

defence staff, General Sverre Hamre, told the Norwegian police that he considered it a threat to the activities of Norwegian defence and national security. Having questioned the authors and PRIO staff closely associated with preparing the report, the police completed their investigations in June 1979 and sent preliminary charges against Gleditsch to the court. They charged him on three counts: two under the penal code — revealing information which ought to be kept secret in the interests of national security relative to foreign powers, and acquiring this information or making it available to others — and one under the law on defence secrets — recording, copying, or publishing sketches of fortifications or associated installations. According to Norwegian practice, the police also appointed three independent experts to evaluate the report. The intelligence service proposed two of these (one was the former head of the service) and Gleditsch and Wilkes the third. Not surprisingly, the experts nominated by the intelligence service supported General Hamre's opinion that the report threatened national security. The formal indictment charges Wilkes as well as Gleditsch with all three charges, which carry a maximum penalty of 4½ years imprisonment.

The technical intelligence facilities described in the Gleditsch-Wilkes report collect and analyse data from electronic intelligence satellites, monitor and analyse military and diplomatic radio signals, and intercept and interpret electronic and telemetric communications. Although the authorities are traditionally tight-lipped about such installations, the authors point out that it was very easy to find out about them by using, for example, the ordinary telephone directory and public lists of government-owned property. They also learned a lot by observing the installation's antennas: their size, shape and layout. The authors maintain that if the Soviet Union, with its sophisticated spy satellites and, presumably, other more traditional techniques of spying, is interested in the installations, it would already know a great deal about Norwegian security. They claim that the authorities' secrecy is mainly directed towards the Norwegian population itself, pointing to police reaction to the publication of their report in Norwegian, shortly before the trial began. For two years the report has been available in English and the police have made no attempt to confiscate it; however, they have now declared the publication of the Norwegian translation illegal.

Support for Gleditsch and Wilkes has come from the International Peace Research Association, the Norwegian Writers' Union and political youth organizations in Norway. The trial is expected to last for another week or so, and the verdict will follow a couple of weeks after that. One or both sides will almost certainly appeal.

Wendy Barnaby

UK nuclear power

Plans panned

For the second time this year, Britain's Central Electricity Generating Board (CEGB) has received a rap over the knuckles for not providing enough information about the economic case for its planned nuclear power programme. Hard on the heels of sharp criticism from the House of Commons Select Committee on Energy last March, the Monopolies and Mergers Commission last week published a report on the board's finances (HC 315, HMSO, £9.30). The Monopolies Commission was asked to find out whether CEGB is charging a fair price for the electricity which it supplies to the consumer through regional electricity boards.

The commission says that one of the chief reasons for the high cost of electricity in Britain is CEGB's previous tendency to invest in new plant before strictly necessary. Decisions to order new plant, it concluded, have often been based on over-

estimates of future demand, and economic cases have been made on over-optimistic estimates of construction times, capital costs and the ultimate performance of power stations.

The commission's report is particularly critical of the decision, to build the second advanced gas-cooled reactor at Heysham, taken in 1979 as part of the government's decision to embark on a further nuclear programme, probably based on the Westinghouse design of the pressurized water reactor. Failing approval at next year's public inquiry, CEGB hopes to keep open the option of basing the programme on the notoriously costly British-designed AGR by building Heysham II.

Although the commission acknowledges that CEGB has learnt from its previous mistakes with the AGR, it still criticizes the board for not providing sufficiently detailed cost estimates for Heysham II, even though the decision to build it was taken largely on strategic grounds.

The commission also faults CEGB's case for future nuclear power stations on economic grounds. It says that the board's estimate of net effective cost assumes unrealistic improvements in future construction time and operational performance. Margins of error in cost estimates, together with a better indication of the board's assumptions, should have been presented to the government when making an economic case for the nuclear programme. The board should also have compared the cost of building new nuclear stations with the cost of refurbishing old coal-fired stations.

The commission, however, has praised the way in which CEGB keeps a check on its current expenditure and seems to be impressed with the performance of its Barnwood division, unpopular with many of its contractors, in keeping a detailed check on cost increases during construction. The commission's report, however, ends on a rather gloomy note. Even if CEGB implements all its recommendations, the commission cannot foresee any substantial cut in electricity prices to the consumer.

