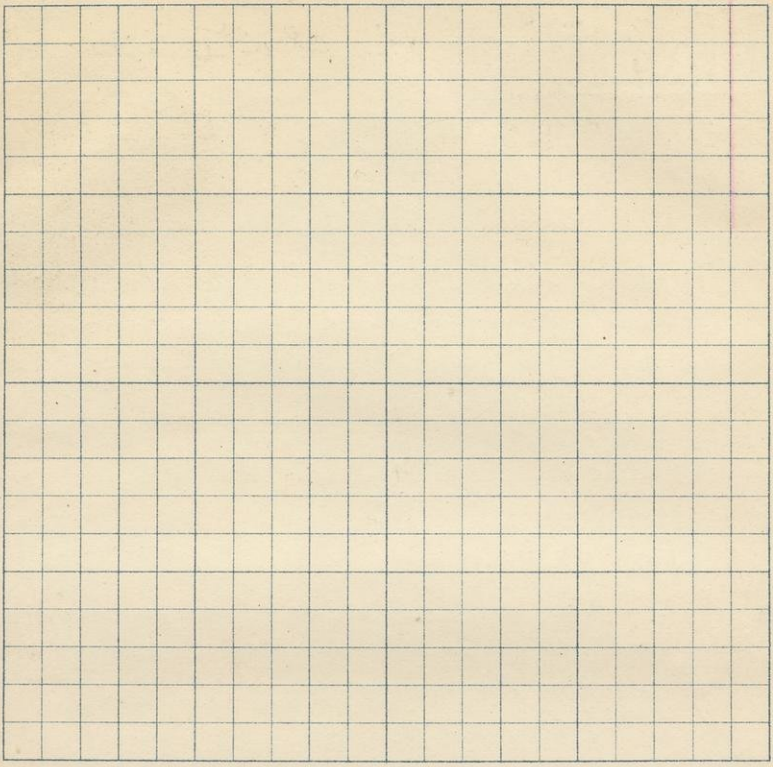
Going S on E line Sec 23.

400 (500) Edge of Hardwood
500 (510) Hardwood
700 (530) "
1000 (540) 8.53 AM. "
1200 (540) "
1500 (630) Hemlock & Hardwood
1950 (530) B.M. 582.28 9.15 AM. Hardwood

Going N on E ⅛ line Sec 23
B.M. 578.35. 600 ft = 25.5 in
Swampy Cedar and Hardwood
200 (580) Spruce and cedar
700 (595) " " "
900 (610) Hemlock ridge
1000 (590) 10.25 AM. Hemlock
1300 (600) "
1400 (580) Cedar swamp.
1960 (570) Hardwood and Hemlock
1998 (565) " " "

11.10 AM. Ll. Cameron Cor.

S. T. R.



1558 Sec 14. 200 paces W 2000 of S. E. Cor

Outcrop of slate 100 ft high.

Strike N 65° E

Spec Dip 20° N

1558 The rock is perfectly banded.

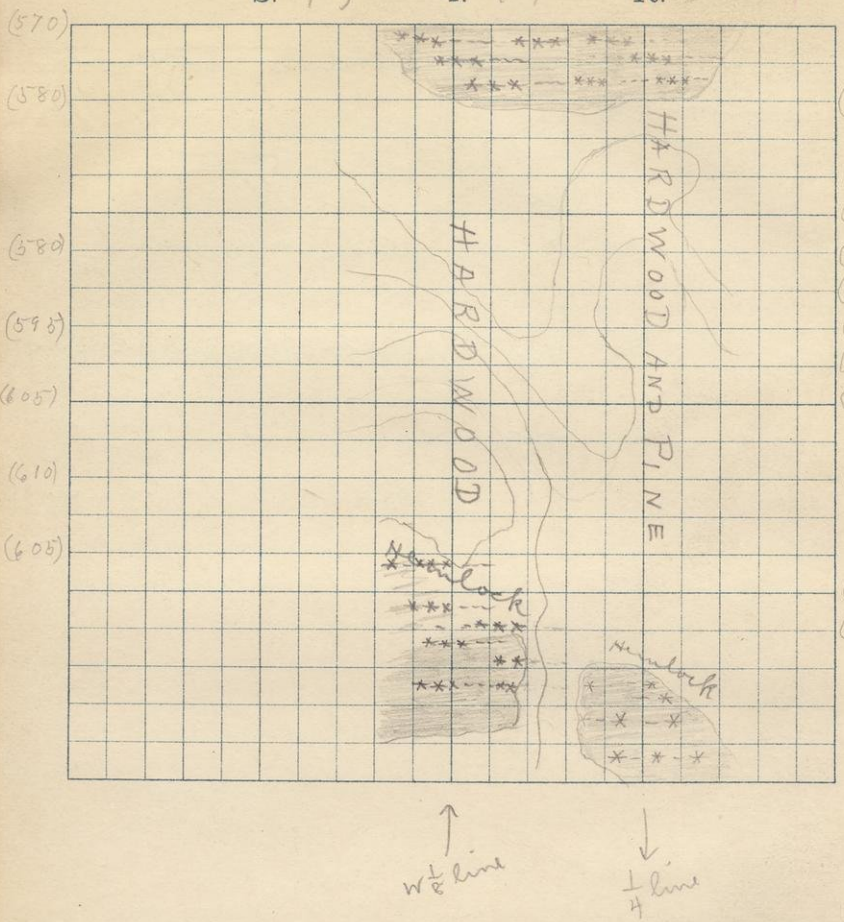
1559 The specimens show the contacts between the various rocks.

Cleavage Strike E & W

Dip 50°-60° S.

16 Oct 9th 1895

S. 15 T. 47 R. 35



543.13
(580)
(570)
(570)
(570)
(580)
(570)
(580)
(580)
(580)
(590)
(590)
(590)

Going S on ¼ line sec 15 8.30. A.M.

B. M. 554 3.13 300 ft = 28.5

Cedar swamp

200 (560) Hardwood

260 (570) Var 4°E "

300 " 3°30'E

400 (570) " 2°E Hardwood + Pine

500 (570) " 2°E " " "

556 " 3°E " " "

617 (560) " 2°30'E " " "

700 (570) " 3°30'E " " "

800 (580) " 3°E " " "

900 (580) " 3°E " " "

1000 (580) 9.40 A.M. Var 3°45'E Hardwood + Pine.

1100 (580) var 4°E Hardwood + Pine.

1212 (590) " 4°E " + "

1500 (590) " " "

1600 (590) Var 4°E. Hemlock, cedar, Hardwood + Pine.

2000 (590) var 4°E 11.05 AM Tamarack swamp.

Going N on W ¼ line Sec. 15.

600 (605) Cedar and Hemlock

800 (610) Hardwood

1000 (605) 3.35 P.M. "

1200 (595) var 5°E "

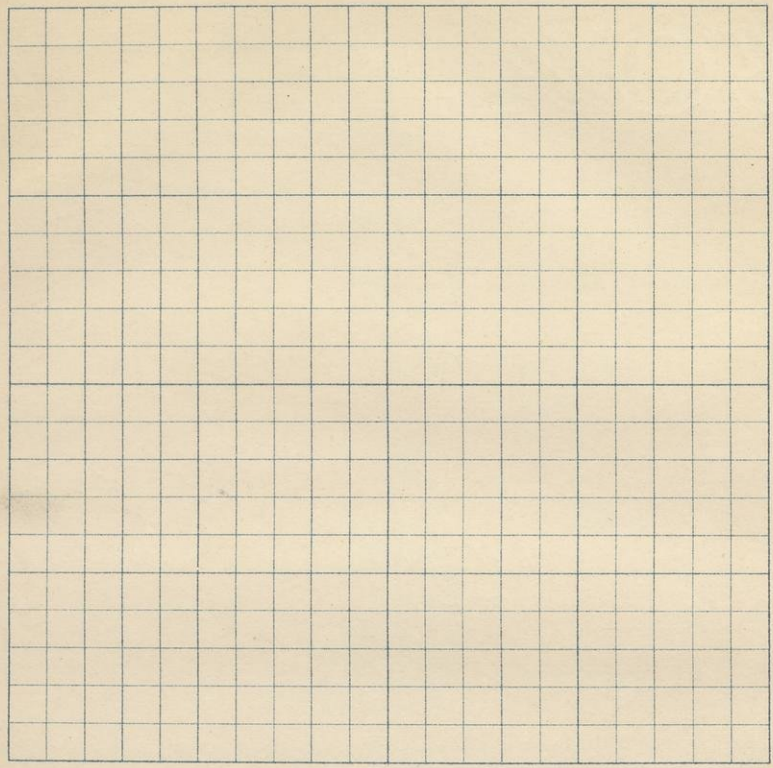
1450 (580 Hemlock

1800 (580) Cedar swamp

1950 (570) " "

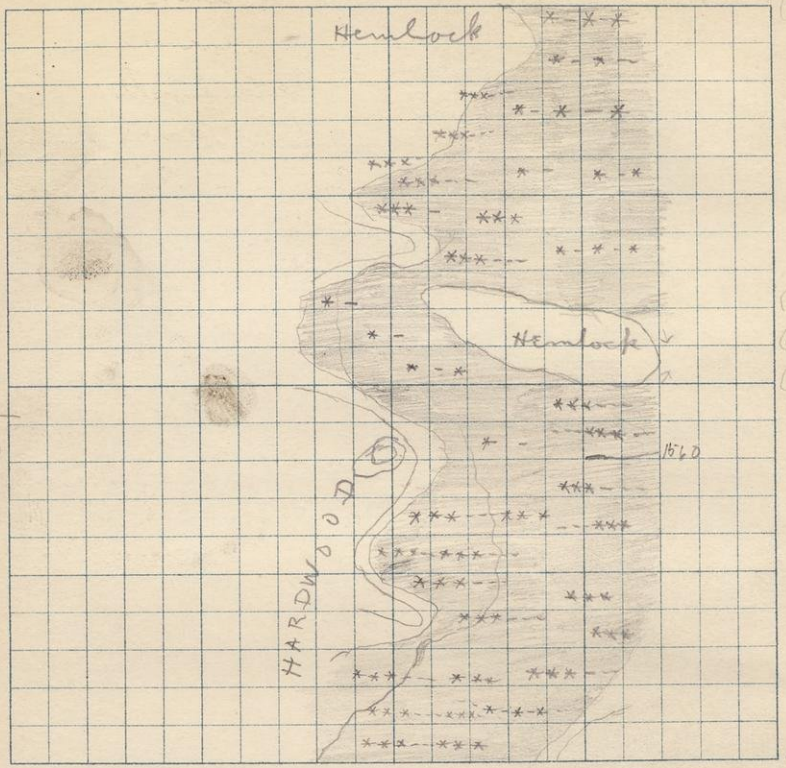
B. M. 558. 15

S. T. R.



20 Oct 9th 1891

S. 22 T. 47 R. 35



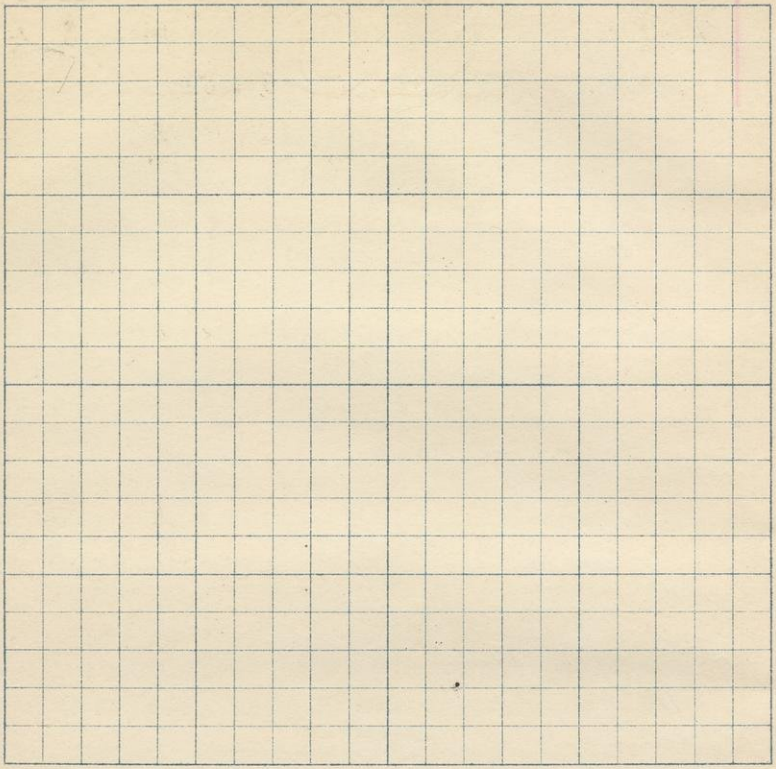
Going S on 1/4 line Sec 22

0 (590) Tamarack swamp
800 (590) Edge of swamp.
900 (~~590~~ 600) Var 5° E Hemlock.
1000 (590) 11.45 A.M. Cedar swamp
1200 (590) Ledge of a new kind of spotted schist. It is a kind of
1560. greywacke with good sized dark
1561 secondary crystals. Some of the rock is spotted with hematite due to decomposition of siderite. Some of the rock (1561) has a brecciated appearance.

