

# Polish scientists form free union

Polish scientists and university teachers have been quick to set up an independent trade union.

The Gdansk accords, signed on 31 August between Vice Premier Mieczyslaw Jagielski for the Polish Government and Mr Lech Walesa for the Joint Strike Committee of the Baltic littoral, guarantees to all Polish workers the right if they so choose to set up "free trade unions independent of Party and employees".

On 8 September, the new "Independent Union of Scientific, Technical and Educational Workers" (*Zwiazek Pracownikow Nauki, Technicii Oswiaty*—ZPNTO) was established, and two days later it held its first delegate meeting, with 286 delegates (one for every 50 members) representing scientific and academic institutions throughout Poland.

During the labour unrest of the past two months, Polish scientists had kept a fairly low profile, although in at least two institutes of the Academy of Sciences — Experimental Biology, and Hydrology and Meteorology — meetings of support had been held to urge an agreement with the Joint Strike Committee.

The establishment of the ZPNTO is far more than an act of solidarity; the new chairman of ZPNTO, Zdzislaw Bibrowski, a researcher into energy problems at the Institute of Fundamental Problems of Technical Science of the Polish Academy of Sciences, considers that the Gdansk accords represent a new chance for Polish academic life to regain its autonomy, and freedom of research. "This is a problem of vital concern to all scientists," he said. Although ZPNTO hopes to act as a conventional trade union, defending the day-to-day interests of its members, its leaders see the issue of academic autonomy as all-important. If this is granted, they imply, many other problems will solve themselves. Already there are demands from the universities that rectors should be appointed by secret ballot and that senior appointments should be made on the basis of academic criteria only.

Such demands do not come only from ZPNTO. Last week the Party-linked Socialist Union of Polish Students published its own set of postulates, demanding greater autonomy for higher educational institutes, restoration of open discussion and a "moral revival" of the academic community. The governing board of the existing Union of Polish Teachers has adopted a resolution pledging itself to full democratization, independence and self-government; it seems in effect to have disestablished itself from the Central Council of Trade Unions. Addressing the start-of-session conference of university rectors last week, Janusz Gorski, Minister of Higher Education and Science, said that the postulates on higher

education put forward by the various academic establishments were now being studied, while Politburo member Andrzej Werblan urged public discussion on the issue of self-government in higher education as a basis for reforms. Even the Scientific Secretary of the Academy of Sciences, Dr Jan Kaczmarek, told a meeting of directors of research institutes that the academy will have to make a number of internal changes and redefine its role in the scientific community.

For those who have chosen the option of an independent trade union, however, the main practical problem at the moment is to get the new union registered as soon as the new legislation is through. Inevitably, there is considerable organizational work to be done, and ZPNTO is not attempting to rush things. The committee was elected by secret ballot at the delegate meeting and will hold office for only three months during the period of consolidation.

This committee, incidentally, represents a wide range of disciplines: two other physicists, Andrzej Ziabicki and Zbigniew Peradzynski, also from the Institute of Fundamental Problems of Technical Science, Tadeusz Klopotoski from the Institute of Biophysics and Biochemistry,

Krystyna Starczewska from the Institute of Philosophy and Sociology and Piotr Sasinski from the Institute of Literary Research. The only member of the committee not employed in one of the Academy's institutes is Viktor Kulerski, a school-master. The interim committee is largely Warsaw based, but Dr Bibrowski stressed that ZPNTO membership represents the academic community of the whole of Poland, and one of the main items discussed at the delegate meeting was the need to facilitate enrolment of academic workers outside the capital.

However, not all the Polish academic community is entirely happy about the foundation of ZPNTO. Last week's delegate meeting was held in the building of NOT (*Naczelna Organizacja Techniczna* — Chief Technical Organization) in Warsaw. When, however, the delegates and other supporters arrived (some 500 people in all), the NOT officials were unwilling to admit them. Only after lengthy negotiations were they allowed to go in, and even then only on condition that the chairman of NOT read a formal statement that NOT was acting merely as proprietor of the hall and accepted no responsibility for what might transpire. **Vera Rich**

## DNA recombination forces resignation

*Washington*

Dr Samuel I.T. Kennedy last weekend resigned his post at the department of biology at the University of California, San Diego, in the wake of a critical report from the institution's biosafety committee. Dr Kennedy has been in hot water for the past several weeks, since it first became known that he had carried out cloning experiments with the Semliki Forest virus (SFV) at a time when cloning of the virus was prohibited under the recombinant DNA guidelines promulgated by the National Institutes of Health (NIH) (see *Nature*, 14 August).