Judy Redfearn

US science funding

Rewards of genius

Washington

Acting on the theory that intellectual and cultural breakthroughs can be accelerated if latent genius is permitted to flourish free of the more material considerations of making a daily living, one of the newest — and wealthiest — foundations in America has announced the first of a series of five-year, no-strings-attached awards to "exceptionally talented" individuals.

The awards are being made by the trustees of the John D. and Catherine MacArthur Foundation set up two years ago from the estate of the late Chicago insurance and real estate millionaire. The

Gloom on research

A high-level meeting of research councils from Germany, France, the United Kingdom and the United States was held in the English country town of Abingdon on the weekend of 16-17 May. The occasion, arranged by Sir Geoffrey Allen, chairman of the British Science and Engineering Research Council, is the second in a series of consultations begun with a meeting called by Professor H. R. Leibnitz, then the president of the Deutsche Forschung Gemeinschaft in June last year.

The objective appears to have been an exchange of views, most of them gloomy. The United States participants (Dr John Slaughter and Dr H. R. Langenberg, respectively director and deputy director of the National Science Foundation) left their fellow-administrators with the impression that the Reagan budget had been a body blow whose effects will not be confined to the United States, but that the United States is also worried by more long-standing problems — the difficulty of recruiting teachers of engineering for United States universities, for example.

European participants in the meeting are said to have welcomed their transatlantic colleagues into the company of the impoverished, and to have urged that if the United States now faces a period of entrenchment it would be worthwhile thinking of collaboration with European collaborative ventures such as those at CERN. The occasion seems also to have been one for concerted European complaint about the budgetary threat to the solar polar mission, the plan to send two spacecraft (one European, one American) into polar orbits about the Sun.

foundation, which has assets of \$841 million, last week announced 21 individual awards worth a total of over \$4 million, with another 29 expected later in the year.

Eight of the initial recipients are scientists, and include Stephen Wolfram, a 21-year-old physicist at the California Institute of Technology, the Harvard geologist and paleontologist Stephen Jay Gould, and oceanographer and climatologist John Imbrie of Brown University and the University of Rhode Island.

The names were chosen by the trustees of the foundation from a list of nominations proposed by 100 educators, scientists and artists who acted as scouts in what other foundations, more conventional in their granting of awards, have dubbed the "search for genius". There are no conditions attached to the way that the money — between \$24,000 and \$60,000 a year for each individual, depending solely on age — can be used, nor can the award be withdrawn within the five-year period.

The MacArthur Foundation's novel approach to the support of intellectual activities is perhaps the most ambitious of a number of attempts to meet the charge that more conventional forms of funding discourage innovative or risk-taking work.

Last year, for example, Berkeley physicist Richard A. Muller, winner of the National Science Foundation's (NSF) Alan T. Waterman award based on research for which he had initially encountered difficulty in obtaining support, told a congressional committee that individuals engaged in innovative research often had similar experiences, for example when their proposed project did not fit neatly into one or another disciplinary compartment.

Dr Muller's testimony and other similar complaints led Congress to ask NSF to assess current funding mechanisms to find out how well they are working. So far these studies have not uncovered any substantial problems, nor pointed to any particularly radical solutions.

Furthermore, a task group set up last year by NSF's advisory council on the funding of innovative high risk proposals has reported that "on the whole, the foundation's procedures seem to be effective".

In the light of the comments received and of its own investigations, the task force, headed by Halsey Royden, dean of the school of humanities and sciences at Stanford University, suggested that NSF programme officers be given greater encouragement to support innovative risk-taking proposals and that a small Group on Innovative Research Topics be set up under the deputy director, to "promote promising research that does not fit naturally into the framework of existing programs and divisions of the NSF."

Both proposals are now being considered by NSF. However, Dr Langenberg points out that the task force specific recommendations are likely to be absorbed into the bigger organizational changes now under way.

