10 feet 2 inches long, 5 feet 2 inches in diameter at the large end, and 3 feet at the smaller end. The ore is fed in at the larger, and worked up to the smaller end by means of teeth 6¼ inches wide and high, set slanting. From the washer, the ore passes into a revolving screen attached to it. The meshes of this screen are 3¼ inch. The pieces which are too large to pass through this screen are sorted by hand, and the ore sent at once to the works. The silicious ore deposited by the water is reashed in the roller before being buddled. Sometimes the earthy ore occurs hard enough, and sufficiently free from sand, to dispense with washing.

The buddles used are of the regular Cornish pattern, the pulp being fed at the centre, and the discharge being on the circumference. The sand pile, when formed in the bundle, is 13 feet 8 inches in diameter, and 2 feet deep on an average, being higher in the centre, and sloping down towards the margin. Each bundle holds about fifteen tons. Sweeps, five feet in length, attached to revolving arms, push the pulp along as it runs over the conical pile already formed, serving to keep the surface in good condition, and facilitating the deposition of the particles according to their specific gravities. When a bundle is finished, the pile is divided into concentric rings. The innermost of these is regarded as ore, and, after a little more treatment, sent to the works; the next is reworked in the same bundle, and the third portion in another bundle. Keeves are also employed. These are 3 feet in diameter at the top, 2 feet at the bottom, and 3 feet deep. After stirring the ore thoroughly with water till the tub is full, it is allowed to settle, the keeve meanwhile being tapped with an iron bar.

A continuous jig is being tried for concentrating the sand. The dressed ore is transported to the smelting works, which are situated in South Bethlehem, about four miles distant, by wagons drawn by four mules each, and carrying 3½ tons.

Metallurgical Processes.—The oxidized ores used for the preparation of zinc-white generally contain about 20 per cent of zinc. Three hundred pounds of ore, mixed with one hundred and fifty pounds of pea or dust coal, are fed together through chilled-iron rollers and then on to a screen for the purpose of sizing. Fine and coarse ores are not treated together, though subjected to the same subsequent process, which consists in a volatilization of the oxide of zinc by heat, a cooling of the gases, and the collection of the zinc-white in long bags of ordinary muslin, the gaseous substances passing through the interstices in the cloth.

The furnaces are of two kinds, single and double. The former are charged only at one end, and only hold a little over a third of the charge of the latter, which are provided with a working door at either end. The single furnaces are 5 feet long and 3 feet wide, covered with an arch of firebrick, which, at the centre, is three feet above the hearth. The opening into the flue is 18 inches square, and the hearth consists of an iron grate made of heavy rolled iron, with perforations to allow the air to pass through. The front opening or charging door is three feet long, and arched so as to be one foot high at the centre. These furnaces cost about $150, and are charged with 240 lbs. of ore, 120 lbs. of coal, and 100 lbs. of pea coal as a bed. The double furnaces have an opening 30 inches square into the main flue, and are provided with grates, of similar construction to those used in the small furnaces, 16 feet long by 5 feet wide. The working doors are of the same dimensions as those of the small furnaces. The walls are all of firebrick, 8 inches thick, and last about eight years without repairs. The double furnaces are charged with 640 lbs. of ore, 320 of coal, 240 of pea coal as bedding. No fluxes are added, the object being to keep the charge from becoming impervious to the blast, which is furnished by four fan-blowers.

The process lasts four hours for each charge, and considerable attention, on the part of the workmen, is necessary to keep the cinder porous and avoid the cooling of the fire by an excess of blast. Each workman has four furnaces under his care, and cleans and charges one each hour.

The oxide vapor passes from the furnaces along a conducting channel over a sheet of water, into a cooling tower 75 feet high and 80 feet in circumference at the base. Much of the damp, impure oxide settles in this