

by the ingenuity of a group of men who saw the advantages of making use of the abundant source of hydro-electric power in Canada. The process developed has as its main features roasting, leaching, and electrolysis. A modified method of selective flotation was developed to cope with the problem of the complex lead-zinc ore from the Sullivan mine. This method has since become universal in the concentration of lead-zinc ores.

Since the remarkable development in recent years in the construction of the internal combustion engine, the refiner has been pressed to improve the quality of lubricating oil. Until comparatively recent years, the chemicals used in refinery practice were sulphuric acid, caustic soda, and litharge. Research has brought about an enormous decrease in the use of these chemicals and eliminated them altogether in some operations. This has been done by the development of more efficient processes, such as solvent extraction of lubricating oils and solvent de-waxing of lubricating oil distillate. Both of these methods result in lessened manufacturing costs and produce a product far superior in quality to that obtained by the old methods. An important Canadian contribution to petroleum refining is the use of a tower in which the ascending vapours of cracked gasoline meet a descending slurry of finely ground clay. It has been found that the gasoline from these towers will retain its colour and resist oxidation for an extended period.

Subsection 4.—Research in the Universities.*

In general, research in Canadian universities covers the same broad fields as are covered by research in those organizations to which reference has already been made. The utilization, development, and conservation of the large and varied natural resources of Canada provide problems that engage the attention of all research organizations and several of them may carry on similar investigations at the same time. Thus, research in agriculture is carried on by government research workers and also by university scientists while research may be applied to mining problems by scientists in the Department of Mines and Resources, in laboratories of interested industrial firms, and in universities. This does not necessarily mean duplication of effort as investigations of Dominion-wide application are quite frequently carried on co-operatively, with different phases of the work being assigned to the various organizations. Again, the research efforts of universities often supplement those of the other organizations. Besides the study of problems of applied science, an important phase of university research is the investigations in 'pure science' which, although not initiated with a view to immediate application to specific problems, have added greatly to the store of scientific knowledge that may be drawn on to help solve problems as they arise.

University Research in the Field of Natural Resources Development.—

Since agriculture plays a large role in the Canadian economy, research in agricultural problems is actively pursued at many universities. This industry commands the services of specialists in a wide variety of scientific endeavour. The production of forage crops and of grain for the live-stock industry and of grain and other plant products for human food as well as for certain secondary purposes has been aided

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