

project grants on the pattern of the British research councils, instead of state subsidies for the overall budgets of institutions.

Following wide consultations, the agency prepared a list of nine priority areas of research, approved by a ministerial committee in June 1979. By October 1980 436 grant applications had been received and some 70 approved projects were already under way. Applications are being dealt with speedily, the process taking an average of seven months including the time required for three referees (at least one from abroad) to report.

Other achievements include eighteen international agreements for joint projects. Solar energy plants are to be built with Germany and France, and a geothermal plant constructed on the island of Melos in cooperation with the European Economic Community.

There are some clouds on the horizon, however. The law setting up the Science Research and Technology Agency sought to exempt it from the notoriously bureaucratic public accounts regulations, but the Ministry of Finance nevertheless managed to block payments of grants for "technical reasons". The Committee of Ministers which oversees the work of the agency has reaffirmed its confidence in it. One hopes that it will now be allowed to function unhindered.

E. M. Pantelouris

UK space policy

Year of decision

Last year was a busy one for makers of British space policy. By November, a committee of the Central Policy Review Staff, the think tank, had submitted to the Cabinet its study of Britain's efforts in space applications; and an inter-departmental committee, under the Department of Industry, had been created to coordinate space policy more effectively and to discuss the think tank's deliberations. The Home Office was also busy preparing a report on direct broadcast television by satellite.

The sudden interest in space seems to have been stimulated by the fear that Britain might miss out on the profits that could be made from selling space technologies, especially telecommunications satellites. The think tank's report is to remain confidential for commercial reasons. The gist of the recommendations is that there is a demand for space applications satellites which British industry should be encouraged to meet.

One important question is whether Britain should try to build up its industry alone or whether it should continue, perhaps at an increased level, in the space applications programmes of the European Space Agency (ESA) which France and Germany, in particular, have used more effectively than Britain to boost their own industries. The most likely outcome is that Britain will continue at more or less the same level in ESA's telecommunications

programmes, but that greater efforts will be made to transfer the results of ESA's research and development to industry.

The government is unlikely to rush to pour money into the industry, seeking rather to encourage private investment. A central issue in the telecommunications field will be the government's attitude to the monopolies held in television broadcasting by the broadcasting authorities and in satellite communications by the telecommunications division of the Post Office, British Telecom. A bill to dilute British Telecom's monopoly is now before Parliament, and could be used by the Department of Industry to liberalize access to satellite communications, leaving the way open for private operators, in particular, of small satellites for business communications. If greater incentives are given to satellite operators, the next question will be the ability of British Aerospace (which not everyone is convinced could withstand open competition) and other UK manufacturers of satellite components to meet the demand.

A government announcement on the subject is expected soon and it may seem rather bland, leaving the question of monopolies at least until the Home Office has reported on direct broadcasting by satellite. A decision will have to be taken fairly shortly, however, on the scale of Britain's effort in another space application — remote sensing — if it is not to miss the opportunity of cooperating in ESA's next programme. This year promises to be a vital one for Britain's space industry.

Judy Redfearn

Herbicide safety

Bill of health

The herbicide 2,4,5-T has been given a cautious but clean bill of health by two recently published reports. One*, by the Advisory Committee on Pesticides of the UK Ministry of Agriculture, Fisheries and Food, says that there is no sound medical or scientific evidence that herbicides based on 2,4,5-T are harmful to humans, animals or the environment in general. The second, by the European Community's Advisory Committee for Safety, Hygiene and Health Protection at Work, says there is no conclusive evidence that 2,4,5-T causes cancer, but asks for further evaluation of the long-term risks.

The British pesticides committee, essentially the licensing body for pesticides and herbicides, has reviewed 2,4,5-T nine times since 1970. Its latest review was undertaken at the request of the Minister of Agriculture after the National Union of Agricultural and Allied Workers claimed,

*Further review of the safety for use in the UK of the herbicide 2,4,5-T. Available free of charge from Pesticides Branch, Ministry of Agriculture, Fisheries and Food, Room 678, Great Westminster House, Horseferry Road, London SW1P 2AE, UK.

in March 1980, that 2,4,5-T was harmful.

