Unorthodox epidemiology

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Diseases from Space. By Fred Hoyle and Chandra Wickramasinghe. Pp.196. (Dent: London, 1979.) £6.95.

THIS is an unusual book. It is well produced and easy to read, being written in a narrative and popular style; but its six chapters and three appendices are apparently intended to be a serious presentation of a theory put forward by the authors. The subject matter ranges widely. They start with cosmology and their interest in the organic molecules to be found in interstellar space. They suggest that life may have evolved in cometary bodies composed of organic chemicals, which would have had an inner zone protected from radiation and warmed to about 10°C by internal chemical reactions. In this "pool", primitive life-forms like bacteria and viruses evolved and then, when the comet passed near the Earth, were shed into space as micrometeorites, protected from ultraviolet radiation by a coating and sufficiently small not to be overheated on entering the Earth's atmosphere. They then sank towards the Earth, were carried on down to its surface by storms, and thus initiated biological life in the primeval Earth. They further assert that the process continues and that clouds of viruses, particularly those of influenza and the common cold, rain down upon the Earth and cause epidemics of these diseases; and that epidemics of smallpox, and of bacterial diseases like cholera and plague, may occur in the same way.

The authors have obviously read widely and thought deeply, and I am unable to express a useful opinion on their theory of the origin of life. However, as they extend the theory to explain epidemics, this can be examined in relation to present knowledge of infectious diseases. For instance, they argue that influenza viruses descend from space and are breathed in by birds, animals and man, and that the transmission from person to person or animal to animal is unimportant. They do not explain how an organism which must have produced untold billions of particles in a cometary puddle in space (and which they suggest may have arrived on Earth inside a bacterium) was also exquisitely adapted to replicate in avian and mammalian cells. The influenza virus has specific functioning elements by which it penetrates membranes, involves the cell nucleus, is replicated in ribosomes and forms new particles by inserting viral protein into the cell membrane which then bulges out and envelopes the virus nucleic acid and other peptides lying in the cytoplasm beneath. In Earth laboratories many common cold

viruses, rhinoviruses and coronaviruses multiply only in human cells, and only some such cells — in what sort of cells do they replicate in space? The influenza viruses found around 1930 have almost exactly the same internal peptides as those that circulate now — does all influenza come from one cloud of meteorites?

A key fact of their argument is that they have looked at published literature, investigated outbreaks of influenza in schools and found no evidence that influenza spreads from person to person. They state that if influenza did spread in this way it would be distributed in the children in a school by a random process. They show that it is not random — at Eton some houses were heavily affected and others virtually free, as judged by clinical diagnosis — so they prefer the earlier theory that influenza is due to a "miasma". It is stimulating to have current thinking challenged in this way, but I doubt if their theory provides a better model to explain known facts than do our present concepts. There is evidence that different

individuals shed varying amounts of virus, so in small groups they would be expected to infect at different rates — and I think the spread of the recent H1N1 virus from China across the USSR, and to Hong Kong and across the world, is better explained by spread from person to person than by viruses descending from space first in one area and then in the next. I would expect an influenza virus coming from space to appear over a very wide area if it really has to sediment slowly and negotiate the jet streams as the authors describe, even if it does survive desiccation and ultraviolet radiation.

I cannot agree with the theme of the book, which smacks more of science fiction than of science, but I think it is good that it has appeared. I would hate to think that unorthodox views could be suppressed, or that authors could never be published if editors or reviewers did not like their work. □

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US politics and the test ban

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Blowing on the Wind: The Nuclear Test Ban Debate, 1954-60. By Robert A. Devine. (Clarendon/Oxford University Press: New York and Oxford, 1978.) £7.95.

THIS book is a detailed account of the reactions of US politicians, scientists and the public to the attempts to stop tests of nuclear weapons. It is confined almost entirely to the time when Eisenhower was President (1952-60) and is a political and sociological study rather than a technical discussion. Technical questions are mostly dismissed with the statement that some scientists said one thing and others said the opposite.

To have the events, and the views of the people concerned, set out in chronological order is useful. There are some well-documented judgements that run counter to widely held beliefs; for example John Foster Dulles appears as a strong and consistent supporter of a test-ban.

Useful as it may be, the book makes dull reading. This is, in part, due to the almost exclusive concentration on US views; negotiations require at least two parties and the interest lies largely in the contrast of aims and methods of the two sides. The

extent to which this book ignores all non-US participation is lamentable. The only references in the bibliography to publications by non-American authors are to Khrushchev's memoirs (transcribed and edited in the US), *Sakharov Speaks* (also a US publication) and Harold Macmillan's memoirs. The last of these is the only item in the bibliography that is not published in the US. It is, of course, difficult to understand the motivations and internal struggles of a closed society, such as the USSR; it is, however, important to make the effort. The first route to understanding is the study of official pronouncements and propaganda. If propaganda loses touch with the real world and with real intentions, it loses plausibility and becomes unconvincing to those it is intended to influence or deceive. For example, it was possible to follow the German retreat across Russia in 1944 by noting the westward progression of the locations of alleged German victories. For the Russian views on the test ban there is much more evidence than propaganda.

The 1958 'expert' discussions hold a special place as the first discussions with the Russians in which there was any real meeting of minds. Stalin had been dead for 5 years and Khrushchev had consolidated his power. There was a new situation in which Russian good faith and intentions had to be assessed anew. These matters are inadequately dealt with by the author who seems to have read only the final agreed report and not the transcripts of the day by day discussions, which are much more instructive.

The 1958 meetings were also of interest from another point of view. The American delegation consisted of a mixture of Hawks