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Township 43 north, ranges 30, 31, and 32 west, specimens 31830-31899, 33201-33205: no. 284. No. 284 [1891]

Sanford, Samuel, 1865-1927

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

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84

LAKE SUPERIOR SURVEY

284

Sanford

Indut

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 ninth 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.






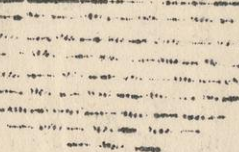
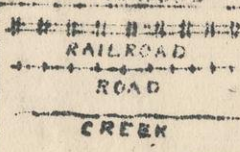
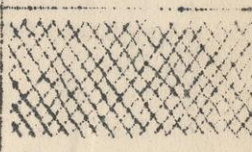



It will be the constant business of the geologist to search for outcrops. All hills within a reasonable distance of the course of travel will be examined. Oftentimes upon the steeper slopes of a hill a rock surface is covered with a coating a few inches thick of moss, leaves or vegetable mold and can 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, $N. 47^{\circ} E.$; Dip, $68^{\circ} S. E.$ 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 $3 \times 4 \times 1$ inch. In case several specimens of the same ledge are necessary, and when ledges are numerous, specimens $2 \times 2 \frac{1}{2} \times \frac{3}{4}$ 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.

 <p>PINE OR HEMLOCK</p>	 <p>HARDWOOD</p>	 <p>PINE OR HEMLOCK AND HARDWOOD</p>	 <p>CEDAR SWAMP</p>
 <p>SPRUCE OR TAMARACK SWAMP</p>	 <p>MARSH</p>	 <p>RAILROAD ROAD CREEK RIVER</p>	 <p>NO STRUCTURE</p>
 <p>↓ 55° S. NEARLY MASSIVE</p>	 <p>↓ 38° E. ↓ 5.62° E. SHALY OR BEDDED</p>	 <p>783° SECONDARY STRUCTURE.</p>	

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				

284

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

#9 Note Book ~~8~~¹

S. Sanford
Topographer

Steve Souney

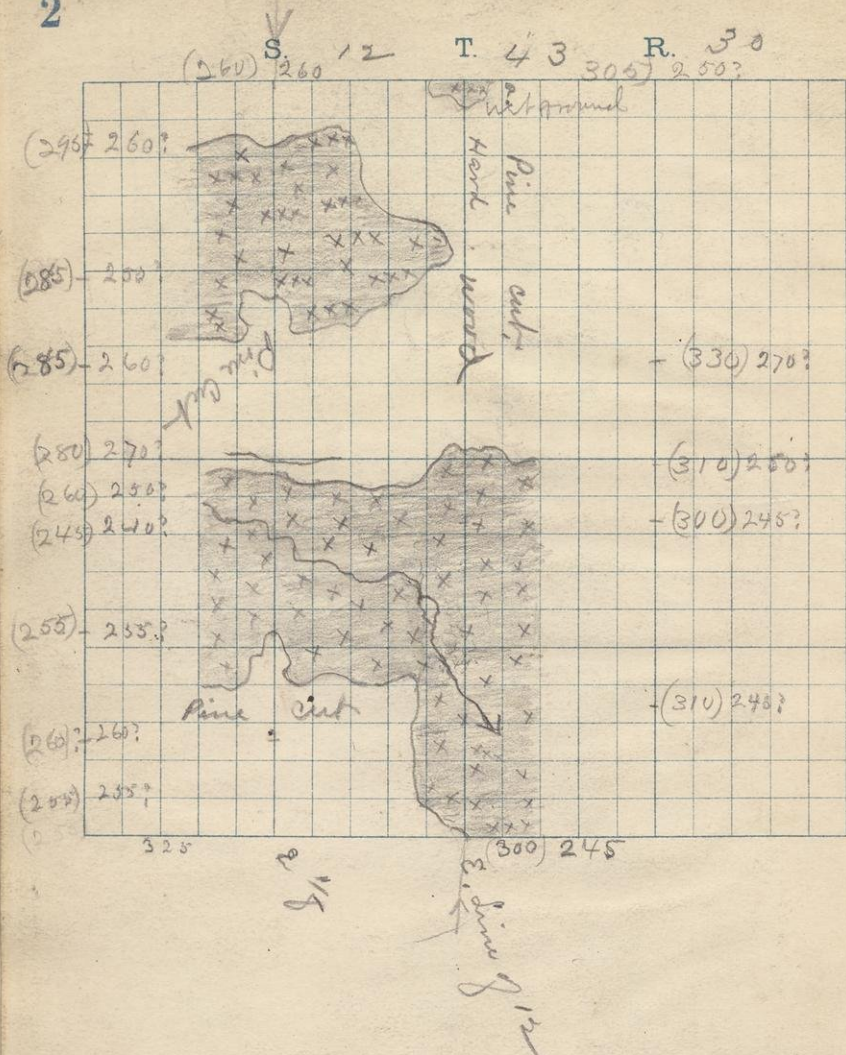
Compassman

SPECIMENS - 1830-1899
3201-3205

43-30

43-31

43-32

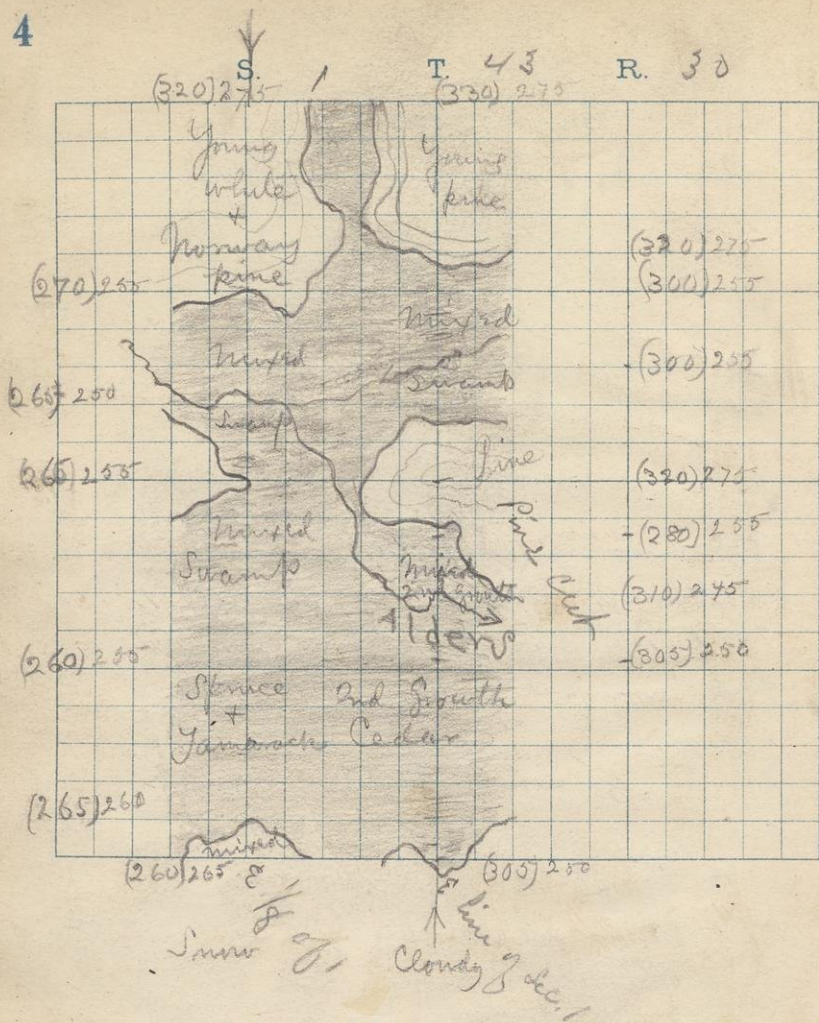


N.B. As much marks in N. buch could not be distinguished - the interpolations are guesswork.

No list of these buch marks was furnished our camp.

72° 60' 27" 8.45 A.M.
10W

Oct. 26 Overcast
 Running North on E. Sec. line of 43-30
 Bench Mark 246.91 Aneroid 300.
 Mixed swamp. Mostly Cedar.
 445 creek 2 ft. wide flowing south E. 310.
 555 Small Tamarack
 820 Cedar Tamarack & alder Q 300.
 990 Mixed, cedar " & Pine " 310.
 1250 Hemlock Maple Birch & Pine 330
 1525 " " " " " " 305
 2000 Mixed Timber Cedar " " 305
 Going South on E & 3 Sec 12 " 260
 Scattering Pine Maple & Birch 1,10 P.M.
 180 Mixed swamp Cedar Balsam Q, 295
 520 Tamarack " " 285
 570 Mixed Pine & Cedar.
 750 Thick Pine & Maple " 285
 1000 " Cedar & spruce " 288
 1100 Tamarack " " 260
 1200 Small creek 245
 1470 Hemlock " " 255
 1750 " Maple " " 260
 1900 Thick and growth Balsam 255
 2028 Struck line near Stake
 Mixed timber Pine spruce Balsam
 Bench Mark 325.96 Aneroid 260
 2.35 P.M.



Oct 22 Cloudy 10. a.m. Rain.

5

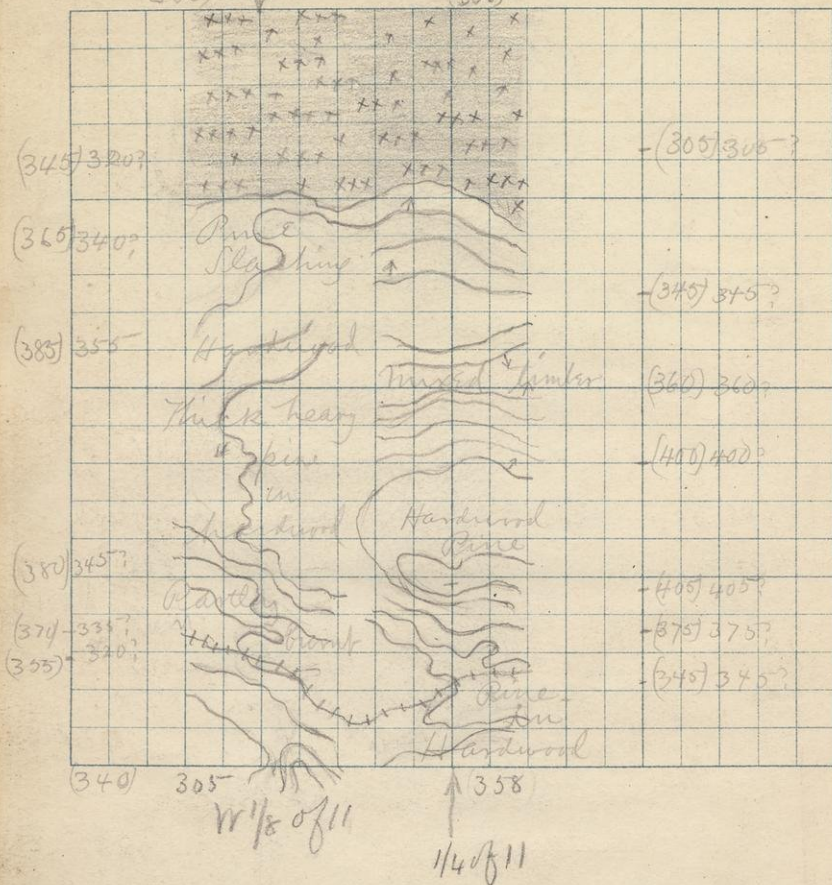
Running North on E. sec. line of 1. 43-30	
Mixed timber Pine Cedar, Amersoid	305-
500 Swamp second growth cedar.	
Spruce & tamarack	" 305-
700 River 14 ft. W Alder Marsh	" 310
863- End of swamp white Pine Norway	320
1000 Thick 2nd class Pine	320
1300 Mixed cedar Spruce " Swamp "	300
1340 Small creek.	
1500 cedar & Balsam	" 300
1600 Small white Pine & Norway	320
2018 Struck line at cor, cannot distinguish P.M.	
Thick Norway & white Pine Amers.	330
Going South on E & of sec. 1, 43-30	11.45-a.m.
Small thick white Pine & Norway	2, 12.1X. 320
500 edge of swamp cedar & tamarack	
Snowing very hard Amersoid	270
775 River Cedar & tamarack "	265
1000 Mixed " Spruce & Pine	260
1500 " Spruce " Tamarack Thick "	260
1900 End of swamp mixed Timber	265
2040 Struck line near Stake	260
Scattering Pine Maple & Birch	

1:10 PM

(330) 310 S. 11

T. 43

R. 30



Run on 1st 30th

Bench 358.267

Anemid 1600=29.9

Hardwood - thick heavy pine,

215 late road to camp. (345)

360 (375) 475 (405) 800 (400)

1000 8,25 am (360) mixed timber

mostly cedar 1250 (345)

1635 cedar swamp (305) 1800 Cam

oak spruce - mossy

Long S - mixed swamp - cedar spruce (330)

400 same swamp (345)

600 pine clashing (365) some good maple

900 (385) Hardwood 1100 (395)

1500 (380) The hardwood from 1000 on
has in it thick heavy pine of good quality.
About 1500 - it is partly burnt, & from there on

1650 (370) 1700 to road to camp (355)

Hot line 2013 net at lake

Bench 305.25

Anemid 300

8

T43

R. 30

(316/295)

(295/11.40)

310?

310°

(260)

295°

(325)-320

(300/275)

300°

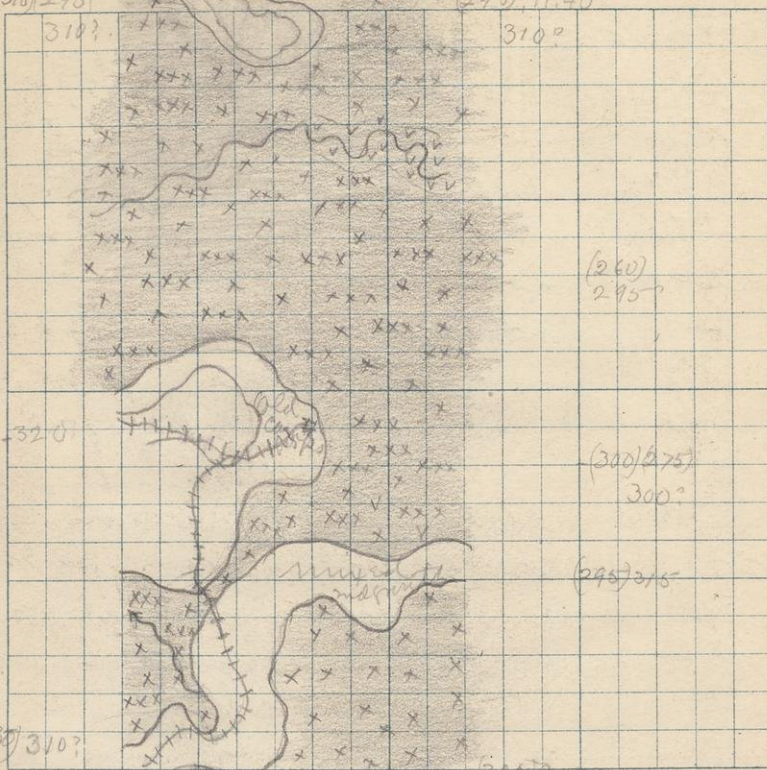
(295/315)

(385) 310?

(315) 305?

K/8/2

↑ 1/40/2



July 14 on 1/4072

9

9 Am in swamp - fairly open space
+ stamrack post

300 mixed timber 2nd growth (295) pine
recently cut 700 mixed swamp

800 (300) (24 plates valley about 275)
1300 260 1475 creek 20 ft wide
flows S + E

Struck line at 2020 at
old original 1/4 plate. found
no stake set by Levell's party

B.M. 11.40

What does 11.40 mean? Aneroid (295)

My compassman paced it 500
paces + we started. I from that point

Found no plate + no bench mark
Bench mark may have been burnt

Found something that looked like a
B.M. blaze about 470 paces W of
1/4 plate - but nothing like a 1/8 stake

Going South

11.55 Am Aneroid 295 (310)

Cedar swamp then Tam-

Arack, 440 creek 15 ft wide
flows E 890 edge of swamp

1125 hit road to old camp (325)

1800 creek - 2 ft wide flows W + N

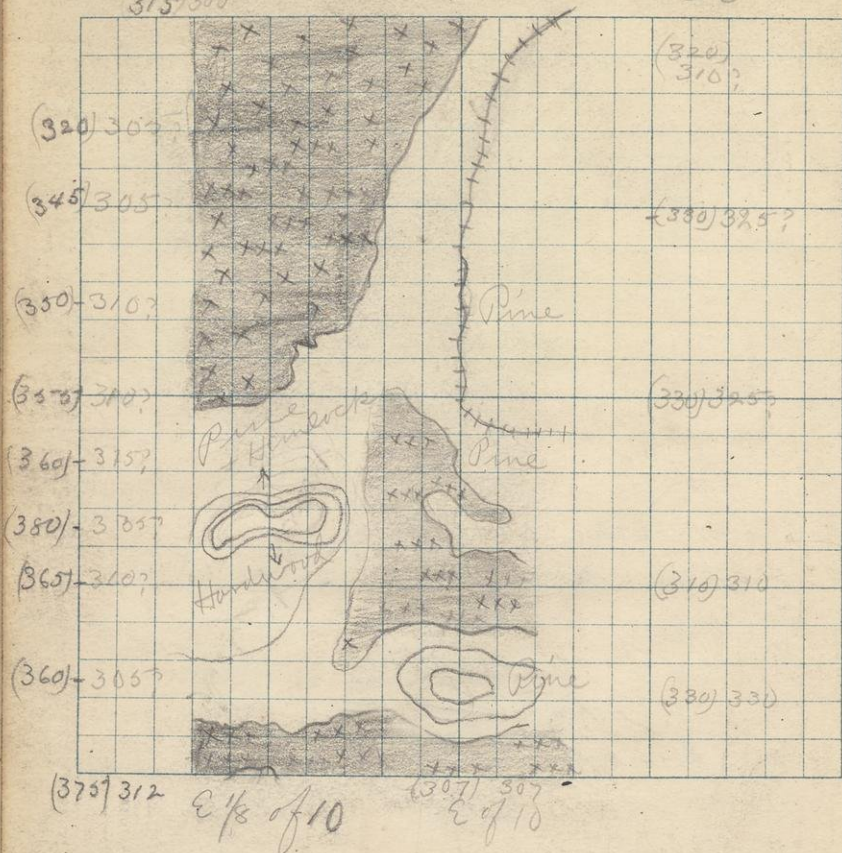
1900 to road (330) Struck line Bench (2650)

315/300

S. 10

T. 43

R. 30



Bench 307.11
2800 = 28.3

8 AM

Corner in cedar swamp - (follow transit line)

100 Thick fair pine - 200 (330)

500 in cedar swamp (310)

500 mixed timber - fair pine

1000 to road 8:20 AM (330)

1100 is course of road - we follow it
proper variation is 19°30'W

1400 - leave road & run from 10°30'E (330)

1900 cedar swamp (31)

Struck line at 2070 100E of stake

Going south on $\frac{2}{3}$ of Sec. 16 12.16 M

Open Tamarack Swamp Am - 315

500 " & Cedar " 320

500 Thick 2nd growth " & Alder. " 345

740 12°50'N " " " 350

1000 Mixed Spruce & Tamarack " 355

1160 " Pine & Hemlock " 360

1335 Thicket " Birch " 380

1600 2°30'N " " " 365

1850 Edge of Cedar swamp " 360

Struck line at 2010 near stake

2010 Mixed Timber Tamarack Spruce & Pine

Bench Mark 312.96 Aneroid 375.

