on applied biology — to which the Brussels programme is directed — depends on the scale and quality of communications among scientists, and that the principal contribution of the biomolecular engineering programme would have been to set up a network of working contacts throughout Europe. A single European state does not have sufficient biotechnologists to make significant advances in competition with the United States or Japan, they argue.

This point appears to have been lost on the research committee of the Council of Ministers, which has now passed the problem to the diplomatic level in Brussels — the committee of permanent representatives, Coreper. But with the present low level of diplomatic concord in the Community, there seems little hope of a resolution.

● Britain's recent white paper on biotechnology was roundly condemned by British researchers at the second European conference on biotechnology at Eastbourne last week. Dr Duncan Davies, whose chief scientist's office at the Department of Industry produced the white paper, made a flying visit to the meeting to defend his position. He was subjected to a barrage of speeches from the floor, but managed to squeeze in that he would review the white paper's provisions on the education and training of biologists. Informed opinion, however, expects little to come of such a review. **Robert Walgate**

Taking note, or shelving?

The British House of Commons last week "took note" of the European proposed programme on biomolecular engineering, a mechanism which allowed the Under Secretary of State for Industry, Mr Michael Marshall, to state the government position on the latest version of the programme.

The original proposal (for 26 million European Units of Account (EUA) over five years) was "over-ambitious in both scope and expenditure", said Mr Marshall; but the shift of emphasis away from research and towards training in the revised proposals (an 11.8 million EUA four-year compromise proposed in Brussels) "is of an extent not hitherto contemplated".

Without naming France, Mr Marshall indicated that the government did not share the French view that there is a significant lack of training opportunities. Nevertheless Britain would continue to work towards an acceptable compromise, he said.

Tam Dalyell MP, described by one member of the House as "almost a walking Select Committee on Science and Technology", warned the minister to be wary of the French position, saying that the new proposals "by pooling training, hand over British expertise to the French for little or no return". The House took note. **Robert Walgate**

European Space Agency

Space on the cheap

Paris

The member states of the European Space Agency are still at odds about the future. Although they have agreed to the proposal of Mr Erik Quistgaard, the agency's director-general, that the budget should be reduced to 60 per cent of its present level over the next ten years, they are hopelessly divided on how to spend the money. The problem is that the reduced budget will not support the three programmes that have been put forward — in telecommunications, space transportation systems and science. So the agency is wrestling with priorities.

Quistgaard's suggestion that the mandatory science budget, to which all member states must contribute, should be increased by 60 per cent over the next ten years has so far fallen on stony ground. Britain, Sweden, Spain and Belgium have flatly turned down the proposal; only Germany has agreed to contribute in full.

Lacking unanimous agreement, the agency may therefore have to take the unprecedented step of admitting optional contributions to scientific programmes. That, according to Ernst Trendelenberg, director of scientific programmes, could divide European space scientists into privileged and under-privileged depending on their nationality.

Germany and France are the most likely to favour this approach, but for different reasons. Germany would like to divert some of the money spent on Spacelab to science, and France is keen that there should be a steady stream of satellites for launching with Ariane, whose development it has supported heavily. Britain, on the other hand, says the agency is too inefficient to justify more spending on science.

The most heated debate in the agency, however, is about the choice of space applications for the next ten years. The two chief candidates — space transportation systems and telecommunications — have been proposed by France and Britain. France argues that Europe must have a launcher to rival the space shuttle, especially if materials processing experiments on Spacelab demonstrate that space has commercial potential. It would like to develop more sophisticated versions of Ariane and ultimately an unmanned partly-reusable space transportation system called Solaris, which is expected to be put before the agency's council at the end of the year.

France disagrees with Britain's proposal to spend more on telecommunications on the grounds that that should be left to industry. Both France and Germany withdrew from early plans to build a large satellite for direct broadcasting, preferring instead a bilateral programme. Neither believes that the "Large Satellite Programme" (L-sat), due to be approved in June by Britain, Italy and some of the smaller countries, goes sufficiently beyond their own plans to justify participation. Britain, on the other hand, with a smaller space budget than either France or Germany, sees L-sat as its opportunity to compete for world markets.

