

in the scheme is so small, there are more involved than in previous years when there have been only one or two or none at all. By publicity, however, the Royal Society hopes that more teachers will come into the scheme. Although the projects are chosen and carried out by the teachers, there are hopes that pupils will be involved whenever possible. This should be an opportunity for them to find out what research entails. From the teacher's point of view this is obviously a way of keeping themselves in the scientific world while doing a worthwhile job of teaching.

The quality of their research is exemplified by the increasing number of papers they are publishing. Among those published last year was that by Mr W. H. Dowdeswell of Winchester College, who is well known for his contributions to ecological genetics. With advice from Professor E. B. Ford and his colleagues at Oxford, Mr Dowdeswell and Mr J. C. L. Day have investigated natural selection in the snail *Cepaea* on Portland Bill (*Heredity*, **23**, 169; 1968).

NUCLEAR POWER

Exchange of Information

AN agreement on the exchange of nuclear information was signed last month between the governments of France and Japan. The agreement is the latest in a long series which the Japanese are using to set the stage for a rapid expansion in nuclear power capacity. So far, Tokai Mura, one of Britain's few successes in the export of complete power stations, is Japan's largest nuclear power station, but it will be rapidly overtaken by others if Japan's ambitious nuclear power programme goes according to plan.

By 1975, Japan intends to increase the existing nuclear capacity to more than 9,000 MW; in 1985, this will have been further increased to between 35,000 and 55,000 MW, providing almost a fifth of the country's electricity. This represents the commissioning of at least two nuclear stations each year until 1985, an ambitious programme by any standards. Even if this rate of development is not achieved, it is clear that for the next ten years or so the Japanese market is going to be one of the most lucrative in the world. For this reason alone, Japanese industry is certain to develop its own systems, and the agreement signed with the French seems to be designed to speed up the process. The six reactors approved or under construction in Japan at the moment are all of American design.

Another reason for the agreement is the parallel work on fast reactor systems which is in progress in Japan and France. The French experimental fast reactor Rhapsodie began operations in 1967, and a prototype reactor is expected to be operating in 1973, the same year as the Japanese prototype comes on to power. It is this accident of timing which has made the possibility of collaboration attractive. The Japanese fast reactor prototype will be a 100 MW (thermal) reactor, cooled by liquid sodium, and a similar reactor with a capacity of 100 to 300 MW (electrical) will follow, to be brought on power in 1976. The recent agreement provides for exchange of basic information on the behaviour of liquid sodium and the materials used, as well as some collaborative research in the same areas.

But Japan is not limiting its nuclear agreements,

and sensibly seems to be using them to get the most out of other countries. In March last year, Britain and Japan signed a thirty-year agreement which provides for collaboration on the peaceful uses of atomic energy and, more specifically, for the supply of fuel to Japan for any British reactor sold there. Agreements have also been signed between the UKAEA and the Japanese Atomic Energy Research Institute for the exchange of basic data useful in the development of fast reactors; the information is likely to stop well short of the commercial secrets necessary for building marketable systems. Information about the fuel used in the steam generating heavy water reactor programme has also been sold to Japan, and an agreement has been reached between the AEA and the Furukawa Electric Company for the manufacture in Japan of AGR fuel if an AGR is built there.

EURATOM

Biology Soldiers On

EURATOM's Biology Division has just issued its second report (*Euratom's Biology Programme 1964-1967: Report, Perspectives and Bibliography*). Euratom's involvement in biology started in 1961 with a programme which, to begin with, concentrated on problems of radioactive contamination. Since then, the division has had more than its share of financial difficulties—in 1964 it faced budgetary cuts that amounted to a reduction of forty per cent in its uncommitted funds—but it has managed to soldier on. Not surprisingly, the report is peppered with splenetic asides about the limitless costs of space research, although it is silent about the French machinations which are currently threatening the future of Euratom itself. France recently proposed that Euratom should abandon its communal research programmes altogether.

Politics aside, the report conveys a picture of vigorous and wide-ranging research. Most of the division's projects are contracted out to universities and institutes throughout the six, although the division has fifty professional research staff on its own account, and its budget runs at about \$5 million a year. The biological effects of radiation continued to be a main interest, with projects ranging from the ecological—the accumulation of Mn⁵⁴ in the bivalves of Lake Maggiore—to the molecular—the role of hydroxyl radicals in the gamma ray inactivation of the phage Φ X 174.

Any evaluation of the genetic risks associated with radiation exposure requires some assessment of spontaneous mutation rates. Cavalli, a contractee, has attempted to do this for a category of human genes (sex-linked recessive lethals) in an intriguing way. He examined a 1/200 sample of the Italian population for signs of correlation between sex-ratio of offspring and the age of the maternal grandfather at the birth of the mother. Results so far apparently hover on the brink of statistical significance, and the survey is being continued.

In other research topics, the biology division has strayed some way from its original radiobiological brief into such fields as immunity, phage biology, crop improvement and the growth of pathogen-free animals. The topics covered seem intelligently chosen, though most of the work being done seems perhaps of less than