

THE NUCLEAR WINTER.

Owen Greene looks at the scientists' startling new prediction about the effects of a nuclear war.

After a nuclear war the world's atmosphere and climate would probably change drastically. For months a black cloud of smoke and dust would cover the northern hemisphere, blocking the sunlight and causing the inland temperatures to drop by enough to turn summer into winter. This 'nuclear winter' is expected to follow even a 'limited' nuclear war.

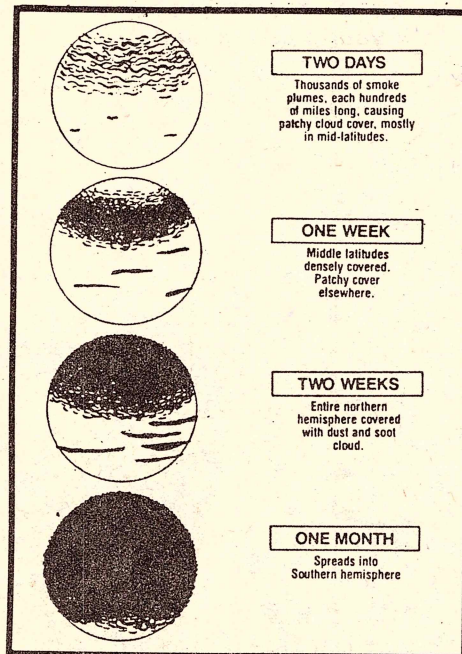
These predictions surprised everyone, not least the scientist who first made them last year. Since then they have been checked and refined by many eminent scientists, coming from the USA, Europe, USSR and elsewhere. Although there are still many uncertainties, most experts now believe that the nuclear winter theory is essentially correct.

The predicted climatic changes could be caused by a black cloud of hundreds of millions of sooty smoke and dust. The smoke would come from the vast fires that would be started by the heat from the nuclear fireballs, especially in urban areas, forests, grasslands, and oil and gas stores. The dust would come from the huge craters blasted out by nuclear explosions on or near the ground.

At first the cloud of smoke and dust would be patchy and mostly confined to the areas above Europe, the USA and the USSR, where most of the targets are. Within two or three weeks, the cloud would spread to cover most of the northern hemisphere. Surprisingly, as the sun heats the cloud up, wind patterns are expected to change so that the cloud is carried deep into the Southern hemisphere as well.

Nearly all the sunlight would be blocked by the cloud. For several weeks it would be like twilight or darker, even at noon. For months it would be heavily overcast. Robbed of the sun's energy, land temperatures would plummet by 20-30°C taking as long as a year to gradually recover. Plants would not get all the energy they need in order to grow from the reduced sunlight. They would begin to 'consume themselves', becoming stunted or dying. The sudden unexpected cold would kill or injure many more plants, particularly during spring or summer.

Animals, faced with a severe second winter, would die of starvation and cold in their millions. Even an average temperature drop of only 4°C over several weeks would be sufficient to



destroy most of the harvest.

The layer of ozone in the upper atmosphere which normally protects us from harmful ultraviolet radiation would have been disrupted by chemicals formed in, and carried high in to the air by, the nuclear fireballs. As the smoke and dust fall to the ground and the cloud gradually thinned out, more than double the normal of ultraviolet light would reach the ground, burning people, animals and plant leaves, and injuring eyes.

Biologists estimate that over half of the species of life on earth could become extinct. Only the hardiest and most adaptable species would survive.

In the years after the war most of the world's ecology would be dominated by pests and weeds.

All of these estimates apply to a 5000 Megaton (Mt) war involving about one third of the world's nuclear stockpiles. Calculations indicate that wars of 1000 Mt or less (that is less than half the probable scale of a nuclear war limited to Europe) could cause almost as serious effects, depending on the targets hit. Obviously, if more than half the world's nuclear arsenal were used, the consequences would be even more severe.

Of course, even without a nuclear winter, nuclear war would be a catastrophe. One or two billion people, up to half of the present population of the earth, could die. Nuclear winter threatens the survival of the rest.

The new predictions cast further doubt on the usefulness of civil defence measures and are, surely, a powerful argument for the urgency of nuclear disarmament. The world's nuclear weapons stockpile would have to be reduced to less than a tenth of its present levels to avoid the likelihood of nuclear winter if nuclear war occurred.

Unfortunately, it seems unlikely that the leaders of the nuclear weapons states will spontaneously change their policies in response to these new scientific findings. After all, the basis of nuclear deterrence is that the worst will never happen, and if it does, the consequences will just have to be faced, nuclear winter or no nuclear winter.

However, properly followed up, the nuclear winter predictions should improve the prospects of nuclear disarmament. They could alert more people to the risks of the present policies and the need for changes. The governments and the peoples of non-aligned countries can now see that a nuclear war would directly threaten their survival even if they escaped from the actual nuclear attacks unscathed. They might be moved to consistently and urgently demand nuclear disarmament. With this added support we are more likely to succeed in our efforts to remove the threat of nuclear catastrophe.

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