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Changing summer a nuclear

OWEN GREENE examines the nuclear winter predictions and looks at their implications for nuclear weapons policy and the peace movement.

SCIENTISTS are becoming more and more convinced that a nuclear war would probably lead to catastrophic changes in the world's climate.

For weeks and months large parts of the earth would be covered by a black cloud of smoke and dust. The cloud would block most of the sunlight and cause inland temperatures to drop, probably by enough to change summer into winter.

The smoke in the cloud would be generated by the vast fires in urban areas, forests and elsewhere, that would be ignited by the heat of the nuclear fireballs. The dust would be hurled high into the atmosphere by nuclear explosions on or near the ground.

In the weeks after a large-scale nuclear war, the cloud would spread from the regions near the targets to cover most of the northern hemisphere. Unexpectedly, it seems likely that as the sun heats the cloud, the normal global wind patterns would be disrupted, so that the smoke and dust would also be carried deep into the southern hemisphere.

Land temperatures during a nuclear winter would plummet by as much as 20-30 degrees centigrade on average.

Twilight

For weeks the sooty smoke would block the sunlight, making it like twilight or darker, even at noon. It would be heavily overcast for months. By absorbing sunlight high in the atmosphere, the cloud would rob the earth's surface of part of the sun's energy.

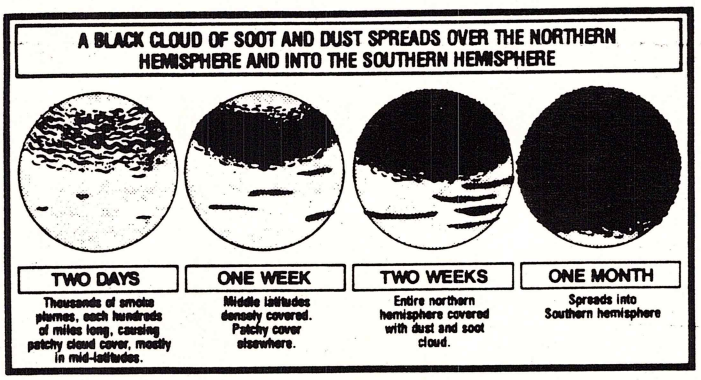
As a result land temperatures under the cloud are predicted to plummet, probably by as much as 20-30 degrees centigrade on average. It could take a year or more for the cloud to clear sufficiently for the average temperatures to return to normal.

In the darkness, plants could not photosynthesize all the energy they need to grow. They would become stunted or die. Many more plants would be injured or killed by the sudden cold.

Immense numbers of animals would perish from starvation and the freezing temperatures. When the effects of radiation, ultra-violet radiation, and the other horrors of the aftermath, are also taken into account, it is no surprise that biologists have estimated that a nuclear war could lead to the extinction of over half the species of life on this planet.

Even without climatic disruption, global nuclear war would be a catastrophe which could lead to the death of one or two billion people. However, nuclear winter threatens the existence of the rest of the world's population.

Therefore the new predictions must, surely, prompt everyone to re-examine present nuclear weapon policies. Certainly they raise further doubts about the effectiveness of civil defence against nuclear war.



Many people have resisted such a re-examination on the grounds that the predictions are only theoretical and may not turn out to be correct.

The calculations and assumptions behind the nuclear winter predictions have now been checked by many eminent scientists in the US, Europe, and the Soviet Union.

There is a growing scientific consensus that the basic conclusions are correct, although a great deal of research remains to be done. Nevertheless it is true that there is a chance that large-scale nuclear war would not lead to a climatic catastrophe.

This, however, is irrelevant. The only way we could ever be certain would be to wait until a nuclear war actually happens. Then it would be too late. In the real world, decisions must be made on the basis of imperfect knowledge.

If nuclear war occurs there is a good chance that human civilization and most species of life on earth would be destroyed. This means that the risks of nuclear deterrence can only be acceptable if there is no possibility of nuclear war ever happening.

This is patently not the case. Therefore the new findings enormously strengthen the arguments in favour of reducing the world's nuclear arsenal to, at least, below the level at which climatic catastrophe could be triggered.

