

their budget is in real terms not very different from what was agreed three years ago. Others say that little purpose is served in reminding one Administration of promises made by its predecessor.

One of the ironies of ISABELLE is that the problems of magnet design which have delayed the project by about four years appear in the past few weeks to have been resolved. If the Administration practises what it has been preaching the only remaining hope for the accelerators is that Congress may choose to appropriate funds for the project against the Administration's wishes.

## High-energy physics

### LEP approved

While American physicists agonize over the future of a new accelerator (see above), twelve European nations last week agreed in principle to the construction of LEP, a 27-km circumference machine to collide electrons with positrons at energies up to 50 GeV per beam — enough to create the long-sought neutral intermediate vector boson.

The twelve nations are the members of CERN, the European centre for research on nuclear physics at Geneva where LEP will be constructed. Three members (the Netherlands, Sweden and Norway) have given approval subject to parliamentary approval at home.

The principal questions still hanging over LEP concern the precise annual budget at which it will be built — which affects how rapidly it might be brought into service — and environmental opposition in the French and Swiss territory under which the LEP tunnel must be bored.

If all goes well the budget will be decided at the December meeting of CERN Council. (On CERN's own plans, it would be about 630 million Swiss francs a year — £182 million — enough to have LEP in action by early 1987.)

But environmental approval is more unpredictable. At present, CERN is restricted from building even a reconnaissance gallery. The gallery is needed to permit inspection of the geologically critical boundary between the sandstone floor of the Geneva valley and the limestone Jura Mountains to the north (under which the LEP tunnel must pass), but a Lyons court ruled that CERN had no valid licence for the work. CERN has now guaranteed that the accelerator will not be built until and unless the appropriate local French and Swiss procedures for approving large constructions are completed successfully.

Such approval is yet to come — for the French and Swiss accession to LEP at the level of CERN Council was made at ministry level, and is subject to local approval. However, CERN staff are confident that the environmental "dangers" of LEP — for example that it might affect the water table — have been wildly exaggerated, and that local approval will be granted.

**Robert Walgate**

## US research support

### Academy exhales

#### Washington

Dr Frank Press's first essay as a constituency lobbyist since his election as president of the National Academy of Sciences, his colloquium on the latest budget proposals on Monday and Tuesday last week, was a tactical success. Its most tangible product, a document labelled "consensus statement", drafted in a closed session on the second day, is a nice amalgam of moderate belligerence and sympathy for the Administration's economic problems.

The colloquium itself was the first response of what the labour unions might call organized science to the decision in September that all federal agencies except the Department of Defense must reduce their discretionary expenditure by 12 per cent. (NASA, for the current financial year, is let off lightly at 6 per cent but has been told that 1983 will be worse). Discretionary expenditure is that not mandated by explicit provisions in legislation.

The consensus statement acknowledges that economic problems "have eroded research and development", but says that the new budget proposals will do "irreparable damage" unless long-term research is protected, if necessary at the expense of "development and demonstration". The document urges the Administration to assume responsibility for supporting scientific research, but asks for a formal review of the machinery by which this is done.

Before the definition of consensus preoccupied the colloquium, diversity was rampant. One speaker was so alarmed by the threatened 12 per cent reduction as to fear a return to pre-Sputnik days. Another warned his academic colleagues not to expect too much from industry, whose support now accounts for 3 per cent of university budgets. Industrial grants would have to increase threefold to make good the damage done by the 12 per cent cut.

The colloquium also broke new ground by giving currency to the word "prioritization" — deciding what research should be given first claim on limited funds. This notion is in sharp contrast with earlier declarations of faith in a plurality of sources of funds.

The statement argues that the abruptness of the new cuts will be especially damaging. This is well illustrated by the plight of the National Science Foundation, none of whose expenditure is mandated by Congress, but which finds itself committed to the US Navy for support of the Antarctic research programme as well as to several national laboratories. It has become known in the past few days that these commitments may mean that the softer, grant-making parts of the foundation may find their budgets cut by up to 18 per cent, especially if spending on social science,

education and international relations (cut severely in March) is now protected.

