

reaching many of its conclusions makes it difficult to check on whether the agency is doing a good job. NRC member Mr Victor Gilinsky expressed concern that protection given in IAEA statutes to industrial, secret or other confidential information has been interpreted in the broadest manner to withhold information about the safeguards system.

Suggesting that undue secrecy made it difficult for NRC to fulfil its responsibilities for checking the adequacy of IAEA safeguards — responsibilities whose legal status still remains ambiguous — Mr Gilinsky said that the commission believed more information should be reported to IAEA's board of governors by its secretariat, and that the United States should try to obtain better information on overall international safeguards effectiveness and on any significant safeguards problems in countries receiving US exports.

Mr Kennedy replied that the general limitations on the agency's role — such as the substantial amount of classified information which it could not release — are "simply facts of international relations. . . The IAEA safeguards system entails a unique compromise of sovereign rights by many nations, and it is certainly no surprise that this compromise is subject to specific limitations". **David Dickson**

Germany's breeder Gap unbridged

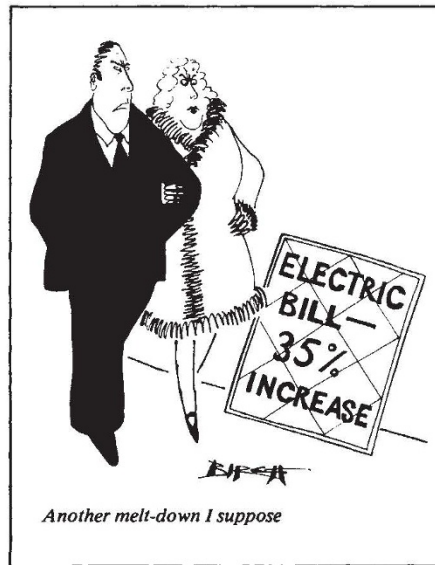
Ulm, West Germany

Rapidly rising costs are threatening the future of West Germany's SNR-300 fast-breeder reactor, with government and public service utility companies still arguing over who should foot the increased bill if the project is to continue.

The Minister of Research and Technology, Andreas von Bülow, has succeeded in extracting from the utilities an increased financial contribution to the SNR-300 plant at Kalkar. At the end of October he announced that Rheinisch-Westfälisches Elektrizitätswerk (RWE), the leader of the owner/operator utility group, is willing to put up an additional DM 375 million. Two other utilities not so far involved in the project, Preussenelektra and Nordwestdeutsche Kraftwerke (NWK) are prepared to contribute DM 172 million.

Even so these pledges fill only half of a total shortfall of DM 1,100 million created by recent cost overruns. The federal government is unwilling to provide the extra funds from its own budget, and insists that the full amount should be paid by West German industry and in particular by the utilities, each financing a fraction corresponding to its share of electricity generation. "It is perfectly clear," von Bülow recently said, "that without an increase in the participation of the utilities, the future of the fast breeder is in danger and a halt to construction before the end of the year cannot be ruled out".

The weeks ahead will show whether von Bülow's warning is merely a tactical ploy or whether there is a real chance that work on the fast breeder will stop. Although budgetary problems have triggered off this latest confrontation, if the minister regarded the fast breeder as an absolute economic necessity it seems likely that he could accommodate the necessary additional DM 550 million over five years (DM 110 million a year) within this present budget — the ministry has a proposed total budget of DM 6,600 million for 1982 and an energy research budget of DM 2,550 million. "The present situation," he said, "necessitates a reconsideration of the original objectives of government support." At the same time the minister announced that government funds for microelectronics and biotechnology will be increased over the next few years.



Another melt-down I suppose

Political uncertainty is one of the reasons why the utilities are reluctant to shoulder an increased share of SNR-300 costs. The Bundestag has reserved to itself the decision on whether the SNR-300 should be put into operation when completed. The utilities hesitate to commit themselves as long as this uncertainty persists, and the pledges made so far are contingent, among other conditions, on a positive decision from the Bundestag.

Licensing uncertainties have been another major obstacle — but here at least the greatest difficulties appear to have been overcome with the passing of the fourth part of the licence on 15 October.

