

reference to the fertility of the land. Clay is chiefly composed of **silicate of alumina**, that is to say, silica combined with alumina. The fertility of clay, however, is very largely dependent upon the presence of a peculiar form of silicate of alumina, which demands special notice.

24. Some few years since Professor Way carried out an investigation into the character of the silicates of alumina, and disclosed truths of immense importance which have not been generally understood, and consequently have not been taken advantage of. He showed the existence of a class of bodies which are termed **double silicates**. These were silicates of alumina in which part of the alumina had been replaced by an equivalent quantity of some other substance, such as lime, soda, potash or ammonia. Thus we have these double silicates in soils as silicate of alumina and lime, as silicate of alumina and soda, as silicate of alumina and potash, or as silicate of alumina and ammonia. These substances will hereafter be seen to be exceedingly important, and a familiar acquaintance with them is most desirable.

The **Alumina** also possesses in one respect an exceptional character. Whilst it is most valuable in assisting other bodies to enter into the crops growing upon the land, it appears to act rather as an "out-of-door servant," carefully avoiding going into the plant.

25. **Phosphoric acid** is by general consent considered as one of the most important substances found in the soil. Its influence upon the fertility of the land is very great, for every cultivated plant requires a supply for its successful growth. In combination with lime it forms a large portion of the skeletons of animals, and the demand which cultivated plants thus make upon the soil for phosphoric acid enables them more perfectly to supply the requirements of the animals by which these are afterwards used in food. A supply of phosphoric acid in the soil is therefore of very great