THE GEOLOGICAL AND NATURAL HISTORY SURVEY OF MINNESOTA.
N. H. WINCHELL, STATE GEOLOGIST.

1872—1882.

THE

GEOLOGY OF MINNESOTA.

VOL I, OF THE FINAL REPORT.

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ASSISTED BY WARREN UPHAM.

SUBMITTED MARCH 10, 1882, AND PUBLISHED UNDER THE DIRECTION
OF THE HON. FRED VON BAUMBACH,
SECRETARY OF STATE.

ILLUSTRATED BY FORTY-THREE PLATES,

AND FIFTY-TWO FIGURES.

MINNEAPOLIS, MINN.
JOHNSON, SMITH & HARRISON, STATE PRINTERS.
1884.

vial clay. These bricks in the outer part of the kiln are red, and gradually change to cream-colored in the central part of the kiln, where they were subjected to greater heat, while next to the fires they are greenish yellow.

Close northeast of Le Sueur, on the terrace of modified drift next below the Le Sueur prairie, J. Wetter has made bricks ten years, averaging 100,000 per year. His clay has a thickness of five feet, and is underlain by sand, the two forming a terrace about 110 feet above the river. The sand is mixed with the clay for tempering, in the proportion of one to three. The color of these bricks is deep red.

One mile south of Waterville, on land of Thomas Slechta in section 35, a kiln of red bricks of good quality was made in 1878, at the east side of the railroad. The clay was partly taken from a railroad cut, and has a thickness of six feet free from gravel. The cost of manufacture was too great for competition with the brick-makers of Mankato and Chaska. About a mile farther south, in the north edge of Waseca county, this business has been carried on several years by David Wood, averaging about 250,000 yearly. These are excllent, red bricks, here worth $7 to $8 per thousand.

Peat. Professor Winchell's description of the peat deposits of southern Minnesota, in the second annual report of this survey, mentions two localities in Le Sueur county. A marsh crossed by the Saint Paul & Sioux City railroad in Kasota showed on the east side of the railroad, six rods from the drift bluff, good peat, 8 inches, underlain by black, sandy clay, 2 feet, with frequent shells in each of these beds. In the same marsh, west of the railroad and fifteen rods from the drift bank, the section is:

"1. Roots and stems of grass, with some peaty, vegetable decomposition..... 8 in.
2. Black, peaty mud, with a few fragments of shells and some sand.....1 ft. 4 in.
3. Black or brown mud, with sand and fragments of shells.....4 ft."

At the head of lake Emily, in the same township, on M. L. French's land, is the following section:

"1. Roots and soft, fibrous lake sediment.....1 ft.
2. Peaty lake sediment, with little or no sand.....1 ft. 6 in.
3. Peaty mud, with a little sand.....1 ft.
4. Black lake mud, sandy.....2 ft."

An analysis by Dr. P. B. Rose of the peaty deposit at lake Emily gave hygroscopic water, 9.83 per cent; ash, mostly silica, 67.17; and organic matter, 23.00. A hundred pounds of this peat, air-dried, is estimated to have the same heating power as 34 pounds of oak wood.

ABORIGINAL EARTHWORKS.

Mr. J. Blackiston of Saint Peter describes an interesting group of several aboriginal mounds, nearly round, twenty to forty feet in diameter at the base and five to ten feet high, which were situated on the bottomland of the Minnesota valley in the north part of section 4, Kasota, about four miles north of St. Peter. It is reported that in 1847 the river's channel was nearly a mile west of these mounds, but since then it has gradually worked eastward, until in the freshet of April, 1881, the portion of the bottomland where they stood was washed away. A partial excavation of some of them had disclosed numerous relics, which Mr. Blackiston has deposited in the state museum, including human bones, a silver wristlet with "Montreal" stamped upon it, tubular copper ear-pendants (one having hair in it), a string of thirty white china beads, a large brown glass bead, four common pins, a needle, a small pearl ornament, and a quartz arrow-point.*

About a mile farther east, in the N. E. ¼ of section 3, Kasota, the top of the bluff a quarter of a mile north of the railroad water-tank bears three mounds, which are respectively two and a half, three, and five feet in hight. The first and second have the usual circular, dome-like form; but the third, which is south of the others, has a truncated top, with a level, circular, narrow rim. and inside this, instead of being flat, as one expects from seeing it at a distance, there is a bowl-like hollow two feet deep. The mound appears to remain in an undisturbed condition, retaining the same form in which it was left by the builders. If it had been completed in the usual manner, its hight would be about eight feet. The bluff on whose verge these mounds are situated has an elevation of about 225 feet above the Minnesota river, and commands a very beautiful prospect, looking up the valley.

*Ninth annual report, pp. 163-4.