The hope is that these two conflicting views can be reconciled. Professor Hubert Curien, director of the Centre National d'Etudes Spatiales, believes that Britain may be moving towards the view that space transportation systems must be developed within the agency. And John Hawkes, of the British Department of Industry, thinks that his French colleagues may now be more ready to agree that telecommunications development beyond L-sat should be supported on a European scale.

If Mr Quistgaard is to put his ten-year plan into operation, he needs to know soon which of these options the agency should be studying. To pursue both would entail scrapping the agreement reached on the future budget. **Judy Redfearn**

Quistgaard awaits orders

Paris

Erik Quistgaard, director-general of the European Space Agency, is optimistic. The present stalemate between the member states, he says, might be broken if the users of space technology were more intimately involved. Thus post offices, users of remote sensing data and industrial users of experiments on Spacelab rather than government departments should have more influence over what the agency does. The problem is that although most states know what they want from space, few are decided about their expectations of the agency.

Mr Quistgaard believes that it is up to member states to tell him what they want. Some delegates, however, are looking to him for solutions. The rejection of his proposal that the science budget should be increased is hardly encouraging.

Quistgaard believes that Europe can and should compete with the United States and others in telecommunications, remote sensing and space transportation systems. He favours unmanned space transportation systems as an alternative to the space shuttle. **Judy Redfearn**

Cystic fibrosis

Diagnostic hopes

Techniques now being developed at various centres in Britain and the United States have stimulated optimism about new approaches to the prevention of cystic fibrosis. Workers in the field are particularly excited by the prospect of being able to detect carriers of the genetic defect.

Among genetic deficiency diseases, cystic fibrosis is peculiar in that the nature of the underlying molecular defect is as yet unknown. The belief that only a single gene

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is involved has, however, recently been confirmed by Romeo (Bologna), working with records of dispensations for cousin-cousin marriages accumulated at the Vatican. Among Caucasian populations, the frequency of carriers of defective genes is thought to be 1 in 20. The Vatican records have confirmed that cystic fibrosis is an autosomal recessive disease, accounting for the normal incidence in Northern Europe of 1 in 1,600.

Attempts at antenatal diagnosis of cystic fibrosis have been based on the virtual absence, in those with the overt disease, of an uncharacterized proteolytic enzyme. This technique, originally developed by Dr Henry Nadler in Chicago, is now being taken up at other centres. It may eventually be possible to offer amniocentesis to pregnant women who have already produced one child with cystic fibrosis, although the frequency of false positives and false negatives has not yet been determined confidently.

Two techniques for the recognition of carriers are being developed, one of which is based on the occurence in the serum of both homozygotes and carriers of a protein apparently characteristic of cystic fibrosis. Last year, Dr David Brock's group at the Department of Human Genetics at the University of Edinburgh reported the raising of antibodies against the protein (Manson, Jean and Brock, David J.H., *The Lancet*, 16 February 1980) and the possibility that these might be used to distinguish between cystic fibrosis patients (carrying a full dose of the protein), carriers (with a smaller amount) and normal people. Since then, better techniques for raising antibodies have been developed, and there are plans for the development of monoclonal antibodies. The second technique, developed in Los Angeles, is based on the differential response of cystic fibrosis patients, carriers and normal people to the administration of the drug ouabain.

The hope now is that a relatively straightforward way of recognizing carriers may reduce to manageable proportions the provision of amniocentesis for mothers at risk of producing children with cystic fibrosis. In Britain, the Department of Health is under some pressure to prepare for a pilot scheme against the time when the diagnostic techniques are fully developed.

Genetic screening may well be possible before the nature of the underlying defect is understood. One possibility is that the protein characteristic of cystic fibrosis is in normal people removed by the proteolytic enzyme which is the basis of proposed diagnosis of the disease by amniocentesis. In Britain, Professor R. Williamson (St Mary's Hospital Medical School) has embarked on a programme for the identification of the cystic fibrosis gene using techniques of chromosome sorting and genetic manipulation.

