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Township 44 north, ranges 32 and 33 west, specimens 31273-31298. No. 235 1891

Sanford, Samuel, 1865-1927

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

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LAKE SUPERIOR SURVEY

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.





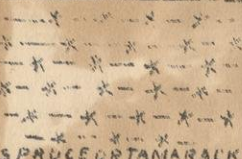
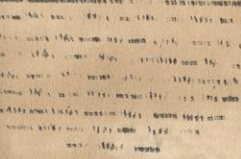





It will be the constant business of the geologist to search for outcrops. All hills within a reasonable distance of the course of travel will be examined. Oftentimes upon the steeper slopes of a hill a rock surface is covered with a coating a few inches thick of moss, leaves or vegetable mold and can be stripped with the pick. Where the exposure is small and there is the least possibility that it may be a large boulder, 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 $2x2\frac{1}{2}x\frac{3}{4}$ 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 OR SPRUCE</p>
 <p>SPRUCE OR TAMARACK SWAMP</p>	 <p>MARSH</p>	 <p>RAILROAD ROAD CREEK RIVER</p>	 <p>NO STRUCTURE</p>
 <p>NEARLY MASSIVE</p>	 <p>SHALY OR BEDDED</p>	 <p>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				

235

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

336.65 - car } 6.
448.57 E 1/8 }

1

Note Book 3

S. Sanford
"Geologist"

L. Lowrey

Compendium

81 286-90 not located or
noted

SPECIMENS: 1273-1298

TOWNS: 44-32
44-33

June 25 1891

3

Plating S. 7.38 AM, Birch mark 501.24

Avoid 1 28.66

2000 - 28.11 15 paces W

4 inch mark - Deer River, 20
paces wide.

200 low ground, cedar, spruce &
little fairly good hemlock

500 " " 486 (490)

600 " " Some good cedar 491 (495)

700 " " 506 (510)

800 " " 501 (505)

875 " " ground begins to rise

980 " " ground falls away 524 (530)

1100 501 (505)

1200 mixed timber, some good
pine, but very scattering

1300 496 (500)

1400 501 (505)

1600 fine thick maple (505)

1700 " " " ground falls away (530)

1750 " " " rises (495)

1900 " " " "

1900 (520)

Struck line at 2004 paces; 13 paces
W of line

4

S.

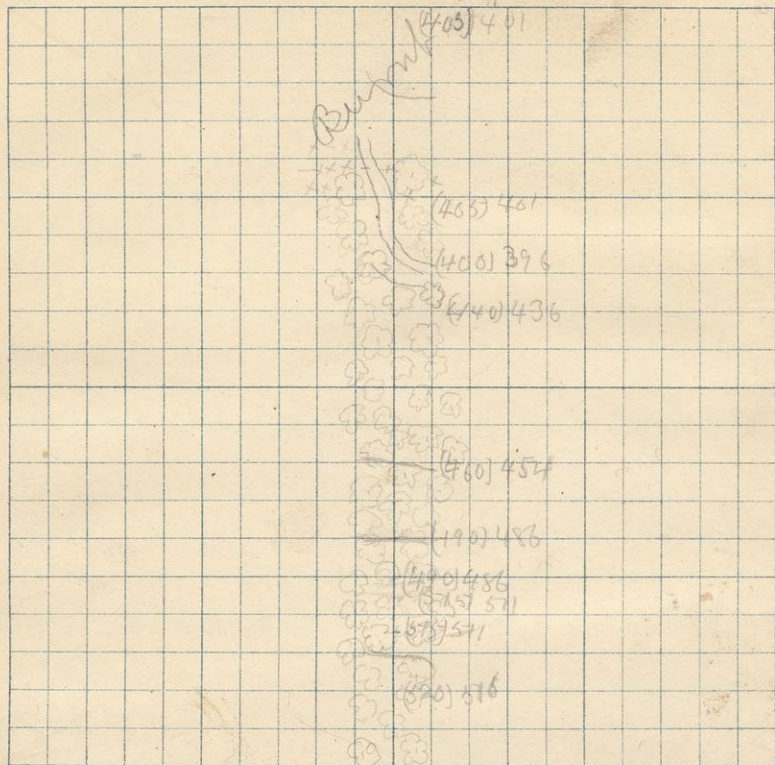
8

T.

44 N

R.

32 1/4



Joining S on 1/4 line of 8
Tap is South

June 25 1891

5065

114 Blake, fine thick maple (570)

200

516 (320)

460

511 (515)

600

482 (490)

800

454 (460)

1000 partly burnt mixed timber, spruce
hemlock & little pine, most is hardwood

1200

(440)

1280 river bank falls away

1344 edge of Deer River

(400)

1400

10.10 AM

1.15 E

1500 partly burnt spruce, balsam
hardwood (405)

1600 same swamp - more cedar
swamp

1700 Burnt swamp

Atmos. Gauge at 1995 feet
33.3 miles N. of 114 stake,
Bench mark (burnt)
Anemoid 7

407.77

4057

324

11

Going N from N¹/₈ stake

11.42 am

Bench mark

440.96

1700 = 28.75

Balsam, cedar & pine maple
maple heavy, others light, 2⁰

200 good thick maple 435 (440)

400 " " " 444 (450)

400 " " " 1.30⁰ 2

600 452 (460)

745 tote road, good

7.45 12.45 PM

1.11⁰ 58

800 430 (440)

815 Edge of deer river bank ⁷³⁰ (440)

820 edge of river 425 (435)

840 other bank 460 (440)

900 mixed, a very little hemlock

oak mostly maple

1100 fine thick maple 460 (470)

1200 " " 490 (500)

1200 2.30⁰ 202

1300 " " 578 (530)

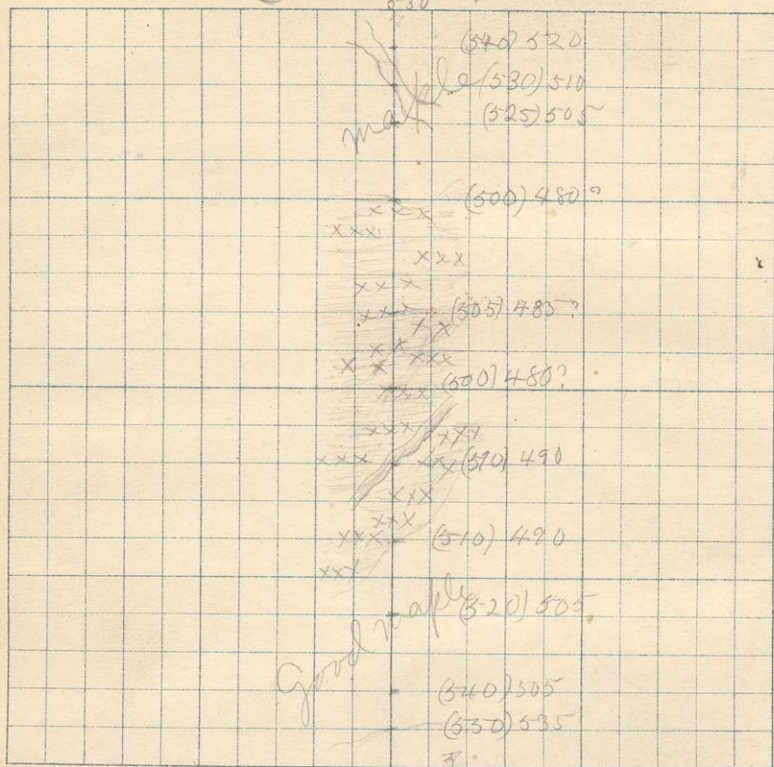
1500 " " 548 (560)

1500 1 PM 202

1700 546 (580)

1900 545 (560)

struck line at 2058 corner; 19 rods



Met 1/8 line of Section 5, going
 N. 744 N. R 32 W
 Sky clear

June 25 1891.

9

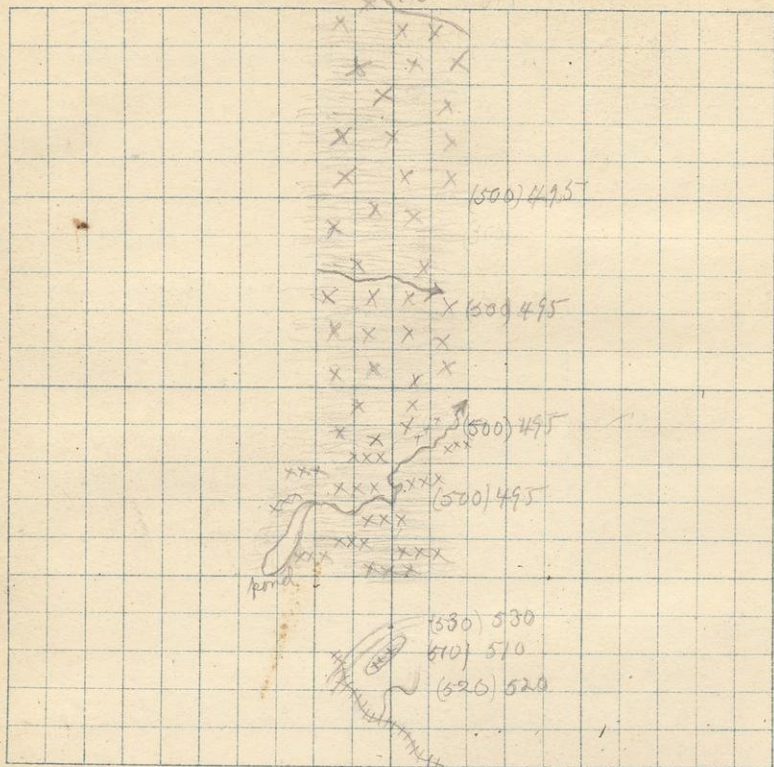
1/8 stake	2 PM	2.45
1/8 stake	good thick maple	(260)
100	"	(330)
200	"	(340)
400	"	(320)
600	edge of cedar swamp	(310)
800	edge of Deer River	(340)
	River 10 paces wide	375
	then cedar swamp	
1000	in swamp	500
1100	hemlock + spruce swamp	
1200	burnt cedar swamp	(303)
1300	grass	
1345	2.50 PM	200
1500	edge of hardwood	(300)
1600	mixed timber, chiefly maple	
1700	maple chiefly 3:10 PM	1.30
1760		(5.25)
1800	" ground takes a rise to	(530)
	right of line	
1900	timber chiefly maple	(540)
1910	3.20 PM	1.45

Struck line at 1992 paces

H2 paces N. of corner

Bench mark X 530
Corner 7 528

6 44 32
S. E line of T. 36 30 49 0 R.

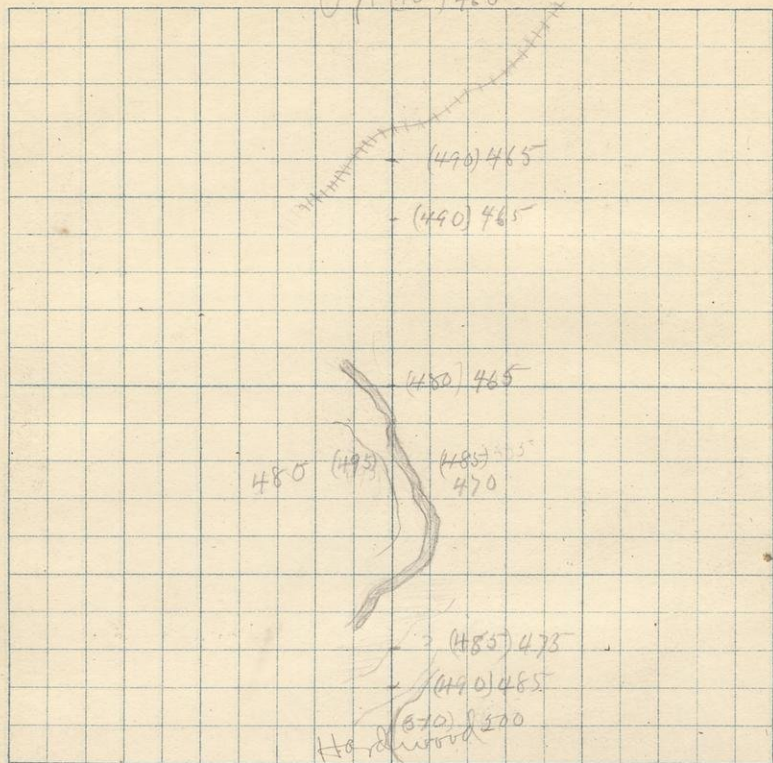


Young Son & line of
Sky Clear
Top is 3

Going June 26 1891
 Bench mark on E line of 6 503.11
 Anemid 7 11700 ft = 28.6 in
 105

110 paces - to road, - old one
 200 mixed timber, partly burnt 520
 300 edges of cedar swamp 510
 350 bottom of narrow ridge
 370 tops of cedar " 530
 500 mostly spruce, partly burnt
 600 " " 500 30'E
 700 creek 8 ft wide, flows SW 500
 710 same creek
 800 spruce & tamarack swamp
 900 same 500
 1000 same 8.22 ft 0° 15' E
 1200 mostly spruces 0° 45' E
 1280 creek 8 ft wide flows W
 1400 swamp, same 1° 30' E
 1500 same swamp 500
 1600 " "
 1700 " "
 1800 " "
 2000 " "
 2080 9.20 1° 15' E
 2150 grand river
 L track line at 2110
 came down on line (800)

S. E. line of 7 T. 44 N. R. 32 W.



Top is
2 line of 7

June 27
Jung's section corner
on E line of 7.

13

100 mixed timber, pretty hardwood (370)
150 10.38 E
200 (490)

430 low ground, cedar & softwood (383)
447 edge of Deer River here as
at yesterday, river is swift
flowing over a bed of boulders - no
outcrop seen.

495 other side of river
700 mixed timber, mostly (495)
softwood, some good pine, but thin

800 15 paces S of here 495

805 edge of Deer River 483

900 other side of river 480

1000 Birch timber with 480

scattering good pine

1400 10.48 10.45 E

1450 Slim, birch, cedar & scattering pine (490)

1500

1600 same but more hardwood (490)

1680 tote road, good one

1700 11.04 AM 10.10 E

Struck line at 1810

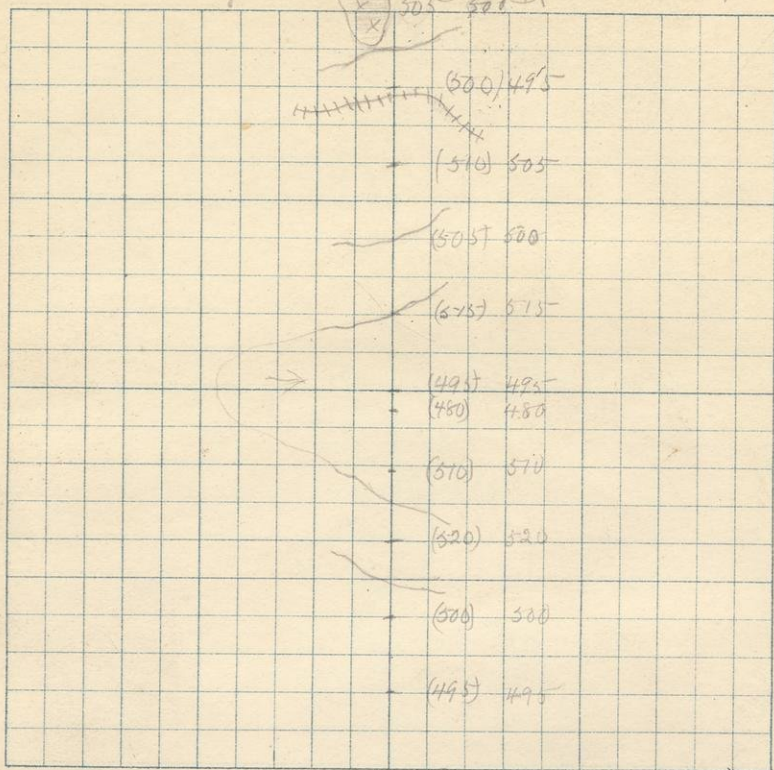
Came down on line

Bench mark

one rod 7

458.77

485



Going N on E $\frac{1}{8}$ line of Rec 7.

