

Notebook No. 243 - Leverett

COUNTY

Alger: 2-9

Delta: 9-10

Luce: 1-2

INDEX TO  
LEVERETT'S NOTEBOOK  
NO. 243

- Page 1. June 26, 1912 Levels south from Newberry.
- Page 2. June 26, 1912 Levels south from Wetmore.
- Page 3. June 27, 1912 Levels south of Munising.
- Page 4. June 27, 1912 Levels around Chatham and Chatham  
to Limestone.
- Page 6. June 28, 1912 Levels Limestone to Trout Lake and  
Winters P. O.
- Page 8. June 29, 1912 Levels southeast from Winters P. O.
- Page 9. June 30, 1912 Levels northwest from Escanaba to highest  
Algonquin and levels furnished by C & NW.  
Escanaba north and in Perkins Branch.

NOTES OF FRANK LEVERETT

U. S. Geological Survey

Notebook No. 243

June 26, 1912 - Newberry, Michigan - Levels run and Algonquin shore at Newberry with Lloyd G. Hornby. 7:45 A.M.

Altitude at Depot assumed at 776'. Deduct 11 feet. We level along Newberry Avenue south.

|   |                 |
|---|-----------------|
| First note - At S side, Helen Street              | 783.35 - 11     |
| Post Office                                       | 787. _____ City |
| Second note - At S side, John Street              | 790. - 11       |
| Third note - At S side, Truman (?) Street         | 794.26 - 11     |
| Fourth note - At S side, Harris Street            | 797.42 - 11     |
| Fifth note - Sidewalk in front of school building | 799.37 - 11     |

The school house ground is just about 800'. Roads running east 809'. Base of bouldery till ridge probably an old shore 814.6 - 11. This rises abruptly to 825-30' its crust being uneven. There is a wave washed plain south of this setting in at 835' and running to 845-50'. At tope of rise is a beach west of \_\_\_\_\_ at 870-71 - 11. There is then a slope ascent to a terrace at north base of gravel pit. Gravelly bar - 883.8 - 11. Base of cut bluff. Highest Algonquin beach. (883.8 - 11 -- 870') This runs ESE through Asylum grounds. Top of bluff by house west side of road 909.4 - 11. Wave washed gravelly plain west of Asylum in E-W road west of a sandy knoll 911.2 - 11. Top of sand knoll 917.73 - 11.

On return we noted weak sandy bars west of road at about 870 and 850-55'. We saw no higher land than the sandy knoll west of the Asylum in the vicinity of the Asylum. There are similar sandy knolls in fields 1/2 mile WSW from the Asylum.

In 1905 I noted small islands west of there that are bouldery.

It seems probable that the highest shore here is not far from 920'. (Look up the readings with aneroid for the knolls just noted.) There is

a broad wave washed surface around the Asylum and westward at about 910-12'. A.T. with a few shallow basins and sags. (900' corrected)  
We could see land south of McMillan that is much higher than the Asylum ground. There is also an isolated hill a few miles north of McMillan that rose above the highest Algonquin.

Levels run near Wetmore

Am. 29635 at Newberry at 11:30 A.M. - - 11 = 765.

We take train to Wetmore and Scofield Hill. We take altitude at Wetmore Bridge on Anna River to be 857' and level along track to Wetmore Station 858' (Gannett makes it 851', but probably incorrectly.) and then south to Anna River 837.2. Within a level 1-2' higher than this, water drains both to Lake Superior and Lake Michigan. Peaty accumulation amount to all of this difference so the old channel was not over 837'.

At cross roads S side of Anna River = 848' (at center of cross plot)

Sandy flat possible beach by log barn - 863' on east side of road, opposite door.

South 130 paces - 870'

South 60 paces to cut bank on east side road - 878.9

Bar on west side of road is 880.7. This is probable water level.

South 76 paces to next station at cut bank back of bar - 881.4

Storm beach here about 885 feet - 885'

South 40 paces to station in a cut - 892.23

South 36 paces to top of bluff at level of a sandy beach - 904.3

South 63 paces (to base of a bank back of the beach) - 903.7

Top of bank 12 paces south - 907.3

South 53 paces to base of next bank on east side of road - 913

South 25 paces to top of bank - 921.7

South 35 paces to next station in road - 924.4

South 30 paces to top of steep rise - 932'

South 100 paces on plain - 935.3

South 250 paces to base of Scoffold Hill - 942.8

The low water level here is about 947.7

High water storm cut at base of very steep bluff - 960'

Where path on old road drops into S edge of new road - 959.