Among the hundred participants the two principal government representatives appear to have left contrasting impressions on their audience. Dr J. Khaduri, one of the hard men from the Office of Management and Budget, preached economic realism and told his listeners that they would lose more from continued inflation



*Press, moderately belligerent; Keyworth, inscrutable* than from the government's emergency budget. In the meantime, he declared, there is bound to be hardship. But at least there is also a chance that scientific enterprise could be growing again on the basis of a "new equilibrium" and with the help of dollars whose value remained constant from one year to the next. It is unfortunate that the Secretary of the Treasury, Mr Donald Regan, should have had to admit a few days later that the federal budget would probably not be balanced by 1984.

Dr George Keyworth's declaration seems to have been harder to interpret. The science community is not yet sure whether to regard him as a friend at court or as the Administration's lightning rod. Dr Keyworth himself is probably not yet sure. Last week, however, he left at least some of his audience with the impression that he believes the consequences of the emergency budget will be less serious than now seems likely. Does he know something, or is he simply being well mannered?

## European space policy

### New satellites due

Europe's activities in space received new impetus with the announcement last week that the United Kingdom is willing to make its contribution to the Large Telecommunications Satellite (LSAT-1), and with the decisions made at a European Space Agency (ESA) council meeting to recommend three projects to member nations for further development. Provided the member states do not refuse to fund them, the three projects — the Earth Resources Satellite (ERS-1), the Ariane 4 launcher and the Spacelab "follow-on" spacecraft — will begin their next development stages in about three months' time. Other issues of great concern to the members of ESA — particularly collaboration with the United States and the ten-year plan of ESA's director, Erik Quistgaard (*Nature* 290, p.536) — have

been deferred until the next council meeting in December.

The Minister for Information Technology at the British Department of Industry, Mr Kenneth Baker, announced last Friday that the United Kingdom was willing to provide its 34 per cent share towards the cost of LSAT-1 (which would amount to about £77 million over the next ten years). The project will only proceed once other interested ESA members, particularly Italy, the Netherlands and Canada, have decided to fund it.

The concern of the United Kingdom has been that the balance of responsibilities for the specifications, management and marketing of the satellite, both before and after its expected launch on Ariane early in 1986, should be shifted from ESA to industry. The satellite will carry four groups of payloads, two of them primarily commercial, the others more experimental. The former are to be funded mainly by Britain and Italy, and are intended to provide efficient communications for businesses and facilities for high-powered direct broadcasting of television. The two more experimental payloads, involving Italy and Belgium, will function in the millimetre (20–30 GHz) waveband, and are intended to investigate signal propagation characteristics at these frequencies. Once the usefulness of LSAT-1 has been adequately demonstrated, further satellites of this type may be developed on a commercial basis and — to this end — the satellite has been designed to be launched by either Ariane or the space shuttle.

The decisions made at last week's ESA council meeting have increased the chances for launches of the Earth Resources Satellite, Ariane 4 and the successor to Spacelab in 1986 or thereabouts.

The successor to Spacelab will involve the development of increased electrical power and mission duration within the present Spacelab configuration. ESA's recommendation, if funded by member countries, will initiate the construction of this craft. Moreover, there will begin a study into the development of a pallet that would be launched from the shuttle to be retrieved from low Earth orbit later.

Ariane 4 is, to some extent, ESA's answer to the space shuttle, in that current models of Ariane cannot launch the large payloads that may be required over the period 1985–95. Modifications to the first stage, allowing an increased fuel volume and the addition of liquid fuelled boosters, will increase Ariane's maximum payload capacity to 4,300 kg (as opposed to Ariane 3's limit of 2,460 kg). It is intended that Ariane 4 will not only launch single large satellites such as Intelsat 6 but also provide an improved dual launch facility.

The oceanographic remote sensing satellite ERS-1 is now set for the second stage of its feasibility study, involving a detailed design and costing. Experiments already earmarked for the satellite will investigate the wind field and ocean wave

heights. An announcement of opportunity has also been issued for prospective experimenters to fill the remaining 50 kg of payload capacity. The final decisions on the mission's design and instrumentation will be taken in 1983. One problem still to be decided upon concerns the distribution of data from ERS-1, particularly the degree to which this is centralized.