Lky Clear

going N from $\frac{1}{8}$ stake

Bench mark 493.86

Aneroid no 7, 1200 = 29.1

$\frac{1}{8}$ stake in good heavy maple 2⁴⁵E

200

(495)

200

12.35 PM

3⁰E

400

" "

(500)

600

(520)

760

12.53 PM

0°

790

Ground falls away

(510)

950

(450)

1000

12.57

0.30E

1000

Good maple with some to third

(495)

1200

1.05 PM

1⁰E

1200

heavy maple

(375)

1400

" " + scattering pine

1⁰E

1400

(505)

1600

good ^{very} light pine

(510)

1700

12.0 PM

1⁰15E

1790

to road good oak

(500)

1800

190

(500)

1900

good scattering pine

1950

1.35 PM

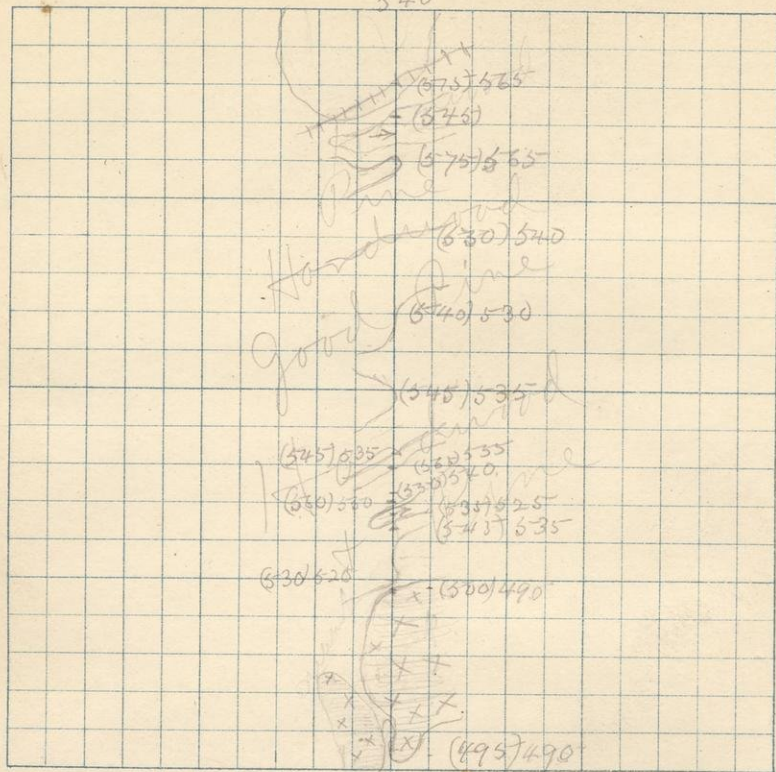
1⁰15E

Struck pine at 2004 paces

11 paces N of line

S. 6

T. 44 N R. 32
540

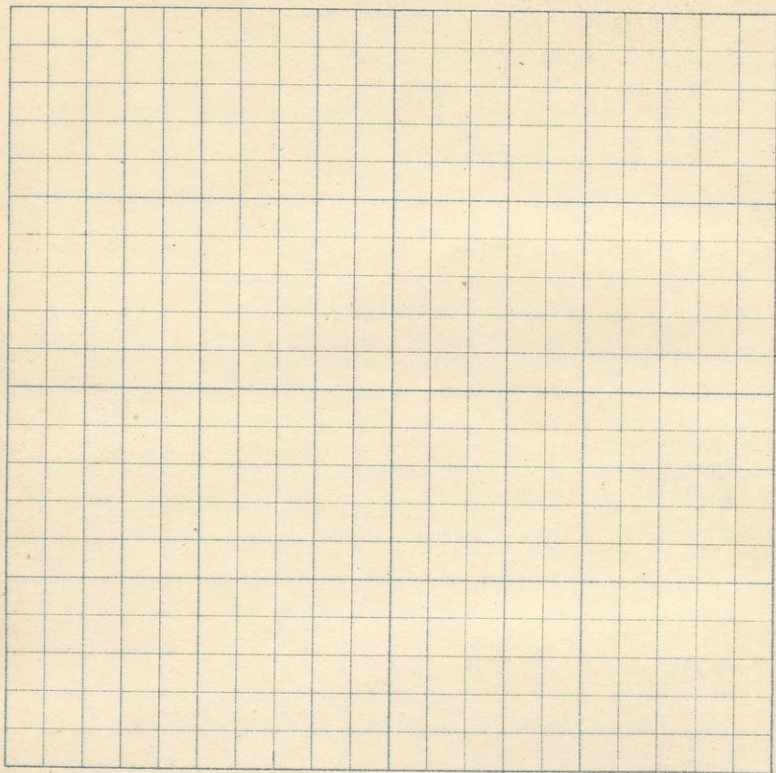


Long Run E 1/8 of 6

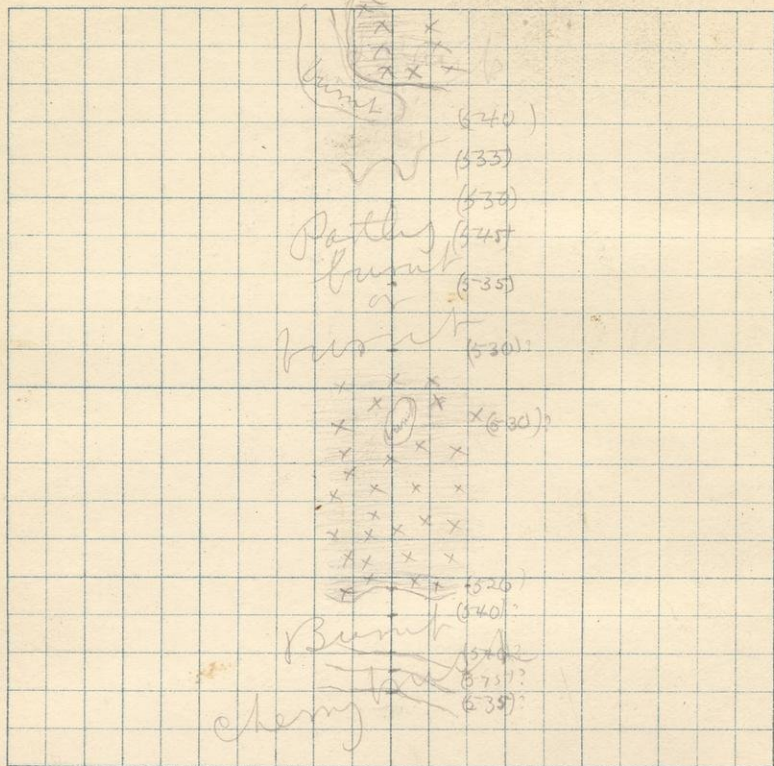
at slate

17

40	2.20 Pm	0.30 S
40	open spruce tamarack marsh	495
200	muskeg - tamarack	
480	edges of muskeg	(500)
500	top of hill	830
	Some good pine, scattering	
650	2.40	1.0 S
650	Some good pine, but scattered	(545)
675	Hardwood, fine maple	(535)
700		560
720		(530)
700		565
840		675
900		
1000		(545)
1112	Good heavy maple	
1200	Some fine pine	(545)
1200	3 Pm	1.0 S
1700	fine, thick pine	
1365		1.36
1400	splendid pine	(530)
1600	fatty burnt hardwood & pine	(575)
1600	3.15	1.0 S
1725		(545)
1800		(575)
1815	to road - good pine	



1943 Struck line at 1993 ¹⁹ feet
at Stake 3.30 PM
Bench mark 539.42
Anemoid no 7 530



Going on $\frac{1}{2}$ line of sec 1.

Sky Cloudy

Running on from $\frac{1}{2}$ to 0° E.

Did not interpolate on
acct of peculiar readings of
anemoid

June 27

21

Bench mark 571.34

Aneroid \nearrow 28.61 : 1400 = 28.8

Burnt timber, with thick ~~and~~
new growth of cherry poplar birch

200

(536)

260

(575)

300

(340)

400

(410)

475

Edge of tamarack swamp

(520)

500

in swamp ^{marsh}

800

Creek 4 ft wide \nearrow 45 Am

(330)

860

burnt island

900

(530)

1100

burnt spruce + pine

(530)

1380

edge of burnt spruce +

(535)

1400

thick coniferous pine

(545)

1500

" " "

(550)

1600

burnt ground falls away

(535)

1700

(520)

1800

1900

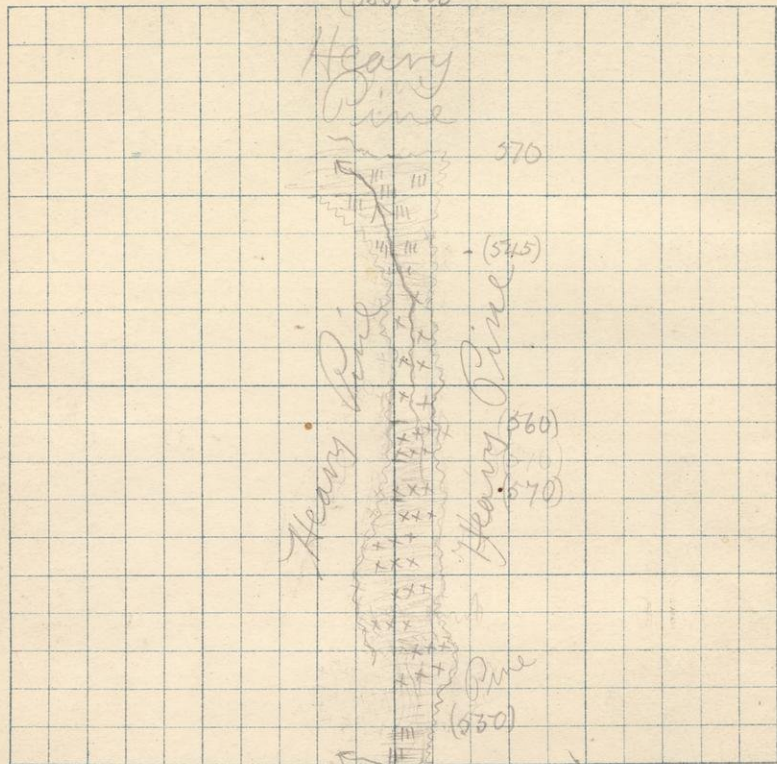
Struck line at 2015 - right at stake

S. 12

T. 44 N

R. 33 W

(565) 503



Young San 1/4

line of section 12
1/4

Did not interpolate - readings wrong?

12 paces W of section line, creek
 125 paces 5 ft wide place, W F (535)
 1/4 plate in meadow swamp

100 + 118 paces W of line, fine
 thick pine (530)

300 cedar swamp

375 " 927 AM

1° 0' N

500 in swamp

625 10:40 AM

0° 0'

700 20 paces of line, splendid
 thick pine

(570)

900 same cedar swamp

560

1000 "

1100 same

1200 spruce stone rock swamp

1300

meadow swamp

1357 creek 10 ft wide flows S. (545)

1500 ridge of meadow swamp

1600 very thick fine pine (570)

1700 " " "

1800 finest fine I ever saw

struck line at 2030 exactly at
 post 11 AM

Barck Mark

marked no 7

50663

565

24

S. 12

T. 44 N R. 33 W

30

Bunk
Pine

(530) 500

(530) 520

(525) 520

The
Pine

(510) 490?

(525) 505

(520) 505

(510) 500

(506) 500

1273

20

15

going N on N $\frac{1}{8}$ ⁵⁷⁰ of 12

Sky cloudy

Gang X on N $\frac{1}{8}$ line
Bench Mark

25

Ameroid 7 28.565 1200 = 28.9

200 splendid "thick pine 500

265 paces 20 paces N of line. outcrop

of ⁵⁰albite 75 ft long at least 30

1273 broad. Outcrop from a low knoll

10 ft in the level woods. Rock

is a dark greenish gray quartzite

300 very compact, massive in fact

Did not determine strike + dip

~~the~~ rock ^{very} massive. Dip may be vertical.

N 1273, N 265, W 1520

400 fine heavy pine (570)

600 (520)

765 ground falls away (525)

800 tamarack meadow swamp

900 alder swamp + tamarack

1000 spruce + cedar swamp

1100 edge of swamp (510)

1150 fine thick pine 520

1300 " 2. Rm 520

1410 edge of spruce tamarack swamp 520

1428 creek 6 ft wide flows SE (525)

1500 - 1430 open swamp - brush

1600 burnt cedar swamp (530)

1700 burnt pine 530

1800

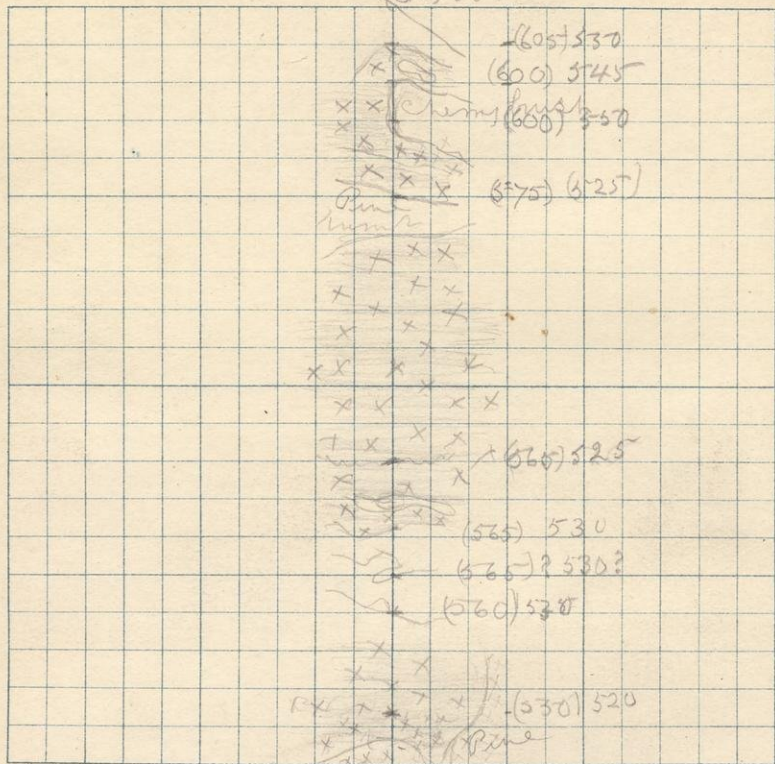
26

S. 1

T. 44

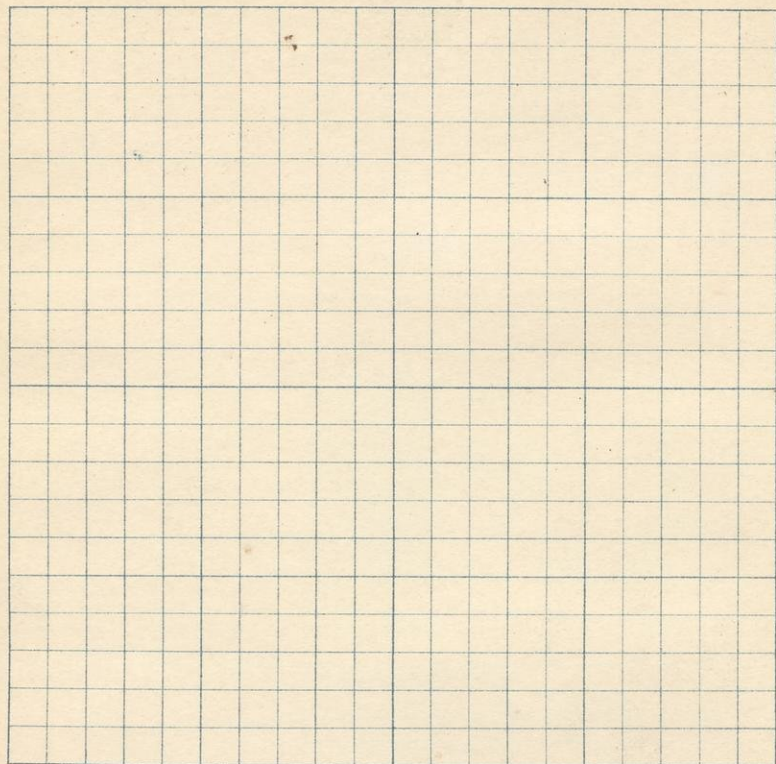
R. 33W

(600) 535



W 1/8 of 35

Struck line at ? ? pace **27**
 174 slake. This slake
 not yet located by our
 party. ? (530)
 100
 140 (530)
 145 hunt spruce (540)
 200
 300 " "
 400 hunt pine, cherry bush (530)
 500 ground firs (535)
 610 dead tamarack marsh (535)
 660 other side
 660-700 low island
 700-800 dead tamarack
 800 green tamarack 3:10 Pm (565)
 900 " "
 1000 " 3:25
 1100 3:30
 1200
 1300 Dead "
 1400 edge of swamp
 1500 partly hunt pine 575
 1510 tamarack marsh 575
 1540 3:58 Pm 0'00
 1600 edge of marsh
 1660 ground firs
 1700 hunt pine; cherry bush 400



Started & from a $\frac{1}{4}$ stake ²⁹
set by same gunmen

1800

600

1900

605

Struck line at 2020, 23
paces S. of $\frac{1}{4}$ stake

Benchmark

533.

