and the synthesis of polymers through photocycloaddition reactions, are two other aspects of the subject that are briefly covered in separate chapters.

Although they have been comparatively neglected, photochromic polymers remain of great interest because of their potential applications. The mechanisms of the photoisomerization of polymers containing different types of photochromic groups are thoroughly discussed, in connection with the distinct properties of such materials.

Photocrosslinking and photocuring of polymers are among the fastest-growing areas in polymer photochemistry because of the widespread applications of these technologies, in microlithography for the formation of relief images, and in the surface treatment of materials by instant curable protective coatings. Rabek gives a comprehensive account of the basic chemistry involved in the different types of photoresist materials currently employed, but he covers only rather briefly the photocuring process which has recently come to prominence.

The last section of the book deals with the photodegradation of commercial polymers, and considers the methods used to improve the outdoor durability of these materials through the addition of light-stabilizers and antioxidants. These two chapters are mainly orientated towards basic mechanisms and product identification, and they describe the various chemical effects of ultraviolet radiation on polymers and the modes of action of a great number of photostabilizers. This is a helpful up-date of several previous reviews in this area, which again is of great practical importance. The book ends with a short discussion of new polymeric systems which have potential application in solar-energy conversion and storage.

This book gives a well-balanced and up-to-date picture of the various topics of current interest in polymer photochemistry. It contains a wealth of well-presented information about current research, and will be a valuable textbook for academics, industrialists and graduate students. Taken as a whole, it is also a most useful work of reference that will be an essential addition to any library serving those working on polymers. □

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New editions

- *Deterministic Chaos: An Introduction*, 2nd edn, by H. G. Schuster, with new sections on sensitive parameter dependence, fat fractals and the Farey tree. Publisher is VCH, price is DM108. For review see *Nature* **318**, 241 (1985).
- *Magnetic Resonance Imaging: Basic Principles*, 2nd edn, by Stuart W. Young. Additions include new developments in superconductivity. Publisher is Raven, price is \$49. For review see *Nature* **310**, 803 (1984).

Electric art — this attractive arrangement of thin sections through electrical cord is taken from the new paperback edition of The Secret House by David Bodanis. The book, a popular, illustrated account of the "unexpected world in which we spend our nights and days", is published by Touchstone, New York, price \$9.95.

Jan Hinsch/SPL

Southern pedology

Fiorenzo C. Ugolini

Antarctica: Soils, Weathering Processes and Environment. By I.B. Campbell and G.G.C. Claridge. Elsevier:1987. Pp.368. Dfl.220.

CAMPBELL and Claridge must be congratulated on having taken on the onerous task of writing about all the aspects of Antarctic natural systems themselves, rather than procuring an array of experts to produce individual chapters. The result is a well-integrated, readable book in which climate and geological and biological processes are all made pertinent to studies of soils, and which provides a comprehensive view of the Antarctic ecosystem. The authors write fluently and have assembled their material with skill, but the success of the book largely stems from their deep knowledge of the subject.

Following a thorough treatment of geology and geomorphology, climatic zones are defined and related to important determinants of soil properties such as temperature and moisture. Climatic zonation is the basis for distinguishing the main soil moisture regimes — ultraxerous, xerous, oceanic subxerous and moist — and these form the basis for the principal groupings in the soil classification system proposed by the authors. The rest of the chapters are devoted to biology, weathering (physical and chemical), soils and soil properties, soil distribution, salts, soil development and glacial history. There is, too, an appropriate and timely discussion of soils and human activities.

Although physical weathering is recognized as the most important process for rock disintegration, not enough emphasis is placed on the role of unfrozen water in frozen soils and no mention is made of modern theories dealing with this unique state of water. Salt weathering and weathering induced by unfrozen water can explain most of the alteration phenomena

observed in continental Antarctica.

The number of observation and profile descriptions provided is impressive. Systematically presented, these observations have allowed Campbell and Claridge to provide a soil chrono-sequence that reaches into the mid-Miocene, and may prove to be a very valuable tool for reconstructing the fluctuations of the Antarctic ice-sheets. Such a long soil-time relationship is perhaps only possible in Antarctica, where disturbances, so common in warmer regions, are minimized. Thus time becomes the principal factor responsible for soil changes.

Because continental Antarctica is extremely arid, salts tend to accumulate in the soils, and their origin has long been a controversial issue. Weathering, oceanic air masses, marine invasion, sedimentary rocks and auroral activity have all, at one time or another, been suggested as the cause or source. Campbell and Claridge have been able to discriminate between them and present a plausible picture for salt distribution and composition.

Although there are only a few typographical errors, there are one or two other mistakes or slips. Figure 6.3 (p. 127) is printed upside down, perhaps to remind us that this is the way the world is seen from Antarctica. Also, important references are missing in the discussion of ornithogenic soils.

Much of our understanding of soil processes in the cold desert of Antarctica stems from the work of pedologists in the late 1950s and the 1960s. This book does not, perhaps, represent a great advance in knowledge as such beyond those early observations. But Campbell and Claridge have applied the initial concepts beyond the original local studies and have expanded them into a continental view. Their book is a masterly survey of the fundamental principles of Antarctic pedology, and represents the culmination of an era of exploration and scientific work. □

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