

fearing that the clause may be more destructive of US than of Canadian economic interests.

Moynihan's staff counters that the market for videotext and teletext is still so fluid in the United States that the big customers, who plan to use these systems to bring newspapers and news services into homes within a decade, can still choose the French or British system, that under development by AT&T or some other.

The US Federal Communications Commission (FCC), which has the legal power to affect the outcome by developing standards for this new industry or by endorsing some industry-proposed standard, is standing aside. In October 1981, FCC announced that the market should decide which systems were the best. The announcement, not yet a formal notice, heartened British Videotex and Teletex of New York, the company responsible for marketing Prestel in the United States. So long as FCC does not endorse a North American standard, Prestel still has a fighting chance. Senator Moynihan's clause would give it even a better one.

**Deborah Shapley**

## Canada and yellow rain

# UN expert group asked to act

### Washington

This autumn will see a test of the United Nations' ability impartially to examine allegations of Soviet-inspired use of toxin weapons in South-East Asia. The Canadian government has submitted a report to the United Nations that gives credence to the charges and explains how they could be resolved. It will be up to the Group of Experts convened by the General Assembly to recommend to the Assembly whether or not to take up the report's suggestions. So far the Group of Experts has failed to reach any conclusion. The Soviet Union has denied that there is any toxin warfare in South-East Asia.

Canada has strongly supported the extension of the Group of Experts' mandate last year when its first investigation did not decide the matter. Refugees from Laos and Kampuchea say that helicopters and fixed-wing aircraft have been spraying poisonous gas that causes death to humans, animals and plants. If this is true, the Vietnamese, who

are presumably flying the planes and helicopters, would be in violation of the 1925 Geneva Protocol prohibiting the use of poisons in warfare. If, as is suspected, the Soviet Union is the source of the toxin weapons, it is in violation of the 1972 Convention on Biological and Toxin Weapons.

Independently of its active role on the issue in the United Nations, the Canadian government commissioned its own study of the matter. In February it asked Dr H. Bruno Schiefer, chief of the toxicology group in the Western College of Veterinary Medicine at the University of Saskatchewan, to try and resolve the veracity of the charges. Dr Schiefer made a two-week visit to Thailand — neither he nor the Group of Experts were allowed into Laos or Kampuchea to check reports first-hand or take samples. Like the Group of Experts, Schiefer interviewed refugees through an interpreter and took samples from border areas near the sites of the alleged attacks.

Schiefer concluded that the events reported to have taken place at the time of the alleged attacks "cannot be explained on the basis of naturally occurring phenomena". He corroborates an assessment made by the US Department of State earlier this year that toxin warfare was indeed being conducted there (*see Nature* 25 March, p291).

Schiefer first sought to resolve an apparent inconsistency. The poisons found in border areas, the particular tricothecene mycotoxins involved, act slowly and would have to occur in massive quantities to cause human death. Yet refugees seemed to say that clouds of "yellow gas" sprayed from the air caused death immediately. After close questioning of refugees, Schiefer concluded that the human deaths were not occurring immediately but that humans, animals and, plants in the vicinity were dying 10 to 14 days afterwards. This would be consistent with the level of poison reaching the ground in sprays.

Another problem has been that the tricothecene mycotoxins involved could not alone penetrate the human skin in such a fashion as to cause death. Schiefer began searching for possible agents that might be combined with the tricothecene to facilitate entry through the human skin. Because some of the refugees reported a garlic-like smell after the attacks, Schiefer suspects that dimethyl sulphoxide (DMSO) could be such an agent. The report suggests future field searches for DMSO and other possible agents.

The report also urges that a search should be made for the only known mycotoxin that could kill through ingestion, macrocyclic tricothecene, which thus would not need any additional agent to penetrate the skin.

## Communication without compatibility

None of the six main videotex standards is fully compatible with any other. Each offers a different solution to the central problem of balancing quality of display against the cost of the terminal.