Aneroid 7

690

610

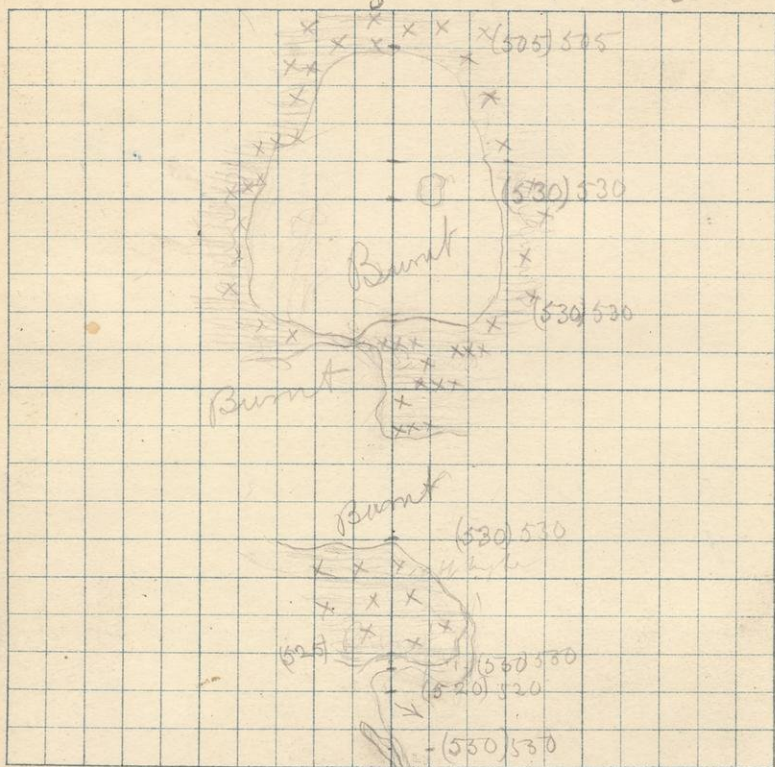
535

55

14112

1-12

4.30

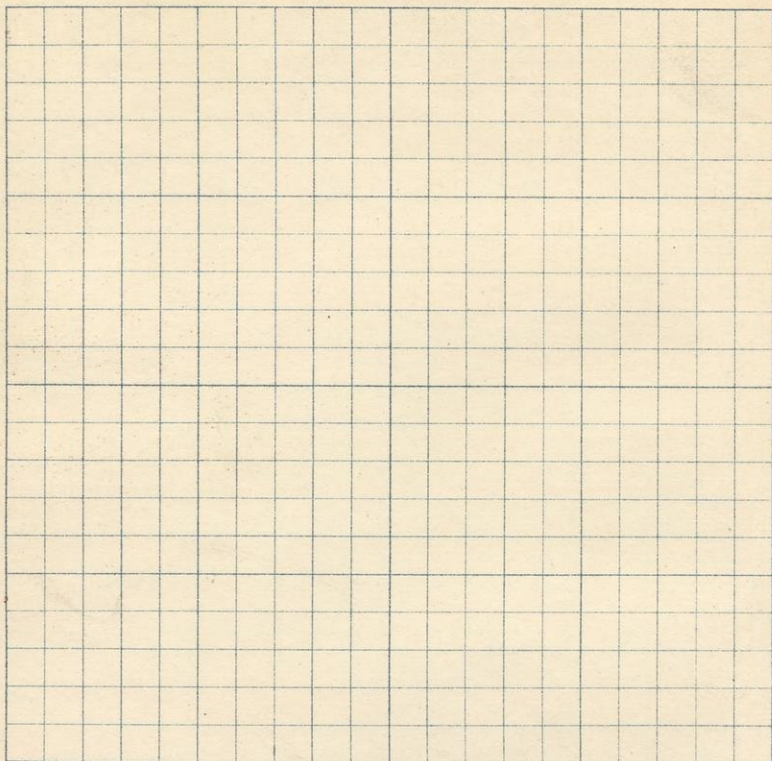


Going on E line of 2.
 Sky clear & cloudy by
 turns. Top is South

June 29
Running ~~from~~ section line
2 line of 2

31

Bench mark 525.3
Anemoid 7 28.255, 1400 = 25.4
Bench mark on E side of "hog
back", ^{which} 40 ft above surrounding ^{swamp} marsh.
Hog back runs N. - a little E.
Bench mark 10 ft above swamp
50 top of ridge 530.
200 valley about 520
245 9.10 am 1.30
265 top of ridge (5.33)
308 open tamarack swamp (5.25)
500 in swamp
590 other edge of swamp
600 9.15 7.58
600 burnt timber (5.30)
875 edge of partly dead cedar
spruce swamp.
900 in swamp 9.35 6.30
1000 in swamp
at 1000 - 4 paces N of, + 85 ft of 1/4 stake
1800 edge of 1/4 swamp (5.13)
1375 10.02 AM 1.00
1375
1375 burnt (5.30)
1500 " (5.30)
1600 burnt 525



1100

~~10:05~~ 10:05 am

1700

1800

1900

dead cedar 12 p.m. (1905)

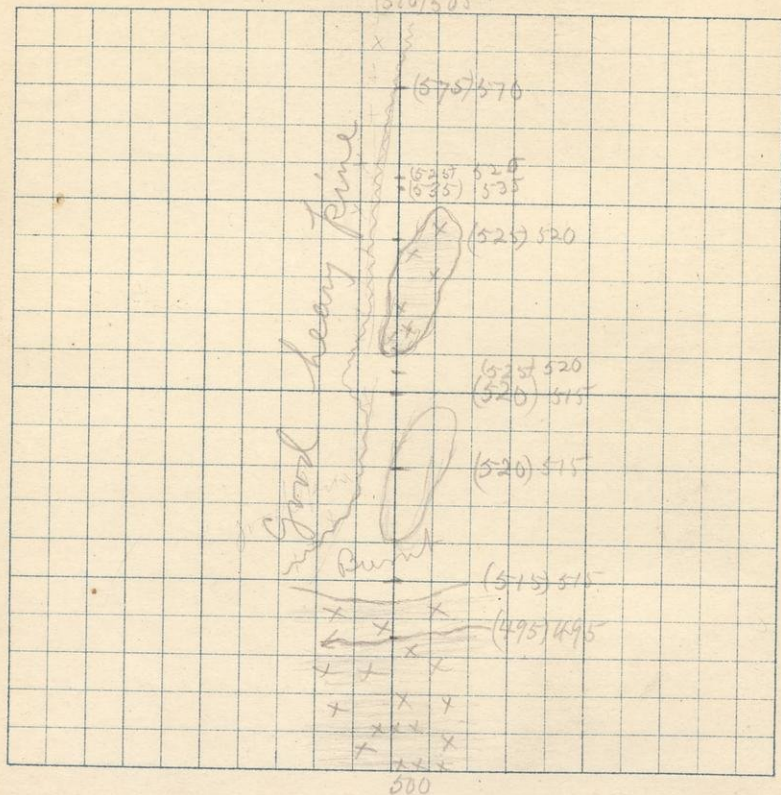
Stump line at 2000 paces about
40 paces W of corner

2

S. 11

T. 44

R. 33



E line of 11

Corner in dead spruce & tamarack
swamp (500)

10.35 Am 11.15 W

100 green tamarack

200 dead "

300 330 creek 5 ft wide flows E (495)

500 450 edge of swamp

500 burnt spruce & pine (515)

800 (520)

900 (520)

1100 (525)

1100 edge of open tamarack swamp (510)

1100 11.35 Am 0.35 W

1200

1300 edge of swamp

1400 burnt pine (525)

1540 535

1560 525

1600 1600 " " 510 W

1700 1700

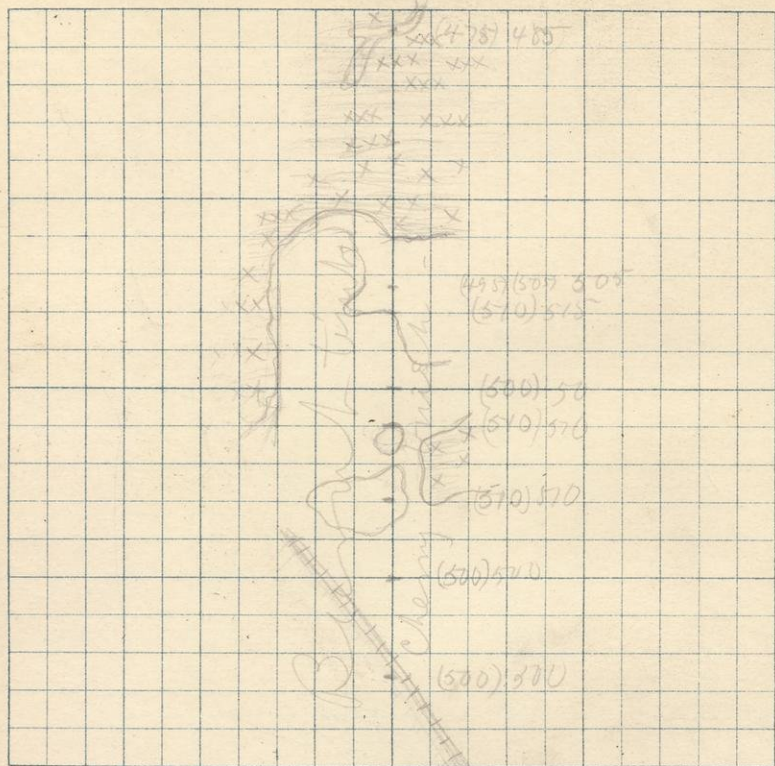
1800 1800 575

1775 2000 7 3.30 W

Strike line at about 2000
about 30 paces E of line

Bench mark 504.83

aneroid 7 12.45 PM 510



going down E $\frac{1}{8}$ line
 Likey Cloudy

Running 1' W for 1300 meters

Going N on E 1/8 line of 11
 Bench mark 506.66
 Aneroid 7 28.85 $n = \frac{1400}{400} = 3.5$

250

500

270 rail road, Crystal Falls to
 Hemlock mine

500 burnt timber, cherry & poplar brush (500)

700

(570)

800 50 paces E of line open tamarack
 swamp

900

(370)

1000

2.40 Rtn

570.

1200

510

1290

x(495) (505)

1400 Spruce & tamarack swamp, dead. 490

1500

1600 edge of cedar swamp

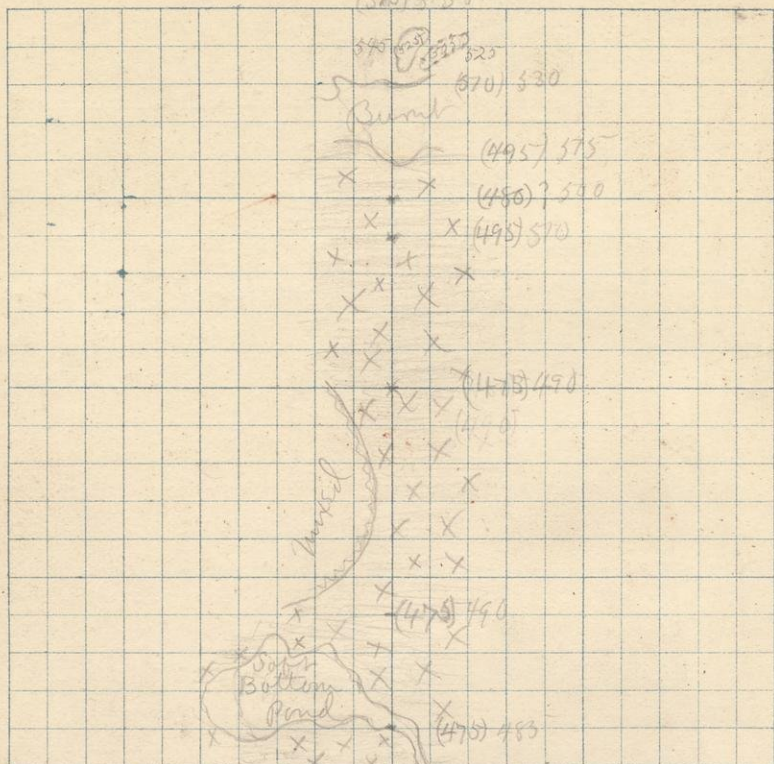
1700

1955 creek channel? very shallow broad
 & muddy (475)

Struck stake at 2010 paces

S. 2

T 44 N R. 33W



Going N on E $\frac{1}{8}$ line of 2

Running 1 $\frac{1}{2}$ N for 1500 paces
+ 6 $\frac{1}{2}$ 30 $\frac{1}{2}$ N for 500

Going Ar on $\frac{1}{8}$ line of 2

100 paces Stake in dead open
tamarack swamp

100 paces - East end of shallow
pond - No Muddy Bottom Pond

100

875

Lopped $\frac{1}{2}$ hour to build raft

400 green tamarack swamp

475

600 dead tamarack swamp

700

800

900

1000 very slow walking 4.48 Pm

1100

(475)

1200 partly dead cedar tamarack swamp

1300

1400 dead cedar spruce cut pine 495

1500 dead spruce cedar

swamp 450

1600

(495)

1700-1800 hunt hunter

1800 hunt " "

(510)

2 struck $\frac{1}{8}$ stake at 2003 paces

Bench mark

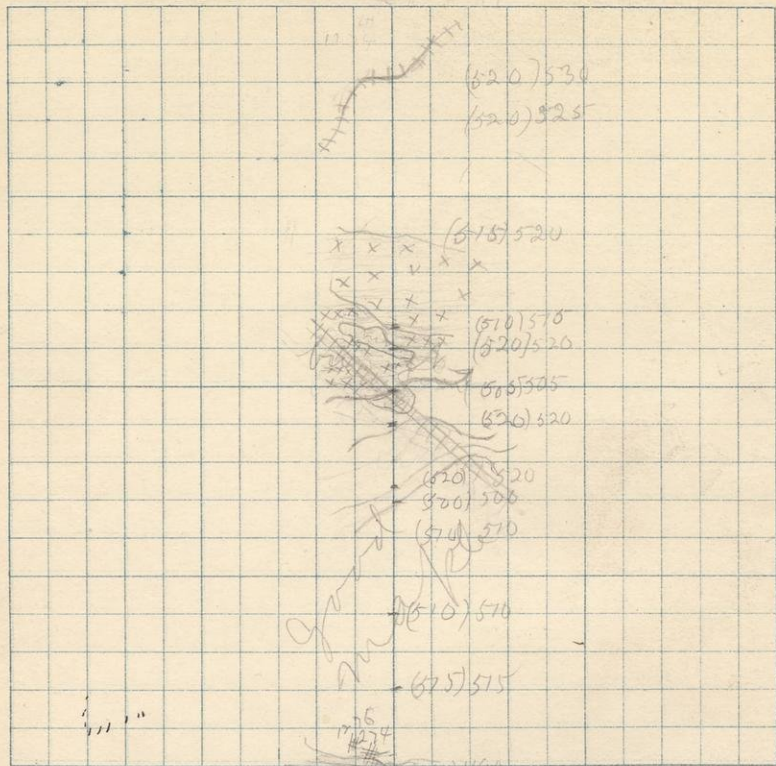
536.48

Anemoid 7

575

5 20 Pm

575
220



Gang S on 1/4 line of 3
 Sky cloudy, variation determined
 by sighting down line

Tope is S

July 5 on 1/4 line of 3
June 30 1891

Bench mark

491.