Top of bluff on old road 1015' Bar.

At intersection with new road 1005' Bar.

370 paces from Depot to log barn - 1110'

We start leveling north from Wetmore and come to first well defined beach at center of  $SE\frac{1}{4}$  Sec. 13 at 879'. There is another at 903-4 ft. in fields.

Good levels run near Munising and Wetmore

Altitude at road by line of NE and  $SE\frac{1}{4}$  of  $NE\frac{1}{4}$  Sec. 13 - 892.33.

Altitude 918' on plain near center  $NE\frac{1}{4}$  of  $SE\frac{1}{4}$  Sec. 12 where road turns NW at large gate for house west of road. There is an ill defined gravelly beach on crest of glacial ridge 30-40 rods south of intersection with E-W  $\frac{1}{4}$  line wagon road in Sec. 12, Alt. 929.37. The highest beach near line of this road is 950'. One beach on E-W road is 946', another 949.96.

The shore features are faint above the beach 903.23'. It is possible that ice border drainage instead of shore action made the steep bluff of Scoffold Hill? (Query is Leverett's) There seems to be north of the base of the bluff a good shore feature at 913'. Higher levels do not present so clear a set of shore features.

June 27 - 5:30 A.M. Am. 29855 at Munising at lake level.

29,825 on sandy beach or bar.

29,800 at probable Nipissing cut bank base of hill 645-50.

29,750 at low notch (?) in face of bluff - 705'  
29,635 - 810' at wave notch by a platform on face of bluff.  
29,500 - 925' at brow of bluff on a beach with a sag and cut  
bluff back of it.

29,475 - 945'± on top of cut bluff.

29,450 - 960' at bar on highest point a flat topped sandy gravel.  
This is 960'. A little further west there is a slightly higher plain  
27,445 - 966', with boulders and in front of it to north a notch at  
5 ft. lower or 961'± A.T. A trail runs west of this level. There is a  
very definite notch at 956' with bank 10' higher back of it.

29,480 at brow of bluff where this trail starts down hill.

29,750 at foot of steepest part of bluff.

29,800 at Nipissing by bluff.

29,825 on sand bar on Munising Avenue.

We go up to Chatham to begin leveling. Chatham station is 267.5 ft.  
above Lake Superior or 869.5' A.T.

The road crossing at NW corner Sec. 34 is 876.37 where Adams gave me  
877'. So we can use Adam's levels without correction.

#### North from Chatham

We level north from depot to crest of ridge.

Altitude at Mr. Christofsons in Chatham by front gate - 862.67

Front small gate of Exp. Farm - 862.06

Base of Weather Bureau cage - 873.53

Thermometer in box - 878.5

Bar 220' south of 1/4 post Sec. 27 and 28 - 880.8

Cut bank about 60' south of 1/4 post - 881.4 (a strong lake feature)

Beach (faint) 150' north - 895.6

Cut bank a road intersection south side east-west road - 896.4

Same altitude for storm beach 30 rods north where land drops to north 896.4. Low water beach at base of cut bank facing north is 888'.

West

Going west on Munising track. The highest Algonquin

Munising RR at line Secs. 28 and 29 is 896'

{ L.W. 890'  
H.W. 894.5'

In Chatham

The cut bluff south of cross roads in Chatham - 882'. Base of cut bluff ENE of school house - 888'. This is low water for highest shore line.

School house (?) table - 902'

Sandy sag east of school house - 895.3. Probably within reach of storm waves.

One mile south of Chatham

At beach near south end of line of Secs. 33 and 34. Storm beach (query is Leverett's) - 887.75. Sandy bar 350 paces east on town line - 897' (change hill from morainic to flat till). Weak sandy ridge possible storm beach - 890' on slope of till plain.

Steep cut bank base of steep part - 875'. The plain a few rods east is 870'+. It is likely to correspond to 882' cut bluff in Chatham. This is about 1/3 mile east from the Rock River County road.

Two miles south of Chatham

We then run east on line of Secs. 3 and 10, 2 and 11 and find the storm beach - 883'. Sag east of storm beach - 878'. Two small sandy beach lines east 879.85. The muskeg swamp near west end of line of Secs. 2 and 11 is also 879' or in harmony with highest Algonquin.

