



spread loss of fisheries and of non-commercial fish within two to six months has been inferred;

21. The long-term rebuilding of agriculture and fisheries, once normal climate had returned, would be difficult because of our heavy dependence on technology, seed banks, fertilizers and other aids likely to be in short supply;

22. It is possible that long-term climatic anomalies caused by a nuclear war might hinder or prevent the re-establishment of pre-war (or indeed any) high-intensity agriculture in Canada.

Impact on Society

The Committee was not explicitly asked to consider the social impact of the nuclear winter, nor did its composition allow it to do so in an expert fashion. Nevertheless it tried to visualize what might happen. Clearly the answer for Canada will depend on at least these unknowns:

- the size and nature of the nuclear exchange
- whether Canada will be a target, and if so in what regions
- the extent of physical damage
- the impact on other countries, especially the USA
- the state of survival of services, infrastructure and institutions
- the degree of conflict or cooperation between urban and rural parts of the nation
- the state of preparedness (food storage, security of energy supply, hardening of communications against electromagnetic pulse, etc.).

In the light of these considerations the Committee came to no firm conclusions about the impact on society, but includes in the Supplement speculations on short, intermediate and long-term adaptations to the new, forbidding environment. One conclusion is that

23. The socioeconomic consequences of the various scenarios should be examined in much greater detail by a qualified group of social scientists."

Copies of the *Nuclear Winter Report* are available at a cost of \$15 from the Royal Society of Canada at 344 Wellington Street, Ottawa, Ontario, K1A 0N4.

Canadian Government Response

The following is the Government's response to the Royal Society of Canada report, as made by the Right Honourable Joe Clark, Secretary of State for External Affairs, in the House of Commons on June 27.

"The Royal Society's study focuses on the possibility of a nuclear winter and its consequences for Canada. The conclusions of the study are in basic agreement with the findings of other scientific organizations such as the Swedish Academy of Science and the US National Academy of Science. The principal conclusion is that a major drop in global temperature could follow a nuclear exchange. This phenomenon, popularly called nuclear winter, is the result of smoke and dust particles reducing the incoming energy from the sun.

The Royal Society puts forward many recommendations for further research to reduce the current scientific uncertainties surrounding the nuclear winter hypothesis. These uncertainties concern, for example, the amount of smoke that could be generated by burning cities and forests; how that smoke would be distributed in the atmosphere; the magnitude of the drop in surface temperatures; and most importantly, how these factors will affect agriculture, livestock and fish, other species and, of course, the survival of man.

There is general agreement within the Government that the nuclear winter hypothesis is scientifically credible even though the details regarding its magnitude and duration are subject to great uncertainties. Some of the scientific uncertainties may be reduced by continuing research within existing programmes.

The Government agrees with the Royal Society that any Canadian studies pertaining to nuclear winter should be fully coordinated with similar efforts in other countries. With this in mind, copies of the report will be forwarded to the United Nations in accordance with the resolution (39/148F) passed during the thirty-ninth session of the UN General Assembly. During the last session of the General Assembly, Canada stressed the importance for nations to carry out studies on the phenomenon and to report their findings to the United Nations as part of an international undertaking to reduce

the possibility of a nuclear war. The submission of the Royal Society's report to the United Nations will serve as a useful Canadian contribution to international recognition that in a nuclear war there would be no winners.

The Royal Society's study does support, however, the basic tenet of civil defence that there would be survivors. It is the humanitarian duty of government to have at least modest plans to increase the number of possible survivors. Current civil defence planning has concentrated on problems related to short-term survival. The nuclear winter hypothesis introduces new longer-term concerns and the Government accepts the Royal Society's recommendation that our post-nuclear attack preparedness, including the implications for agriculture, transportation, communication and general living conditions, should be re-examined.

Beyond its scientific nature, the Royal Society report also has national security implications. It is clear that a nuclear conflict would be catastrophic. This reinforces our basic conviction that any nuclear war must be prevented. Consequently, the Government continues to support NATO and its deterrence policy which has ensured our security for over 35 years. Our adversaries must appreciate that no nuclear war can be won in the traditional understanding of victory. The Royal Society report reinforces this basic conviction. It follows, therefore, that we must continue to do all that is within our power to deter the initiation of all war.

In this regard, Canada will maintain the high priority we have assigned to our participation in those multilateral arms control fora — Geneva, Stockholm, Vienna — in which we have a direct negotiating role. At the same time, we have welcomed the resumption of United States-USSR negotiations in Geneva and support the USA in its efforts to achieve a more stable strategic relationship at the lowest possible balanced level of nuclear forces.

Finally, the federal Government wishes to thank the Royal Society of Canada and its committee of experts for preparing this report. They have provided a unique and thought-provoking perspective concerning the possible implications for Canada of a nuclear war."