Critical Condition: Human Health and the Environment *edited by Eric Chivian, Michael McCally, Howard Hu and Andrew Haines* (The MIT Press, Cambridge, Mass., 1993), pp.xi + 244, US$15.95, ISBN: 0-262-53118-6 (pbk).

While a number of books have appeared documenting the environmental degradation which is occurring in various parts of the world, few have addressed the implications of this degradation for human health in a readily understandable fashion. This book aims to fill this gap. It has been prepared by a group known as Physicians for Social Responsibility which, in 1985, shared the Nobel Peace Prize with its umbrella organization International Physicians for the Prevention of Nuclear War. The heavy representation of physicians (in the American sense) in the contributors to this volume has ensured that the links between the environment and human health are indeed emphasised throughout the work.

The book comprises an introductory essay and 10 papers which, with one exception, have all been prepared especially for inclusion in this volume. Together they provide a summary of the evidence and arguments concerning the effects of a variety of environmental problems on human health, including air pollution, drinking water pollution, food contamination, occupational exposure to toxic agents, radiation from nuclear weapons and nuclear power, the environmental damage of war, loss of stratospheric ozone and the consequential increase in exposure to ultraviolet radiation, climate change, population growth, and species extinction and biodiversity loss.

In general, the contributors have managed to cover a large amount of technical material in a readily digestible fashion. An example of this is the lucid explanation of the relationship between stratospheric ozone, tropospheric ozone and respiratory function. In the stratosphere or upper atmosphere, ozone protects humans (and other living things) from exposure to the sun's harmful ultraviolet radiation. Ozone itself, however, is a respiratory irritant, so that its presence in the troposphere or lower atmosphere can cause respiratory problems in humans. With the appearance of ozone holes in the stratosphere, more UV radiation penetrates down into the troposphere where it enhances the production of ozone. This problem is summarised nicely as follows: "Ozone plays two contrasting roles in the expected global environmental changes. In the stratosphere it provides a shield against harmful UV-B radiations, while in the troposphere it acts as a greenhouse gas and as a health hazard. So we are losing the ozone where it is beneficial and gaining it where it is deleterious to human health" (p.148).

The going is not always so easy, however. Consider the following statement with regard to food contamination: "Other polyhalogenated aromatic hydrocarbons of concern include the polybrominated biphenyls (PBBs) and the chlorinated benzenes (the most common chlorobenzene compound is hexachlorobenzene), both of which become concentrated in the adipose tissues of animals and humans" (p.57). Nevertheless, the contents should be, for the most part, accessible to the "general reader" (p.x) without recourse to a scientific dictionary.

In my view, books of this kind serve the important purpose of emphasising the consequences for human health as the prime motivation for concern about environmental change. In recent times, the health sector has become increasingly aware that public debate about environmental issues is often conducted in a human health vacuum. The present volume, along with another published in the same year with a similar theme,[1] should go some way towards redressing this situation. This is not to suggest that the authors of this book would dispute the general thrust of the changes advocated by environmentalists. But as the editors suggest, "No arguments for the environment are more persuasive than those made from the perspective of human health" (p.x). This book can then be seen generally as helping to strengthen the arguments of environmentalists.

The authors clearly have a passionate belief in the three themes which underlie this vol-

ume: That the physical environment is the most important determinant of human health; That protection of the environment and preservation of ecosystems are, in public health terms, the most fundamental steps in preventing human illness; and That physicians are the most knowledgable about the impact of environmental change on health and should therefore be prominent spokespersons in communicating with the public about environmental hazards.

This passion may sometimes lead to a premature dismissal of, or a failure to consider, alternative competing hypotheses which are consistent with the data. For example, in discussing the effects of UV-B radiation on skin cancers, it is stated that "the incidence of melanomas has already been increasing in the United States; between 1982 and 1989 it rose by 83%" (p.144). However, the extent to which this is due to increased exposure to UV-B radiation is debatable. A recent paper has considered a number of causes of rapidly increasing incidence of melanoma, including the possibility that earlier diagnosis has led to a large increase in the detection of a non-metastasizing form of melanoma which may be biologically analogous to the vast majority of basal cell carcinomas (which have a considerably lower mortality risk than metastasizing melanomas).[2]

Another example relates to the discussion of results of studies comparing cancer mortality in nuclear workers with other workers. Of the 51 results reporting excess site-specific cancer mortality in nuclear workers, only six of the differences attain statistical significance (pp.108-9). This feature of these results is not discussed in the paper.

