and the efficient cross-indexing provided by the editor. The price is modest in relation to the central importance of the subject to anyone interested in the health or disease of animals or man. C. R. C. HEARD

GENES AND HISTONES

The Molecular Biology of Development

By James Bonner. Pp. vi+155. (Oxford: Clarendon Press; London: Oxford University Press, 1965.) 25*s*. net.

THE Molecular Biology of Development, written during the author's tenure of an Eastman visiting professorship at Oxford during 1963–64, is for the most part a résumé of several papers from his own laboratory. Its racy, colloquial style reads like, as it probably is, a transcript of the lectures he gave during this assignment. It certainly conveys his vivid enthusiasm for his thesis, which is that the histones are the natural gene inhibitors so that if the gene is covered with histones it is repressed, while if it is uncovered it is active. This is, of course, an attractive hypothesis and James Bonner makes the most of the limited evidence which can at present be adduced. A more cautious and critical survey of the evidence and possibilities would have been more useful.

Prof. Bonner states that his object is to apply the "framework of molecular biology" to the biological problems which remain to be solved. "It is my thesis", he says, "that we can now profitably go back and re-examine what it is that makes the differences between the different kinds of cells of a higher organism." The book may do good in directing the attention of research students to an enormous field of study which is just becoming accessible to investigation, but in which, although a few clues have been obtained, reliable signposts are still obscure. The fact is that the hypothesis by itself is not enough to explain the activity or inactivity of genes. It would be necessary in addition to explain what puts histones into their proper places and takes them off when required. The author has little to say on this, except for some mention of the possible intervention of hormones and other substances.

Although the enthusiasm is there, the facts are often presented in a slipshod and sometimes misleading fashion, and students would be well advised to supplement their reading by other sources. For example, the account given of the fractionations of histones in our laboratories can only be described as a travesty of the facts; three distinct methods are mixed up and as presented would certainly not work. Prof. Bonner would probably say that he did not aim at giving a precise account of these fractionation methods. But rather than a misleading account of details it would be better to say simply, as he indeed concludes, that "a variety of methods lead to the separation from calf thymus histone of four principal fractions".

Another example of loose reporting is the attribution to "Murray, 1964" of information on the *N*-terminal groups of histones. In fact all that K. Murray states in the paper quoted is that "Determinations of the N-terminal groups of the various histone fractions also indicate that the fractions are not homogeneous". Prof. Bonner's conclusion is "there is an interesting lack of heterogeneity amongst the histones with respect to the N-terminal groups". Conceivably both these statements hold some truth, depending on the point of view, but it is not reasonable to put forward a paper in which the only statement on the subject is that quoted first as a justification of the second. The fact that the information so far obtained is largely due to D. M. P. Phillips is not mentioned.

Readers who expect to learn much about development will be disappointed as the chapter on this subject (Chapter 12) is highly hypothetical and consists of a translation in 'computer language' of a sequence of processes involved in bud growth. The whole mechanism is described in a flight of fancy as "Digital organ generator Model A (DOGMA)". Evidently Prof. Bonner also has some doubts, since he concludes, "we do not yet know if the approach will be a fruitful one". J. A. V. BUTLER

PENICILLINS

The Penicillin Group of Drugs

By Prof. Gordon T. Stewart. Pp. xii+212. (Amsterdam, London and New York: Elsevier Publishing Company, 1965.) 55*s*.

THE discovery of penicillin is one of the few that deserve the hackneyed description 'epoch-making'. Fleming's original work in 1929 and the later development by Chain and Florey literally marked the beginning of a new era in the history of man. This antibiotic era has already profoundly changed the whole practice of medicine, but the special fascination of the penicillin group of drugs lies in their unique combination of medical and scientific interest. Prof. Stewart has tried, as he puts it, "pulling some of the strings together", and *The Penicillin Group of Drugs* is intended to illustrate "a continuing interaction of intellectual and practical endeavour".

The aim of the book then is clearly conceived, and the author has shown imagination and enthusiasm in defining it. But the achievement does not match the conception and the result is rather disappointing.

After a short preface setting out the purpose of the author in writing the book, the first three chapters deal with the history of the penicillins. Then follow chapters on the acid-stable penicillins, a chapter comparing the oral penicillins, and then one on methicillin. Three chapters are devoted to the mode of action of penicillins, and separate single chapters to toxicity (and pharmacology), resistance, allergy and epidemiology. The final chapter is on the cephalosporins.

The historical chapters are perhaps the best in the book. They are interestingly written, though sometimes in a semi-popular and rather dramatic style, and they give a good account of the various stages in the development of the different penicillins. But after these, in the chapters dealing with individual penicillins, the departure from chronological order has no advantages and something nearer the historical order of their discovery would have been in fact better. The isoxazole penicillins come more logically after methicillin than as part of a section on oral penicillins, since their penicillinase stability is a far more important reason for their use than their acid-stability, though this gives them one (sometimes doubtful) advantage over methicillin.

As regards the factual content of the book, there are many examples of facts incorrectly or ambiguously stated. On page 48, the statement that up to 50 per cent of strains of *E. coli* in some situations may form amidase is misleading and probably inaccurate. On p. 72 it is stated that methicillin has a high affinity for staphylococcal β-lactamase, but on page 145 it is stated to have a low affinity. On page 105 it is stated that the lactam-dihydrothiazine ring of 7-aminocephalosporanic acid is intrinsically more stable to most forms of β-lactamase than the lactam–thiazolidine (ring) of 6-aminopenicillanic acid. This is a loose and misleading statement: with some strains the reverse is true.

There are numerous mis-statements due to misprints, mis-spellings or verbal mistakes. For example, on page 149 the part played by *Trichophyton* species in protecting hedgehogs from infection by staphylococci (except by penicillinase-producing strains) is attributed to their ability to produce penicillinase. What is really meant is their ability to produce penicillin or a penicillin-like substance, as is correctly stated on page 161. On pages