generation from fossil fuels, coal and oil. The main environmental problem is to reduce the effects of sulphur dioxide, either by dispersion using tall stacks, or by limiting the emission by removing the sulphur from the flue gases at the power station, or from the fuel oil at the refinery. The climatic consequences of the accumulation of carbon dioxide in the atmosphere are discussed, and there are some interesting contributions in the new field of atmospheric chemistry—the study of "photochemical smog", and the life cycles of sulphur dioxide and nitrogen oxides on a continental or a global scale.

The final section on "waste" heat is disappointing. There is far too much repetition; the same basic information is presented many times with variations which must confuse the non-specialist reader. For example, "nuclear plants require 40 per cent more cooling water than fossil-fuel plants" (p. 345); "nuclear plants waste 60 per cent more energy than fossil-fueled plants" (p. 353); and "fossil-fuel plants discharge approximately one-third less waste heat to the cooling water than do nuclear plants" (p. 369). In only one instance is it pointed out that future designs of nuclear plants will not require more cooling water than fossil-fuel plants. Two of the authors use the term "thermal pollution" for warm water discharges and emphasize the possible deleterious effects and the need for the control of temperature rises to a few degrees (F). The other contributors to this section take a more constructive approach and point out that the problem can be solved by the proper siting of power stations and the design of cooling systems, and that beneficial uses of "thermally enriched" water can be developed.

Summing up, the book is rather a mixed bag, but the patient reader can assess the various contributions for himself and obtain an overall picture of the American environmental scene—which, of course, is not necessarily relevant in Britain. J. S. FORREST

Invertebrate Fossils

Atlas de Paléontologie des Invertèbres. By René Verniory. Pp. 217+89 plates. (George Librairie: Genève; Masson et Cie: Paris, 1970.) 190 francs.

THIS volume has been published after the author's death. The wholly laudable desire to ensure that the dead man's work has not been in vain cannot gloss over the real difficulties involved. Most of the deficiencies of the book can be ascribed to this.

The plan of the book is one which I have met before in works published in Switzerland. It consists largely of a systematic summary of the salient facts about the palaeontology of the invertebrate phyla, these being illustrated by sketch diagrams on fold-out sheets. These fold-out illustrations make up about half the thickness of the volume.

The criticisms of the book—understandable under the circumstances of publication—are: failure to cover some invertebrate groups at all; a sometimes obsolete classification—it has been known since the work of Kozlowski in 1938 that the graptolites are not coelenterates—and an utterly inadequate bibliography. For these reasons the work cannot be considered as a standard work of reference and its price would, I think, effectively prevent its sale in England for any other reason. It is clear why the book is so expensive—the cost of the many fold-out pages must be high. This does not alter the hard fact that only an indispensable reference work—the *Traité de Paléontologie* itself is an example—can hope to have a sale when its price is more than £20. K. A. KERMACK

Cancer of the Lung

Morphology of Experimental Respiratory Carcinogenesis. Edited by P. Nettesheim, M. G. Hanna, jun., and J. W. Deatherage, jun. (Proceedings of a Biology Division, Oak Ridge National Laboratory, Conference held in Gatlinburg, Tennessee, May 13–16, 1970.) Pp. xiv+483. (National Technical Information Service, US Department of Commerce: Springfield, Virginia, 1970.) $6.

THIS book covers the proceedings of a conference which was a logical sequel to one held in 1969 and reported in the *AEC Symposium Series* No. 18. The earlier meeting concentrated on methodology whereas the papers given at the 1970 symposium, although they still include a considerable amount of experimental detail, lay the main emphasis on the resultant lung changes as seen by light and electron microscopy. This has been supplemented in some cases by histochemical studies.

The experimental species used by different authors vary from the usual laboratory rodents to the white Pekin duck, thus there must be considerable variation of normal lung structural detail. Nevertheless a useful if fairly generalized synopsis of the main cell types found in respiratory tissue is given with some histochemistry. The study of cell kinetics is limited to rats and mice.

Although the bulk of the material concerns experimental oncogenesis, there are also papers on human occupational hazards which may lead to cancer of the respiratory tract. Particular reference is made to the uranium mining and asbestos industries and the influence cigarette smoking may have on individuals exposed to these hazards. Much evidence supports the idea that the induction of respiratory cancer can be multifactorial and such a possibility has not escaped the notice of the scientists, a number of whose experiments are designed to examine this facet of the problem.

Many of the investigations are to establish biological models for the future evaluation of changing (and it is hoped, improved) environments either natural or industrial; others are attempts to elucidate the mechanisms by which a particular carcinogen acts. It is important therefore that there should be uniformity of nomenclatures and a description of the WHO classifications of human lung tumours is given. In the later "Panel Discussions" some tentative ideas are put forward for similar but less detailed classifications of natural and experimental animal tumours. It is certain that the majority of experimentalists will welcome this move and the project is being continued by the International Agency for Cancer Research at Lyon.

This is a book essentially for those actively involved with the problem of experimental respiratory carcinogenesis to whom it is well recommended. Some of the work reported is not entirely new but many of the papers are by recognized world authorities in this field of research. These proceedings therefore make interesting and informative reading as well as being a useful source of reference material in this still rather disputatious area. BRIAN R. DAVIS

Hydrogen Bonding

Hydrogen Bonding. By Serge N. Vinogradov and Robert H. Linnell. Pp. xi+319. (Van Nostrand Reinhold: New York and London, July 1971.) £4.75.

THE aim of this book is to review hydrogen bonding and the many and important applications of this phenomenon. The book is stated to be written particularly for undergraduates and postgraduate students and research workers in the life sciences. Because of the breadth of topics and wide range of experimental techniques that are used in studying hydrogen bonding, this is not an easy task to undertake.

In my opinion, the concept of the book is admirable and timely. In addition, with a few exceptions, the balance of topics chosen for the different chapters is also very good. However, the book falls down very seriously in execution and contains an unusually large number of errors. For example, the very first figure, Fig. 1-1, is wrong, Fig. 1-4 is poorly and inaccurately drawn, and Fig. 2-1 is also wrong. Such rather obvious mistakes which occur at the beginning of the book are also to be found not infrequently in later chapters. Another example is given by the first