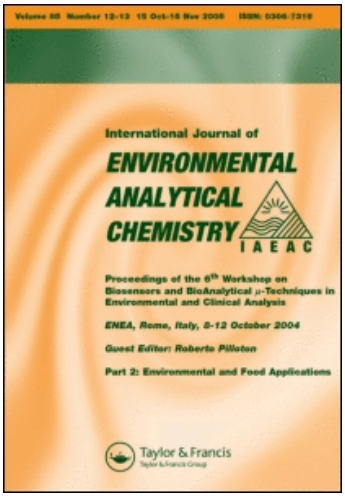

International Journal of Environmental Analytical Chemistry
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713640455

Book Reviews

To cite this Article (1986) 'Book Reviews', International Journal of Environmental Analytical Chemistry, 27: 4, 325 — 345
To link to this Article: DOI: 10.1080/03067318608079825
URL: http://dx.doi.org/10.1080/03067318608079825

Intern. J. Environ. Anal. Chem., 1986, Vol. 27, pp. 325–345
0306-7319/86/2704-0325 $18.50/0

Printed in Great Britain

Book Reviews

TRACE ELEMENT CONTAMINATION OF THE ENVIRONMENT (Revised 2nd Edition, Fundamental Aspects of Pollution Control and Environmental Science Series Nr. 7), by David Purves, Trace Elements Department, Edinburgh School of Agriculture, Edinburgh, Scotland, 243 pages (including 6 figures, 50 tables, 38 pages 721 references, an author index of 10 pages (which refers to the used references), and a subject index of 9 pages), hard cover, format 232 × 157 mm, ISBN 0–444–42503–9, Elsevier Science Publishers, Amsterdam (1985), US$55.50, hfl. 150.00.

Although there has been an explosion of interest in the field since the first edition (1977) the content of the volume is somewhat more concentrated (with a few less pages, but with about 300 more references), which is not a disadvantage for the handy book. The structure into eight chapters has not been changed:

—Trace-Element Contaminants
—Factors Affecting the Trace-Element Composition of Soils
—Trace-Element Contamination of Soils
—Trace-Element Contamination of the Atmosphere
—Sources of Trace-Element Contamination of Soils
—Availability of Trace-Elements in the Soil
—Consequences of Trace-Element Contamination in Soils
—Trace-Element Contamination of the Hydrosphere
—Prevention of Dispersion of Metals in the Environment.

It is said that the aim of the new edition remains to evaluate the global biological consequences of dispersal of trace elements, originally mined from localized limited deposits, in the environment. The author thus considers metal contamination, exhaustion of finite

reserves of ores, dispersal of trace elements, and biological consequences. A good idea was to include the last chapter, because this information is normally not included in similar monographies. The book is useful as a reference source for a wide range of people, which must use however the information in a critical way. Not all chapters are up-dated to the same levels, and while the chapters on soil and agriculture—where the author is an expert—are well written, the chapters on atmosphere and waters are still somewhat imperfect. Contamination of the atmosphere is perhaps the most critical area of environmental pollution, but it is treated in one of the shortest chapters, and one misses adequate information on distribution of elements between monomolecular dispersion and within atmospheric particulates (speciation, which is responsible for bioavailability), and on long distance transport and deposition. Also in the rather short chapter on contamination of the hydrosphere speciation is not adequately discussed, and many concentration values for seawater presented are for instance by orders of magnitudes wrong, because old measurements were reproduced from authors who at the time were not aware of the problems involved in sampling and analysing. For instance the concentration values for cobalt, copper, lead, manganese, nickel, silver, tin and zinc are 10 to 1000 fold too high in the table on page 154. It seems that also the literature is used somewhat arbitrarily, and some first class experts in the area of environmental chemistry and of biochemistry of metal compounds are not even mentioned in the references list, although their publications would help to bring the information at various places in the book up to date. We miss for instance relevant references of Bianchi, Diplock, Fishbein, St. George, Mart, Newland, Nürnberg, Savory, Schlipköter, Schrauzer, Skilleter, Steinnes (a reference by Hanssen does not include most relvant results), Stoeppler, Sunda, Sunderman and Wedepohl (the only reference relates to a publication of 1961!), to name just a few first-class authors in the field.

