

willing and able to serve if elected", which presumably implies a detailed discussion of the terms on which a "proposed nominee" would take the job.

Thereafter the council of the academy will inform the members, who have until 1 December to make alternative nominations (which must be supported by at least fifty members' signatures). If necessary, ballot papers are distributed by 15 December and must be returned by 15 January 1981. In principle, the council can put more than one name to the membership, but it has not in recent years done so. The present procedure, devised only in the 1960s, appears in the 1980s to be calculated to maximize the embarrassment of the "proposed nominee" and of the academy as a whole.

## Bell Research Labs

# Split possible?

Washington

There is much consternation at the Bell Telephone Laboratories at the unexpected announcement last week that the parent company, American Telephone and Telegraph (AT&T), is to split into two quite separate operating companies. This move, which has been prompted by a decision of the Federal Communications Commission (FCC) made public in May, may be followed at some later stage by a decision that Bell Labs itself should be split in two.

Scientists working at Bell Labs fear that such a development would impair the quality of the organization's research. For the time being, however, uncertainty rather than anxiety rules. No decision has been made as yet about the consequences of the split in the parent company for the research organization.

The crucial decision of the FCC (known as the Final Decision on the Second Computer Inquiry) is the latest stage in the FCC's decade-long attempt to adjust the rules for regulating the public telephone networks to meet new technical needs. Since 1968, the FCC has held that companies such as AT&T should not enjoy the exclusive right to supply terminal equipment for their telephone lines and other channels of communication.

More recently, the difficulties of regulating the common carrier networks have increased with the development of data processing networks, domestic satellite communications and the prospect of other technical developments. For the past four years, the FCC has been searching for a definition that would allow the networks to supply some kinds of equipment but prohibit them from supplying other items.

In its latest ruling, the commission has abandoned this exercise in semantics and opted for a more radical solution. In future, it says, large common carriers of electronic signals must be concerned only

with the development and management of the network. If they wish to supply terminal equipment as well, they must do so through a separately constituted company with a distinctive board of directors, separate premises and so on.

Although the same rule would apply in principle to all telephone companies in the United States, for the time being the FCC has ruled that it should apply only to AT&T and to General Telephone and Electronics, which operates some 8 per cent of the American telephone network in locations scattered from Florida to California.

The response of AT&T to this radical proposal has been equally surprising. Although the company argued strongly against separation in its evidence to the FCC, on the grounds that vertical integration is beneficial, it announced last week that it would go ahead with the formation of two separate companies to be responsible respectively for the operation of the telephone network and the supply of terminal equipment (telephones included).

It is not yet clear whether the separation of the two parts of AT&T will be as complete as the FCC requires. Moreover, the move does not imply that AT&T accepts the commission's ruling — indeed, AT&T is one of thirty objectors who are threatening to carry their case to the courts if the decision is not modified.

The complication for Bell Labs is that the research organization is a jointly owned subsidiary of AT&T and of Western Electric, itself the subsidiary of AT&T responsible for manufacturing terminal and network equipment. The FCC ruling is vague on the implications of the proposed split in AT&T for research and development, saying only that affiliated companies would be required in future to buy research and development services from other affiliated companies at a fair valuation.

One obvious development, that most feared at Bell Labs, is that AT&T may in the end be required to divide both Western Electric and Bell Labs itself into parts separately responsible for communications networks and for terminal equipment. AT&T is also alarmed at the prospect that even separation of activities on which it has now embarked will impede the free flow of ideas between operations and research and development.

If there were to be a split of Bell Labs, the chances are that the largest part would go to the network side. Of the 1980 budget of \$1,255 million, more than 45 per cent was exclusively concerned with network operations. The remainder may be considered relevant to both sides of the telecommunications business.

How soon the future of AT&T and of Bell Labs will be decided is a matter for conjecture. The FCC has set a deadline for the complete separation of AT&T by March 1982, but will now be required to comment on the objections to its ruling, most probably in October or soon afterwards. If the courts accept that the

objectors to the ruling have a case, several further months may elapse before the regulations have the force of law, in which case the deadline would no doubt be put back. Excessive delay is likely, however, to breathe life into the bills now languishing in Congress that aim more directly to regulate the public communications networks.

