Pouched Mammals

The Biology of Marsupials. BERNARD STONEHOUSE and DESMOND GILMORE, Eds. University Park Press, Baltimore, 1977. viii, 486 pp., illus. $39.50. Biology and Environment.

The Biology of Marsupials. DON HUNSAKER II, Ed. Academic Press, New York, 1977. xviii, 538 pp., illus. $36.

The identity between the titles of these two volumes belies the differences in their content. The volume edited by Stonehouse and Gilmore is almost entirely about Australian marsupials whereas that edited by Hunsaker is mainly about American marsupials, with some reference to Australian species.

There is a small amount of overlap between the volumes. The taxonomy of marsupials is dealt with by the same author in both volumes. The paper in the Stonehouse and Gilmore volume has a most useful annotated list of all marsupial species that is completely up to date. The paper in the Hunsaker volume clearly reviews the certainties and uncertainties of marsupial classification, and describes in detail the ecological and morphological similarities between members of the South American didelphoids and members of the Australian dasyuroids. The author makes a strong case, using all the available evidence, for following Ride's classification at the ordinal level, but he argues for a closer relationship between the didelphoids and dasyuroids. He does not believe that the bandicoots deserve a separate order. Both volumes also have papers on marsupial chromosomes, that in the Hunsaker volume extending to cytogenetics. These papers emphasize the usefulness of marsupial chromosomes in evolutionary investigations. Finally both volumes have papers describing the diseases of marsupials, that in the Hunsaker volume being an extensive and complete consideration of the diseases of both American and Australian marsupials.

The Hunsaker volume consists of eight long papers that cover, in addition to classification, chromosomes, and diseases, the ecology of American marsupials, their behavior, the central nervous system of marsupials, the development of marsupial lymphatic and immunohematopoietic systems, and the special anatomy of *Marmosa robinsoni*. With the exception of the last, these papers are of particularly high quality. The paper on ecology points out the relict nature of the South America caenolestid populations in relation to the utilization of colder habitats. The paper on behavior emphasizes *Didelphis* but gives good coverage of what is known about behavior in other species. Both volumes show how little information, apart from Kaufman's excellent study on whiptail wallabies (*Anim. Behav.* **22**, 281 [1974]), is available about the behavior of Australian marsupials. The paper on the central nervous system of marsupials notes how little marsupial brains differ from those of placentals and draws attention to the only true functional differences—the unique blood circulation of marsupials and the absence of double cones and oil droplets in the retinal cones of placental mammals.

In contrast to the Hunsaker volume, the Stonehouse and Gilmore volume consists of 24 much shorter papers organized in five sections. The papers are erratic in quality, ranging from superb papers on marsupial phylogeny, historical biogeography, and biogeography in relation to plate tectonics to a paper on the behavior of the Tasmanian devil that would hardly have been published in any reputable journal. The former three papers give a comprehensive review of what is known about the origin and distribution of marsupials. That on phylogeny gives an excellent figure on the stratigraphic distribution of fossil marsupials that will be of great value for explaining the vagaries of marsupial evolution to undergraduates. It also presents cogent arguments for the origin of marsupials in North America as opposed to South America.

There is a section of seven papers on various aspects of population and behavioral biology of a number of species. Most present no new data but review their subjects well. A paper on the success of marsupials as introduced species gives details of the introduction of marsupials in an amazing number of locations, including Britain, Germany, Hawaii, and the Channel Islands. Another paper deals with the continuing investigations in Australia of the causes of spontaneous mortality in all male *Antechinus* after their first breeding season. The authors suggest that changes in peripheral plasma corticosteroids are very likely the cause of such deaths. The next section deals with marsupial anatomy, with four papers covering various comparative aspects. One of these is a highly perceptive ecological comparison of marsupial and placental patterns of reproduction in which the author makes the points that marsupials invest fewer resources in their young than placentals do and that the marsupial cycle of reproduction uses less energy than the placental. She suggests that the reproductive biology of marsupials may have been a considerable advantage in certain environments.

The final section of the Stonehouse and Gilmore volume deals with endocrine and metabolic studies. It includes a brief review of pituitary function, a comprehensive and interesting review of adrenocortical functions in marsupials, and papers on the metabolism of the quokka, on the brush-tailed possum, on reproduction in male marsupials, and on plasma acid phosphatase activity in two species of Tasmanian marsupials.

Both volumes are well produced, with few typographic errors and good indexes. The type of the Stonehouse and Gilmore volume is close set and irregular and sometimes irritating to read. Both volumes will be necessary reading for all those interested in marsupial biology. The volume edited by Stonehouse and Gilmore is particularly recommended for its seven papers on the taxonomy and the evolution of marsupials.

R. M. F. S. SADLEIR
Department of Biological Sciences, Simon Fraser University, Burnaby, British Columbia V5A 1S6, Canada

Parts of the Solar System

Planetary Satellites. Papers from a colloquium, Ithaca, N.Y., Aug. 1974. JOSEPH A. BURNS, Ed. University of Arizona Press, Tucson, 1977. xxiv, 598 pp., illus. $19.95.

The 33 known satellites add up to a tiny portion of the total mass of the solar system. However, they constitute a significant fraction of the accessible evidence concerning the origin of the solar system. A book on planetary satellites is timely, given the events in 1977 that have contributed, or will contribute, to this body of evidence: the discovery of rings around Uranus by stellar occultation; the indications of systematic cratering patterns on Phobos seen in photos from a Viking close approach; the launching of Voyager, which will pass close to Io and Titan; and the congressional approval of Jupiter Orbiter, which will yield more detailed data on the Galilean satellites.

The volume reviewed here is a consequence of an International Astronomical Union colloquium, but it is not a typical symposium proceedings, for a selection has been made of the papers presented at the meeting, some papers have been rewritten to make them comprehensive and systematic reviews, two introductory overviews have been added, and extensive cross-referencing has been incorporated. Hence the three-year delay between the colloquium and publi-