

**Subsection 2.—Research in the Departments of the Dominion Government.****THE DEPARTMENT OF AGRICULTURE.\***

Since the beginning of the twentieth century there has been a remarkable change in the relation of the farmer to the scientist. The scientist has taken his critical methods to the fields; the farmer has brought his problems to the laboratory. To apply the laws of science to the practices of agriculture is the function of the research and experimental services of the Dominion Department of Agriculture. Highly trained specialists are continuously at work carrying research projects through various stages of analysis in the laboratory, and through testing under controlled conditions in stable, greenhouse, and experimental plot. Finally the products of their research are tested under practical farming conditions throughout the area concerned.

There is no one science of agriculture; it is made up of many sciences. The tillage and fertility of soils, the growth and protection of plants, the feeding and care of animals, and the processing of farm products into human food and clothing present problems that the research worker solves by reference to the laws of a score of sciences. Because of the great diversity of effort required in reaching a practical solution, research on many problems is not confined completely to any one unit of the Department of Agriculture. The major part of the research work, however, is conducted in the Divisions of the Science Service and the Experimental Farms Service. Units of these two services are located in every province. The research work of the Department is co-ordinated with that of the agricultural colleges and the National Research Council, and there is an interchange of personnel and facilities wherever the work will be benefited.

**Research on Soil Problems.**—The basis of profitable farming is the maintenance of soil fertility. In a young country, the store of fertility accumulated over centuries of soil weathering and plant and animal decay is tapped by the first few generations of farmers. After the virgin soil has been partially exhausted of the mineral constituents that are used by the growing plant, the farmer's troubles begin to multiply. The vigour of the plants is lowered, crop yields decline, and weeds, diseases, and insect pests increase.

The soil surveyor, who maps the areas covered by various productive and unproductive types of soils, furnishes basic information from which the economist and the administrator are able to evolve land utilization policies for future settlement, or for the rehabilitation or abandonment of areas that are now in distress. This type of work is under way throughout the Dominion in co-operation with the provinces, and has reached an advanced stage in several areas.

The soil chemist and the field-crop specialist are able to determine the kind and amount of plant food needed for various crops on various soils, and to recommend fertilizers that will produce profitable crops. The manufacture of commercial fertilizers has been greatly improved through the research work of the chemist, and regulations controlling the content of fertilizer mixtures have been drawn up and are administered by the Department for the protection and benefit of the farmer and the manufacturer.

Studies in plant nutrition conducted by the Department have ascertained the causes and the methods of prevention of many obscure diseases. For example, although as early as 1857 boron was known to be present in plants, it is only within

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\* Prepared in the Department of Agriculture.