## NPT review conference

# No declaration

The Second Review Conference of the Non-Proliferation Treaty ended on Sunday (two days later than originally planned) with a smack in the face for the three sponsoring nuclear powers, the Soviet Union, the United Kingdom and the United States. Although the nuclear powers had been expecting trouble at the conference, largely on the grounds that they had been less diligent than required by the treaty in the pursuit of strategic disarmament and the fostering of civil nuclear developments elsewhere in the world, they were apparently taken aback also to find themselves criticized on the grounds that either Israel (not a signatory of the treaty) or West Germany (which is) had been helping with the development of nuclear weapons in South Africa.

The most immediate cause of trouble was the failure of the conference to agree on a report of the past month's proceedings at Geneva. The drafting process came to a fruitless end in the early hours of Sunday morning, and the conference was concluded later in its day.

By all accounts, the review conference has been rough going ever since the opening speeches were made in public during the first ten days. The government of Mexico appears to have taken the lead in asking that the nuclear powers should agree to a package of demands on arms control, including a declaration that they would abide by Salt II while awaiting ratification of that treaty, impose on themselves a moratorium on nuclear testing and allow the negotiations on the Comprehensive Test-Ban Treaty (conducted up to now between the three nuclear power signatories of the treaty) to be carried on with the UN Committee on Disarmament. For the nuclear powers, the sticking-point last weekend was this demand that such a declaration should be included in the final report of the review conference.

The overriding question now is whether the failure to produce an agreed report will be followed by mass defections from the treaty. The closing speeches at Geneva, including that from the Iraqi chairman, were variations on the theme that nuclear proliferation remains a serious danger, and that the conference had served to draw attention to many of the beneficial aspects of the treaty.

The discovery by several of the

signatories that the quinquennial review conferences offer a means of twisting the arms of the nuclear powers on arms control may paradoxically help to keep some states loyal to the treaty. Others, however, will no doubt be able to use the failure to produce an agreed report as an excuse for withdrawing from the treaty, even though those tempted to take such a step will no doubt be impelled in that direction by separate political considerations.

In the wake of the Geneva conference, the meeting of the Committee on Assurances of Supply of the International Atomic Energy Agency, planned for the end of this month at Vienna, assumes greater importance. It is thought unlikely that the nuclear powers will be spurred to further negotiations on strategic disarmament at least until after the American presidential election.

## Plutonium

# Dounreay loss

Only a few weeks before the British government is due to make an announcement on the future of the fast breeder reactor, the BBC television programme *Panorama* alleged on 8 September that a total of 35 gram of plutonium from the prototype fast reactor at Dounreay was lost in 1973 and 1976. The United Kingdom Atomic Energy Authority admits that the plutonium has never been accounted for, but says that it could not have left the fuel cycle and was most probably reprocessed or even dumped in a waste repository.

The first case of missing plutonium occurred in 1973 when a routine accountancy check revealed that 10 gram of the element was missing from a can containing the remnants of several spent fuel pins. The pins, originally about 0.2 inches in diameter and 2 feet long, had been irradiated in the reactor core for one year and then chopped up for analysis by chemists and metallurgists. The shortfall in plutonium was equivalent to one fuel pin.

The second case concerned a fuel pin which had been irradiated in the reactor core for one day in 1966. It had then been treated in the same way as the first pin and the can containing it had been stored in a cooling pond. It contained 25 gram of plutonium. In 1977, the can that was thought to contain the remains of the fuel pin was found to contain another type of spent fuel.

The UKAEA says that it investigated the losses and reported the second to Euratom, of which Britain was then a member. A driver of a mechanical digger was hired to uncover all the material in a dump of low-activity waste in the hope that the second lot of missing plutonium would be discovered. The contents of the dump were analysed, but the missing spent fuel was not found.

The UKAEA says that each case was investigated thoroughly, and that the to

missing irradiated fuel pins must either have been reprocessed or dumped in a depository for highly radioactive wastes, examination of which would be too hazardous to undertake. It says the plutonium could not have been removed from the fuel cycle. Its conclusion is that there must have been an error in the system of keeping records of the movement of plutonium. Since the incidents, the UKAEA says, it has tightened up on its procedures for monitoring the movement of radioactive materials around the plant.

