

## Iron metabolism

*Iron Metabolism.* CIBA Foundation Symposium 51 (new series). (Elsevier: Amsterdam, New York and Oxford, 1977.)

THE steady flow of research publications and symposia devoted to this topic illustrates the continuing fascination exerted by iron on a whole range of workers in the biological sciences—biochemists, bacteriologists, pathologists, clinical scientists, and more recently, immunologists.

This volume contains the proceedings of a CIBA Symposium held in London in December 1976 under the Chairmanship of Professor A. Jacobs. There are 16 contributions on selected aspects of iron metabolism, well chosen to cover topics of current interest and new advances over a wide scientific front. The format is conventional; most of the contributors, American and European, present authoritative reviews of the subject under consideration, usually including some additional new data of their own, following which the topic then receives open discussion. Also included are two periods of less structured general debate; firstly, on the iron-storage compound haemosiderin; and secondly, on ferritin, transferrin synthesis, and passage of iron into cells.

In a volume of such general excellence, it is perhaps invidious to select individual contributions for comment. However, the reviews on the structure and function of the storage compound ferritin by Dr Pauline Harrison, on the phenotypes of ferritin by Dr J. Drysdale, and on the iron-transport protein transferrin by Dr E. B. Brown are particularly useful statements of the present state of knowledge.

The iron-binding and transport proteins elaborated by bacteria, the illuminating analogies which can be made with the function and behaviour of mammalian iron-binding proteins, and the hope that such bacterial compounds could lead to more effective iron chelators for the treatment of human iron overload, provide a good example of the progress possible from coordination of research effort in different fields; this topic is well served by Dr J. B. Neilands, and by other contributors during discussion. A second area of common interest to clinicians and bacteriologists is the role of iron and iron-binding proteins in infection. There is strong evidence that iron availability is critical for bacterial growth, suggesting that mammalian iron deficiency might protect against bacterial infection; on the other hand evidence continues to be presented (here by Dr R. K. Chandra *et al.*) that iron deficiency may be associated with impaired immuno-

competence and therefore increased liability to infection. This problem remains to be solved, and awaits good statistical evidence on the incidence and severity of infection in iron deficient and iron replete subjects.

Included among many other important contributions are new data on the pathogenicity of iron overload in haemochromatosis and thalassaemia; on the abnormalities of haem synthesis and other intracellular events in sideroblastic anaemias; on iron kinetics and erythropoiesis; and on altered monoamine metabolism in the brains of iron-deficient rats, and the platelets of iron-deficient humans.

It is perhaps unjust to complain of the lack in this Symposium of an imaginative, entirely new general hypothesis such as the Fletcher-Huehns proposals on the functional heterogeneity of the two iron-binding sites on transferrin, now more than 10 years old; Professor Jacobs' revival of the idea of a labile intracellular iron pool probably comes closest to this. There is also a stimulating proposal by Dr R. L. Willson that anatomical or

functional 'decompartmentalisation' of intracellular iron may lead to cell death or to sublethal cellular damage with subsequent carcinogenesis, and that zinc could play a role in protecting the cell against the damaging effects of such iron.

The book is beautifully produced, with an excellent index; there are good figures and illustrations, and a list of references is appended not only to the formal contributions, but to those made during open debate as well. Perhaps a slightly heavier editorial hand might have been laid with benefit on the discussion sections, which occupy almost one-third of the book and are inevitably somewhat inconsistent in quality; however, these sections contain much that makes the book the exciting and stimulating production it is, and should not be missed.

It is a pleasure to recommend this volume strongly for all working in the field of iron metabolism.

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## Geology of coral reefs

*Biology and Geology of Coral Reefs.* Vol. 4: Geology, Part 2. Edited by O. A. Jones and R. Endean. Pp. 337. (Academic: London, New York and San Francisco, 1978.) \$35; £24.85.

THIS volume came aptly to the attention of this reviewer shortly after re-visiting Low Isles, the site of the Great Barrier Reef Expedition 50 years ago. Much of its contents deal with these reefs—notably the account by O. A. Jones of the Great Barrier Reefs Province in which he discusses the vexed question of the nature of the foundations of these reefs, a subject on which, however, further light will be thrown with the publication of the results of the Royal Society and Universities of Queensland Expedition to the northern reefs. There is a useful bibliography of publications on the Great Barrier Reefs; also some reference, omitted earlier, to the relevant results of the Royal Society Expedition to the Solomon Islands in 1965.

Valuable papers by G. R. Orme deal with the Coral Sea Plateau beyond the confines of the continental shelf and with sedimentation in the coral reef environment. Much of what constitutes a reef is not the cemented mass that resists oceanic seas but the often immense banks of derived material to leeward. The nature and origin of these sediments, which are of great geological significance and provide a distinct environment for life, are

most productively analysed in what many will find a highly stimulating review.

Most readers will be closely held by the first three chapters under the impressive authorships of first Harry Ladd, and then J. A. Steers and David Stoddart. The first two papers deal with types of coral reefs and then specifically with fringing and barrier reefs and atolls. Here are surely laid to rest the long drawn out and largely illogical controversies between the believers in subsidence, in glacial control and in antecedent platforms. Darwin emerges supreme; the uplift he viewed in the South American Andes has been shown to be balanced by subsidence in oceanic areas, though it required borings for test explosions with atomic bombs to demonstrate this with final clarity. And although Daly's theories hold little water today, they did emphasise the significance of Pleistocene reefs which are so often the basis over which modern reefs form little more than a veneer.

The second paper from Cambridge is about coral reef islands, the authors discussing what James Cook in 1777 wrote about as the "different opinions amongst ingenious theorists concerning the formation of such low islands". Such sand cays may be buttressed by beach rock or sheltered by shingle mounds behind which mangroves become established.

This book, the final volume in the series on coral reefs, should prove of interest to a wide body of readers.

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