farmers, Department. Patent Office Report, 1858. Calcareous Manures. (CONTINUED.)

BI-CARBONATE OF LIME.

Lime is sometimes combined with a double proportion of carbonic acid gas, in which state it is called a bicarbonate, and to a certain extent is readily soluble in water. Hence, springs are often impregnated with it, and the waters that gush from fissures in lime rocks, distribute it thro' the soil in their neighborhood, which is a mode Nature very frequently ado, ts in fertilizing the earth. Here let it be remembered that carbonate of lime, though insoluble in pure water, may be dissolved to a considerable extent in that which is impregnated with carbonic acid gas; and that, when it holds lime in this way, and is exposed to the air for a length of the increased and increasing demand time, or is heated over the fire, the for fuel, I would offer one that was lime will again separate from it more invented by our distinguishel counor less completely. In this manner stalactites are formed in caves ; substances are petrified in lakes and streams; beds of marl, in some cases, are produced; drains are often choked up with lime; and crusts are provements or alterations as may deposited at the bottoms of kettles and steam-boilers.

Limestones, however, are seldom pure. They always contain a considerable quantity of other earthy matter, chiefly silica, alumina, magnesia, and oxyd of iron, with a trace of phosphate of lime, sometimes of and other organic remains. In limeity, it may amount to 12 or 20 per are met with in which the proportion of lime is so sn.all, that they will not burn into agricultural or ordinary building lime, refusing to slake, or water. contain a less amount of lime in prostone from which it has been burned

When the carbonate of lime, which is contained in marble, common limestone, or in the shells of oysters and other shell fish, is exposed to a high temperature, in the open air, the carbonic acid they hold, in combination with other ingredients, is driven off by the heat, and the lime remains behind in a caustic state. They are decomposed more readily when a current of moist air is allowed to pass through the burning mass. Hence on a large scale, this process is performed in kilns. A ton (2,000 lbs.,) of good limestone yields 1,126 lbs. of caustic lime, the weight of which per bushel varies with the kind of stone employed, and with the manner in which it is burned. In some varieties of lime. a bushel does not weigh more than 75 pounds; while in othit should be bought and applied by At the bottom of the kiln, there is weight.

tom of large kilns, two or more open-AMERICAN CITIZEN ings are made for admitting the air Job PrintingOffice! necessary for supplying oxygen to the fire, and for dragging out the lime after it is burned. Lime-kilns may be built either of stone or brick; but the latter are

considered preferable, particularly for the inside lining, as they are better adapted to stand a high degree of hea'. They should always be situated at, or near, the quarry, and if possible, in the side of a cliff, or bank; or they may be furnished with a "ramp," or inclined plane of earth or stone, for carting up the fuel and lime-stone to their tops.

As the improvement of kilns is a matter of great national importance, especially since the use of lime as a manure has become so general, and more particularly so as the price of it is every day increasing, owing to tryman Benjamin Thomas, (Count Rumford,) and erected at Dublin, in Ireland. which, as far as is known, answered the Count's expectations, with a view of suggesting such imtend to bring it, or something resem-

bling it, into general use. In order that the inventor's ideas of what he calls a "perpetual" kiln may be clearly understood, I will give a description of it. The objects which he had in view were, first, to cause the fuel to burn in such a manner as to con potash and soda, and often of animal sume the smoke, which was effected by obliging it to descend and pass stones of the best quality, the foreign through the fire, in order that as earthy matter, or impurity, does not much heat as possible might be genexceed 5 per cent. of the whole, while erated. Secondly, to cause the flame it is often much less. The chalk and and hot vapor, which rise from the mountain limestones are generally of fire, to come in contact with the limethis kind. In those of inferior qual- stone by a very large surface, in order to economize the heat, and precent. ; while many calcareous beds vent its going off into the atmosphere, which was done by making the body of the kiln in the form of a hollow, trunca ed cone, and very high in proportion to its diameter ; nnd by fillfall to powder, when moistened with ing it up quite to the top with lime Quicklime, of course, will stone, the fire being made to enter near the bottom of the cone. Thirdly, portion to the superiority of the lime. to make the process of burning lime perpetual, in order to prevent the waste of heat, which unavoidably at-

tends the cooling of the kiln in emp tying and filling it, when to perform that operation it is necessary to put out the fire. And fourthly, to contrive matters so that the lime in which the process of burning is just finished, and which, of course, is still in tensely hot, may, in cooling, be made to give off its caloric in such a man ner as to assist in beating the fresh THOS. ROBINSON. quantity of limestone, with which the kiln is replenished, as often as a por tion of lime is taken out of it.

To effect those purposes, the fuel is not mixed with the limestone, but is burned in a close fire-place, which opens into one side of the kiln, some distance above the bottom of it. For large kilns, on these principles, there may be several fire-places, all opening ers, it will weigh nearly or quite 100 into the same cone, and situated on ATTORNEYS' AT LAW pounds. This difference shows how different sides of it, which fire-places uncertain the quantity of lime ap. may be constructed and regulated plied to the land may be when it is like those of the furnaces used for estimated by the bushel. Therefore burning porcelain or earthen-ware.

a docr, which is occasionally opened The following table by professor to take out the lime. When, in con-Johnston exhibits the chemical chan- sequence of a portion of lime being ges which a ton (2,240 pounds) of drawn out of the kiln, its contents pure limestone undergoes, and the relative proportion in which the several compounds exist in it after it which is occasioned by the removal of has been burne l, slaked, and then ex- the burned lime, is immediately filled posed to the air, or mixed with the up with fresh stone. As soon as a

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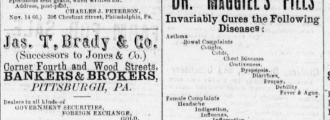
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