The union reviewed the scientific literature on 2,4,5-T and referred to 20 cases where it was alleged to have harmed humans or farm animals. The advisory committee says, however, that the union's evidence does not indicate that 2,4,5-T is a health risk.

Concern about 2,4,5-T has centred mainly on the presence of a contaminant, 2,3,7,8-tetrachlorodibenzodioxin (dioxin), a teratogen and carcinogen in some animal species. The committee now believes that this concern may have been misplaced and that the risks posed "by dioxin contamination in 2,4,5-T formulations may hitherto have been overestimated".

First, the committee says, dioxin contamination of 2,4,5-T formulations sold in the United Kingdom is now at the low level of 0.01 p.p.m. Second, the committee says that new studies enable it to identify for the first time "a daily level of intake below which effects on reproduction do not occur in the rat", that is 0.001 $\mu\text{g kg}^{-1} \text{ day}^{-1}$.

In the circumstances, the committee considers that 2,4,5-T itself would present a problem before its dioxin contaminant, but that there is no convincing evidence that any effects caused by 2,4,5-T will be passed on to succeeding generations "on an heritable basis". The committee also notes that the WHO/FAO authorities have set a "no effect level" for 2,4,5-T in animals at 3 mg kg^{-1} . Employing a thousandfold safety margin, WHO/FAO have set a "temporary acceptable daily intake" for a man at 3 $\mu\text{g kg}^{-1}$ for 2,4,5-T containing 0.1 p.p.m. dioxin.

The committee does, however, accept the union's claim that workers using 2,4,5-T are not always adequately protected. It suggests that exposure to the herbicide should in future be measured in urinary excretion.

On the question of alternatives to 2,4,5-T, the committee is doubtful. Much less is known about their toxicity and the committee, in continuing to allow 2,4,5-T to be used, is relying on the maxim "Better the devil you know . . .".

All of the twenty cases where 2,4,5-T exposure is alleged to have caused health problems are discussed in the report. The advisory committee has harsh things to say about coverage of alleged 2,4,5-T incidents and accuses the press of causing needless distress by publicizing cases without the consent of the individuals involved. The committee may have been unwise in making this accusation, given that most of the individuals referred to in the report seem to have sought out journalists.

Although the committee has given 2,4,5-T herbicides a clean bill of health, it does ask for prospective epidemiological studies of the risk from exposure to herbicides in general. Professor Robert Kilpatrick, chairman of the advisory committee and dean of the school of medicine at the University of Leicester,

says that a prospective study is in the offing and that 2,4,5-T would almost certainly be one of the herbicides investigated.

The report ducks one issue, however, that of trade union involvement in its decisions. The unions would prefer the Health and Safety Executive (HSE) — where the unions are included on various committees — to be responsible for assessing herbicide safety. Kilpatrick says that this is a matter for ministers to decide. But it seems likely that the unions will be involved in planning the prospective epidemiological study on herbicides. It remains to be seen, however, whether participation on this *ad hoc* basis will satisfy them. Despite the reassuring conclusions of the advisory committee's report, the recent decision by the Trades Union Congress to instruct its members not to handle any 2,4,5-T imported into Britain stands for the time being. **Alastair Hay**

UK forestry policy

Research wanted

British policy on forestry research came in for a drubbing just before Christmas in a critical report from the House of Lords Select Committee on Science and Technology. And the annual report of the Forestry Commission, the public agency responsible for publicly-owned forests, did little to answer the criticisms when it appeared a few days later.

The select committee's chief complaint is that there is no coordinated policy on forestry research. The Forestry Commission is accused of being too concerned with wood production to bother promoting less obvious areas of research, so that the Natural Environment Research Council has been left to support "fundamental and strategic research" — a responsibility which it has shouldered "lightly", according to the committee.