David Dickson

High-energy physics

On the rocks

The Swiss tunnel expert Giovanni Lombardi, who has honeycombed the Alps with road and rail tunnels, denied last week that it might be impossible to build the tunnel for LEP — the next big project of the European nuclear physics laboratory CERN.

The assertion, in the British magazine *Consulting Engineer*, would have prevented governments from approving LEP construction at next month's crucial CERN Council meeting. Lombardi is not only a world-recognized expert on Alpine tunnelling but also CERN's principal geological adviser.

Lombardi and CERN do however admit to geological difficulties in that part of the LEP tunnel which will go under the limestone of the Jura, to the north-east of the CERN site. The worst of the troubles have however been avoided by shrinking LEP from 30 km to 27 km circumference, it is said. In this way, the tunnel should avoid the folded core of the Jura, a region of unstable limestone which Lombardi knows to contain water and mud-filled caverns.

Even so, progress through the Jura will be uncertain and based on "forage à l'avancement", where a small (2-inch) hole is drilled 20–30 m ahead of the main borer to probe for boundaries between limestone layers. At hundreds of metres below the water table, there may be mud and pebble-filled "karsts" at these rock divisions which will have to be emptied and filled with concrete before drilling through. If water-flow through the karst is too great, it can be impossible to place the concrete.

Uncertainties of this kind have persuaded smaller member states of CERN, led by Sweden, to demand guarantees that the CERN budget will not be raised to meet any extra costs. It has thus been agreed that future CERN budget increases can be vetoed by any state, while for decreases a two-thirds majority is sufficient. And CERN's director-general, Herwig Schopper, has agreed in principle that LEP cost escalations would be met by lengthening the time over which LEP is built.

Strenuous efforts to delineate the geology of the Jura are under way at CERN, but the principal reconnaissance gallery will not reach the tricky region until April next year. So CERN is also drilling a hole vertically above the deepest part of the proposed tunnel under the Jura and making geophysical observations from within it to find the water table and the trend lines of the various limestone boundaries. The results of this investigation will not, however, be known for another three months.

Meanwhile CERN is preparing for its mid-year council meeting on 25 June at which delegations from the 12 member states would normally approve the 1982

budget. This year the budget contains an appropriation for LEP, which is not being costed separately. The debate will centre on precisely what level the budget should take, and what guarantees can be given on LEP cost overruns.

Sweden, apart from its doubts on the latter score, is in political crisis, and will almost certainly abstain; Norway may do the same; and the Netherlands are in the midst of elections and cannot predict their position. Moreover, the CERN Council delegations of many of the member states have not yet been officially briefed (this includes Britain) and so the outcome is far from certain. Procedurally, if eight states vote for the budget including LEP, and none votes against, LEP can go ahead, and this seems likely, although Schopper would like to leave the door open for a few months after June to achieve a unanimous decision.

Robert Walgate

Hormone legislation

Consumer protest

Brussels

The failure of the European Community's council of agriculture ministers to make significant progress on banning the use of natural and artificial hormones in livestock production is forcing European consumers to take retaliatory measures. The Bureau of European Consumers' Association is now trying to persuade the sympathetic member states to block meat imports from the United States, New Zealand, Australia and elsewhere.

Last September, the Community agreed in principle to ban the use of all hormones in livestock breeding. The decision was hailed as a victory for the consumers but has since proved to be a hollow one. It has been suggested that the September council failed to understand the difference between natural and artificial hormones and hence the problems of forbidding the use of the former. On 12 May, the agriculture ministers met to consider the European Commission's two proposals for directives to implement the ban — the outcome was disappointing.

A German proposal was adopted banning some artificial hormones already forbidden under existing laws operating in all member states except the United Kingdom. Diethylstilboestrol and other stilbenes are now to be banned, although whether this entails a separate directive or merely the partial implementation of the Commission's all-embracing directive is unclear. The other growth hormones, and the problem of enforcing any bans, will again be considered by the next agriculture council on 15 June.

The United Kingdom is becoming increasingly isolated in the discussions. The philosophy of not to ban a hormone until it has proved to be dangerous resembles that of the United States, but the legislation of other Community countries reveals a much