

ARCHAEOLOGICAL REPORT.

ravine a huge mass had toppled from the sides until it found its resting place exactly where the road had to go; generally such masses are "sunk" in the earth or in loose rock directly below, a hole being formed and the mass undermined until it can be pried into the hollow formed for its reception. Here it was but a few feet to bed-rock and the mass could not be disposed of in this way. No drills! no explosive! What was to be done? An Indian labourer suggested a method—a very common method, often resorted to by farmers when clearing land in stony localities he said he could dispose of it by the aid of fire and water and took the job for its removal.

First, he set a gang piling spruce tops and brushwood about the obstacle, and then felling trees from the sides of the ravine upon the whole. Another party built a temporary dam, stopping a little mountain brook and holding its flow in reserve till required. Below the dam a crude slide was built of trees, which was faced afterwards with rough boards; this was intended to direct the water upon the rock. Soon a great fire was blazing; and, all being in readiness, the dam was broken, and the flow poured down upon it. "Look out for splinters," cried the Indian. With the water doing its work for a short period, a deep sullen boom came from the overheated mass, which fell apart in three pieces of such size as enabled them to be "sunk."

The contractors for the building of a roadbed at a point in the Yellowstone Park were nonplussed by the nature of the rock found there; drills would not stand in the working, and it was by accident on this occasion that a means was discovered for the advancement of the undertaking. A fire had been built to sit by at dinner-time; after the meal, someone threw a pail of water on the flames. The water in conjunction with the heat caused the "sinter" or amorphous silica deposit to become so fractured as to suggest this action as worthy of further investigation, which finally resulted in the method being adopted for the task in hand.

To quote from Mr. Willoughby's article further, he states that: "Scores of pits are found in Licking and Coshocton Counties, Ohio, sunk into the solid rock, some of which are eighty feet in diameter and twenty feet deep. The actual area excavated cannot be less than sixty acres, and the labour would have required the united efforts of hundreds of men for many years, even if they had possessed steel tools. The best of drills must be repointed in order to penetrate this rock for six inches. Traces of fire are found in these excavations, which suggest the method probably employed in working the quarries. Fires were kindled on the rock, after which water was thrown upon it. This caused the rock to crack. Pieces were broken off with hammer stones found in the vicinity."

Here we have proof that the natives of that day knew of the fire and water process in the working of material required for their needs.

These views are not given with any desire to suggest that the laws of heat and expansion, or cold and contraction, are not fully understood. That would be ridiculous. Nor need we admit that the Indian was possessed of better reasoning power than we. We all know the consequence of pouring hot water in a cold glass; or when cold water falls upon the chimney or lantern globe. We have reversed the circumstances, but the action is the same since we have adhered to the laws of contraction and expansion.

Glass is made from several classes of quartz; pure lime and quartz sand make the glass of commerce. Quartz is an oxide of silicon. The amorphous silicon met with during the Yellowstone operations yielded to fire and water. Flint is