**Philip Campbell**

## Environment research council **Rothschild persists**

The Rothschild customer/contractor principle, whereby British government departments (the customers) commission research in the research councils (the contractors) is still alive in environmental research, despite its demise in medical research and modification in agricultural research earlier this year. Its survival seems to be largely due to Sir Hermann Bondi, a well-known advocate of the principle, who has been chairman of the Natural Environment Research Council (NERC) for the past year.

Sir Hermann believes that the principle will work well, but only if NERC is careful to accept those contracts which will benefit its research as well as satisfying the customer. He also acknowledges the difficulties inherent in multi-customer contracts which can put a project at risk if one customer decides to withdraw support.

One such casualty is the £5 million Land Geological Survey of Great Britain which was threatened when the Department of the Environment, largest of the three customers, decided to cut its contribution for 1981–82 to two-thirds of its level in 1980–81 and to support only tactical research directed mainly at resource planning.

It plans a further cut in 1982–83. The result has been a substantial reduction in the amount of strategic and long-term research which is mainly geared to detailed geological mapping.

Despite these problems, however, Sir Hermann remains optimistic about the work of NERC. When introducing its annual report last week (HMSO, £4.00), he said that he had had a "marvellous time" during his first year as chairman. Although a slightly reduced budget has diminished the vigour with which the council can pursue some projects, he says he is impressed with the quality of the research it supports and sees no danger of stagnation.

During 1980–81, the year covered by the annual report, £26.1 million of the council's £72.9 million budget was earned from contracts, the remainder coming from the Department of Education and Science through the science vote. Support for universities, however, decreased slightly, with £75,000 less spent on new research grants than in the previous year (the council currently awards about £3 million of new research grants a year).

**Judy Redfearn**

## Hoechst in Boston **Contract cleared**

*Washington*

Deft collaboration between the US General Accounting Office (GAO) and Congressman Albert Gore has now forced into the open the controversial agreement between Massachusetts General Hospital and Hoechst AG, the Frankfurt-based chemicals company. Earlier this year, representatives of the hospital declined to hand over their agreement with Hoechst to a congressional subcommittee of which Mr Gore is the chairman, on the grounds of commercial confidentiality. Under the agreement, Hoechst will support a new department of molecular biology at the hospital, spending more than \$50 million in the coming decade. In return, Hoechst will have the first refusal on an exclusive licence to exploit any patents generated by the laboratory during the period of its financial support.

The intervention of GAO, prompted by Congressman Gore, was based on the possibility of a conflict between the hospital's agreement with Hoechst and the requirements of the 1980 amendments of the patent legislation which, among other things, gave non-profit making institutions such as the hospital the right to first refusal of patent rights arising from federally supported research. The provisions of the new patent legislation came into force on 1 July this year, two months after the hospital's agreement with the company.

Evidently, the new agreement between Hoechst and the hospital has been drafted with the new legislation in mind. GAO says, in a letter to Mr Gore, that it should be possible for the hospital to keep separate the research funded by Hoechst and that funded by federal agencies, the National Institutes of Health (NIH) in particular. As things are, the hospital's research programme is supported to the tune of \$30 million a year by grants from NIH.

Difficulties will arise, according to GAO, only when there is doubt over whether a patent exploited by Hoechst has been supported exclusively by funds provided by the company, or where patents arising from jointly funded projects would be dealt with differently under the agreements between the hospital and Hoechst and NIH respectively. In all the circumstances, both the hospital and the company are likely to lean over backwards to avoid complications of this kind. Even so, when making public the terms of the contract on 16 October, Mr Gore uttered dark threats about the necessity that US institutions made strong with public funds should assist American and not foreign industry.

The details of the contract now published are unlikely to offend academic susceptibilities. Hoechst's support of the new molecular biology laboratory is defined by a programme of payments that will include the best part of \$18 million for