

fiting the crops, and thus also larger applications are rendered necessary.

If the soil be a stiff clay as well as full of water, then larger doses still be required; and if it be also marshy, and therefore abound in vegetable matter, very large applications of lime must be laid on, in order to obtain the full benefits it is capable of producing.

3°. *The kind of cropping* is also of consequence. Green crops are benefited by larger doses of lime than crops of corn. In reclaiming boggy land it has been observed, that while the addition of above a certain quantity of lime lessened the after-crop of oats, a turnip or potato crop, if taken first was excellent in proportion to the quantity of lime applied. A similar remark applies to the ploughing up of lea. If corn is to be taken, the liming may be postponed, but, for a green crop, lime will generally be advantageous. By land which is lying in grass, less lime will usually be required in the same number of years, than by an equal extent in arable culture. Much, however, will depend upon the way in which the grass land is treated; and if it is cut for hay, more of course of everything, and of lime among the rest, will be required than when it is kept in permanent pasture.

4°. *The kind of husbandry followed.*—An improving husbandry, for example, will call for larger applications of lime. If, as means of improvement, the land be ploughed deeper, the lime will be diffused through a greater body of soil, and should therefore be present in greater quantity. Or if the land be drained and sub-soil-ploughed, with the view of removing noxious matters from the deeper soil, and of allowing the roots to descend, a more abundant liming may in the first instance be required—since it is desirable that some of it should find its way into the under soil, to aid in preparing it for the safe descent of the roots of the growing crops.

5°. *The form in which the lime already present, exists in the soil* is also a matter of much importance. The soil may contain 6 or even 10 per cent of lime in the state of silicate, and yet pay for the addition of a considerable first dose of *quick-lime*, because this silicate must itself undergo decomposition, through the joint action of air and moisture, before it can produce the good effects which follow from the use of lime. A reasonable per centage of gypsum may also be present, and yet the land may pay for liming; because the gypsum is not fitted to perform all the functions of quicklime, or of carbonate of quicklime, or of carbonate of lime in the soil. In this latter case, however, much will depend on the nature of the soil itself, on the kind of manure applied to it, and on the circumstances in which it is placed—points to which I may hereafter have an opportunity of adverting.

6°. *If the land has been previously limed*, a larger quantity is believed to be necessary to produce an equal sensible effect compared with that

produced by the first addition. This may arise from several causes.

a. If the land be nearly destitute of lime when the first application is made, a very remarkable effect will necessarily be produced, since a certain proportion is necessary to the ordinary fertility of the land.

On a second and third application, the land already contains more lime than at first; and therefore a larger quantity must be added if it is to come in contact with as many particles of soil on which it can act, as the first lime readily reached.

b. For instance, the whole quantity of that kind upon which it can readily act, may be less than it was on the first application; and hence the lime must be diffused through it in larger proportion, if it is to be brought in contact with as much of this vegetable matter, and produce as great a sensible effect as at first.

c. But the good farmer will not often expect to see upon his old-cultivated land a sensible effect produced by lime equal to that which is seen when it is newly brought into arable cultivation; the addition of lime from time to time, in good husbandry, being made rather to keep up the existing condition of a productive soil, than to add materially to its actual fertility. This point will be more fully discussed in a succeeding article.

7°. *The geological character and structure of a country* have also much influence upon the quantity of lime which its soils require; but this point is of so much interest and importance that it will be better to consider it in a separate section.—*Johnson's Treatise on Lime.*

THE HONEY BEE.

The Collateral hive differs in appearance from the bar hive; still the principle, though less simple, and not so certain, is in reality the same—that is, the honey is obtained from the ends or sides of the hive. It consists of three-wooden boxes, made of good one-inch deal, about ten or eleven inches inside measure, nicely fitted together, placed on a level floor three feet from the ground, and sheltered from the weather and hot sunshine. At the back of each square box is inserted a small pane of glass, covered by a door. The entrance is at the bottom of the centre one. On some there is a bell-glass on the top of the centre box, with a movable cover. A swarm is put into the centre box, and when more room is required, the bees are allowed to enter one of the side boxes, by drawing up the slide which separates it from the central box. This additional space is supposed to prevent swarming, but it seldom does. If they do not swarm, and the season and pasturage are good, the bees may fill the other box and also the glass at the top. The amount of produce will thus be equal to that of three.