Research application

Hungary expects

Budapest, May

The Hungarian Government is hoping to reshape the balance between academic and applied research without reducing the total number of research jobs. This was the burden of a statement by Mr Joszef Marjai, one of the deputy chairmen of the Hungarian Council of Ministers, at the Investment Goods Spring Fair held here from 23 to 28 May.

Mr Marjai promised that there will be no reduction of the number of research jobs, and said that there may be even more jobs availble for scientists and technologists. "But we cannot promise that everyone will stay in the same job."

Mr Marjai's remarks, however, echo a major dilemma in Hungarian science planning. At present, science in Hungary has a top-heavy structure with, it is generally agreed, too many research institutes for a country of 10 million people to support. Last month, Janos Szentagothai, president of the Hungarian Academy of Sciences, told the General Assembly of the Academy that time and energy could no longer be wasted on 'insignificant and middle-level' basic research. Plans are now being formulated for the network of research institutes to be modified to serve 'social and economic needs'.

There is little doubt that many young scientists are reluctant to leave the academic seclusion of their research institutes. Even the show-piece Babolna collective farm has found it difficult to recruit a qualified agricultural economist. Young biology graduates joining the Plant Protection Service speak of their field-work as if it were a kind of purgatory. Hungary needs scientists to work in agriculture and industry, and while the planners so far have been unwilling to deny promising students a few years post-graduate research, the view is growing that the country simply cannot afford to give them a niche in some institute for life.

The problem can, to a certain extent, be ameliorated by directing research talents not to the needs of the Hungarian economy but to export. More than half of the Hungarian GNP comes from exports, and one pavilion at the Budapest Fair was used by the Academy of Sciences, Ministry of Education and National Committee for Technological Development to show that academic research can sometimes yield practical benefits. The goods on display ranged from a laser theodolite to a fixed-bed denitrification column and from a computer-aided electromyograph to an electronic Braille writer. "We don't want over-specialization", explained Gyoergy Paris, science organiser of the Ministry of Education. "We make what foreigners want to buy."

Nevertheless, like most Hungarian scientists, he was not over-enthusiastic about the plans to direct more scientists to industry. "It is a pragmatic solution", he said, "and not good for research. Some people simply cannot do practical work. But we are a small country — and what else can we do?"

Hungarian planners, of course, are not unique among their Comecon partners in trying to integrate science into production. The Hungarians, however, place less emphasis on the socialist virtue of the process. Nevertheless, the Hungarian problem is exacerbated by the lack of natural resources and by a long tradition of academic elitism.

As in most Comecon countries, Hungary has developed a research structure based on Academy institutes which are independent of the universities, and, perhaps, too large for the country to support. Eight years ago, Bulgaria solved this problem by integrating the staff of the institutes of the Academy of Sciences back into the teaching structure of the universities. In the next few years, it seems likely that Hungary may be forced to adopt a similar solution.

During the past year there has been a major press debate, launched in May 1979 by an article by Professor Gyoergy Adam, former Rector of Budapest University, in *Magyar Tudomany* ('Hungarian Science'). The whole role of the university and its is already under discussion. **Vera Rich**

Hungarian Academy — changing with the times?

High-energy physics

More of less money

Washington

American high-energy physicists are in a jittery mood. They are now faced with the prospect that the three main national particle accelerators may have to close down during the summer months as a result of Congressional budget cuts — and that there may be worse in store next year.

The immediate difficulty stems from a recommendation by the Appropriations Committee of the House of Representatives that $8 million would be rescinded from the $325 million already approved — and largely unspent — for the current financial year.

Half of this saving would come from delaying construction costs of the 400 GeV Isabelle Project at the Brookhaven National Laboratory, with relatively little impact expected over the full seven-year period of the project. But the remainder would include $1 million taken from physics research, $2 million from facility operations, and $1 million from high energy physics technology.

The only way such cuts could be absorbed would be to stop all experimental work at the three national accelerator laboratories until the new financial year begins in October. Dr Leon Ledermann, director of Fermilab, said last week that the decision would be disastrous.

Construction of Fermilab's new energy-saver, designed to double the accelerator's energy to 1000 GeV by the use of superconducting magnets, is already biting deeply into the laboratory's operating funds. Further reductions could mean that the operation of the accelerator was halted entirely next year, so that the construction of the Tevatron could be made the laboratory's top priority, according to Dr Ledermann.

At Brookhaven, the proposed reduction in operating funds would mean that between eight and ten weeks of experiments planned for the summer would have to be put off. And the same would be true at the Stanford Linear Accelerator (SLAC) in California, where the new PEP collider has only just come into operation, but on which experiments could not be carried out until the autumn.

In an already tight financial year, the budget axe seems to be falling particularly heavily on energy research, partly because the energy budget is considered jointly by Congress with the budget for dams and other 'pork barrel' construction projects which carry considerable appeal to legislators in an election year.

The situation for next year remains cloudy, largely because the debate over how to balance defence and social expenditures within a balanced budget means that Congress has yet to agree on its own financial guidelines. However there are

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several pointers around, and none of them is promising.

Thus although the Carter Administration recommended significant increases for high energy physics both in its original budget request in January and in the revised request in April, the Senate Budget Committee has proposed reductions in the whole of the science budget to make room for extra defence spending.