Dr Kennedy has from the outset said that his work with Semliki Forest virus was accidental, and that he had been intending to clone fragments of the genome of another arbovirus, Sindbis virus. At one stage it had been suggested that the two kinds of viruses were confused when a package of vials containing various virus specimens was damaged during air transport from the United Kingdom.

The report prepared for NIH by the university's institutional biosafety committee now says that it does not accept Dr Kennedy's description of the experiments that were carried out, and suggests that the violation of the guidelines may have been deliberate.

This possibility, which has been strongly denied by Dr Kennedy, has led the committee to continue its ban on further

cloning experiments in his laboratory. It argues that agreements between research workers and biosafety committees must be based on mutual trust; and that in the absence of such trust "permission for cloning should not be granted".

The report contains two separate sections, one presenting a chronology of events as determined by the committee, the other the chronology as described by Dr Kennedy. Both descriptions agree on many points, in particular that subsequent laboratory tests revealed that cloning of SFV DNA had indeed occurred when it was prohibited by NIH guidelines (a prohibition that has since been lifted).

But there are significant differences in some of the details of the experiments and their timing. According to Dr Kennedy, defective interfering (DI) virus particles were prepared from stocks of Sindbis virus early in 1979 and subsequently used to generate further Sindbis DI particles. RNA prepared from the particles was cloned in a strain of *E. coli* in December 1979, and the DNA isolated from this clone was successfully used in January 1980 to transform mouse L cells.

The committee gives a slightly different version of events. It claims that it was a Semliki Forest virus preparation enriched in DI particles that was used in the summer of 1979 and that the DNA was used to infect cells in August and subsequently in January of this year. According to the

committee, it was only after the necessary methodology had been established and a number of different cloning strategies had been established that the successful cloning of the double-stranded DNA was carried out in March and early April — not last December, as Dr Kennedy claims.

The committee bases its reconstruction of the experiments on a close examination of Dr Kennedy's research notes, which it admits give a picture of him as an experimentalist with wide-ranging technical competence who describes protocols "clearly and completely".

However, it differs from Dr Kennedy in its interpretation of key sections of the notes. For example, it uses passing references to the use of SFV DI RNA material — which Dr Kennedy insists was used only for experiments establishing the conditions for complementary DNA synthesis — to support its conclusion that the experiments carried out in the summer of 1979 were specifically done to prepare SFV DI RNA for cloning.

The committee also bases its conclusion on the results of hybridization experiments carried out at the end of April 1980. Since both versions of the chronology agree that the clone should contain SFV sequences, the committee says that the RNA used to give a positive hybridization result must have come from SFV, quoting a published reference which claims a very low sequence homology between the two arboviruses.

Finally, with regard to the date of the cloning, the committee's conclusion that the experiments were carried out in March and April, and not last December, is based on its scepticism that a loose-leaf notebook purporting to describe the December experiments is in fact an accurate record, containing for example data transposed from the April experiments and other notebooks.

Dr Kennedy's resignation will relieve NIH of the need to decide what further action to take. Neither of the two previous violations of the guidelines has faced NIH with the problem of deciding which of two conflicting interpretations of events to believe.

Further light on the affair may eventually be shed by a confidential investigation being carried out by the university's biology department. This is expected to look into claims from laboratory workers that they knew last summer that they were working with material from Semliki Forest virus.

The departmental inquiry is also expected to investigate the source of the concern of graduate students that Dr Kennedy's work may have been in violation of the guidelines. This concern was reported to the head of the department in May, after a seminar given by Dr Kennedy at the Salk Institute was interpreted as confirming their earlier suspicions. (All four graduate students resigned from the department at the same time and have since been moved to other

departments in the university.)

