

which are those germs which cause zymotic diseases. There are beneficial and injurious bacteria. They belong to a very low order of plants known as the fungi. They lack green colouring matter and are microscopic in size.

*By Mr. Pridham:*

Q. Have you ever tried experiments with buckwheat for fertilizers?—A. Buckwheat can only take nitrogen from the soil like other plants, but it is easily grown. A crop of it ploughed under returns to the soil plant food in a condition more or less assimilated for future crops. You have, so to speak, partially digested it. It adds humus-forming material to the soil, which is an important factor in soil fertility. There are several ways in which this green manuring may be done profitably. If the soil is exceedingly sandy the nitrogen-collecting crop, previously manured, if possible, with potash and phosphoric acid fertilizers, may be turned under just after flowering and while yet still green. If clover is used, the first crop may be fed and the second growth ploughed under. However, in the majority of instances, the more economical and profitable method will be to use the legumes as soiling crops, as in this way we obtain highly nutritious food very cheaply—food that will allow us to diminish the grain ration of the cattle, and at the same time to replace on the soil from 75 to 85 per cent of all the plant food in the crop. I think we should draw the attention of our farmers to the importance of this question, and to the necessity of endeavouring to increase the fertility of their soils by growing more of these leguminous crops. In this way, we may cheaply obtain the most costly element in both plant and animal food, and at the same time, permanently improve the condition of our soils.

*By Mr. McMillan:*

Q. Do you think that they would be of more value acre for acre, where a good crop of corn can be raised? Which crop can we raise the greatest quantity of?—A. We have to look at this matter from several standpoints. In comparing clover with Indian corn, we can obtain a much larger yield from the latter crop. In the case of grasses, however, that ratio is altered. We obtain not only richer food through the legumes, but we also obtain a larger yield per acre. I am advocating a more extensive growth of legumes, but in doing so I am not in any way speaking disparagingly of Indian corn. On former occasions, I have gone into the question of the growing of corn very fully, and pointed out to this committee that it is our chief and most important fodder crop in this country. It is of inestimable value for dairy purposes and the one plant which has made winter dairying possible, but at the same time we have to recognize this fact, that the Indian corn plant takes from the soil those three essentials of plant food which I have already mentioned, in considerable quantities. The growth of Indian corn does by its proper culture, improve the tilth of the soil, still it cannot utilize the free nitrogen of the air to make its albuminoids from, nor can it add plant food to the soil. In the growth of the legumes, we have, on the contrary, a valuable fodder produced cheaply, in addition to the nitrogen stored in the roots, which may be used by the future crops.

*By Mr. Carpenter:*

Q. Would you recommend the growing of pease in an apple orchard?—A. A great deal would depend on the character of the soil. If you wish to improve the tilth, that is to say, if the soil is deficient in humus as well as to supply nitrogen; if it were a light porous soil it would be well to turn in a crop of clover or pease, and in that way increase the amount of plant food and the capacity of the soil for moisture. I do not think it is advised, however, by the best authorities, to grow a crop in the orchard if the soil is fairly good, because it is looked upon, generally, that the trees require all the ground available to furnish them their plant food. In the second place, in doing so, you would add nitrogen, which is not the most essential fertilizer for orchards. At the same time that such a crop is grown there should be added some wood ashes or some other form of potash.