

The review brought out clearly that the main problem that limits the help the Agency can give to developing countries is lack of resources for assistance projects. There is in this field, as in many others under the authority of the Economic and Social Council, no shortage of technically sound and viable projects but a lack of funds. As I see it, the main, the fundamental problem to be discussed by this session is how to increase the necessary funds. No coordination, no streamlining of procedures can, more than in a superficial way, improve the situation. It seems likely that, in 1968, we in the Agency shall only be able to carry out less than 30% of the requests for technical assistance experts, fellowships and training.

We are constantly reminded of the military applications of nuclear science and technology. The peaceful applications in producing electricity, in hydrology, in desalination, agriculture, medicine and industry, can play an increasingly important role in helping to solve the problems of the developing world.

"It will be unfortunate, to say the least" concluded Dr. Eklund "if the resources so readily available for other uses cannot be put more amply at our disposal in the campaigns to produce and conserve more food, to increase the product of industry, to combat disease and to bring water to the arid areas".

SUCCESSSES AGAINST INSECTS AND PARASITES

With more and more answers being found to intricate problems which have entailed years of research in many parts of the world, some successes can now be claimed in the fight to control insect threats to crops, animals and human beings.

Nuclear techniques are playing an important part in world efforts, and recent reports show that they have been effective in pioneer work against crop pests as well as in finding an answer to some diseases caused by parasites.

300 000 000 FLIES WITH A PURPOSE

More than three hundred million flies have been bred in laboratories and released in Central America with the paradoxical purpose of reducing the fly-population —and the results at this stage look promising, even allowing for understandable scientific caution.

The insects belong to the family of the Mediterranean fruit fly, destroyer of large quantities of fruit of various kinds in many countries. The Agency, acting on behalf of the UN Development Programme in collaboration with seven countries in the area, is attempting to save losses which can amount to as much as 80 000 000 dollars a year according to some estimates to Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama. The laboratory-bred flies have been released over an area of many thousands of acres after having been subjected at the pupal stage to irradiation. The effect of this is that they cannot propagate, though otherwise unaffected. Nor can their matings with native flies produce offspring, with the result that populations fall drastically but no other living creature or plant is harmed.

Breeding of the flies has been carried out in Costa Rica, by methods pioneered in Hawaii, perfected in Israel and adapted with a feeding formula suitable for Central America evolved at the IAEA laboratories in Seibersdorf near Vienna. Their first experience of flying has usually been in aircraft provided by the Nicaraguan Government, from which they have been dropped to disperse them widely.

The full effects can only be assessed during the next citrus growing season, but since the programme got well under way there has been evidence of reduced damage to fruit. Now the releases have been extended to Panama.

ERADICATION FROM ISLANDS

At a meeting of an international panel of experts on insect pest control held at Agency headquarters in August, Dr. L.F. Steiner (USA) expressed the opinion that experience with the sterile male technique had been so satisfactory that he could foresee only greater and greater application of it to eradicate harmful insects. Reporting on recent experiments in the Mariana Islands, he said that the oriental fruit fly, which is similar to the Mediterranean fruit fly, had been eradicated from several islands, including Guam, Rota, Saipan and Tinian.

An important experiment on the island of Capri to determine the ability of laboratory flies to survive in natural conditions has demonstrated satisfactory survival rate and dispersal range. It was begun in April by the Italian Government with the assistance of the Agency, the Food and Agricultural Organization and the Israel Atomic Energy Agency. Dr. David Nadel, the IAEA scientist assigned to the project, told the panel that in spite of exceptionally cold, rainy spring weather, useful information had already been obtained on the behaviour of the flies produced in laboratories in Israel and lately in Austria and "air expressed" to the island. Traps and fruit samplings at key points had also shown the absence of wild flies on Capri, although on the nearby island of Ischia fruit is already infested.

The joint FAO/IAEA Division of Atomic Energy in Food and Agriculture arranged the panel, whose experts were drawn from eight countries as well as the World Health Organization, EURATOM and FAO. In addition to the subjects already mentioned, they discussed the application of similar methods

for combating other major pests, including several species of fruit flies, the screw-worm fly (a cattle pest), rice stem borer, codling moth (a fruit pest) and the gipsy moth which feeds on leaves of fruit and forest trees. In speaking of the olive fruit fly, W.F.Baldwin (UK) said that experiments in Greece had indicated ratios of laboratory to wild flies which could give good control at the right time of the year.

VACCINES AGAINST PARASITIC DISEASES

The joint FAO/IAEA division also has a coordinated programme for the use of nuclear techniques to study and control diseases caused by parasites—liver flukes, hookworms and tapeworms are examples. These diseases have debilitating effects on both animals and men, particularly in developing areas of the world, and have long been of major concern nationally and internationally.

Twenty scientists from 12 countries and two international organizations met for another panel meeting in Vienna early in August, and also reported some successes. A great hope has always been to find a method of vaccinating human and animal populations against the infections, but attempts by conventional means to find suitable vaccines have been unsuccessful. A few years ago, however, irradiation work with some worm parasites resulted in the production of worms which could produce immunity but in other respects were harmless.

Vaccine production, immunology and the pathological effects of various parasites were discussed at the meeting. It was learned that the first two vaccines produced by using radiation methods, against lungworms in sheep and cattle, are well established in veterinary practice in several countries and are gaining more and more interest. Two new radiation vaccines, against gapeworm in poultry and hookworm in dogs, have successfully passed field tests and may be expected to appear on the market in the near future. The hookworm vaccine is of considerable interest also in human medicine, as it indicates the possibility that a vaccine against the human hookworm may one day become a reality.

Promising preliminary results in immunization against three other parasitic diseases were reported. These are echinococcus, a serious tape worm malady; malaria; and trypanosomiasis—sleeping sickness in man, Ngana in cattle.

Opinion as a result of the meeting is that further progress towards vaccine production will depend to a great extent on a better understanding of the relations between the parasite and its host. Immunology and pathophysiology are two areas of the utmost importance in this respect, and are making increasing use of isotopic methods, which in many instances will be necessary for the proper elucidation of significant questions. Strong recommendations were made that work on these subjects be performed simultaneously with the research on allied problems related to vaccine production.