

international news

Canada's reply to Indian nuclear explosion

David Spurgeon, Ottawa

CANADA has responded quickly and firmly to India's explosion of an underground nuclear device. External Affairs Minister Mitchell Sharp announced four days after the weekend's test that Canada has suspended all nuclear assistance and cooperation and recalled Atomic Energy of Canada Limited's resident representative.

Mr Sharp said that the Canadian government is very disturbed by the tests, in which a device of approximately 15 kilotons yield was reported to have been exploded at a depth of 100 metres. "For all intents and purposes", he told a press conference, "India now has developed the capability of producing a nuclear weapon".

Canada's concern has resulted from the likelihood that the plutonium used in the explosive device came from a reactor named CIRRUS that was a gift from Canada. Canada has also designed and helped to build and equip two electric power reactors at Rajasthan (Rapp I and Rapp II), and most of India's nuclear personnel have been trained in Canada.

Canada has long been fearful of India's nuclear intentions. Copies of correspondence between Prime Minister Pierre Trudeau and India's Prime Minister Indira Gandhi in October 1971, which were distributed at the press conference, reveal Canada's concern at that time for the prevention of proliferation of nuclear weapons.

"The use of Canadian supplied material, equipment and facilities in India, that is, at CIRRUS, Rapp I or Rapp II or fissile material from these reactors, for the development of a nuclear explosive device would inevitably call on our part for a reassessment of our nuclear cooperation arrangements with India, a position we would take with any other non-nuclear weapons state with which we had cooperation arrangements in the nuclear field", Mr Trudeau warned.

"My government", replied Mrs Gandhi, "reiterates its commitment to the provisions contained in the nuclear cooperation agreements between India

and Canada to which your government is also committed. Our two governments have acted in conformity with these arrangements for the past several years. The obligations undertaken by our two governments are mutual and they cannot be unilaterally varied".

What appears to have let the Indians off the hook, at least in their own minds, is their interpretation of the underground device they exploded as a "peaceful use" of nuclear energy. This interpretation has never been shared by Canada, but it seems to have been India's all along. Canada signed the Nonproliferation Treaty but India refused on the grounds that it was "discriminatory".

Canada did win inspection provisions for the two Rapp power reactors by the International Atomic Energy Authority but there were no such provisions for the CIRRUS reactor. CIRRUS seems the most likely source of plutonium for the device. For other reasons: AECL officials say that the one Rapp reactor now running has not been operating long enough to produce sufficient plutonium for an explosive device. The Rapp reactors are of the Candu type, fuelled with natural uranium and they are not ideal for producing weapons grade material in any case.

The CIRRUS was initially fuelled by Canada but subsequent fuel was manufactured by the Indians themselves, according to Canadian officials. The Indian fuel was not subject to inspection. Thus the plutonium for the device could have come from the Indian fuel and have been separated out in India's reprocessing plant, which has been operating since 1964. In fact, press reports in India were said by a spokesman in Canada's Department of External Affairs to have quoted Indian officials as saying that this was the case.

Asked for his personal reaction to news of the explosion, J. L. Gray, President of AECL, said quite frankly "I was really quite surprised and very disappointed". Gray suggested that halting Canada's nuclear assistance at this point will have little effect on India's nuclear power programme. "It might delay them but it won't stop their programme," he said. One of the Canadian-built Rapp reactors is already running, the other is nearly finished and India is building four more of its own.

In future Canada will try to assure that there is no ambiguity about the

meaning of the phrase "peaceful uses" in agreements with other countries. But it is not clear how that will be accomplished for Mr Trudeau's 1971 letter to Mrs Gandhi seemed clear enough. Mr Sharp said that Canada "made it clear in international discussions and in bilateral exchanges with India that the creation of a nuclear explosion for so-called peaceful purposes could not be considered as a peaceful purpose within the meaning of our cooperative arrangements".

India's action has also brought up the question of Canada's aid programme to that country in general. Mr Sharp said that Canada is conscious of the very large costs involved in the development of nuclear energy for peaceful purposes and appreciates the substantial resources needed for the development of explosive devices. "Canada does not intend to share the burden of relieving such costs" he said. Thus the Canadian government is not prepared to agree to any roll over of India's commercial debt to Canada which is largely related to her nuclear energy programme.

Apart from the danger of nuclear weapons proliferation, many Canadian officials have found it hard to understand the rationale of putting a high priority on an expensive nuclear device which has a questionable utility while such vital national problems as assuring an adequate food supply continue to go unresolved. Indian spokesmen said the device was needed to aid in developing new energy sources, but understood nuclear devices have not been notably successful in such uses, even in the United States.

Oil from Russia?

from our Soviet Correspondent

SPEAKING in London recently, Academician Vladimir A. Kirilin, Deputy Chairman of the Council of Ministers of the USSR and Chairman of its State Committee for Science and Technology, called for cooperation between Britain and the USSR over energy matters—both in nuclear energy and oil production.

The occasion was the third meeting of the Permanent UK/USSR Intergovernmental Commission for Cooperation in the fields of Applied Science, Technology, Trade and Economic Relations. Mr Peter Shore, Secretary of State for Trade led the United Kingdom delegation and pre-

sided; Academician Kirilin headed the Soviet delegation.

The meeting paid considerable attention to ways of implementing the recently signed (May 6, 1974) Ten Year Agreement on the Development of Economic, Scientific, Technological and Industrial Cooperation, studying, in particular, the cooperation in major technological projects on a compensation basis and the necessity for flexibility in planning individual cooperative ventures.

