

model in hard wood of a coal breaker complete in all parts. Bituminous coal has been prepared in sections one foot square cut out of the principal veins of the State so as to show their total height and structure with portions of the "bed" and "top" rock *in situ*. Of these there are sixteen, some of them nine feet high. They are enclosed in glass cases for protection and preservation. Geological structure is however shown on a yet grander scale by means of an immense glass tube eighteen feet in length—a wonder in itself—filled with samples of the rock taken at intervals of one and five feet from the boring of an oil well 2300 feet deep. Each half inch of vertical height in the tube represents a stratum of five feet in thickness, the varying color of the rock bringing out the strata with great distinctness. It may be mentioned that while the petroleum exhibit is extensive, the finest oil exhibit will be the private one of the Standard Oil Co., which has erected a special building on the grounds where a model oil well and processes and products may be seen.

Slate from the great quarries of Bangor, Belfast, Pen Argyl, Danielsville, and Slatington is shown in blocks $6\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{1}{2}$ inches. Large sawn and dressed blocks are shown by the Peach Bottom Slate Producer's Association. Naturally curved slate from the Old Bangor Slate Co., of Bethlehem, is used in the construction of a slate pavilion.

Among single specimens deserving notice is a magnificent slab 16ft. 2in. in length by 6ft 9in. in breadth of a very dark marble from King of Prussia, Pa. And not the least interesting, and by no means the least beautiful are several specimens of the Siliceous oolite of this locality, a rock which has proven attractive to collectors and lapidaries.

Perhaps the most unique single exhibit is the reproduction shown by Mr. E. P. Butts, of '93, of the clay furnace used in the manufacture of iron in Western Asia, 400 B. C., by means of this crude device good grade of steel was also made from the charge of ore, limestone and charcoal. Mayhap,

away back in that early dawn when first the leathern bellows that made possible the reduction of a few wheelbarrow loads of ore was invented, some one descanted upon the ingenuity of his age. But fancy him behold his rude appliance developed into the *tuyeres* of our furnaces, mighty Vulcans breathing their heated breath into tons and tons of molten mass, and making possible the mighty industrial reactions of our day!

As has been said the effort was chiefly to represent our raw materials and then trace them through the changes they are made to undergo while being converted into forms of beauty or utility. To this end the glass and tile exhibits are particularly effective. The latter shows raw clays, ground clay with the coarser particles washed away by water, and the finer held in suspension, these dried into impalpable dust, mixed with finely divided coloring matter, and then placed in moulds with or without surface design and subjected to an enormous pressure; this latter process completing the rough tile. The glazing of tile is also exhibited.

It may be here remarked that these raw materials and half manufactured products are not beautiful objects to look at in the sense that the handsome specimens of a mineral collection are beautiful. Raw clays, calcined clays and furnace charges do not show much beauty of form. Not even the ochres, and mineral paints upon which is founded our important pigment industry display beauty of color. But the exhibit being essentially a demonstrative and educational one will richly repay those who try to appreciate it. Some of the stories it will tell to the man of affairs and the student will all be in the rhythm of industry. Not unsightly clay, but building brick, fire brick, pottery, tiles, terra cotta, beautiful porcelain, and the metal aluminium. Here is the eloquence of industrial conquest teaching that mineral wealth does not so much consist in rich lodes of gold and silver as in the commoner mine and quarry products. Though her iron, petroleum, and coal may long years hence be mined in diminishing quantity, her ledges of limestone, sandstone, redstone,