At the cheap end of the scale are the systems with "alpha-mosaic" graphics, producing pictures on the screen with a crude building-block appearance. The memory of alpha-mosaic terminals stores a limited repertoire of basic mosaic shapes, from which an incoming byte of data can extract a particular shape and place it in a particular slot on the screen. The result, although inelegant, is economic in the use of memory and transmission bandwidth. But the description of information in the database is terminal-dependent.

"Alpha-geometric" systems specify pictures in terms of basic geometric figures and coordinates of a point on the screen. Almost any shape can be created and placed anywhere on the screen, while picture descriptions are not generally terminal-dependent. But greater memory and processor requirements raise the cost of such terminals.

The leading videotex systems have the following characteristics:

- **Prestel:** An alpha-mosaic standard established in 1974 by the British Post Office (now British Telecom) in cooperation with the broadcasting authorities BBC and IBA. Internationally, there are more Prestel-type terminals than others. Extended graphics capability is being developed.

- **Antiope:** The alpha-mosaic standard developed by the French tele-

communications and broadcast authorities (DGT and TDF).

- **Telidon:** The first alpha-geometric standard (produced by the Canadian Department of Communications) has attracted much attention for its superior display capability.

- **32 × 16 US alpha-mosaic:** The central characteristic of this system — 16 lines of 32 characters — is based on the low-cost Motorola VDG microchip. It has been adopted by US cable television and microprocessor manufacturers.

- **CEPT:** An attempt by the Association of European Telecommunications Administrations to establish a unified European alpha-mosaic standard. The standard can interpret data according to either the Prestel or the Antiope schemes, depending on the terminal.

- **PLP:** AT&T's Presentation Level Protocol is not a standard in itself but is a vast package of options, from which AT&T will select a subset to be included in a terminal for mass production. The range of capability offered is so great that a comprehensive terminal would be of prohibitive cost. The importance of PLP is its flexibility and AT&T's formidable powers for production and marketing. Other suppliers are willing to modify their standards to be compatible with PLP. The CEPT standard is compatible with the PLP alpha-mosaic subset, but is restrained from change because of the many videotex and teletex sets already in use in Europe. Discussions with AT&T to modify its alpha-mosaic subset may prevent a permanent split between US and European standards. **Bronwen Maddox**

Schiefer also found that tricothecene mycotoxins do not occur naturally in the environment in the region — as they do in other places (such as Saskatchewan). Nor did he find evidence of the human illnesses that are associated with naturally-occurring tricothecene mycotoxins. His report recommends more systematic questioning of refugees so that a proper epidemiological survey can be made.

The mycotoxins in question are toxin weapons, whose production, development, stockpiling and transfer is forbidden by the 1972 Convention. Use of the weapons in warfare is prohibited by the 1925 Geneva Protocol. There has been some confusion about whether to count the

mycotoxins as chemical or biological weapons because although chemicals they are the products of living fungi.

Schiefer's report suggests that the agent involved may be not only the pure chemical but the chemical and fungus mashed together. It recommends that future field work should look for evidence of the fungi that produce the poisons.

The Canadian government has not formally endorsed Schiefer's report but has forwarded it to the Group of Experts. Its own study of the matter will continue, it says. The Group of Experts is due to report to the next General Assembly, which opens in mid-October and will stay in session about six weeks.

**Deborah Shapley**

## European community research

# Spending money

*Brussels*

The brief Belgian summer has not distracted officials at the European Commission from putting together plans for the new European science strategy agreed at the ministerial meeting on 30 June. Three papers have been presented to the Council of Ministers, EEC's decision-making body, covering the reform of the research and development programme of the joint research centres, the preliminary phase of the Esprit programme on information technologies and the first phase, for 1983, of the long-term plan to stimulate the scientific and technical potential of the European Community.

The last of these projects, however tentative, is the most interesting. The Commission is proposing that the Community should spend \$5 million to stimulate research in seven selected fields, thus paving the way for spending on a larger scale in the period 1984–87. For next year, the plan is that funds should be spent on a handful of fashionable fields of enquiry — new applications of cell and molecular biology, composite materials, mathematical analysis applied to optical problems, the behaviour of materials in the presence of combustion, non-destructive testing, interface phenomena and transitory effects in climatology. Information technology is already catered for by the Esprit programme.