ERNEST MERIAN

TOXIC SUSCEPTABILITY (MALE/FEMALE DIFFERENCES), Environmental Science and Technology Interscience Series, by Edward J. Calabrese, University of Massachusetts, Amherst, U.S.A.,

336 pages (including 13 figures, 19 tables, a summary of 14 pages, literature references added to each sub-chapter, and a good index of 10 pages), linen, format 240 × 168 mm, ISBN 0–471–80903–9, John Wiley and Sons Limited, Chichester, West Sussex PO19 1UD, England (1985), £61.35

The author demonstrates that sex-related differences to toxic agents in rats and other mammals are not rare occurrences, and that it is thus reasonable to ask whether one sex is at a greater risk for developing an environmentally induced disease. After the introduction and before the summary nine chapters consider

—details of sex differences in biochemical and physiological processes that are likely to affect susceptability to toxic agents (for instance differences in plasma protein binding, in biliary excretion, in enzyme activities (aryl, hydrocarbon hydroxylase, epoxide hydroxylase glucuronidation!)
—extent to which the pregnant state may alter susceptibility (e.g. beryllium may be a factor affecting the course of pregnancy, exposition to ethylintrosourea, and vagina)
—sex differences to liver toxins
—sex differences to renal toxins (e.g. cadmium, carbon tetrachloride)
—occurrences of inorganic contaminants (e.g. observations with cadmium, selenium, and ozone are discussed in detail)
—occurrences of organic contaminants (e.g. pesticides, TCDD, benzene (role of body fat, and of quicker metabolism by liver microsomal enzymes in males), polycylic aromatic hydrocarbons (including comparisons of mutagenic responses) nitrosamines)
—drugs (lithium and ethyl alchol are considered in this chapter)
—oral contraceptives
—endogenous and related substances (such as Vitamin C).

In a table in the summary 15 examples of sex-related differences in human responses are discussed, for instance induced by aflatoxin, benzene, dimethylbenzanthracene, lead, cigarette smoke, and trichloroethylene (besides drugs and hormones). The book is a very rich collection of observations—interesting for all scientists dealing with xenobiotics—although many observations must be reproduced again, and then possible artefacts must be considered. The author also regrets that in most cases only studies in one species are known

(and that also great strain specificities must be considered further in future).

ERNEST MERIAN

OCCUPATIONAL AND INDUSTRIAL HYGIENE: CONCEPTS AND METHODS (Advances in Modern Environmental Toxicology, Volume VIII), edited by Nurtan A. Esam and Myron A. Mehlmann, 240 pages (including 76 figures, 15 tables, references added to each chapter, an appendix of four papers (1965–1974) by Theodore F. Hatch, and a subject index of 10 pages), cloth, format 236 × 159 mm, ISBN 0–911131–09–4, Princeton Scientific Publishers Inc., 301 North Harrison Street, Princeton, New Jersey 08540, U.S.A. (1984), £68.00.

The volume contains the proceedings of a symposium held in honour of Theodore F. Hatch, who directed his work to some basic problems in the physiology of the respiratory tract. An introduction on the emergence and evolution of industrial hygiene was presented by Dr. Anna M. Baetjer from the Johns Hopkins University, Baltimore (who also passed away in early 1984). The book contains 10 important lectures written by experts from universities and industry in the eastern United States. Together they give an excellent basis for understanding occupational hygiene, stressing also reactions requiring more research. This background is of course also relevant in environmental research. The ten chapters deal with

—Engineering Control of Occupational Health Hazards
—Industry-Wide Occupational Health Studies
—On Estimation of Occupational Health Risks
—Recent Advances in Respiratory Tract Particle Deposition
—Estimation of Heat Stress Studies
—Aerosol Measurement
—Establishing Threshold Limit Values for Airborne Sensory Irritants from an Animal Model and the Mechanisms of Action of Sensory Irritants
—The Present State of Occupational Medicine
—Reacting to Cancer Clusters in the Workplace
—Pulmonary Clearance.

The book is mainly related to transport mechanisms and retention,

and to physiological responses, which are explained. One does however not find too much information on analytical chemistry (the critical chapter on aerosol measurement discusses only the important parameters related to particle size) and on specific risks with relevant chemicals. In the subject index one finds quite a few references related to benzene, cigarette smoking, formaldehyde, and silicosis, but less to critical inorganic pollutants, such as arsenic, beryllium, cadmium, chromium and nickel compounds.

ERNEST MERIAN

POLLUTION CONTROL AND CONSERVATION, edited by Dr. Margit Kovacs (Agricultural Univeristy, Gödöllö, Hungary), 398 pages (incl. 30 tables, 73 figures, references (mostly Hungarian and not very new) after the chapters, a valuable glossary (of about 600 terms used in environmental control) of 34 pages, and a subject index (of 4 pages), linen format 256 × 156 mm, ISBN 0–85312–213–X, Ellis Horwood Limited Publisher, Chichester, U.K. (1985), £59.50.

The book—written by 13 Hungarian scientists and translated by T. Waldmeyer, London, U.K.—is structured into twelve chapters:

—The Present State and Importance of Environmental Control
—The Biosphere, Landscape and Natural Resources
—The Role and Importance of Ecosystems in the Biosphere
—Genetic Principles of Environmental Control and Population Biology
—Air Pollution
—Water Pollution
—Soil Destruction and Soil Pollution
—Environmental Control and Plant Protection
—The Effects of Urbanization on Landscape Elements and Woodland Cover
—The Role of Forests in Environmental Protection
—Nature Conservation
—The (Hungarian) Legal Basis of Environmental Protection.