Aneroid 28,405

$\Delta = 400$

A. 30 W

35 paces S

1274

No 1274 is a conglomerate from ledge. 1965N; 925-W. Ledge outcrops in various places along an E + W line just S of the section line. Conglomerate is much not amorphous, shows its two constituent pebbles but poorly except on a weathered surface. Rock is quite massive & flake chips are not very well defined.

No 1276 N 1950; W 900.6, section line

1275 1276 is from E continuation of same ledge. Outcrops a cliff 30 ft high just S of section line

1276 Did not determine strike & dip

200 Birchwood, little good

(573)

200 "

"

11.0 W

400

more good maple

510

400 V

"

"

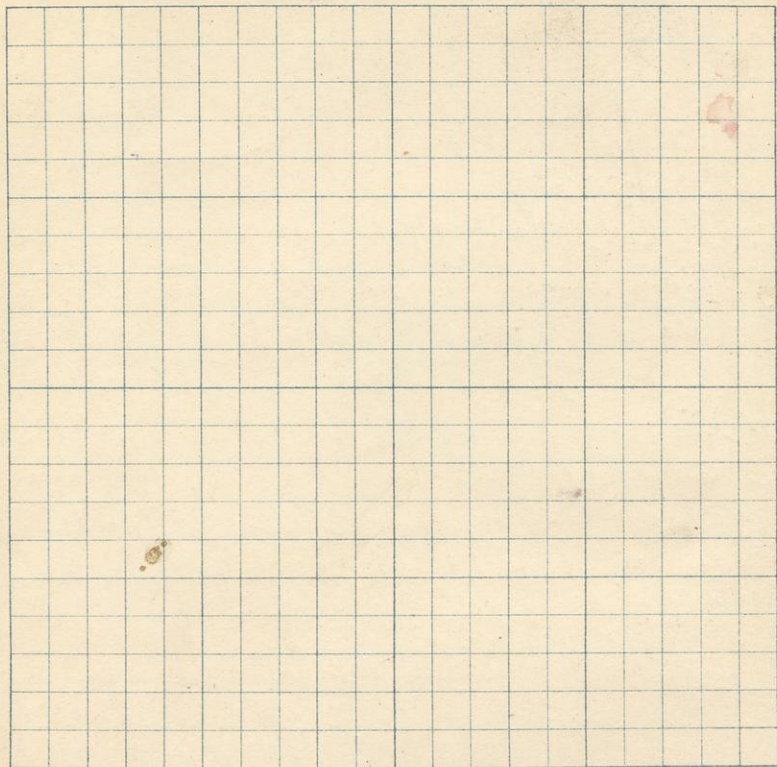
"

8° W

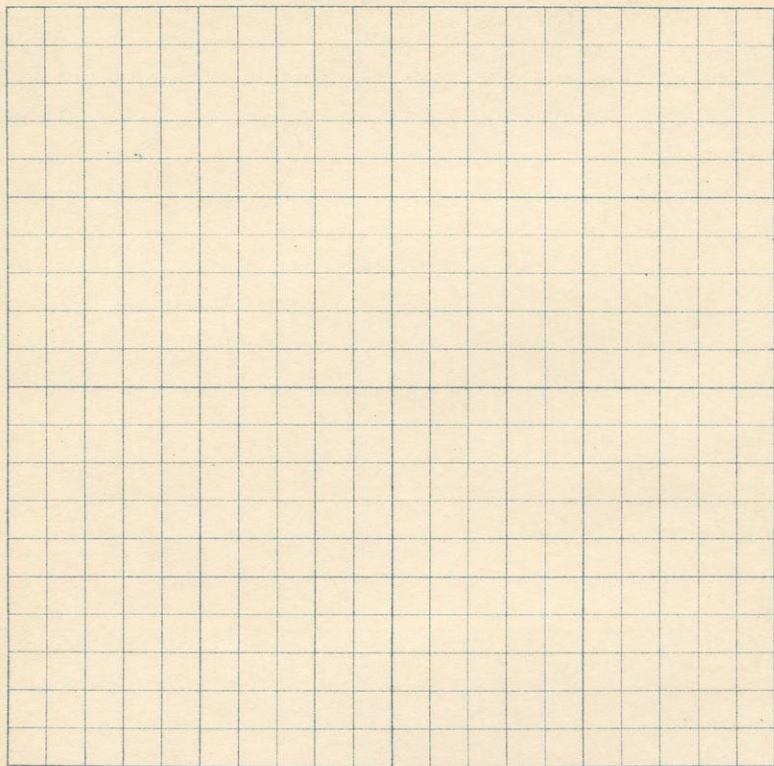
S.

T.

R.



600	Some good maple	(570)
600		1° 15' W
730	" " "	(320)
700		(300)
800		4° 0' 445 E
1900	burnt timber	W 4° 8' 445 W
900	dead cedar	(320)
985	R.R. Crystal Falls to Hemlock mine -	hill (on track) (570)
985	creek	2 ft wide flows SW
975	dead cedar swamp	(505)
1050	swamp dead cedar	1° 30' W
1100		10 30 W
1100		520
1150	Spina Stamenack swamp	(510)
1200	" "	
1300		2° 8' W
1400		510
1500	mixed timber, a few	(515)
1500	scattering good pine	4° 0' W
1600	mixed timber, some good	swamp
1700	" "	520
1800		2° 15' W
1800	take road	520
1837	take road, in fair shape.	
1900		

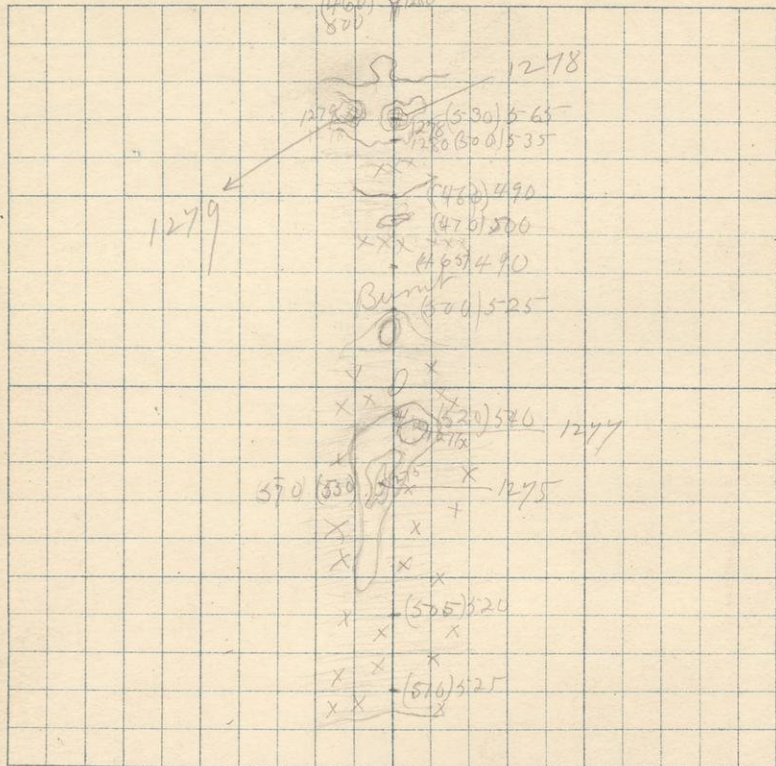


Struck line at 1997 paces, came
down whole distance on Hazed line
which strikes line 8 paces W of 1/4
post.

T

44 W

R. 33 W



Spring San 1/4 line of 10

Top is 5.

114 post 8,40. Am

47

114 post mixed timber

570

150 spruce stamens swamp

200

(510)

1700

(505)

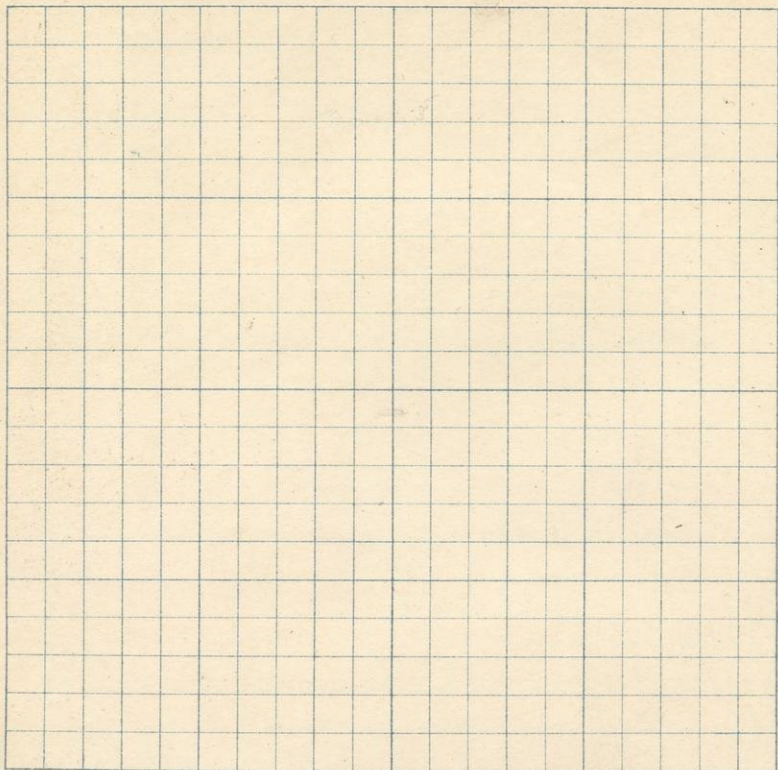
300

5746

146 No 1275, X 1460, W 1600

1275 This specimen is from small out
crop of the same (apparently)
conglomerate that outcrops at 1274
& 1276. Strike & dip are
anywhere from the much
metamorphosed character of
the rock

1277 No 1277, X 1460, W 1050, this
ledge apparently extends
along the line for over 400
paces. at 1277, the N face
of it is about 15 ft high &
steep; E face is covered by
soil & slopes down gently into
surrounding swamp.
Strike & dip are both ob-
scure
Top of outcrop (32)



1279 N about 300, W about
 900. This is fragment, effects
 a cypress needle. The layer from
 which it was taken, probably produced
 the local variation which made a
 curate locating difficult.

700 750 35-2 of line (530)
This is about highest point of ledge
Rock same

900 810
1000 9.50 Am same rock,
on line

1160 Top of small knoll, east of
Continuation of same ledge

1200 Bunt timber (520)

1300 10.20 Am (465)

1465- rock ridge, same rock (470)

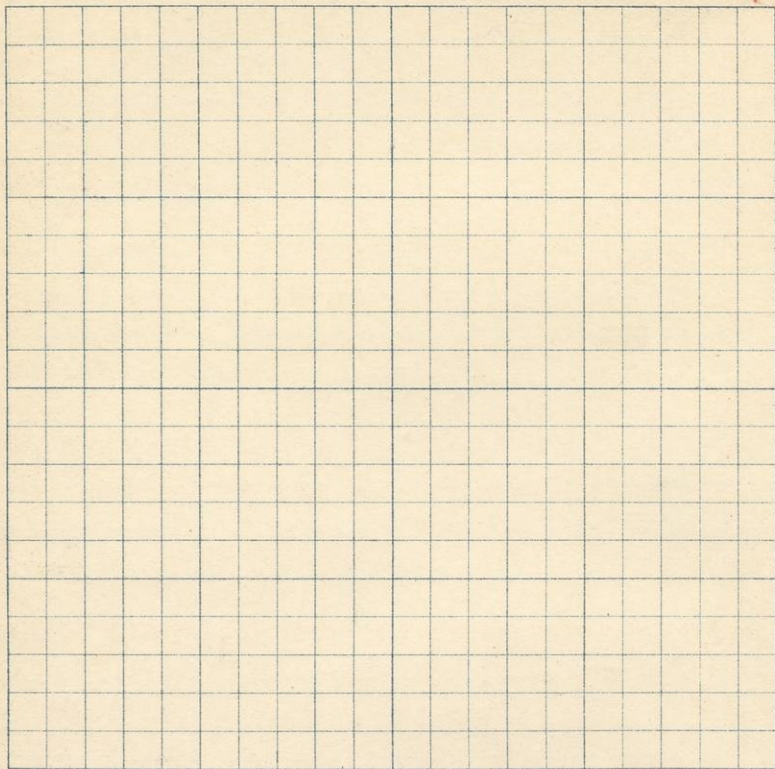
1500 dry hd of creek (460)

1600 dead cedar, numerous
outcrops of conglomerate all about
here, most of them small, but
some large. The outcrops form peaks
A little knob in dead cedar swamp
which has an undergrowth of alder, area
is slow one to explore,

1800

1850

300 N, 900 W outcrop of conglomerate
279 meters, appears strike of contact about N.
dip vertical or slightly S W. (500)
Top of outcrop (530)



Specimen 1278, N 230 (about), W
850 (about), a rubble of the
conglomerate

1290 is quartz of jacking nature,
a rem in the conglomerate.