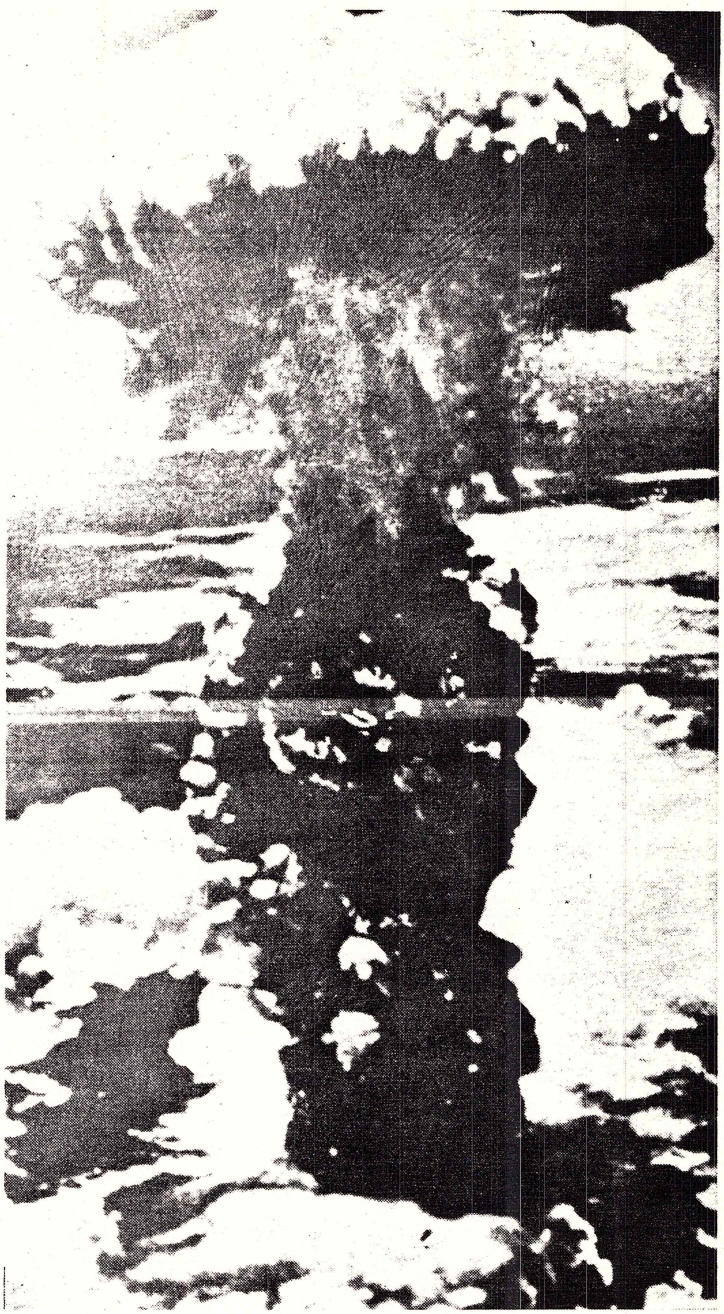
Computer calculations indicate that a nuclear winter can be expected if more than about 100 million tons of smoke is sent into the atmosphere within a few days. This corresponds to a nuclear war of some 1000-2000 megatons, assuming that about 20-30 per cent of the warheads detonate close to urban areas (which produce vast quantities of black smoke when they burn).

Present nuclear stockpiles are eight to fifteen times greater than this nuclear winter threshold. A smaller, sub-threshold, nuclear war might cause some climatic changes. The consequences of such changes would be serious but perhaps not catastrophic on a global scale.

Some people have breathed a small sigh of relief after the nuclear winter predictions. Surely, they say, leaders of nuclear weapons states will now choose to abandon nuclear war fighting strategies. Surely the dangers of a crisis provoking pre-emptive first strikes have receded and the nuclear arms race will be abandoned as futile! Unfortunately, these hopes have little foundation.

In the first place we have no reason to believe that nuclear weapons policies are so directly linked to rational argument. The arms race seems to be driven by

into winter



all sorts of political, institutional, ideological and economic processes.

These usually have a much greater influence over decision makers than long-term rationality. If it were otherwise we would not be in the desperate situation we are in today.

Secondly, the nuclear winter findings can easily be used to argue in favour of the further development of nuclear war-fighting strategies and destabilising technologies.

Military strategists may react to the new predictions by producing plans for small nuclear wars below the nuclear winter threshold. A nuclear war limited to the Middle East, the sea, or other regions, might be below this level.

All-out nuclear war in Europe alone would be well over the threshold, but a few hundred tactical weapons could be used in Central Europe without the likelihood of climatic catastrophe.

Most missile bases are far from urban areas. A strategic nuclear exchange between the US and the Soviet Union aimed only at these bases and a very few command centres and remote airfields might generate only sub-threshold amounts of smoke.

The nuclear winter predictions could, therefore, strengthen rather than undermine illusions about the desirability and feasability of limiting nuclear wars. They are illusions because, in practice, limited nuclear wars would very probably escalate to levels far above the nuclear winter threshold.

Warheads

The new predictions could be used to support the production of more accurate warheads such as those on the Pershing-2 missile. Such warheads have relatively low explosive powers and would ignite fires over smaller areas than would the older, larger, warheads. Some modern designs of warheads penetrate the earth before detonating, reducing the fire zone still further.

Another response to the nuclear winter predictions has been to use them in support of Reagan's strategic defence initiative, or "star wars" plan.

The argument says that ballistic missile defences on both sides would ensure that too few warheads would reach the ground in a nuclear war to trigger drastic climatic changes.

In fact this argument fails even if we neglect the fact that missile defences would not cover Europe. The simplest counter to missile defences is to deploy more warheads.

So if war occurs and, as seems likely, the missiles defences do not work well, the attacks would be even further over the threshold than they would be now.

Finally, the nuclear winter findings do not necessarily remove the incentives to launch a pre-emptive first strike in a crisis.

If war seemed to be inevitable, both sides would have to weigh the balance between two options: (a) Devastation plus nuclear winter if the other side strikes first; (b) Less devastation plus nuclear winter if we strike first. It may not be all that irrational to prefer option b) to option a).

Clearly the nuclear winter predictions will not automatically lead to the slowing down or abandonment of the nuclear arms race. However, if they are properly followed up, they present the peace movement with important opportunities.

The predictions make it vividly clear that nuclear war would be a global catastrophe. Non-aligned nations are now more likely to exert real pressures on the nuclear alliances to abandon their nuclear weapon programmes.

In the UK, the prospect of nuclear winter is already alerting many new groups of people to the present dangers. Cold and dark is so much more thinkable and frightening than unimaginable levels of radiation and blast.

If these groups of people become involved in the wider arguments for nuclear disarmament, then the new predictions may prove to play an extremely important role in our eventual success.

However, this success depends, as always, on the continuing commitment of those people who have already become a part of the peace movement.

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