It can be recommended to study the volume—also as a model for similar problems in other countries—and a greater part can also give

a good background information for education, especially since many figures speak for themselves. It is a detailed account of the components, functions, stability and load capacity of the natural and semi-natural ecosystems vital to the life on this planet, as they affect the injurious effects of human interference on the nutrient cycle. There is a prognosis on the effects of planned waterways, power stations and dams upon water quality; and discussion on the impact of urban development, the role of forests in environmental control, and the interconnection between environmental control and law. The authors distinguish between damages which can be restored with some financial sacrifice, and irreversible processes going on. Besides informing on Hungarian measures taken to protect natural and artificial environments and discussing ways to change the social consciousness, for instance atmospheric and aquatic transports of pollutants (cycles), indicators, mutations, and control techniques are also handled.

E. MERIAN

THE BIOSPHERE: PROBLEMS AND SOLUTIONS: Studies in Environmental Science 25, edited by T. Nejat Veziroglu (Clean Energy Research Institute, Univeristy of Miami, Coal Gables, Florida, U.S.A.), 712 pages (incl. 117 figures, 104 tables, references added to the contributions, an author index of 2 pages, no subject index), hard cover, format 247 × 173 mm, ISBN 0–444–42424–5, Elsevier Science Publishers, Amsterdam and New York (1984), US$139.00, hfl. 375.00.

These are the Proceedings of the Miami International Symposium on the Biosphere, April 1984. The well presented book is structured after an introduction into 16 sections:

—Global View
—Biosphere Reserve
—Environmental Aspects of Hydrocarbon Fuels
—Radioactivity and Nuclear Waste
—Land Management
—Acid Rains
—Water Quality
—Water Resources

—Coastal Resources Management
—Pollution of Rivers
—Industrial Waste
—Economic Development and the Environment
—Health Hazards and Solutions
—Endangered Species
—Environmentally Compatible Systems
—Space Pollution
(it is however surprising that Soil and Impacts on it are missing).

The 55 contributions are written by authors from the U.S.A., from India, from Canada, and from five other countries. Many philosophical, semi-scientific and scientific papers consider what is happening (environmental effects of human activities in industrial and in developing countries and in the space, also by energy production and consumption) and what could be done (alternatives) to improve the environment and quality of life for all the inhabitants, for plants (which may also be able to restore lands), and for endangered animals (including the giant panda, herons and aquatic organisms) of our fragile planet. The reader thus finds broad information (with specific background on somewhat arbitrary selected subjects) and ideas on monitoring, modelling, conservation and research gaps, and gets a better multidisciplinary understanding on energetic cycles and ecosystems.

E. MERIAN

CHEMICAL PROCESSES IN LAKES: Volume in Environmental Science and Technology, edited by Prof. Dr. Werner Stumm (Swiss Federal Institute of Technology, and Swiss Institute for Water Resources and Water Pollution Control EAWAG, CH-8600 Dübendorf), 435 pages (including 167 figures, 61 tables, references added to each chapter, and an index of 9 pages), cloth, format 240 × 169 mm, ISBN 0–471–88261–5, John Wiley and Sons Inc., New York, Chichester, Brisbane, Toronto and Singapore (1985), £69.35.

This important volume provides an excellent multi-disciplinary study of the dynamics and mechanisms of aquatic systems. Emphasizing physical, chemical, and biological processes such as transportation/distribution of chemicals, surface chemistry, and geobiological cycles

of trace elements. Each lake is viewed as a microcosm. In adopting this perspective, it determines not only how the chemical environment interacts with organisms and aquatic ecosystems, but how these systems relate to one another. Eighteen Swiss, American, Canadian, British, French, German and Yugoslavian senior authors and 13 Swiss and American junior authors have structured the book into 17 chapters:

—Spatial and Temporal Distribution of Chemical Substances in Lakes: Modeling Concepts
—Conceptual Models for Transport at a Redox Boundary
—Aqueous Surface Chemistry: Assessment of Adsorption Characteristics of Organic Solutes by Electrochemical Methods
—Strategies Isotopes and Productivity in the Lacustrine and Marine Environment
—Redox-Related Geochemistry in Lakes; Alkali Metals, Alkaline-Earth Elements, and ^{137}Caesium
—Mechanisms Controlling the Sedimentation Sequence of Various Elements in Prealpine Lakes
—The Pavin Crater Lake
—Phosphate Interactions at the Sediment–Water Interface
—The Influence of Coagulation and Sedimentation on the Fate of Particles, Associated Pollutants, and Nutrients in Lakes
—The Coupling of Element Cycles by Organisms: Evidence from Whole-Lake Chemical Perturbations
—The Geobiological Cycle of Trace Elements in Aquatic Systems: Redfield Revisited
—Metal Transfer Mechanisms in Lakes; The Role of Settling Particles
—Acidification of Aquatic and Terrestrial Systems
—The Chemistry of Bog Waters
—Lake Restoration
—Kinetics of Chemical Processes of Importance in Lacustrine Environments.