1700
or 1800Great local variation
of needle - needle points at
most E + W.1278 Numerous fragments of ore
in bedded ledge of conglomerate
with ore fragments.Difficult to locate this spot
exactly on acct of variation of
needle. Not run enough true
dial. Strike of bed may be NW
dip NWRidge runs nearly N + S
This whole area needs to be carefully ex-
amined on a clear day.18 + 19 variation, so far as can tell
by run, not bright enough to use
dial, is about 30° SW

1700 Top of ridge, 20 paces E of line (470)

1280 N O: 17000, 74 post is on this outcrop
did not determine strike + dipStrike line at about 300° E

2025 paces, 150 paces E of Bm

Bench mark

500.54

Anemoid 7

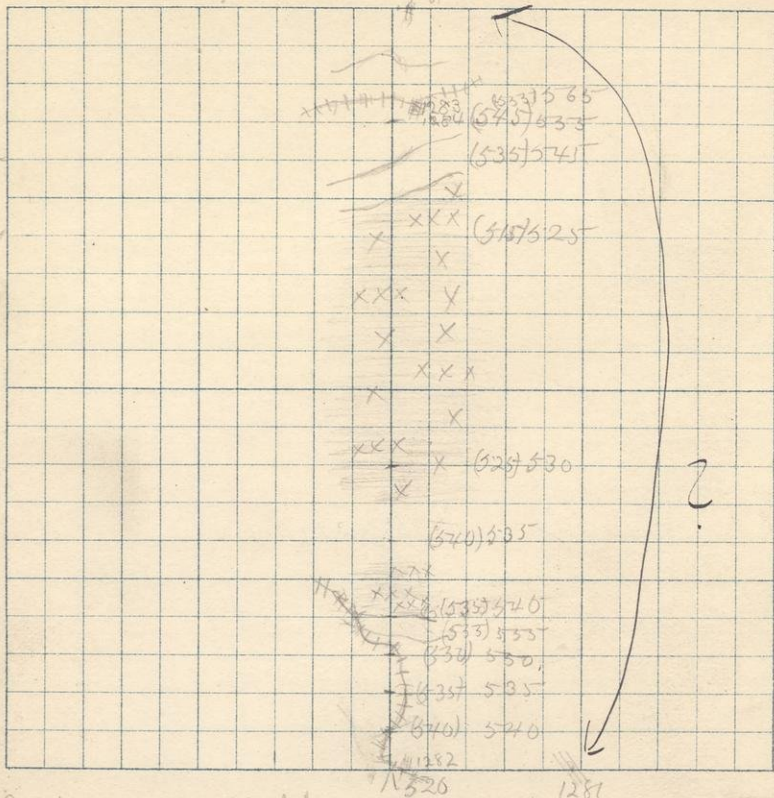
71.20 dm

460.

4m 4.00 dm about 40° SW

S. 10

T. 44 N R. 33 W



from N 1/8 of 10

Sky cloudy

Starting with 11:00 W when 11:30 W

1281 + N.O. W 50. This specimen
is from layer of purple slate, about
1 ft. thick in conglomerate strike
N 60 W - dip, vertical.

Young R from N 1/8 lake
r 12,30? Rm

Bench mark

519.05

Aeroid > 28,435.

1000' = 29"

1282 N, 10; W, 1475. outcrop with small

10 paces, Wagon road, good

100 mixed timber, partly burnt.

little good timber

540

200, a few good scattering pine

535

300

"

530

350

(535)

400

"

"

(540)

400 cedar swamp, salses

(535)

500 cedar, mchlerhenlock, lotte

(540)

scattering

700 Spruce & larch swamp

800

"

thick cedar wide growth

(525)

900

1000

1100

2 Rm

1200

2.08 Rm

1300

1400

1400? 2.30 Rm

(515)

1500? burnt timber swamp

1600

partly burnt soft wood

(535)

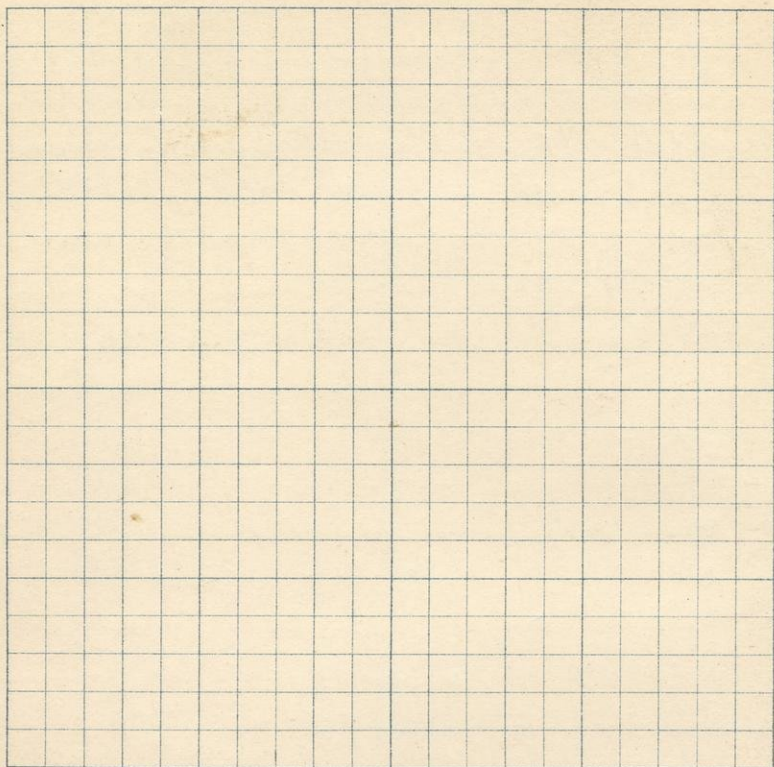
1700

(545)

S.

T.

R.



1760 the road, in far shade

16/1283-84, N 230 W 1470

outcrop

Small of conglomerate no 1283

1283 + slate? no 1284.

585-

Top of outcrop.

585-

1284 Did not strike any E+W
line - Fin been through this
section within a few weeks

1283 is a specimen of the con-
glomerate from the outcrop

1284 is a specimen of the
slate? Did not see contact

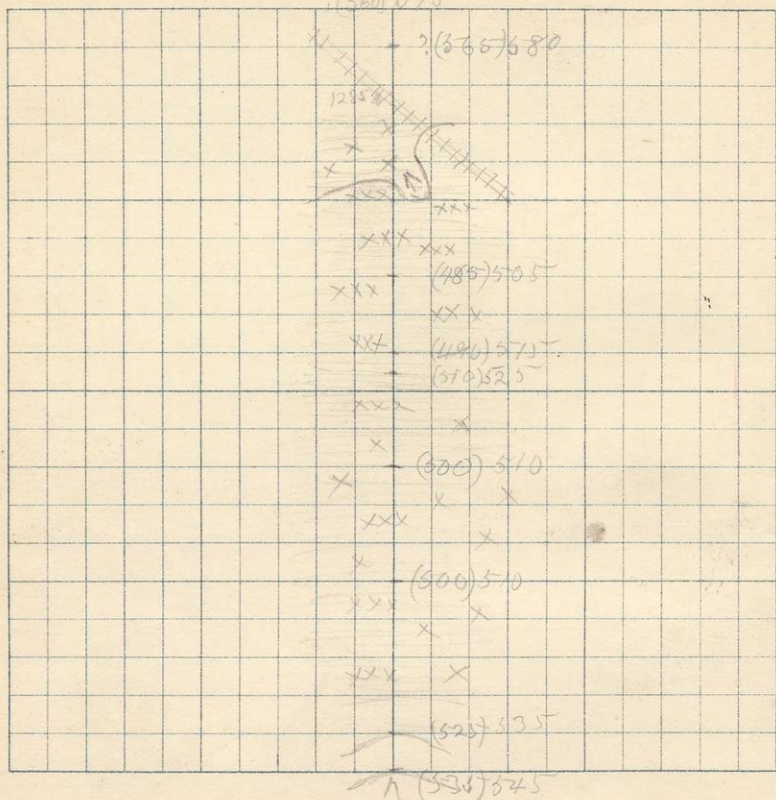
S. 3

T.

44 N

R.

33 W



Going in a W $\frac{1}{8}$ line of 3
 Sky cloudy
 running with about 2° W.

at probable line

57

535-

100

525-

200 burnt cedar & tamarack

300

(500)

600

700

800 struck an E + W line. - 1/4

line of 3" C + N. W. R.R. survey

struck it at

4700 ft W of section corner (500)

800

20.30

went E to about 3960 ft
from section corner started
tr from there on

20.30

505-

1050

570-

1100 Swamp

(490)

1200 dead cedar swamp

1300 cedar swamp

(485)

1400

1500 cedar & alder swamp, very slow
walking 4.05 PM

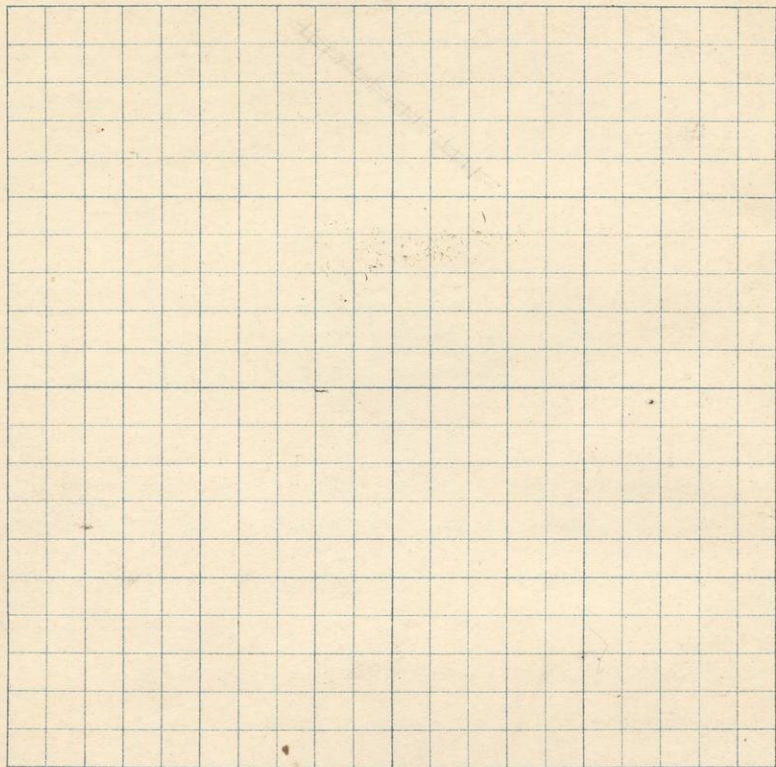
1600 paces struck E + W Razed
line of Rail Road (C + N. W.) survey
struck it just about where I expected
it to be

1600 paces tamarack swamp & pine

S.

T.

R.



This line ought to be 500 paces
N of 1/4 line - our pacing way?
1700

1840 rail road, Crystal Falls
to Hemlock mine

N 1285 N 1840 W 1525

Just N. of where line crosses
RR in small cut - is outcrop (?)
of metamorphic conglomerate. Pebbles
are large size, often 1 ft in diameter
1285 well rounded C

1285 is specimen - the fine
grained rock is the pebble, the
the coarser with quartz is the ce-
menting material

Strike & dip of outcrop are of
course exposures 15 ft ^{long}
and covered with drift. 3 ft high

1900

535-
Strike line at 2050 paces
4 paces E of Bench Mark

Bench Mark

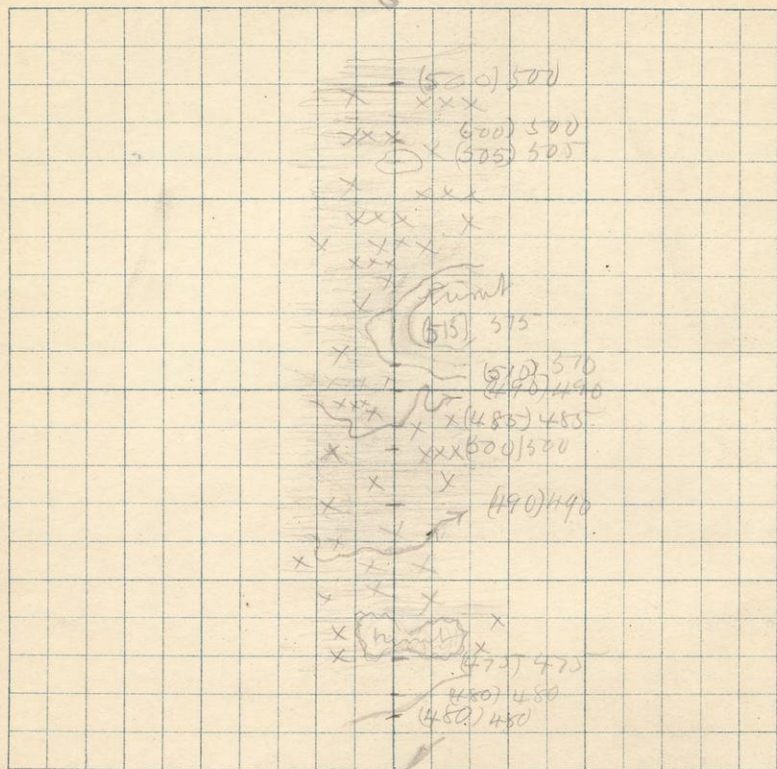
473.84

Aerial

530,

running

4. 75 - 2 M



Grassy S on E section line of 4
 Sky cloudy
 Running on 9' W to 1/4 post
 then with 8' N & less for 500
 paces, then with 5' N to 2' N

July 1, 1891
Sump 1 on E line of 4

61

Bench mark 7.45 Am 482.85-

Area rd 7, 28.625- 1600 = 28.5-

150 partly burnt mixed timber (480)

200 mostly softwood (450)

300 Spruce swamp, partly burnt (475)

340 burnt opening

400 burnt swamp, Spruce clamrack

500 same burnt swamp

590 creek, 3 ft wide, flows W.

600 8.20 Am

700 burnt cedar & spruce (490)

800 (520)

900 creek 2 ft wide, flows W 485

1000 partly burnt soft wood 490

1050 (570)

1100

1200 swamp, cedar, elder etc (570)

1300 "

1400 " 9.00 Am

1500 " partly burnt
Beginning to rain

40m >

1600 9.40 Am (505)

1650 (520)

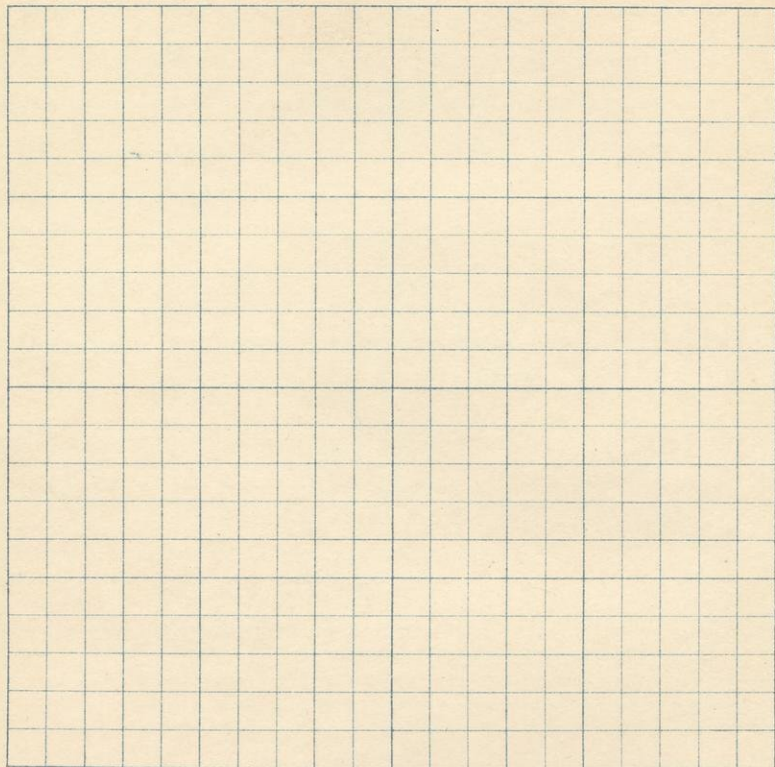
1700

1800 cedar soft wood, a little poor
maple (500)

S.

T.

R.