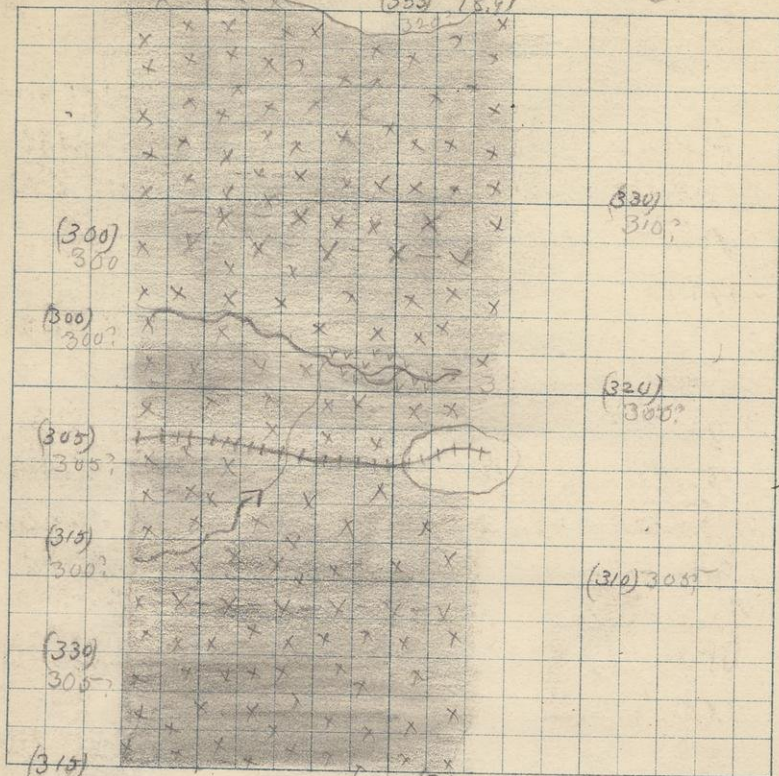
1.30 P.M.

325°

26.43 S. 3

T. 43
(353) 18.91

R. 30

(315)
300

E' 1/8 of 3

↑ E' 1/8 of 3

(320) 300

Going N on 2 of 30

13

Corner in spruce-tamarack swamp (320)

833 ft

500 in swamp (310)

800 to road 1000 creek 2 ft wide

flous W (320)

1040 creek 20 ft

wide - flous E?

1500 swamp (330)

1450 mixed timber - pine clashing -

1995 corner - Bench 18.91

Anemid 355

Going S on 2 1/8

1/8 in cedar swamp Bench 26.43

10.53

Anemid 18027.3

Cedar swamp changes to tamarack
at about 300. Large tamarack-swamp
fairly open (340)

600 (300)

825 creek 10 ft wide flous E 300

1125 to road (305)

1400 creek 4 ft wide Tamarack swamp 315

1700

Q. 330

Struck line 2010 at Lake

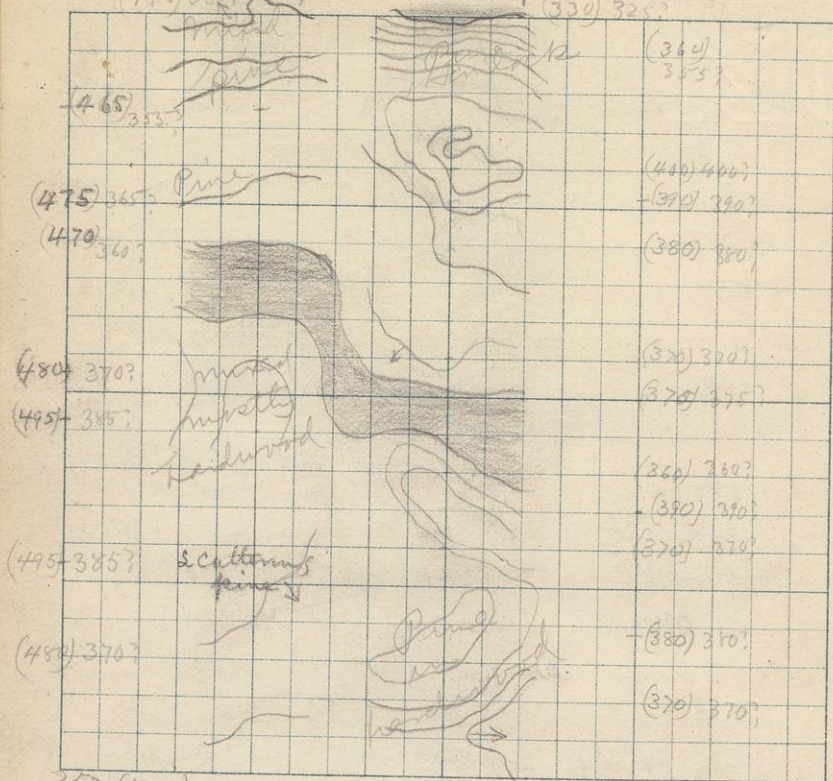
2000 open tamarack swamp Q. 315

12.10 M

(440) 335 S. 9

T. 47

R. 30



357 (470)

345

11/8 89

1/4 89

9.15 Am

Bench 345.49 ¹⁵

fairly thick heavy
pine in hardwood

around 2400-2855

200 (370)

375 (380)

600 (370)

700 (390)

800 cedar swamp (360)

1000 mixed swamp (375) 940 Am 37

1100 (370)

1400 (380)

1520 (390)

1600 (400)

1900

good hemlock +

pine - pine cut to E of line (380)

Struck $\frac{1}{4}$ stake at 10.20 Am (330)

cedar swamp

Young S. on W 1/4

(440)

mixed timber a little fair

pine.

200 (465)

500 (475)

600 mixed swamp (470)

800 mixed swamp slowly change to mixed
growth,

950 fairly thick 1st quality pine to W
of line; to E of line pine cut. (480)

1075 2.20 Pm

(490)

1450 mixed timber - mostly hardwood - with
scattered pine (495)

1500 fine thick hemlock + fine thick pine

1700 (480)

in hardwood

Struck line at 1990 near stake

Bench 357.46

255 Pm

around (470)

440

S. 4

T. 43

R. 30

100.59 (475)

(485) 435 (495) 435?

400?

(440) 385?

(420) 350?

Pine

(405) 335?

xxx

Pine

(400) 350?

(420) 340?

xxx

(390) 355?

soft pine

(415) 335?

Pine

(370) 335?

xxx

(370) 335?

(415) 320?

(420) 330

xxx

(440) 335?

N 1/8 of 4

1/4 of 4

(330) 325?

1/4 of 4 - going N

100 then tamarack - 220 cedar swamp

380 creek 5ft under flowing E

615 lot road pine slashing

660 mixed timber - pine slashing (370)

1000 thick fairly heavy pine 6th of 1/4

line. good quality 1140 - lot road (370)

1500 same pine - partly burnt (390)

1700 (400) 1900 (445) 1975 (495)

Struck line at 2003 at 1/4 slate

Bench mark burnt

11.20 AM

Anemoid (495)

going S 12.151

Bench 100.59

Bench is burnt

Anemoid (475)

Partly burnt thick good pine -

200 (420)

350 cedar swamp (405)

630 - edge of swamp (420)

650 thick

heavy good pine 840 (415)

1000 cedar swamp

1445 creek 5ft under - flows E (415)

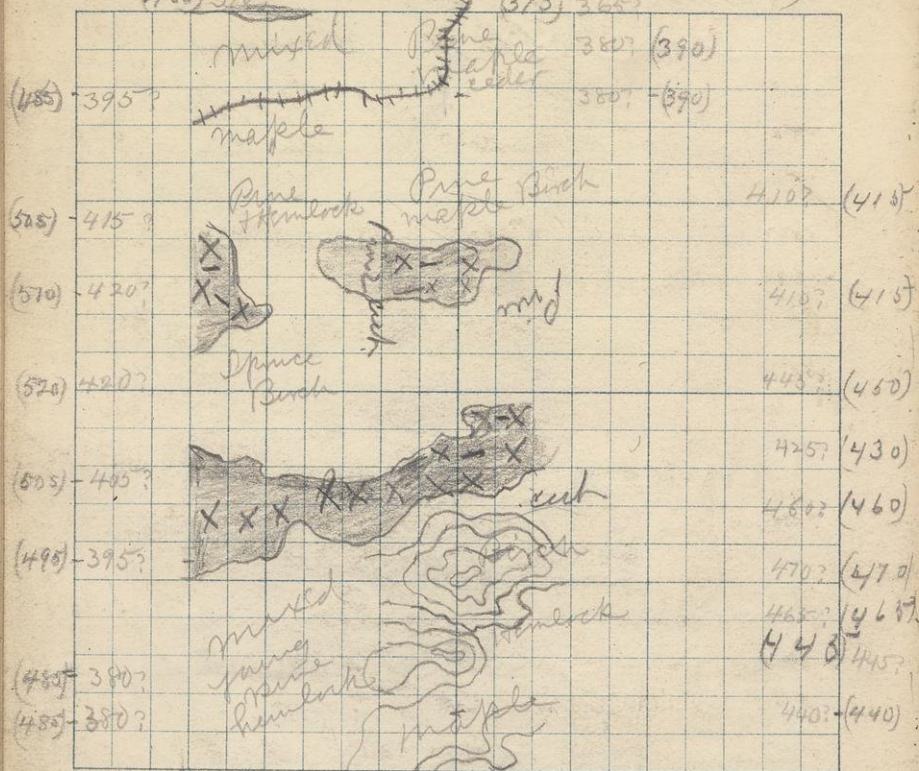
1540 lot road

1700 (420)

Struck line

(440)

(460) 372 S. 8 T. 43 R. 30 (375) 365



401 (505)

2. 1/2 line of Sec 8
E. Sec Line. 78

Sten Loney - Compassman
topographer

P. Sanford - unable to run

Going N. on E. Sec. Line of Sec. 8. 19
Mixed Timber Bench Mark 453.09

8.40 A.M.	Anneroid	455,
150	Good Maple	440
400	" " Hemlock	465-
500	" " Birch	470
1000	2 nd " Growth. Balsam cedar + Maple	450
1230	Tamarack & Hemlock	415-
1375	edge " Maple + Birch	415-
1500	Pine " "	415-
1785	" " + Cedar	390
1900	toot road mixed Timber	380
Struck Line + corner 1992 edge of cedar swamp		
9.00 A.M.	Anneroid	375-
<hr/>		
1.20 P.M.	Anneroid	410
Going south on E. $\frac{1}{2}$ of Sec. 8. 43-30		
Mixed timber, Cedar Hemlock		
225	" " Maple toot-road	485-
540	Pine " Hemlock	505
750	Mixed Timber " Tamarack	510
1000	" " Spruce Birch	520
1230	" Swamp " Cedar	505-
1450	End of " Mixed Timber	495-
1750	Thick Small Pine + Hemlock	485
1880	" " Hemlock " Pine	485-
Struck Line a 2027 20 E of Slater		
Good thick Pine + Maple		
Bench Mark 401.89	3.5 P.M.	505

Going North on E. Sec line of Dec. 5-43-3021

10.2 A.M.

Cedar Swamp	Annexoid	375-
100 Edge of " Maple & Birch		380
160 " "		370
500 Burnt " Hemlock		375-
720 " "		380
880 Creek Tamarack		355-
920 Edge of Swamp		380
1000 Thick fair Pine		360
1300 Edge of Cedar Swamp.		370
1500 " " Mixed Timber		390
1750 Maple & Hemlock		385-
1870 " B. M.		430
Struck line 1995 near Cor. 11.29 "		440

Heavy Maple Hemlock & Linn 11.30 A.M.

Going South of B. & M. line of Dec. 5-11.43 A.M. Annexoid 440

Pine all cut. Mixed Timber Burnt

460 Cedar ^{cut} "		425-
430 Lot Road Maple & Hemlock		425-
800 " "		415-
940 Cedar Swamp		415-
1065 creek Cedar & "		410
1230 mixed Timber		445-
1400 Cedar Swamp		425-
1600 Maple & Birch		445-
1700 " "		465-
1900 Cedar Swamp		445
Struck line 2015 Mixed Cedar		460
& Tamarack Hemlock		
at State	1.15 P.M.	

(345) 385

S.

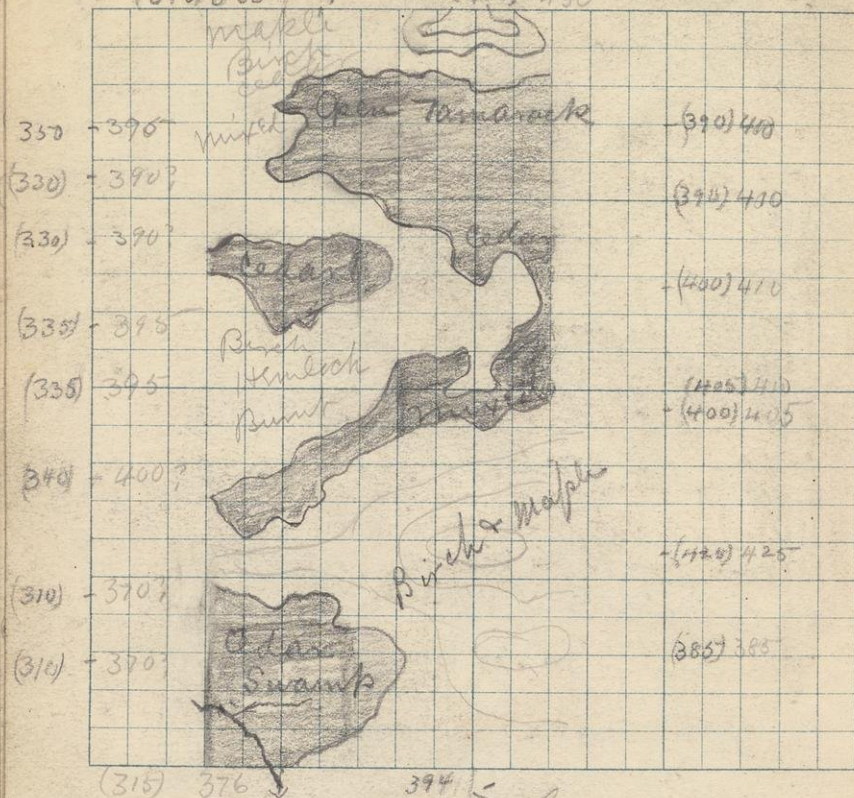
7

T.

42

R.