Some utility companies originally argued that SNR-300 is a national project that should be financed from taxpayers' money. It remains to be seen whether they will soften their stand in the face of a threat to abandon the project. The West German utility association, VDEW, is now discussing alternative finance strategies including a research and development levy on electricity sales modelled on the present subsidy for West German coal used in the generation of electricity. **Otto Keck**

Israeli education More gloom

Tel Aviv

The complaint that cuts in higher education could seriously endanger Israel's scientific potential in the 1990s ran through the symposium organized at the end of November by the Israeli popular science magazine *Mada* to celebrate its twenty-fifth anniversary. Ironically, the symposium coincided with the *Isratech* exhibition, a celebration of recent Israeli achievements in applied science.

While *Isratech* celebrated the success of Israel's funding policy, which for the past decade has emphasized applications, symposium participants maintained that, unless investment in higher education is stepped up, Israel's advantage in many sectors of technology could prove short-lived. The symposium was chaired by the physical chemist Dr Ephraim Katzir, formerly Katchalski, who produced the 1968 report which effectively switched government emphasis from pure to applied research.

Unlike other new states, Israel has a research infrastructure which antedates independence and which is based on institutions such as the Technion, the Weizmann Institute, the Hebrew University and the Volcani Agricultural Institute. Until the late 1960s, Israeli science policy was aimed at more of the same. The Kachalski report redirected government attention to the needs of industry. Only some of Katchalski's recommendations were implemented. Chief scientists were established in ministries involved in research and development, but the proposed upgrading of the National Council for Research and Development failed to materialize — indeed, in 1977, it was actually downgraded, being transferred from direct responsibility to the Prime Minister's Office to the new Ministry of Energy and Infrastructure. At the same time, all spending on research has been eroded by inflation, now 133 per cent a year.

Even so, the post-Katchalski era has produced a number of achievements. Industry has done well, and now employs more science graduates. Agriculture has seen a steady stream of advances in crop breeding, soil chemistry, irrigation techniques and such novel methods as the sterilization of soils by solar energy. Both production and productivity have increased.

The symposium was chiefly alarmed by the other side of this coin — the continuing absence of a national science policy and the continuing brain-drain to the United States and Europe. The participants blamed people's willingness to leave on the cutbacks in university finance and the mismatch between what universities teach and what industry (and students) demands.

In the past ten years, there has also been a stagnation of student numbers in the exact sciences while total student numbers have soared. The underlying reason is not

clear, although the decline has been greatest in the "traditional" fields such as civil engineering, while the most modern departments such as computer sciences are full to overflowing. This suggests that the universities are failing to adapt to modern trends — an ironic conclusion when they themselves have founded such institutions as the Institute of Forward Planning at Tel Aviv or the Neimann Institute at the Technion to act as potential policy advisers.

Employment problems are exacerbated by the relatively small payrolls of the new science-based industries. Would-be students therefore think twice before investing some five or seven years — delayed by a further three years military service — in an exact science when the job prospects are so uncertain.

The Jerusalem College of Technology, which was specifically founded to train the expert workforce the country needs, may be an exception. It is a relatively small and religious foundation where the all-male students study Judaism in the mornings and technical subjects to first degree level in the afternoons and evenings. The "new pioneering spirit" described by the founder and rector, Professor William Low, has presumably helped to take the edge off job uncertainty.

Perhaps inevitably, the symposium produced a gloomy forecast for the next couple of decades. According to Professor Joshua Yavner of Tel Aviv University, unless the government stops the cuts in higher education, Israel will suffer the loss of its main "natural resource" — educated manpower. Hitherto, the University Grants Committee, which administers the government's block funding of higher education, has tried to restrict the cuts to ancillary and non-academic fields (although library budgets have been considerably curtailed), but a point will soon be reached where no more such economies are possible. Then, inevitably, the output of science graduates and PhDs will begin to decline, and the new science-based industries, founded on the expertise of those who graduated in the 1960s and early 1970s, will fail to achieve their early promise.

Vera Rich

US research patents

Conflicts arise

Washington

United States universities are lobbying hard in defence of their newly-won right to an automatic patent on all inventions arising from federally supported research. They are alarmed that their rights may be circumscribed in what may be the most profitable field — genetic engineering.