Thus throughout the book
—the solid–solution interface
—the sediment–water interface (regulation of heavy metal concentrations)
—the response of the lacustrine ecosystems to human impact, and
—measures for restoring eutrophied lakes

are covered in-depth. Manganese species are for instance treated in relation to transport at redox boundaries, to redox chemistry, to sedimentation rate, to variation in pore water, to biological oxidation, to geobiological cycles in the ocean, and to metal transfer mechanisms in lakes (including oxidation catalysis by "manganese bacteria" and use of manganese oxides as scavengers of other metals).

This recommended book is thus designed to guide research in chemical limnology, making excellent use of the experimental flexibility of lakes. It contributes a greater understanding of how geochemical cycles in aquatic systems are coupled by organisms and altered by civilization, which in turn may inspire better understanding of our global ecosystem. It provides also important background information on speciation, isotopes, kinetics and nutrients.

E. MERIAN

AIR POLLUTION AND PLANTS, edited by Clément Troyanowsky, Ecole supérieure de physique et chimie industrielles, F-75005 Paris, 298 pages (including 120 figures, 32 tables, references added to the contributions, and an index of 4 pages), linen, format 244 × 176 mm, ISBN 3–527–26310–1, VCH-Verlagsgesellschaft mbH, D-6940 Weinheim (1985), US$52.50, DM 120.00.

These proceedings of the 2nd European Conference on Chemistry and the Environment, May 1984, D-8990 Lindau (see also Report Chemosphere 14, No. 2, N1–12, February 1985) includes 41 presented papers of German, British, French, Norwegian, Finnish, Austrian, Spanish, Swedish, Polish, Yugoslavian, Czechoslovakian, and Bulgarian scientists. After an introduction the well presented volume is structured into five parts:

—Atmospheric Chemistry as a Source of Aggressive Compounds
—Direct Effects of Air Pollutants in the Atmosphere and on Plants
—The Mechanisms of Damage to Forests: Tentative Interpretations
—Indirect Effects of Air Pollutants: Measurements and Models
—Special Topics (incl. Effects on Materials and Buildings).

The contributions presented are descriptions of facts and reports about research work aimed at elucidating underlying causes and mechanisms as well as consequences. Main topics are the transport

of air pollutants. atmospheric chemistry as a source of aggressive compounds, and direct and indirect effects of air pollutants on plants. It is established that damage to plants can continue to increase even though pollution decreases. Thus long-term and accumulation effects have to be considered as well as a synergy between pollutants and other harmful agents, each of which would not be detrimental by itself. The book provides a cross-sectional view of efforts by European researchers to understand and evaluate the multitude of factors that affect health of plants and trees.

Detection, distribution and charaterization of atmospheric pollutants are thus carefully discussed, as well as deposition and element-distribution in plants and their organs. As an addition the book (which can be recommended to those interested in environmental chemistry, monitoring, and biological interactions) contains two important contributions on effects of atmospheric components on iron sheets, architecture and monuments.

E. MERIAN

RECEPTOR MODELING IN ENVIRONMENTAL CHEMISTRY (Volume 76 in the Series "Chemical Analysis"), by Prof. Philip K. Hopke, University of Illinois, Urbana-Champaign, U.S.A., 319 pages (including 66 figures, 47 tables, many equations, 29 pages of references (up to 1983), an appendix on selected source profiles of 48 pages (which contains however not very new, verified data), and an index of 5 pages), linen, format 236 × 162 mm, ISBN 0-471-89106-1, John Wiley and Sons, New York, Chichester, Brisbane, Toronto, Singapore (1985), £86.75.

Receptor modelling within the air pollution research has become the way of referring to the class of methods where the properties of the sample are used to infer the origins of its components. The illustrated models are thus used to quantitatively apportion aerosol mass to particle sources, but also more generally to solving of problems, where the measured property can be considered to be a linear sum of independently contributing components. The necessary analytical and mathematical methods have been carefully developed and described (including the applications of automated laboratory computers which made statistical methods accessible and more

reliable). The valuable book—after a preface and an introduction—is structured into eight chapters:

—Sampling and Analytical Methodologies (e.g. XRF, PIXIE, ICP-ES made progress of sample analysis possible)
—Optical Microscopy
—Scanning Electron Microscopy
—Introduction to Mathematical Receptor Models
—Chemical Mass Balance
—Factor Analysis
—Other Mathematical Models
—Applying Receptor Models to Environmental Problems.

Since development of strategies to manage the quality of environmental systems needs better understanding the flow of materials through the system, the sources and sinks, transformations, and transport pathways of the species of interest (including short-term source impacts and identification of nonducted sources) the author puts emphasis on the characterization of differentiated airborne particles (using also conservation of mass and mass balance analysis). He compared also measurement, dispersion model data, and receptor model data with reality. He thus outlined the analytical methods so that their capabilities and limitations for receptor modeling purposes are presented. TSP standards, libraries of source composition profiles, and network programmes are also considered.