30



4.1 line of Sec 7

line of Sec 7

Blair Lounney
+ Topographer

Compassman

P. Sanford unable to run

Going North on $\frac{1}{4}$ line Sec. 7 T43R23E
 9 A.M. Bench Mark 39.411 ^{annul}
 Mixed timber 395-
 300 " " Burnt 385-
 580 Maple & Birch 425-
 550 Mixed Swamp 460
 1000 " Timber 405-
 1285 Edge of Cedar Swamp 460
 1500 open Tamarack " 390
 1700 End of " 390

2000 Maple Birch & Hemlock Struck Line

2030 at Stake v. 2.18^{10.20 a.m.} 415-

Going S. on W $\frac{1}{8}$ line of Sec 7 1.55 P.M. ^{annul} 345-

Maple Birch & Cedar
 320 mixed burnt timber " 350
 435 " Tamarack " 350
 610 " " Cedar " 330
 840 " Birch & Hemlock 335-
 1000 Maple " " Burnt 335-
 1335 " " " 340
 1570 Edge of " Cedar " Swamp 310
 1820 Small Creek " 310

Struck Line & Stake 1970

1970 Mixed swamp B.M. 376.74

annul 315-

3.15 P.M.

creek 50 W of Stake

a. 295-

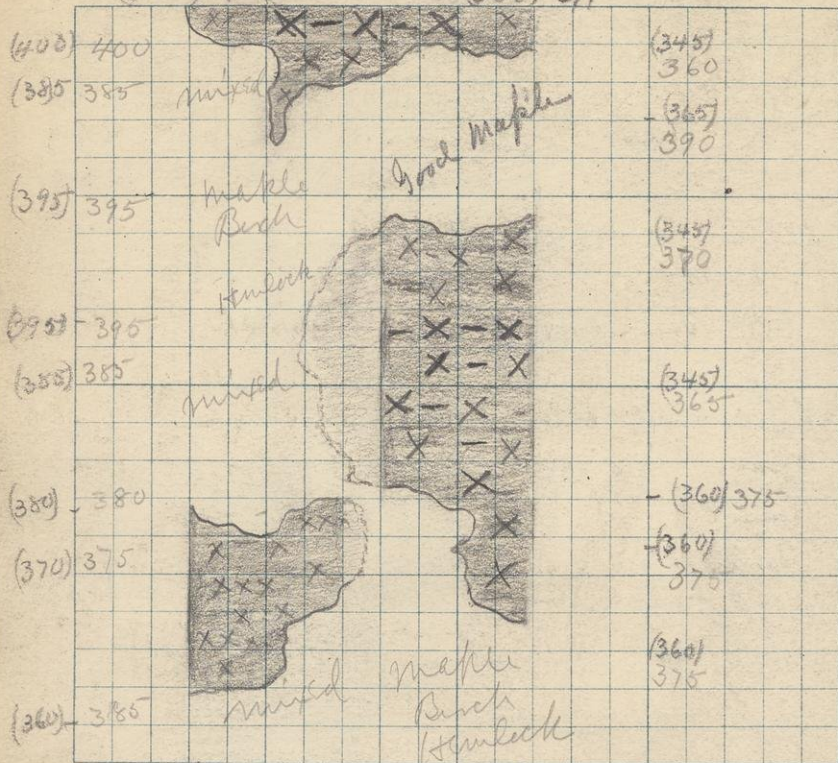
(395)

S 6

↑
T

(365) 397

R. 30



385 (345)

↓
1/4
line of Sec. 6

↑ (415) 430

1/4
line of Sec. 6

Steve Louney
Compassman
1000 ft. topographer
I
6

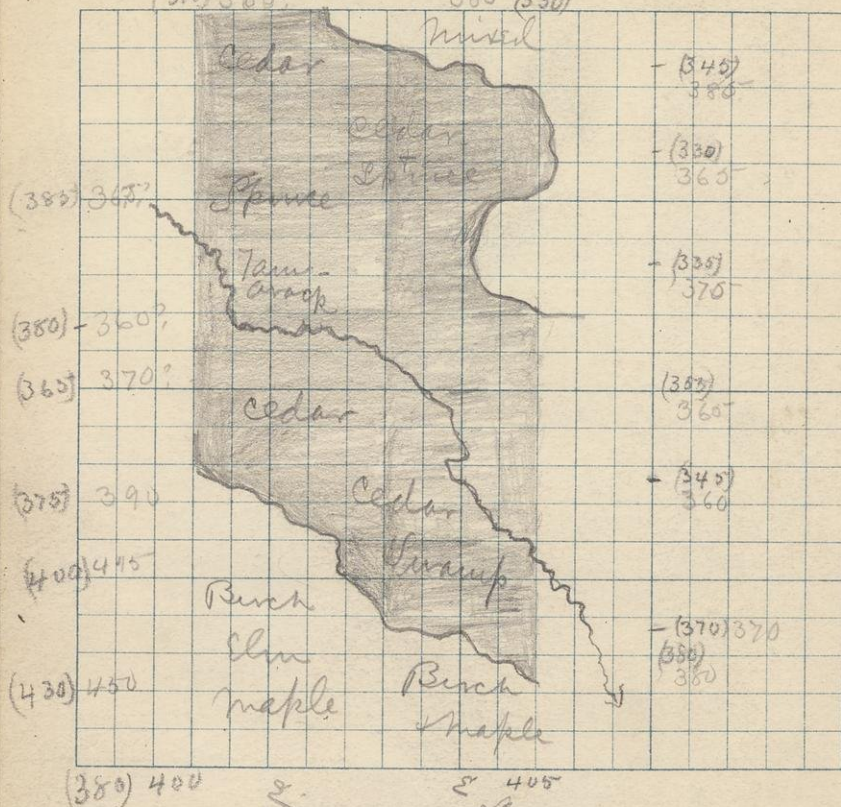
N.B.

West 1/8 stake of Sec. 6 on North Branch line
100 Paces to far west. Proved by pacing
from 1/4 stake.

Going N. on $\frac{1}{4}$ line of Sec. 6 T43-R30	25
Maple Birch & Hemlock. Aneroid	415
300 " " & Elm. e. "	360
590 mixed Timber	360
700 Tamarack Swamp " e "	360
1000 2 nd growth of Tamarack Swamp	345
1400 End of swamp - mixed timber "	345
1700 Good Birch & Maple	365
1900 Tamarack & Spruce Swamp	345
1995 " " " B. M. - 396.44	
Struck Line & Stake 1995 11.30 a.m.	360

Going S. on W. $\frac{1}{8}$ line of Sec 6. T43 R30 B.M. 394.92	
Tamarack swamp Cloudy 11.45 - a.m.	
100 edge of Tamarack	Aneroid 400
200 mixed Timber	" 385
500 " Maple & Birch	395
835 mostly Hemlock	395
1000 mixed " Cedar	385
1330 " " "	380
1500 " Swamp	370
1800 " Timber	360
2015 " Maple Birch & Cedar	
Struck Line 2015 Near Stake	345
1.50 P.M.	

S 12 T 43 R. 37
 (370) 380? 385 (330)



2¹/₂ Line 12
 2¹/₂ Line 12

Steve Loney Comptroller
 + 9 topographers -
 P. Sanford unable to run

Going N. on E. Sec. Line of 12. ^(Range Line) T43-31 27
 cloudy Bench Mark 405.5 aneroid 405

Birch & Maple 8.45 A.M. N. 32° E + 2° 30' E
 301 Pine " Birch Aneroid 380
 380 Edge of Swamp Cedar 370
 775 River " & Alder " 345
 1000 Thick Cedar Swamp " 355
 1355 " " " 335
 1630 " " & Spruce Swamp " 330
 1850 End of " " 345

2025 Shuck Line + Cor. mixed timber " 330

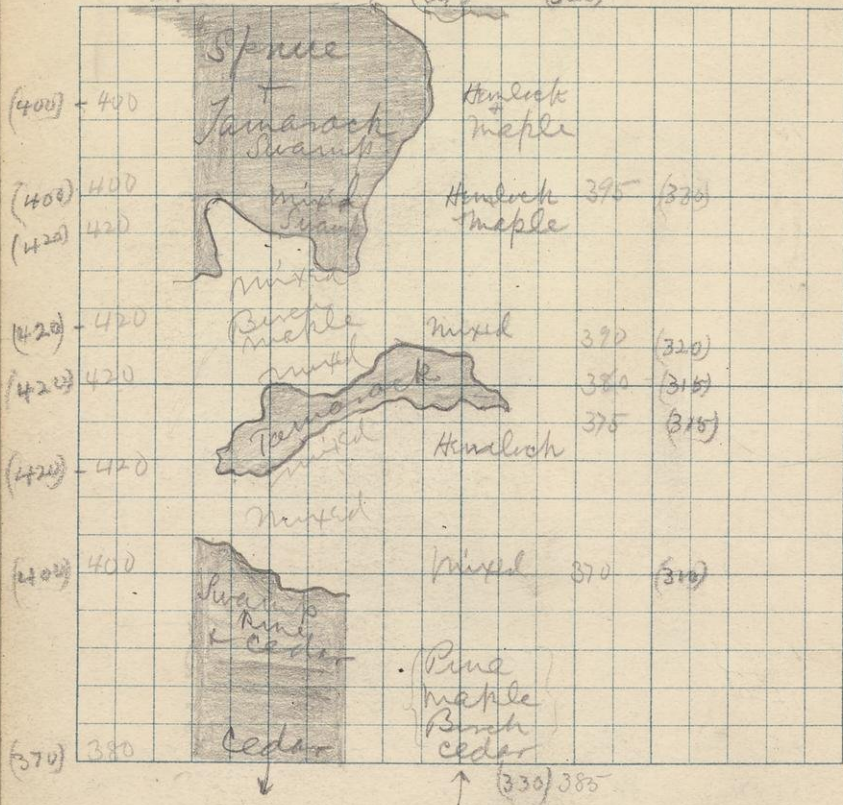
Going S. on E. 1/2 Line of Sec. 12 T43 R31
 10.25 A.M.
 Thick Cedar Swamp 1.40 P.M. Aneroid 370

500 Thick " mostly Spruce " 385
 830 River " Tamarack 380
 1000 Thick Cedar Swamp " 365
 1290 Edge of Swamp mixed timber 375
 1500 Good Birch & Maple " 400
 1800 " Elm " " 430

Shuck Line 2025 30 paces W. of State
 2025 Mixed timber Bench Mark 399.67
 Aneroid 380

3. P.M. N. 30° E

390 S. 1 315 T. 43 (325) R. 31



Glen Loney, Comptroller
 & Topographer

E. Sec. Going N. on E. Sec. Line of Sec. 1 (Range Line)	10.25 a.m.	29
Cedar Pine Maple & Birch	annuroid	330
500 mixed timber		310
900 " " Mostly Hemlock		315
1000 Tamarack Swamp		315
1100 mixed timber		320
1500 " " Hemlock Maple		330
1700 " "		

Struck Line & Cor. 2040 near stake P.M. 395.29
 2040 mixed Cedar & Tamarack annuroid 325-
 11.35 a.m. V 2.41'E

Going south on E $\frac{1}{2}$ Line of Sec 1 T 43 R 30		
Spruce & Tamarack swamp	Sunk mark	391.72
255 " " "	annuroid	390
500 " " Cedar		400
600 mixed timber		410
845 Good Birch & Maple		420
1000 mixed Timber Edge of Swamp		420
1220 " "		420
1500 " Swamp Pine & Cedar		400

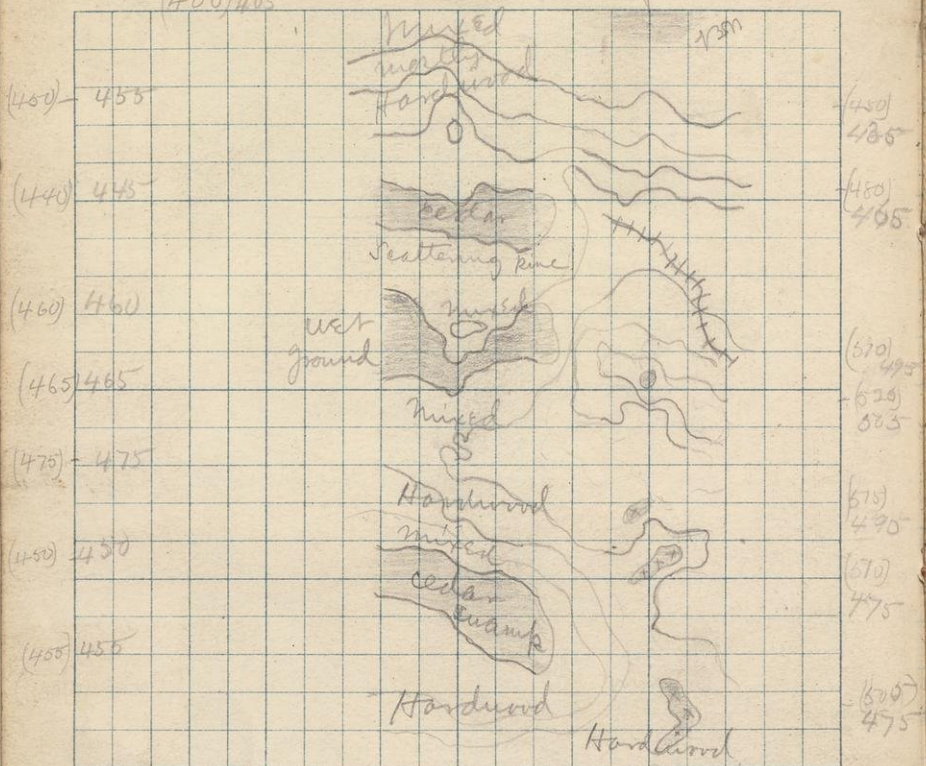
Struck Line 1985 no. stake
 1985 Thick Cedar Swamp 370
 1.40 P.M. V 2.45'E

S. 11

T. 43

R. 31

(400) 405



Run on about 5⁰⁰g, 12 AM

Going from 11 1/2 of 11

Bench 472.00 **31**

Variation 0° + 1° 43' E Aneroid 150 = 285

Fine hardwood Run on 0° E

200 mixed timber 300 (455)

360 cedar swamp

530 edge of swamp (454) then mixed
timber 680 hardwood - fair.

810 (475) mixed timber - mostly hardwood

1000 wet ground (465) Run on 1° 0' E

1100 mixed growth - balsam mostly

1200 (460) 1300 some heavy but

very scattered pine - in the mixed timber

1400 cedar swamp. 1500 ^{now} run on 3° 0' E (440)

1770 (450) mixed - mostly hardwood

Struck line at 1970 at stake about 400

Going S on 1/4 line

Wet ground - then mixed timber

Run on 3° 0' for 500 250 (450)

450 hardwood - thick pretty good pine
+ hemlock - (450). 600 old tote road

900 (510) 1000 good hardwood. 2,300 Run

1030 (525) 1300 (575) 1500 (570)

1880 (505) Struck line at 1990 N of

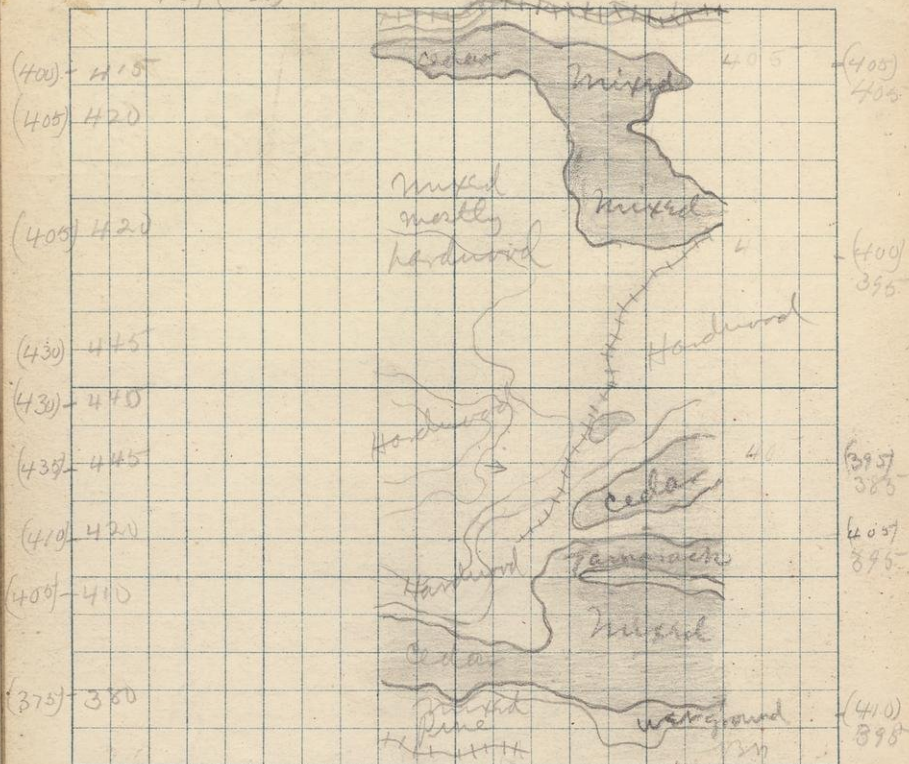
Stake about 20 Aneroid (500) 470.00

3.10 PM

Run on 29° 0' 0' from 500

469 (455) 2

T. 43 437 R. 31



11/8/72

Clear

1/4/72

Clear

Going from NW 1/4 of 2

10.45 AM
Run on 30° 0' E

33

Hardwood with scattered pine

200 late road 185 cedar swamp (875)

350 edge of swamp - then mixed timber

450 (405) 600 fine hardwood (410)

780 (435) 950 (430) 1100 (430)

1400 (405) mixed 1700 mostly good

hardwood (405) 1800 tamarack swamp

(410) 1900 edge of it

1903 late road Struck line at 1990

near stake Bench 468.23

1.80 PM

Aneroid 455

Going S on 1/4 line Bench 437.50

Hardwood - good 1250? 1750 = 28.6

150 mixed swamp (405) 450 mixed swamp

650 wet ground 675 mixed, mostly
hardwood (400)

750 late road 1245

1200 cedar swamp / 390? 1240 other side

1350 other side of it 1400 tamarack swamp (405)

1520 mixed swamp

1830 edge of swamp 1875 (410) mixed

timber heavy pine 1900 wet ground

10 Struck line at 1992 at stake

1.50 PM

(440)

Nov 3 Joington E. of 10

T43, R31 35

8.35 AM

fine hardwood ^{line} ^{2100 = 29.2}
Bench 478.47

Vanatum 0.15' E.

300 same timber 480 V 0° 30' W

380 V 1° 20' W 457? V 1° 0' W 580 V 1° 0' W

570 (460) 600 mixed timber

700 cedar swamp (450) 800 0° 30' E

900 creek 2 ft wide - flows N 440

1000 9.12 AM, 0° 45' E

1200 edge of swamp V 1° 0' E (430) thick
hemlock 1400 (470)

1450 old tote road

1500 cedar swamp (420). 1600 (430)

mixed timber mostly hardwood

1830 (440) hardwood

Struck line at 1990 at stake

in following line V 2° 30' E (440)
from Jan 8/18

~~mixed~~ - some more pine scattered
throughout hardwood

300 in mixed timber - with good cat. pine (440)

V 2° 0' E 375 mixed swamp - cedar

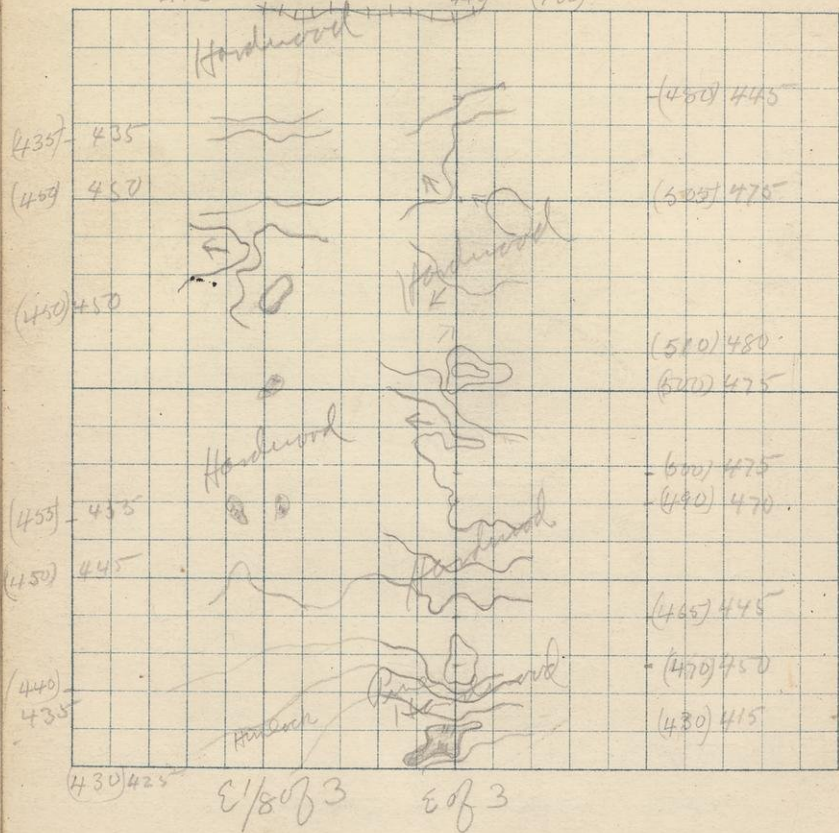
500 V 2° 0' E 700 V 1° 30' E 750 wet. (creek?)