1400, some timber, with a little
scattering pine of good size
Shrub section line, on corner
elake, at 2012 paces

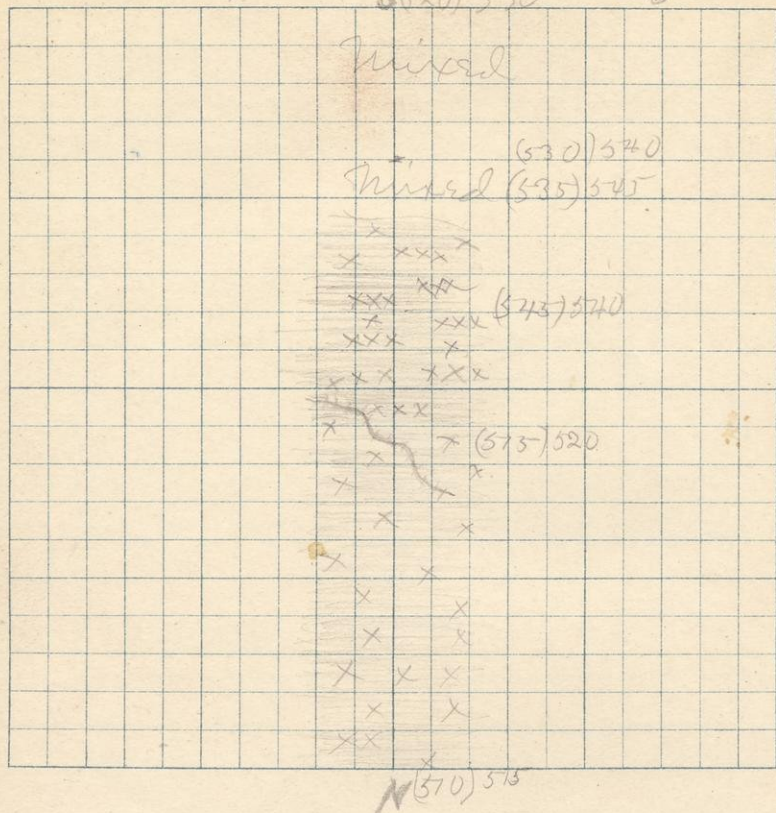
This whole mile is practically
cedar tamarack or spruce swamps.

The fire has been in it. The int
test parts are yet green, the
knolls of a few feet (5) elevation
have been thoroughly burnt. The
swamp as a whole contains I
should think $1/2$ to $2/3$ burnt
stuff.

S. 9

T

B.



June 2 / 1897

101° 25.5'

65

100

200

300 Green Spruce Hemlock Swamp 670

380 " 10:30 Am, first chance 10° W

400 " 8° W

465 " 10:21 Am 20.30° W

500 " 1° 0' W

600 " Sky Cloudy again

700 " running on 10° E

800 50 paces W of line to

Wagon road - to Hemlock

865 same road 670

O Went W about 12 paces

11.11 Am 6° 0' E

900 Green Cedar Swamp

1000 " 9° 0' E

1100 "

1200 11.40 20° 0' E

1200 Spruce cedar Swamp 640

1300 about 40° W

1400 numerous sub angular

fragments of lean red hematite ore

the hematite in the drift

1500 mixed timber some good birch, a

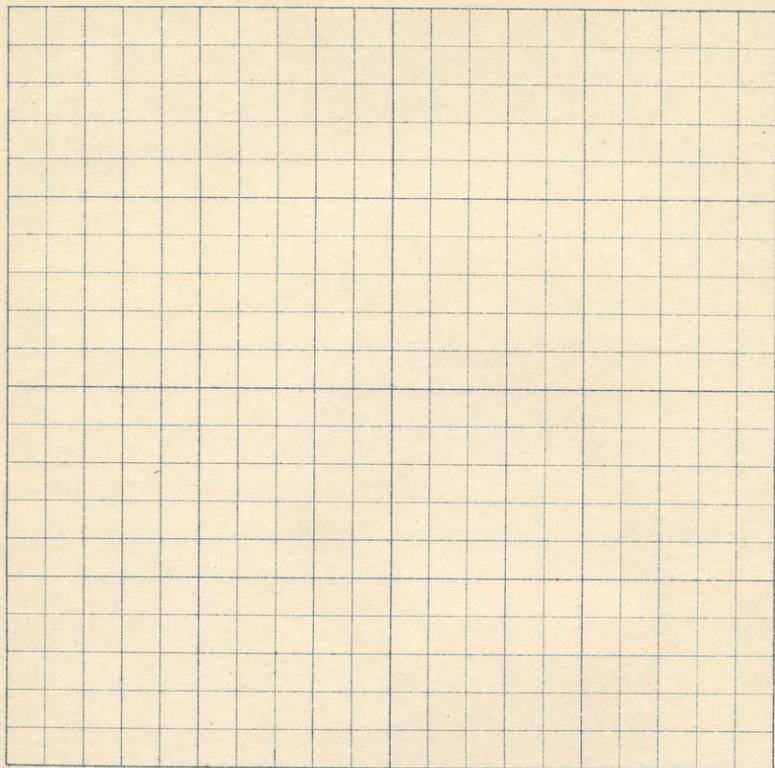
little good maple (335)

about 9° 0' E

S.

T.

R.



1600 Pine timber

vanetia by sighting down line ^{about} 2.00 W (330)

16120 Sunshine

6.5

1768

5.30 E

1800, a little scattering pine

Struck line at 1980 paces
about 18 E of Bench mark.

12, 25, RM

Bench Mark

329.06

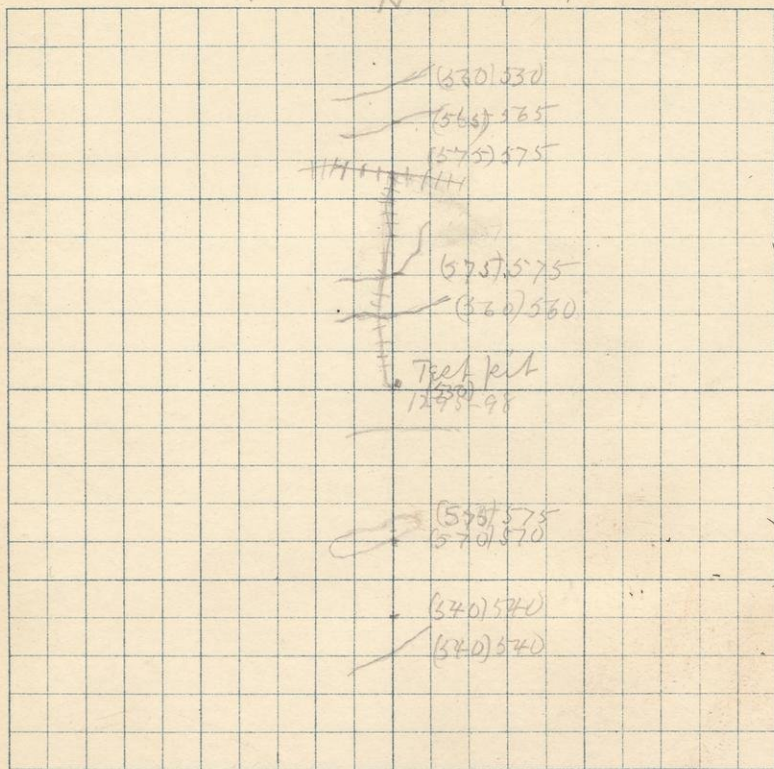
Anemid 7

520, 329.06

S. 9

T

R.



going to on 2 1/8 June of 9.
Sky clear or cloudy by turns.

69
Gony to from E 1/4 line of 9
Bench mark 532.88

Bench mark

532.8 f

Aneroid 7,28.58

1.22 Rm

29.1^m = 1050 oz

307

2° 30' E

7 fine ^{heavy} thick maple

(344)

485-

1. 37

4⁰ Δ'E

(5757)

1296

1297

filled with green rock &
cherty layers. apparent strike

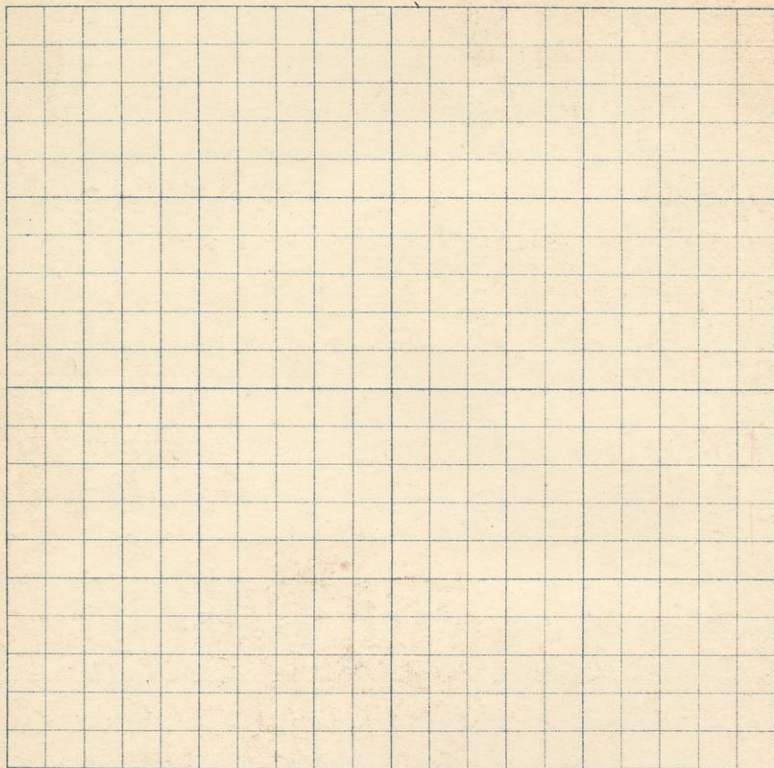
1298

Pit is rather a wet one
It was located from float ore.

S.

T.

R.



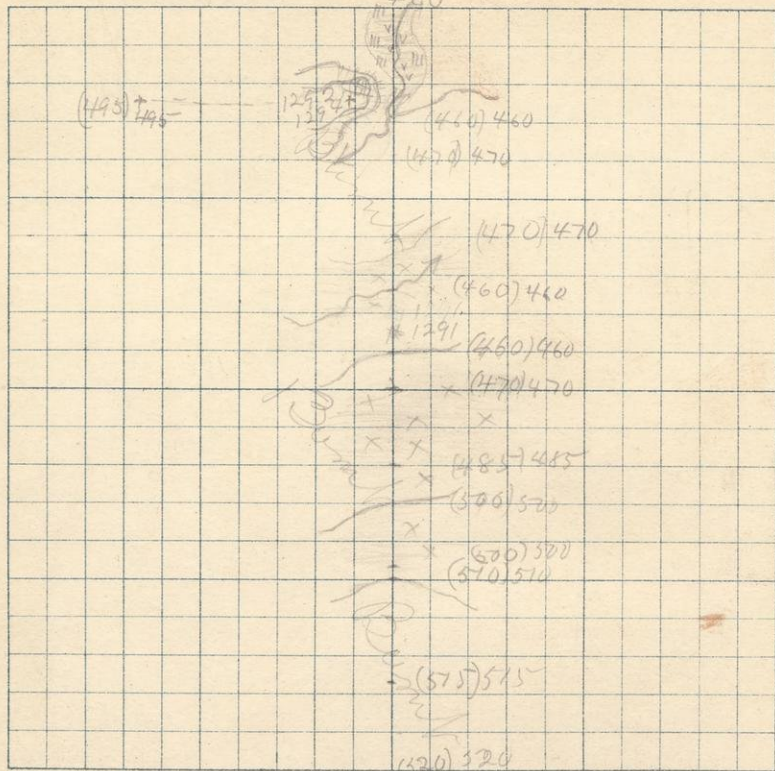
1600	2.30	530
1000		400
1090	good heavy maple	5 ⁰⁰ 30W
1165	2.40	5 ⁰⁰ 0
1200		530
1290	2.38	5 ⁰⁰ E
1300		570
1350		570
1400/1380		8 ⁰⁰ E
1400		575
1500		
1575	road forks - road from Crystal to Henlock mine road to first prospect hole we visited	
1575	2.41	8 ⁰⁰ W
1600		(575)
1700	2.45	8 ⁰⁰ W
1700	good heavy maple	(535)
1800		(330)
1890	3 PM	5 ⁰⁰ 30W

Struck line at 2004 15 paces
of a 1/4 post

S.

T.

R.



Going N on E 1/8 line of 4

1/8 Blaker	520
1000 burnt mixed timber	
240 3, 15 Run	1, 45 W
300	(375)
400	
500 burnt soft wood	670
525 burnt spruce swamp	(500)
600	
700	(380)
800 burnt spruce pure cedar	(485)
900 burnt Cedar swamp	6, 0 W
1000 burnt cedar spruce	(470)
1060	
1100	460
1150 No 1291, N 1150	

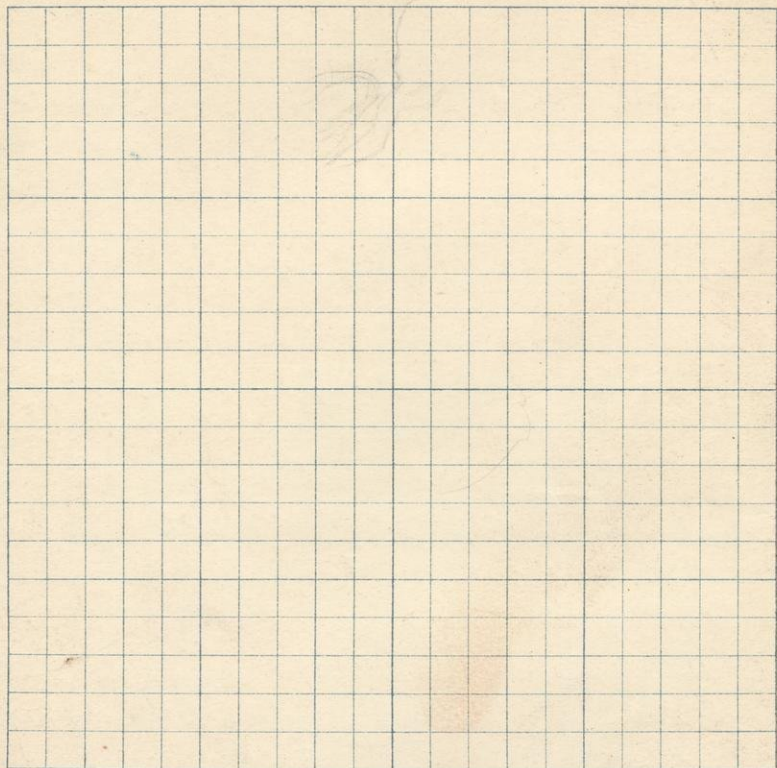
1291 Rock is a dark gray blue or green quartzite? Exposed surface much broken by action of frost. Strike & dip undetermined.
No 1291, N 1200, E 500, (465)

1300 120 W
1260 creek 5 ft wide flows SW (460)

S.

T.

R.



1400. Burnt Softwood

(470)

1610

4170

1700 edge of Hemlock river

River falls a few feet in 200 over large boulders. Saw nothing unusual

River was an outcrop (460)

1800 5 x 1800, W 530m. outcrop

1292 is large oval mass, forms N. end of a ridge very green with trees. Rock is a conglomerate(?) with a few very thin beams of gasping on(?)

