

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**