

# studying uses of radiation

Among the events this year which have demonstrated the efforts of the Agency and the Food and Agriculture Organization of the United Nations to increase the knowledge of nuclear techniques have been two six-week courses held in association with national atomic energy organizations.

In Italy the use of radiation to induce beneficial mutations in plants was the subject, and in India stress was on ways of preserving food, in addition to the sterilization of biomedical products.

## Genetic Improvements in Plants

A specialized course in the use of radiation and other processes for the genetic improvement of agricultural plants, was held in Rome during May and June. Organized by the Comitato Nazionale per l'Energia Nucleare (CNEN) in collaboration with the Food and Agriculture Organization (FAO) and the Agency, it took place at the laboratory for Nuclear Applications in Agriculture of the Casaccia Nuclear Studies Centre.

The closing session of the course, attended by experts from 15 European and non-European countries, was held on the premises of FAO in Rome, with the official participation of representatives of the three promoting bodies: Dr. O.E. Fischnich, Assistant Director General, Agriculture Department of FAO, Dr. B. Sigurbjörnsson, Deputy Director of the FAO/IAEA Joint Division, and Professor Carlo Salvetti, Vice-President of CNEN.

Dr. Fischnich stressed the importance of collaboration between countries in different continents and at different stages of economic development in a sector that appears particularly promising. It had been proved possible to improve plants genetically by using radiation, causing mutations planned in advance. He considered it significant that the experts attending the course came from countries with varying and different agricultural traditions, such as Chile, Colombia, Cyprus, Greece, Iran, Israel, Lebanon, Pakistan, the Philippines, Poland, Sudan and Thailand.

Dr. Sigurbjörnsson examined the scientific and experimental aspects of the course, pointing out that its organizers, and Professor Giantommaso Scarascia Mugnozza in particular, had sought to stress the result of experiments which could have a considerable influence on the improvement of agricultural production. The induced-mutation method of plant breeding had now emerged as truly efficient, as proved by the high number of superior crop varieties resulting from its use and grown throughout the world.

Professor Salvetti expressed his pleasure at the choice of the Casaccia Centre for the course. Among the most important undertakings of advanced countries in the nuclear field, he mentioned the desalination

of sea water for civil, industrial and agricultural uses. The link between this programme and that of the applications of nuclear energy in agriculture was obvious.

In a farewell address, Professor Scarascia Mugnozza, thanked those attending the course on behalf of the Casaccia research workers.

### Microbiology

A six-week training course in radiation microbiology sponsored jointly by the International Atomic Energy Agency and the Indian Department of Atomic Energy took place in April and May at the Bhabha Atomic Research Centre, Trombay.

Shri H.N. Sethna, Director of the Research Centre, inaugurated the course. He said that the programme was specifically oriented to the applications of radiation microbiology in relation to food preservation and sterilization of biomedical products, an area of major interest to most developing countries.

The following are excerpts from the Director's address:

"Most of you know" he said "that during the last decade important discoveries in biology have become possible through experiments with microbes. These have led to rational explanations of the mechanism of heredity and metabolic controls in the process of differentiation. It is strongly believed that the basic ideas established with the microbes can lead to similar discoveries in higher forms of life."

"Commonsense tells us that elimination of the pathogenic and preservation of the beneficial organisms should be the objective. The application of massive radiation techniques, a by-product of the atomic energy development programme, has begun to contribute a great deal towards preservation of food and sterilization of biomedical products."

"Let me cite one example. Fish, which forms an important source of protein food, decays in a few hours after it is caught if not stored in ice. This spoilage is essentially due to the microflora inside the fish. By using massive radiation techniques we can in fact prevent the spoilage of fish and many other important sources of food."

"It is imperative that we should make sustained efforts to save what we produce. Neglect of this aspect would neutralize the small gains which accrue from increased food production. The methods of radiation pasteurization and radiation sterilization of insect pests from food grains have opened up possibilities of food preservation. It is up to us to exploit these potentials to make a "hunger-free world" of tomorrow."

Dr. A.R. Gopal-Ayengar, Director of the Bio-Medical Group at the Research Centre, expressed his gratification that a number of scientists from developing nations in South East Asia, West Asia, Europe and Latin America were attending the course. The basic difference between developed and developing nations was not the lack of resources in materials and men but one of initiation in the exploration of science and technology to human advancement. In the last decade or so, he said, there had been an awareness of this aspect.

Thirty years ago, science and technological know-how was the prerogative of developed nations. At that point in history, nations were either developed or underdeveloped. With the unrelenting efforts of a number of international organizations and the IAEA in particular, in the field of atomic energy, this distinction had slowly and steadily been transformed. No nation today could afford to neglect science and technology. "It is to national economy something like salt in your food", he said.