The committee asks that the Forestry Commission should mend its ways by appointing a chief scientist, and that the Advisory Board for the Research Councils should decide which of the two obvious candidates — the Natural Environment Research Council and the Agricultural Research Council — should be responsible for longer-term research. The commission should also be urged to provide advisory services for the owners of private woodlands much in the spirit in which the Agricultural Advisory Services help private farmers to tackle agricultural problems.

The commission's own account of the past year (to March 1980) confirms a preoccupation with the production of wood and in this respect some of the results are impressive. Machinery and pesticides have made the planting of trees a more certain business, with obvious benefits to production costs. The development of local seed supplies, the search for more productive species and for the avoidance of damage by high winds and the control of

Lords look ahead

The House of Lords Select Committee on Science and Technology will study scientific advice to government in its next inquiry. The idea came from Lord Todd, chairman of the committee. The committee will consider whether the post of chief scientific adviser to the government, which was abandoned in 1974, should be reinstated and whether responsibility for science should be removed from the Department of Education and Science.

pests and forest diseases remain the mainstays of the commission's research.

British forestry is a controversial business with the commission frequently pilloried for its preoccupation with conifer plantations. The select committee makes a case for the preservation and renewal of often ancient broad-leaved woodlands, suggesting local authorities as suitable custodians. There is a plea for research to throw light on the more effective planning of land use.

The implementation of many of the select committee's recommendations will cost money — both for reorganization and for an increase in volume of some areas of research. The current level of forestry research funding of just under £5 million for the past year is not generous when compared with the current value of the forest estate of £500 million. But recognizing that an increase in public funds is unlikely, the committee suggests that extra revenue could be created by a 0.1 per cent levy on imported timber and wood products, raising £2.75 million a year.

There is little prospect that extra funds could be found in the Forestry Commission's profits. The commission acknowledges that over the next three years it is unlikely to make the financial target of 3 per cent a year in real terms required of it by the British government. In this respect, the Forestry Commission has yet to make an effective response to the criticism of its financial operations by the Treasury in 1972.

Judy Redfearn

UK clinical research

Future not so rosy

Celebrating their fiftieth anniversary in London last month, members of the Medical Research Society were not altogether optimistic about the future. One of the principal fears, aired at the day-long symposium on the organization of medical research, was the declining ability of clinical departments to attract and train the people to keep them in the front line of research.

Part of the problem is to provide the money and status to keep non-clinical research workers in clinical laboratories, where their knowledge and expertise is essential. Dr J. L. Gowans, secretary of the Medical Research Council (MRC) pointed out that although MRC grants can sometimes cover the costs of such people, the universities should really be providing them with permanent jobs.

Professor W. S. Peart of St Mary's Hospital Medical School, London, said that in hard times, hard choices must be made in medical schools between technical staff and academic staff — it may be necessary to take on a new postdoctoral fellow rather than a lecturer.

The other side of the problem is the difficulty of providing high quality scientific training for medically qualified staff without disrupting the smooth course of their clinical careers. Professor Peart was disturbed by the lack of young people entering academic clinical research.

The continuing revolution in biology will increase the need to unite basic and applied research on man. Dr S. Brenner, director of the MRC Laboratory of Molecular Biology in Cambridge, pointed out that human molecular and cell biology, now in its infancy, will become the essential interface. In twenty-five years, he said, it will be as essential for researchers in pathology, cardiology and so on to have a thorough knowledge of cell and molecular biology as it is now for clinical endocrinologists to know their steroid chemistry. **Mary Lindley**

New rings for old

Claims from ground-based astronomers that Saturn has an innermost D ring, stretching from the bright C ring down to the planet's cloud tops, were apparently disproved by Pioneer 11 in 1979. But this image from Voyager 1, taken soon after its encounter with Saturn last November, reveals an inner ring, complete with fine structure, between the planet (bottom left) and the C ring (top right). Here, Saturn's shadow falls across the ring, which is apparently too faint to be detectable from Earth.

