

research to strengthen their teaching abilities, I envisage the main research effort as being in a field to concern industry, business and the public services, often in a regional or even a local context. The universities will thus continue to be the main repositories of pure research conducted with the cultural aim of the advancement of knowledge for itself."

#### RESEARCH COUNCILS

### New Chairman for NERC

SIR PETER KENT is to succeed Professor F. H. Stewart as chairman of the Natural Environment Research Council from October 1. Sir Peter, 60, who was knighted this year, is a former exploration manager and chief geologist of British Petroleum. His appointment is for a period of four years.

Sir Peter is no stranger to science policy. From 1968 until it was disbanded he was a member of the Council for Scientific Policy and he is currently an independent member of the Advisory Board for the Research Councils.



Sir Peter Kent

He comes to the Natural Environment Research Council at a time when it is having to adjust to the large scale reorganization of its work that emerged from last July's white paper on government research and development. Sir Peter was a member of the working group that produced the Dainton report on the research councils—which recommended a rather more evolutionary change in the relationship between the research councils and government departments than the large scale transfers of funds that Rothschild proposed and the government, after amendment, accepted. This year £2.25 million of the council's £15.3 million budget (1971–72

prices) were transferred to the Department of the Environment and the Department of Trade and Industry. A further £3.25 million and £4.5 million will have to be found in 1974–75 and 1975–76.

Sir Peter's experience with BP— which he joined in 1936—makes him well aware of the basic problems in geology and oceanography, as well as giving him an insight into the workings of industry that few academics achieve.

Sir Peter is a graduate of the Universities of Nottingham and London, a fellow of the Royal Society and a member of its council since 1968. While with BP he was responsible for geological survey work in Iran, East Africa, Papua, Canada, Alaska and Britain including the North Sea.

#### RADIOACTIVE WASTE

### Safe in the Sea

REASSURANCE that the dumping of radioactive waste at sea is safe is given in a report issued yesterday by the National Radiological Protection Board.

Dr G. A. M. Webb and Dr F. Morley have built a model to evaluate how radioactive waste disposed of in the deep ocean is dispersed with time. By making all kinds of unlikely assumptions about the worst possible conditions for disposal, they confidently conclude that up to several thousand and, for some types of activity, several million times the quantity of radioactivity now disposed of in this way could be deposited on the sea bed without the dose limits recommended by the International Commission on Radiological protection being violated. Not only are the amounts of activity now being disposed of by Britain and other countries in this way negligible by comparison with the maximum allowed amounts, but Dr Webb and Dr Morley also point out that radioactive waste could be disposed of in the sea for several thousand years without there being any adverse effects.

A basic assumption made in the model is that the waste is dropped into deep water in packaged drums and that the drums reach the sea bed without any of the activity leaking out. In practice these drums are not airtight to ensure that during descent the pressure inside the drum remains the same as that outside so that there is no danger of the drum fracturing before it reaches the sea bottom. The different types of radioactivity are considered separately. The Harwell scientists assume that the tritium in the waste is released immediately the drum reaches the ocean floor whereas in practice it will probably take the tritium several years to percolate out of the drum. It is also assumed that all other waste will gradually leak out

within ten years although it is suspected that drums will retain their soluble waste for up to tens or even hundreds of years and indeed much of the waste could languish in the drums for much longer than that.

But the most significant assumption made is that the activity once released will not deposit onto sediments on the sea floor and that it will diffuse throughout the ocean. In practice most of the activity would be removed in this way and little would be left to be circulated.

Britain at present disposes of at most 20,000 curies of radioactive waste in the sea bed every year, of which only about 100 curies are due to alpha activity. According to the model it would be perfectly safe to deposit up to  $10^{10}$  curies of alpha particle waste based on  $^{239}\text{Pu}$  every year and up to  $10^6$  curies based on  $^{226}\text{Ra}$ . Up to  $10^{11}$  curies of general beta and gamma active waste could also be dumped with  $10^{15}$  curies of tritium as well.

#### SPACE

### Mars Soft-lander ?

from our Soviet Correspondent

THE launch of Mars-4 and Mars-5, the latest Soviet Mars probes, on July 21 and 25, was announced with the usual reticence about their programmes. The official TASS press releases stated simply that their main aim was to continue "the scientific investigations of the planet Mars and its ambient space begun by the Mars-2 and Mars-3 probes in 1971", two probes "analogous in structure and purpose" are being used so that "simultaneous scientific investigations" . . . may "permit more complete data to be obtained". This does not imply, however, that the two probes are entirely identical.

The Mars-2 and Mars-3 probes, coming as they did almost ten years after the Mars-1 flyby, carried out an interesting series of synchronized observations of surface and atmospheric features from different orbits (that of Mars-2 being near-circular and Mars-3 highly elliptical).

It is difficult at this stage to estimate how the new probes will "continue" the programme. So far, the Soviet space planners have avoided straight-forward repetition of a successful project—thus Lunokhod-2 differed from Lunokhod-1 in carrying magnetic experiments and in traversing a far wider survey area. It seems likely, however, that some soft-landing attempt may be made. Whether this would be a simple physico-chemical instrument package, or one of the more exotic automated exobiology experiments or the roving "Marsokhod" that has been mentioned in the Soviet press, will probably remain a mystery until the probes reach Mars in February, 1974.