reactor fast neutrons and fission neutrons quite independently. He discussed particularly the damage caused by gamma rays emitted by the specimens themselves as a result of capture of thermal neutrons. He also discussed the importance of these types of measurement in understanding the basic mechanisms of radiation damage.

V.E. Goldansky (USSR) described what is known as the nuclear spot welding method and some of its applications. He said that the emission of heavy charged particles in some nuclear reactions causes intense heating within the microvolumes at the particle tracks. The introduction of lithium or boron, which undergo such reactions, into the surface layer dividing any two materials and the subsequent irradiation of these materials by thermal neutrons causes heating of a large number of such microvolumes at the surface of contact and results in the so-called "nuclear spot welding" - a very strong binding of these materials with a relatively weak radiation-chemical effect. Mr. Goldansky said that the possibilities of this method were first demonstrated when a number of polymeric and other materials were bound together. Later this method had been used to increase the strength of binding rubber surfaces with certain fabrics. The results showed that the binding strength was up to four times greater than that reached by other methods.

The participants also had informal meetings to assess the most important current problems in the field and to discuss the experimental and theoretical methods by which they might be tackled. This helped in defining a number of directions in which research programmes could be planned and conducted.

The following scientists acted as chairmen of the scientific sessions or as leaders of panel discussions: Professor A. Seeger (Germany), Dr. H.G. Van Bueren (Netherlands), Professor S.V. Starodubtsev (USSR), Professor E.W.J. Mitchell (United Kingdom), Dr. E. Nagy (Hungary), Dr. A. Herpin (France), Dr. W.E. Roake (USA), Dr. J.H.W. Simmons (United Kingdom), Dr. W. Kosiba (EURATOM), Professor P. Baruch (France), Professor E. Andronikashvili (USSR) and Dr. L. Giulotto (Italy).

REPORTS FROM IAEA FELLOWS

Training in various branches of nuclear science and technology is one of the most important ways in which IAEA has been endeavouring to promote the peaceful uses of atomic energy throughout the world, and by the end of last year more than 500 trainees had completed their studies under the Agency's fellowship programme. In an attempt to assess the value of this programme, the Agency requests the fellows themselves, after they have completed their training and returned to their home countries, to send brief reports on their training and the use being made of it in their work.

Summaries of a few of these reports were carried in the last issue of this Bulletin; a few more are summarized here.

Raul Brenner, a Brazilian scientist, who has been in charge of the Electronics Department of the Atomic Energy Institute in São Paulo since 1958, was awarded an IAEA fellowship for studies and practical training at the Brookhaven National Laboratory, USA. Apart from designing electronic circuits and servicing electronic instruments at the Institute in São Paulo, he has also been teaching electronics as part of a course in nuclear engineering given at the Institute. On the value of his training, he says it gave him "an invaluable introduction to the new and extraordinary field of semiconductor devices which are becoming so important in electronic instrumentation".

Alfonso E. Leon Guim, of Ecuador, received nine months' training in the Radiotherapy Department of the Queen Elizabeth Hospital, Birmingham, UK. He says that during the period of his training he was able to gain wide experience in radiotherapy, including the treatment of patients by radium, X-rays and radioisotopes. He also attended a course at the Harwell Isotope School and a medical course at the Christie Hospital and Holt Radium Institute in Manchester. After returning home and at the time of writing his report, he was working as honorary assistant in the General Hospital in Guayaquil City and as a private practitioner. He says: "The experience I have had during my training in England has given me a new opportunity to work on the diagnosis and treatment of cancer with patients in the General Hospital and in my private office."

Laodamas Sklavenitis, a Greek scientist, received a year's training at the Technische Hochschule in Munich, Germany, and at Harwell, England. He had practical training in Munich, followed by a three-month general course at Harwell on radiation protection. After his return to Greece, he has been head of the Health and Safety Division of the Greek Atomic Energy Commission, his duties including the organization of the Health and Safety Division of the Commission and of the Health Physics Section of the Democritus Nuclear Centre. He has also been en-

gaged in the preparation of safety regulations for isotope applications in Greece.

