REPORT ON GREECE

ESTABLISHMENT OF AN ATOMIC CENTRE

The idea of the atom as the ultimate indivisible particle originated with the Greek philosopher Democritus, and nearly twenty-four centuries later the Greek national centre for work derived from the divisibility of the atom is going to be called the Democritus Nuclear Centre. Democritus did not conceive of the nucleus, and his concept of indivisibility disappeared centuries later after the work of Rutherford, Bohr and others, but the term he had employed remained and has become one of the most potent symbols of the achievements and aspirations of the modern world. The Greek authorities could hardly have chosen a more appropriate name for their atomic energy centre.

The Centre will be the focal point in the atomic energy programme now being developed in Greece. An outline of this programme is contained in the report of an IAEA mission which visited Greece in February this year. The mission, which consisted of two senior members of the IAEA Secretariat, had extensive discussions with members of the Greek Atomic Energy Commission and with representatives of various Ministries. During these discussions the mission was informed of the present and planned activities of the Greek AEC at the Democritus Nuclear Centre and outside this Centre, in particular at the Alexandra Hospital in Athens. The mission visited the site of the Centre, the Athens Technical University, the chemical laboratories of the University, and the Alexandra Hospital.

Created in 1954, the Greek AEC deals with all atomic energy matters in the country, including research, education, safety, isotope applications and prospecting. As already indicated, the main project of the Commission is the establishment of the Democritus Nuclear Centre, which will have a research reactor and a number of supplementary laboratories.

Democritus Nuclear Centre

Following an agreement with the US Government, a site has been chosen for the Centre on the outskirts of Athens. The reactor will be of the swimming pool type, with a maximum thermal output of 1 mw. The construction of the reactor building is being carried out under the responsibility of the Greek AEC.

The laboratories at the Nuclear Centre will consist of buildings for physics, chemistry, technology, biology, a hot laboratory and a decontamination unit. At the time of the mission's visit, the reactor building and a temporary laboratory were under construction.

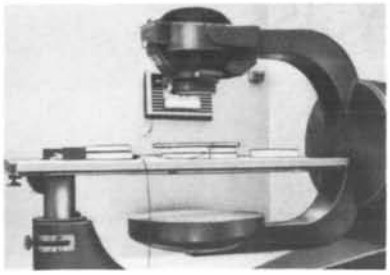
A certain amount of atomic energy research is also carried out at the Physics Institute of the University of Athens. The mission found that a small radiocobalt source was available at the Chemistry Department of this University for use in experiments in radiation chemistry. Besides, there were two small cobalt-60 units in private hospitals, used for radiotherapy.

Since 1956, a radioisotope laboratory has been in operation at the Department of Clinical Therapeutics of Athens University; the laboratory is located at the Alexandra Hospital. The laboratory is well designed, fully equipped and manned with doctors and physicists most of whom have received extensive training abroad. Routine diagnostic and therapeutic work as well as clinical research is carried out on a considerable scale and a number of papers have been published on the results achieved. In addition a number of hospitals in Greece are planning to set up their own isotope laboratories. It is also intended to carry out some research work in experimental medicine at the projected biological laboratory of the Democritus Nuclear Centre.

Assistance to the Greak Programme

The members of the IAEA mission discussed the country's needs of technical assistance with the members of the Greek AEC and with its scientific staff. The AEC wishes to ensure the effective execution of their projects for the setting up of a nuclear research centre and for the development of a sound and balanced research programme, as well as for the establishment of adequate health and safety measures in work with ionizing radiations throughout the country. It is also intended to promote the use of radioisotopes in medicine, which is already being done at the Alexandra Hospital.

With these various aims in view, the Greek AEC requested IAEA to provide them with four experts; the requests were approved by the Agency's Board of Governors at its session in April. One of these experts - a specialist in health physics - will assist the Greek AEC in organizing a health physics department and a central radiation safety service and in preparing a health hazards report for the Greek research reactor. Another expert will be concerned with the medical applications of radioisotopes, particularly in the clinical research field. Routine diagnostic and therapeutic radioisotope services have already been established at the Alexandra Hospital, and the time has come for extending the work to include clinical



A cobalt 60 teletherapy unit recently installed at the Alexandra Hospital, Athens. At the request of the Greek AEC, an expert from IAEA went to Athens to help the hospital staff in charge of the unit in putting it into operation and advise them on various aspects of its working

research on diseases which are common in Greece. The advice of a third expert will be available mainly in connexion with the research programme of the Greek reactor. The fourth expert will advise the Greek AEC on the setting up of the biological laboratory of the Greek Nuclear Centre; he will also assist in developing a work programme and take part in actual research work.

The IAEA Board also approved a Greek request for the supply of a small amount of equipment, essential for the work of the experts. Besides, the first medical research contract to be given by IAEA was placed with the Department of Clinical Therapeutics of Athens University for work on the diagnosis of certain diseases with the aid of radioisotopes. The investigations are expected to help in the treatment of echinococcus, a parasitic disease which forms cysts in the lungs and the liver, and of certain types of haemolytic anaemia. These disorders are common in Greece as well as in several other sub-tropical regions of the world.

IAEA's first Visiting Professor, Dr. A. G. Maddock of Cambridge University, went to Greece to give a series of lectures at a radioisotope training course held by the Greek AEC in April this year. While part of the laboratory facilities for his teaching work in Greece was provided locally, Dr. Maddock also had at his disposal the Agency's mobile laboratory which was sent from Vienna for this purpose.

WITH THE ISOTOPE UNIT TO ATHENS

IAEA's mobile isotope laboratory, which had earlier been used for some training work in Austria, made a rather eventful trip to Athens in March-April this year. A vivid description of the journey was given in a report by the driver of the vehicle, some extracts from which are reproduced below:

"We crossed the border (between Austria and Yugoslavia) ... The customs formalities consisted of the police admiring the interior of the truck and the size of it seemed to surprise them ...

"After Niš, the condition of the roads became very bad. People everywhere began to take considerable interest in the Unit. When we stopped for the night, it was necessary that the truck be within visual distance; otherwise we could have lost a door as a souvenir ...

"The effects of the roads were beginning to show; even bolts and nuts on the tires were loose ... The weather began to get cold and there was snow in the mountains. Roads became much worse. There were narrow, sharp curves full of holes. We crossed bridges with signs fixing a 6- to 10-ton limit. The bridges were made of wood. Our truck weighs 13 tons. There was a long bridge across the Morava River with a 10-ton limit. It was a very narrow bridge, just as wide as our truck; consequently, other vehicles had to wait until we crossed the bridge. We were very concerned about breaking the bridge and travelling into the river ...

"It rained all day and this was our worst day ... It was necessary to drive across an agricultural field; the main road was under repair and there was no way but to go through the field ... A railway crossing was under repair on a hill. In order to go up the hill it was necessary to drive into a meadow and cross the railroad. In performing this manoeuvre the Unit almost turned over as we were driving along the side of the hill through thick mud, and the Unit began to slide down the hill. The back right wheels left the ground. One foot more of sliding down, and the truck would have toppled over ... We were deeply embedded in mud which had piled up on the left side of the Unit. We shovelled for over an hour. We were finally able to move onwards across the railroad crossing. The fuel tank of the truck hit the rails and only by putting stones under the wheels was it possible to make the truck move again ..."

The mobile isotope laboratory crossing a wooden bridge on the Yugoslav side of the Greek frontier