Strike of ledge nearly E & W. Dip unascertained

2000 (605) Hemlock. B.M. 600.12
12.20 P.M. Closed at 2182, 150 W of Stake
Going N on W 1/8 line Sec 22
B.M. 587.32 1000 ft = 28 in
1.40 P.M. Cedar swamp. Var 5° E
400 (410) Hemlock with fine pine
700 (410) Hardwood
840 (425) Hemlock hill
920 (400) Tamarack swamp
1000 (400) 2.18 P.M. " "
1400 (610) Hemlock and hardwood
1600 (600) " Ridge

S. T. R.

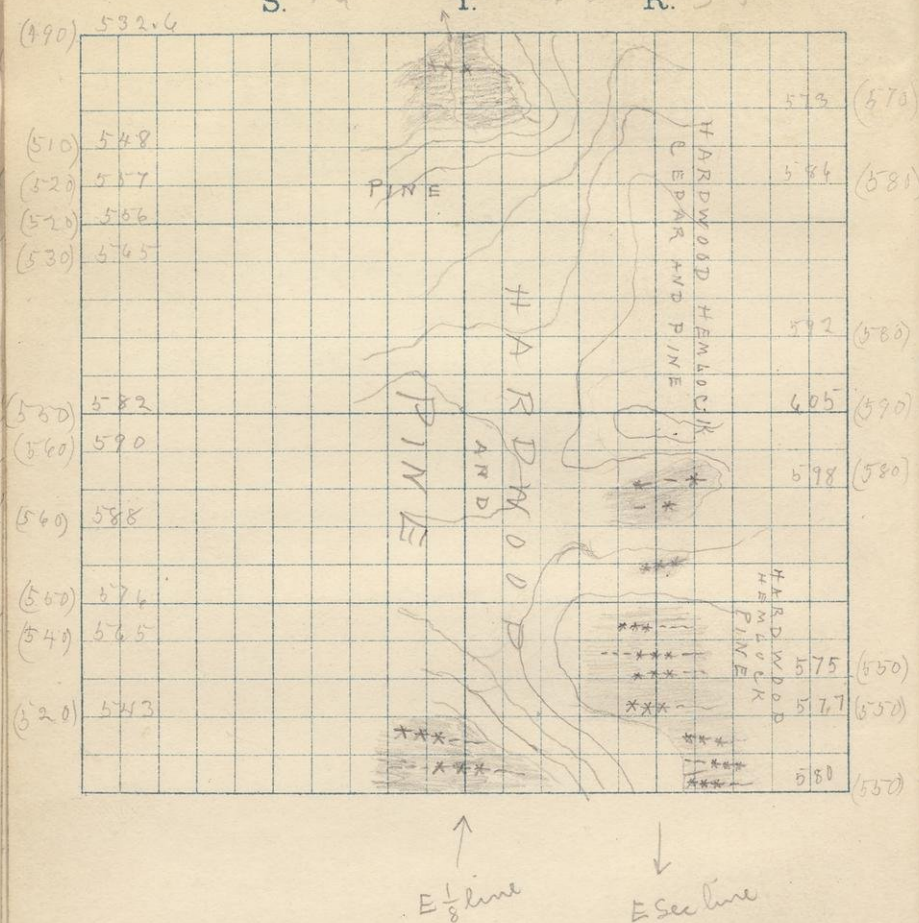


1900 (600) Cedar, hemlock, hardwood
2000 (400) Hemlock

Found line at 2050.
3. P. M.

24 Oct 10th 1891

S. 14 T. 47 R. 35



Going S on E line Sec 14 7.20 AM.

B.M. 559.84 1500 = 275

Hardwood

200 (570) Hardwood, hemlock, cedar, pine

400 (580) " " " "

800 (580) Hardwood + Hemlock

1000 (590) 8 A.M. " "

1150 (560) Tamarack Swamp

1700 (550) Cedar swamp

1800 (550) Hemlock, hardwood and cedar

2000 (550) Sec line. Hardwood & Hemlock

9. A.M.

Going N on E 1/8 line Sec 14.

200 (520) Edge of Swamp.

400 (540) Fine Hardwood

500 (550) " "

700 (540) Hemlock and Hardwood

900 (560) Fine Hardwood

1000 (550) 11.50 AM "

1400 (530) "

1500 (520) Pine, hemlock, birch.

1600 (520) Very fine pine.

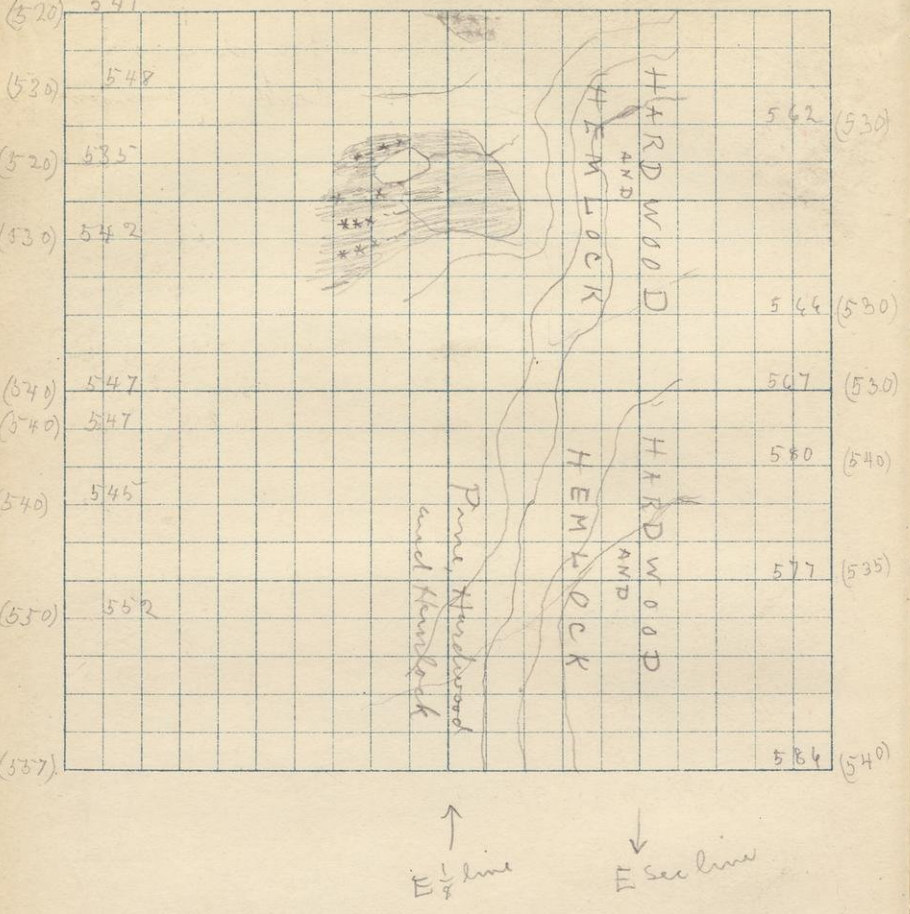
1700 (510) Hemlock & Hardwood

2000 (490) B.M. 533.6 Cedar Swamp

12.24. P.M

26 Oct 18th 1891

S. 21 T. 47 R. 35



Going S on E line Sec 21

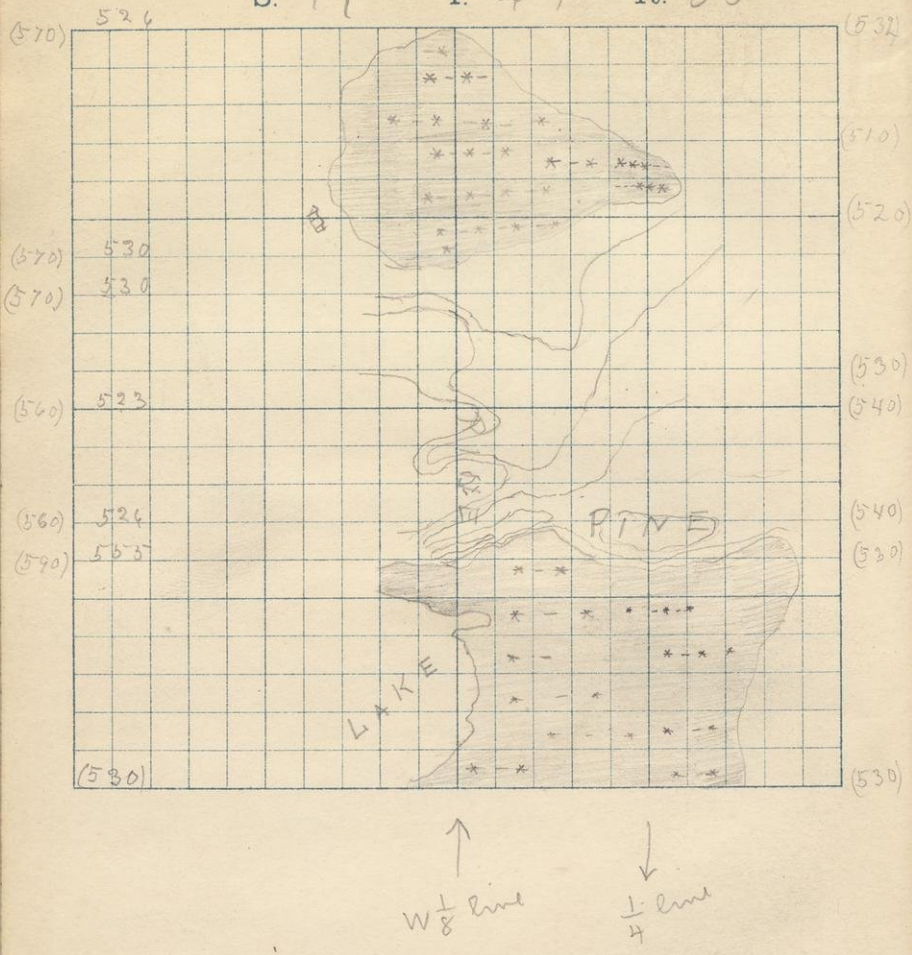
300 (530) Small stream flowing W
800 (530) Hemlock & Hardwood
1000 (530) 9.25 A.M. Hemlock + Hardwood
1200 (540) " "
1500 (535) " "
1940 (540) B.M. 584.38, " 9.50 A.M. "

Going N on E ⅛ line Sec 21
B.M. 554.68 200 ft = 2 9 m
10.10 A.M. Hardwood + Pine
400 (550) Hardwood & Pine.
700 (540) Hemlock, hardwood, pine.
900 (540) " " Fine Pine.
1000 (540) " " " "
10.34 A.M.

1400 (530) Edge of swamp.
1600 (520) Small stream, open meadow
1800 (530) Fine Pine + Hardwood
1950 (520) 11.20 A.M. Sec line Cedar swamp

28 Oct 12. 1891

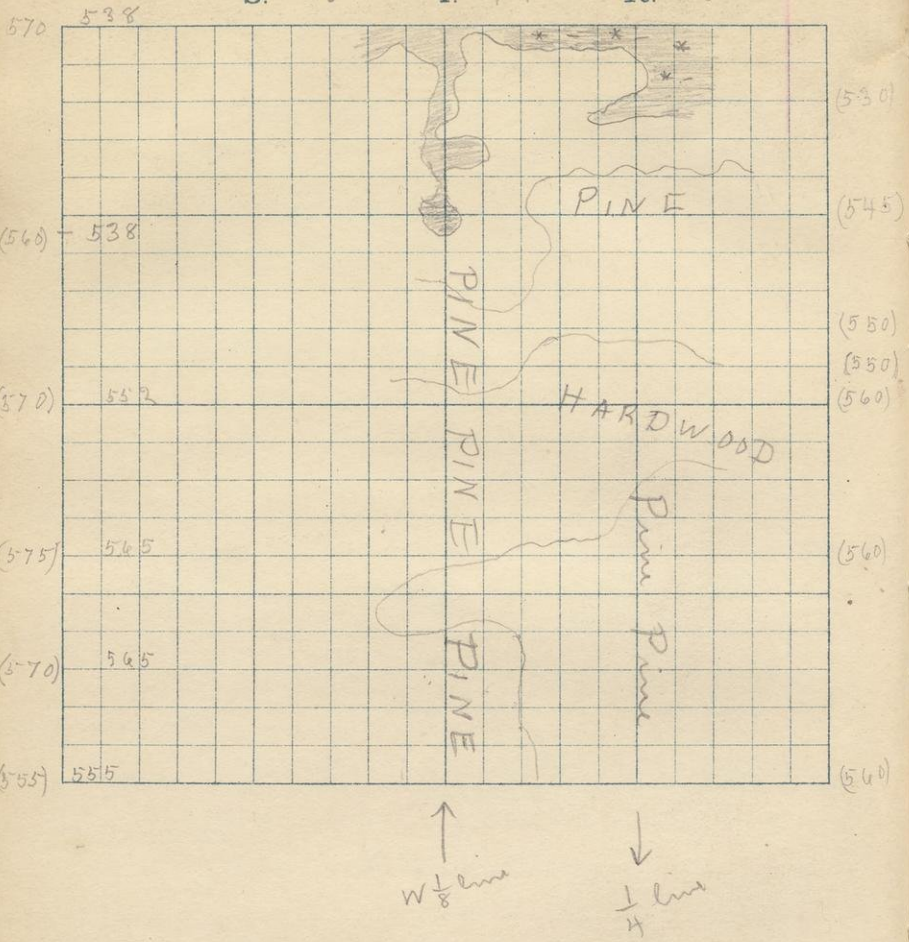
S. 17 T. 47 R. 35



Going S on ¼ line Sec 17
8. A.M.
B.M. 531.58 200 ft = 28.6 m
Hemlock + Pine.
300 (510) " " "
500 (520) Hardwood
600 Big Pines "
900 (530) Very heavy Pine and Hemlock
1000 (540) 8.35 " " "
1300 (540) Great grove of Norway & White Pine
1400 (530) Open Tamarack Swamp
1920 (530) Sec line. Open Tam. Swamp 9. A.M.
Going N on W ⅛ line
600 (590) Edge of Pine
700 (560) Var 5° E. Pine.
1000 (560) 12.10 P.M. Hemlock, Hardwood, Pine
1300 (570) Hardwood + Pine
1400 (570) Tamarack Swamp.
1930 (570) Edge of Swamp
B.M. 526.65.
12.35 P.M.

30 Oct 12th 1891

S. 20 T. 47 R. 35



Going East $\frac{1}{4}$ line Sec 20.

200 (530) Norway + White Pine Very heavy.
500 (545) Heavy Norway and White Pine.
800 (550) " " " " "
900 (550) Hardwood + Pine.
1000 (560) 9.35 AM Hardwood
1400 (560) Very Heavy white Pine
1965 (560) " " " "

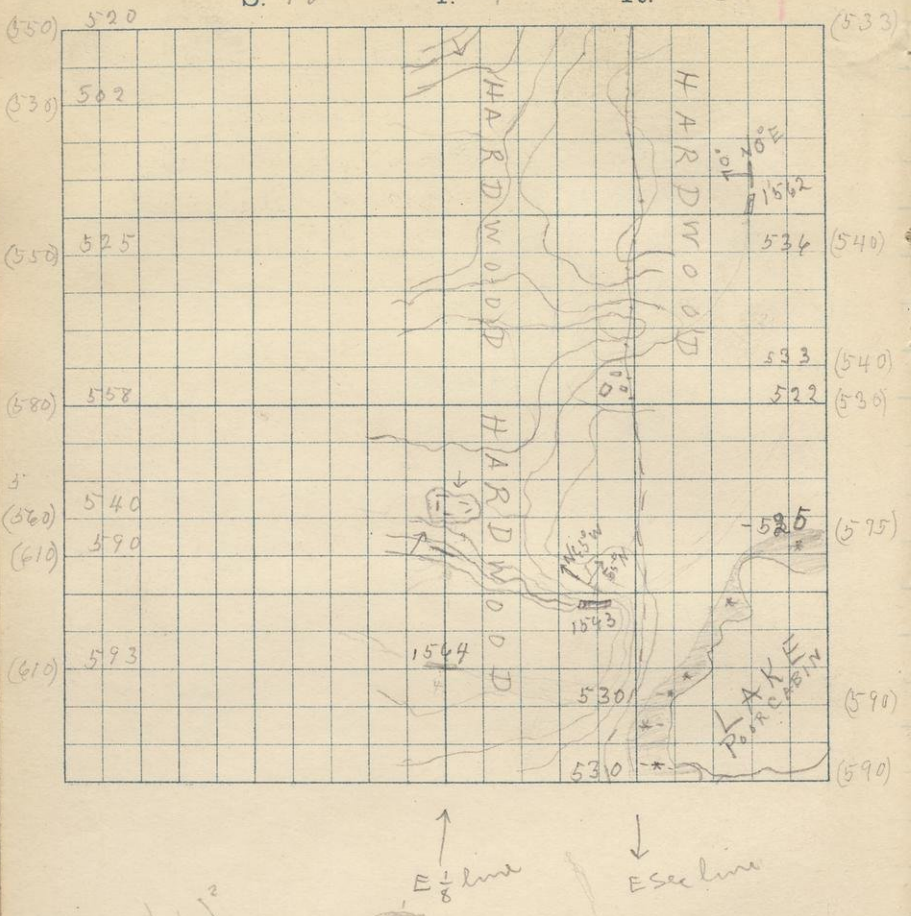
B.M. 558.25 10.05 AM.