990 0° 0' 1060 0° 30' W

1130 test pit (475) Another test pit

10 paces - pits are now so filled
in that cannot say how deep they were
see page 39

416 S. 3 T. 43 R. 31
449 (485)



Young Run 2 of 3

Mixed timber

100 (430)

275 480 Heavy ^{my} scattered pine in hardwood

400 (460) 500 good hardwood maple elm

700 (495) 775 V 30° 30' E (500)

875 1000 (495) good maple ~~elm~~ timber (500)

1600 (570) 1500 (500) fine hardwood

1750 1775? 480 1860? ^{to} road

Ben Struck line at stake Bench 449.18

12 AM 11.35

aneroid 480

July 5. 12.45 AM Bench 416.63

Fine hardwood ^{fine} maple ^{aneroid} 30 = 1700

Run on 40° 0' E for 500 paces

350 pure timber (435) 400 V 30° 30' E

500 (450) 800 (450) V 30° 30' E mixed timber

1000 small patch of tamarack swamp 1.15 AM

1200 fair ^{mixed} hardwood 1350 (455)

1500 V 30° 30' E mixed - maple, birch, cedar (450)

1500 (440) a little thick but light pine near here

1900 young hemlock - pine cut

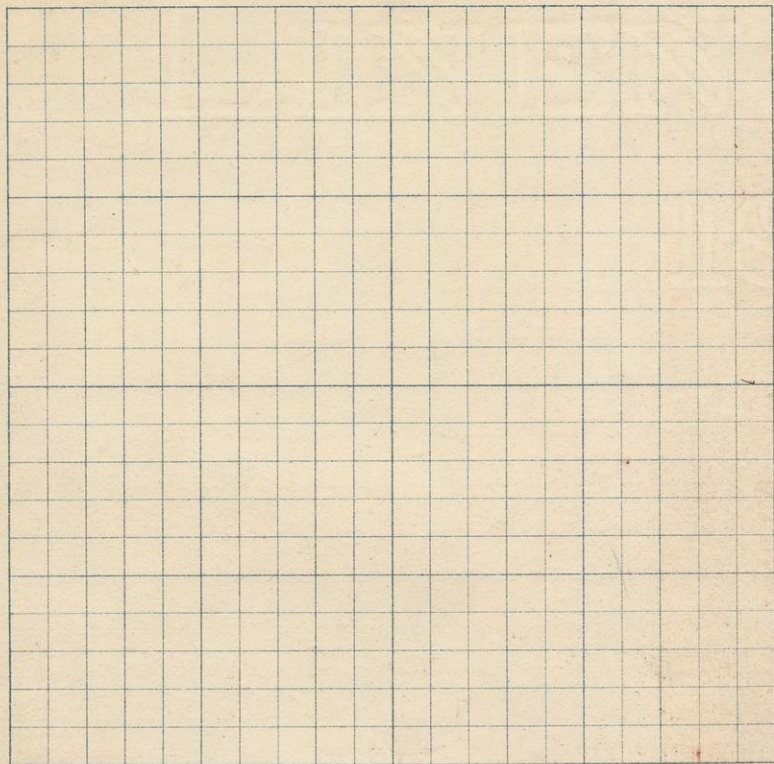
Struck line 1991 at stake (430) V 20° 0' E

1.40 PM

S.

T.

R.



1830 Probably reached solid rock + 1830 - last thing taken out of pit - is probably from ledge. Other pits have been sunk

in a N + SW line - about 200 paces long

1832 from pit 20 paces E of 1830

1831 from pit farthest W. about 50 paces W of 1830

1200 V 10° 0' E

1833 from pit next to farthest E. another pit 45 paces further E was abandoned because of washing rocks evidently. Pit is in cedar swamp - too much water for diggers. Rock from all pits much alike. A red "decomposed granite" schist or slate with cherty concretions or layers. What is this decomposed?

1300 good hardwood (450)

1425 V 30° 0' E

1800 V 30° 45' E

N 405 W 500 two test pits, Specimens

1834 from angular boulders - Am not sure if

1835 from ledge. Very likely are

1070 30° 0' E (455) fine hardwood

Shook line at 2000 about 20 W of stake Bench 464.04

Amorid 475

Young N on 1/4 589 Bench 37805
41
Mixed Swamp Aneroid 2700-281

8.20 Am Run on 40" 0'E
230 creek 8 ft wide flows W (375?)
350 mixed swamp 500 (390)
675 edge of swamp then mixed timber
800 (405) 840 spruce swamp. (395)?
990 edge of swamp. 9.05 Am then
mixed timber end growth (390)
1350 (420) mixed growth
1620 (420) mixed end growth - hardwood mostly
1700 mixed softwood, 1860 tamarack
Swamp
Struck line at 2000 at stake

Young San N 1/8 2.15 PM (395)
mixed timber

250 mixed swamp 350 edge of it

500 (385) mixed timber

1848 N 1375 W 1500 outcrop of diorite?

(445) 6 ft of outcrop

700 (590) mixed - some hardwood

930 (370) N 1100 W 1500 outcrop of diorite?

960 (410) 1300 (370) 1400 mixed mostly
hardwood. 1500 1000 ft of diorite?

1849 N 500 W 1400 massens - diorite?

1850 coarse at N end of outcrop, - finer S.

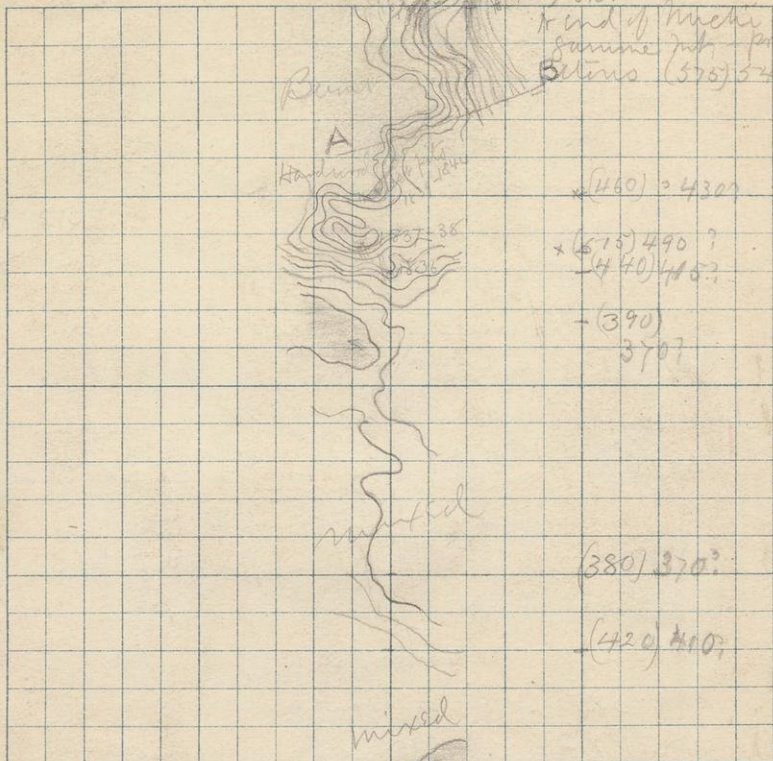
1851 at S. N. end rock is schistose
cleavage strikes N 45° W dips N. at
a high angle - 75°? Did not find a contact

S. 4

T. 2

R. 31

31



Chandy
1/4 7/4
notes on
pages 43, 47, 49.

See page 99 for section
across A B. Hypothetical one
also for few remarks

Summit N on 1140 ft
mixed timber 9.50 AM (400) 43
300 (420) 500 partly burnt mixed &
growth (380) run on 40" 0' to here - from
600 run on 3" 0' - struck a N + S line
near here which runs on about 0" 30' N. we
did not follow it. 1170 (390) Burnt
1300 (440) 0

1836 - N 1300 W 1000. Strike N 15 W dip 90°.
outcrop of very siliceous limestone
apparent strike may be that of clear
age

1837 1837 N 1350 - Str 16 50 out strike N 30 W
dip about 70 W outcrop of same rock
but very plainly stratified - some layers
much more siliceous & weather whiter;

1838 the regular limestone weathering a dirty
light brown; layers range in thickness
from 1 in to several ft.

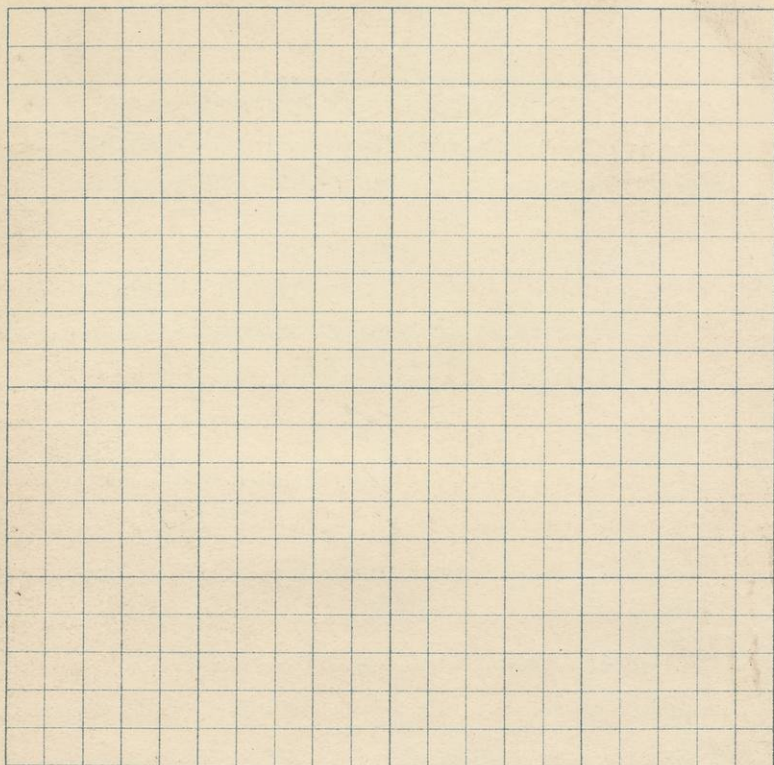
1837 is regular limestone - 1838 the more
siliceous. Top of outcrop (500)
1500 (460) hardwood

N 1500 N 1075 outcrop of siliceous lime-
stone, strike N 30 W; dip W at high
angle. running N from it is a line of
old test pits - now so covered in that
cannot determine positively whether ledge
but from pieces last thrown out make

S.

T.

R.



following 1st succession of strata

1839 nearest limestone 1839 a gink? 30 ft? thick

1840 is is next a sort of soap rock

1840 then 1841 a limestone; then 1842,

1841 this is a sort of Schistose green stone, 1843 is next N.E. a. high

1842 mica? Schist or "soap rock"

1843 1844 is farthest N.E. a banded slate

1844 This slate is similar apparently to other banded slates found near iron ores - I think if test pits had run farther E, would have struck ore, perhaps soft hematite like 1846.

Run on 8° E from 1150

18 N 1700 11.41 - run (440) 1860 (420)

Struck line at 1860. - 30 E of 1/4 slate

found no bench mark at 445 stake (425)

250: passes E slope of michiganian int

Just N of 1/4 stake some old test pits - sunk & grassy. Pits show some fairly rich hematite - over 34% Fe.

Quartzite & soap rock

30 paces W, is pit showing banded slates

See page 49

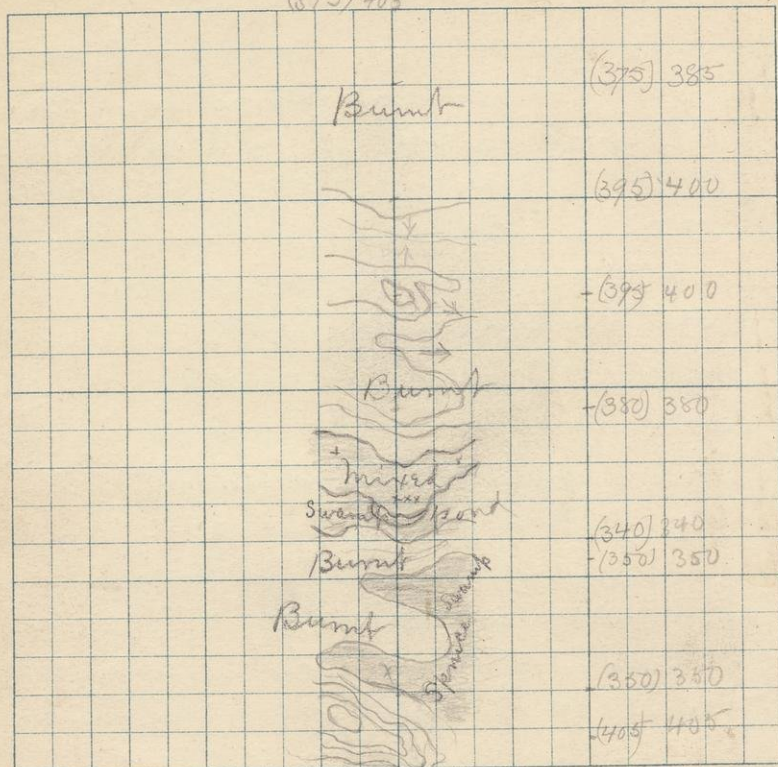
1845 1845 N 2000 - W 750 - a massive lean iron ore forming center & highest portions of Michiganian mountain

S. 4

(395) 405

T. 43

R. 31



(420) 384

Claydy

N¹/₈ of 4

Top is South.

1:15 P.m.

(420)

47

June 5 m 11/8 74 Bench 384.37

Burnt

Aneroid 1906.289

75 (405) 200 Spruce Swamp (350)

440 Open Spruce Swamp

600 mixed swamp (340) 550 (350)

800 burnt mixed 950 (380)

1250 " " (395)

1500 burnt mixed - mostly larchwood (395)

1800 (375)

Struck line at 1900 Found
no stake set by compass men
of Killers party - stake 5 from a
Cumberman's 1/8 stake

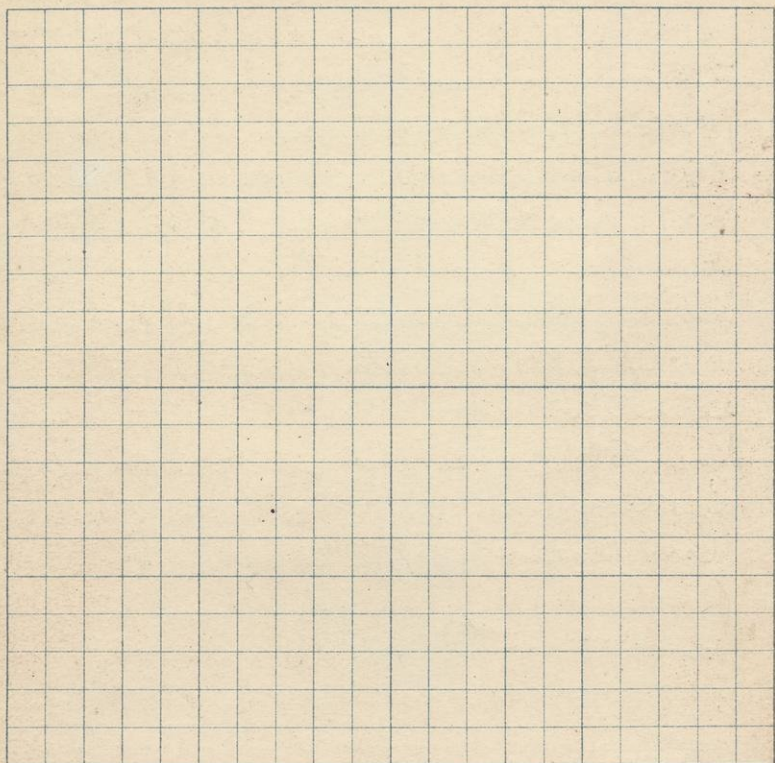
Run on 530' E for 500

" " 210' E about - for rest of way

S.

T.

R.



1846 1846 N 15, W 1000 ~~sec~~ sec 33, T 44

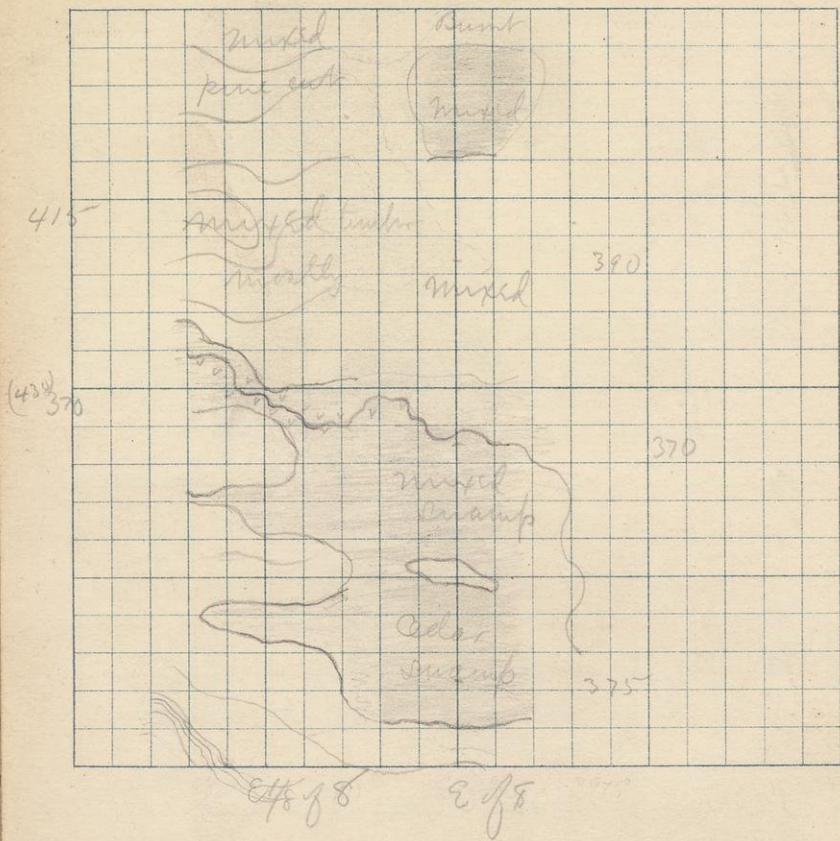
1847 R 31, Specimen of hematite.