An interesting issue which arises at a number of points throughout the book is the setting of standards for exposures to environmental contaminants. One aspect of this which I have found intriguing is society's apparent willingness to tolerate higher, and in some cases much higher, exposures to these contaminants in the occupational setting compared with the exposures tolerated for the public at large. An example of this is provided by the U.S. radiation standards which, in 1987, specified a maximum permissible whole-body dose of external radiation of 0.10 rems per year for general public exposure but 5 rems per year for occupational exposure(50 times the maximum permissible exposure for the public at large! (p.100). Finding the explanation for this difference would be an interesting social science research project.

Another interesting aspect of environmental standard setting, although one which falls outside the scope of the present book, is the determination of the economically optimal health risk from exposure to environmental hazards. In general, maximum permissible exposures have been revised downwards through time as evidence has accumulated on the adverse health effects of such exposures. However, as allowable exposures continue to fall, the health benefits from further reductions are likely to get smaller while the costs of attaining the new standards are likely to increase. Eventually, it seems that the cost of obtaining lower exposures may outweigh the benefits, at which point further reductions in exposures will not be economically optimal. The National Health and Medical Research Council in Australia is currently in the process of developing a Policy Paper on the incorporation of economic considerations in the determination of environmental health standards. This accords with the suggestion in one paper in this book that defining societal notions of "acceptable" risk is an important area for future research (p.45).

Environmental health is a complex field. This book provides a good overview of the effects of a range of environmental hazards on human health written in an intelligible fashion. The synthesis of chemistry, biology, demography and medicine (among other disciplines) which it provides in discussing environmental health ensures that it will be useful to a wide range of readers interested in this field.

REFERENCES

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2 R.C. Burton and B.K. Armstrong, 'Recent incidence trends imply a non-metastasizing form of invasive melanoma', *Melanoma Research*, 4, 1994, pp.107-13.

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Strategic Industrial Sourcing: the Japanese Advantage *by Toshihiro Nishiguchi* (Oxford Univrsity Press, Oxford, 1994), pp.xxi + 318, $75.00, ISBN 0-19-507109-3.

The success of Japanese manufacturing industry has prompted many studies of its characteristics to see if they can be emulated elsewhere. What is it that gives major Japanese manufacturers the ability to produce such a great variety of goods with speed and quality that so often leaves their western competitors gasping for breath in their wake?

In this book, Nishiguchi argues firstly that the distinctively Japanese way of working with subcontractors is a major contributor to this ability, and secondly that this way of working is not an artifact of Japanese culture but can be transplanted, complete with its benefits, to other countries.

Nishiguchi's conclusions are firmly based on the field research reported in the book, in which he visited and conducted interviews at scores of manufacturers and subcontractors in the automotive and electronics industries of Japan, Britain and USA. He finds that the most distinctive characteristic of Japanese subcontracting is its emphasis on "synergistic problem solving rather than antagonistic bargaining" (p. 6). By this he means that Japanese assemblers (or prime contractors, as they are called in some fields) involve themselves very closely with their subcontractors. For example if there is a problem in the quality or cost of goods coming from the subcontractor, the assembler's first response is likely to be not to drop the subcontractor, but to help him by lending him engineers to improve the subcontractor's manufacturing techniques so that their product is of both higher quality and lower cost ("problem solving"). In this way both parties benefit. Similarly, by maintaining work for, and otherwise supporting, those subcontractors who are willing and able to meet the high quality standards, Japanese assemblers encourage their subcontractors to invest in equipment and skills specific to the assembler's needs. This win/win negotiation breeds mutual dependence ("synergy"). From this base, particularly in the electronics industry, the subcontractor is encouraged and trusted to take over the complete assemble — though not the marketing — of whole appliances. In these circumstances, the subcontractor may well have a range of sub-subcontractors, with whom he in turn has similar relations. This leaves the main assembler free to devote more of his energy and time to developing the next range of products. Again both parties (and the consumer) benefit.

In contrast, the traditional western relation between assembler and subcontractor is distant and focused on short-term price. ("Can this subcontractor give me the cheapest price; if not I'll get another one.") In these circumstances, the subcontractor is seen less as a partner than as an antagonist and the relation is one of antagonistic (win/lose) bargaining. Neither party is committed to the other for longer than the short term of each individual contract. As one British subcontractor put it, "All [the assemblers] are concerned about is a cheap price.