

State of Illinois
Dwight H. Green, Governor
Department of Registration and Education
Frank G. Thompson, Director

Division of the
S T A T E G E O L O G I C A L S U R V E Y
M. M. Leighton, Chief
Urbana, Illinois

LRF

No. 83

C I R C U L A R

June 1942

HALLOYSITE CLAY IN ILLINOIS

By

J. E. Lamar

- - - - -

Samples of clay obtained from a considerable amount of such material in the dump of a mine in the W. $\frac{1}{2}$ NE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 16, T. 12 S., R. 6 E., about two miles northwest of Raum in central Pope County, Illinois, have been identified by X-ray* and the petrographic microscope^o as composed of halloysite type clay mineral. The material in the dump is reported to have come from a deposit of the clay about 10 feet thick encountered in a shaft sunk near the northwest valley wall of Lusk Creek for the production of fluorspar and other minerals. As the shaft was filled with water, first-hand examination of the deposit was impossible.

This is the first known occurrence of any considerable thickness of halloysite clay in Illinois.

* Identification by W. F. Bradley, Illinois Geol. Survey, 1942.

^o Identification by R. E. Grim, Illinois Geol. Survey, 1942.

Halloysite clay has no extensive commercial use at the present time, probably because of the relative rarity of sizable deposits of the clay. Therefore, the presence of the clay in Illinois is at the moment largely of scientific interest. The clay does have peculiar properties, however, and it is likely that research will reveal special uses for this somewhat unusual variety of clay.

The clay in the mine dump has a waxy luster and sub-conchoidal fracture when fresh but weathers to a white mass devoid of these characters and resembling an ordinary clay. It is white to light blue in color, though locally it is stained yellow or brown by iron oxide.

The location of the deposit and the character of the clay correspond closely with the location of the old "clay diggings" near Raum and the "kaolin" they are reported to have contained. In a report dated 1866, Engelmann* describes the "diggings" in "the east part of sec. 16, T. 12 S., R. 6 E., near Lusk Creek" as follows:

"The pure portions of this clay - some of it mechanically mixed with extraneous impurities, which deteriorate its quality - are purely white or have a slightly bluish tint. It is from uneven to subconchoidal in fracture, without the least grit, unctuous to the touch and adheres vigorously to the moist tongue. When moist it is translucent, and by long exposure and working it becomes plastic, which it is not when it is newly dug.

"It is exposed on the side of the hill, about 15 feet thick; but the excavation is not sufficient to determine the true character of the deposit. Perhaps it is an altered shale of the Chester series, intercalated between the limestones, which has assumed its present condition through the same agencies which caused the mineralization of the limestones, at the time when the galena and fluorspar were deposited. . . . Perhaps, however, it is only a deposit on the side of the hill and in immediate connection with the fault which passes there through the formation."

In 1907 a later examination of what is believed to be the same deposit afforded the following data:°

The old "clay diggings" have "been abandoned for many years, but apparently once contained a deposit of considerable

* Engelmann, Henry, Geological Survey of Illinois, vol. I, p. 483, 1866.

° Purdy, Ross C., and DeWolf, F. W., Preliminary investigation of Illinois fireclays: Illinois Geol. Survey Bull. 4, pp. 172-173, 1907.

commercial value. The clay is gray, waxy or greasy, and grades abruptly from its purer form into the associated red sandy clay. No considerable quantity of the better material now remains exposed. . . . There is apparently a fault here which brings St. Louis limestone into contact with Mansfield sandstone. While the relations are obscure, the kaolin appears to occur along the fault zone, as though a decomposition product of older rocks or a secondary deposit intimately related to the faulting."

The occurrence of halloysite clay in the shaft dug recently suggests that the abandonment of the deposit sometime between 1866 and 1906 was not necessarily due to the exhaustion of the deposit. The quantity of clay remaining is not known and can probably be determined only by test-drilling or test-pitting.

The clay, as has been intimated above, probably is associated with a fault occurring at or near the deposit. There are possibilities that in other parts of Hardin and Pope counties of southern Illinois similar geologic conditions may exist and that other deposits of halloysite clay may be found in some such places.

No data are given in the reports previously cited as to the use made of the clay but it was probably used for ceramic purposes, possibly for making pottery, stoneware, or similar clay products.