1853 Shaft about 40 deep - sunk 8 yrs ago. my compassman worked in it, about 100 tons of ore taken out. Some of it 50 high per cent Fe. Ore body small - a men pocket - about 25 ft across punched out at either end + at bottom. Rocks bounding ore are "quartzite"? + Soap rock. Strike of formation somewhere about N + S. Several test pits to N - about 50 paces - show Soap rock - possibly some slate, 35 paces W is test pit showing banded slates. This banded slate is apparently about the same as 1844. 1844.

1847 1847 Several specimens of the Soap rock.

1853 1853 is specimen of "quartzite".

1852 1852 banded slate.



Young W on E of 8 Run on about 3⁰ S E

Young San E $\frac{1}{8}$ of 8 mine

Run on 5⁰ 30' - 2⁰ 30' E

750 (440)

800 (400)

1000 (440)

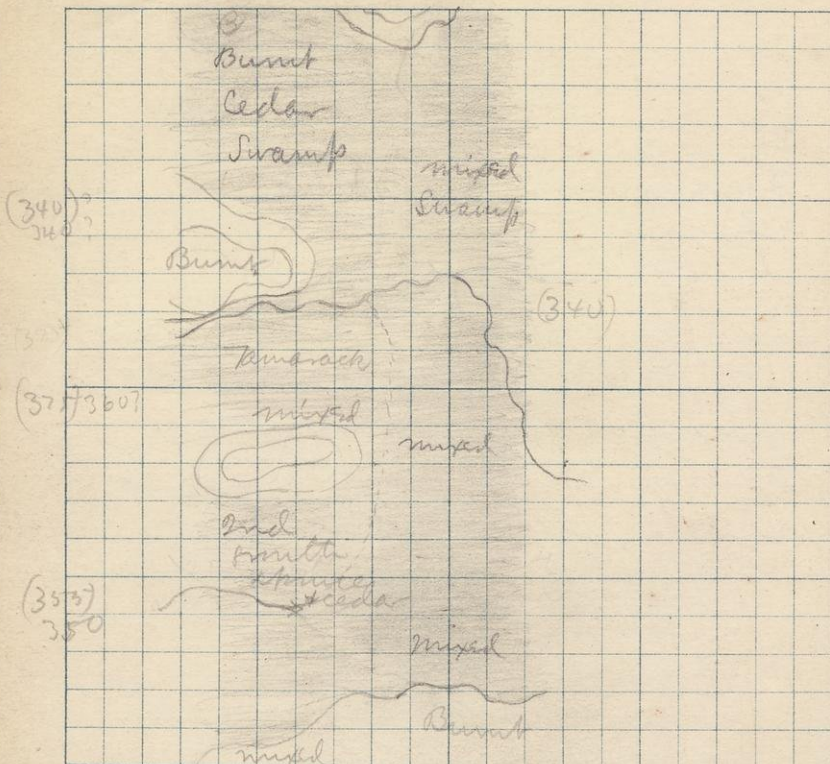
71030 creek 10 ft wide - alders along
bank - flows W (430)

Chuck line 1930, 150 W of Bm

S. 85

T. 43 N.

R. 31 W



E 1/8 of 5

E 1/8 of 5

Young N on E of 5

Young Son E 1/8
Mixed swamp

580 (340)? mixed timber

1000 (375) 1050 mixed swamp (365)

1560 2nd growth spruce + cedar (330)

1560 Creek 10 ft wide flows E (355)

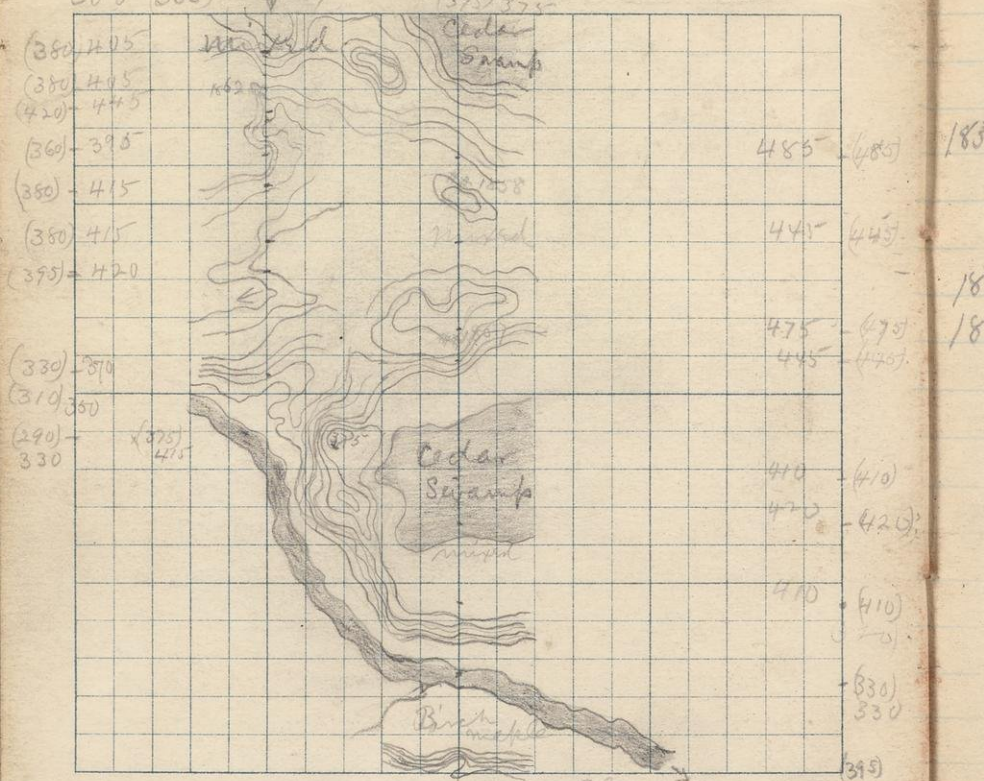
1760 mixed growth

380 (365)

S. 7

T. 43

R. 31

W $\frac{1}{8}$ of 7

4 of 7

Notes on page

57

Remainder of
W $\frac{1}{8}$ of 7 on page 64

Going N. on $\frac{1}{4}$ line Sec. 7, T. 43 R. 30 cloudy 55
Run on 1930 R. M. 395.92 $v = 200$
Mixed Burnt timber 8.10 a.m. around 395-

85 pines Birch & maple 340

235 River mixed timber " 330

1854 N 380 W 1000
" ledge of greenstone - fine grained agglomerate
435 top " " 410.

570 cedar swamp 420

1855 N 600 W 1050. big outcrop of greenstone

1856 forming bluff (1855) greenstone is rather coarse grained gabbro. On E side of the outcrop is what appears to be an outcrop of granite, like 1856. It may not be an outcrop, as it is broken up by weathering into angular boulders many have been a large boulder. I feel pretty sure, however, that it is an outcrop.

715 cedar swamp (444) 935 edge of it. then very thick mixed growth, chiefly scrub cedar. 1090 (445) confoundedly thick scrub cedar

1857 N 1150 W 1000 low outcrop of rather fine grained greenstone - granite?

Top of outcrop (475)

N 1250 W 1100 outcrop of greenstone - like 1857

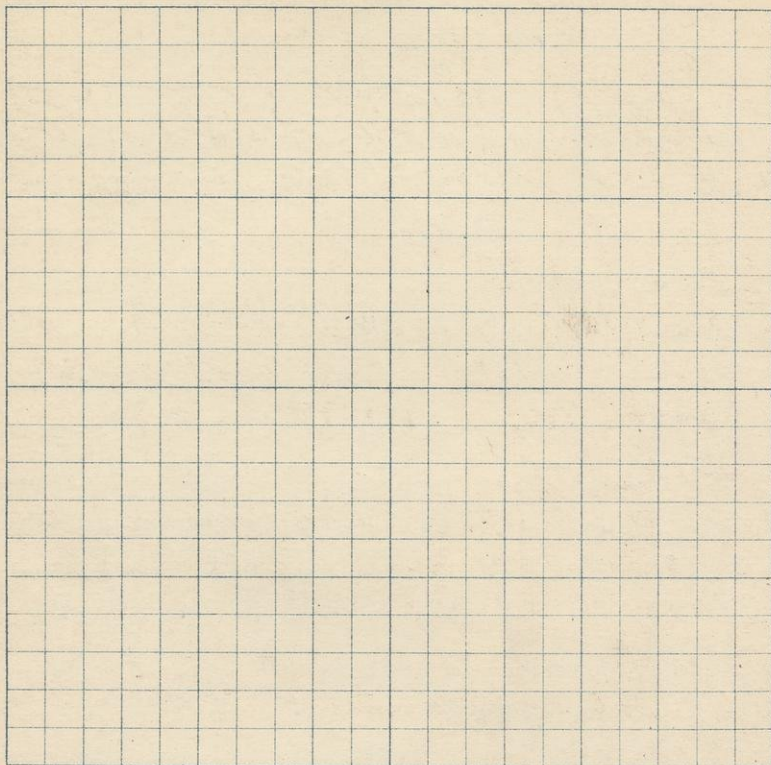
1400 thick mixed (445)

1858 N 1580 W 1000 large outcrop of greenstone. ledge breaks N. + E. about 1630 to 4480

S.

T.

R.



186

186

186

1700 foot of outcrop (415) 1800 cedar swamp/57
Struck line at 1995. near stake (325)

Some Son W 1/8 of 7

1/8 stake in mixed timber (353)

100 mixed mostly hardwood (350)

1862 N 1800 W 1500 outcrop of massive
fine grained greenstone - probably forms
core of hill

200 (300) 250 (200) 360 (360) 410 (380)

532 1/8 stake 600 mixed - mostly hard-
wood (380) 690 (295) 80 partly timber

mixed (395)

1863 N 1200 W 1500 outcrop - smaller of coarse
grained greenstone. gabbro?

950 (320) 900 outcrop of greenstone W
of line. 1100 (310)

1120 Michigan mine R. flows S. 60 paces
wide (290)

1864 980 1350 E outcrop of greenstone
top of outcrop (325)

Some of greenstone forming this hill is like 1864

81/85 343.02 An (27.5)

367

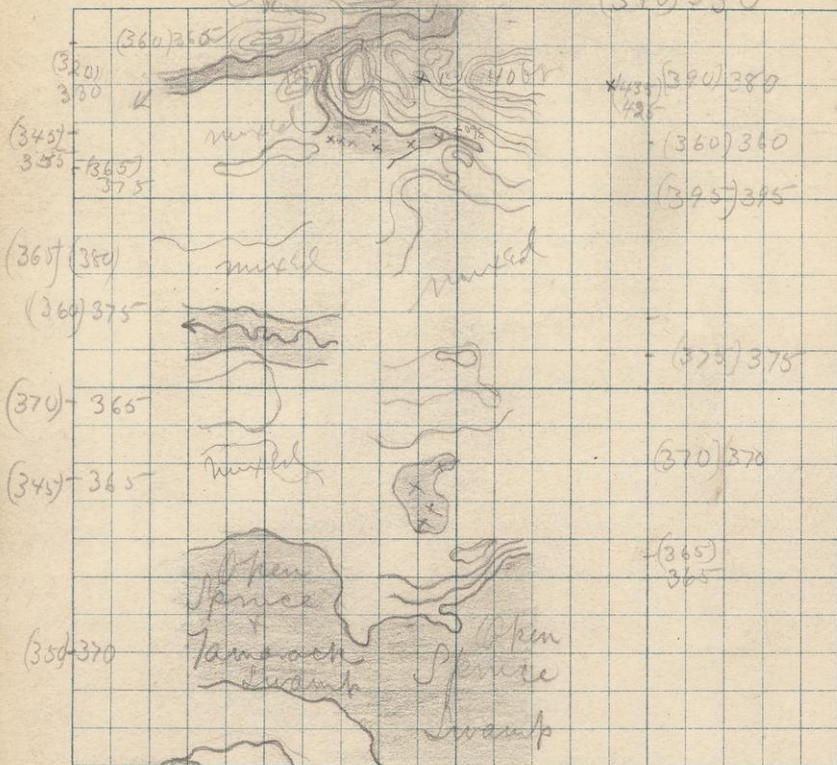
S.

T. 43

R.

31

(340) 330



p.m.

W 1/8 of 6

1/4 of 6

Notes on
page 63

Going to 1/4 of 6

59

Stake in open spruce swamp 1025
250 thick mixed swamp
555 (365) fairly thick heavy pine - cut
to E of line

800 (370) 9.50 1000 1290 (375)

Mixed burnt growth - old burning a few
scattering white & honey pine

1580 (395) 1650 cedar swamp (360)

1800 (390) ~~425~~ 425 50 W of line 425-

1859 11800 E 950 fine grained greenstone, big
outcrop. Some rock forming by outcrop 80 W of line
Parts of outcrop & it appears coarse agglomerate

1900 50 W greenstone

1920 Michigamme R 50 paces wide flows &

Struck line at 1995 - can stake - presum-
ably the one set by Leavitt's party on other
side of R. according to government plat it
should be on E. side. Bench mark also
probably on W. side. Did not cross
R. Our party should be provided
with a sufficient number of good
packers. Then use the geologists & com-
passmen could take rafts made at
crossings. We have not time.

Found old original 44 stake on E side

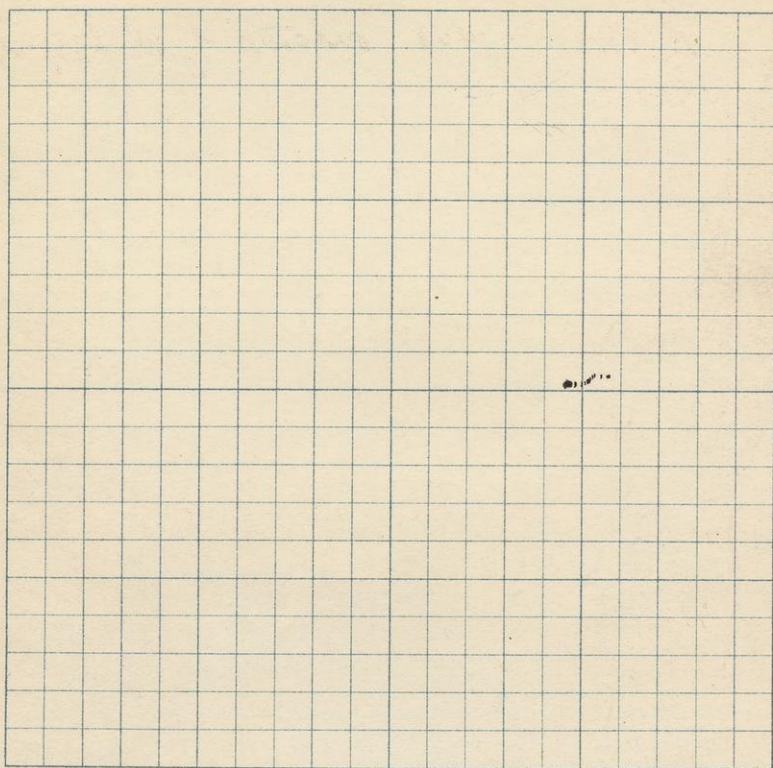
11.45 AM Michigamme R (340)

Granite outcrops all along the
River bank

S.

T.

R.



1860 N 1900 W 1130 outcrop of greenstone 61
agglomerate.

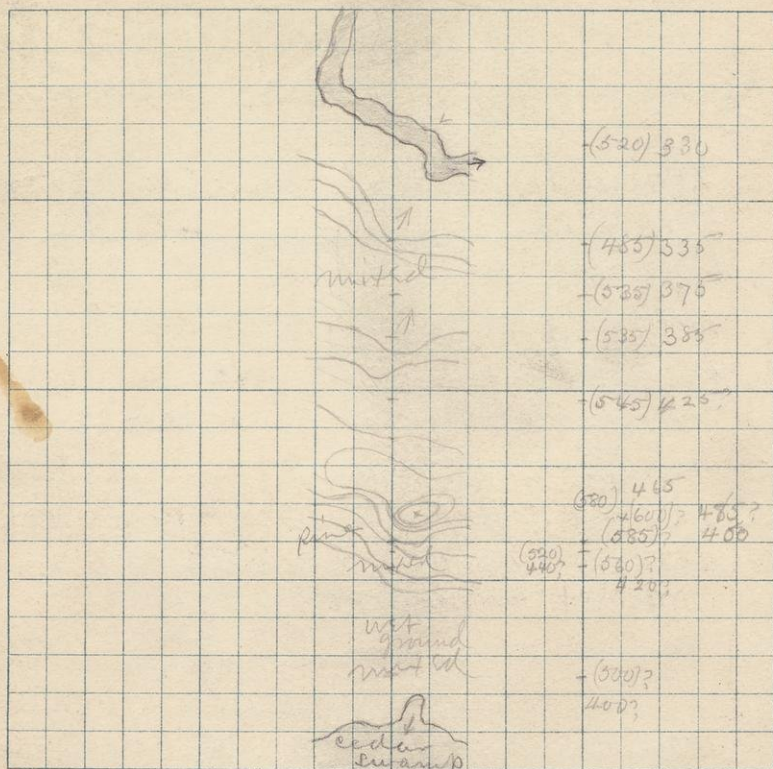
1861 N 1830 W 1400 outcrop? of slaty green-
stone? - N.B. on returning to camp
compared this specimen with some others,
general opinion was that it is not
greenstone - but greenstone. In that
case, the little fold that Mr
Brooks found in the E 1/8 of 6 probably
extends as far west where 1830 was
found. Topography shows that it might.
Hills on each side of river greenstone-
fold may be in wrinkled - Though
hills at 1839 are greenstone - country
to N is low flat, slates meta may un-
derlie it. Saw no real outcrop of
rock at 1861 - Simply a patch
perhaps 40 ft across of angular
fragments of slate on wrinkled schist.