E. MERIAN

POLLUTANTS AND THEIR ECOTOXICOLOGICAL SIGNIFICANCE, edited by Prof. Dr. Hans Wolfgang Nürnberg, Nuclear Research Center KFA, D-5170 Jülich, 515 pages (including 165 figures, 124 tables, references added to the chapters, and an index of 5 pages), hard cover, format 236 × 159 mm, ISBN 0–471–90509–7, John Wiley and Sons, Chichester, New York, Brisbane, Toronto, Singapore (1985).

This book considers the major organic and inorganic chemical pollutants which have ecotoxicological significance. It is based on presentations at the Eurpoean Environmental Summerschool in June

1979 at the Nuclear Research Center D-5170 Jülich, but updated. Each topic includes a discussion of the methodology used in approaching problems, supported by reference to case studies or findings. Major ecochemical aspects of the pollutants are covered with respect to their fate, behavior, transfer and pathways as functions of the important general and specific parameters of the various types of ecosystems. Significant analytical aspects are also discussed with a view to guiding the reader in obtaining relevant and reliable data, and information on ecotoxicology, ecogenetics, regulatory topics and on industry and the environment challenge is included.

The well presented book, in which leading experts in the field presented in an excellent multidisciplinary way a complex scientific field, is structured into four sections:

—I. Atmosphere (with 11 chapters)
—II. Aquatic Environment (with 8 chapters)
—III. Terrestrial Environment and Man (with 8 chapters)
—IV. Regulatory and General Aspects (with 3 chapters).

The authors dealt especially with those introduced chemicals not occurring naturally in the environment and with the enhancement of levels of naturally existing organic and inorganic substances, constituting pollution of the affected ecosystems. Many hazardous substances exist in the ecosystems at trace levels as a consequence of their distribution after emission, ecochemistry is thus demanding applied trace chemistry. Accurate and reliable data are a mandatory prerequisite for relevant judgement and conclusions on the ecotoxicology of the studied pollutant under the given ecological condition. Ecotoxic significance may be very specific: some pollutants under the given circumstances will be more toxic for plants or microorganisms, others will have impacts on higher animals and/or man, causing not only toxic effects but also induced genetic damage.

The book is thus of wide interest to chemists needing more information on the fate of their products, to biologists looking for more information on exposure and biovailability, and for students, for government agencies and international agencies. It could however not be completely avoided that the chapters have been presented in a somewhat arbitrary and individual way. This has led to a few gaps which can be filled in a second edition. For instance one does not

find adequate information on nitropolycyclic aromatics and on polycyclic heteroaromatics (which may have crucial effects), and on soil chemistry and ecotoxicology (e.g. microorganisms, bacteria and earthworms are not listed in the index).

E. MERIAN

CHEMICAL WASTE (HANDLING AND TREATMENT), edited by Dr. Karl Robert Müller, BASF, D–6700 Ludwigshafen and nine American, British, French and German co-editors, 360 pages (including 64 figures, 56 tables, references added to most of the chapters, and a subject index of 8 pages), hard cover, format 248 × 171 mm, ISBN 3–540–13246–5, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo (1986), DM. 198.00.

12 German (also from the Democratic Republic), French, English, Danish and American contributors have intended to give a survey of currently important aspects of (industrial) chemical wastes and their handling (including control of storage and transport). New insights should help to overcome still existing communication problems between the scientific community and public. The well presented book is structured into four parts (with subchapters). After an introduction on legislation one finds information on

—The Nature of Chemical Wastes
—Handling and Treatment
—Hazards

Preference is given to presenting either the application of old problems (some of the methods are absolutely new and not mentioned before, e.g. fast onfield analysis for the evaluation of old landfill-sites, computer application to waste management problems, and composting for industrial wastes). This contribution is intended to stimulate further work in the area and provide scientifically accurate and environmentally sound approaches to the subject of waste handling and treatment.

Unfortunately the information has been collected somewhat arbitrarily. One misses critical comparisons between incineration and disposal, and the crucial problems with sewage sludge are not discussed (in the index under the term "sludge" there is also a

reference to page 336, which is blank). It would certainly have been interesting to analyse the great experience in handling PCDD containing wastes, but under the term "TCDD" one finds just a highly theoretical reference to destroy the compound with cetylpyridinium chloroiodide. Azo compounds are said to be very toxic and explosive (which is certainly in such a general statement not true), and again a fancy detoxifying method is described (nothing is said about reduction and other (bio)degradation possibilities, and the risk of getting more ecotoxic intermediates). Probably the reader would be more interested to get information how to really and practically detoxify critical wastes. Wood preservation is mentioned in an EPAlist of hazardous wastes without mentioning what to do with it. Practically no information is given for instance for cadmium containing wastes (except an indication that they may arise from collections of cadmium nickel batteries (what are the problems if they are not collected?)). The reader thus finds useful basis information for further investigations, provided he is critical. Unfortunately however not all chapters are presented in a qualitatively comparable way.

