structions of beauty, but he notes that hierarchical forms of society have created many of the aesthetic landscapes that motivate him and cautions that aesthetic extremes may lead to untenable moral positions. Determining causality for this set of concerns would require an examination of social order on another scale. Tuan's offering is to create an augury by extricating the good and salvaging the beautiful. His conclusion is about an alternative structure of values, perhaps a visionary future that joins peoples of difference in common priorities. It is a geography of hope.—CAROLYN L. CARTIER

COMPUTERIZED ENVIRONMENTAL MODELLING: A Practical Introduction Using Excel. By J. HARDISTY, D. M. TAYLOR, and S. E. METCALFE. vii and 208 pp.; diagrs., index. New York: John Wiley & Sons, 1993. $27.95 (softbound). ISBN 0-471-93822-X.

Computer tools offer marvelous opportunities to support geographical observations and analyses with a host of graphics. They also offer the adventurous scholar a chance to make models of ideas in an electronic environment. The word model means different things to different individuals. To quote Frank Harary, "When a mathematician uses the word, he is referring to the physical or social realization of his theory. On the other hand, when a scientist speaks of a mathematical model, he means the area of mathematics which applies to his work" (What are mathematical models and what should they be?, 1971. *Biometrie-Praximetrie* 12 [104]:3–18). The authors of "Computerized Environmental Modelling" use the scientific interpretation of the word: there is no discussion of the logic of the axiom system on which models are built; instead, they emphasize training to use the computer to analyze environmental ideas in some systematic manner.

Mathematical models are important because they allow one to confront even possibly sketchy ideas with a host of hard facts quickly, easily, and accurately. Numerous individuals incorporate modeling into their research agendas as a matter of practice, but few books show beginners how to do so. J. Hardisty, D. M. Taylor, and S. E. Metcalfe help fill this void by offering instructions on how to use Microsoft Excel to create computer models of environmental topics.

The book has four parts, each of which is subdivided into chapters. Part I, Environmental Modelling, introduces the reader to general-systems ideas applied to the environment and to the ideas on which the systems approach to modeling is based. Part II, A Practical Guide to Computer Modelling, leads the beginner from making a model on paper to making one on a computer in the context of environmental models. Chapters on stochastic and feedback modeling tie the practical aspects of Part II to some general-systems underpinnings presented in Part I. Part III, Examples of Environmental Models, offers an ocean-temperature model and one on acid deposition as well as others, including one based on a hypothetical world—Daisy World. A chapter

on modeling chaos in Excel gives nice abstract balance. What Part III does not offer is an opportunity to model with large, complex data sets and the host of attendant problems such as across-software interfaces that arise. But perhaps this topic is too advanced for the targeted readership. Part IV contains appendixes that touch briefly on technical matters not discussed in the main body of the text and, very briefly, on a comparison between Microsoft Excel and Lotus 1-2-3 and other spreadsheets.

Based on an undergraduate geography course at the University of Hull, this book achieves its goal of addressing problems through an "easy to use software system." The book contains numerous graphics and is clearly written and appears to be carefully thought out; indeed, it does bear the hallmark of classroom testing.

An instructor considering this book as a supplement in a course that involves modeling might be well advised to determine, prior to requiring its purchase, whether the modeling or the data set will drive the course. If it is the idea of modeling, it is appropriate to choose the software based on what is easy to use and currently in vogue or on similar criteria. However, if certain data sets will be required for laboratory use, the instructor should determine that they are compatible with the software and the supporting written materials. For example, data sets available from the World Resources Institute and from the World Bank contain a variety of environmental data. However, the World Bank "Stars" data set, version 1.1 1990, will download only into Lotus 1-2-3, Javelin, or Quick View or as an ASCII file; the World Resources Data Base (1992) can be exported in spreadsheets of limited size into various software programs, including Microsoft Excel and Lotus 1-2-3. No universal strategy yet exists to make modeling easy. This book is helpful and an important contribution in the context set for it by the authors: use with Microsoft Excel.—SANDRA LACH ARLINGHAUS

TELECOMMUNICATIONS AND GEOGRAPHY. By AHARON KELLERMAN. xviii and 230 pp.; maps, diagrs., bibliog., index. New York: John Wiley & Sons, 1993. $59.95. ISBN 0-470-22034-1.

The geography of communications has a long but not particularly rich history that tends to transmit ephemeral, intangible information that falls outside the dominant geographical paradigm of researching the mappable and tangible, from product commodities to traits of real people. To recognize this history Aharon Kellerman quotes a passage from an 1897 publication by Friedrich Ratzel on the importance of information communication. He then addresses the difficult task of blending the patchwork of empirical studies of communications geography into a unified construct. He focuses on telecommunications, defined as two-way communications, usually electronic in nature, over a distance. Telephony and its recent associates—data transfers, electronic mail, and faxes—provide the bulk of the material. Kellerman's