
THE DEPOSITS OF GLASS SAND AT TOBOSO, OHIO.¹

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This glass sand quarry, about one half mile west of Toboso, on the Baltimore & Ohio railroad, is conveniently reached by traction line from Newark to Zanesville, leaving the car at the Black Hand station. The quarry, located in a cliff bank on the south wall of the Licking which joins the Muskingum at Zanesville, is owned by the Edward H. Everett Company of Newark, Ohio. The sand produced is used chiefly by the American Bottle Company of the same place. This company manufactures annually about 1,000,000 gross of amber and green bottles.²

The rock used here for glass sand belongs to the Black Hand formation of the Waverly series, Mississippian period. A section at the quarry, measured and described by Professor Charles S. Prosser, is as follows :

1. Presented at the Annual Meeting of the Ohio Academy of Science, Oxford, Nov. 30. 1907.

2. Figures supplied by Mr. J. M. Keckley, employed by the American Bottle Company, Newark, O.

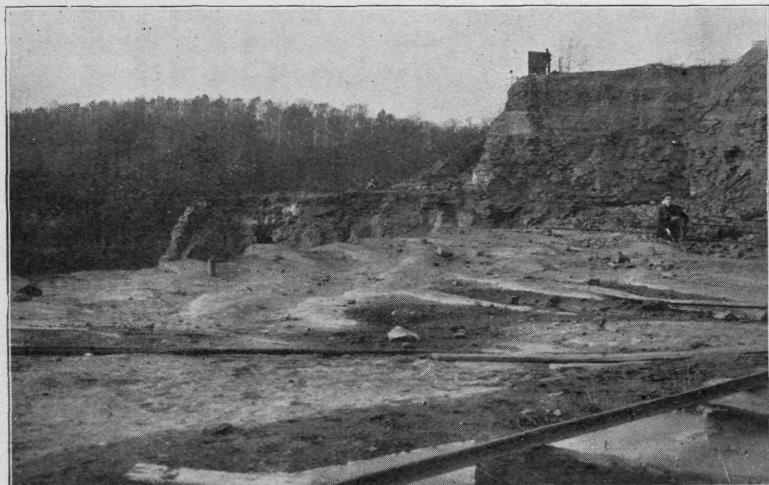


FIG. 1. The coarsely rippled surface of Conglomerate II, which caps the stone used for glass sand; above this, about twenty feet of the Logan shows.

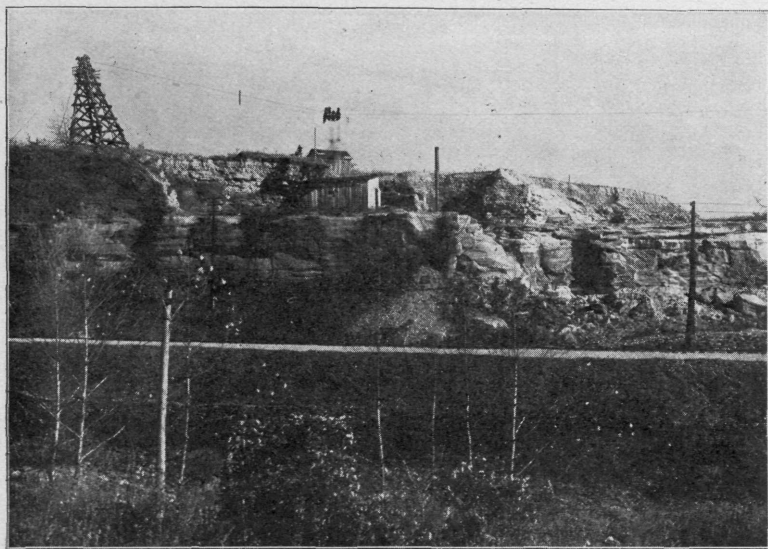


FIG. 2. View of the east end of the Everett quarries, showing the cable and conveyor; camera stands on the north bank of the Licking which flows at the foot of the retaining wall of the railroad, the Baltimore and Ohio. The prepared sand is loaded directly into the cars.

SECTION OF SOUTHERN BANK OF LICKING RIVER AT EVERETTS
AND CO'S QUARRY³.

| | Thickness Feet | Total Thickness Feet |
|---|-------------------|----------------------------|
| No. 6. Till..... | 7 | 101 |
| 5. Thin, irregular bedded, drab or bluish sandstone and bluish argillaceous shales. In places at the bottom is a 3-inch clay shale resting on the massive conglomerate with a sandstone to conglomerate layer above. Lower part of the <i>Logan sandstone</i> | 22 | 94 |
| 4. A coarse conglomerate stratum at the top of the conglomerate which in places is 11 inches thick. The top of the <i>Black Hand conglomerate</i> | 1 | 72 |
| 3. Gray to drab coarse grit, which in places is a conglomerate that is worked for glass sand. This forms the upper part of the main cliff..... | 21 | 71 |
| 2. Coarse grit and conglomerate to the base of the cliff at the Crusher..... | 16 | 50 |
| 1. Mostly covered bank below the Crusher but all in the conglomerate as shown by exposure a little farther down the river Level of Licking River..... | 34 | 34 |

The very coarse horizon, Conglomerate II⁴, No. 4 in the above section, and the erosion-remnants of the superjacent Logan sandstone (Fig. 1.) are stripped, and dumped into an abandoned water-course a few rods east of the quarry. The first mill for preparing the sand was built at the west end of the quarries; the new mill, which more than doubles the capacity of the plant, stands nearer the place where quarrying is now being done.

The stone is conveyed to the older mill by a cable (Fig. 2.) which lifts the skips from the trucks that have been pushed along temporary tracks to a point directly beneath the cable. Tracks lead to the new mill, and by raising the trucks a few feet, the stone is fed into the breaker directly from the skips. After leaving the breaker the stone passes through a Williams pulverizer, is screened, then fed into a Philip-McLearen wet pan where it passes between heavy "chasers," and is next washed by being augered through a trough against flowing water which floats off some of the aluminates. They do not dry the sand, but car it directly from the washer, or pile it for later shipment. The present daily output is about 300 tons.

3. Journal of Geology, Vol. IX (1901), p. 228.

4. C. L. Herrick, Bull. Denison University, Vol. IV (1888), p. 105.

C. S. Prosser, American Geologist, Vol. XXXIV (1904), pp. 358-60.

The analysis of two samples of this sand shows a much higher percentage of iron than is contained by the sands ordinarily used for glass:

| | 1. | 2. |
|--------------------------------------|--------|--------|
| SiO ₂ | 84.24 | 84.41 |
| Fe ₂ O ₃ | 2.88 | 2.91 |
| Al ₂ O ₃ | 7.00 | 7.15 |
| CaO | .70 | .69 |
| MgO | .47 | .38 |
| Loss on ignition | 2.29 | 2.29 |
| Alkalies, etc., undetermined | 2.42 | 2.17 |
| | 100.00 | 100.00 |

Among the undetermined elements, titanium has been detected, but no attempt has been made to ascertain its amount.¹

1. See Ernest F. Burchard, "Glass Sand Industry of Indiana, Kentucky, and Ohio," Bulletin U. S. Geological Survey, No. 315, (1906), pp. 372-373, for an earlier description of this deposit. On page 376 he gives analyses of several sands.

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