E. MERIAN

PROGRESS IN CLINICAL BIOCHEMISTRY AND MEDICINE, VOLUME 1, Editorial Board: Prof.. E. Baulieu (F-94270 Bicêtre), Prof. D. T. Forman (Chapel Hill, NC 27514, U.S.A.), Prof. L. Jaenicke (D-5000 Cologne), Prof. J. A. Kellen (Toronto, Canada M4N 3M5), Prof. Y. Nagai (Tokyo, Japan), Prof. G. F. Springer (Evanston, IL 60201, U.S.A.), Prof. L. Traeger (D-6000 Frankfurt a.M. 70), and Prof. J. L. Wittliff (Louisville, KY 40292, U.S.A.) with four contributions on essential and non-essential metals, metabolites with antibiotic activity, pharmocology of benzodiazepines, and interferon gamme research, 203 pages (including 12 tables, 42 figures, references added to the four chapters, no index), cloth, format 249 × 170, ISBN 3-540-13605-3, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo (1984), DM. 98.00.

The environmental and toxicological chemist is especially interested in the first contribution "Toxicity and Carcinogenicity of Essential and Non-essential Metals" (45 pages, 9 tables, 2 figures) by M. Costa, A. J. Kraker and St. R. Patierno, University of Texas,

Houston, TX 77025, U.S.A. After an introduction of 9 lines only, the chapter is structured into 9 subchapters (aluminium, arsenic, beryllium, cadmium, chromium, lead, mercury, nickel, other metals). The references are also structured accordingly into 9 paragraphs, but are on the average rather old. One misses for instance the names (and newer literature) of A. Léonard and J. Savory (for arsenic and aluminium), D. N. Skilleter and Th. Stiefel (for beryllium), G. Kazantzis, C. G. Elinder, M. Stoeppler, H. Oldiges and S. Takenaka (for cadmium), A. G. Levis, V. Bianchi, D. Beyersmann, L. S. Levy and G. Bronzetti (for chromium), and H. W. Schlipköter and his collaborators (for lead). Other metals includes cobalt, copper, manganese, silver and vanadium, but for instance zinc and selenium are missing. The author certainly did his best to present 13 metals on a limited number of pages given to him, but this space is just too small to really inform in a balanced way, and in some cases illustrating facts are thus selected arbitrarily (omiting some relevant information). In the case of arsenic (3 pages only) one misses for instance indications on sources (some drinking waters, combustion, pesticides, etc.) and on relevant transformations (also into organic compounds) in the environment, in fish (eventually getting into the food chain), and in mammals. In the case of beryllium (2 pages only) nothing is said about critical cell biochemistry and immunologic reactions. Regarding cadmium (3 pages only) the most relevant inhalation studies are not discussed. In the case of chromium the differentiation between inorganic Cr(III), Cr(III) complexes, and Cr(VI) chromates and oxides is not adequately described as far as cell membrane transfers and redox reactions. It must therefore rather be recommended to rely on a somewhat more expensive—and thus more complete—handbook, than to try to get understanding from such a short review, which can only refer to some arbitrarily selected literature for further information.

The second contribution by R. G. Werner, Dr. Karl Thomae GmbH, D-7950 Biberach an der Riss on "Secondary Metabolites with Antibiotic Activity from the Primary Metabolism of Aromatic Amino Acids" may also be of some potential interest to ecotoxicologists and environmental chemists, since such transformations may also take place in the environment. The author has put together relevant information on 69 pages (including carefully selected literature for further studies).

E. MERIAN

ECOTOXICOLOGY (The Study of Pollutants in Ecosystems), by F. Moriarty, Cambridge CB3 7HD, U.K. (Member of the IUCN Commission on Ecology, CH-1196 Gland), 233 pages (including 74 figures, 30 tables, 23 pages of references (mostly from the 1970's), and an index of 9 pages), cloth, format 235 × 168 mm, ISBN 0-12-506760-7, Academic Press Inc. Publishers, Orlando (Florida) and London (1983), US$36.00, £22.00.

After a good introduction considering definitions (a science concerned with effects on ecosystems; scientists involved in any subject should be able to recognize distortion when they meet it), not anticipated pathways (cycles), persistence, interactions and biological significance (thus discussing the nature of pollutants and of ecosystems), the book is structured into six chapters:

—Population Dynamics
—Communities
—Genetics of Populations
—Effects on Individual Organisms
—Prediction of Ecological Effects
—Monitoring

The author has written a useful introduction for scientists, non-scientists, teachers and students (blending ecology and toxicology) by discussing a series of closely linked essays, in which he selected examples from the literature to illustrate ideas of general relevance. One must congratulate the author for his selection of relevant figures which explain scientifically correctly complex correlations, normally not well understood by non-biologists. Some oversimplifications had however to be made, for instance in the chapter "Prediction of Ecological Effects", which is based mainly on experiences with some traditional pesticides only. The chapter "Monitoring" is structured into the subchapters "Amounts of Pollutants in Organisms", "Effects of Pollutants on Organisms" and "Monitoring of Named Species". The author clearly shows that research into the control of pollutants is supported, but that some of the problems are of wider concern than those of just one pollutant or industry.