Going North W $\frac{1}{8}$ line.

B.M. 555.05 800 ft = 28.6 in Pine heavy
300 (570) Pine "
600 (545) " "
1000 (570) 11 A.M. " "
1450 (560) Small open marsh
2015 (570) $\frac{1}{8}$ stake Open Marsh
11.40 AM

32 Oct 13th 1891

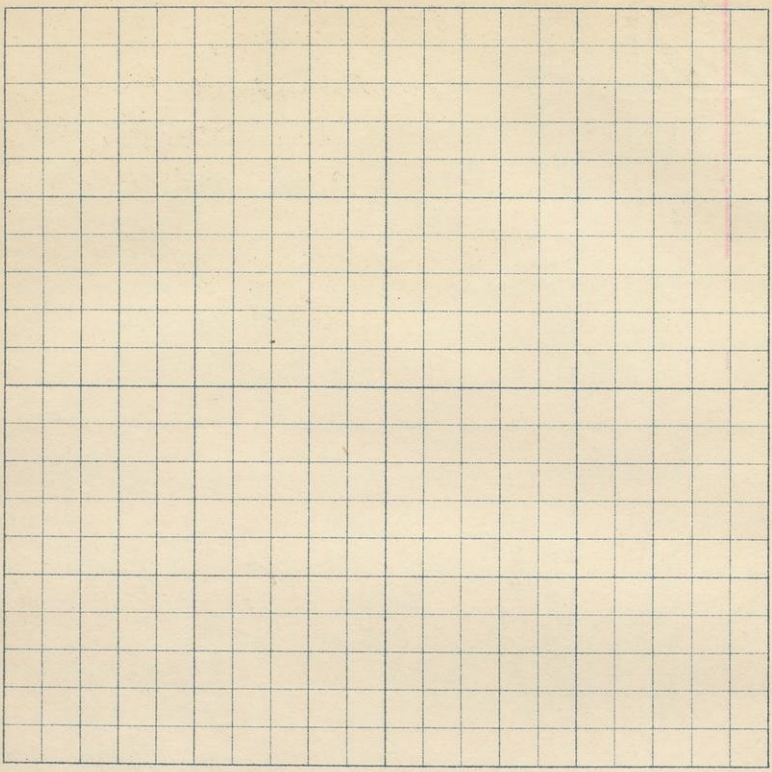
S. 18 T. 47 R. 35



Going S on E line sec 18
7.40 A.M.
B. M. 533.43. 800 ft = 28.2 m
600 (540) Hardwood, Hemlock, Pine
900 (540) Edge of Homesteader's clearing
1000 (530) 8 A.M. Homesteader's cabin.
In N.W. Quarter of Sec 17 on
W Edge of the large Tamarack
1562 Swamp. is a large ledge of
black slates and grits. The
slates are well banded and
show an almost horizontal
bedding. The cleavage strikes
E & W and dips 50° S. The bedding
is so near horizontal that
the true ~~beds~~ strike cannot
be made out. Spec 1562 shows
bedding and cleavage

1563 Sec 18. ~~500~~ paces N 100 paces W
of S.E. Cor.
Large ledge of slate and grit.
Plumbago said to be found
near bottom of ledge. Rock
well banded. Some of it contains
a little disseminated iron
Strike N 65° W
Dip 55° N

S. T. R.



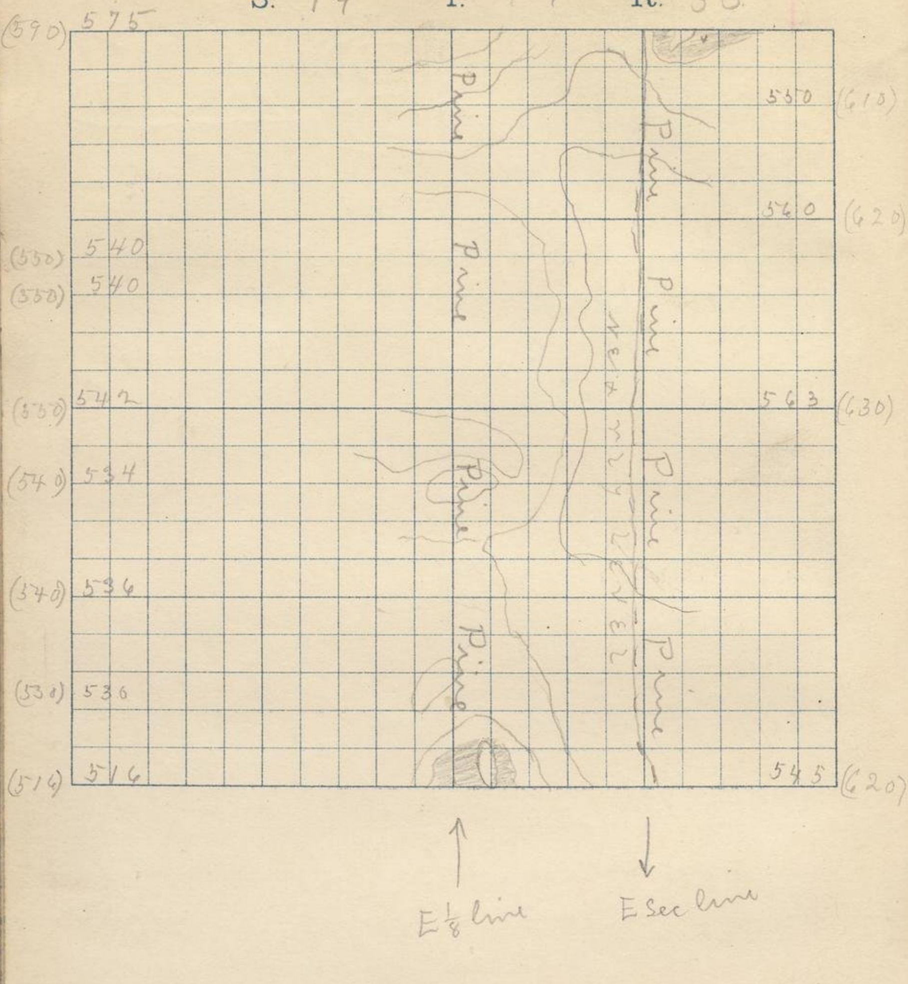
In the ledge of 17 the trend is N. and S.

10.05 1350 (575) Hardwood + Pine.
1800 (580) Hemlock.
2000 (590) 10.30 A.M. Pine and Hemlock
— Going N on E & line
300 (610) Ledge of Slate.
1544 Some ferruginous concretions
No dip or strike.

Hardwood
500 (610) Hardwood
700 (540) "
1000 (580) 1.25 P.M. "
1400 (550) "
1800 (530) "
2000 (550) Bench line "
B.M. 520.39. 1.40 P.M.

 Oct 13th 1891

S. 19 T. 47 R. 35



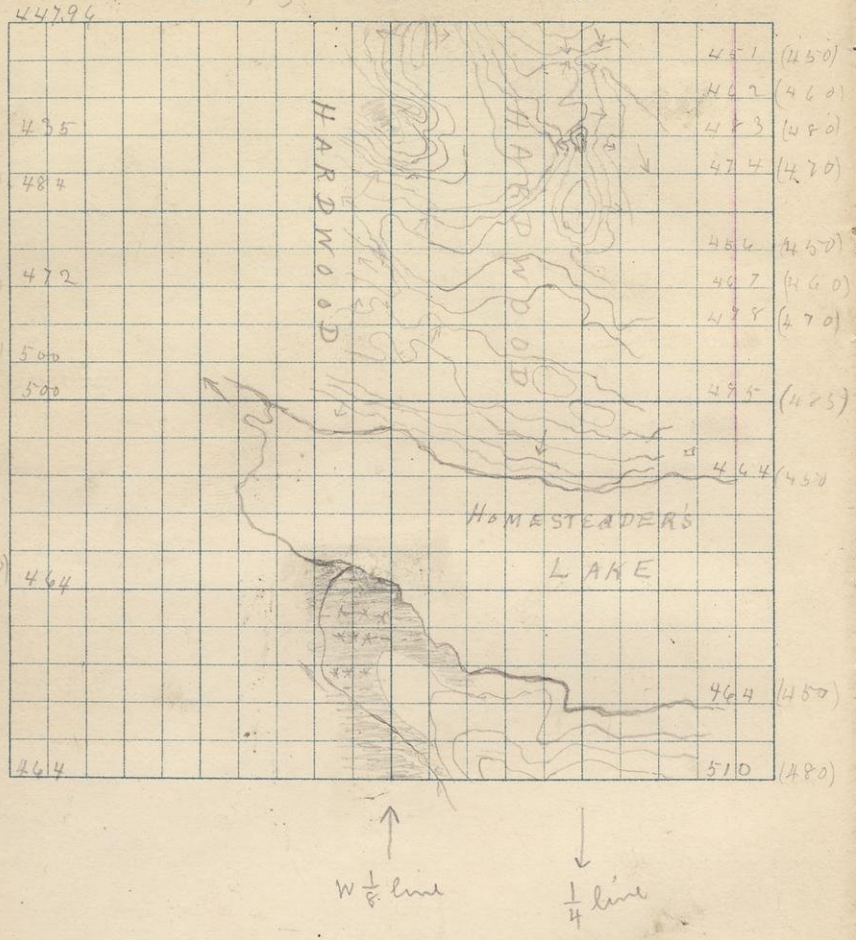
Going S on E line Sec 19.

200 (610) Fine Pine.
500 (620) Magnificent Pine.
1000 (630) 10.40 A.M. " "
2000 (620) 10.56 A.M. Fine Pine
B.M. 54 597

Going N on E ⅛ line Sec 19. 11.40 A.M.
B.M. 515.73 600 = 28.3 in
250 (530) Very heavy Pine
500 (540) " " "
800 (540) " " "
1000 (550) 12.10 P.M. Pine.
1300 (550) "
1400 (550) Very heavy Pine.
2025 (590) " " "
Sec line. 12.40 P.M.

38. Oct 15th 1891

S. 13 T. 47 R. 34



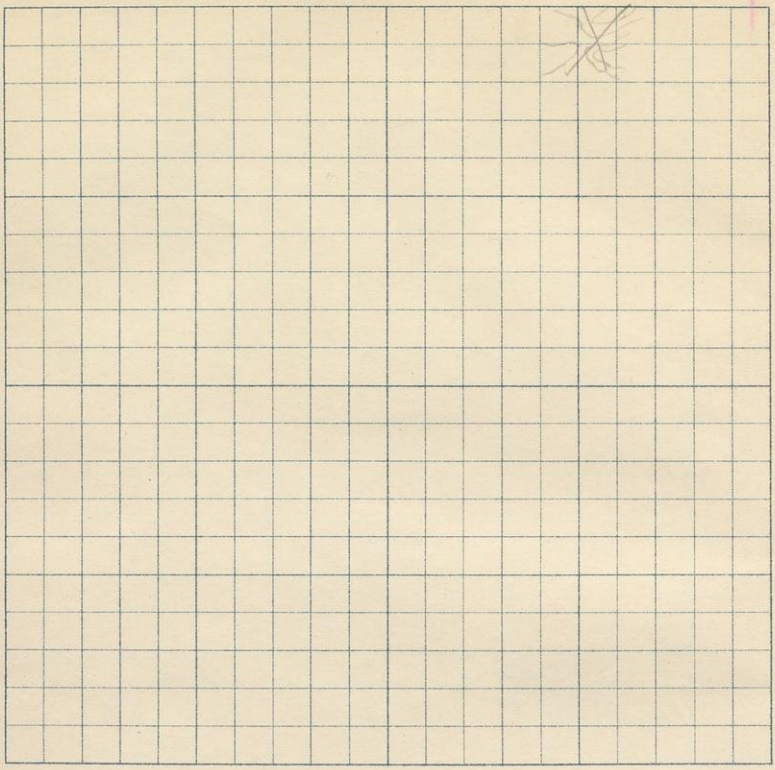
Going S on $\frac{1}{4}$ line Sec 13

B.M. 473.76 900 ft = 28 rm.
8.25 A.M. Hardwood
100 (460) "
200 "
300 "
400 "
500 Hemlock + Pine
700 Hardwood
1000 9. A.M. "
1225 Homesteaders Lake (460)
2000 (Sec line $\frac{1}{16}$ stake 10.54 AM Hardwood.
Set back 180 pins to S. shore of Lake

Going N on W $\frac{1}{8}$ line Sec 13
~~520~~ Lake of the Homesteaders
1000 (480) 2.40 P.M. Hardwood
2000 (420) B.M. 447.76 3.20 P.M

