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Book review

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BOOK REVIEWS

ENVIRONMENTAL MANAGEMENT, (3 volumes) editors B. Nath, L. Hens and D. Devuyt (Brussels, VUBPRESS: 1993. Approx. 890 pp. Paperback) (£25 per volume) ISBN 90 5487 035 4–6

These volumes present a comprehensive overview of environmental management. The work developed from the European Master's Degree Course in Environmental Science and Engineering; a project supported by the TEMPUS Programme of the Commission of the European Communities. The publication is by UNESCO's International Technological University in collaboration with the institutions who delivered this programme. The aim is to present an overview of interdisciplinary tools and methods now available for environmental management. The underlying theme is the encouragement of sustainable development.

The work brings together information on environmental management from institutions and in disciplines traditionally isolated from each other. It provides theoretical background information, discussing and analyzing recent developments with examples and case studies. Each volume has a sub-theme. Volume 1, 'The Compartmental Approach', covers environmental conflict management; water resources; soil; air pollution; noise; waste; energy resources and natural hazards. Volume 2, 'The Ecosystems Approach', considers coastal, river and inland water, upland and mountain, urban, rural and desert environments. Special attention is given to tourism, parklands, and reserves. Volume 3, 'Instruments for Implementation', considers sustainable development. It covers establishment of health and environmental standards; risk analysis; disaster management; environment reporting; impact assessment; life cycle analysis; auditing; economic factors; legislation. Each chapter starts with academic objectives and ends with self-assessment questions.

There are nearly 40 named contributors, mainly academics, but including practitioners and researchers, from institutions throughout Europe. No one reviewer can make an informed comment over such a range of disciplines! This review will focus on Environmental Legislation (Volume 3, Chapter 10 pp. 261–295).

Chapter 10 is presented in two parts: 10.1 'History and General Principles of Environmental Legislation' and 10.2 'EC Legislation'. Neither chapter is concerned with the detail of the domestic laws of particular states.

The first chapter describes features in the development of environmental law; introducing concepts in the historical context in which they emerged. It provides an overview of the establishment of environmental regulations in European countries indicating the general principles underlying contemporary environmental legislation. The account notes that the Romans had laws for the protection of water, but until the middle of the twentieth century there was no attempt to protect the environment for its own sake. The reasons why this concern for the environment occurred, and the ways in which legislatures responded, is discussed in a single page. Less than three pages are devoted to setting out relevant

European legislation: no mention is made here of UK legislation though in a subsequent section the now outdated 'United Kingdom (Pollution Control Act) of July 31, 1974' is listed. The chapter concludes with a page on 'general principles': but 'general purposes' would perhaps describe more accurately its content: the themes are prevention of pollution; protection; balanced development; renovation; preservation and maintenance of the environment. The very general level at which the chapter addresses its ambitious aims is matched by multiple choice self-assessment questions which confirm that the reader is expected to have achieved only an appreciation of the subject.

The second chapter introduces EC environmental legislation explaining the competence and processes of the Community, the scope of EC environmental legislation, and, broadly, the relationship with legislation of the Member States. The Directives concerned with water, air, noise, chemicals, nature conservation and other relevant general measures are listed, with their full titles and references, but there is little about their content. The chapter concludes with the system for ensuring that Member States implement EC legislation. The reader might be somewhat taxed to identify the answers to the self-assessment questions; their focus is on the constitution of the EC.

While the three volumes are published in English, the reading lists include works in other European languages. This is a shock to an English lawyer trained in the common law system, conscious of the territorial boundaries of national laws, and only slowly coming to grips with the significance for the common law of EC laws!

All those involved in this project are to be heartily congratulated on publishing such an ambitious work: anyone who has edited and collated the disparate offerings of a number of contributors will appreciate the enormity of a task involving so many different centres of learning and spanning so many disciplines. The task is that much greater when the theme is one which is developing so rapidly as is environmental management. Nevertheless the differences of style, objectives and level between the two law chapters may indicate a more general problem within the work as a whole.

It is with hesitancy that this reviewer questions whether the editors are wise to identify as their primary audience postgraduate university students interested in interdisciplinary approaches to solving environmental problems. While the contributors represent the numerous disciplines which have a role in environmental management each discipline largely remains locked within its own chapter. The work is essentially *multi* rather than *inter* disciplinary: the task of identifying the role of the individual disciplines in the context of particular problems is inevitably left to the student.

The book is published when, in the UK at least, there is debate as to the nature and purpose of university education. In this debate postgraduate management education has its own special problems. Universities are modularising their curricula, and determining levels for each module so that students may select pathways from introductory to advanced levels. In this framework postgraduate modules should be at a high level within the discipline on which they rely but they often introduce students to a range of disciplines, which they have not studied at undergraduate level, in circumstances such that the mastery of any one discipline is inevitably much lower than that achieved by specialist undergraduates. In addition, all tertiary education, but especially management, is becoming more vocational: students are encouraged to seek credit for prior learning (often

obtained at the work place) to enable them to enter the system above the foundation level, and much of their learning thereafter is of a practical nature. Whether the students are in the classroom or at the workplace they will need reference books which will resolve problems of the workplace.