Two weeks ago, the House of Representatives Science and Technology Committee approved an amendment to a draft bill on patent rights, already approved by the Senate, to exempt the results of research using recombinant DNA techniques from

the broad provisions of patent legislation passed by Congress last December.

The amendment was offered by Representative Albert Gore of Tennessee, chairman of the committee's investigations and oversight subcommittee, and follows his criticism of an agreement between Massachusetts General Hospital (MGH) and the German chemical company Hoechst that would, he claims, allow the company to benefit unfairly from research paid for by the US taxpayer (*Nature* 18 June, p.525).

Several Washington-based groups representing research universities have protested, saying that this amendment undermines the whole purpose of the new legislation, which is to speed the transfer of research results to private companies. They point out that three years ago, after consulting universities and industry, Dr Donald Fredrickson, then director of the National Institutes of Health (NIH), concluded that no special arrangements need be made for the application of patent laws to genetic engineering research.

An aide to Mr Gore said last week that the congressman might agree to withdraw the amendment before the draft bill reaches the floor of the House for discussion. The Senate has already passed such a bill which even expands the scope of last year's legislation to include not only universities and small businesses but all companies receiving federal research funds, and Senate aides said last week that they were totally opposed to the House committee's amendments.

However, Mr Gore still seems keen that the bill should make a sharp distinction between the control of research results funded from public and private funds. This could complicate efforts by NIH to interpret the new law's provisions on jointly funded projects.

Under the terms of the MGH/Hoechst agreement, the company will provide the hospital with up to \$50 million over a ten-year period to support basic research carried out in a new Department of Molecular Biology. All the research would be under the control of MGH and all research results could be freely published after a 30-day preview by the company, but Hoechst would have first refusal to license patentable results.

Both MGH and Hoechst insist that this arrangement is compatible with existing academic practice, that they have gone to great lengths to avoid any possible conflicts of interest or undue secrecy, and indeed that the terms of the agreement might act as a model for other universities seeking research support from the private sector.

Mr Gore, however, says that his concerns are endorsed by a report he commissioned from the General Accounting Office, the investigative arm of Congress, which pointed out ways in which the agreement might conflict with the patent legislation passed last year. Under the current legislation, any patents arising from jointly

funded research would remain the property of the research institution, but the federal government would be permitted free use of the patent, and would also be able to reclaim control of the patent rights. However, MGH acting director general Dr Joseph Martin insisted that a clear distinction would be made between research supported by the federal government and that financed by Hoechst.

Mr Gore remains unconvinced. He argues that maintaining a clear separation between separately-funded research projects is "simply a fiction" and promises that, even if his amendment to the patent legislation is dropped, he will be keeping a close eye on the MGH/Hoechst and other similar agreements, to protect what he describes as a massive public investment in recombinant DNA research. An official in the legislative office of NIH said last Friday that he felt the concern raised by the General Accounting Office; about jointly funded research "is certainly a problem that is not non-existent, although it does not currently appear very prevalent". A delegation from NIH will be visiting MGH next week to discuss the impact of the new patent legislation on future arrangements for federally funded research at the hospital.

David Dickson

Science in France

Democratic union

Grenoble

How far can democracy go? This question is emerging as one of those central to the new politics of science in France, and it was put to a remarkable test last week.

Professor Robert Tournier, the 47-year-old director of the renowned laboratory for very low temperatures at Grenoble, in the Rhône-Alpes, announced some time ago to his colleagues that he wanted to resign the directorship to have more time for research in his own laboratory. Normally, the CNRS would take advice on a new director from the laboratory steering committee, and from the CNRS "parliament", the Comité National, and then would merely announce an appointment. This time it has another factor to take into account. Internal advisory committees in the laboratory could not agree on their recommendation for a successor, and Fournier, as a good democrat and socialist, asked the whole laboratory, including technicians, to give their advice on two candidates.

The resulting "election" took place last week. It has no official significance, and was nearly a draw. But the trades unions (their favoured candidate having won) are treating the event as a clear selection of director, and have written to the Paris headquarters of the Centre National de la Recherche Scientifique, to which the laboratory belongs, to say so.

As it happens, the narrowly-elected