40 Oct 16th 1891

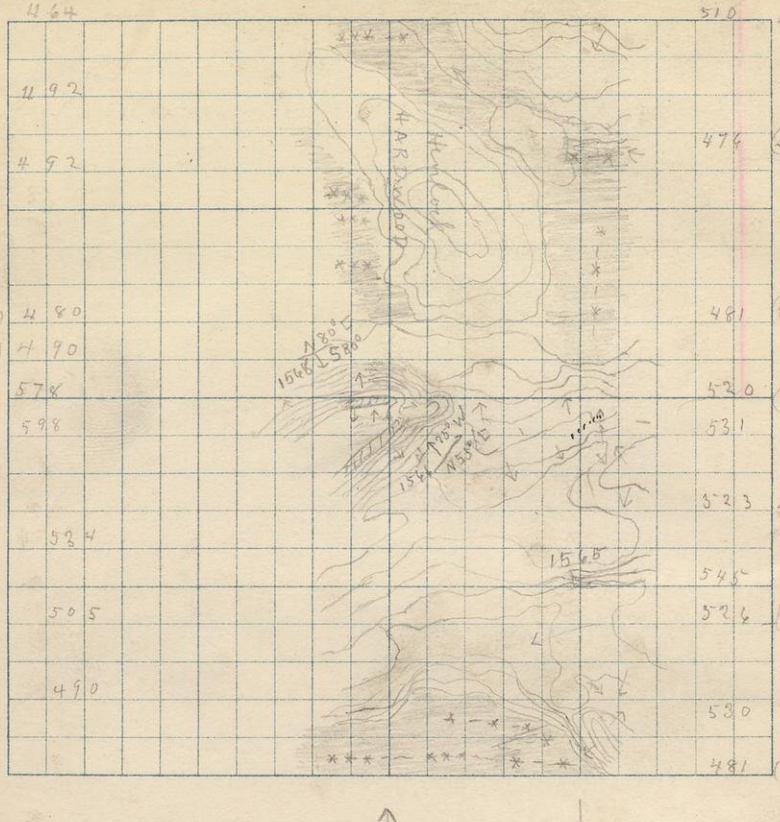
S. 14 T. 47 R. 34



~~Young Son Lime See 14~~

~~B.M. 428.24 0 = 29.2~~

S. T. R.



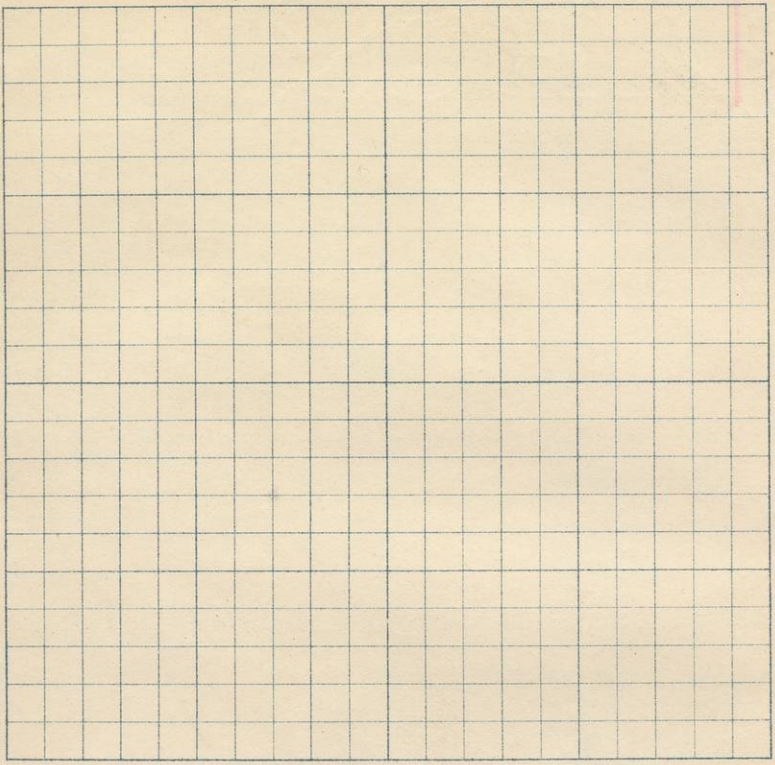
W 1/8 line

1/4 line

Going S on ¼ line Sec 24

300 Tamarack swamp
900 Edge of swamp
1000 11 A M Hardwood and hemlock.
1100 Fine Grove of Pine
1300 Pine. Very heavy timber.
1480 Sec 24.
1000 paces W 520 N of S. E Cor
Small ledge of greywacke slates.
1565 No dip or strike. The specimen is interesting as showing the development of secondary slate in the graywacke by pressure and slipping.
Trend of ledge E & W
Cleavage dips 60° S.
1800 Fine Pine ridge
2000 (426) B.M. 481.45, Tam. Swamp 11.40 A.M.
Going N on W ⅛ line Sec 24. 12 M.
B.M. 478.50 600 = 28.4 m Cedar swamp.
200 Hardwood and Pine
400 " " "
700 Fine Hardwood
900 Great ledge of black slates and greywacke
1566 Strike N 55° E
1567 Slip 25° N.W.

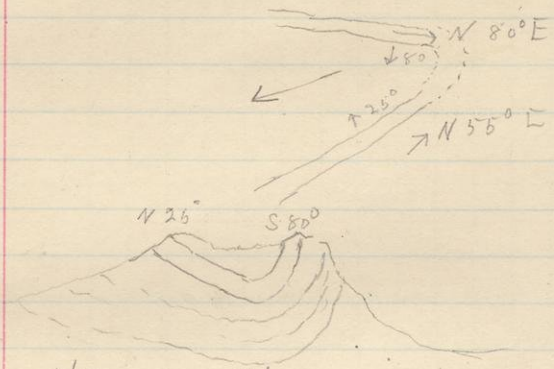
S. T. R.



The specimens both show contacts.

100 paces farther N is another very large exposure. Here the

Spec 1568 Strike is N 80° E
Dip 80° S.

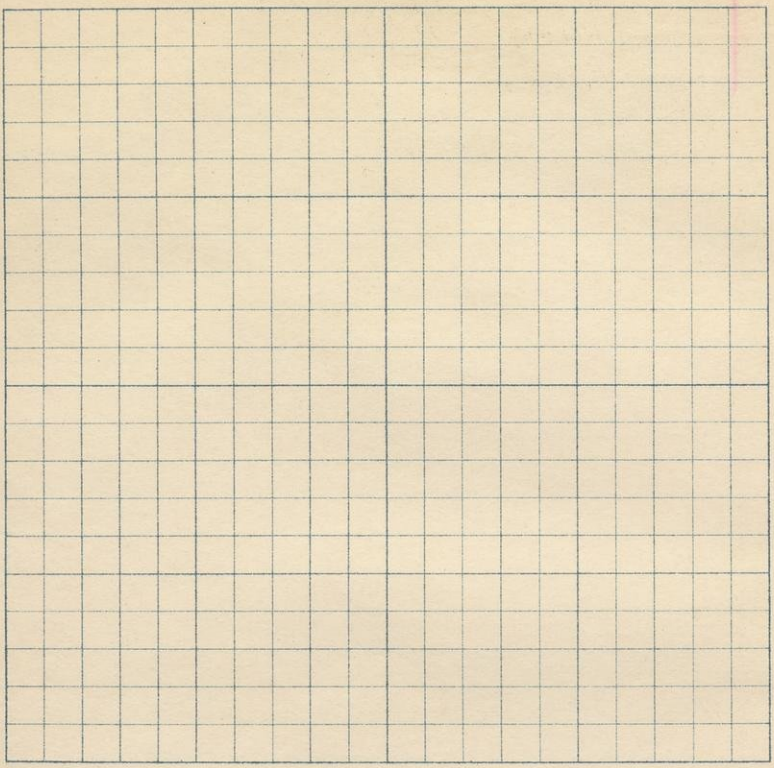


Here in these immense exposures we have the eastern nose of a sharp syncline plunging S.W. The hill is over 100 ft high and covered with hardwood.

1000 1.15 P.M. Great ledge.

The specimens all show good contacts so that there is no possibility of mistake. The topography here shows the synclinal structure perfectly.

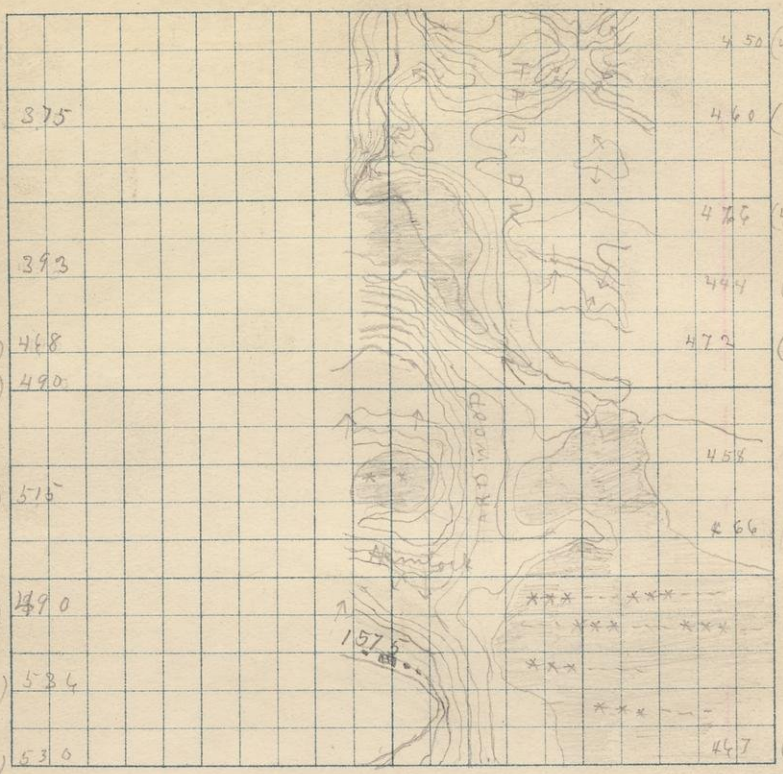
S. T. R.



1200 (470) cedar swamp
1600 (480) Hemlock + Pine
1800 Hardwood hemlock and Pine.
2000 Sec line 2 P.M.

48 Oct 14th 1891

S. 14 T. 47 R. 84



Going S on E line Sec 14 8.15 A.M.

B.M. 428.24 $\theta = 29.2$.

Hardwood.

300 (440) "

800 Hemlock and Cedar

8.45AM 1000 Good sized stream flowing N.W

1125 Tamarack swamp

1300 (480) Hemlock and Hardwood

1430 Cedar swamp.

2000 9.45 AM. Cedar swamp

— Going N on E $\frac{1}{8}$ line Sec 14 2.57 PM.

200 (588) Hardwood

Sec 14 500 paces W 300 N of S.E Cor

Small ledge of what seems to

1575 be an eruptive rock probably

felsitic. So hard that I could

only procure small specimens.

700 (546) Small Spruce swamp

1000 (530) 3.25 P.M. Hardwood

1400 Cedar swamp

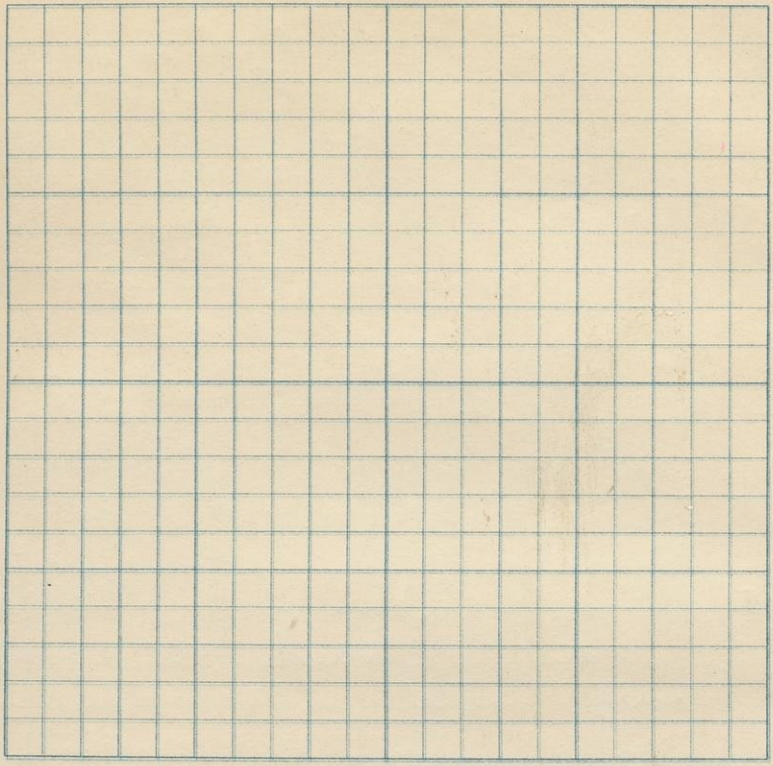
1500 Good sized stream in Beaver meadow

1700 Good mill site.

2000 (460) Hardwood and Pine

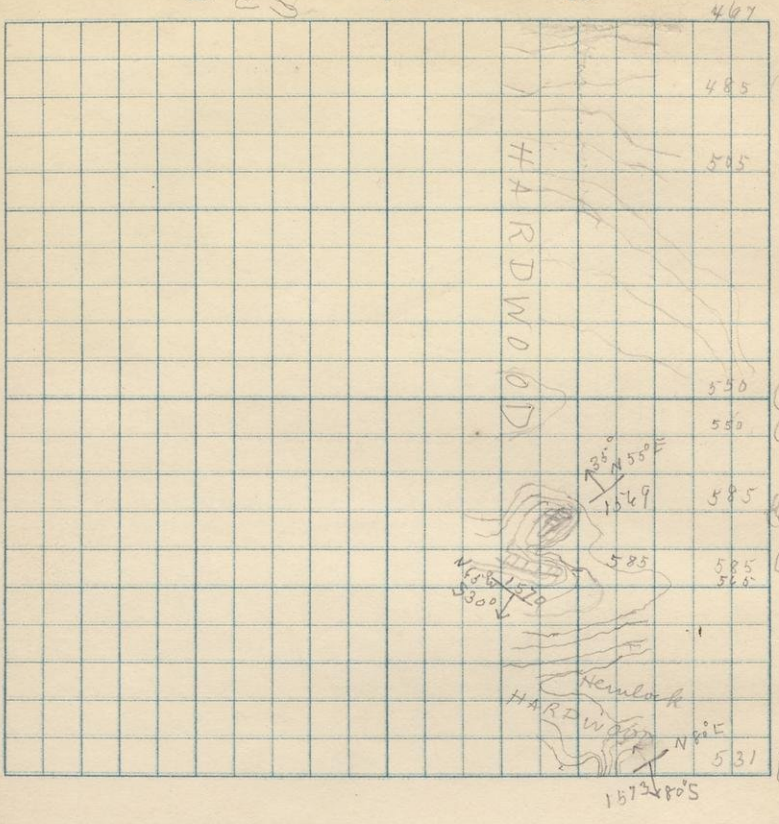
B.M. 348.60 3.55 P.M.

S. T. R.



52

S. 22 T. 47 R. 36



E See line

Going S on E line Sec 23

0 cedar swamp

200 (510) Pine Hardwood.

1000 (580) 10.15 A.M. Hardwood.

Here is a high rocky ridge with no actual outcrop seen yet. No doubt a continuation of of the outcrop seen yesterday in Sec 13. Slate and graywacke slates with a little disseminated iron in red specks.

