

*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.

Taking the book as a whole, the republished papers and the photographs of the early research workers and their materials are chiefly of historic interest. As would be expected from its composition, there is a great deal of repetition and, apart from providing additional background information, I am doubtful of the need to republish the original papers. The final chapter provides a comprehensive summary of the results to date and could, perhaps, have been more profitably published as a paper in an appropriate genetical or breeding journal.

Even with the increased interest in breeding for improved quality, I doubt whether this well produced book will be purchased by many individuals. However, every student of genetics should be aware of the significant results it contains, while laboratories concerned with breeding and selection should have a copy available for reference, and as a source of encouragement to the breeder when progress by selection appears to be slowing down.

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