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EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phone: 202-387-7171. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. See also page xv, *Science*, 25 September 1970. ADVERTISING CORRESPONDENCE: Room 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.

Will the World Come to a Horrible End?

Doomsday predictions have been popular since biblical times, but the sources of doom are changing. Famine, war, and pestilence have always been the old-time favorites—so much so that people have almost learned to live with them. The possibility of destruction of life on Earth by the impact of a large asteroid, or by the radiation effects of a close-by supernova or a solar superflare, has not evoked much public concern—which is perhaps surprising because the probability of such natural catastrophe, though small, is finite.

Instead, the current fashion seems to be to predict ecological disasters. For a while there was great concern that we would run out of oxygen because of the burning of fossil fuels. This particular concern was laid to rest recently and conclusively (1). Another concern for global oxygen came from the possible effect of DDT on marine phytoplankton (2). This particular problem was first raised by L. V. Berkner and L. C. Marshall, but is judged to be a problem no more (3). After many years of speculation and discussion, the effects of fossil-fuel burning on climate seem to be reasonably clear. While there has been an actual increase in the CO₂ content, the "greenhouse effect" of climate warming has been small, and even negative, because of the overwhelming effects of atmospheric dust which tends to cool the atmosphere (4). Even the long-range effects of CO₂ are likely to be reduced, partly because of the buffering action of the ocean, partly because of the increased photosynthetic absorption and storage by forests, while a limit to CO₂ production is also set by the prospective exhaustion of fossil fuels (5).

New technologies do not always produce major clear-cut global effects. For example, operation of a fleet of SST's might decrease stratospheric temperature somewhat because of the emission of water vapor; on the other hand, it might also increase stratospheric temperature because of the production of particles (6). But there is no evidence for sea-level changes or for adverse effects on life due to increased ultraviolet transmission.

Does this mean that we can now forget about ecological disasters? On the contrary; it is absolutely necessary to investigate each and every one of the side effects of our modern technology to its final conclusion and examine their possible influence on the global climate and on the ocean. There is probably nothing more important to man's future on this planet than an understanding of the long-range effects of his activities. The history of Earth gives abundant evidence of cataclysmic happenings. The stability of climate, for example, is not known, nor is it known how close we are to the limit where another ice age could be triggered. The possibility that we might inadvertently set off an irreversible reaction must constantly be kept in mind.

At the same time, we should be careful not to cry "wolf" needlessly or too often. The public and the media give special weight to statements from anyone who is a scientist, provided they make news. Scientific credibility can easily be lost by exaggerated claims and extravagant statements. We need to provide a voice of reason, not just of alarm. As scientists, we have the responsibility to speak up, but we also must know when to stop talking.—S. FRED SINGER, *Chairman, Committee on Environmental Quality, American Geophysical Union, Washington, D.C.*

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