Cases of pollution through time

Peter D. Moore

Historical Monitoring. MARC Report No. 31. Monitoring and Assessment Research Centre, The Octagon Building, 459A Fulham Road, London SW10 0QX, UK: 1985. Pp.323. Pbk £20, \$30.

SINCE the development of the concept of Uniformitarianism in the eighteenth century it has been the common practice of stratigraphic geologists and palaeontologists to use the present as a key to the past. Only in relatively recent times has it been recognized that many modern environmental problems can better be understood if their historical perspective is adequately appreciated. So it is that the techniques of biology, physics and chemistry are now being applied extensively to the study of the temporal development of many of our current ecological crises, from heavy metal pollution to acid rain and the greenhouse effect.

This report from the Monitoring and Assessment Research Centre of Chelsea College, London, is a review of the many areas in which such studies have been made and an assessment of the relative values of the various approaches. It is not a practical manual with detailed recipes of methods, but it provides a thorough bibliography through which the full information on such methods can easily be located.

The introduction of a time dimension into pollution studies demands that materials are available for analysis which have developed or accumulated in chronological sequence. Five main forms of evidence are described here — marine and lake sediments, ice masses, peats, tree rings, and animal and plant remains — mainly as found in museums, but also including archaeological remains, particularly human tissues. Each is discussed and case studies are described to illustrate their respective potential as sources of historical information.

The text is assembled in an orderly, yet lively and critical manner so that the reader is constantly reminded of the complications inherent in the interpretation of data from any of these materials. Does the concentration of a particular pollutant, for example, reflect the ambient level at the time of its formation? Can one separate the natural background noise of an element from long-term trends produced by human influence on global cycles? Often the answer is negative. Take sulphur in the Antarctic ice cores: here there is a considerable input from marine sulphur sources, such as vents, and high variability is also introduced by terrestrial volcanic eruption. In combination, these problems make it impossible to detect long-term

trends in anthropogenic atmospheric sulphur in ice cores.

The use of peat cores for documenting fallout of heavy metals, such as lead, has been dogged by problems of metal movement within the profile. Living plants may transport the element down through their roots, and so upset its stratification, or the metal may be washed through loosely compacted surface layers and then accumulate at the water table. Nevertheless, lead profiles in peats do seem to correlate well with the evidence from historical records.

The bones of our ancestors may also indicate former pollution levels, but are some elements preferentially absorbed from or lost to the soil after burial? Could

the fact that Peruvian bones of 1300 AD have only one-tenth of the lead levels of modern human bones be due to such post-interment processes? Because most other metal contents have remained the same, this seems unlikely.

This report is a concentrated collation of material which both conveys the results of current research and provides the reader with sufficiently critical opinions for the appraisal of its reliability. It is an ideal source to which the advanced undergraduate and postgraduate student can refer as well as the research worker. □

Peter D. Moore is Reader in the Department of Biology, King's College London (KQC), 68 Holford Lane, London SE24 9JF, UK.

Modified responses

Ruth Arnon

Immune Modulation Agents and Their Mechanisms. Edited by Richard L. Fenichel and Michael A. Chirigos. Dekker:1985. Pp.678. \$99.50 (North America), \$119.25, SwFr.275 (elsewhere).

IMMUNOMODULATION is a relatively new term which is used to describe two different phenomena — the potentiation and the suppression of the immune response. The past decade has witnessed the discovery of an ever-increasing number of natural and synthetic compounds which have interesting immunostimulant properties, while, at the same time, progress in basic cellular immunology is revealing numerous and diverse regulatory materials produced by the immune system itself. None of these latter products are antigen-specific, but they do have the advantage of acting physiologically and are usually of relatively low toxicity. Several immunomodulation agents, such as prostaglandin, cyclosporin A and thymic factors, have already found clinical application, but we still have only a limited understanding of their mode of action.

Immune Modulation Agents and Their Mechanisms, a recent addition to Dekker's *Immunology* series, attempts to fill in the gap in the literature on this important group of products. The book contains an impressive list of biological response modifiers, description of their properties, a review of the relevant literature and a summary of the clinical trials performed with them. Its advantage, mainly for clinicians and immunopharmacologists, is the gathering of all this information under one roof, thus supplying the reader with an overview of the various immunomodulators and a basis for comparison between them. On the other hand, the parts dealing with mechanisms of action are somewhat scanty. True, this may be the only mechanistic evidence that is available, but the title of the book promises more than is delivered.

Several of the contributions are excellent — Mathé's account of immunomodulating agents is concise but informative; the two chapters on thymosin and that on cyclosporin A are comprehensive, and try to explain mode of action as well as to supply the reader with all the available information; and the chapters on autoimmune diseases and on tumour and metastatic diseases are also very good. Regrettably, however, this high level is not uniformly maintained throughout the book.

A few other shortcomings are also evident. Each chapter deals separately with a different agent, hence there is a degree of repetition of general material. Many of the agents are discussed in two separate contributions in Parts I and II of the book; this division is not clear cut and the result is considerable redundancy in some pairs of chapters such as 1 and 29, 3 and 23, 4 and 19, 5 and 22, 8 and 26, and 10 and 23. Also, the introduction to the book as a whole and those to its two constituent parts are too short and not very useful. A single, all-embracing summary of the field would have been preferable.

On the whole, however, this is a helpful book which provides a thorough survey of the literature in this burgeoning area of research. Clinicians, pharmacologists and immunologists will benefit greatly from reading it. □

Ruth Arnon is a Professor in the Department of Chemical Immunology, Weizmann Institute of Science, Rehovot 76100, Israel.

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