

body known as quick lime. When in this condition its properties are rather remarkable. It unites with water so powerfully as to cause it to boil, and it takes up carbonic acid from the air with avidity. It will also unite, but very slowly, with silica, sand or quartz. These properties conspire to make quick lime one of the most useful substances, for, in consequence, it becomes possible to make mortars and cements, which are indispensable in the arts. Quick lime is the oxide of calcium; slaked lime is quick lime combined with water, forming, in chemical language, a hydrate. Slaked lime, spread as a mortar upon the walls of a dwelling, or in the interstices of brick work, loses its surplus water, retaining a definite quantity, and absorbs carbonic acid from the atmosphere, and thus hardens or "sets." Sand is added primarily for the purpose of affording numerous centers of attraction, around which the neighboring particles of lime are grouped, whereby large and widely extended cracks are prevented.

The operation of freeing the limestone from its carbonic acid is performed simply by raising it to a light red heat, which is sufficient to drive off the volatile gas. Theoretically, there is forty-four per cent. of carbonic acid and fifty-six per cent. of lime in limestone, but this purity is never reached in nature. The purest possible limestone is white marble, like that of Carrara and the ancient Mount Pentelicus, of which statues are made; but even these are not entirely pure. The Portland Lime and Cement Company's supply is of rather uncommon purity, and contains about nine-tenths carbonate of lime. The remaining constituents are not injurious to the quality or strength of the lime. I spoke of the process of burning, to which the limestone is subjected. If we examine the kilns, we will find that the method, though simple in itself, has yet

required the expenditure of a great deal of ingenuity. The objects in view, of course, are to economize labor, fuel and time. The large stacks of boiler plate are lined with fire brick, to withstand the high degree of temperature to which the inner surface is subjected, and have the appearance, from the top, of wells, being vertical cylindrical shafts, twenty-five or more feet deep. At the bottom there is a passage for discharging the finished product; opening into the chamber near the base are three fire-places, which supply the necessary heat. Wood is the fuel, and something in excess of a cord each day is consumed in each fire-place, the highly heated gaseous products of combustion passing into the shaft and circulating among and heating the fragments of limestone. A ton of limestone will produce six barrels of lime, containing two hundred and twenty pounds per barrel, as put up at these works, instead of the ordinary weight of two hundred pounds, as elsewhere.

Although people speak of "burning" lime, it is easily seen that the word is a misnomer, for the lime does not burn in the least. It neither takes fire nor is otherwise consumed. We may the more plausibly take exceptions to that word, as used in this connection, as there is an excellent and expressive one which meets the case exactly. It is "calcine," which is derived from *calx*, the Latin name for lime.

Abundant supplies of pure and easily accessible carbonate of lime are very valuable sources of wealth to a country. Thus far limestone has not been found to exist as abundantly as could be wished in Oregon. The only source at present easily available in Oregon, is the quarry near Gold Hill, in Jackson county, from which the company in this city derives its supply. It there exists in immense quantities, and is considerably better than the average for purity. Analysis