1100 (580) Hemlock

1300 (630) large ledge of graywacke (almost quartzite) and slate

1569 Strike N 55° E

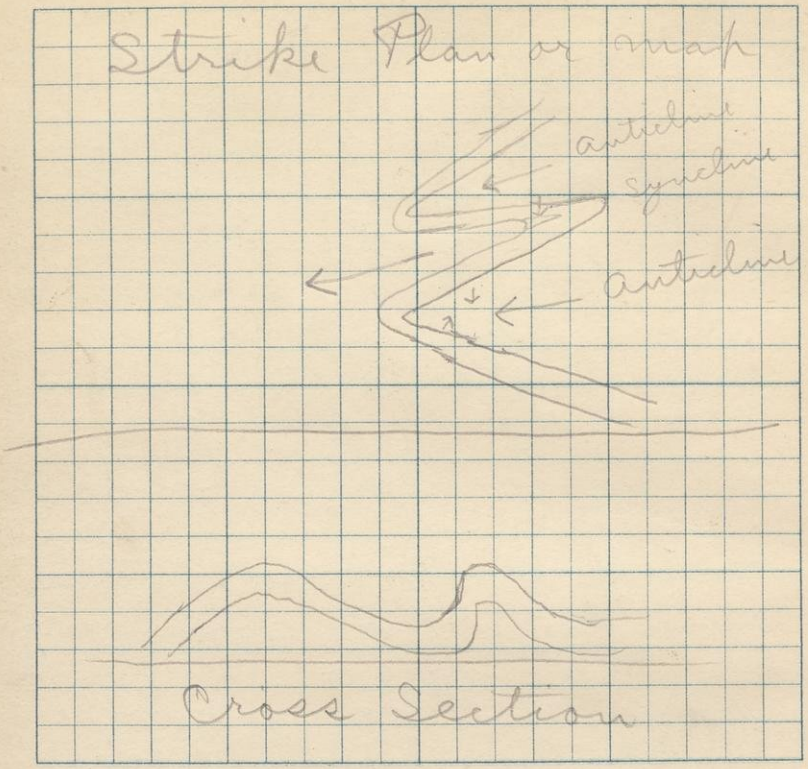
1570 Dip 35° N E

Spec 1569 shows a graywacke (which makes up the greater part of the ledge) with a weathered end showing the red ferruginous material which does not appear on the unweathered end. 1570 shows a plain contact between graywacke and slate

Cleavage strikes E & W

Dip 50° S.

S. T. R.

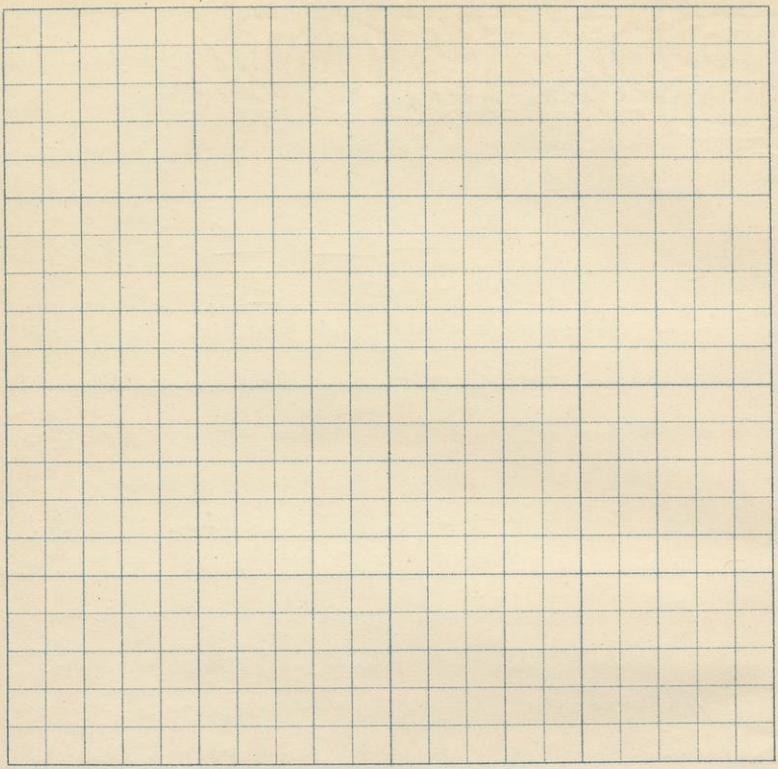

Strike Plan or map
anticline
syncline
anticline
Cross Section

1460 Offset 80 paces W
Immense ledge of quartzite (or
siliceous graywacke) and slate.
1571 Section 23 540 paces N and 80 W
1572 of S. E. Cor

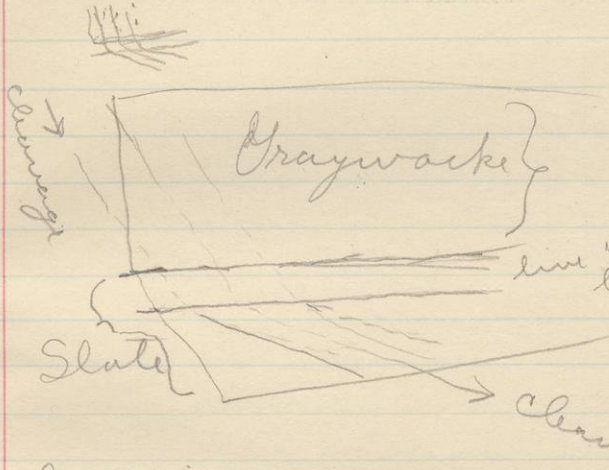
Strike N 65° W
Dip 30° S.

In this ledge in spite of its great size there seems to be only one contact. The upper layer is a very massive layer of graywacke. Specimen 1571 shows the contact. 1572 shows the normal gritty graywacke. I have no doubt that the structure here for some distance is a series of sharp folds with noses pointing alternately pointing east and west. That is to say, the formation plunges toward the west, the noses of the synclines point E, and those of the anticlines W. The folding is on the whole gentle and the cleavage almost constant

S. T. .. R.



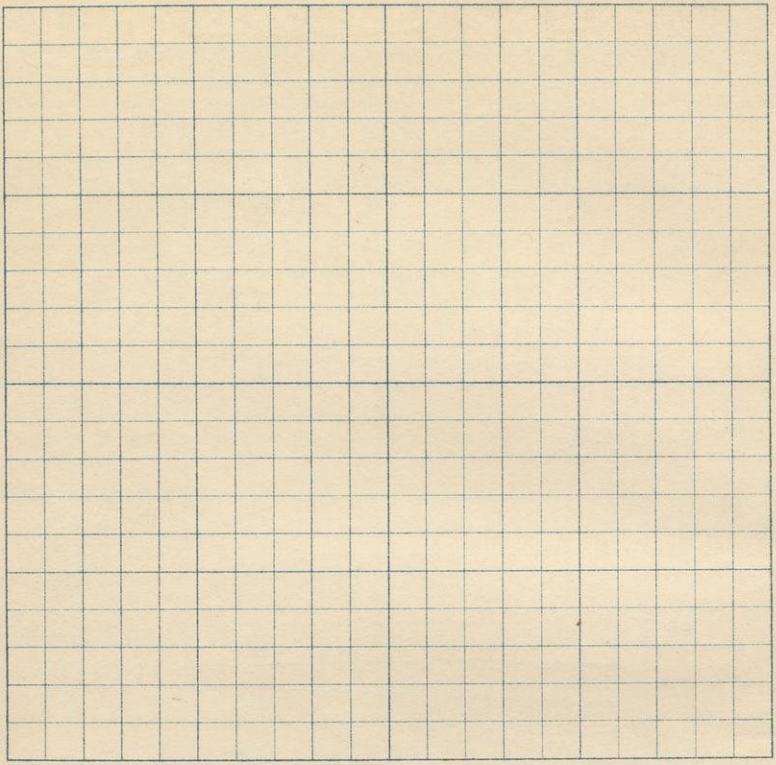
It is to be noted, however that the cleavage planes in passing out of a hard stratum into a soft one, are almost always perceptibly bent. This is not always just at the contact of the two rocks, but sometimes an inch or two inside the slate



In this whole district the cleavage dips about 50°-60° S.

1600 (430) 12.15 P.M.
1700 Hemlock
1800 Hardwood
2000 B.M. 530.99. 12.24 P.M "
Aneroid 600.

S. T. R.



On the Bench line 50 paces E of Sec line is an immense ledge of slate

Sec 24. 2950 paces W of S E Cor.

1573 Strike N 80° W
dip 15° S.

Specimen 1573 shows a good contact (which is very well marked on the ledge), together with some good roofing slate.

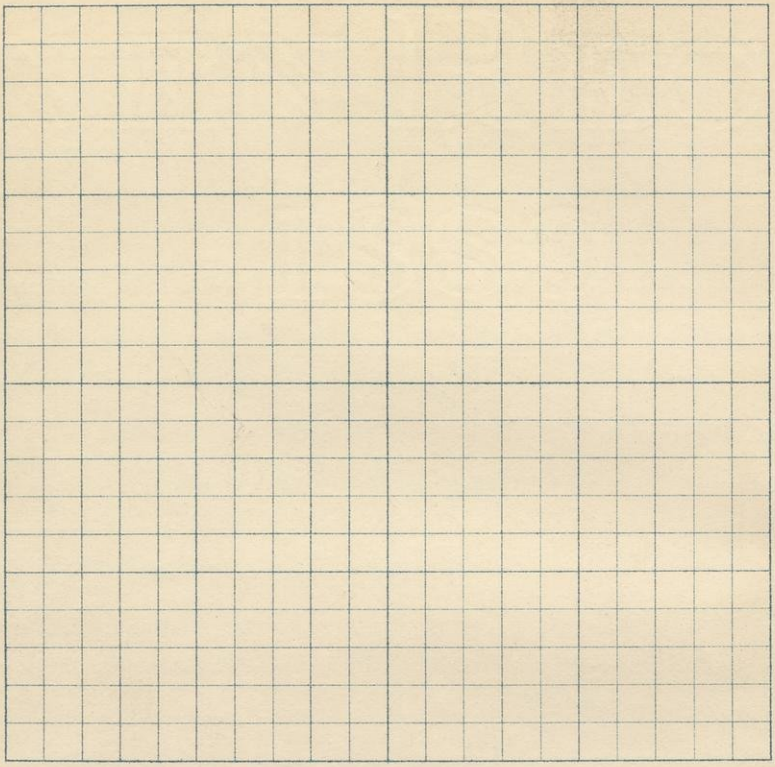
[Cleavage Strikes E & W
dip 60° S.]

At the northeastern extremity of the ledge the dip is nearly vertical and the strike has swung around to N 80° E. Th

Strike N 80° E
dip 80° S.

This agrees exactly with the observation made on the ledge in Sec 24, 1500 paces W and 1000 N of S.E Cor. It is to be observed that when the dip is nearly vertical in this district, the strike is N 80° E When the dip is toward the N the Strike is N. E. When toward the

S. T. R.

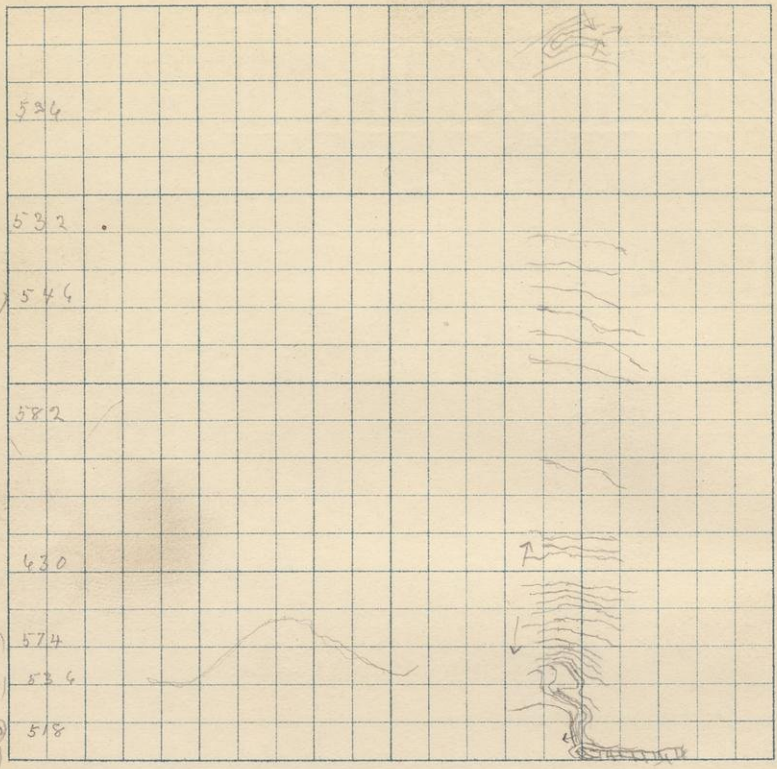


South it is N. W. but N.W.
This is additional evidence that the structure here is a series of rather small folds all plunging W.

Sec 23
W $500 from S E Cor
1574 Great ledge of slate.
Strike N 80° W
dip 80° N
Spec 1574 shows contact, which is here very marked.
The strike and dip here add to the evidence stated above

62 Oct 16 th 1891

S. 23 T. 47 R. 34



Going N on E ⅛ line Sec 23

2.P.M. B.M. 480.93 O = 29.1 m

Great pine grove

300 Fine Hardwood

500 Top of ridge "

900 " "

1000 2.24 P.M

1200 (570) "

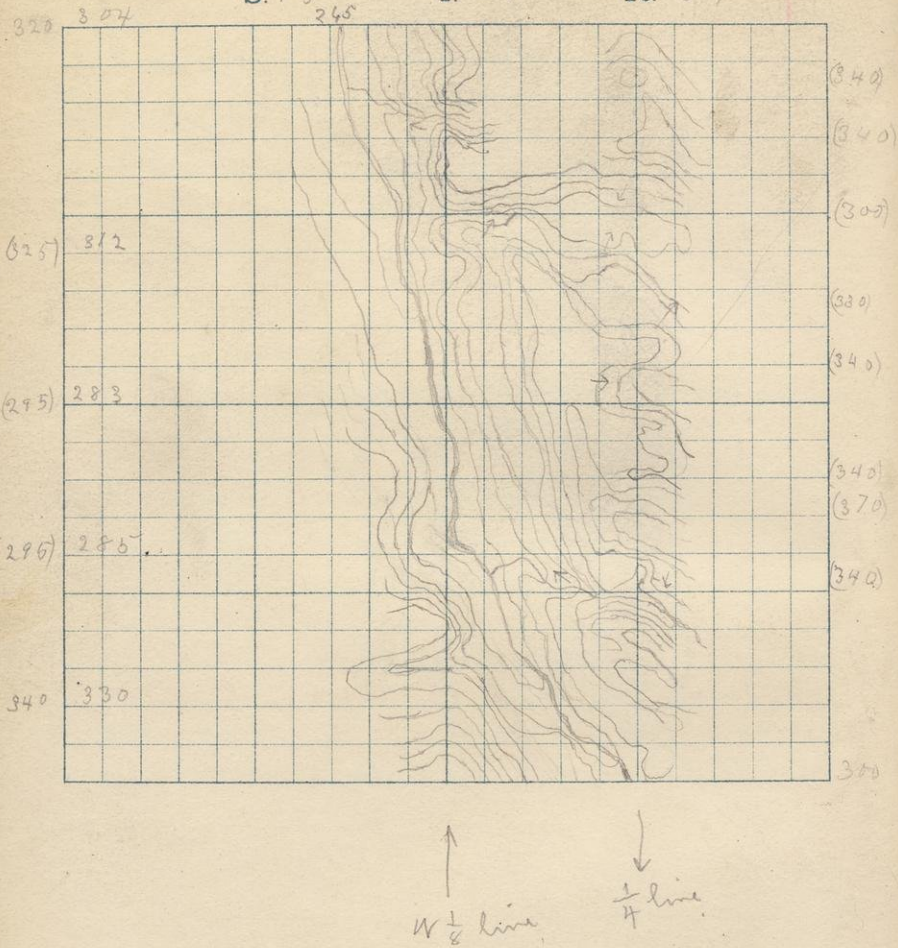
1400 (560) "

1700 (570) Hemlock and Hardwood

2000 (570) "

64 Oct 19th 1891

S. 15 T. 47 R. 34



Going S on 1/4 line Sec 15.
7.45 A.M.