Going S on W line of 6 - Range line
65 Michigan R. 400 mixed timber
500 Tamarack, 800 mixed timber
1000 Knoll 20 ft high 1250 mixed timber
1260 Tamarack swamp 1320 mixed timber
1500 Tamarack swamp. 1580 ridge, mixed
timber. 1635 Tamarack ^{swamp} ^{swamp}
2015 mixed timber Hit line.
N.B. Map is on page 66.

S. 12

T. 43

R. 32



384
E 1/8 of 12

my aneroid acted
queerly. Interpolated by
guess & by g.d.

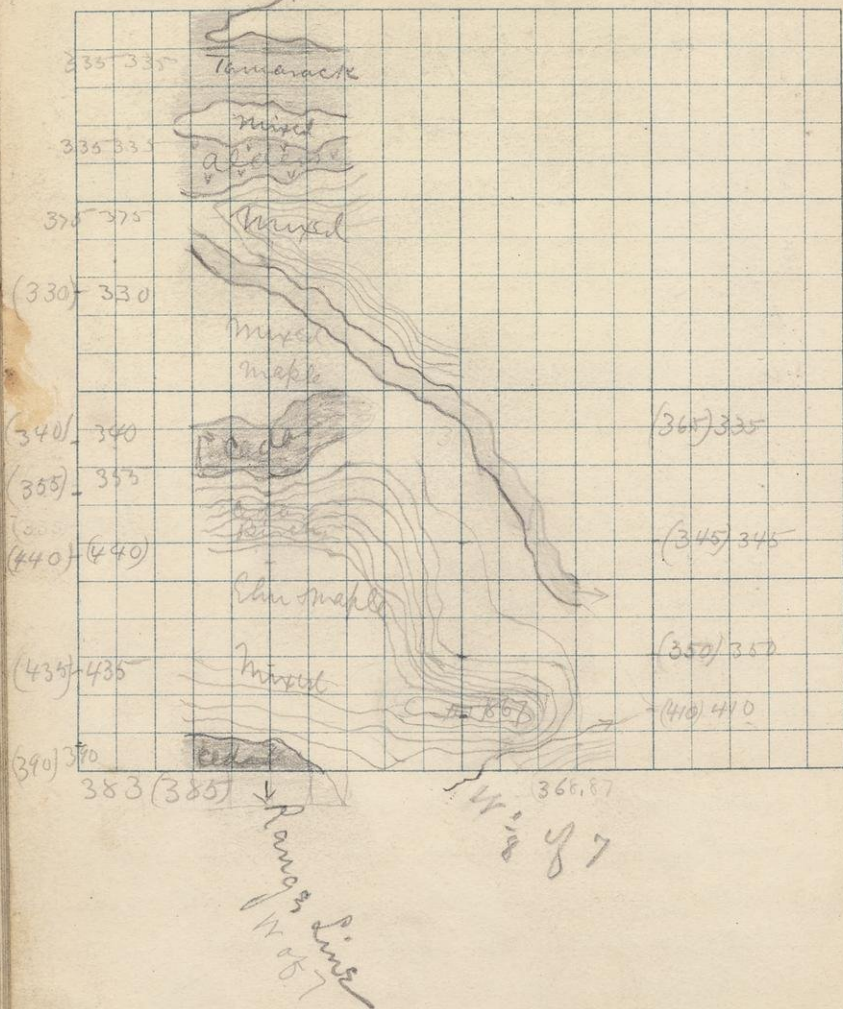
N 1/8 of 6. 12:30 PM Bench 367.93
 Aneroid (350) 28.75 = 63
 90 greenstone outcrop - top of it (360)
 120 N bank of Michigamme R (320)
 greenstone at 90 - medium coarse grained
 chert?
 200 S bank 325 mixed timber (345)
 415 (365) 610 (365) 800 wet ground
 860 creek of wide flows NW (360)
 1020 (370) 120-4 (345) mixed ^{timber on} low hills.
 1400 tamarack & spruce swamp - fairly
 open 1700 other side 350
 1810 (360) Bluck line at 1940
 100 S of stake. Think stake is
 100 paces too far NW.
 NB Map on page 58

Going N in 8 1/8 of 12. Bench 384.82
 1/8 stake in thick cedar. Run on { 500 W 500
 200 W 200
 500 E 400
 250 wet ground. Softwood (500) 400 E of
 of camp 630 (360) mixed timber, some
 good pine. 700 (385)
 1866 N 850 W 500 - greenstone, massive, fine grained
 830 (360) mixed, mostly hardwood
 N 895 W 600 greenstone, 975 (345)
 1865 N 880 W 400, large outcrop of greenstone
 trends NW & SE. fine grained aphanitic (320)
 1145 (335) 1250 (335) 1390 (485)
 1640 Bank of Michigamme R. (520). flows E.
 Mixed timber along banks. Follow up W bank

S. 7

T. 43

R. 31



Cloudy

Going N. on W $\frac{1}{2}$ of Sec 7. 43-31 65
Mixed timber B. M. 318, 87 8.50 a.m.

1867 N 150 W 1500 ledge of greenstone (410)
300 Mixed Burnt timber (300)
600 second growth Hardwood (345)
900 struck River (360)

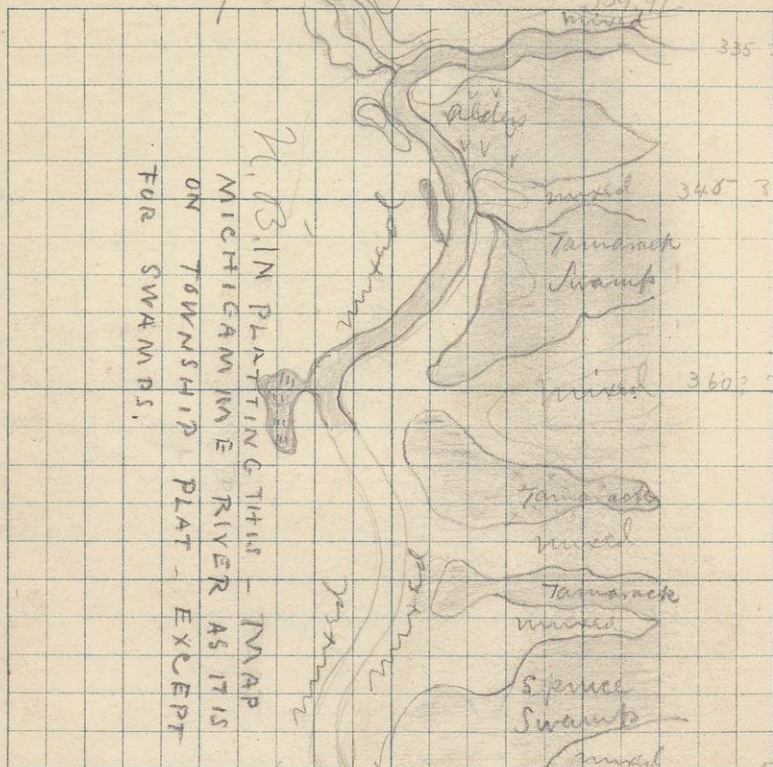
9.40 a.m. W line of 7. 43-31
Going South from River on Range Line
Mixed timber mostly Maple (330)
400 " " Cedar & Birch (340)
530 " " (355)
700 Good Maple & Elm (440)
1000 Mixed timber mostly maple (435)
1200 Swamp Cedar (390)
1330 Cor. Thick Cedar swamp (385)
B. M. 383, 18 10.30 a.m. (385)

W line of 7 - north of River -
N.B. This broken up running due
to fact that Michigamme R is too deep
to wade - no packs in camp to make
rafts - & in hurry to finish work.
50 Tamarack mixed timber
60 Tamarack Swamp 250 mixed timber
N 167 S, W 2000 greenstone ledge.
340 cedar swamp, 440 mixed timber
600 river, mixed timber

S. /

T. 43

R. 32



N. 1/2 IN PLATTING THIS - MAP
MICHIGAN RIVER AS IT IS
ON TOWNSHIP PLAT - EXCEPT
FOR SWAMPS.

(335) (505)

E 1/2 of 1

E of 1

345 345

Range line

Notes on page 61.

from N on S $1/8$

Mixed further along riverbank

11.35 On bank of Muchingumme 100 W of $1/8$ stake
(355) 200 banks of river about 6 ft high - few
fish higher than land behind - no outcrops
along river - two high land within 100 paces
at 1000 water edge (510)

1500 1830 Creek 15 ft wide - at mouth (330)

Went North 150 paces beyond ~~where~~ where
racing ran out - then S to open meadow about
lake - then went up meadow 450 paces - saw

Did not find track line - though saw old original
all blazes near where racing ran out Hunted
for over 1 hour - then returned to where saw
old original blazes & followed them W - there
are spots about 100 paces apart on the line
but it is not marked - the $1/8$ stake located

Why was this work done so carelessly?

Going W on old original line - found
line leading S. the river about 70 paces

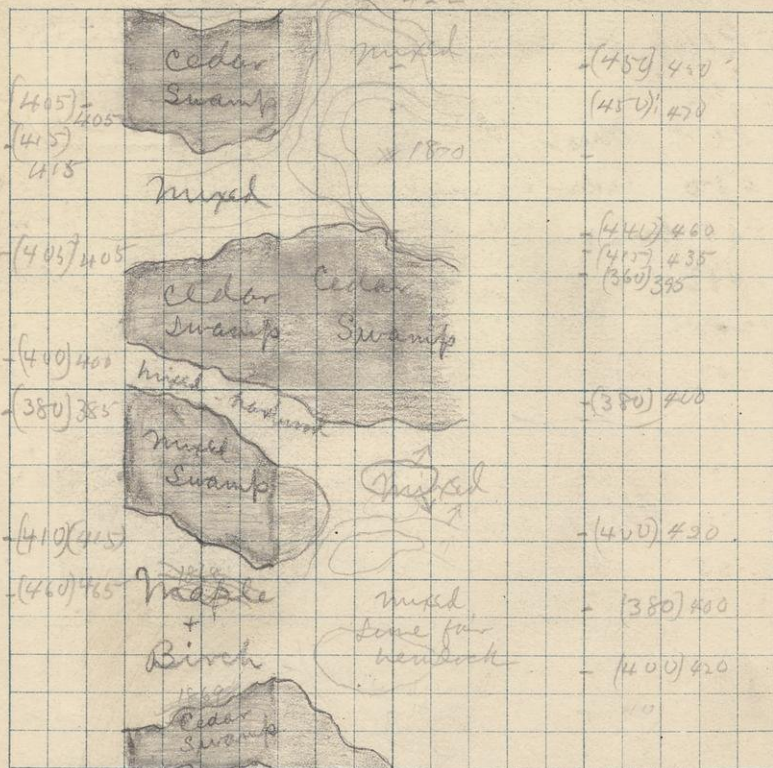
then 70 paces S of old original blazes
there is a blazed poorly blazed marked line
running W - this is presumably meant
for the track line - Where is the

track mark for the $1/8$ stake where
is the $1/8$ stake

↓
422 S. 2

T. 43
422

R. 3 2



395 380
1/4 of 2
Line Sec. 1

Going south on $W \frac{1}{2}$ line Sec. 2 T48-30 3260

Mixed timber mostly Hemlock $R M 422.73$
Annooide 430

2.35 P.M. 50 Cedar Swamp 405-

250 " " 405-

365 Mixed Timber 415-

450 Cedar Swamp 405-

925 Mixed Hardwood 400

1050 " Swamp 380

1200 " " "

1400 Maple & Birch 410

1868 N450 W1550 Sedge of granstone, diorite 460

1869 N120 W1550 granstone Sedge, diorite? 480

1900 Thick cedar Swamp

2050 Truck Line mixed Swamp 390

44 line of 2 Bench 422.55

Mixed - mostly hardwood Run on 50° for 1000
130 (450) 333 (450)! Went up full at 30° E at 1000
least 3 ft.

1870 N1625 W1000 - granstone, holocyclolite, diorite?

590 (440) 620 (415)

N1380 W1000 granstone,

690 cedar swamp (360) 1030 in swamp (380)

1080 edge of swamp, then mixed growth. 1280 (400)

1590 - mostly hardwood, some fair hemlock (380)

1750 (400) Hit line at 2030, 1000 of
clake (360)?

Run on 50° E for 1000
 30° E for 1000

↓

S. 11

T

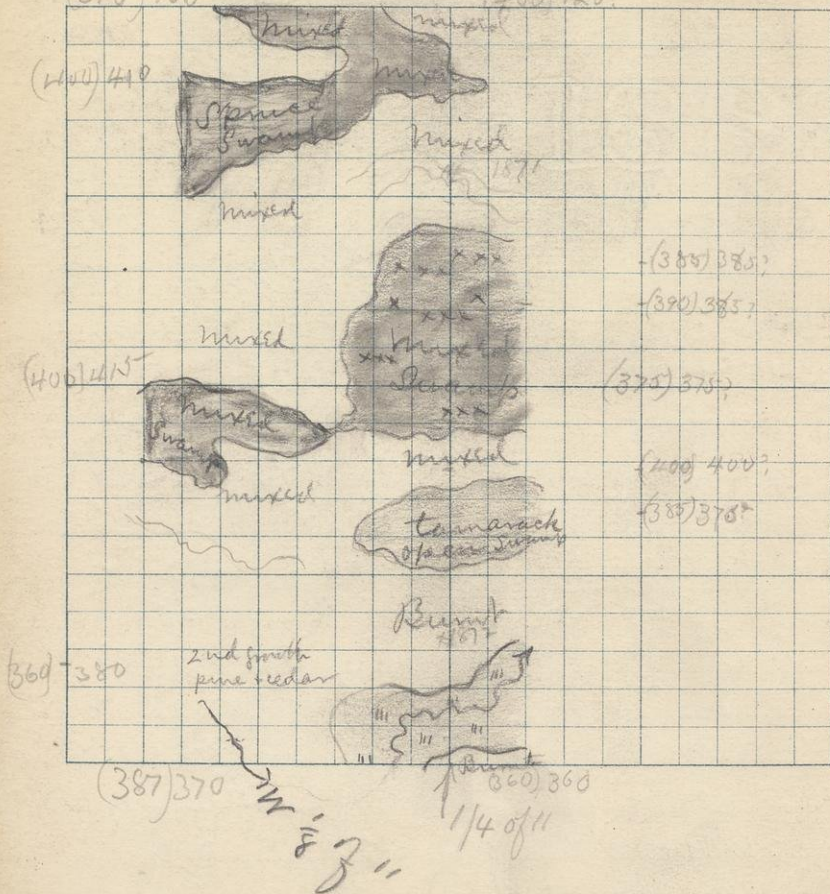
49

B.

32

(390) 400

Fig 50 4207



Going S. on W $\frac{1}{8}$ of 11 T. 48 - 80 cloud 71

Mixed timber 4.50 P.M. (390)

200 Spruce swamp (400)

400 mixed timber

1000 " " Edge of Swamp (450)

1200 " "

1750 2nd Growth White Pine & cedar mixed (360)

2060 Struck Line

4.45 P.M. B.M. 387.28 (370)

$\frac{1}{4}$ of 11 (450) 80 mixed timber W of line

1871 N 1570 W 1000 greenstone, holocystalline, diorite?

575 cedar swamp (385) 785 (390)

1000 wet ground, practically swamp (375)

1225 (400) mixed timber 13

1325 mixed swamp (465) 1275-1485 open tan
arack swamp (350)

1872 1872 N 350 W 1000, greenstone, forms in
very low ridges or knolls.

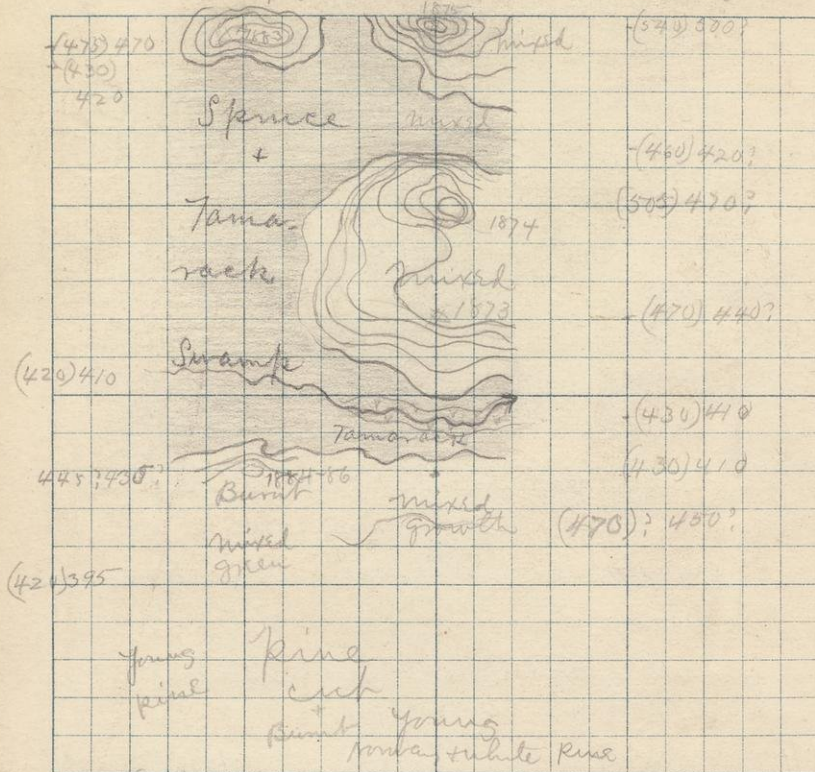
Struck line at 1870
near stake. Think made a mistake
off 100 paces in count.

Run on $2^{\circ}30'E - 4^{\circ}0'E$

S. 10

T. 43

R. 32



396 (410)

E 1/8 of 10

399

E 1/4 of 10

Cloudy

cloudy
Notes on
page 77.

Run on $40^{\circ}0'$ E for 500 - then on $0^{\circ}0'$ for 500 then
8:25 AM $1^{\circ}0'$ for 200. - then $2^{\circ}0'$ E Bench 399.95

Young Iron E line of 10 anemoid 2400-2800
Thick young ^{white snow} pine - cut on SE of 10

675 (470)? my anemoid is practically worthless
for accurate work - Don't think I
have gone up hill 50 ft.

much growth mostly young hemlock (430)

500 Swamp - young tamarack 945 creek 4

fl. made. fl. on E (430) 8:50 AM

now mixed timber. 1200 (470)

1873 N1210 - W0 - outcrop of rather schis-
tose greenstone - schistosity only not
especially apparent except by
ease with which it breaks in an
approximately E-W direction - outcrop
small - though rock probably formed core
of hill - outcrop may be a boulder

1874 N1445 W0 large outcrop of fine
* grained aphanitic greenstone.
Top of outcrop 405 - ledge trends N-W.
1640 (160) mixed growth Swamp

1874, apparently; crops out at 1600.

