to be slipped away from the cavernous Jura limestone, and further into the stable sandstone of the valley, in which all previous CERN accelerators have been built.

The result is that only 3 km (as opposed to 8 km previously) of the 27 km tunnel for LEP will be in the unpredictable limestone. Moreover, at the Jura side the ring will be higher — about 140 metres below the surface — so that if any difficult water-filled caves are encountered, it will be possible to deal with them from above.

A further — and far from negligible — benefit may prove to be political. There has previously been vociferous environmental opposition to LEP from the French side (the Jura; LEP straddles the French-Swiss border). This opposition rested in large part on the (distributed) effect that the limestone borings might have on the source and flow of the River Allondon, which supplies water to a number of villages. The source was to have been within the LEP ring; now it is outside, and where the ring passes under the river it is within stable sandstone.

LEP will be paid for out of the current budget only by running down certain existing facilities. The intersecting storage rings for protons and other nuclei will be closed at the end of 1983; and operations on the 600-MeV synchrocyclotron (CERN's first accelerator) will be reduced to the mainly Scandinavian Isotope Separator On-Line (ISOLDE), which performs unique experiments on short-lived muclei and, incidentally, keeps the Nordic countries happy. **Robert Walgate**

UK university funding

No reprieve

The British government is sticking to its guns over cuts in university grants, indicating that universities have failed to convince the government that spreading the cuts over five instead of three years would cost less because compulsory redundancies, involving large compensation payments, would be avoided. Last week, Sir Keith Joseph, Secretary of State for Education and Science, reaffirmed his belief that the cost to the taxpayer will be less if the cuts are implemented quickly.

Hence, it is no surprise that the universities' recurrent grant for 1981–82 has been set broadly in line with the government's expenditure plans of last April. The grant at £995 million will be only £16 million more than the estimate, to account mainly for an inflation rate higher than expected. The research councils, however, may have come off slightly better than feared. At £478 million, the science vote for 1982–83 will be roughly in line with this year's figure, although the allowance for increases during the year is only 5.5 per cent.

Despite his rejection of the universities' argument, Sir Keith has nevertheless accepted that the cost of redundancies cannot be met out of the universities' recurrent grant. But his allocation of £50 million in 1982–83 for restructuring the university system has already met with derision from the Committee of Vice-Chancellors and Principals which says that the sum is far too small. The vice-chancellors also fear that if the 5.5 per cent inflation allowance cannot be met then the number of redundancies will increase. A sum for restructuring in 1983–84 will be announced some time next year.

Sir Keith expects to reach a decision early in the new year on the scheme proposed by the vice-chancellors' committee for compensating redundant academics. Academics who take their cases to court, however, could be awarded considerably more than indicated under the scheme, making it almost impossible at present to estimate the total redundancy bill.

Advanced higher education has fared worse than any other sector of education under the government's cutbacks. The overall reduction in the education budget next year compared with this is one per cent, with further education for non-academic school leavers winning increased support. Clearly, the universities have lost out to the much stronger voice of the growing numbers of unemployed.

Judy Redfearn

Recombinant DNA research

EEC safety dispute

Brussels

A deep division of opinion has become evident among the EEC's institutions over the need for strict legal controls to minimize the dangers of research using recombinant DNA techniques. By a narrow margin, the European Parliament's Committee on the Environment, Public Health and Consumer Protection came out against the EEC going further than merely making recommendations on the registration of all relevant research. However, following a colloquy held in May (see *Nature* 21 May, p.181) the Economic and Social Committee (ESC) is strongly advocating that the European Community adopt a legally binding text enforcing tight safety controls.

Both opinions will be taken into acount by the ultimate decision-makers in the Committee of the Permanent Representatives to the EEC (Coreper) whose experts have been awaiting the views of the two consultative bodies.

The issue has been subject to an unusual amount of debate. In 1979 the European Commission itself proposed a legally binding directive along the lines demanded by ESC. This was then withdrawn and replaced by a set of recommendations to take account of evidence and scientific opinion which increasingly suggests that the dangers from bioengineering are less than were at first feared.

ESC thinks that the recommendations are too weak and that the reasons put forward to justify the original draft directive still hold good. It still considers that in the long term the unforeseeable and potentially serious consequences of recombinant DNA work require a "better safe than sorry approach", especially when pathogens are used as vectors or hosts. Also, the EEC has a responsibility to ensure that competition for commercially applicable research is not distorted by different rules on what can be done, and at what speed, in each member state.

The colloquy held by ESC to debate these points failed to budge the committee from its opinion, although many of the speakers there affirmed that the risks associated with genetic manipulation are small or negligible. The committee, however, remains convinced that transferring the techniques from laboratory to factory will not mean lower safety standards. Official guidelines would, therefore, be better than a system of self-regulation.

The report produced by Italian Euro-MP Domenico Ceravolo for the parliament echoes many of these concerns, but his resolution in favour of a directive was overturned in the committee vote by a majority of only one. In his report, Ceravolo attacks the European Commission's view by saying that even if a risk is only based on a hypothetical chain of events, this is no justification for thinking it any less valid or significant. And he argues further that the conjectural risks cannot be dismissed because no suitable criteria are available for assessing them.

Whether his arguments will win the day in the parliament's plenary session remains to be seen. A full vote was postponed at the last minute on 18 December but the vote is expected to go against Ceravolo. The liberals and conservatives, who form the majority in the house, support the Commission and feel that too much legislation will slow down the growth of Europe's biotechnology industry. The socialists and communists disagree and take their cue from the Italian left wing which sees EEC legislation as the best way of bringing Italian research under control.