A Hungarian research chemist, Tiber Sik, of the Biochemical and Isotopic Laboratory of the Institute of Genetics of the Hungarian Academy of Sciences, received an IAEA fellowship to go to the Institute of Biochemistry at the University of Lund, Sweden, where he attended a course in biochemistry and undertook practical work on the synthetic labelling and measurement of biologically important compounds with carbon-14. In his report he says that the methods he studied at Lund will be used in the study of nucleic acids at the Hungarian Institute of Genetics. Apart from the experience he gained of synthetic and measuring techniques, the lectures and scientific discussions which he attended at Lund have been useful in the investigations he has been carrying out subsequently.

In 1959, R. Niloperbowo, an Indonesian geologist, received eight months' training in the Atomic Minerals Division of India's Department of Atomic Energy. He spent one month on the physical and chemical study of minerals, one month in learning the methods of car-borne scintillation survey, and the remaining seven months on field work for uranium prospecting. At the time of writing his report, he was Assistant Geologist in the Economic Geology Division of the Geological Survey of Indonesia. His training in India, he says, was extremely beneficial, and "the knowledge gained will be of much help in starting a radioactive minerals prospecting programme".

An Iraqi scientist, D. Iwas Mekhael, was granted a fellowship for training in Japan in the agricultural applications of radioisotopes. Apart from attending a series of courses at the Japan Atomic Energy Research Institute and Japan's National Institute of Agricultural Science, he participated in field experiments with paddy rice using nitrogen-15, phosphorus-32 and calcium-45. He also participated in fertilization experiments and in laboratory and field experiments for root activity tests. After returning home, he has prepared for the construction of a small laboratory and conducted agricultural experiments with radioisotopes. The training he received in Japan, he states in his report, gave him a good theoretical background and practical experience "to conduct small-scale experiments to solve some scientific agricultural problems that cannot be solved by traditional methods".

The economics of nuclear power was the subject in which Tatsuo Suzuki, of Japan, was trained at the Massachusetts Institute of Technology, USA, under a fellowship awarded by IAEA. He studied the past development of the electric utility industry and the electrical machinery industry in the United States and examined the possible role of nuclear power in that context. After returning to Japan, he joined the Programming and Co-ordination Department of the Japan Development Bank which supplies long-term and low-interest loans for industrial development. The project of the Japan Atomic Power Company for the construction of a full-scale nuclear power station is covered by the Bank's programme. Mr. Suzuki writes: "Because the Bank's loan activities for nuclear power projects are expected to become important in the near future, the training which I have been given under the IAEA fellowship should be fully utilized in appraising and evaluating the nuclear power projects for the Bank."

A Polish scientist, Jerzy Malinowski, was awarded an IAEA fellowship for studies and practical training at the Centre d'Etudes Nucléaires de Saclay, France. His work was devoted to the study of measuring techniques and the practical application of neutron activation analysis to various materials. He returned to Poland as chief of the Laboratory for Radiometric Methods of Analysis in the Analytical Chemistry Department of the Institute of Nuclear Research, Polish Academy of Sciences. In his report to the Agency, he says: "The training has given me the possibility to study the techniques and methods of radiometric analysis, to introduce these methods into our daily work, and has helped me to develop the plans for our future laboratory facilities."

An IAEA fellowship enabled Abd El Sadek El Meligy, of the United Arab Republic, to study for a year at the Institute of Theoretical Physics, University of Copenhagen, Denmark. He attended a course on nuclear reactions and a course in relativistic quantum mechanics, and undertook research on certain problems. He writes: "The advanced lecture courses and the frequent theoretical discussions which took place during my stay at the Institute of Theoretical Physics in Copenhagen has brought my knowledge of various problems in physics up to date. I have also become acquainted with new research problems, specifically in the theory of beta decay with which I am engaged at present."

Milutin Penčić, of Yugoslavia, was granted an IAEA fellowship for training in the USSR in certain agricultural applications of radioisotopes. During a training period of six months, he worked on the application of phosphorus-32 and carbon-14 in studying the physiology of plants. When he sent his report, he was engaged in research on corn physiology at the Institute for Corn Research at Zemun Polje, Yugoslavia. His specific field of investigation was the physiological activity of the root system and the intensity of photosynthesis under special conditions of outside life. He states that his training in the USSR has been useful to him in the application of isotopes and in the handling of the apparatus needed for this work.