The law teacher is very aware of how difficult it is in a modular structure to equip students undertaking multi-disciplinary programmes with a sufficient understanding of any one discipline. The lawyer's problem is at its most extreme in study programmes which aim to produce managers competent to function in more than one jurisdiction. The general and conceptualised approach in this work can be only a foundation for a more detailed study of the laws applying within any particular jurisdiction. It would have been helpful if the reading lists had built on the introductory material within the text to indicate how to get to the information needed by practitioners within Europe about the domestic laws of individual states.

It is to be hoped that the high cost of the work will not prevent it from reaching its market.

Brenda Barrett
7 October 1993

THE CHEMISTRY AND DEPOSITION OF NITROGEN SPECIES IN THE TROPOSPHERE, editor A. T. Cocks, publisher Royal Society of Chemistry, 1993, x + 134pp., ISBN 0 85186 355 8, price £35.00.

This book contains the proceedings of a symposium organised by the Environment Group of the Royal Society of Chemistry in February 1992. It includes articles on photochemical oxidants, their measurement in urban and rural conditions, the chemistry and deposition of particulate nitrogen, wet deposition, and deposition modelling. It also has a useful account of the developing Critical Loads concept, encompassing both sulphur and nitrogen and their associated acidity. Its expressed aims are to review current knowledge and uncertainties in atmospheric science and the links between emissions and affected targets.

As sulphur emissions have waned over the past few decades, there is recognition that nitrogen oxides play a central role in acid deposition and acidification of soils and surface waters. Their emissions have continued to increase, perhaps explaining why large sulphur emission reductions have not brought the expected benefits. Unlike sulphur emissions, where the sulphur content of the combusted fuels is the key, nitrogen oxides relate to variable combustion conditions. In atmosphere they are involved in complex processes leading to the formation of photochemical oxidants. Ammonia from agricultural emission and its reaction products also contributes, adding to acidification of oligotrophic natural systems or nitrogen saturation in some terrestrial systems. Links between emission sources through to targets can be diverse and complex, but it is only by quantification of crucial relationships between emissions, atmospheric conditions and the environmental effects that the cost benefit of emission control can be assessed. Control legislation driven by European Community Directives, however well-intentioned, seems to have outrun this priority.

Some long-established problems, unresolved for sulphur emissions, apply also to nitrogen species with their more complex chemistry and fate. There is still concern regarding the validity of emissions data, especially for ammonia. The apparent

simplicity of wet (bulk) deposition sampling conceals an acknowledged underestimate at exposed and high altitude sites, and analysis for nitrogen species may be flawed by inadequate conservation. Dry deposit is still estimated from theoretical deposition velocities, assuming some unreal homogeneity of surface characteristics. These deficiencies become evident in the uncertain budgets for emissions and depositions, although some reasonable values are now available, including the 'sink' of nitrogen species provided by the North Sea. An international EMEP model incorporating physical and chemical processes, transport and removal from atmosphere is thought to be reasonably realistic, but year by year variation in deposition, even for sulphur, can be as much as an order of magnitude at target sites. Trends of increasing NO_x emissions with decreasing ambient ozone demonstrate their inverse relationships in both urban and rural conditions, with consistent diurnal and seasonal patterns, but conditions in the nearfield in cities, where mixing is incomplete, prevents any true assessment of human health risk there, not unlikely in static winter conditions as evidenced in London December 1991, when NO_x concentrations were as high as 423 ppb.

Considering the physical/chemical contributions together, rather little new information and understanding emerges, although the focus on nitrogen rather than sulphur species is to be welcomed.

What is almost entirely lacking is attention to target effects – perhaps in keeping with the aims set out by the RSC to guide their invited contributors. Only one chapter on 'Critical Load Concepts' addresses this question. Here it is helpful to see the definitions and methods of calculation for soils and fresh waters set out succinctly although the rather theoretical nature of the exercise overall leads to reservations on its practical application. Critical chemical values for soils and surface waters are proposed to protect terrestrial and aquatic ecosystems in sensitive areas, but there are substantial difficulties regarding the appropriate spatial and temporal resolution for mapping areas where CL is exceeded (i.e. where damage is evident or expected). In some formulations, the CL value is dependent on unknown pre-acidification conditions, and different methods lead to quite variable CLs. As the other contributions also demonstrate, there can be little confidence yet that a national or even a specific source emission reduction will result in the expected benefit at a remote site. Further, sensitive areas receiving only 'background deposition' of acidity or associated sulphur and nitrogen deposition cannot improve without some other positive intervention.

As with many conference proceedings, the text comes as 'photoready' material in some variety; as such it won't be a treasured volume, but the text and illustrations are always clear. Some editorial pressure might have been applied, however, to oblige all authors to set down clear conclusions and perhaps to apply some critical view of how their topic satisfies the central aims set out in the preface. Alternatively, the editor might have offered a tailpiece. The publication can be obtained directly from the Royal Society of Chemistry in UK, and from CRC Press Inc., Florida USA.

G. Howells
18 November 1993