

## Second skin



Sloughing palmate gecko from the Nambi desert in south-west Africa. From *The World of Reptiles and Amphibians* by Maurice Burton, (Orbis: London, February 1974.) £2.50.

specifically with primary sedimentary structures and textures, commencing with a brief summary of the major hydrodynamic factors controlling the formation of certain types of structure. This section is similar in its approach to other monographs on the subject. One of its assets is that, as well as being descriptive, the authors have attempted to summarise the varied opinions on the genesis of sedimentary structures. It is perhaps unfortunate that more attention was not paid to the hydrodynamic significance of sedimentary structures, and that the importance of chemical and mineralogical parameters should have been restricted to just over two pages. Also, this section does get involved at times with rather laborious classification schemes.

In the second and most important part of the book the emphasis is placed on modern environments and includes an encyclopaedic treatment of glacial, desert, lake, fluvial, delatic, coastal, shelf and lagoon, tidal flat and ocean basin environments. The authors have, where possible, based their discussions on studies published within the last decade. Consequently, the book provides an up to date, and at times stimulating, appraisal of the subject. Certain topics have been treated to greater depths than others, due in part to a combination of the particular expertise of the authors and a current lack of detailed knowledge on some modern environments. But, in all chapters, the writers have been objective in their efforts to present the processes and characteristic structures and sequences typifying given sedimentological regimes. A pleasing feature is that, from the choice of examples, it is clearly demonstrated that more than one facies model is often required for a particular environment. Furthermore, the importance and application of biological parameters is stressed throughout.

The book is lavishly illustrated with

579 diagrams and photographs, mostly of high quality, but often rather repetitive. It is in fact a little irritating at times to find, due to their large number, that many of the figures are out of phase by several pages with the text. Editorial standards are high, and both printers' and geological errors are at a minimum. The reference list is most comprehensive and should prove to be invaluable for literature searches.

BRIAN WAUGH

## Stellar surface

*Cosmic Gas Dynamics.* By Evry Schatzman and Ludwig Bierman. Pp. xv+291. (Wiley: Chichester, March 1974.) £8.40.

PROBLEMS of gas dynamics are of importance in most branches of theoretical astrophysics, and a comprehensive treatise on cosmic gas dynamics would be vast indeed. A glance at this volume immediately indicates its specialised nature in spite of its general title. Roughly two thirds of the book is taken up by Schatzman's article on stellar hydrodynamics. The remainder is devoted to a study of the physics and dynamics of the solar wind written by Biermann. There is no attempt to link the two articles and they can be read independently of one another.

Schatzman's article is concerned largely with hydrodynamic and hydro-magnetic phenomena occurring in the outer layers of main sequence stars. Stars of spectral types A to G possess extensive outer zones in which the energy transport is largely by convection. The properties of convection zones are not well understood, and their structure is generally described by the phenomenological approach of mixing length theory. The convective motions act as a source of pressure waves which may propagate outwards into the surrounding radiative zone. The study of these waves and their effects are of great

importance in establishing the properties of the stellar corona. A large section of the article deals with these problems. Various aspects of stellar surface activity, such as solar flares, are discussed and the article ends with a brief discussion of the possible role of stellar mass loss in the angular momentum decrease which must occur as stars contract onto the main sequence. Although well written, the article makes few concessions to the reader, and a fairly good background of hydrodynamics and magnetohydrodynamics is necessary to follow the discussion.

The existence of the solar wind is a direct consequence of the types of subsurface stellar phenomena referred to earlier. Biermann first briefly reviews the properties of the solar corona, and then describes in more detail the gross dynamics of the corona and solar wind. A logical progress from simple inviscid hydrodynamics to two-temperature models is followed. The conditions under which the flow may be described by macroscopic equations are discussed and reference is made to solar wind models in which the ion properties are approached by way of the Vlasov equation. The interplanetary magnetic field and the angular momentum of the wind are briefly treated, and the article ends with a short discussion of the interface of the wind and interstellar medium. I was rather disappointed to find no account of the interaction of the wind with planetary bodies and comets.

Both authors are well known for their extensive contributions to the work they describe and write with considerable authority. I have two criticisms. The diagrams have been taken directly from the literature without any attempt to relate their size to the amount of information contained in them. The caption arrangements are very poor. Captions are separate from the figures in some cases, two figures are captioned merely as "universally familiar", and one caption is in French. The second criticism is the very long delay between the writing of the articles and the publication date. The contents are based on lectures given by the authors in 1968 with slight amendments made in 1970. This delay has been particularly unfortunate for the otherwise excellent article by Biermann. Since the time of writing, satellite observations have given a great deal of information directly bearing on the subjects in the article. Considerable progress has been made theoretically and the extensive reviews in the *Asilomar Conference Proceedings* are available in print. The publication delay has not affected the stellar hydrodynamics section as much, but then £8.40 is a great deal to pay for 176 pages of lecture notes. J. E. DYSON