MEDICAL ISOTOPE USES IN THAILAND

In February 1959, the International Atomic Energy Agency sent an expert, Mr. Norman Veall, of Guy's Hospital, London, to Thailand to assist in the development of the medical application of radioisotopes, particularly in diagnosis and clinical research. Mr. Veall, who was the first long-term technical assistance expert provided by IAEA to a Member State, completed his mission last August, and later submitted a report to the Agency's Director General. The report is of interest not only because of an account of the assistance given to the medical authorities in Thailand, but also because of the indications that it contains of work that can be initiated or encouraged most profitably.

One of the first tasks of the IAEA expert was to give a series of lectures to groups of medical workers in order to provide them with an introductory account of the various applications of radioisotopes in medicine.

Work with radioisotopes was already under way at the Radiology Department of Siriraj Hospital, where 15 to 20 patients were referred to the Department each week for tests with radioactive iodine used as a tracer. A number of cases had also been treated with therapeutic doses of radioiodine. The laboratory is well provided with nucleonic equipment and certain additional items of essential equipment were obtained under the IAEA expert's guidance. Certain delays were, however, experienced in obtaining supplies of radioisotopes from abroad because of customs and other import regulations, and Mr. Veall regarded the establishment of a procedure by which the numerous formalities could be simplified as his most urgent task. With the completion of the preliminary arrangements, it became possible to improve the existing facilities, techniques and organization of work at the laboratory and to establish new diagnostic procedures on a routine basis. For example, the dispensing of routine tracer doses of radioiodine was simplified and reorganized. Again, a specialized system for measuring the output of the heart with the help of radioisotopes was established for the investigation of patients with cardiac disorders.

Blood Cell Studies

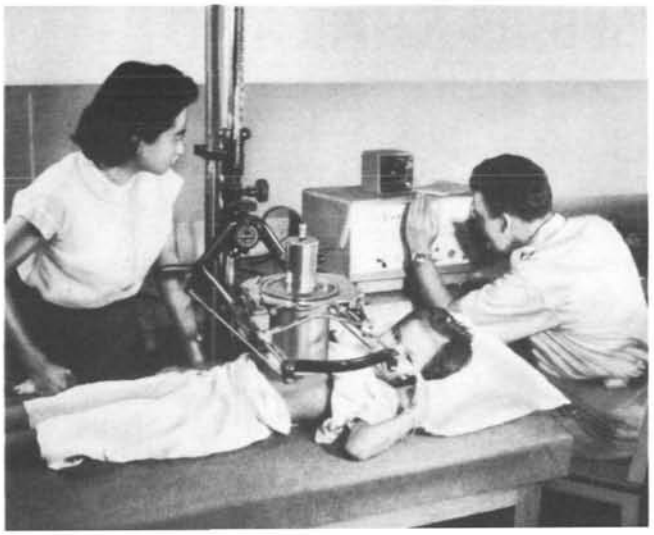
The School of Medical Technology, which consists of two laboratory buildings at the Siriraj and Chulalongkorn hospitals, provides a three-year training course for medical laboratory technicians. The school is gradually assuming responsibility for an increasing proportion of the routine clinical pathology in both hospitals. At the time of the IAEA expert's arrival, measurements of the survival of red blood cells in the human body had been carried out on some 60 patients suffering from a particular type of inherited anaemia. As this work was already being done in a competent manner, Mr. Veall confined himself to introducing minor variations in techniques and to advising on the planning of experiments and the interpretation of data.

Many workers, however, were interested in using techniques of measurement with the help of radioactive chromium and it was decided to give the highest priority to an extension of this work. This decision was guided by several considerations. In the first place, the widespread incidence of blood cell disorders in Thailand represents an important practical problem of clinical research. Secondly, there are several competent medical workers in Bangkok who have specialized in this field and are anxious to use radioisotope techniques for diagnostic or research purposes, and most of them have already had some practical experience of this work during their training abroad. And thirdly, because of the fairly long half-life of radiochromium, the supply situation was not seriously affected by delays in completing the customs formalities on its arrival from abroad.

A scheme was therefore evolved under which several groups of workers could carry out these studies. A preliminary seminar and a practical demonstration were first arranged at Siriraj hospital and subsequently the IAEA expert visited each of the individual groups and carried out further demonstrations in their own laboratories. Technical problems were discussed at regular meetings.

In view of the comparatively large number of patients who undergo operations for the removal of the spleen as treatment for the abovementioned type of anaemia, it was considered necessary to set up facilities for carrying out investigations with the help of radiochromium, since there is now a good deal of evidence which suggests that it will then be possible to determine in advance whether or not an individual patient might benefit from this operation. In these investigations, some of the red blood cells of a patient are labelled with radioactive chromium and re-injected. Radioactivity measurements over different parts of the body can then indicate whether or not the spleen is mainly responsible for the anaemia and the spleen can be subsequently removed if found responsible. The essential parts of a scintillation counter for radioactivity measurements were obtained with IAEA funds and this equipment was set up at Siriraj and used for training purposes. Subsequently, with a second counter installed at Chulalongkorn, it became possible to carry out this procedure on a routine basis in both hospitals.

Following a course of lectures given by Mr. Veall at Chulalongkorn hospital, it became clear that there was considerable interest among the hospital staff in



A test in which some of a patient's red blood cells have been labelled with radiochromium and re-injected. Termsri Chomnijarakij of Thailand's School of Medical Technology and Norman Veall, IAEA expert, are measuring the uptake of radiochromium in the patient's spleen with the aid of a gamma ray counter (UN photo)

radioisotope techniques but there was no equipment. With the co-operation of the hospital authorities, a small radioisotope measurement laboratory was set up in the School of Medical Technology and several types of work were initiated. Among these was an experimental study of the use of radiophosphorous for the diagnosis of certain types of lung affections. Mr. Veall advised the individual workers concerned to concentrate on a limited number of techniques to acquire experience before attempting to set up a routine isotope service.

Subjects for Research

In the course of Mr. Veall's work in Thailand, several subjects appeared to be suitable for research projects; these are of particular interest to many of the less developed countries, as well as locally. Among these were blood disorders, nutritional disorders and cholera. Another subject of special interest on which the IAEA expert's advice was sought was the possibility of labelling snake venom with radioisotopes and then using it for research purposes. It appeared that snake venom labelled with radioiodine would be useful for basic studies on immunity as well as in connexion with the routine production of anti-venene serums. There also seemed to be a number of possibilities for using such material in experiments on the distribution and mode of action of snake venom on animals. Radioactive cobra venom, labelled with radioiodine, was prepared with the aid of the Pasteur Institute in Bangkok, and some preliminary tests were carried out with promising results. Mr. Veall thought that further advance in the field of snake venom research might be facilitated if the existing techniques were supplemented by the use of radioisotopes. He suggested that a stock of uniformly labelled venom could be prepared and stored by IAEA for supply to interested research workers in countries which are particularly concerned with this problem.

Radioactive meat being fed to a snake, as part of a pilot experiment in Bangkok in which the radioactivity of extracted snake venom is to be checked later in connection with work on the production of anti-venom serum (UN photo)