

One of our daily papers goes on to speak as follows : "Although much has been done, the Dominion is just beginning its career as one of the great granaries, orchards and dairy farms of the Empire. Canadians are concerned with only one market; they concentrate all their efforts to secure our patronage. As a mere example of beneficent government assistance, the system of agricultural education followed is a great achievement; as a piece of organism it is marvellous, as we have this immense territory, with its scattered population knit together with a series of links which establishes complete connection between the producer in the far North-west and the consumer in England with the fewest possible intermediaries; not less significant is the effect of all this in cementing the commercial bond between the motherland and her premier colony, and in increasing our common interests."

I will only add one thing to all that Professor Robertson has been saying (although I know the lesson implied thereby is already being enforced by the various agricultural experts in Canada), and that is, that to secure, and to retain, our market—a great and growing one—the great point to be arrived at is *quality*. If that be good, and if farmers are content to take a moderate profit for their wares, they will not be disappointed in achieving pecuniary success—the end of all their strivings.—*Farming*.

NOTES ON RECENT AGRICULTURAL CHEMICAL RESEARCH

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The nature of the micro-organic life infesting horse manure, as also the functions performed by these minute forms of life, in its disintegration and decomposition, have recently formed the subject of investigation by Professor Severin in Russia. During the course of these investigations the experimenter succeeded in isolating no fewer than twenty-six different species of bacterial life from horse manure, of which twenty-four were aerobic (*i.e.*, requiring the presence of air for their development), while only two were anaerobic (*i.e.*, developing in the absence of air). Of the two anaerobic varieties, one proved to be that giving rise to tetanus or lockjaw. Experiments were also simultaneously pursued with regard to the nature

of the influences at work in the decomposition of the manure. In one experiment the manure was allowed to decompose under the influence of the air alone, and with the exclusion of bacterial life; while in another the decomposition was allowed to proceed with both agencies at work—*viz.*, the presence of air and also of micro-organic life. From the results Professor Severin concluded that the decomposition of the manure was almost entirely due to the agency of bacteria, and was only to a very slight extent influenced by the direct oxidising action of the air. By raising the temperature sufficiently high to retard the action of the bacteria, the purely chemical oxidising influence of the air was only increased three and a-half times, while, on the other hand, the decomposition due to the germ life was decreased to the extent of seven and a-half times.

The results of Professor Déherain's examination of the drainage waters from the soils of the experimental station at Grignon have recently been published; and it may be well to cite one or two of the more outstanding of these. During wet years, the amount of nitric nitrogen in the drainage water from uncropped fallow soil was found to amount to as much as 180 lb. (equal to $9\frac{3}{4}$ cwt. of nitrate of soda, or $7\frac{1}{2}$ cwt. sulphate of ammonia). This, it may be pointed out, exceeds the requirements of even the most exhausting crop; and strikingly demonstrates the ruinous loss of a most valuable fertilising constituent, when land is permitted to remain under such conditions. On soils where crops were being grown, very much less nitrogen was produced by the process of nitrification, which was due to the fact that the rapid evaporation of water from the plants so exhausted the water of the soil that there was not sufficient moisture left to permit of active nitrification. One striking result of these investigations might be specially adverted to—*viz.*, that in wet seasons soils bearing crops, even where no manure was applied, produced good crop, which contained decidedly more nitrogen than that produced in the uncropped fallow fields during the same period. Professor Déherain concluded that, although a considerable amount of the nitrogen of soils is in an unavailable form, the nitrifying bacteria are capable, if sufficient moisture is present, of rendering this nitrogen available for the requirements of even the largest of crops.

(To be continued.)