Jasper Becker

Electronic publishing

Journal plugs in

The British experiment to explore the feasibility of electronic scientific communication is well under way. The experimental electronic journal of the Universities of Loughborough and Birmingham, *Computer-Human Factors*, has received 16 papers in its first year — more than an earlier experiment in the United States received in its three-year life. Last week, the British Library, which is backing the experiment with £256,000, organized a demonstration for publishers,

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journalists, editors and librarians.

The experiment is designed chiefly to identify the problems encountered by authors, editors, referees and readers in conducting editorial business on computers. Consideration will also be given to the possibility that electronic journals could fulfil the role of conventional journals. The experiment is also being used to investigate the role of computer networks for other less formal types of communication, such as newsletters, requests for comments on papers before submission to the journal, general communication between groups working on similar problems, the collaborative writing of papers and simply sending messages.

Members of the team working on the project say they are satisfied with the first year's results, ascribing their electronic journal's success in attracting papers to flexibility. In its purest form, an electronic journal would eliminate all paper; writing and editing would be done by means of VDUs (visual display units) and all transactions carried out over telecommunications links. Readers would also have access to the journal on their VDUs from a central computer memory.

Users of the journal preferring to see results on paper can get hard copy from printers at their terminals, and authors are also given flexibility by being allowed to submit papers either on-line or in the conventional way by posting typescripts to the editor. The editor can in-put perfect typescripts by optical character recognition but has to type in untidy ones on a word-processor. Of the 16 papers submitted so far, two have been on-line, and the rest came as typescript too untidy for optical character recognition.

The project, under editor Professor B. Shackel and his assistant Dr David Pullinger, is based at the University of Technology, Loughborough, and the central computer facility is provided by the University of Birmingham under the direction of Professor P. Jarratt. The 50 participants in the project, from universities throughout Britain, make up the journal's contributors and its only readers. Contributors are allowed to submit papers to conventional jounals three months after submission to the electronic journal. Although that option undermines the value of the electronic journal, its absence in the earlier United States experiment is thought to have dissuaded many potential contributors.

With two more years to run, the project is still at an early stage and the team is reluctant to draw many conclusions. Questions to be addressed, however, include the extent to which users can manage without paper, whether electronic journals could publish faster than conventional journals, the suitability of publishing papers and letters as soon as they are accepted rather than in batches as "issues" and alternative methods of refereeing.

Cost comparisons between electronic and conventional journals will be particularly difficult to assess. Capital cost could be minimized by using equipment initially acquired for other purposes, but running costs — chiefly the cost of using the telephone — will fall not only on the "publisher" but also heavily on users. One particular headache is how to compare the cost of reading time for conventional and electronic journals.

Even if this latest experiment demonstrates that electronic journals are feasible, the day when they become a practical reality in major subject areas is a long way off. The electronic journal, if it arrives, is likely to creep in gradually. Conventional journals, for example, may introduce new technology giving authors and readers the option of on-line access. But the problems of going entirely electronic are too formidable to be contemplated seriously for a few years yet. **Judy Redfearn**

Creation science trial

Verdict awaited

Washington

It may be another week before the verdict is known on the creationist trial which ended in Little Rock, Arkansas, last Thursday. Initially, Judge William Overton had promised an immediate verdict on whether a new state law requiring equal time for the teaching of evolution and "creation science" in state schools was unconstitutional.

At the end of the two-week trial, however, the judge announced that the amount of evidence presented was so large that his verdict would be delayed, although he has promised to deliver it by 31 December.

Despite the delay, the American Civil Liberties Union (ACLU), which brought the case on behalf of several local religious groups, biology teachers and school children, is confident that it has won. "It was no contest," Mr Bruce Ennis, the chief ACLU attorney, said after the trial had ended. "The state did what it could do. It was inadequate not because it did not do its job, but because creation science is a religion."

Supporters of creation science also seemed to be accepting their defeat. But in this case the blame was being placed on the performance of state attorney general Steve Clark in defending the creation science law. The creationists promise a tougher fight in the next court case, which is likely to be a similar challenge against a creation science law passed in the state of Louisiana.

Although Judge Overton has yet to declare his verdict, he did say that it would be limited to the question of whether the creation science version of the origins of the world was religion, despite any explicit religious or biblical references in its description in the Arkansas law.

He added that he would not undertake to decide the validity of the biblical version of creation nor the theory of evolution. ACLU has asked the judge to determine various "findings of fact" — such as the definition of a scientific theory being based on natural laws and being "explanatory, testable and tentative" — which it hopes can be used in future court battles.

The second week of the trial was taken up largely by various witnesses called by the state to present a case in favour of creation science and the Arkansas bill, virtually identical copies of which are now pending before almost 20 other state legislatures.

Cross-examination by ACLU attorneys provided some colourful testimony. One supporter of creation science, having described how a creator could still be a scientific concept, perhaps comparable to Aristotle's "first cause", went on to describe his belief in exorcism and unidentified flying objects, claiming the latter to be attacks by Satan on God's world.

The star witness for the defence was Professor N.C. Wickramasinghe, head of the department of mathematics and astronomy at the University of Wales in Cardiff. Professor Wickramasinghe told the court that the odds against life originating by chance anywhere in the Universe were so high as to be virtually impossible. "One is driven almost inescapably to accept the possibility that life results from deliberate creation", he said.

He claimed that his own theories about the possible existence of microorganisms on comets bringing life to Earth had been rejected by other scientists largely because of their "indoctrination in Darwinism".

But if such statements were music to the ears of the creationists, there was less consolation when Professor Wickramasinghe was asked to comment on the creation science law, when he claimed that most of it was "claptrap", and that "certain parts of the law are demonstrably wrong".

One of the scientific witnesses who had been expected to appear for the defence unexpectedly left town shortly before he was due to testify. Another scientific witness whose appearance was cancelled by the state was Henry D. Voss, an electrical engineer who has published papers on space physics. **David Dickson**

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