

have here a sufficiently difficult problem to solve, and we trust that soon a laboratory attached to the tobacco division will enable us to arrive at definite conclusions.

Besides the chemical theories that we have just received, we should also take into consideration reasons connected with the climate and agricultural conditions generally. With regard to the climate it is clear that Canada, owing to the length of its winter, and the almost complete absence of any between season, is not particularly favoured. Autumn cultivation is sometimes difficult, and one is often obliged to wait long before entering upon the spring cultivation, for the melting of the snow and the rainy season which follows, render the fields unworkable. But up to a certain point the activity and zeal of the planters as well as the beautiful summer compensate for the unfavourable climatic conditions, and therefore we are not really faced with any very serious difficulty. From the agricultural point of view, arable cultivation and especially ploughing is of the first importance. Thus if the arable bed is not thick enough it causes sterility of the soil. In fact it is the deep soil that best secures the great reserve of humidity which is essential to tobacco. This humidity, so preserved, rises by capillarity to the surface. Thin layers on the contrary soon dry and are subjected to quick alterations of temperature. For soils that are not deep the carting of earth to increase the thickness of the arable bed is recommended as also is subsoil ploughing when the nature of the subsoil allows it. In the event of this last operation the deepest ploughing must be commenced before the winter, and the depth of the subsequent ploughings must be gradually lessened in order to render the soil sufficiently light for tobacco. When possible one may utilize the proximity of a stream in order to increase the thickness of the arable bed by temporary irrigation. Unfortunately the operations of warping are rarely possible in our country, and moreover they would hardly be practicable for the plant with which we are concerned.

An excess of water is also a cause of sterility. In this case indeed nitrifying bacteria deprived of oxygen, die asphyxiated and cannot consequently fulfil their important function of nitrification, so that the nitrogenous material remains inert.

Lastly, if an excess of lime is frequently detrimental, the absence of this substance is always a cause of sterility. A considerable accumulation of humus indicates the absence of lime. We have already seen the important rôle that lime plays not only as an agent of saturation and assimilation of potash, but also as a cause of reversion. It will therefore be unnecessary to dwell any longer upon its action.

Here we leave our study of the causes which we believe explain partly the stationary condition and even the diminution of yield. For every defect the remedies proposed, and which at first sight seem to be the right ones, have appeared to us to be either inefficacious or impracticable. Does this mean that such a state of things cannot be remedied? Really the problem may be stated thus: How to obtain good yields of tobacco by a powerful yet gradual enrichment of the soil by humus, and to re-establish a due proportion of nutritive constituents whilst obtaining from the soil meanwhile all that it can give. Possibly the study of a rational system of rotation will furnish the solution of the problem.

The rotation we recommend is a triennial one as follows:—

- (1) Tobacco.
- (2) A cereal.
- (3) Clover.