Four miles south of Chatham

We go south to line Secs. 15 and 22 and run east  $1 \frac{3}{8}$  miles to the highest Algonquin on line Secs. 14 and 23.

The altitude at SW corner of Sec. 3, 905'. We soon rise to 922-25 ft. and then begin a descent across low till swells. At the border of the old Lake Algonquin is a till ridge 25' high above low water of lake. The storm beach can be easily located here to a fraction of a foot by a sharp line along base of ridge or 3-4 ft. up from it at 877.89 ft. With low water at 874-5 ft.

Lake Algonquin limits

As a result of today's work I have learned that the highest Algonquin Lake stage did not cover the low ridges south and west of Chatham, that I had supposed were submerged. Even the ridge in the road directly west from the school house stood above the lake at storm level. It is purely a glacial feature.

The Munising RR cuts a ridge higher than Lake Algonquin just south of MP 18 and the flat land by RR crossing of wagon road in line Secs. 28 and 29 may not have been under Lake Algonquin.

We stop for the night at Limestone with a farmer in NW corner SW $\frac{1}{4}$  Sec. 27, T.45, R.21W.

Levels run near Limestone P. O.

June 28, Limestone P. O., Michigan.

The W $\frac{1}{4}$  part of Sec. 27 here is 919.81 A.T.

We level south of RR crossing about 90 rods and take top of rail at middle of wagon road - 908.9. The SW corner of Sec. 27 is 912' (Adams). The altitude given by Adams in Note Book 242, p. 50 for W $\frac{1}{4}$  post of Sec. 27 was not by the ridge in middle of road a few stops north (the esker). Top

of esker on west side of road by fence 943.3 where not cut into by road.

This is the divide between Johnson Creek a tributary of Lake Superior and Dexter Creek a tributary of Lake Michigan.

There are sharp ridges of esker from for 1 1/4 miles east along this divide. Then a plain 1/4 mile to edge of Lake Algonquin. West edge of plain is 880'.

There is a gravelly spot 25 rods east in road 875.3. One in front of Russell Johnson's house is 874'.

A sag west of it is 870'.

A storm beach shows nicely directly south of center Sec. 26 at 869.6.

An ordinary beach on its east face - 866'.

A bar in front of Elmer Anderson's on the E-W quarter line road is 867.5.

There is a bank by Charles Stevens and Elmer Anderson's barns whose base is 863'. Extreme low water.

Top of bluff - 855.7.

Base of bluff by RR 60 rods from W end line Sec.  $\frac{25}{36}$  - 828'.

RR track top of rail middle of wagon road east rail - 828.5.

Sandy bar a few rods east - 828'.

Second sand bar a few rods east - 827'.

Head of West Branch of Mud Lake - 770.1.

There is a swamp at 770-1 ft. running south to Trout Lake. Trout Lake is only 761.5 by Cleveland Cliffs Iron Co. Survey while Mud Lake is 768'. But Trout Lake is raised 6 ft. by a dam or to 767.5 so it is practically at Mud Lake level.

Near Trout Lake

Trout Lake - 761.5 ft. + 6

First strong beach west of Lake - 801 ft. + 6. A strong bar with heavy

stones on it and a sag 3-4 ft. deep back of it. Top of bluff back of this sag  $812' + 6' + 818'$ . Base of a high bluff back of this  $817.8$ . (corrected by adding  $6$  ft. =  $823.8'$ ).

There is not a well defined shore above this but a weak terrace or notch in the moraine at  $865'$  to  $866'$  at the summit on the road and just north of the road, add  $6' = 872'$ . Outwash apron Jack Pine plain at  $846'$  add  $6'$  to this =  $852'$ .

We set in leveling west of Trout Lake at 50 rods from west end of line of Secs. 1 and 12, T.44, R.21W. at base of a steep bluff. Lloyd ran hand levels to here from a slightly lower beach  $802.8 + 6$ , 80 rods east, making a rise of about  $12'$  to this place -  $815' + 6' = 821'$ . We rose only  $13'$  above the sag at section corners -  $828' + 6' = 834'$ .

At  $1/4$  post of Secs. 11 and 12 -  $825' + 6' = 831'$ .

At sag base of sandy beach center of Sec. 11 -  $823' + 6' = 829'$ .