E. MERIAN

GUIDELINES FOR THE STUDY OF GENETIC EFFECTS IN HUMAN POPULATIONS (WHO Environmental Health Criteria No. 46), by a group of experts under the chairmanship of Dr. J. R. Miller, Takeda Chemical Industries Ltd., Osaka, Japan, 126 pages

(including 3 figures, 7 tables, 26 pages of references, no index), paper board cover, format 210 × 140 mm, ISBN 92-4-150186-5, World Health Organization, Geneva (1985), SFr. 12.00.

After a preface and an introduction the important critical publication is structured into three chapters:

—Methodological and Epidemiological Issues
—Mutations in Somatic Cells
—Germinal Mutations

The guidelines principally encompass the design of methods that are considered practicable at present. They are intended as a source of information on the design and conduct of genetic studies on human populations exposed—or suspected to be exposed—to mutagenic agents. The monograph is based on the results of consultations held in Ann Arbor, Michigan in July 1981, and of two meetings in Ottawa, Canada in October 1980 and in September 1984. An increase in the frequency of somatic mutations (genetic or chromosomal) can be established in cells from relatively few individuals, in the frequency of mutations in germ cells large study populations must be examined. It is especially emphasized what information should be recorded. Within the chapter "Germinal Mutations" the authors differentiate between germinal chromosome abnormalities, biochemical approaches to detect gene mutations in human populations, sentinel phenotypes, and fethal death. Sensitivity of techniques is discussed, but the examples of studies included in the guidelines do not include indications for causes (for instance specific mutagens) of the observations. Apart from some discussions of one-dimensional and two-dimensional electrophoresis and of enzyme activity studies the term "analysis" rather refers to statistical methods for the analysis of data. One finds little information on chemical induction of aberrations and mutations.

E. MERIAN

AIR, COMPOSITION AND CHEMISTRY (Cambridge Environmental Chemistry Series), by Dr. Peter Brimblecombe, Norwich, U.K., 224 pages (including 78 figures, 36 tables, many equations, valuable literature references for further reading (up to 1985) added to each chapter, 3 pages of further references

(unfortunately no references are given in the text to support information and statements), and an index of 5 pages), paperback or hard cover, format 247 × 173 mm, ISBN 0-521-27523-7, Cambridge University Press, Cambridge CB2 2RU, U.K. (1985), £8.95, US$14.95 (paperback); £25.00, US$39.50 (hard cover).

The excellently presented (and especially the clear figures) on knowledge about the atmosphere and man's influence on it provides especially students of chemistry, environmental science, ecology, geography and public health—but also other interested persons—a thorough understanding of air chemistry. In 9 chapters:

—The Atmosphere
—The Natural Components of the Air
—Gas Phase Chemistry in the Atmosphere
—Aerosols
—The Composition and Chemistry of Cloud Droplets, Rainfall and Air-Sea Exchange
—Sources of Pollution (including Combustion, Photochemistry, Meteorology)
—Effects of Air Pollution (Urban Air/Effects on Health/Effects on Plants and Animals/Effects on Building Materials etc./Indoor Pollution/The Museum and Library Environment/Acid Rain and Acid Deposition/Global Pollution)
—The Upper Atmosphere (including Ozone, and the chemistry of the stratosphere)
—The Atmosphere of the Planets and their Evolution.

The reader thus finds concentrated information on a modern (about 30 years old) science. Especially well presented is knowledge on cycles and on chemical, physical and biological transformation, although some crucial newer information on NO_x and HNO_3 (including secondary effects, such as nitration and oxidation of PAH's) could be added in a 2nd edition. Perhaps one should also discuss in a certain way possibilities and limitations of analytical chemistry (especially looking at aerosols) to give a better feeling about accuracy of presented data. It would also help the reader if some further terms (such as sulphuric acid, nitric acid, benzene, toluene, surface activity, etc.) would be included in the index, because the relevant information is included in the book. But otherwise the

overview is indeed very complete, and a useful, understandable summary.

E. MERIAN

THE HANDBOOK OF ENVIRONMENTAL CHEMISTRY, VOLUME 3 PART D and VOLUME 4 PART A, by Prof. Dr. Otto Hutzinger, Chair of Ecological Chemistry and Geochemistry, D-8580 Bayreuth, linen, format 248 × 170 mm, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo (1986).