B.M. 312.40 400 = 28.7
Hardwood.

150 (340) "

300 Hardwood, Hemlock and Pine

400 Hemlock

500 Hemlock, Pine & Hardwood

600 Hemlock & Hardwood

800 "

850 (340) "

1000 (340) 8.15 A.M. "

1500 (340) Hemlock and Hardwood

1600 (350) "

2015 (300) 8.52 A.M. "

Aneroid out over 100 ft. no doubt.

Going N on W 1/8 line Sec 15.

200 (340) Hemlock.

600 (295) Antonagon River

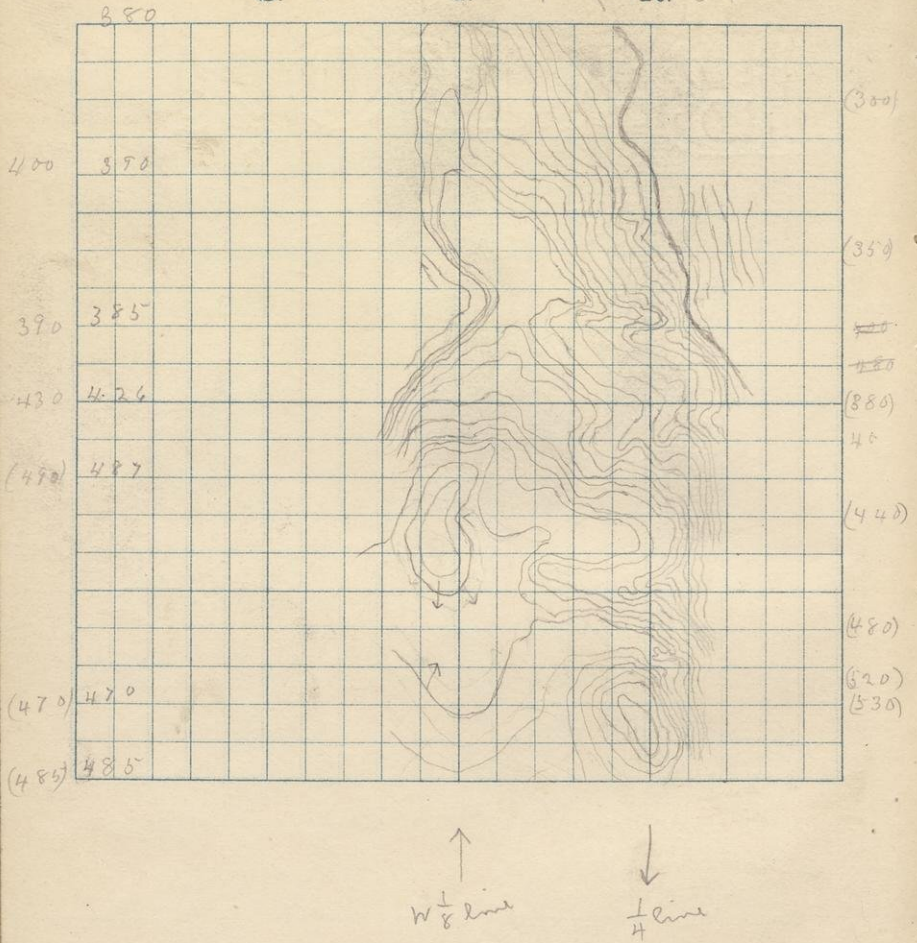
1500 Hardwood + Pine

2000 (320) " " "

B.M. 304

66 Oct 17th 1891

S. 22 T. 47 ↑ R. 36



Going S on 1/4 line Sec 22

100 Right bank of Ontonagon River

200 (300) Cedar, hemlock, hardwood.

600 (350) Hardwood and Pine

1000 (380) 9.35 A.M. " "

1100 (400) Hardwood

1300 (440) "

1750 (520) "

1900 (530) Hemlock and Hardwood.

2005 (505) " " "

B.M. 506.87. 10.10 AM.

Going N on W 1/8 line Sec 22. 10.45 A.M.

B.M. 485.17 = 600ft = 28.7 m.

1000 (11.15 AM. Hardwood and cedar

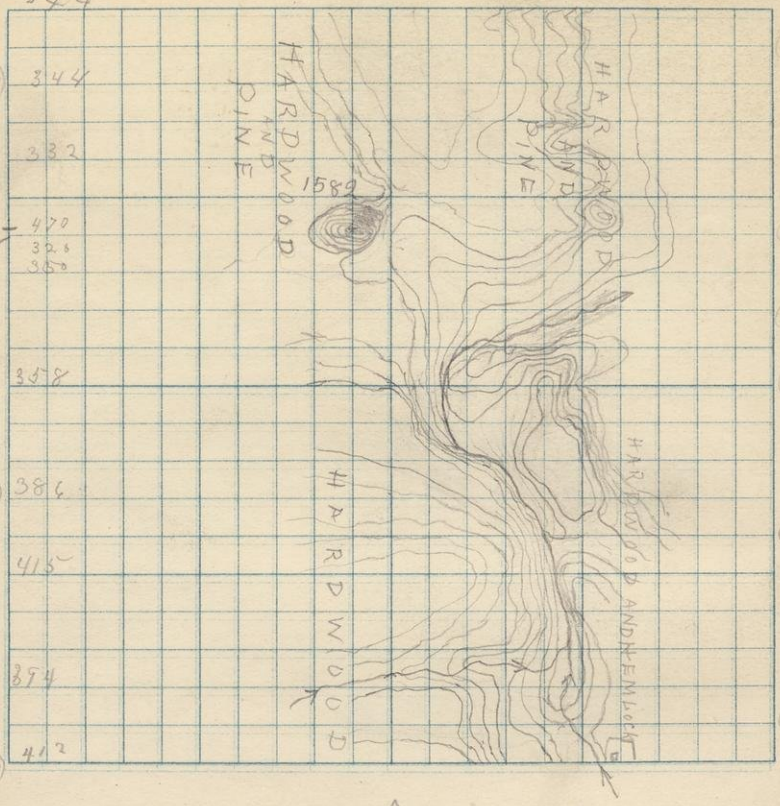
1240 Small stream Hardwood.

1400 (400) "

2000 (390) 11.55 A.M. "

68 Oct 20th 1891

S. 16 T. 47 R. 34



Going S on E line sec 14

B.M. 285.24 700 = 28.3

Hardwood and pine

100 (290) " " "

500 " " "

600 " " "

800 Pine

820 (270) Alders - Stream flowing E.

900 (290) Hardwood and pine

1000 8.7 A.M. " " "

1200 (340) Hardwood and Hemlock

1400 (320) " " "

2000 8.30 A.M. " " "

Going N on E ½ line Sec 14

240 (380) Small stream flowing E

500 (1400) Hardwood

1000 (340) 3. P.M. "

1582 Sec 14 N 1400 W 550 from S.E. Cor

1583 Knob of diorite or gabbro 150 ft. high.

1584 Selected fresh, granitic specimen 1581,

1585 Also an altered one. From base of hill got two specimens (84, 86) which may be the diorite rendred locally schistose, or may be the stratified rock of this place.

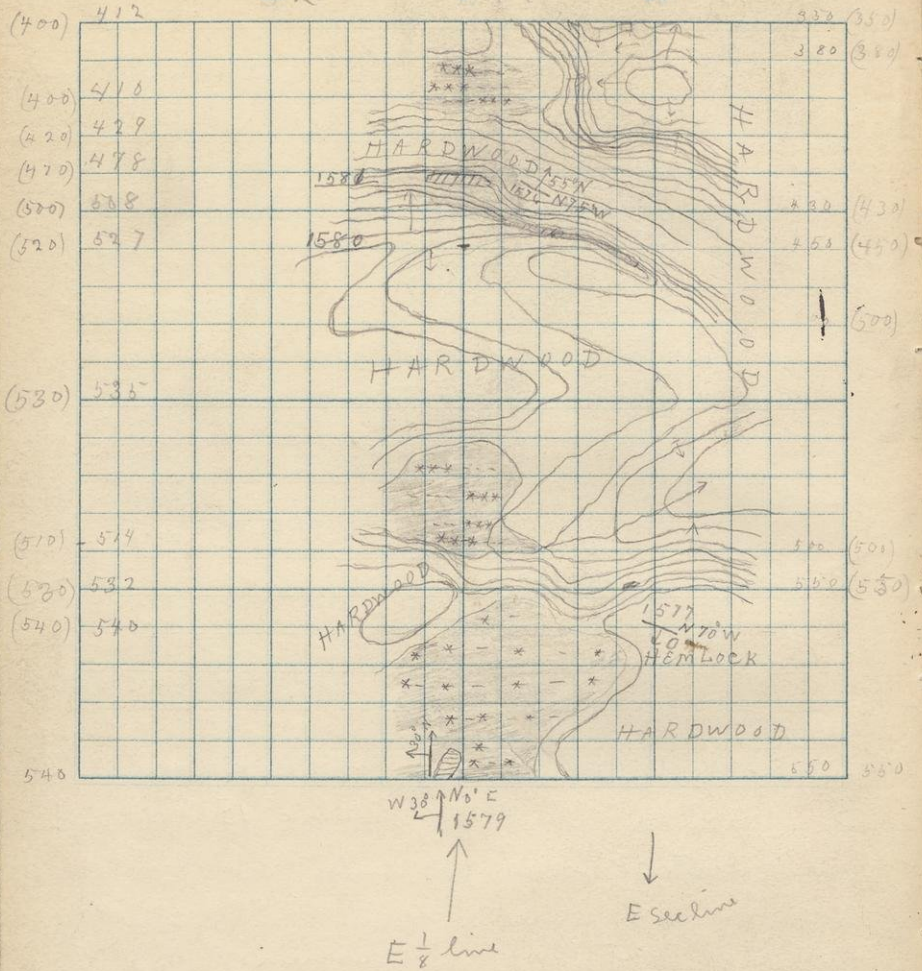
1400 (300

1600 (310) Hardwood and Pine.

2000 (320) B.M. 344.36 4.15. P.M.

70 Oct 20th 1891

S. 21 T. 47 R. 36



Going S on E line Sec 21

100 (380) Homesteader. Some pine.

200 Hardwood and Hemlock.

500 (430)

600 (500) 9.45 A.M.

1576 ~~N 1400~~ Sec 21 N 1400 from S.E Cor.

Great ledge of slate and graywacke

Strike N 75° W

Dip 55° N

These rocks are probably more or less siderite. Red spots can be seen near the surface. Broke off one small specimen of contact.

Cleavage 75

The cleavage here is different from that of any of the rocks I have encountered lately. Dips N. about 70° and strikes E. & W.

800 (500) Fine Hardwood

1000 (510) 10.20 A.M. "

1577 Sec 21 480 paces N 80 W of S.E Cor.

1578 Small outcrop. Graywacke and spotted schist "

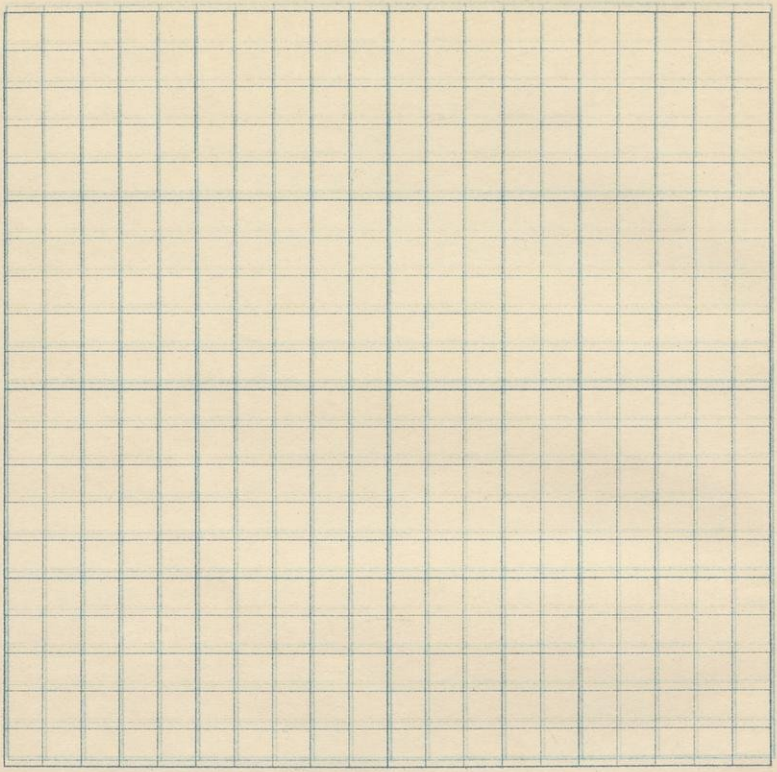
Strike —— N 70° W

Dip Nearly horizontal

Trend of ledge E & W.

This ledge is very interesting

S. T. R.

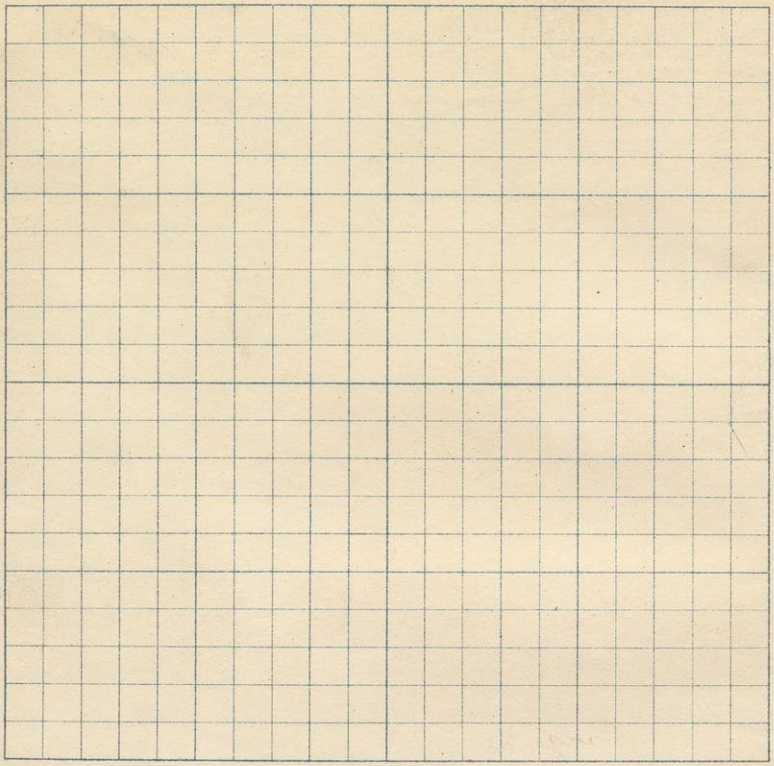


on account of the appearance in it of a small stratum of green spotted (ottrelite?) schist. The main portion of the outcrop is made up of graywacke with red spots due to the decomposition of some ore of iron. (Spec 1578) 1577 shows the contact of the ottrelite schist with the graywacke. It also shows how the dark spots decompose into red specks.
1930.(550) B.M. 549.15.