Top of bank  $832' + 6' = 838'$ .

Base of beach -  $832' + 6' = 838'$ .

Top of sand ridge. Highest Algonquin -  $841.4'$ .

Base of cut bank -  $840.2' + 6' = 846.2$ .

Near the line of Secs. 10 and 11 in a broad swamp west edge (Algonquin) -  $841' + 6' = 847'$ . It now seems very possible that the west edge of the Jack Pine plain east of Trout Lake at  $846' + 6'$  is at this level of the highest beach or  $852'$ . (The highest Algonquin may be  $823.8$  ft. Note 1917) We go to Winters P. O. to stay overnight with John Winters, an old settler.

Levels near Winters P. O.

June 28, 1912 - Winters P. O., Michigan

We run levels east from here starting at  $881'$  at  $W\frac{1}{4}$  part Sec. 22, T.44, R.21W.

Storm Beach is  $830.67'$ . Highest Algonquin Lake W. beach is  $827.47'$ . This is 40 rods east of school house in SW part Sec. 23, T.44, R.21.



Road intersection at middle of line Secs. 26 and 35 is 816.28'. The crest in road 60 rods east is about 825'. The crest in road 60-80 rods south is 821'. We go to swamp 1/2 mile east and run hand levels back. There is a bluff 20-22' quite steep whose base is 795-800 ft. Sand ridges on its crest are fully 820'.

We go south to the RR grade in Sec. 3, T.43N., R.21W. and set in leveling at the highest Algonquin shore 1/2 mile east of the Cleveland Cliffs camp. 802' in Secs. 3, T.43, R.20 East part. We run NW to the NW corner Sec. 3, T.43, R.21 and then north to Winters P. O. at  $W\frac{1}{4}$  post of Sec. 22, T.44, R.21W.

At county line - 834.89'.

At SW corner Sec. 22. (One half mile south of Winters) - 873.3.

At  $W\frac{1}{4}$  post Sec. 22. - 881'.

At  $W\frac{1}{4}$  post Sec. 34, T.44, R.21W. - 863'.

The most remarkable descent we have found is in the 2 3/4 miles from the SW part Sec. 23, T.44, R.21 to east part Sec. 3, T.43W., where there seems to have been 10' per mile.

#### Levels north of Escanaba

June 30, 1912 - 9:00 A.M. - Flat Rock near Wells

We run levels from this bridge of Soo Line RR on Escanaba River up the valley past Groos to the highest Algonquin beach. The bridge is 634' at base of rail.

Base of steep cut bluff west of Groos, probably Battlefield beach 636'. On face of bluff is a notch for Lowest Algonquin at 665'. Top of bluff here is 684'. This is in N part Sec. 2. About 80 rods from S side Sec. 35. We pass an offshore bar of next higher Algonquin 687'. Base of cut bluff near center Sec. 35 - 694.3. The plain north of this is 719' at south edge and rises to 721' at 80 rods north by a dwelling on east side of road.

Just before reaching intersection with E-W road we cross a low sandy bar at 723.6 which is same height as the Algonquin beach 20 rods west of the road intersection. (The highest Algonquin)

The railway altitudes on the C & NW make the highest Algonquin 745' at the knolls about 1 1/2 miles south of Brampton.

Write for data on the Perkins Branch of C & NW to Chief Engineer at Chicago. Letter of July 10 from George Loughnane, District Engineer at Escanaba.

|                                       | Above<br>L. Mich. A.T.                |
|---------------------------------------|---------------------------------------|
| MP. 126 from Green Bay                | 162.32 = 744 <sub>+</sub> Algonquin   |
| MP. 127 from Green Bay                | 163.52 - 745 <sub>+</sub> = Algonquin |
| Brampton platform                     | 160.94 (track about 159')             |
| MP. 128                               | 170.53 = 752 <sub>+</sub> = Algonquin |
| Perkins station                       | 210.17 = 792                          |
| Road at line Secs. 27 and 34 at track | 190.32 = 772 <sub>+</sub>             |
| Clausen at beach (?)                  | 192.32 = 774 <sub>+</sub>             |
| Friday                                | 186.92 = 768.6                        |
| Stegoth                               | 213.92 = 795.6                        |
| Rapid River bridge by Stegoth         | 212.92 = 794.6                        |
| Osier                                 | 264.25 = 846                          |