

Book review

Global Climatic Catastrophes by M.I. Budyko, G.S. Golitsyn and Y.A. Izrael. (Springer-Verlag, Berlin, 1988) ISBN 3-540-18647-6. 110pp, DM 38.

This slim volume of 85 pages of text and 22 figures by three distinguished Soviet atmospheric scientists provides a succinct summary of the potential for environmental disasters on a global scale induced by natural disruptions to the balance of the climate system and by the onset of a major nuclear conflict.

The book is an English translation from the original Russian text published in 1986. It is therefore a contemporary of several other texts dealing with the nuclear war/climate catastrophe connection. Its technical content lies between A.B. Pittock's* popular account of the nuclear winter debate and the detailed, 2-volume SCOPE-sponsored treatise†, Volume 1 of which was also co-authored by Pittock. Its style, however, is more dispassionate than Pittock's popular approach and does not extend the discussion much towards the socio-ethical aspects of the nuclear war debate which tend to dominate the later chapters of *Beyond Darkness*.

The book has only two chapters. The first, comprising about one-third of the text, analyses naturally induced climatic catastrophes which have (or may have) occurred in the past. These catastrophes have two principal origins: volcanic activity and impact by extra-terrestrial bodies. The authors provide highly plausible evidence and arguments which tie mass extinctions of animal species (e.g. the dinosaurs) to periods of extended, intense volcanic activity and to large single, or smaller multiple, meteoric impacts. The purpose of this chapter, in essence, is to set the scene for the second chapter on the possible climatic effects of a nuclear conflict. The fundamental thesis is that cataclysmic detonations, conflagrations, eruptions or meteoric impacts, which inject vast quantities of matter into the upper atmosphere,

have the potential to cause climatic changes of sufficient magnitude and extent to disrupt the world's environments, its ecosystems and ultimately the socio-economic fabric of civilization. Such disruptions in the context of a nuclear conflict have been frequently dubbed the 'nuclear winter'.

This two-fold approach results in a somewhat unbalanced whole, in that evidence for the natural catastrophes must inevitably be indirect and inferential which leads to a relatively straightforward narrative style. In contrast, the section on nuclear-based catastrophes becomes much more analytical in a mathematical and empirical sense. A casual reader, coping quite well with the arguments for climatic induced mass extinctions in the phenerozoic, might find the going harder in those later sections dealing with the optical characteristics of sooty agglomerates, or how one arrives empirically at a mathematical expression for the upper boundary of a thermally driven smoke plume following a nuclear explosion. Notwithstanding this duality, the persistent casual reader and the reader more knowledgeable in the ways of the atmosphere will appreciate the insights to the climatic aerosol catastrophe issue which this book provides.

Like many translations, the book does suffer from an unevenness in expression and prose style. Chapter 1, dealing with the natural catastrophes, is quite idiosyncratic in its idiom in several parts. For example, 'forward scattering of radiation' becomes '... the scattering function is strongly stretched out in the direction of the falling ray'. Other statements such as 'The sum of the indicated increase and the greatest decrease in temperature during the Würm glaciation is equal to 15-20°C.' are at best confusing, while in a few instances the sense is simply misleading, e.g. 'Since the particles of the indicated sizes affect the long-wave radiation less than the short-wave, the radiation balance of the Earth decreases'. Proof-reading by a native English speaker would have eliminated these peculiarities. These problems, however, are mostly confined to the first chapter, suggesting greater fluency in English by those responsible for Chapter 2.

Despite the problems stemming from translation, the text is for the most part unambiguous with only a few minor typographical errors. The diagrams and figures are clear although many are sourced from other publications; the significance of some suffer in the transition from their original explanatory text.

**Beyond Darkness (Nuclear winter in Australia and New Zealand)*, A.B. Pittock, 1987, published by Sun Books, Melbourne. (Reviewed in *Aust. Met. Mag.*, 35, 87.)

†*Environmental Consequences of Nuclear War: Vol.I. Physical and Atmospheric Effects; Vol.II. Ecological and Agricultural Effects*, SCOPE 28, John Wiley and Sons, Chichester. (Reviewed in *Aust. Met. Mag.*, 34, 129-31.)

There are 156 references and around one-third are cited from an original Russian text, presumably not available in English. The presentation of this material reflects the strong interest shown by Soviet meteorological science in the possible consequences of a nuclear conflict that at least matches that shown by their colleagues in the west. However, in these days of glasnost on the one hand and greenhouse on the other, one can only wonder at how quickly an issue can become

passé. The all-consuming problem now of the possible consequences of global warming brought on by the increase of anthropogenic radiatively active gases rates little more than a passing reference in this text.

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