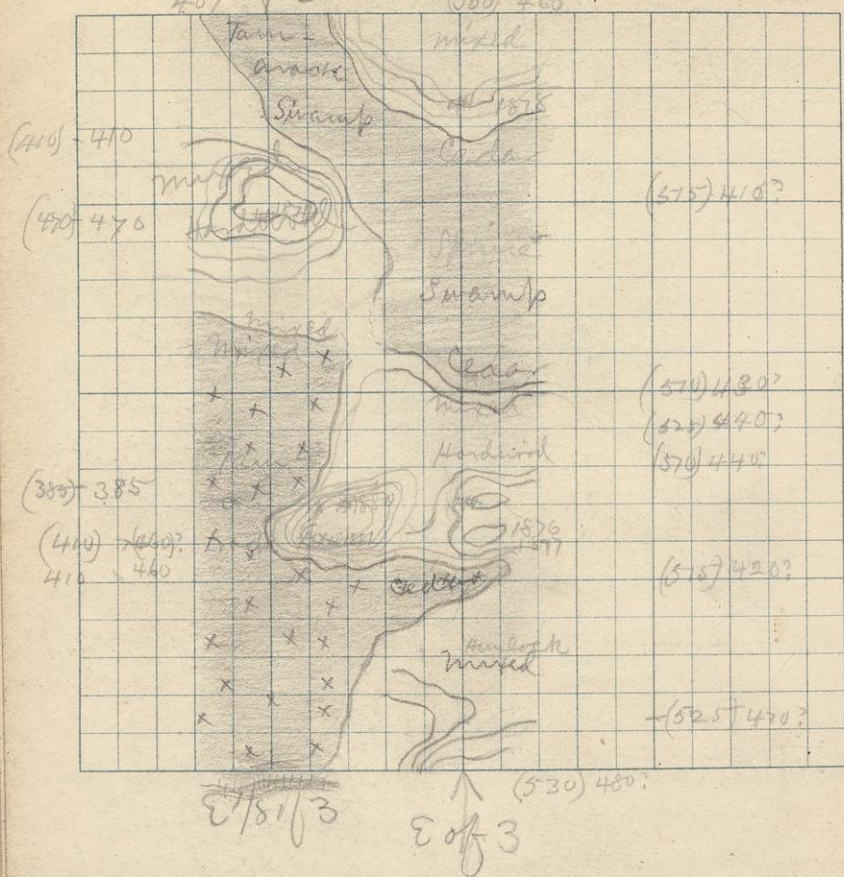
1875 N1970 W0 - the core of this hill is prob-
ably a gabbro? like 1875 - ledge
trends E-W. top of hill (540)

Hot slates

S. 3

T. 13

R. 2



2040 edge of swamp then steep bluff of
greenstone
N. 500 W. 500 Large outcrop of fine
1882 grained aphanitic greenstone.
diabase ash?
Run on $2^{\circ} 36' E$ all the mile.

going N on E of J 3 950m 530
135-525 275 mixed mostly Redwood
300 mixed - some good Hemlock
550 cedar swamp (515)

75

1876 N 700 W 0 outcrop of greenstone - 2 kinds
in contact. 1876 fine grained aphanitic
1877 coarser grained - holocystalline?
a diorite? Strike of contact $N 70^{\circ} E$
800 (570) mixed mostly Redwood

7700 run on $2^{\circ} 30' E$ now, 900 (520) 1000
1100 cedar swamp (510) 1600 other
Side of swamp - center of this swamp is
Sphagnum tamarack - edges are cedar (55)
N 1760 W 0 outcrop of massive greenstone
diorite? top of it 575 ft ~~100m~~

1878

Struck cor. at 1980 11:30 (560)

going S on E 1/8 Bench 407 (305)
1200 Tamarack swamp ~~2215~~ 2100 700
345 edge of swamp - then mixed timber (400)

1879

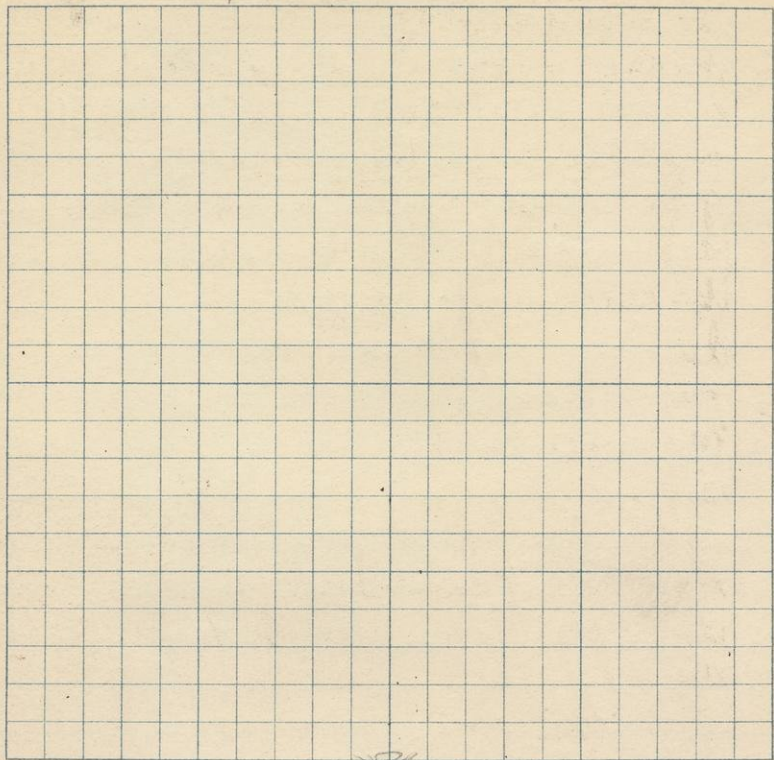
N 1450 W 500 outcrop of massive (470)
greenstone - forming low knoll - good timber
800 mixed timber (410) 850 mixed swamp
mostly tamarack (385)

1880

N 600 W 400 outcrop of greenstone - massive
holocystalline? a gabbro? or diorite? - outcrop
forms a hill 40' fr high

1881

N 500 W 400 another ledge appears,
same as preceding, - 1500 (410)



N B If specimens
are mixed it is not my
fault as there is no
string in camp & but
a few paper bags

Long Sm E 1/8 of 10 Run on ^{2000 ft 500} ^{2000 ft 1000} ^{2000 ft 500} 77
on outcrop of greenstone (111) at outcrop
80 edge of cliff (475)

1883 1920 W 600 on S side of ridge
on which 1/8 slate is located - there is
a good exposure of greenstone. The fine
grained aphanitic bands of the north
face is here seen interstratified with
the agglomerates. Agglomerates are of varying
degrees of coarseness - 1883 is one of finer
ones. Saw none with bombs or frag-
ments over 3 inches long -

135 foot of ridge - Spence stamens (480)

950 creek 400 wide running E

1125 edge of escarp (420)

1884 1200 N 800 W 500 outcrop of greenstone of
varying texture - some fine grained aphan-
itic - some coarse - some amygdaloidal
1885 its appearance or agglomeratic - some
1886 of coarse granular pebbles which have an
incipient schistosity

1200 burnt 1400 green mixed timber

1500 thick young pine belt of line - pine
to E of line cut (420)

Stems line at 2015 - at lake 396.74

240

(419)

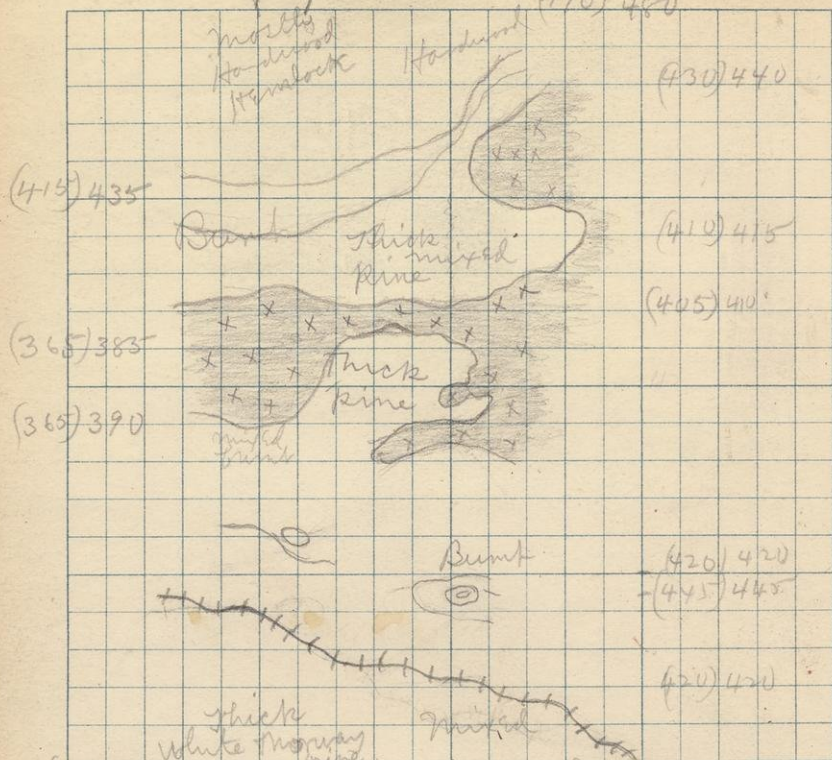
1886 Schistosity

1885 less " coarse semi amygdaloidal
1884 fine aphanitic

S. 9

T. 43

R. 32



(360) 380.75 r. 1/8 09

Cloudy

1/4 09

Snow
cloudy

(399)

Going N on 1/4 of 9 Bench 79
9.00 Am 2110 = 28.5 399.74

215 lot road 420

450 (445) This hill is made up of large angular boulders of crystalline greenstone - a gabbro? Saw nothing that could feel sure was an outcrop

530 (420) 530 hunt timber 650 small narrow strip of tamarack swamp. 1100

tamarack swamp (445) thick pine N of 1/4 line (E+W) + W of N+S 1/4 line

1200 mixed timber 1400 (410)

1800 (430) mixed - mostly hardwood

Ran in 0'' 0' for 1000, then on 30° 30' 30' for 1000. Struck line at 2005 near clat.

9.45 Am (470)

Going S on 1/4 of 9 Run in 100 W 500 paces
0'' 0' 1000
Mixed - mostly hardwood 30'' 0' 500

good hemlock 500 (415) now run on

0'' 0' for 200 paces - run on 100 W to base

500 pine slashing kgins - hunt hardwood

1700 edge of thick tamarack & pine swamp

900 open tamarack (365)

1100 other side of it (365)

1887 N 600 W 450 outcrop? of crystalline greenstone
a diorite? 1900 thick young white Norway

pine Struck line 12.5 Pm

(350)

74

350

Bench 380.75

S. 4

T. 43

R. 32

389

(410) 435?

(410)

425 (425)
470 (465)

x 1839

1888

-(480) 500?

(440)

475
470 (415)
420

mixed

(445)
445?

mixed

Handwood
Pine

(475) 490?

-(485) 500?

(450) 470

Pine

Handwood

Handwood

(430) 465
W 1/8 of 4
CloudyN 1/4 of 4
Snow

Going on 1/4 of 2.0 W for 500 81

Good hardwood Then run on 10.0 E for 1500
775 Fine hard, maple, cherry, basswood,
800 county road 480 1000 (483) mixed
Some good hemlock 1440 (480)
1500 large outcrop of greenstone

1888 1500 1500 massive greenstone - fine
grained aphanitic 1900 Norway pine

hit struck line at 2030. W of stake.

1/4 mile W of line Bench mark hit (40)

large outcrops - apparently of greenstone

200 W of 1/4 stake (37) cedar swamp

Going on 1/8 Bench. 389.61
10.50 Am Anovik 360 2800-27.7

1/8 stake in existing bog 100 edge of
Swamp 200 (410) 200 (410) 11.50 Am

300 100 (425) mixed timber

1889 1700 W 800 outcrop of massive fine
grained aphanitic greenstone, fossiliferous
top of outcrop (465) 625 (440)

7.30 cedar swamp (415) 950 other side,
then mixed timber (445)

Running on about 10.0 E (475) good hard
wood, maple, birch, elm

1600 county road. 1900 good hemlock in

Redd. Struck line at 2030 at stake

12.30 (450)

1000 on 10.0 E

500 " 0.0

500 " 10.0 W

} Run on

Going N. on E Sec. Line of 8. 43-383
mixed burnt timber B. M 382.82 ^{anemid 380}
S. E. M

500 creek flowing E. mixed timber 375

140 old tote road

1890 N 720 W 0 oblique of massive green-
stone - gabbro forms ridge 100 paces long on
E of line - on W of line - across brook, ridge -
runs little N of W for 3/4 miles

ridge top of mound (400) 1700 (440)

9. AM Struck line at ²⁰⁰⁰1900 - near lake? (465)

Run on 3° 0' E for 1000 + 4° 0' E for 1000

Going S on E 1/8

Mixed - mostly hardwood - pine slashing

825 mixed swamp 900 tote road

1891 1000 450 W of line part of dense green
stone - much like 1890

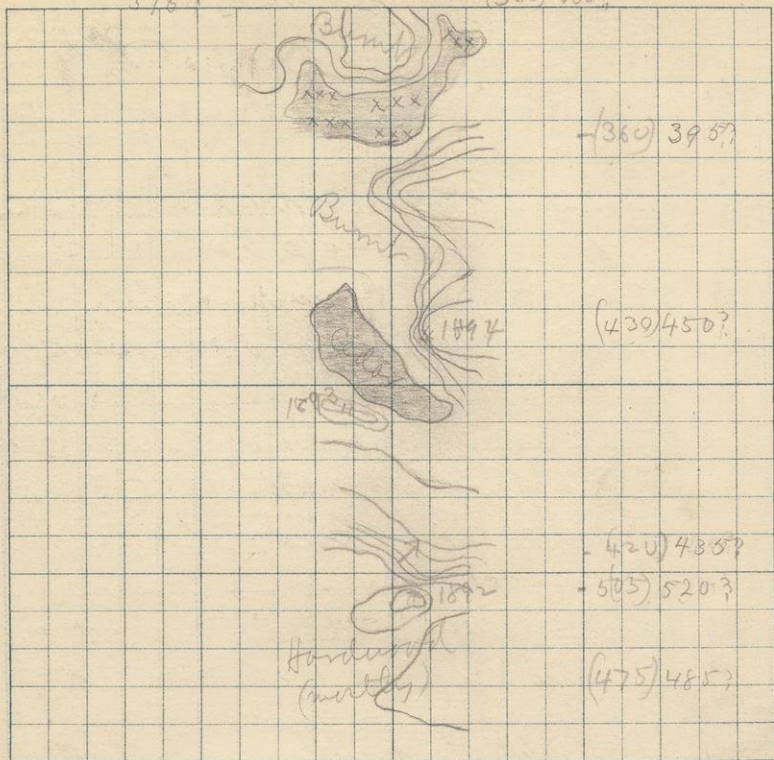
Struck line at 1900 near lake

anemid 370? Berick 375.30

398 S. 3

T. 43

(350) 400232



5/18/55

from N on E of 5
Hardwood - mostly
200-475

370 test pit - sank apparently about
30 ft - did not reach rock - nothing on
dump but sand & gravel

1892 N 450 W 0. outcrop of greenstone - massive
fine grained - forming a low knoll (505)
640 (420) 950 Swamp - mixed

1893 N 980 W 80 outcrop of greenstone -
agglomerate - contains fragments as
large as 6 in in diameter - there is finer
grained cementing material. outcrop
forms a low ridge trending E + W
N 1000 in cedar swamp

1894 N 1100, W 1850, sec. 4 T 43, R 32 knob of green
stone. Like 1893 rock fragments seem to
have a decidedly rounded appearance -
but I doubt if they are much water worn
fragments, some of them, 2 ft in diam.
top of outcrop (430)

N 540. W 0 outcrop of agglomerate like
preceding

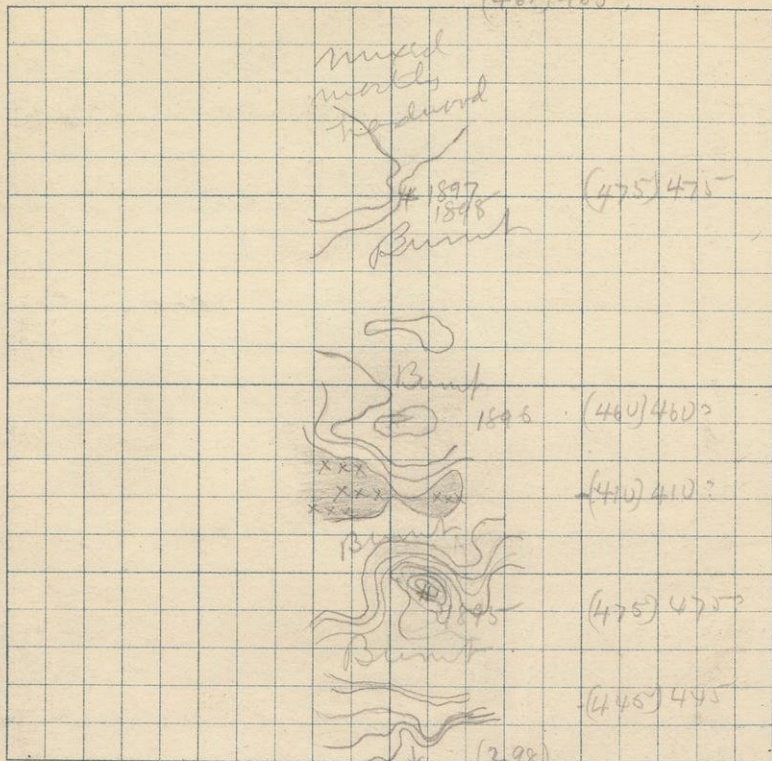
1650 cedar swamp (360) 1800 other side
(350) Shumak Shumak line at about 2000 W of cor
(350) Ran 10.0' W for 1000
" 20.0' " 1000
Bevel mark?