We have already earlier informed about excellent handbooks in this series (Parts A (published 1980), Parts B (published 1982), Parts C (published 1984) of Volumes 1, 2 and 3). The following additions are now really welcome:

Volume 3, Part D "Anthropogenic Compounds" contains 248 pages (including 96 tables, 32 figures, references added to each chapter, and a good subject index of 8 pages), ISBN 3-540-15555-4, DM 188.00.

Volume 4, Part A "Air Pollution" contains 222 pages (including 22 tables, 71 figures, references added to each chapter, and a short subject index of 4 pages), ISBN 3-540-15041-2, DM 168.00.

As in the earlier volumes various aspects of the chemistry of the environment and of chemical reactions occurring in the environment are presented. The new series on "air pollution" allows further the dynamic integrated treatment of complex processes taking place in the air (discussing several sources, transports, transformations and deposition mechanisms), which could not be fitted easily into the three categories of Volumes 1, 2 and 3. Again important and relevant information on reactions, pathways, thermodynamics and kinetics are discussed in the two new columes, to aid understanding of basic distribution occurring in the environment. In fact environmental exposure concentrations—and thus effects and risk assessment—depend on the fate of chemical compounds. Besides described laboratory test methods, mathematical correlations and models help predicting fates of natural and anthropogenic (added to natural backgrounds) chemical compounds and their decomposition products.

Volume 3, Part D is divided into 6 chapters:

—Cellulose Production Processes (and especially the effluent characteristics and treatments, including problems with chlorinated derivatives).

—Asbestos (and its physical (crystallography!) and chemical properties): Production, utilization and fate of the important asbestos fibres—under public dispute—are discussed in detail, as well as their identification and their impact on human health. 934 literature references are listed!

—Carbon Black: colloid carbon of high purity is compared with soots regarding PNA and PAH impurities. The influence of exposure to carbonaceous dusts as far as acute toxicity, inhalation toxicity and genetic toxicity is then discussed.

—Creosote is a complex chemical mixture used as wood preservative, which contains a number of highly biologically active organic components. Many polycyclic aromatic and heteroaromatic compounds and their chromatographic, their physical (octanol/water partition) properties, and their activities (e.g. daphnia and fish toxicity) are listed, warning also because of persistence.

—Elemental Phosphorus (may get into environment during manufacture and use).

—Molybdenum: occurrence, production, uses, chemistry, analytical chemistry, environmental transport, enzymes, biological effects and toxicity.

Volume 4, Part A is divided into 5 chapters:

—Air Pollution in Perspective: air pollution problems (especially by SO_2, NO_2, CO, O_3 and some hydrocarbons), e.g. effects on health, and economics (in U.K.).

—Halogenated Hydrocarbons in the Atmosphere (Methyl Chloride and Bromide, Freons).

—Formation, Transport, and Control of Photochemical Smog (Mechanisms and Modelling, Radicals, Products of Photochemical Smog, such as Ozone and Aldehydes).

—Atmospheric Distribution of Pollutants and Modelling of Air Pollution (Mathematical Approaches to understand Causes for the Dispersion of Pollution).

—The Mathematical Characterization of Precipitation Scavenging and Precipitation Chemistry (Physical Basis, Formulation of Scavenging Models (Microprocess Descriptions), and Spatial and Temporal Variability).

E. MERIAN

EARTH SURFACE SYSTEMS (Springer Series in Physical Environment), by Dr. Richard J. Hugget, Macclesfield, University of Manchester M13 9PL, England, 270 pages (including 162 figures, 15 tables, 20 pages of references, and a subject index of 8 pages), hard cover, format 249 × 172 mm, ISBN 3-540-15421-3, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo (1985), DM 148.00.

The book provides a broad perspective on the methods and philosophy of modelling earth surface systems. It explores in fact a variety of models to explain and predict the patterns and processes observed at the surface of the earth. The assumptions and principles for each main class of model are described concisely, and examples are drawn from both classical studies and the up-to 1984 findings. After an Introduction on systems and models:

Part II "Conceptual Methods" is structured into the two Chapters "Simple and Complex Systems" and "Form and Process Systems"

Part III "Mathematical Models" is structured into the 7 Chapters "Deductive Stochastic Models", "Inductive Stochastic Models", "Statistic Models", "Deterministic Models of Water and Solutes", "Deterministic Models of Slopes and Sediments", "Dynamic Systems Models", and "Conclusion and Prospect".

One gets thus the theoretical background to understand and quantify erosional processes and fluxes (e.g. in rivers, in drainage systems, ground water movement, uptake from soils by roots, sediment deposition, cascades, glaciers, and volcanoes). Biogeochemical cycles are also discussed, for instance for phosphorus, carbon dioxide, and oxygen, as well as strontium and manganes in a tropical rain forest (pp. 214–215), nutrients in Lake Erie and dissipative structures. In the index one finds besides physical and mathematical/statistical terms also studied cases, such as Aswan Dam (Egypt), Caydale moorland catchment (U.K.), river channels in New Zealand, and the Grand Canyon (Arizona).

E. MERIAN