Seek Peacetime Applications

It is also important to choose fields for research in which the results may have important peacetime applications. The maintenance of standing armies in peacetime is rightly justified as a form of national insurance. It is nonetheless considered by economists to be a largely unproductive use of national income. The same cannot be said against Defence Research since it produces, both directly and indirectly, much that adds to the wealth and happiness of the world. The most important peacetime benefits are indirect, but some of the direct ones are easier to comprehend and more spectacular.

Among these might be mentioned the discovery and production in Canada of an effective vaccine against Rinderpest, a deadly disease of cattle. This discovery alone may well contribute enough to the food supply of a starving world to justify the whole of Canada's wartime expenditure on research. British Anti-Lewisite was developed as an antidote for the war gas Lewisite and has proven to be most effective in the treatment of Arsenical Poisoning. The disease, Leukaemia, is now being treated by another war gas, Nitrogen Mustard. The methods and even some of the agents of chemical warfare have been applied with great success to the control of insect pests. Even the humble household moth is now the target of unrelenting chemical attack with DDT.

Arctic Research Needed

You can easily visualize the sort of research programme that will result from the application of these general principles. One example is research on the problems of the Arctic, a general field which meets all the requirements that have been laid down. A thorough knowledge of the Arctic and its problems is essential, both to the regional defence of North America, and to the normal peaceful development of the Canadian North. This knowledge can only be obtained by a well-planned long-term programme of research and exploration. Such a programme must include further mapping and charting of the little known areas of the North, investigation of ice and snow conditions, of flora and fauna, geology, mineralogy, and archeology. There is also much still to be learned concerning the general problems of living and moving and working in the Arctic.

One of the most important fields for research is that of geophysics. This includes meteorology, magnetic observations and studies of radio wave propagation. It is of great importance to us, and to other nations of the earth to know more of the meteorology of the Arctic, for it is there that much of the world's weather originates. The Soviet Union has already established many meteorological stations in the Arctic and is supplying the results of their observations to the world. There is a large gap in this system of weather stations between the Canadian mainland and the North Pole. It is hoped that this gap will soon be filled and thus complete the weather reporting system of the Northern Hemisphere. Much of this work is already going on or will be undertaken in the normal course of the work of the many government and commercial agencies interested in the Arctic. The role of Defence Research will be to co-ordinate and where necessary to initiate work to ensure that the research needs of the Services are met.

Human Element Important

I have discussed only the direct application of science to the production of new weapons. There are two other fields of research of great importance to the Armed Forces which must be included in our Defence Research plans. The first of these is the vast field of research that deals with the human element in war. This field includes not only the prevention of disease and the care of the sick and wounded but also the problems of the selection and training of men and women for the complex tasks of war.