

THE 200th RESEARCH CONTRACT

The International Atomic Energy Agency has placed a research contract with the Department of Anatomy and Histology of Lovanium University at Leopoldville, Congo, for certain bone investigations with nuclear techniques. The Agency will supply the equipment and radioisotopes needed for these studies.

With this, the Agency has awarded 200 research contracts to scientific institutes and laboratories in nearly 50 countries. These represent a somewhat novel form of scientific collaboration and stimulation of scientific research under international auspices. By sponsoring and supporting research projects, the Agency, on the one hand, contributes to the solution of common scientific problems, and, on the other, provides a stimulus to the work of newly established scientific centres in the less-developed countries. In addition, contracts are given for research into problems associated with the Agency's own tasks.

Every research contract is designed to serve one or more of these three objectives. Some of the contracts are for studies from which the Agency's membership as a whole or a large proportion of it is likely to benefit; they fill some of the existing gaps in national research efforts or tackle problems where international co-ordination of research is especially desirable. Those dealing with radiobiology or radiation protection are usually of this kind, and as an example of co-ordination can be cited the research contracts placed with institutes in different countries to study problems of rice fertilization (see IAEA Bulletin, Vol. 5, No. 3). Some other research con-

For the co-ordinated rice research programme, the efficiency of various kinds of phosphate fertilizers being compared for 10 different rice soils in the Agency's greenhouse, using phosphorus-32 labelling techniques. The soils were provided by research contractors in Asia, Africa and Europe



tracts, on the other hand, are designed, at least partially, to assist scientific institutes in the less-developed countries to establish or expand their research facilities and procedures. Contracts of this kind have been placed in several countries for research in such fields as radioisotope applications in medicine and agriculture. Thirdly, some of the research projects are formulated specifically in the context of the Agency's own functions, especially in relation to health and safety and safeguards. For example, several research contracts have been awarded for studies on radioactive waste management which will be of use in the formulation of international regulations or codes of practice, and some for studies on non-destructive testing of materials which are relevant to safeguards procedures.

Here is a subject-wise breakdown of the 200 contracts awarded and 165 contracts renewed so far:

Subject category	Number of contracts placed or renewed	Amount allocated in US \$
Radioactive Waste Management and Environmental Research	56	508 158
Health Physics and Radiation Protection	90	573 382
Radiobiology	81	697 697
Safeguards Methods	14	235 520
Studies involving the Use of Reactors	11	171 685
Radioisotope Applications in Agriculture	58	307 650
Radioisotope Applications in Hydrology	9	67 185
Radioisotope Applications in Medicine	41	335 158
Miscellaneous	5	26 600
Total	365	2 923 035

More than one hundred scientific papers have been published in the relevant literature in connection with the work done under these research contracts. The results of the completed projects are also summarized in a report published annually by the Agency.

Some Recent Contracts

The 200th contract given to the Congo is expected to throw light on a subject of considerable interest about which little is known so far. In recent years, a number of techniques, such as autoradiography and radioactive tracing, have been used to study the skeleton in both man and experimental animals, but very little has yet been done to carry out such studies in the tropical regions of the world. Certain diseases prevalent in the African tropical regions may have some connection with bone composition and metabolism. It would therefore be useful to study the chemical composition of the skeleton in both normal and pathological states and investigate the pathological mechanisms with special reference to sickle cell anaemia, infectious diseases and nutritional disorders.

Bone taken from both normal subjects and pathological states will be studied by activation analysis, a radioisotope technique now widely used for the detection of minute traces of a substance in a sample. Radioactive calcium (calcium-47) will be used to evaluate calcium fixation in bone, and studies will be made on the metabolism of calcium, lead and zinc. For these studies the Agency will supply a variety of instruments as well as the necessary isotopes (calcium-47, calcium-45 and zinc-65).

Other contracts recently awarded by IAEA included two more for research on tropical diseases (to Portugal and Thailand); one to Israel for studies on protection against radiation effects on human health; two to Yugoslav institutes, one dealing with the study of sand movements in rivers, and the other with radioactive waste disposal problems in the Adriatic; and one to Poland, also dealing with waste disposal.

Under a contract awarded to the Radioisotope Laboratory, Junta de Investigações do Ultramar, Lisbon, radioisotopes will be used in studies on schistosomiasis, a disease which affects some 200 million people in the tropical regions of Africa, Central and South America and many parts of the Middle and Far East. It is caused by parasitic worms which live

in many parts of the body, especially in the bladder, the intestine, the liver and spleen, and whose presence gives rise to anaemia and other pathological symptoms. It is spread through various species of snails which act as intermediary hosts. Radioisotopes are to be used in studying the dispersal of these snails, the distribution of anti-schistosomal drugs in the body of patients, and for clinical studies on them.

A special kind of anaemia, caused by hookworm, another tropical parasite, is the subject of a contract awarded to the School of Tropical Medicine at Bangkok, Thailand. It appears that the degree of affection by this disease depends on the iron reserves in the blood of the affected individuals, and this will be studied under the research project.

Bone marrow can be usefully injected into persons who have received a lethal dose of radiation, but it can trigger secondary diseases. Work intended to prevent such secondary effects will be carried out at the Department of Experimental Biology of the Weizmann Institute of Science at Rehovoth, Israel.

The development of methods to measure the movement of silt in rivers with the help of radioactive tracers is the subject of a research contract granted to Yugoslavia. This research is being undertaken partly in view of the intended construction of a dam on the Danube at the Iron Gates, one of the biggest hydroelectric projects in Europe. The other contract to Yugoslavia is for studies on the possible uptake of low-level laboratory and industrial radioactive waste by fish and other sea organisms which might reach man through the food chain. This research, to be carried out at Rovinj on the Adriatic, will be coordinated with that done by IAEA at its laboratory at the Oceanographic Institute in Monaco.

Also concerned with radioactive waste is a research contract placed with the Institute of Nuclear Research at Swierk, Poland. It is aimed at developing a cheap process for the decontamination of liquid waste by ion-exchange.