

the origin of life are well balanced and articulate, as is his thorough treatment of current theory and opinion on the topic. He concludes that the evidence in support of any of the various ideas is inadequate to allow an unequivocal choice among them.

Experts in any given topic who quibble about the details of coverage of their own specialty are, often justifiably, accused of failing to see the wood for the trees. It is not to detract from the overall value of the work that I offer a crystallographer's quibbles. Ball refers to the techniques of X-ray crystallography as bouncing beams of X-rays off crystals and as providing only static information on molecules frozen in place. In light of this shortcoming, he asserts that spectroscopy is 'perhaps the chemist's primary investigative tool'. True enough, and it is certainly too much to expect him to be aware of the subtleties of the study of thermal motion, atomic displacement parameters and structure correlation, or the use of rapid data collection using synchrotron sources and Laue techniques to follow the dynamic details of enzyme reactions in the solid state. Something for a later edition, perhaps?

More fundamentally, his description of the process of structure determination by X-ray diffraction is muddled and inaccurate (pp. 120–121). Ball states 'If the unit cell contains a large number of atoms, the task of indexing the peaks is far from straightforward'. It isn't clear what he means by 'indexing the peaks'. Clearly, indexing the diffracted intensities is trivial and identifying which peaks correspond to which atoms may or may not be straightforward, depending upon the resolution of the map and the accuracy of the phasing. He also has the following remarkable interpretation of the use of electron density maps: 'The advantage of treating the structure in terms of an electron density map is that it allows one to bring to bear some mathematical tools that cannot be applied to a discrete "atomic" picture. Rather than pushing atoms about in order to match a calculated diffraction pattern to the measured one, a continuous map of electron density can be "molded" like clay to the right shape, using a mathematical procedure derived from the work of the nineteenth century French mathematician Joseph Fourier.' Equally fuzzy is his lack of distinction between the heavy atom method and isomorphous replacement as phasing tools, and his total disregard of the existence of direct methods. We should, however, take heart from Ball's assertion that 'Today huge and complex biological structures, such as that of the virus responsible for foot-and-mouth disease, can be solved more or less routinely'.

Such superficiality is perhaps inescapable in a popular work such as this, though one may point to such honorable exceptions as *The Eighth Day of Creation*, and does make one wonder what misconceptions one may acquire about areas with which one is less familiar. However, such misgivings must

be balanced against the good that results from introducing students of all ages to an overview of current hot topics in structural science that, at least, catches the excitement of the 'new chemistry'.

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Books Received

The following books have been received by the Editor. Brief and generally uncritical notices are given of works of marginal crystallographic interest; occasionally, a book of fundamental interest is included under this heading because of difficulty in finding a suitable reviewer without great delay.

Crystallography in modern chemistry, By THOMAS C. W. MAK AND GONG-DU ZHOU. Pp. xiii + 1323. Chichester: John Wiley & Sons, Ltd, 1997. Price £55.00, US \$76.95 (paperback). ISBN 0-471-18438-1. This is a paperback reprint of the original 1992 publication of this book, reviewed in this journal by J. P. Glusker [*Acta Cryst.* (1993), B49, 576–578]. It meets, at least in part, Dr Glusker's criticism that the high price of the original 'puts the book out of reach of a student audience and may deter scientists who would benefit from owning this splendid work from acquiring it for their personal libraries'.

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Collected works of Dorothy Crowfoot Hodgkin. Vol. I. **Insulin**. Vol. II. **Cholesterol, penicillin and other antibiotics**. Vol. III. **General crystallography and essays**. Edited by G. G. DODSON, J. P. GLUSKER, S. RAMASESHAN and K. VENKATESAN. Pp. cxliii + 2230. Bangalore: Indian Academy of Sciences, 1996. Price US \$120 (Individual vols. US \$40). ISBN 81-7296-020-4. A review of this book, by Edward Baker, has been published in the July 1997 issue of *Acta Crystallographica Section A*, pages 528–530.