The equivalent committee in the House of Representatives has not been so harsh. But, like that in the Senate, it is suggesting that first priority within the science budget be given to the space shuttle; and has pinpointed high-energy physics as one area that might accomodate a 'pause in funding'.

More specific proposals have been made by the House Science and Technology Committee, which has recommended a high-energy physics budget for next year of $6 million less then the President's revised request of $354 million.

This cut could be absorbed relatively easily. Proposals from the House Appropriations Committee are expected to be more damaging. No decision has yet been made but it is widely reported that the whole of the energy research budget — including high-energy physics — should be kept at its current level for next year, with no increase to allow for inflation.

The implication of such a proposal, if accepted by Congress, would be to wipe out the 10 per cent increase which had been expected by the high-energy physics community.

The prospect of no growth for the energy research budget has already prompted a letter from Dr Frank Press, Director of the Office of Science and Technology Policy, to the chairman of the Appropriations Committee emphasising the importance that the Administration attaches to the support of basic science.

But in a generally confused budget year, it remains unclear which direction Congress is likely to take. All that is certain is that the bleak outlook will be hanging heavily over physicists meeting this week in Woods Hole, Massachusetts, to chart a strategy for US high-energy physics over the next decade. **David Dickson**

Astronomy

Britain bids for big time

BRITISH optical and radio astronomers have decided to bid for £15.5 million-worth of new telescopes — a 4.2 m optical collector and a 15 m millimetre-wave radio dish — to be constructed at the Roque de los Muchachos Observatory site on La Palma, in the Canary Islands. The request effectively mortgages all major capital spending by the Science Research Council's Astronomy, Space and Radio Board until the middle of the decade.

The proposal is now before the Advisory Board for the Research Councils as part of the SRC's 'forward look', and is within previously agreed guidelines for SRC expenditure. However, because the cost is more than £200,000, the proposal also has to be approved separately by the Secretary of State for Education and Science. A decision is expected within a month. The Netherlands is also involved; the National Research Council (ZWO) is considering a 20 per cent participation in the new instruments.

The 4.2 m light collector is designed to provide high resolution imaging of distant faint sources, comparable with that of the Hale telescope at Mt Palomar, but with considerably better seeing — the best, in fact, in the northern hemisphere. Combined with the UK Infrared Telescope (UKIRT) on Mauna Kea, Hawaii, and the complementary 1 m and Isaac Newton 2.5 m telescopes already destined for La Palma, the 4.2 m would double the amount of guaranteed telescope time available throughout the world to UK optical astronomers.

This estimate takes account of the Roque de los Muchachos agreement, which allocates 20 per cent of the observing time on the telescopes to Spain and 5 per cent to collaborations among other users of the observatory. These are at present Denmark and Sweden; but a site has already been reserved for a French 90 cm solar telescope, and there is a possibility that Italy will join with its own 3.5 m telescope.

The Italian move stems from its recent proposal to join the European Southern Observatory in January 1981, alongside Germany, the Netherlands and Sweden, at ESO's La Silla site in Chile. Part of the price of admission — which is still under negotiation — would be to provide a 3.5 m blank to provide a second major ESO light gatherer (a 3.6 m telescope is already in place), and Italian astronomers are considering splitting a large blank into two halves, one for La Silla and one for La Palma. However, their proposal depends on gaining Italian parliamentary support, which is often slow in coming.

The millimetre-wave radio telescope faces greater competition. The United States has had an 11m instrument reaching down to 2 mm wavelength in place at Kitt Peak for a decade; and France and Germany are constructing a similar dish, and a millimetric interferometer, within the Institut pour Radioastronomie Millimetrique (IRAM) whose headquarters are in Grenoble.

The United Kingdom rejected participation in IRAM because it involved setting up a new and expensive administration, because European salaries would have to be paid, and because it was against the SRC's policy of disengagement from large autonomous research centres.

The proposed millimetre radiotelescope would be complementary to the infrared telescope at Mauna Kea, where the seeing is as good as at La Palma. The infrared telescope, which can operate at most wavelengths between the near-visible and 1.5 mm (with the help of helium-cooled bolometers) cannot provide detailed spectral information. The proposed radiotelescope, using tuned-crystal detectors, will on the other hand be able to provide the profiles of molecular emission

Existing major international optical telescopes

Diameter (m)	nationality of operator	location
6.00	USSR	Mt Semirodriki
5.08	USA	Mt Palomar (Hale)
5.00	USA	Las Campanas, Chile
4.50 (6×1.8)	US (multimirror)	Mt Hopkins, Arizona
4.22	UK (infrared)	Hawaii
4.01	USA	Kitt Peak
4.01	USA	Cerro Tololo, Chile
3.94	Anglo-Australian	Siding Spring
3.66	ESO	La Silla, Chile
3.66	Franco-Canadian	Hawaii
3.05	USA	Mt Hamilton (Lick)
2.72	USA	Ford Davis, Texas (McDonald)
2.64	USSR	Crimea
2.60	USSR	Armenia
2.59	UK (Isaac Newton)	La Palma, Canaries
2.57	USA	Mt Wilson
2.54	USA	Las Campanas, Chile
2.29	USA	Kitt Peak
2.24	USA	Hawaii
2.20	W. Germany	Calar Alto, Spain
2.15	USA	Kitt Peak
2.15	Argentina	San Juan, Argentina
2.08	USA	Fort Davis, Texas (McDonald)
2.00	USSR	Chemakha

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