1294

1

(491)

1760 creek 10 ft wide flowing into river

1775

4:22 PM

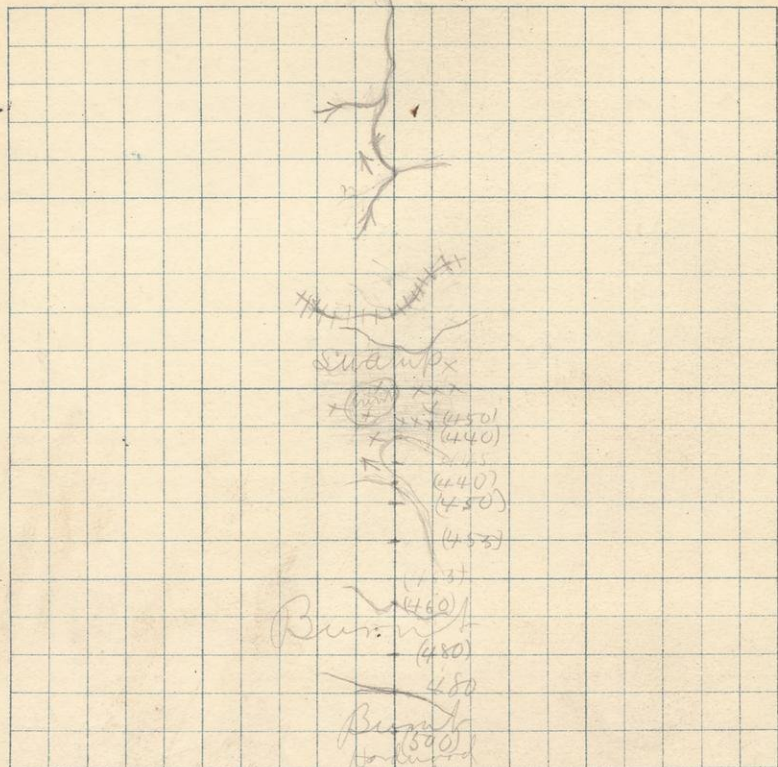
10.36 W

Struck line at 2060, 25-
E of 1/8 stake
Bench mark 558.88
Anemoid 7 460,

S. 5

T. 44 N

R. 33 W



going S on 1/4 line of 5-

sky clear, then cloudy

Top is South

July 2 1891

77

Friday, July 14 line of 5
About 7 AM

Bench mark 499.25

Anevid 7 28.73. 29 = 1200

Bench mark in burnt hardwood

100 Burnt hardwood (500)

200 (480)

300 480

400 7.35 480 E

440 (460)

500 + softwood

600 (450)

* 700 "

745 450

765 (440)

800 (440)

860 (440)

875 farmack Blumie cedar (440)

900 750 500

950 (430)

1000 lot road - good one

1050 burnt swamp (430)

1200 1100 wagon road (430)

1200 1100 burnt soft wood

1400 or 13200 (450)

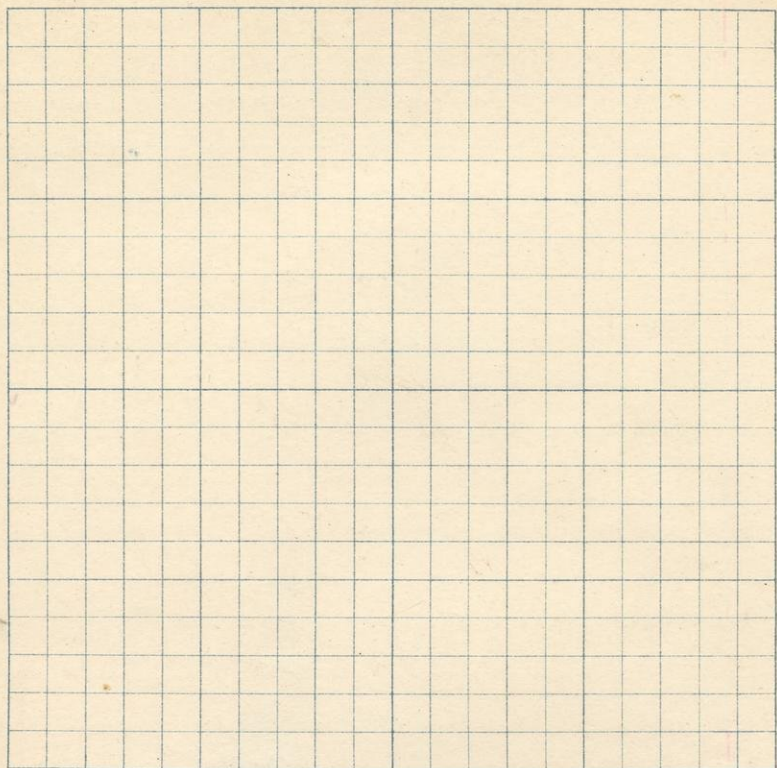
1300 thick scrubby swamp (430)

1400 adn swamp

S.

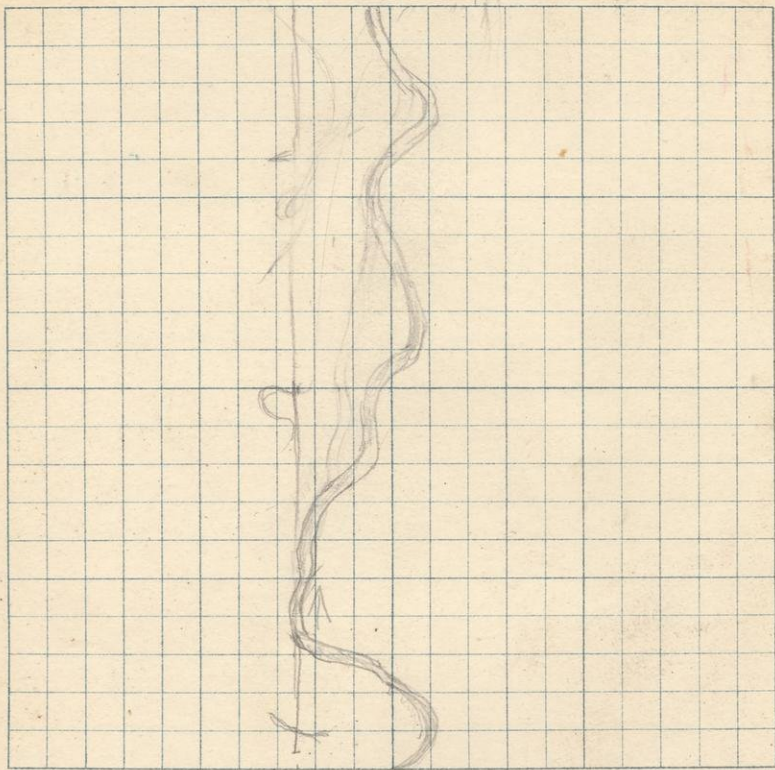
T.

R.



- 1500 alder swamp
 1570 creek 30 ft wide Little
 Hemlock, flows ?
 also another creek 5 ft wide
 flows into the Little Hemlock from
 N.E. (420)
 1600 alder swamp (430)
 1700 " " cedar (430)
 1760 9.20 Am 6.0 E
 1800 edge of Little Hemlock, creek
~~now~~ has been cleared out here
 used for logging. It is full
 50 ft wide
 2000 by river side
 2100 South Bank of
 Hemlock (340)
 Crossed river on log look fully
 fully 20 minutes

no stake or line found



Long S on N⁴ line of 8

Top is South

The Hemlock is not plotted
accurately

my 1st line of 8

81

Starting on bank of Hemlock (245)

9.45 AM burnt cedar stomach 5.75

30 Found line which may be section line

Offset E 250 paces around curves of river. River is pretty dead, & quite deep. To cross it by logs would take too long

End of offset 460

100 burnt timber 410

160 430

200 445

250 50 E

340 Edge of Hemlock river (440)
bank here about 10 ft high on E side

400 river bank open meadow

500 some narrow plank on river

600 wide then burnt postward

700 burnt timber

800 " "

800 1440

900 1430

1000 10.35 AM 5.458

1000 1430

1100

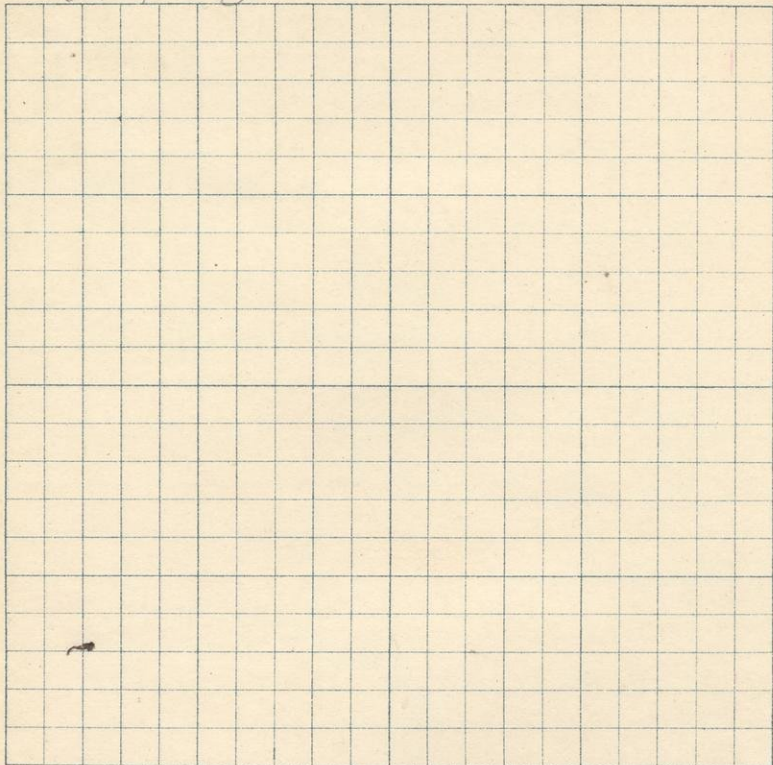
1150 440

82

31° 4' S. 5

T.

R.



my aneroid gave out here. Course
perhaps from ⁸³ ~~trunk~~

1300 bank work

1400

1500

1040 Am

5068

1500

50 ft above river

4809

1600

4617

Mistake of 500 paces in
count

1500 paces = about 2000

2000 paces = about 2500

Reached top about 11 AM

Found a few fine at 30 m. from

it not. Then April 16 250

paces

At end of April reached for

45 m but found nothing.

Then went to W

150 paces from previous point.

2

21. At 1000 paces, 2 paces

above

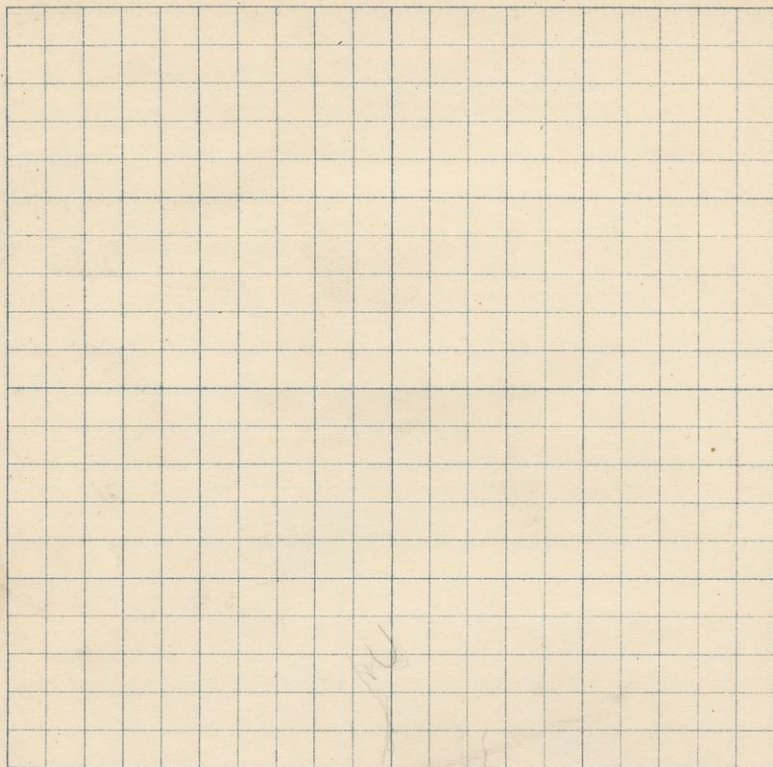
Went up river 500 paces

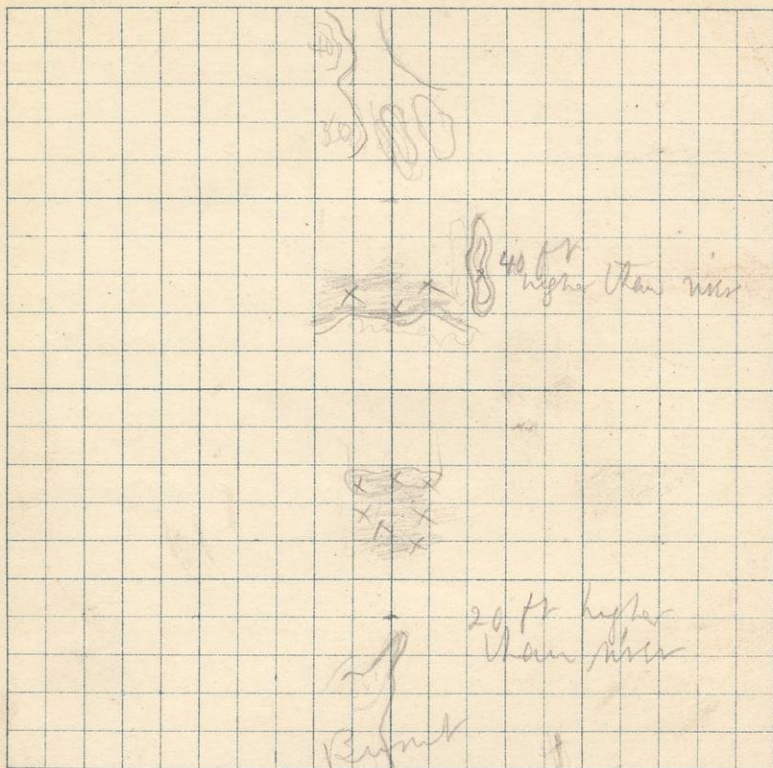
500, paces

S.

T.

R.