If the Commission's proposals are accepted by the Council of Ministers, the research ministers at their meeting arranged for 30 November will invite applications for research funds in respect of both the pilot programme for research and development and for Esprit.

One of the attractive features of the pilot programme is that funds will be available for multi-national projects, including seminars and workshops, as well as for the travel and research expenses of scientists working at foreign laboratories.

The research ministers are unlikely to be as pleased with the Commission's paper on the joint research centres, the latest revision of the rolling three-year programme. The rising cost of the Super-Sara project on reactor safety is the perennial stumbling-block, especially for those governments that were dubious about the project at the beginning. The Commission now argues that work on this project should be pushed ahead so that the past investment in it will at least yield some information in time for it to be used in the design of light-water reactors, but it is not yet clear whether these arguments will prevail. For the rest, however, the Commission has proposed that the work of the four joint centres should be brought more into line with the new framework proposed for the general support of research and development. **Jasper Becker**

## Sakharov note makes waves

# Pugwash survives Warsaw

Last month's Pugwash Conference in Warsaw — the thirty-second in the twenty-five year history of the Pugwash movement — stressed, once again, the special responsibility of scientists to help "devise means to limit and eventually reverse" the arms race, and their "major responsibility" for disseminating knowledge about the meaning and implication of their work. As is customary, the conference concentrated on major issues of arms proliferation and control, destabilizing factors such as the possible use of food and energy strategies for political means and current or recent world conflicts — Namibia, the Falklands, Iraq-Iran, Afghanistan and Lebanon. But what the council's concluding statement called "the deteriorating international climate" was reflected in two topics which did not appear on the official agenda — a letter to the Pugwash movement from Academician Andrei Sakharov and the meeting of council members with General Jaruzelski.

The Sakharov letter was not originally intended for the Warsaw meeting but for the Pugwash Silver Jubilee Conference in Canada earlier this year. It seems to have been delayed in transmission, however, and shortly before the Warsaw meeting came into the hands of one of the intending participants, Dr Joel Primack from the University of California.

Under Pugwash procedure, because Sakharov had not himself been invited to the conference, the letter could only be circulated as a background document. Not surprisingly, there was considerable Soviet opposition — one Russian proclaiming that since twenty million Soviet citizens had died during the Second World War, it was inappropriate for "anti-Soviet propaganda" to be distributed at a Pugwash meeting. Finally, however, normal procedure prevailed.

The Sakharov letter in fact contained little new. It censured the negative stance taken by Soviet delegations at international meetings where "in all discussions of critical problems, they always behave as

well-disciplined functionaries of one gigantic bureaucratic machine".

As in several previous statements, Sakharov gave "absolute priority" to the achievement of international security and disarmament. In spite of his known opinion that there should be no absolute linkage between disarmament and human rights, he also appealed to the participants to speak out in defence of prisoners of conscience in the Soviet Union.

While generally sympathetic, the conference could not agree with Sakharov's view that "the West would be unable to withstand the forces of the USSR and its camp if nuclear and thermonuclear weapons were excluded from the balance". Rather, the conference concluded, the concept that the Warsaw Pact conventional forces are significantly more powerful than those of NATO needs "searching reexamination".

The problem of linkage seems to have underlain many of the doubts expressed by participants about the meeting of the Pugwash Council with General Jaruzelski but meetings with the head of state or government of the host country are a Pugwash tradition.

Pugwash participants say they put a number of searching questions to the general on the implications of martial law, the future of Solidarity and the fate of internees, and that he predictably replied that the present "state of war" was necessary to defend the state and economy from anarchy, but that "a number of democratically orientated social, political and economic mechanisms" had nevertheless arisen.

Even so, some participants felt that the very fact of the meeting might in some sense be interpreted as conferring a kind of approval on the current military regime. Jaruzelski, himself, however, carefully avoided any such claim, saying only that the choice of Warsaw for the Pugwash meeting was an expression of respect for the Polish nation, and of trust in its wisdom".

**Vera Rich**