

astronomers has not been as scrupulous — indeed some stone alignments given astronomical interpretations may be no more than the foundation stones of turf field-walls where the ephemeral materials have weathered away. The lack of scientific knowledge for which field archaeologists are so often criticized has led to a disregard for those skills of observation and site interpretation that are their own stock in trade. A reassessment of the archaeological content of Thom's work — for in the final analysis it is on the stones themselves that the hypotheses rest — would have been a valuable adjunct to Heggie's re-examination of the data.

It is important to stress that this discussion is concerned geographically with north-west Europe and chronologically with the period between about 4000 BC and 1000 BC. Considerable momentum for the study of ancient astronomy in other parts of the world has resulted from Thom's work, though not directly stemming from it, and the levels of observational astronomy practised in other societies will clearly have a bearing on what we expect

from our present vision of prehistoric Britain. Nor will all scholars view the evidence in the same way — there is no simple "standard archaeological model", no "orthodox archaeological picture" to compare with a map of the stars; most models change with new discoveries and new approaches, either imperceptibly or radically.

Few debates can have been as measured and carefully presented. Professor Thom and his son Dr A.S. Thom have outlined in clear steps and precise documentation the basis of their findings on megalithic measurements, shape, astronomy and calendrical matters. Dr Heggie has used this material and considered it in mathematical, astronomical and statistical ways, and has presented his own findings with caution and fairness. His ability to disagree without minimizing the work of others is perhaps his greatest personal contribution. □

J.N. Graham Ritchie is an Archaeological Investigator with the Royal Commission on the Ancient and Historical Monuments of Scotland.

Virus variety for plant pathologists

Milton Zaitlin

Handbook of Plant Virus Infections: Comparative Diagnosis. Edited by Edouard Kurstak. Pp.943. ISBN 0-444-80309-2. (Elsevier/North-Holland Biomedical: 1981.) Dfl.395, \$192.75.

A GIVEN virus often causes disease in several different plant species. Thus although well over a thousand plant virus-induced diseases are known, they are caused by only several hundred viruses (350 are considered in this handbook). This situation is further clouded by the assignment of unique names to identical diseases discovered independently.

A good conceptual framework for virus classification is therefore essential. Fortunately, ten years ago a rational approach to the problem was put forward by a small group of plant virologists in which viruses were collated into 16 "affinity" groups based on their morphology, particle composition, mode of transmission and so on. Quasi-official sanction has been given to this movement by the International Committee on the Taxonomy of Viruses, which has undertaken responsibility for the classification of viruses in general. The classification is periodically reviewed, modified and extended, and every three years, after the meeting of the ICTV, the revised classification is published as a small volume.

Edouard Kurstak's handbook follows the ICTV classification scheme, providing detailed individual chapters on virus groups, each prepared by a specialist. It is an extremely useful reference work. In

addition, there is a perceptive chapter by R.I.B. Francki dealing with plant virus taxonomy in which he outlines the basis for the classification scheme.

A true "handbook" should provide as much data as possible if it is to serve as a good reference work. Unfortunately this book suffers to some degree from unevenness in the depth of information covered for the different virus groups. As might be expected, many of the specialists have tended to emphasize their immediate interests within their assigned group, and they cover the available information beyond their specialities with differing emphasis. As one extreme example, six pages of text are devoted to a detailed listing of the hosts of the hordeiviruses, whereas little information is given for some other groups with extensive host ranges (such as the potyviruses) where such information is available. The editor is not himself a plant virologist and it is understandable that he would have to rely heavily on the judgements of the individual authors as to which topics should be emphasized.

All in all, the book is excellent and would be a welcome addition to the bookshelves of agriculturists, and to plant pathologists in particular. It is especially well-produced on quality paper and contains a great deal of tabulated information and many good photographs. Certainly, I will treasure my complimentary copy. □

Milton Zaitlin is a Professor of Plant Pathology at Cornell University.

Something in the air

J.E. Lovelock

Atmospheric Sulfur Deposition: Environmental Impact and Health Effects. Edited by David S. Shriner, Chester R. Richmond and Steve E. Lindberg. Pp.568. ISBN 0-250-40380-3. (Ann Arbor Science Publishers/Butterworth: 1981.) \$29.50, £17.

AS IN the workings of a Greek tragedy, there is nothing now to indicate the discomforts that lie ahead as heedlessly we burn fossil fuel and CO₂ grows ever more abundant in the air. But this is not so for the small percentage of sulphur in these fuels; of all consequences of mankind's industrial activity on the planetary environment, none are more obvious than those caused by the emission of sulphur compounds to the atmosphere. Their presence is objectionable on scales running from the stench of reduced sulphur compounds locally released, to the planetary-scale effects on climate of the Junge stratospheric sulphate aerosol. In between these lie other consequences, such as the breath-taking lethal smogs which once beset London and the translucent sulphate aerosol which obstructs the summer sunshine over whole regions. Worst perhaps is the destruction wrought by acid deposition which diminishes life in the forests, lakes and rivers of much of the Northern Hemisphere.

Atmospheric Sulfur Deposition is an unusually tight and well-edited collection of papers from a symposium held at the Oak Ridge National Laboratory in Tennessee. It moves from the consideration of the costs and benefits of controls and their legislative implementation to the little that is known about natural sources of sulphur gases in North America, and then to the emissions from the technosphere. The atmospheric chemistry, the transfer across the interfaces with the land, and ocean, the effects good and bad on man-made and natural ecosystems, all are taken into account.

It is a book for those sizeable ranks of professionals concerned with national and regional air pollution problems. These include scientists and administrators in government and industrial service, and also legislators and regulators. For this group it will provide a very credible addition to their working knowledge of the sulphur pollution problem. The book is not primarily intended for those scientists curious about the great natural cycles of the elements and who might wish to know more about the part played by sulphur. Even so, this group also might well benefit

Missing from the review of recent textbooks of invertebrate zoology (*Nature* 295, 482; 1982) was mention of Peter Calow's *Invertebrate Biology: A Functional Approach*. Published by Croom Helm, the book costs £11.95 (hbk), £5.95 (pbk).