Hardwood and Hemlock.

1579 Sec 28. 500 W 1980 N of S.E. Cor
Large outcrop of slate and graywacke.
Strike N & S
Dip 30° W
The specimen shows a very plain contact. This is plainer on the ledge than in the specimen. The ledge runs into Sec 21 but the northern part of the exposure is more moss covered and the rock more crumpled
A good contact in Sec 21 500W 20N shows the same dip and strike as given above. Made some search for bands of ottrelite(?)

S. T. R.



schist but found none.
On this ledge the cleavage again dips south.
Strike of Cleavage E & W
dip 55° S.

— Going N on E ¼ line Sec 21.
B.M. 540.83 300 = 28.7. 12.50 P.M.
Tamarack swamp
500 (530) Hardwood and Hemlock.
625 (510) Edge of cedar swamp
1000 (530) 1.22 P.M. Hardwood and Hemlock
1400 (620) " " "

1580 Sec 21. 1400 N 500 W of S.E. Cor
Long low ridge of shaly rock
No strike or dip
Trend of ledge E & W.
1500 large ledge

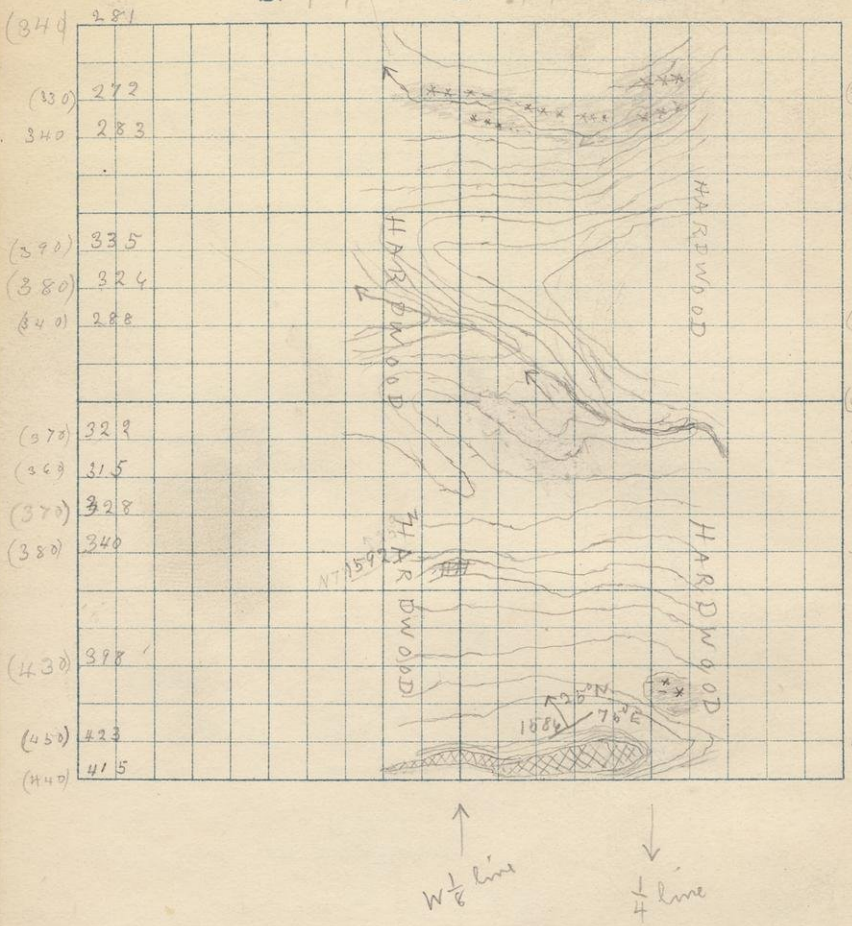
1582 Sec 21 1500 N 500 W of S.E. Cor.
Same ledge as ~~described~~ Page 71.

1581 1600 paces N 500 W S.E. Cor Sec 21.
Another large exposure.
Took specimen of ferruginous greywacke. Cleavage dips 76° N.
2000 (400) 2.30 P.M. Hemlock, Hardwood.

Alpha

76 Oct 22nd 1891

S. 17 T. 47 R. 84



Going S on 1/4 line Sec 17
8.10 A.M.
B.M. 292.81 1400 ft = 27.8 in.
Mixed timber. Pine.
200 (275) Small stream flowing West.
400 (300) Hardwood
800 (340) "
1000 (330) 8.40 A.M. "
1070 (320) Rapid stream flowing W.
1400 (350) Hardwood
1700 (390) "
1780 (390) Small tamarack swamp.

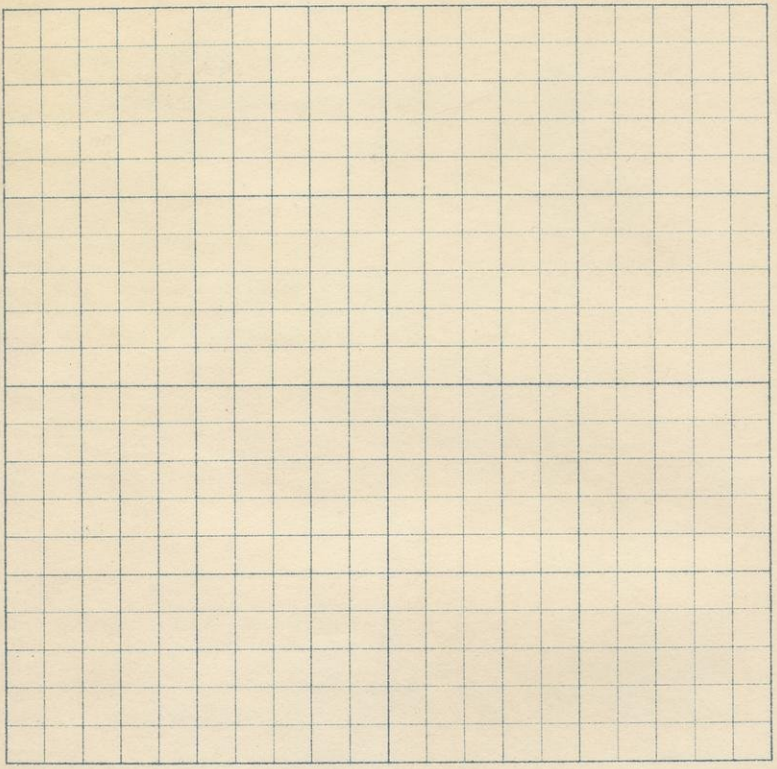
also p 79

1586 Sec 17 100 paces N 1000 W of SE. Cor.
Strike N 75° E
dip 25° N

This is a great ledge of graywacke. It is the largest exposure of ~~the~~ one kind of rock which I have met with among the clastic rocks of this region. It forms a hill nearly a quarter of a mile long 100 paces broad and 60 ft high with rock bare on all sides. This is all a medium grained hard graywacke. Found contact with slate on an outlying outcrop nearly on the section line

2000 Sec line

S. T. R.



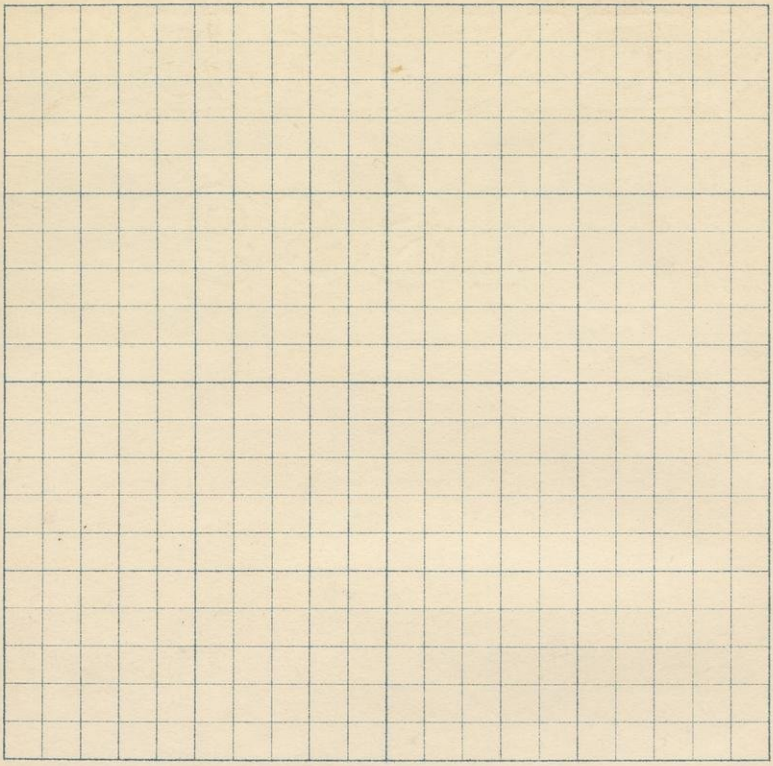
Going N on W ¼ line Sec 17

1586 80 (470) Top of ledge.
100 (450)
300 (430) Hardwood.

1592 Sec 17 580 N 1500 W. of S.E Cor
Graywacke and graywacke slate.
The cleavage is very unusual
Strike of cleavage N & S.
Dip " " " 40° E
Such an extraordinary difference from the normal cleavage would suggest that this were merely a very large boulder but it is a ledge 200 ft long.

1593 A very remarkable thing about this outcrop is the appearance of a bed of slate conglomerate. The pebbles are of sizes from that of a pea to that of a goose egg. The matrix seems to be rather coarser than the pebbles. Unfortunately I could not obtain a contact, the rocks seeming to be very massive and grading into each other. Neither has the ledge any particular trend, but it occupies the sloping side of a hill.

S. T. R.



The longer axes of the pebbles lie about parallel to the cleavage and it is not impossible that the true bedding may be about the same as the cleavage. I have not seen before in this region ~~to-day~~ such massive rocks as I have met to-day. I have seen several large ledges all made of one kind of rock (graywacke) no contacts can be found and often there is nothing to indicate the strike. Perhaps a closer examination of this ledge might reveal something about the bedding, but I am unable to discover anything.

600 (380)

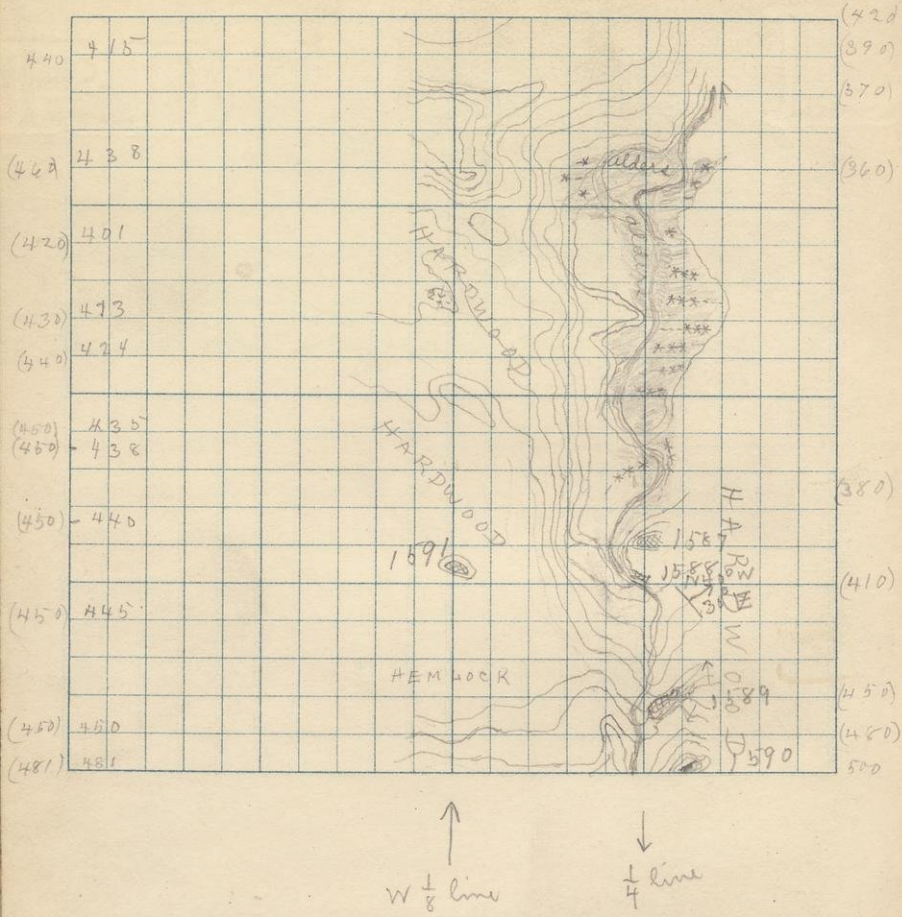
1000 (370) 3.20 P.M. Hardwood.

1200 (340) Very swift stream "

2000 (340) B.M. 281.77. 3.45 P.M.

82 Oct 22nd 1891

S. 20 T. 47 R. 36



Going S on ¼ line Sec 20 10.15 AM

300 (370) Edge of Swamp

400 (360) Small alder thicket.

440 (360) Stream flowing N.E.

1000 (370) 11 A.M. Cedar Swamp

1587 Sec 20 620 N 1000 W of S.E. Cor.
Ledge of graywacke. No strike or dip; Ledge trends E & W,
Cleavage dips south at an unusually low angle.