The *Panorama* programme was also critical of operations at Dounreay on health and safety grounds. It claims that the driver of the mechanical digger, a deaf-mute, was not properly aware of the hazards of what he was doing and was not given adequate protective clothing. It also cites another incident in 1979 when eight men were exposed to plutonium after handling radioactive waste. None of them was aware that the waste contained plutonium and at the end of their shift it was discovered that they had been exposed to radiation.

About this incident, the UKAEA says that the waste handled by the men contained only one gram of plutonium and that none of the men was later found to have significant amounts of plutonium in his blood or urine. The incident had not been reported because the level of alpha radiation in the air in which the men were working was well below the level at which notification to the authorities is obligatory. An attempt was made, says the UKAEA, to inform the deaf-mute driver of the hazards of what he was doing. He was told to stay in his cab and air samples were monitored for radiation. The levels found were within the safety limits.

The uncovering of the incidents has provoked a strong reaction from Mr David Steel, leader of the Liberal Party, who has called for a ministerial statement on the affair. Even before the showing of the film, the AEA had issued a statement that *Panorama* had exaggerated the significance of these incidents, and had also charged the BBC with having declared an interest in making a film about this achievements

Judy Redfearn

## Academic freedom

# Talking shops

### The Hague

Three papers by Dr Andrei Sakharov, written since his exile to Gor'kii, *Eksperimental'noi i Teoreticheskoi Fiziki (ZhETF)*, the most prestigious physics journal in the Soviet Union. This remarkable development was announced by Nobel Laureate Philip Anderson to last week's Conference of the International Sakharov Tribunal of Conscience and Peace.

According to Professor Anderson, the

Editor of the *ZhETF* had initially accepted the papers, which deal respectively with time-reversal, quark/gluon interaction and mass formulae for muons and baryons. At a late stage, however, the censors stepped in to stop publication. The matter, said Professor Anderson, was finally "adjudicated" by the Central Committee of the Politbureau, who decided that publication could go ahead.

The story which amplified by Professor Edward Lozansky, Chairman of the International Sakharov Committee, New York, and a former member of the Moscow Sunday Seminar for Jewish "refusnik" scientists. He told the conference how he had brought the three Sakharov papers to the meeting of the American Physical Society (APS) in April, which decided that if the papers were turned down for political reasons by the Soviet journals the APS would be delighted to consider them. This, thought Lozansky, had probably swung the balance in Sakharov's favour.

Ironically, this revelation of how much Western academic pressure can achieve on behalf of a harassed Soviet colleague was announced at a conference which, in the opinion of several campaigners for academic freedom, should not be taking place at all. One of these is Mrs Tamara Yankievich, Sakharov's stepdaughter-in-law, now resident in the United States. The main grounds for opposing the conference have been the veiled hints from the Soviet side that vociferous action might jeopardize a plan to allow Sakharov quietly to return to Moscow. "Six months after being exiled" was the first date promised for his return; this has now however become "six months after the end of the Olympics".

Unlike the various other "Sakharov" human rights conferences in the past few years, the Hague conference was a human rights conference specifically focused on Sakharov's own plight. As several speakers pointed out, this is a relatively mild plight. For example, Sakharov still has access to a scientific library just across the street from his Gor'kii apartment. Because all the scientific institutes in Gor'kii are involved in classified work, however, there is no possibility of his having any contact with fellow scientists in his place of banishment.

In his presentation to the conference, Professor John Ziman of the University of Bristol suggested that one of the reasons scientists are particularly concerned with Sakharov's case is that his involvement with problems of academic freedom and human rights generally grew out of his disillusionment with a career in nuclear weaponry — what Ziman called "black science" — like black magic, "the application of knowledge in the power of evil".

His "pilgrimage", as Ziman called it, is therefore of particular concern to all scientists, "hard put to it these days to defend our traditional norms — the universality, the disinterestedness, the openness of a transnational community bringing beneficial knowledge to all".