

In the utilization of forest resources, co-operative research in which university workers participate has been concerned with such subjects as the structure and properties of cellulose and lignin; bleaching, physical properties, and characteristics of cellulose-water systems; physical properties of wood; studies of the mechanism of sulphite and alkaline cooking; and purification of rayon.

The varied mineral wealth of Canada produces an equally varied set of problems, many of which are studied by university laboratories in the areas in which the mineral deposits occur. Among such problems are those dealing with the analysis, processing, and utilization of oil, natural gas, coal, tar sands, and various types of ores. The structure of metals and the development of improved alloys and metal products also receive attention. Studies on the petrographic and economic geology of mineral areas throughout the Dominion are also carried on.

Growing appreciation of the value of the animals, birds, and fish that form the wild-life population of Canada has resulted in increased attention to the factors influencing their abundance. In this work the universities have taken a very active part. The life histories of many of the creatures of the wild as well as those of their parasites and of the creatures and plants on which they feed are being investigated. Studies have been made of the migration of birds, the breeding habits of animals, and the factors affecting the value of feeding grounds. The knowledge accumulated from such work forms a sound basis for the work of wild-life conservation.

The inland fisheries of Canada also profit from the work of university investigators on the factors affecting the abundance of fish, the possibilities of stocking waters that are not now considered satisfactory for fish, and the releasing of varieties of fish in new localities which study has shown to be suitable habitats. University workers have also done work of value to the marine fisheries, although most of this type of investigation is conducted in co-operation with the Fisheries Research Board, whose program is described elsewhere in this article.

Scientific and Other Phases of University Research.—These examples of university research in agriculture, forestry, minerals, and fisheries, while obviously important, do not by any means complete the list, even in those fields. The results of many researches that fall in this class can be applied immediately upon completion of the investigation and have a direct and obvious connection with some phase of economic activity. Many engineering researches, for instance, have as their objective the solution of difficulties presented by the use of local materials for such purposes as the construction of roads and buildings, or the determination of remedial measures for certain local difficulties. An example of the latter is found in the study of deleterious effects of certain soils on concrete, now under way at a western university. The fundamental facts obtained in investigations of this nature are usually of wide general importance, even though the original problem is a local one.

The immediate practical application, and therefore the value, of the types of research described above are easily understood. There are, however, researches in many fields of science that are not at all well known, but that contribute to the general fund of knowledge and to the welfare of mankind. Many of these researches are of such a nature that their value can be understood only by those who can directly utilize their results, or who appreciate the gaps in technical knowledge that such