Running on 5° E

Raining hard

287

510

3

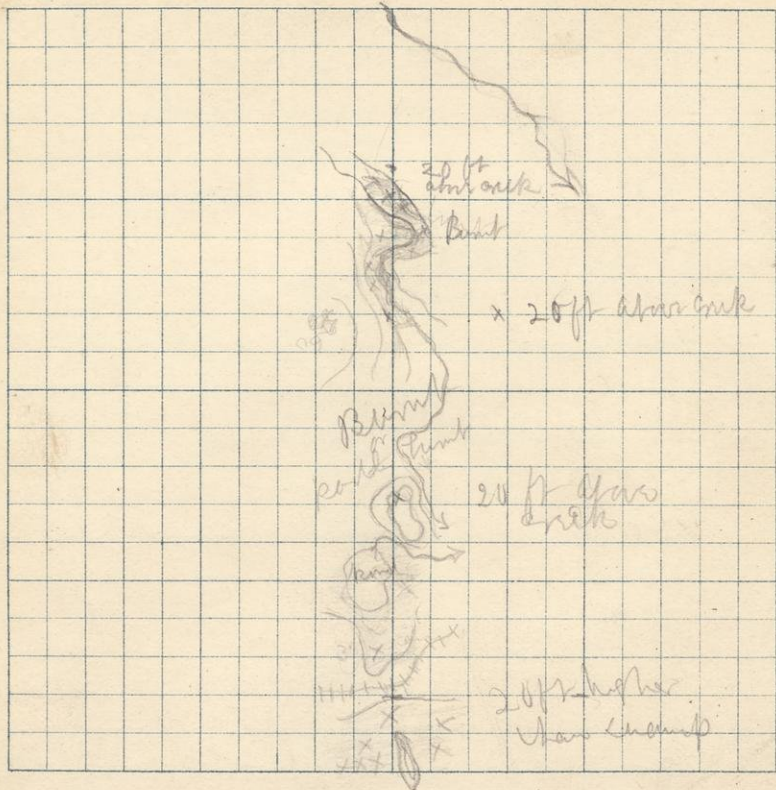
384

75

148

1.385 0

40



1/8 stake in swamp, offset 20
 paces to E in W of. Thig back 300 ft
 100 long 420 high
 100 in swamp
 200 burnt timber 20 ft

222 late road good one

300 dense swamp

400 quaking bog
 425 edge of it

500

628 creek 15 ft wide, dammed

725 W. of bullock 20 ft

825 edge of swamp

871 creek 5 ft wide flows SE

900

1000 buland soft wood

1100 partly burnt swamp 25 ft

1200 creek valley 0

1230 creek 25 ft wide + trans
 dam, latter forms later small
 pond

1350 creek again, flowing W

1400 cedar swamp

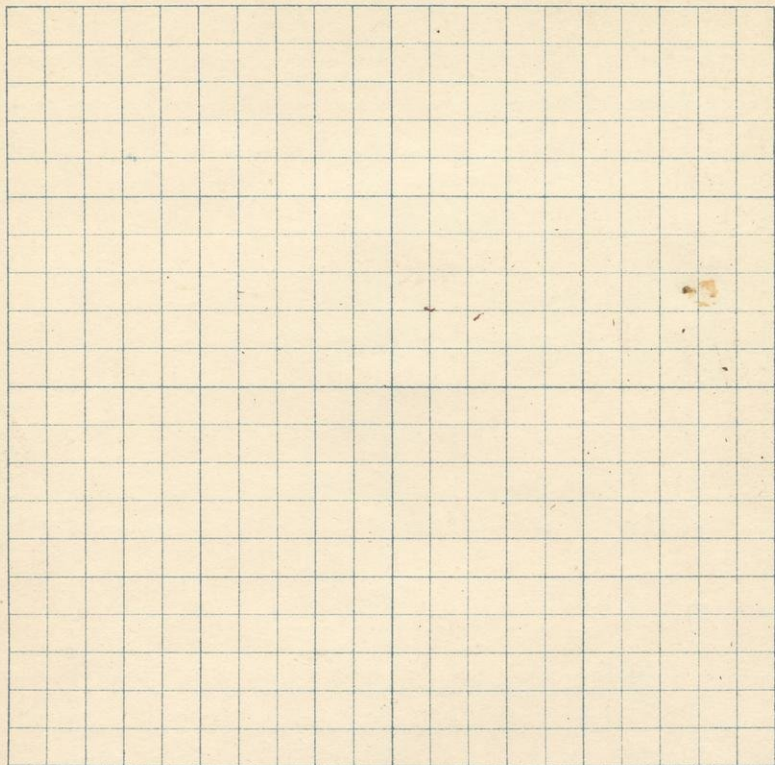
1425 creek side again

1500 cedar swamp

S.

T.

R.



- 1538 Edge of Swamp 8
 1575 burnt timber 20 ft
 15 16 1990 Branch of Hemlock Creek -
 16 17 Beaver dammed - 30 ft wide
 17 18 Truck line at 2030', 40
 18 19 Paces E of Bench Mark
~~1990 Branch of~~
 1990 Branch of
 Hemlock Beaver dam
 Creek 30 ft wide

Truck line at 2030', 40
 Paces E of Bench Mark

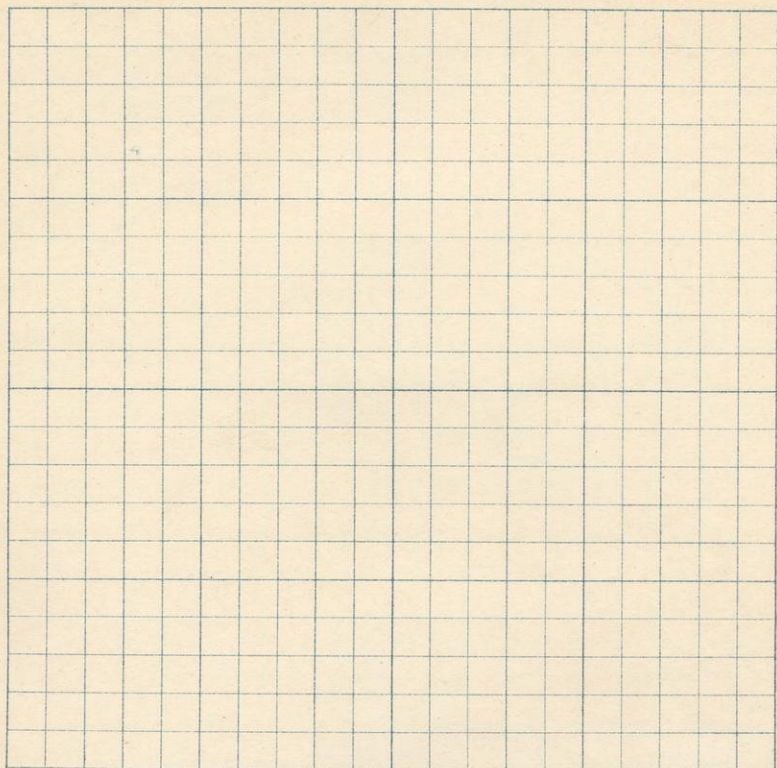
July 3

Bench mark	436.65
Anemid 158, U.S.G.P. 28.33	2460
70 creek 6 ft wide, flows E	2540-535
100 open meadow	4
215 hill above meadow	2580-435
300 burnt wood, big back	2610-535
350 partly	2600-535
400 burnt hard softwood	2610-535
500	2610-535
600	2610-535
700	2610-535
800	2610-535
900	
line. Came on N & S section variation	6° E
910	2610-535
1000 partly burnt	2595-535
1100	2580-535
1110	4° 45' E
1200	2580-535
1225 small open camp	4 2575-535
1340 to road & burnt camp	2595-535
1240 edge of it	4
1400	
1445 to road - good upon road	6° 30' E
1473	2575-535
	4

S.

T.

R.



1385 Hardwood, a little hunk

1800

2573-535

4

1800 1700 Hard & soft wood

1750 cedar swamp

1820 tote road - good wagon road,

going E 35 paces - struck

Section line (?)

80° 0' E

1896

2575-535

Struck line at 1896 (?) 1896, 60
paces N. of corner.

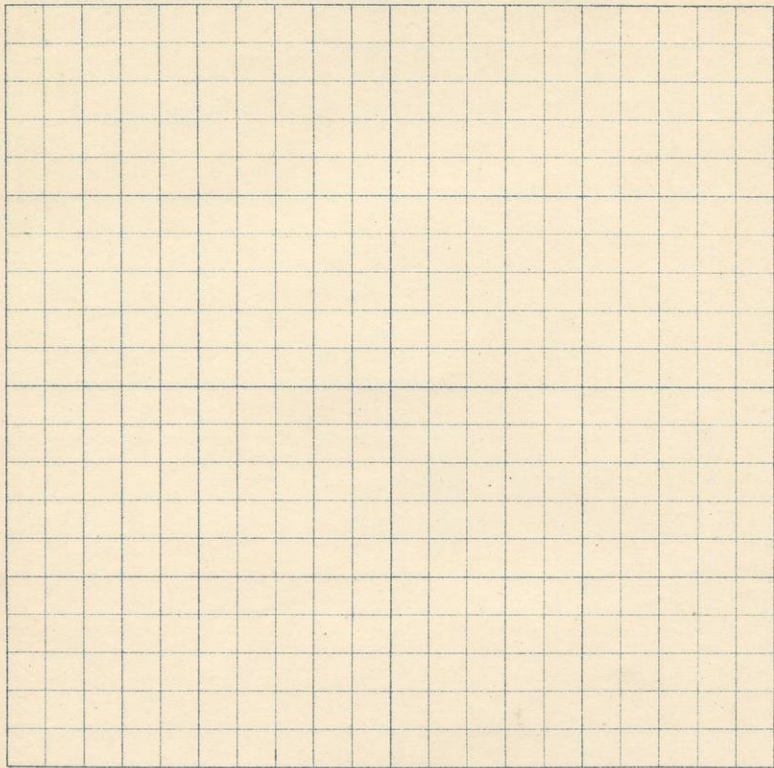
Long Pine E section line of 7 97
the section comes near edge of cedar
shamp, but in shamp

	2575-533
10.09 AM	7.30 E
100	2595
200	2580
300	
330 partly burnt timber	2600
400	2600
500	
500	10625
700 burnt timber	7.45 E
800	2600
900	
1000 partly burnt hardwood	7.45 E
1100	2600-533
1200	2600-533
1400	2600-533
1500	
1600	2610-533
1650	2610
1750	5.30 E
1775	2600
1900	2595
1950	2590

S. 7

T. 44 N R.

33 W



Stretch line at 1944 paces

33 paces E of line

Bench mark

473.48

Award 158

2600

11.15 Am

80.2

475 - 2600

463 - 2540

20 - 60

453 - 2400

475 - 2300

20 - 40

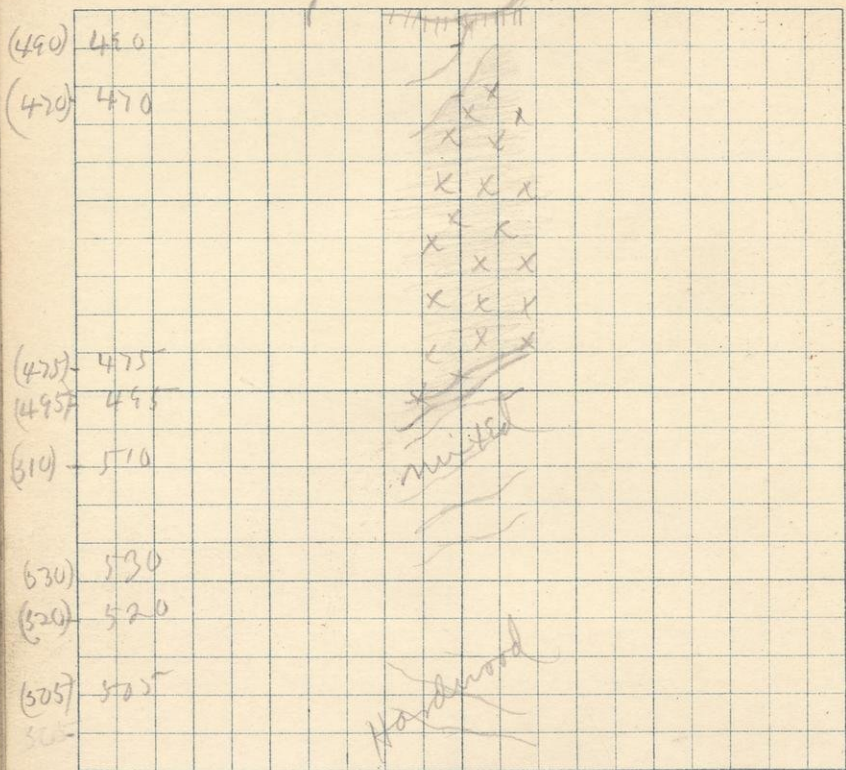
S.

7

T.

44) ✓

R.



good hardwood 495

101

Bench mark 495 97

Aneroid 2815 2615

100 Good heavy maple

200 A little scattering pine 70° 45' S

200 2625

300 12,10 Pm

400 Good maple 2640

500 2630

600 2620

700

800 mixed timber some good maple 2630

800 12,20 6' S

900

960 2615

1000 2610

1025 cedar swamp 2595

1130 spruce + tamarack swamp

1200 " "

1300 "

1400 "

1500 "

2 1600 spruce, tamarack + cedar

1700 " 1.05 Pm 70° 30'

1760 edge of swamp 2590

1800

1900

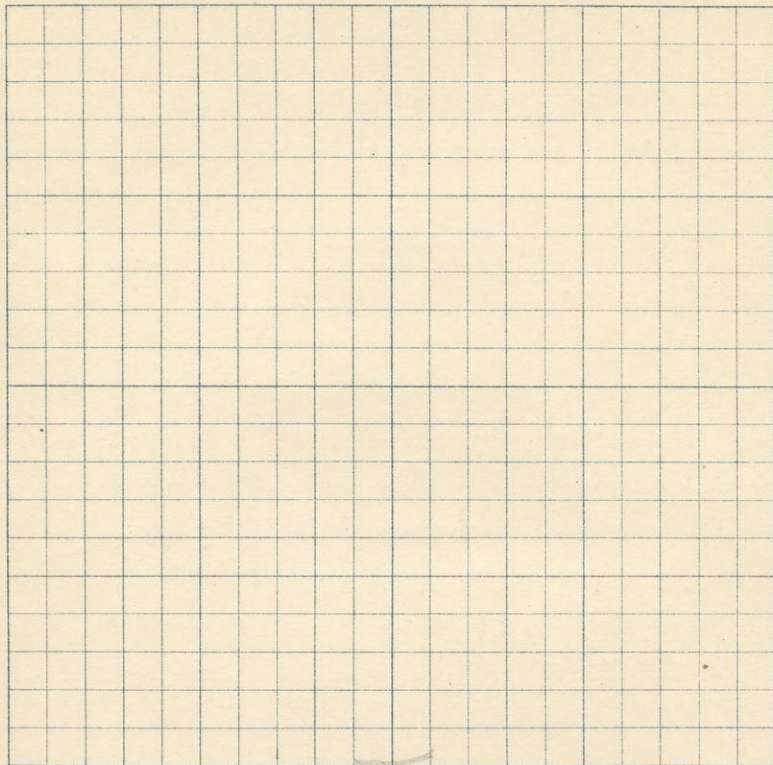
2610

mixed timber some good maple

S.

T.

R.



1990, tote road, good one

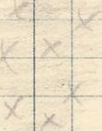
Struck line at 2020 paces, 6 paces
N of $1/8$ stake. Stake set by
Loran Hermin 1.28 PM

S. 6

T. 44
(490) 495

R. 33

(480) 480
(500) 500

 (520) 520
(480) 485
(485) 485


(480) 480

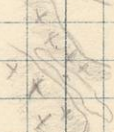
Bent

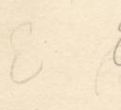
(475) 475
(505) 505


(500) 500



(500) 500




 480
 E $\frac{1}{2}$ line of 6

1/8 plateau

6230

1/8 plateau

2600

10 paces open tamarack + spruce shrubs

2595

100

140 Log back

2620

190 Swamp

200

250 edge of st

300

400

burnt softwood

2620

400

1.55

500

625

620

2625

600

little marsh 30 paces wide

2625

690

burnt softwood

5.308

720

marsh cedar, alder + tamarack

800

" " " "

2600

900

burnt pine feeder

900

little swamp hole

985

burnt spruce + pine

1000

burnt cedar + birch

1100

min swamp, tamarack alder +

2605

1200

" " " "

60" E

1200

" " " "

2600

1300

" " " "

1400

" " " "

1500

edge of swamp

1570

burnt softwood

2615

1570

30 cut

2640

1600

1600

burnt

39.70 E

1700

burnt

2620

1800

edge of swamp

1820

burnt

2620

1800

edge of swamp

2600

1900

burnt

1900

burnt

1900

burnt

1900

burnt

1900

burnt

No 1/8 plate or Bench 107
mark pet. 2585
Anroid

Bench mark 485, 97
Anroid 2610
much time 10671 faces 2 of
Bench mark

1+2 1500 250 ft
of base & W line

3 at $1\frac{1}{4}$ post on section
line

4 near section line or on
it - 50 paces W of $1\frac{1}{4}$
post

5 near 1600 . i of line

6 on section line &
just W - 50 paces
W of W $\frac{1}{8}$ alike

1286 quartzite from about
1600

1287 - conglom heavy, dark
from same locality

1288 conglom " "
from 1400

1289, Jasper conglom, green
red, from around 1500-60
?

1290 put in bag