S. 5

T. 43

R. 32

(465) 465



Spring
 2/8/85
 Cloudy
 Top is S

Bench 398.09 Aneroid 1600, 284 ⁸⁷

150 (445) greenstone

400 (475) ridge of greenstone

1895 N 1600 W 500. This specimen shows banding. greenstone of this ridge is some of it fine grained, Rhyolite, some agglomerate - some banded.

N 1500 W 500 more greenstone mostly agglomerate. country is steep (480)

700 cedar swamp. (410)

900 ridge of greenstone agglomerate - like those seen before.

1896 ~~1440~~ 1780 W 500 low outcrop of green stone - amygdaloid? (460)

Clearing - or just places - strike about N 50 W

1500 greenstone - some

1500 ^{N 500} greenstone. some amygdaloid some agglomerate.

1897 Arate. B

Burnt timber - mixed (475)

1530 amygdaloid greenstone - rock is

1898 also agglomerate - contains bombs of amygdaloid - no very large bombs - none I think over 6 in diameter.

1600 mixed timber mostly hardwood

Strike line about 2000 about at 1/2 mile

Ran on 2000 3 1/2 1000 12 M

485

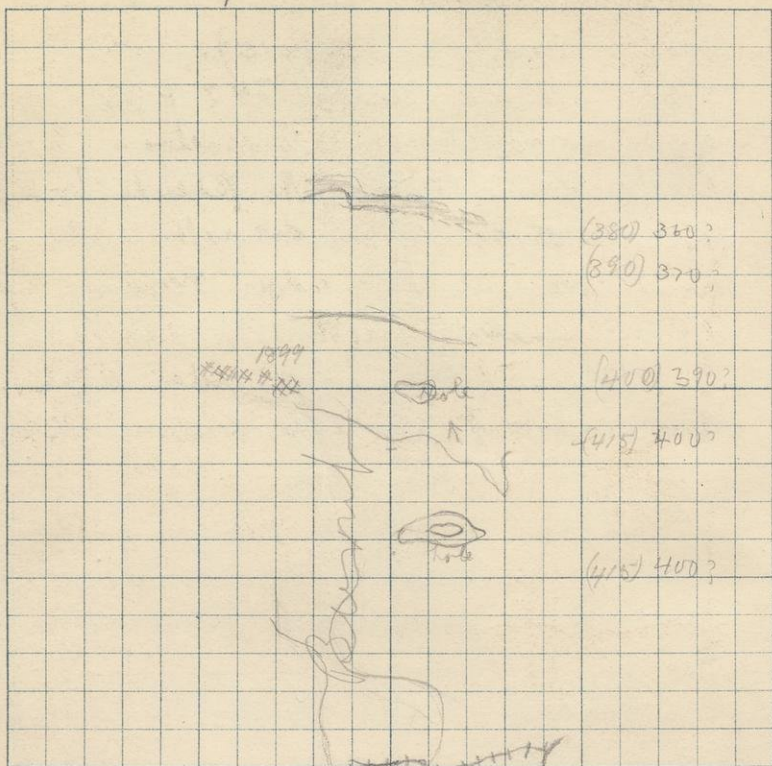
" " 500 0 0.0

500 1 0.0 W

S. 7

T. 43

R. 32



390
Range line
W of 7

Findings on Range line - W line of 89

Burnt timber

Bench 39216

to tote road 500 (415): 860 (411):

N 1000 W 250 sec 12 T 43 R 33 outcrop

1899 of fine grained aphanitic greenstone - a pseudo
conglomerate. many of the pseudo boulders
are several ft in diameter - the outcrop
forms brow of a low ridge running E & W
or a few degrees N of W

1300 (380)

1470

1000 (400)
edge of Paint

River - about 35 paces wide - flows E.

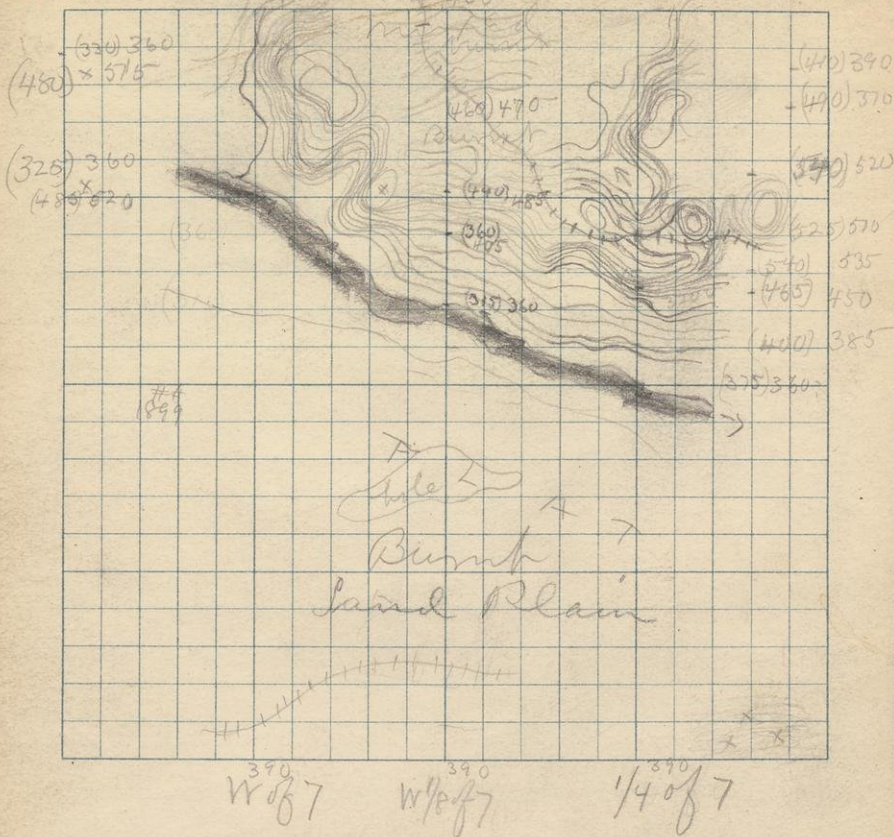
360
315
325

90

S. 7

T. 43

R. 32



Sang on 1/4 of 7

B75

Burnt timber, except close to water

1240 (415) 1100 (400) 1300 (540)

This bluff has for its core an massive
greenstone, seems to be same as 1890.

N 1300 W 1100

3200

1400 (525) 1740 (490) 1840 (410)

Strike line at 1960. 30' of slate
Bench mark?

Spring on W 1/4 of 7

Timber mostly burnt

395

275 maple & hemlock

460

3203

375 Burnt. Greenstone ledge

N 1625 W 1500 - gabbro?

490 (440) burnt timber

Brook

N 1475 W 1500 large outcrop of

greenstone - forms ridge along W
bank of river - probably same as
1890. - That is it is part of same
ridge600 Burnt (360) 800 Timber
cut Paint River (315)

Spring on W 1/4 of 7. Range line.

115 (330) 360? Bank of Paint
River flows E. 10m (325)

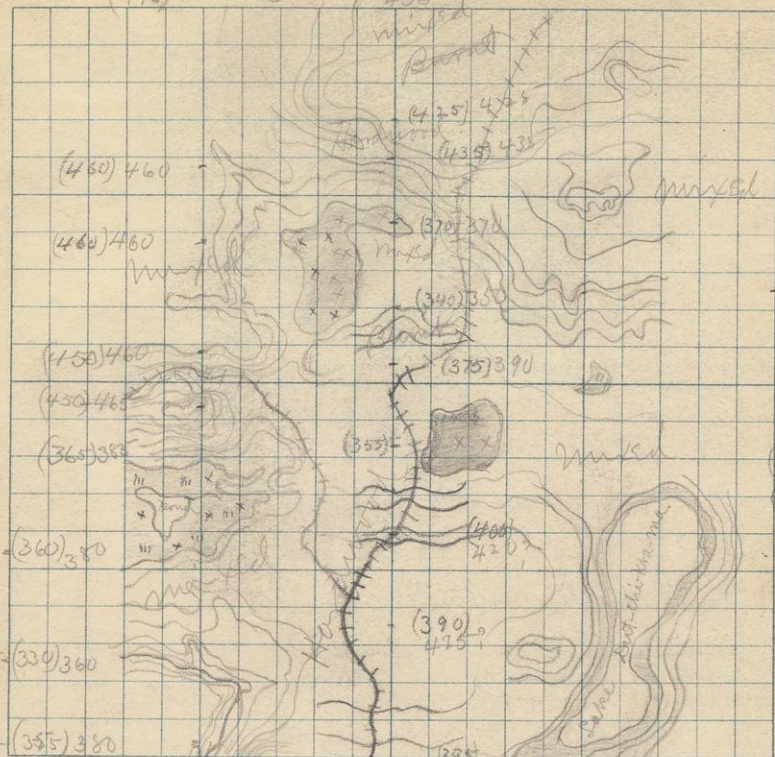
(475)

S.

6

T. 43

R. 32

436
435

going N on 1/4 of 6 9.15 Am

93

Lamarack Swamp (H10)

So. edge of lake (H10) Lake But-dhi-ka-ma.

500 (H10) 700 (H20) partly burnt mixed

700 (355)

1265 (H65)

1570 (570)

3201 N 1500 N 1000 outcrop of fine grained -

3101 aphanitic greenstone, an amygdaloid?

3202 N 1500 N 975 outcrop of greenstone -

3102 more of an amygdaloid than preceding.

(H5-5)

436.71

(455) 9.40 AM

Struck old original at 1995 - found no
bench line - no 1/4 lake, no bench line near - they
were probably burnt during the summer going

N & W found bench line. it is N of old original

Going South on 1/8 of S. B. M. 436.71 a (436)

Mixed timber

10.20. AM

300 Maple & Birch

(455)

400

(435)

575 Mixed timber

(370)

800 Burnt Maple

(340)

950

(325)

1025 Old tote Road Burnt.

(3)

1175 maple & Hemlock

(355)

1400 "

(405)

1640 Good Maple

(390)

1990 Struck line Burnt mixed timber

1990 at Lake Amygdaloid

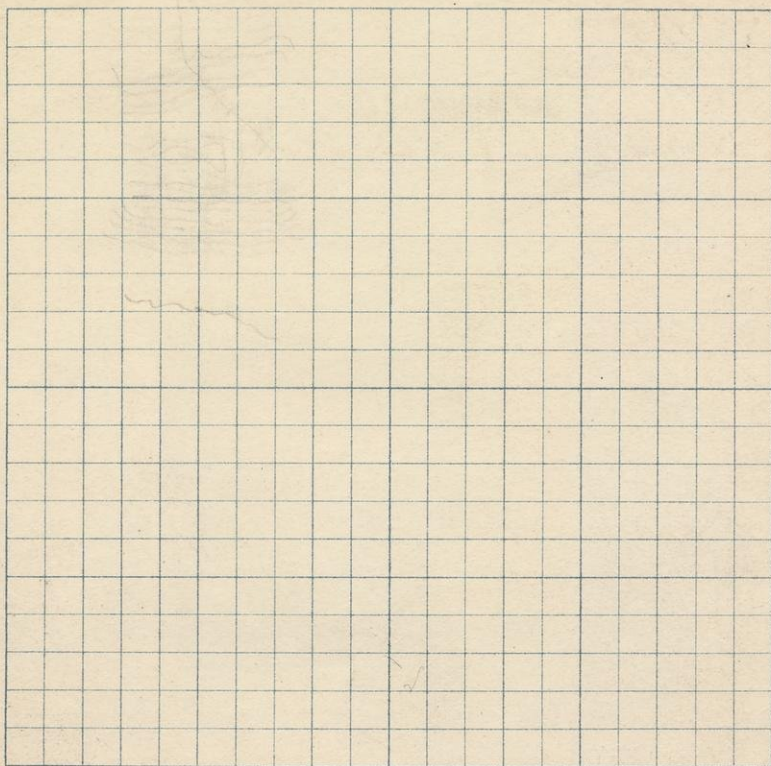
(595)

Good tote Road

S.

T.

R.



30

Map on page 92
 11 AM
 Long San W of 6 - Range line
 Good Hardwood Bench 475, 835
 Ground flat, apparently, to 425
 425 same timber (460) 625 (460)
 930 (450) 975 county road 1060 (450)
 1200 (365) Swamp - open Everything
 burnt from 900. 1450 other side (360)
 1570 (390) 1750 creek spruce fens
 & (330) 1975 (375) burnt mixed.
 N 10 W 1950 fine grained green
 stone. The bluff is formed of
 it.

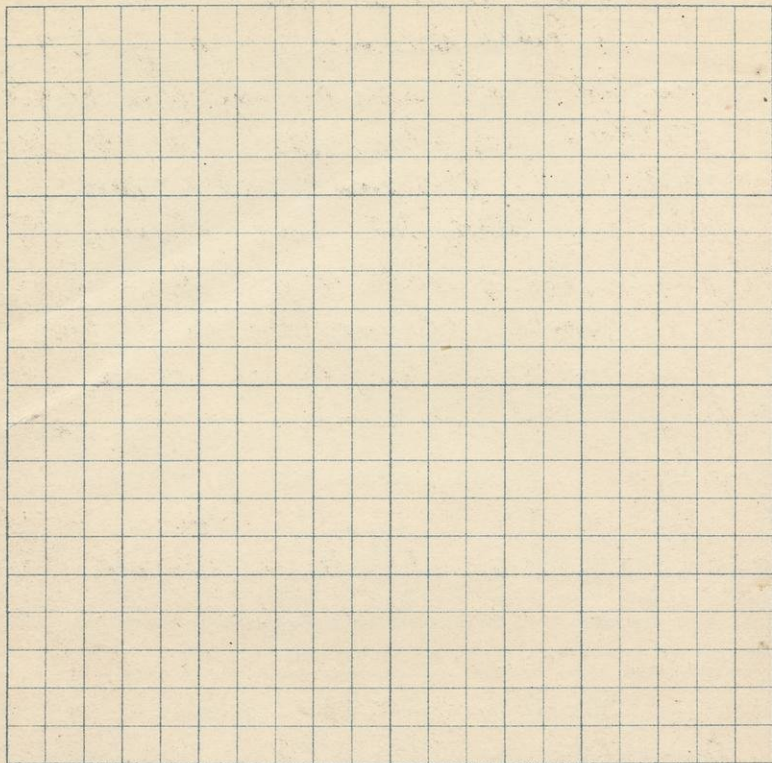
Found no slate near line -
 timber burnt since spring prob-
 ably

The manner in which this ridge
 of rock ends abruptly is very peculiar.
 No high outcrop within at least
 3/4 mile to W.

S. 10

T. 4

R. 1



Nuchigamme Mt.

Nuchigamme Mt is unlike anything we saw during the whole season. No where else did we find outcrops of limestone & "compared stuff" - with test beds showing soft hematite & "soap rock" & greenstone?

Since seeing the Mt. I have seen the country about Iron Mt. Nuchigamme Mt resembles it.

There is little in common, in fact nothing between Nuchigamme Mt & the Crystal Falls folds, or the folds at Mansfield & Hurlock.

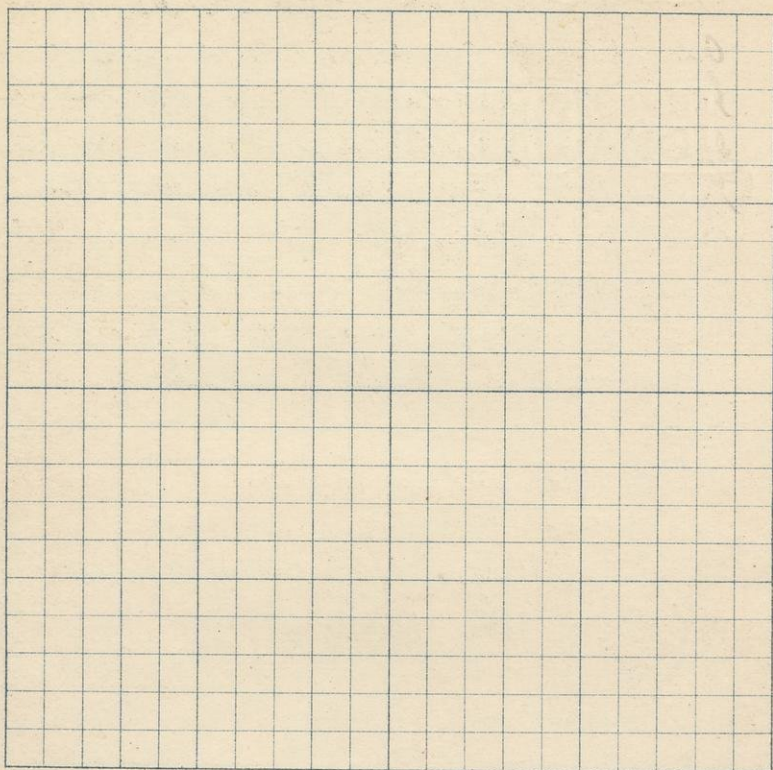
But at Iron Mt, there is limestone, "soap rock" greenstone, soft hematite, slates, & an immense thickness of ocean posed stuff.

I correlate the ^{soft} red hematite, no. (P46) with the Chapin, Miller & ore formation. Hence, in prospecting at Nuchigamme, it seems to me it would pay best for the soft hematite, rather

S. 3

T.

R.

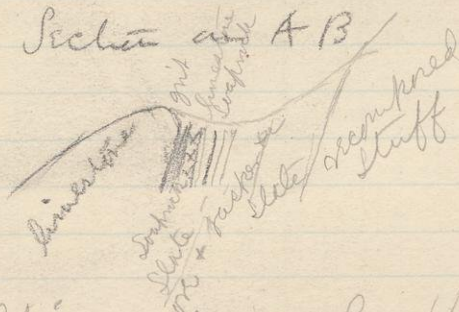


4/53

03

than mine the recomposed stuff
as they are doing at the in-
terrange mine. The recomposed
stuff is I suppose fairly certain
to need ~~cost~~ careful sorting to
make it pay. ~~for~~ A good ore
body of Berremer soft hematite
of ~~it~~ ^{the} ~~exits~~ ^{exits}, would be another
kind of a bird altogether.

Section ~~and~~ A B



This section only $1\frac{1}{2}$ across
mt.

Blank Pages

100-113

Skipped

Michiganensis M



A mass of lean
moss or
or end (575)

32.38
750

32.38
7.50
25
05
65.00
1.40
25
846.83

