

Gate House and intended no doubt for high schools and first-year undergraduates. Possibly they are intended for an even wider audience, although one can only guess because there is no statement about their purpose or even of their authorship. The whole style and tone of this publication, including the general introduction to the accompanying booklets, is journalistic. It offers "off the peg" instant genetics—the whole of molecular biology in 40 frames of technicolour. The structure of DNA, its replication, transcription and translation, mutation and the genetic code are all dealt with. The story is told of how "... the structure of DNA and RNA became everyday knowledge ...". To be fair, the molecular basis of the central dogma does lend itself to a visual aids approach; more so for example than the principles of population genetics where it seems necessary to produce a photograph of $p + q = 100\%$ or 1.00, in colour. The strip on sex determination, sex linkage and influence has some entertainment value. Two of the 33 frames show pictures of real babies! Two more depict, respectively, children playing in a sandpit and a cosy family of four on the lawn. Several others are devoted to the dubious advantages of douching the uterus with a solution of baking soda or vinegar to predetermine a male or female offspring. There is a more useful aspect of the strip of course, dealing with the chromosomal basis of sex determination and sex-linked inheritance, but the edge is taken off it a bit when one reads in the accompanying notes that the XO condition in Turner's syndrome arises as a result of non-disjunction (!) during germ cell formation. This particular kind of annotated film strip could have great convenience value to the teacher, were it not for the fact that there is no such thing as instant knowledge. A grasp of genetics can only be gained in the laboratory, the library and the lecture room through a long sentence to hard labour. There is the added danger too that this "publication" may be seized upon by the less well informed teacher as a substitute for real knowledge and used as prefabricated lectures. There is not even the possibility of falling back on the instruction in one of the several introductory frames to "switch on audio now", because none is provided.

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DNA SYNTHESIS. Arthur Kornberg. W. H. Freeman and Company, San Francisco. Pp. 399+194 figures, 69 tables. £9.40.

The time is now ripe for a broad survey of what is known about the synthesis of DNA. Professor Kornberg's new book takes the reader through all aspects of the subject, commencing with a lucid introduction to the structure and functions of DNA. The provision of the monomer precursors for DNA synthesis and the polymerisation mechanism catalysed by prokaryotic and eukaryotic DNA polymerases are described in detail. The volume is at its best in these sections although the emphasis, not unexpectedly, is placed on the enzyme systems purified from *Escherichia coli*.

Having provided much of the necessary enzymological background, the book goes on to place the enzymes (including nucleases, ligases and methylases) in the context of the replication of DNA *in vivo*, and of repair, recombination and restriction. DNA-dependent RNA polymerase from *Escherichia*

coli is described in a way that provides a comparison of it with DNA polymerases, and the currently accepted involvements of RNA synthesis and of ribonuclease H in replication are covered adequately.

The final chapter is concerned with gene synthesis and reminds the reader of possible social consequences of research in that area.

This is really an excellent book, written clearly and in a stimulating way by a distinguished enzymologist. The illustrations are lavish in number and superior in quality; many of them are in colour and some are good quality electron micrographs. Together with the tables they provide all the centrally important information relating to DNA enzymology and replication. There are subject and author indexes; moreover, original references in the text are quoted in full at the foot of each page.

At £9.40, the volume is perhaps out of the reach of the pockets of senior undergraduate students, but it certainly should be read by them, by all teachers of modern biochemistry and molecular biology and by those engaged in research on DNA. Furthermore, the book is very easily readable, and that is yet another major achievement of the author.

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SEVENTY GENERATIONS OF SELECTION FOR OIL AND PROTEIN IN MAIZE: Ed. J. W. Dudley. Crop Science of America, Inc., Madison, Wisconsin, 1974. Pp. 212. No price stated.

In 1896 C. G. Hopkins, working at the Illinois Agricultural Experiment Station, started to select for high and low protein and oil content in Maize. This experiment, which is still continuing, has now reached its 70th generation and is unique in its duration of selection for economically important characters in an agriculturally useful species.

The book consists of reprints of eight of the classical papers describing various stages of the work, together with a final chapter which provides a comprehensive summary and interpretation of the response over 70 generations of divergent, reverse and switch back selection. The results are of great interest to geneticists and breeders of both cross- and self-fertilising crops, in indicating the possible extent of direct and correlated responses to selection. After 70 generations of selection the high protein lines have 25.5 per cent and the low lines 4.60 per cent protein while the high and low oil lines have 16.7 per cent and 0.76 per cent oil respectively. The possibility of obtaining mean differences which are 20 standard deviations greater than that of the original population as in the case of protein, and 37 standard deviations as in the case of oil, must be a source of encouragement to most breeders, as is the indication that the response to selection has continued for such a long period and that in three of the four populations it shows every likelihood of continuing. This, and the rapid rate of response to reverse selection found in all four lines, suggest that there are still significant amounts of genetic variability remaining in the lines which can be manipulated by the breeder. However, as its grain yield has not been satisfactory and the nutrient quality of the increased protein is poor, the high protein line has not been used commercially; neither has the high oil line, although it has been used as a parent.