

of a suitable agitation, or by forcing air through a pipe to the bottom of the cask. After rousing the contents for about five minutes, there is thrust into the cask containing the petroleum and acid about two pounds of scraps or filings of iron, which should be previously moistened with water. The iron coming in contact with the acid, nitrous gas is generated, and, by saturating the petroleum, deodorization is effected. Should the deodorization be not thoroughly complete, the contents are again roused, more acid and iron being added until the object is accomplished. The petroleum or other products, while being subjected to the above treatment, and previous to distillation, should have the acid wholly removed or neutralized by decantation and washing with suitable alkaline substances, or by the addition and subsequent agitation of fresh slacked lime, in the proportion of 6 lbs of lime to 40 gallons of petroleum. After distillation, the oil is sometimes again submitted to the action of nitrous gas.

THE CHARACTER OF GOOD LIME MORTAR.

I.—*Its Constituents.* These, it is well known, are sand and lime. A word should be said upon each.

1st. *Sand*, as generally found, is silex—in other words, finely broken flint stone. It is found in beds, where it has been deposited by natural causes, Silex is one of the hardest and most indestructible of minerals. The sand of some beds appears under the microscope, very smooth, as though the particles had been recently rolled about in water. In other beds it is rough and angular. This last is the best for mortar, and is called *sharp sand*. The cleaner sand is, the better, since clay or muck mixed with it unfits it to combine closely with lime. Its sharpness moreover enables it to adhere to the lime more firmly.

2nd. *Lime.* Solid limestone rock makes a very durable material for building. But if we use blocks of it, or of rough stone or brick, we need something to cement the separate pieces together, so as to give firmness and beauty to the work. For this purpose we use lime and sand mortar more commonly than anything else. Pulverized limestone would not do this. We therefore burn the lime; this drives off the carbonic acid, which had before constituted the particles of lime into a solid rock. Adding water to freshly burnt lime, in the proportion of about one part of water to three of lime, slakes it, so that it falls into a fine powder, called hydrate of lime. This hydrate of lime very readily absorbs carbonic acid, and returns to a condition resembling pulverized limestone, when it is entirely unfit for mortar. Lime should therefore be used soon after being slaked.

II.—*The Preparation of Mortar.*

1st. Sharp, clean sand and fresh burnt lime being at hand, the first question is the proportion of each.

2nd. The principle here involved is that no more lime should be used than is just sufficient to cement the single particles of sand into a solid mass. Mortar which is thus proportioned will grow hard quicker, and cause brick or stone work to stand firmer than that which has a larger proportion of lime.

3rd. The reason is obvious. Mortar (beyond its mere drying in the air) hardens by the re-absorption of carbonic acid into the solid mass, where it gradually reaches each particle of lime, converting it into limestone. Well-made mortar, properly hardened by time, thus becomes a sort of silicated limestone. The mortar as it dries rapidly, becomes porous to the extent that it was once filled with water. The gradual absorption of carbonic acid by the lime, fills up these pores, constituting the whole into a sort of stone, as already observed. A native of Prussia once informed me that some old fortress, built by the old knights of St. John, at the city of Thorn, presents this singular spectacle. The bricks of which they are built have gradually disintegrated, especially at the corners, leaving the mortar like a honeycomb of rock, and so firm that persons are able to climb up by the insertion of the fingers and toes in the interstices once occupied by the bricks.

Poor mortar, as the masons sometimes call it, thus makes the firmest work, if the whole be done with care.

4th. Of the mixing of mortar, but a word need to be said. If the foregoing principles are correct, the mixing should be very thorough. It should be worked over and over again with the hoe, crin or mortar mill, so that each particle of sand may be brought into contact with its necessary surrounding of lime.

May it not be inferred also that no more mortar should be put between well faced stone and brick than is just sufficient to make them adhere, since a small portion will more readily harden by the absorption of carbonic acid than a large one.

Where lime is cheap, and there is no great need of firmness and durability in the structure which is being erected, lime may be used more freely, the mortar made more hastily, and the sand be less select than above directed. A large proportion of lime constitutes a mortar that is readily used, even when made in a very hasty manner.

The record of falling buildings shows, alas! that too many have been built under the spur of cheapness and haste, with the risk of the durability of the structure and the life of its occupants.—*C. E. Goodrich in Country Gentleman.*

Miscellaneous.

USEFUL RECIPES.

Dying of Woollen Stuffs.

(Continued from page 188.)

10. *Yellow.*—Work for twenty minutes in a bath with eight ounces of tartar, eight ounces of alum; lift and add to the bath two pounds of bark, eight ounces of sumach, eight ounces of fustic, one pint of red spirits; work in this for forty minutes; wash out and dry.

11. *Orange.*—Work for forty minutes in a bath with two pounds of sumach, three ounces of Cochineal dry, one pound of fustic, eight ounces of tartar, one pint of red spirits; wash out this, and dry.

12. *Sky-blue.*—Work in a bath for half an hour with eight ounces of argol, one pound of alum, one gill of indigo extract; wash out this, and dry.