

THESIS.

Subject, Lime-Kiln

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First let us see what the word "lime-kiln" means. Kiln is a name given to various kinds of furnaces or ovens, constructed of brick or stone, in which a high heat can be applied to bodies for the purpose of drying, baking, or charring them, and lime-kiln one from which lime is produced.

The best kiln is one in which the intensity of heat can be produced and kept under the most perfect control at the least expense for fuel. There are two kinds of lime-kilns, intermittent and continuous. The simple upright kiln for burning lime with wood-fuel may be taken as an example of the former in which the fire is allowed to go out after each burning. The latter is one which can be burned but once because all the



material used in the kiln is converted into lime.

Let us go into detail about each. First we will take up the intermittent kiln. This kiln is built of brick or masonry with a brick lining. On the inside it is circular in the horizontal section. A kiln of ten to eleven feet in the largest diameter, may be about twenty-five to twenty-eight feet high and from five to six feet in diameter at the top and seven to eight feet at the bottom. On one side at the bottom is an arched opening five or six feet high through which wood is put and the burnt lime is removed. In charging, the largest pieces of stone to be burnt are first selected, and formed into a rough, dome-like arch, rising

about five or six feet. Above this arch the kiln is filled from the top, taking the larger stones for the lower layers and topping off with those that are smaller. When starting a fire under the dome, the heat should be raised gradually to the required degree, in order to prevent a sudden expansion of the stone forming the dome, which might either cause a downfall of the entire mass above, or choke the draught by the stone breaking up into numerous fragments. After the heat is once reached through the mass of stone, it should be maintained to the end of the burning.

One great defect in intermittent kilns is the enormous waste of heat which takes place



at each burning, for the quantity of fuel expended in raising the contents of the kiln, to the degree of heat necessary to burn lime.

These kilns are usually located on a hill-side, so that the top is easily accessible for charging the kiln, and the bottom for supplying fuel and drawing out the lime.

Intermittent bell-shaped kilns, using gas, coke, or coal for fuel, are extensively employed in Great Britain, France, <sup>and</sup> Germany.

The continuous lime-kiln is always built in a level place. First a layer of wood or rails is laid. Then across this layer, two or more flues, according to the size of the kiln, are laid; at the

middle of each flue a smoke-stack is erected; next a layer of coal, then stone, and so on in alternate layers until it is the required size. The kiln is now ready for burning. It is started by dropping some hot coals down the stacks. These kilns are oval shape and are larger at the bottom than at the top. Sometimes they are square.

A good kiln of this example was burned near my home last fall. This kiln was forty feet long and twenty feet wide. It contained seven cords of wood, eighty perches of limestone, and one thousand bushels of coal. It produced two thousand bushels of lime. The burning lasted seven weeks. Lime produced in these



kilns is called commercial-lime and is far from being pure.

Lime has been used for many centuries as a means of increasing the fertility of land. All crops require a certain amount of it. It promotes the decomposition of all kinds of vegetable matter in the soil and in the decomposition of certain salts whose bases form the food of plants. On certain kinds of land, the finer grasses do not thrive until the land has been limed.

The great consumption of lime is in the production of mortar, and for this purpose it has been used in

construction by all modern  
as well as the most ancient  
nations. It was used many  
centuries ago by the Greeks,  
Hebrews, Egyptians and  
Romans.