

In the best cultivated counties in Scotland lime is most generally laid on finely pulverised land, while under a fallow, or, immediately after being sown with turnips. In the latter case, the lime is uniformly mild: in the former, quick lime, as pernicious (in a certain extent) to vegetation, may be beneficial in destroying weeds, and the turnip fly. Sometimes mild lime is applied in the spring to lands and harrowed in with grass-seeds, instead of being covered with the plough: this has been particularly beneficial upon hill pastures. In some places lime is spread on grass lands a year or more before it is ploughed, with decided benefit to the pasture and to the subsequent crop. But in whatever manner this powerful stimulant is applied, the soil should never be afterwards exhausted by a succession of grain bearing crops, a justly exploded practice, which has reduced some naturally fertile tracts to a state of almost irremediable sterility.

We shall conclude this important subject in our next number with a few remarks upon the quality and some further observations upon the quantity of lime. We may here observe that we have condensed the preceding remarks from Reid's practical chemistry, from Fife's and Ure's chemistry, from the volume "British husbandry in the library of useful knowledge," and from Jackson, so that our readers have the latest and best authorities upon this subject, which we particularly urge upon the attention of our farmers, for we are convinced that too many of them are unacquainted with the value of lime, as one of the most useful and powerful agents in agriculture.

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#### AGRICULTURAL CHEMISTRY.

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THE reciprocity between the animal and vegetable kingdoms in contributing to preserve a healthy state of the atmosphere, is one among the unnumbered instances of omnipotent in-

telligence. The study of it must interest, and the contemplation of it excite our admiration. The untutored Indian "sees God in winds and hears him in the clouds;" the mighty tempest and the rolling thunder proclaim the power of Deity; but the natural philosopher recognises equally the Omnipotence and the Omniscience of the Creator in the economy of nature—in that wonderful arrangement, which produces an astonishing variety out of a few constituent principles, and manifests Supreme wisdom in the harmony that characterises them. There is a reciprocal dependence between man, and the grass to which he is compared. The one wants oxygen, and the other requires carbonic acid, the former throws out carbonic acid, and the latter, in return, furnishes oxygen for the former.

From the experiments of physiologists, it appears that about 40 cubic inches of air enter the lungs of a man at each ordinary inspiration in a healthy person, and allowing 20 inspirations a minute, 1,152,000 cubic inches, or 666½ cubic feet are inspired daily. The ordinary inspirations and expirations of health are about 18 a minute, and generally once for every four pulsations of the heart, making the standard pulse about 72. The entire quantity of air contained in the lungs, when filled by inspiration, is not expelled by every expiration; a portion remains in the minute air vesicles. It is supposed that not less than 280 cubic inches remain in the lungs at each expiration, and that about one eighth part of air contained in the lungs is changed by each respiratory act. The change produced on the blood by respiration is the conversion of venous into arterial blood. The change upon the respired air is a loss of bulk, the loss of oxygen, and the formation of a greater or less quantity of carbonic acid, or, the absorption of oxygen and the evolution of carbon. The azote of the atmospheric air appears but little altered in quantity. The proportion of carbonic acid form-