

Other responsibilities were added in the past four years. These include process development on production of nuclear grade materials at Canadian uranium mills and co-operation in research on non-nuclear uses for uranium. The research and development division also renders assistance to the Eldorado sales campaign in foreign countries.

The division has research and laboratory facilities in Ottawa and smaller establishments at Port Hope and Beaverlodge.

During the last ten years Eldorado has expanded greatly and many processes developed by the research and development division were put into operation and plants or plant units were designed. The immediate years ahead will not likely see any expansion except perhaps in the production of ceramic oxide. As far as the operating plants are concerned the research and development division will continue to work toward better efficiency and lower costs, but the scope for cost savings will not be as great as in the past. On the other hand, in a competitive market, even modest cost savings and increases in efficiency are very important.

In the cast of Beaverlodge ore, the emphasis will continue to be on improving leaching rates and recoveries. More research is required, particularly on the effect of grinding and aeration on leaching and further reduction in reagent costs. Continued research is required to improve or even maintain efficiency since the leaching characteristics of the ore undergo changes as new sections of the mine are developed. Pilot plant operation is in progress on scavenging of uranium from barren solution by amalgam reduction, the aim being to reduce reagent costs and soluble loss. Cheaper substitutes for filter aids now in use will be tried at Beaverlodge to confirm laboratory testing. The precipitation pilot plant at Beaverlodge is being used to confirm laboratory results on improved methods of precipitation. A thorough mineralogical study of current tailings has started. Tests will be made on the reduction of vanadium content of the precipitate.

With regard to Port Hope operations, the division will continue to co-operate with the operating staff in improving or maintaining efficiencies in solvent extraction operation. The type of feed materials to solvent extractions will be changing due to contract changes and the suspension of operations at Port Radium. Closer control on impurity elimination is anticipated. Test work on low acid extraction systems will continue as cost improvements are possible. The work on cleaning of organic solvent will also continue.

Studies are underway to examine the feasibility of recovering protactinium from refinery waste products, since a small market may develop for this element.

The green salt and metal plants will resume operation in mid-1961 and assistance to the development of these operations will continue.

Development work toward a continuous process for production of nuclear grade UO_2 will go on for an extended period, since there are many alternative flowsheets to consider. At the same time, basic studies will continue on the effect of process variables and physical characteristics of UO_2 on sinterability. Much progress has been made to date on improvements in product from the current batch operation but additional work is required.

The co-operation with Atomic Energy of Canada Limited on the development of metal fuel elements will involve more metallographic analyses in addition to the substantial amount of such work to date. This work will be of lasting value to Eldorado since the behaviour of uranium metal during fabrication and under irradiation is of importance to operation and sales.

The research and development group working at Port Hope will be somewhat reduced in number compared to 1960, but staff may be shifted from Ottawa if required. A system has been initiated this year to co-ordinate all the research staff and facilities available in the refinery and research and development division groups.