The question has inevitably been raised of whether Dr Kennedy's action may have been prompted by the knowledge that a group at the European Molecular Biology Laboratory at Heidelberg is hard at work on the sequence of Semliki Forest virus. The German group was given the go-ahead to clone the virus under P3 conditions more than a year ago and in the past six months has been able to carry out subcloning of purified sequences under P2 conditions. As a result, the group has been able to sequence a substantial proportion of the virus genome.

Last Friday, Dr Kennedy resigned from the university, still protesting his innocence but complaining of "irreconcilable differences" between himself and "certain sectors of the university". Dr Kennedy said that he would shortly be sending his own version of events to NIH; and that he had resigned both as a matter of principle and because from a practical standpoint the decision of the institutional biosafety committee meant he would be unable to continue with his recombinant DNA research at the university, and "I don't want to settle for that".

David Dickson

## Uranium enrichment

### New French process

The French process for the enrichment of uranium by chemical techniques, under development since 1968, seems about to be launched commercially. The Commissariat à l'Énergie Atomique (CEA) says that the process is now economically competitive with the diffusion process and that, because even small-scale plants can be economic, it may be attractive to countries planning only a small number of pressurized water reactors but anxious to secure a supply of enriched uranium for them.

The French, nevertheless, hold that for a number of technical reasons the new process will not increase the risks of nuclear proliferation. The CEA says that the Department of Energy in the United States has been studying the French process since September 1979, and that a decision on a cooperative commercial venture is expected soon.

The chemical enrichment process, inferred from the relevant patents, apparently involves the counter-current flow of aqueous and organic solutions containing uranium. The aqueous phase is a solution containing trivalent uranium ions. The organic phase contains uranium liganded to molecules rich in phosphorus-oxygen bonds. At equilibrium, it is claimed, the ratio of uranium-235 to uranium-239 isotopes may be up to a factor of 1.002.

Although the degree of separation obtainable from such a counter-current system is less than that from a single stage

of the diffusion process (estimated at 1.004), so that more stages would be needed for a given enrichment, the power requirements are much less. In the chemical process, energy is consumed chiefly in the interconversion of the aqueous and organic solutes. The CEA says that the overall power requirement is only a quarter of that involved in the diffusion process.

The CEA gives two simple reasons for believing that the chemical process would not contribute towards weapons proliferation. First, the time needed to bring a cascade of counter-current stages to equilibrium, which increases with the length of the enrichment cascade and thus the degree of enrichment required, might amount to ten years for a plant producing weapons-grade uranium. The CEA also says that the chemical process requires high uranium concentrations, and that problems of criticality would arise at high enrichment. In other words, people seeking to make weapons-grade uranium would risk blowing themselves up.

Not everybody is persuaded that the French process is as promising as the CEA says. On strictly economical grounds, gas centrifuges have much to offer. Like the chemical process, centrifuges (using gaseous uranium hexafluoride) work with near thermodynamic equilibrium, so that energy consumption is inherently low. Moreover, the degree of isotopic enrichment at each centrifuge stage in a cascade is much greater than that obtainable from diffusion plants and the French chemical process.

Inevitably, centrifuge plants designed to produce low-enrichment uranium can be quickly rearranged to produce a smaller amount of highly enriched uranium. Sceptics of French claims argue that the technical and economical advantages of the centrifuge design are so great that they will not be discarded for the nebulous political benefits of the French chemical process.

French interests are unlikely to be deterred by this argument, and are likely in future years to be impressing on Third World countries the benefits of a process that, in principle at least, offers independence from the uranium supply policies of the major powers.

Robert Walgate

## Fast reactor

### UK looks abroad

The shape of the possible collaboration on fast reactor development between the UK Atomic Energy Authority (UKAEA) and its opposite numbers elsewhere became clearer earlier this week with the publication of the authority's annual report for 1979-80 (HMSO, £2.00). Reports that the AEA might join in the exploitation of the French Super-Phénix design are confirmed, but the possibility of