Soviet meteorology

Bolts from out of the blue

UP to 25 per cent of recorded weather information fails to reach the Soviet Union's Hydrometeorological Scientific Research Centre, the new director, Aleksandr Vasil'ev, has told an *Izvestiya* correspondent. The interview is also the first indication that Vasil'ev had been promoted from his former post as deputy, thus generating speculation that his predecessor, Dr Mikhail Petrosyants, had been dismissed for failing to forecast the hurricane which caused widespread devastation in the Russian Federal Republic on 9 June.

The storm, apparently caused by a warm dry airstream from the eastern Mediterranean meeting a cold airstream from the Barents Sea, has cost the Soviet Union upwards of 120 million rubles (\$150 million) in restoration work, compensation and insurance. Devastation of houses and "production facilities" is reported from Ivanovo, Gor'kii, Kalinin, Kostroma and Yaroslavl as well as in the Chuvash republic, with an unspecified number of deaths. A special resolution of the party central committee and the Council of Ministers to make good the damage done by "a natural calamity" was passed in mid-July.

The Ivanovo hurricane was followed almost immediately by three further meteorological calamities — extensive flooding in the Baikal area in mid-June, a hurricane in the Volynia district in Western Ukraine in mid-July and flooding in the Amur basin "complicated by Typhoon Holly" in late August. But in these cases, although there was considerable damage to agriculture and production schedules, some warning seems to have been given. In the case of Ivanovo, however, there was apparently no warning.

Reliable weather forecasting is particularly important to the Soviet planned agriculture, where the logistics of sowing and harvesting are determined regionally. Moreover, Soviet meteorologists still have to live down the memory of last autumn, when the unexpected onset of severe weather left more than 40 ships of the Arctic mercantile fleet stuck in the ice.

In the event, the new icebreaker *Leonid Brezhnev* extricated the vessels. The Soviet press at the time stressed the valuable lessons learned for future Arctic navigation, which may be why the northern navigation season has been ended several weeks earlier this year. But *Pravda* also noted a year ago that Arctic weather was not by itself "guilty" of causing the emergency, and that all those responsible for the ships' presence in the ice so late in the season should share the blame. Coming only a few months later, the Ivanovo hurricane may well have made it necessary for the meteorological service to offer a scapegoat. And, at 65, Petrosyants is already past the official retirement age.

But is Vasil'ev justified in blaming the problem on poor information flow? The question is pressing because of the new drive to extend the use of "improved" land, which has to be made fit for agriculture by either irrigation or drainage. Last week's central committee plenum admitted that all is not well with the much publicized food programme, launched by Leonid Brezhnev only in 1982, and "further measures" were urged by Mr Chernenko including a major extension of irrigation and the bringing in of virgin land, in Soviet Central Asia. River diversion projects, allowed to lapse during the Andropov era, seem on the way back. Yet even the most optimistic planners admit that such schemes can only yield the projected harvests if every drop of irrigation water is carefully husbanded. Failures in weather forecasting could have serious results.

The Soviet meteorological service

appears to have the technical means. It maintains a union-wide network of weather-watch stations, including "outposts" such as that on Franz Josef Land, and a fleet of weather ships, which not only participate in forecasting programmes but also attempt to correlate Soviet weather conditions with such factors as the change of sea temperature in the northern Pacific. As early as 1970, experiments were under way with networks of automatic recording stations which would feed data automatically into a computer.

Reliable weather forecasting is also one of the main justifications for the Soviet space programme, while the export of meteorological equipment and the training of operators form an important part of Soviet aid programmes to developing countries. Vasil'ev's suggestion, that it is not the information gathering but the information transmission system which is at fault, is one to which the State Committee for Hydrometeorology and Environmental Control will no doubt pay attention.

Vera Rich

Corporate research

Monsanto goes for independence

St Louis, Missouri

THE Monsanto Chemical Company's new \$150 million Life Sciences Center in Chesterfield, St Louis, opened this week and will employ 1,200 scientists, engaged mainly in basic biological research, by 1987. About one third of the scientific budget of the company is earmarked for biotechnology research, and Richard Mahoney, Monsanto's chairman, is prepared to invest \$25–\$75 million before seeing a return in the marketplace, at least ten years from now.

The first commercially-produced biotechnological product will be a bovine growth hormone (methionyl bovine somatotropin, MBS) which will increase milk yields by 15–20 per cent, thus allowing farmers to reduce the sizes of their herds. But the blue-suited Monsanto managers are most proud of their company's commitment to basic research, in which they claim now to be self-sufficient. The basic biology of the MBS development had to be contracted out to Genentech.

Monsanto will, however, continue supporting university research programmes, including the 5-year \$23 million collaboration with Philip Needleman's group at Washington University (St Louis). Here, the discovery in the mammalian heart of atrial peptides affecting sodium balance and smooth muscle tone (*Science* 223, 67; 1984) has led to current investigations of the role of these peptides in human blood pressure control.

Rooftop greenhouses and 123 "growth chambers" at the new institute are the two most visible signs of the company's investment in plant genetics and physiology. In plants, expression of genes via the soil

bacterium *Agrobacterium tumefaciens* may eventually confer characteristics such as insect or disease resistance and increased seed production; now Monsanto is extending its earlier work on pea plants (*Science* 223, 838; 1984) to petunia and tomato. The commercially attractive goal of expressing genes in monocotyledonous plants is, however, well advanced in European laboratories; altered *A. tumefaciens* plasmids can be expressed in asparagus (see *Nature* 311, 594; 1984) and plants of the Liliaceae and Amaryllidaceae families (*Nature* 311, 763; 1984).

At last week's opening ceremony, Frank Press, president of the National Academy of Sciences, endorsed Monsanto's research investment, but warned of the dangers of an imbalance between federal and industrial research spending. (Industry now spends more on basic research.)

Press attacked the government practice of supporting work by a single investigator in a single department, and stressed the need for a different basis for the US grant system. Monsanto is ideally placed to make the massive financial investment needed for a multidisciplinary attack on scientific problems and says it intends to continue publishing its research promptly in the scientific literature.

It claims to have learned from past mistakes in the arena of public opinion, being eager to comply with the National Institutes of Health guidelines for recombinant DNA research and preaching the benefits of biotechnology research to the public. So long as it remains open about its work in this highly competitive area, this huge boost to basic biological research will be welcome.

Maxine Clarke