Financial support for most of the British research in this field is provided by the Cystic Fibrosis Research Trust, which is now spending more than £500,000 a year. It is a sore point with those involved that the Medical Research Council's contribution to work in the field, although small, was exaggerated in a reply to a parliamentary question last October.

Safety at Windscale

Yes we were wrong

The British nuclear industry's site at Windscale, the source of a long sequence of mishaps in the past decade, was last week given an adverse report by the Health and Safety Executive, the organization in charge of the Nuclear Installations Inspectorate. And British Nuclear Fuels Limited, the owner and operator of the site at Windscale, put its hand on its heart and acknowledged that it had been at fault.

The report by the Health and Safety Executive is largely concerned with managerial failures at Windscale. It says that British Nuclear Fuels had allowed the condition of the several plants at Windscale to deteriorate until by the early 1970s, their safety could not be assured; and that the efforts made since 1974 to enhance the safety of the Windscale facilities further complicated the assurance of safety by their demand on resources. The report complains that the company paid too little attention to the filling of senior posts at Windscale and that the arrangement whereby the Northwest Area General Manager is responsible for safety in the whole of Windscale but also at other plants means that his responsibilities are too much diluted.

The report says that most incidents at Windscale have arisen because of mistakes in the execution of routine tasks. About a quarter of the 30 or so incidents reported each year since 1976 have involved the exposure of people to doses of radiation exceeding the limits laid down. The inspectors say that the managers of the plant must provide workers on the site with regularly updated and more explicit instructions for carrying out routines tasks and that a promised review of safety procedures should be completed more quickly than now seems likely. In the long run, the Nuclear Installations Inspectorate wants to see a system for the independent audit of safety at Windscale.

The effect of the Health and Safety Executive's report on the publicly owned parts of the British nuclear enterprise is likely to be far-reaching. British nuclear engineers appear to acknowledge that Windscale, because of the way in which it has been created by the addition of new plants to an already overcrowded site, and because of its relative antiquity, is not the ideal model for the safe operation of nuclear plants. But other nuclear sites are likely to encounter similar problems which will be less readily excused.

US university regulations

Complaints listed

Washington

Jumping on the anti-regulation bandwagon which helped propel Mr Ronald Reagan into the White House last November, US colleges and universities are eagerly compiling a list of federal regulations which they feel are stifling the productivity of their educational and research efforts.

One regulation that the universities have in mind is the notorious Circular A-21, issued by the Office of Management and Budget, laying down strict accounting rules which must be obeyed by any scientist and his or her institution receiving federal research support. "A-21 is at the top of our priority list for reform", Mr Sheldon Steinbach, general counsel of the American Council on Education, said last week.

Another rule which the universities would like to see changed is the requirement that scientists should provide a precise account of the way that their time is divided, not only between teaching and research, but also between different research projects. Another relates to cost-sharing between universities. And although the Carter Administration, in its last month in office, took steps through the Office of Management and Budget and the Office of Science and Technology Policy to reduce the impact of the A-21 rules, many universities feel that they are still far from satisfactory.

The universities' point of view had already been presented to Vice-President George Bush, who has been appointed by President Reagan to head a task force on regulatory reform, and has announced the Administration's intention to defer several new regulations proposed by Mr Carter, and also to take a close look at several existing rules to see if they should be revised.

Last week, Mr Bush was presented with a nine-point plan to streamline federal rule-making which had been drafted by 62 leading businessmen and educators organized by the American Council on Education into a Business Higher Education Forum. The forum's statement linked together the complaints made by the business community about, for example, the impact of health and safety regulations, and those coming from the academic community about the general burdens of educational regulation.

The report of the forum says that, as a result of the many educational reforms introduced over the past twenty years, from rules about facilities for handicapped students to affirmative action programmes, regulation of higher education "has mushroomed", with 400 laws on the statute book overseen by 34 committees of Congress.

One complaint is the economic impact of the regulations. According to Howard Bowen, an economics professor at the

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