1588 Sec 20 600 N 1000 W of S.E Cor
More graywacke

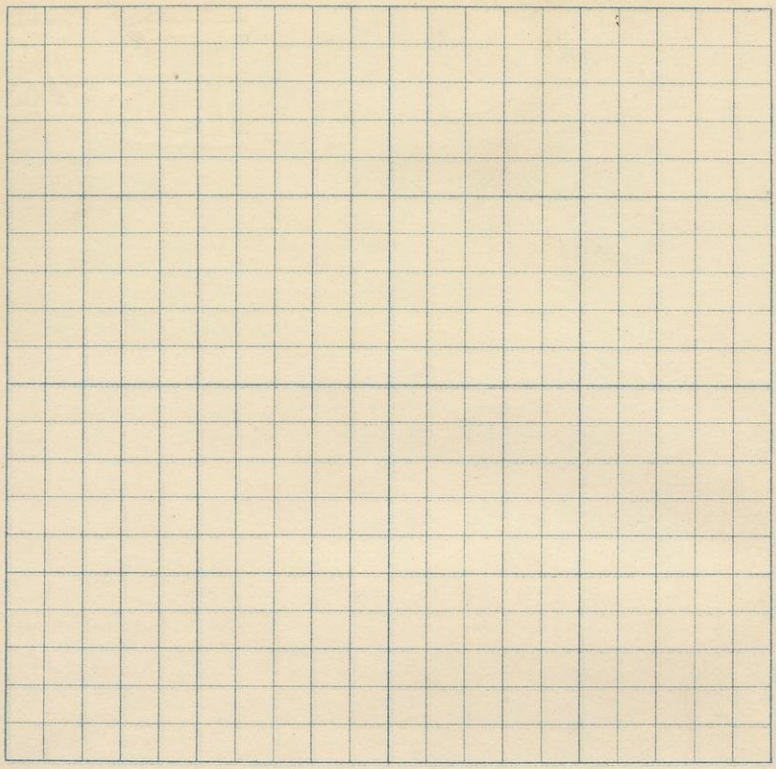
1500 (440) Very rapid stream
At this ledge H. Cameron found a very fine contact
~~Strike~~ N 40° W
Dip 30° N.E.
Spec 1588 shows contact also some pebble like inclusions in the graywack occurring within 6 inches of the contact.

1800 (450) Very rapid river.

1589 Sec 20 150 N 1000 W of SE Cor
Graywacke, large ledge.

1900 (480) Stream rapid

S. T. R.



2000(530) 100 paces E of stake.

1590 Sec ~~21~~ 20 900 W of S.E Cor.

Graywacke

2000 B.M. 481.85

Aneroid 500 12.30 P.M.

— Going N. on W ½ line Sec 20

B.M. 481.27 0 = 29.3 1.03 P.M.

100(450) Hemlock

500(450) Hardwood

1591 Sec 20 N 500 W 1500 from S.E Cor

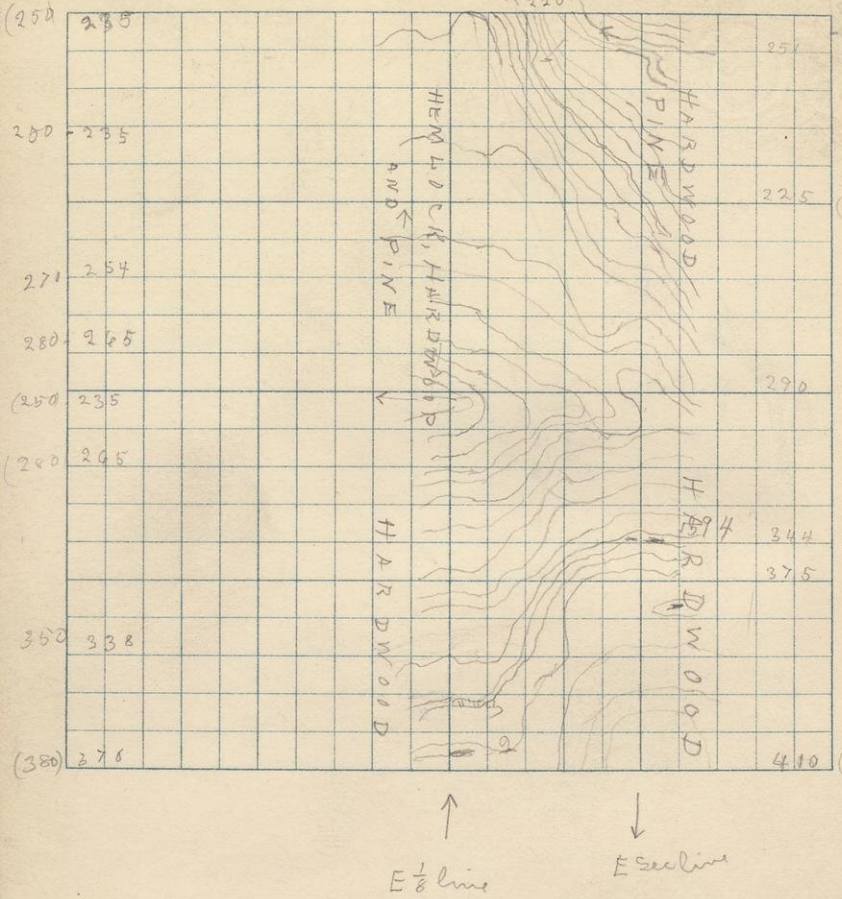
Graywacke, considerable exposure. The specimen is somewhat interesting, showing the development of schistosity and secondary slate in massive graywacke.

1000(450) 1.40 P.M. Hardwood

2000(440) 2.10 P.M. Hemlock and cedar

86 Oct. 23d 1891

S. 18 T. 47 R. 34



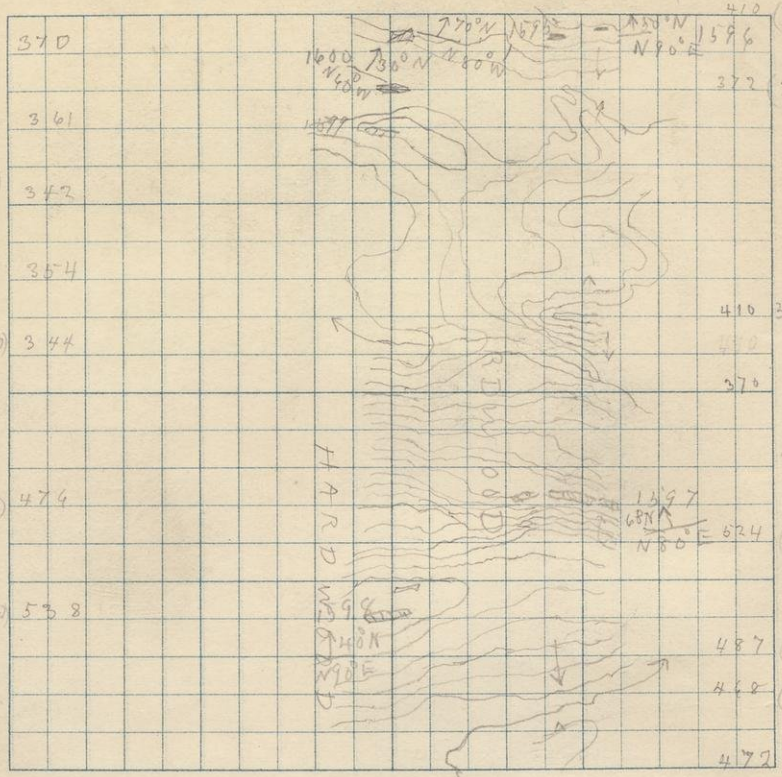
Young S on E line Sec 18

B.M. 252.05 200 = 28.8 6.40 AM.
54 (225) Small stream
100 Hardwood and young Pine
200 " " " "
500 Swift stream flowing N.W.
1000 7.10 A.M. Hardwood, hemlock, Pine
1400 (330) Hardwood
1594 Sec 18 580 N of S.E. Cor
Great ledge of graywacke and graywacke slate. Exposure on N side. Trend of ledge E & W.
1500 (360) Hardwood
2000 (390) See line 7.30 A.M.
Hardwood

Young N on E ¼ line Sec 18
1902 Sec 18 200 N 500 W 9.40 A.M.
Banded slates
Strike N 60° W
dip 45° N.
1903 Sec 18 350 N 600 W
Graywacke
800 (280) Hardwood
1100 9.50 A.M. "
1400 (270 Hemlock and young Pine
2000 (250)
B.M. 235.80 10.07 A.M.

88 Oct 23d 1891

S. 19 T. 47 R. 36



Going S on E line Sec 19

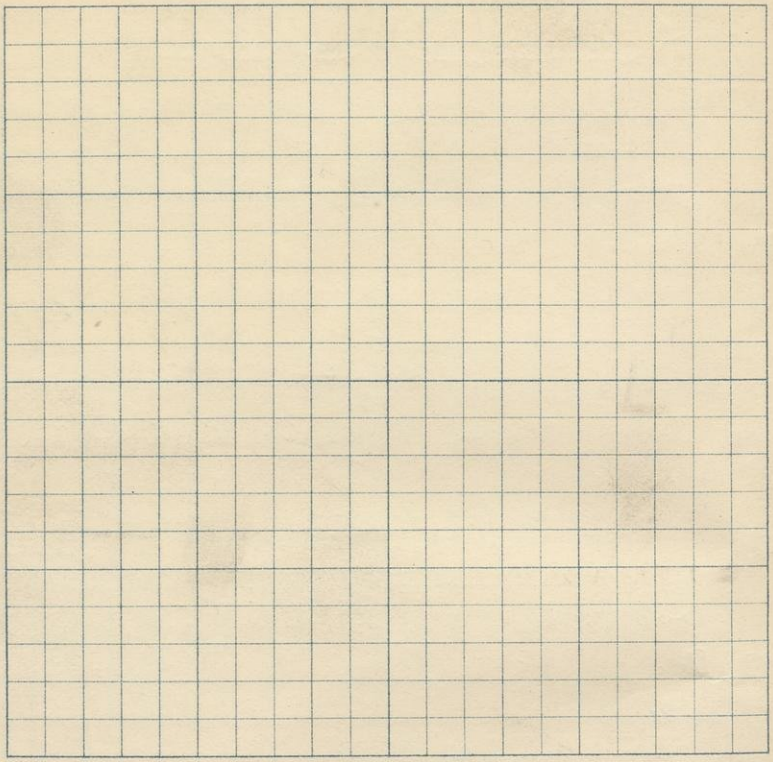
0. Homesteaders Cabin.

1595 Sec 19 40 W. 1960 N of S.E cor
small outcrop of massive gray-
wacke trending E & W, Exposure
toward the S. pretty steep.

1596 Sec 20 19 26N 1950 W of S.E cor
Slate and graywack.
Strike E & W. 42
Dip 50° N
Specimen shows contact
200 (350) Hardwood
800 (380) Crest of Hill
950 (340) small swift stream
1000 (350) 7.56. Homesteader's.

1597 Sec 19 720 from S.E Cor.
Immense ledge of slate and
graywacke
Strike N 80° E
Dip 60° N.
Specimen of banded slate
1700 (450) Hemlock
1830 1430 Stream flowing E
2000 (470) B.M. 472. Hardwood
8.25 P.M.

S. T. R.



Boring N on E ¼ line Sec 19

B. M. 482.65 500 ft = 28.5 8.35 A.M.

Hardwood

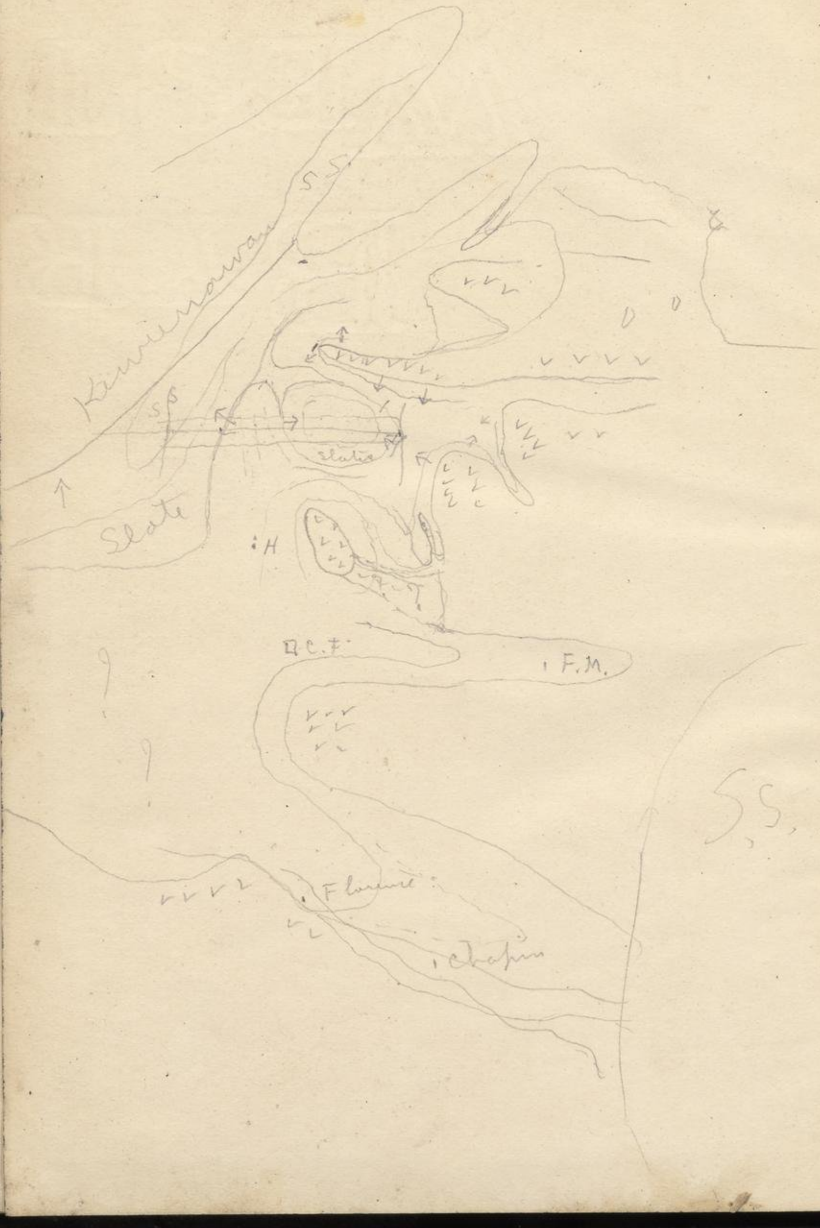
1598 Sec 19 500 W 400 N
Strike N 90° E
Dip 40° N
Banded slates.

400 (540) Hardwood
700 (480)
1000 (370) 9 A.M. "
1130 (350) Stream.

1599 Sec 19 500 W 1700 N
Ledge of graywacke trending E & W.

1600 Sec 19 1800 N 500 W of SE cor
large ledge of slate and graywacke
Strike N 60° W
Dip 25° N.
Specimen shows contact.

1901 Sec 19 1900 N 500 W
Slate and graywacke
Strike N 80° W
Dip 70° N.
Specimen shows contact.



S.S.
Keweenawan
S.S.
slates
Slate
H
F.M.
S.S.
Chapin


M
F
Mem.