It was recommended that further exchanges should take place in the fields of crystal structure and macromolecules, astronomy, phase synchrotron radiation, plasma physics, hydrostatic extrusion, corrosion and tribology.

At the press conference after the meeting, Academician Kirilin said that cooperation in the field of breeder reactors "in which both countries have had notable achievements" could considerably reduce the cost of energy production.

As to oil production, he said that talks have begun with British Petroleum, to be continued in Moscow next month, to outline a possible scheme by which the United Kingdom would provide the plant and that in return the Soviet Union would deliver oil for BP "for we do not expect at the moment, the UK will deliver oil to the Soviet Union!". This, however, he stressed, is still in the planning stage, and a number of possible options for co-operation in this field lie open.

Speaking generally, Academician Kirilin stressed that the current round of talks and, indeed, the 10-year agreement could only bear their full fruit in an atmosphere of detente and co-operation, which, he averred was a fundamental tenet of Soviet foreign policy. This raised a number of questions about the rights of scientists to emigrate, and what proportion of the goods to be exchanged had originated in Labour Camps (the questioner was doubtless thinking of *The First Circle*). Academician Kirilin replied that there were no labour camps in the Soviet Union, and that because of semantic difficulties, this question could not be profitably discussed, that "almost all" scientists who wished to emigrate could do so—the exceptions being those concerned with national security, and that as for the Panovs (who as dancers could hardly fall into that category), he personally had never heard of them until he came to London, but he was sure their fate "would be dealt with fairly". At which point, in the cause detente and cooperation, Mr Shore intervened and brought the discussion back to the safer channels of mutual economic benefits and exchange.

After the conclusion of the official talks, the Soviet delegation began a

programme of visits to laboratories and research establishments with which possible cooperation was envisaged. The first visit on the programme was to the fusion laboratories at Culham, where Academician Kirilin presented a paper read on his behalf by Dr John Chubb, on the present and future energy situation in the Soviet Union. His data seemed perhaps, a little on the optimistic side—fast-neutron reactors a practical possibility by 1985, and it was interesting to note that in spite of the importance which he places on co-operation in thermonuclear research as a source of cheap power in the future, he stressed the immediate emphasis in the Soviet Union on the coal industry, and recommended a rethinking of the advantages of coal to the West!

Archaeology in crisis

from a Correspondent

A BASIC reorganisation of archaeological excavation in Britain is heralded in a recent press release from the Department of the Environment. It scarcely hints, however, at the underlying problems created by the increase in rescue archaeology, and by the apparent failure of the Department of Education and Science to respond to the current archaeological crisis with the awareness shown by its sister Department.

Mr Crosland's announcement promises an increased grant of £1,063,000 for rescue excavation and post-excavation work in Great Britain during 1974–5. When compared with the grant of £440,000 for 1972–3, and £813,000 for 1973–74, this shows a continuing awareness of the widespread destruction which urban development and mechanised farming are wreaking upon what is left of Britain's past. For the evidence can be rescued only now, before it is gone for ever.

The accelerated growth of rescue archaeology in this country has created its own practical problems, however. There is a shortage of skilled archaeological fieldworkers for the senior positions, and especially of trained diggers—the equivalent, in a sense, of laboratory technicians in the natural sciences. Even so, there are now many hundreds of these diggers, working all the year round, replacing at least in part the amateur archaeologists who until a decade ago made up the entire work force on any summer dig. The emergence of what is in effect a new profession—of full-time digging archaeologists—requires some coordination in terms and conditions of employment, and trade union membership is now under active discussion (*The Times*, May 25, 1974). The formation of some sort of Association of Professional Archaeologists has now been proposed,

which could propose and promote some unified career structure, serving the varied interests of archaeologists in museums, the universities, the civil service and the local authorities as well as the full-time diggers.

These logistic questions are less important, however, than the crucial one of using the annual rescue budget of £1 million to good effect. Hitherto this has been entirely the responsibility of the Ancient Monuments Inspectorate of the Department of the Environment—and its very title recalls that until a decade ago the Inspectorate's principal task was the maintenance of the ancient buildings and archaeological sites under its guardianship, and the protection from destruction of other sites listed as scheduled monuments. The explosive growth of rescue excavation, financed by the Department of the Environment, has put heavy new responsibilities upon its archaeological personnel.

The second, and ultimately more important part of the Minister's announcement takes account of this by setting up a number of advisory committees. The first is a new national advisory committee (a sub-committee of the Ancient Monuments Board, which advises the Secretary of State on the scheduling of Ancient Monuments) to advise on the priorities of archaeological excavation in England. In addition 13 advisory committees are to be set up on a regional basis to advise on local priorities for rescue excavation and archaeological survey where sites are threatened.

It remains to be seen how this structure of regional committees and a national committee will operate (and there has been immediate criticism that the regional committees are not to have direct representation on the national committee). But at least it goes some way to meet a fundamental point, which the urgency of rescue excavation and the expenditure of public money upon it both at national and local level, has sometimes served to obscure. The only purpose of rescue excavation, where the site itself is by definition doomed, is the provision of information about the past. All rescue excavation is research, aimed at providing new information to enlarge our knowledge and understanding of the past. Yet hitherto, as both the Council for British Archaeology, and Rescue, The Trust for British Archaeology have pointed out, there has been no coherent research strategy of any kind in this country. Sites have been dug simply because they were threatened with destruction. But while this is a necessary condition for the expenditure of public funds, it is certainly not a sufficient one, for even the increased funds allow for the complete excavation of only a tiny fraction of the sites threatened. In general, in-