

on his own speciality. Much of the credit must go to the editors, who have persuaded most of the seventy-one authors to write in a style that is clear and relatively free from the jargon so common in the clinic or laboratory. No budding psychiatrist need be put off by the size of the volume: he will find no better book to serve both as an introduction to the subject and as a standard reference work.

Beginning with a section on the history of psychopharmacology, the book is divided into ten sections; the subjects include basic anatomy and physiology, the biochemical mode of action of drugs, the pharmacological basis of therapy, methods of studying the actions of drugs in humans, and drug abuse. A valuable feature of this arrangement is that individual sections or chapters can be read independently. The cross-referencing and bibliographies allow the reader to go more deeply if he desires. Unfortunately the index is not quite up to the standard of the rest of the book; for example, under "dopamine" no reference is made to the excellent chapter on the extrapyramidal side effects of drugs, where this neurotransmitter features prominently.

By 1965 some fifty million people had taken chlorpromazine, and yet the fundamental mode of action of this drug is still not understood. The reader of this book will wonder whether there is too much emphasis at present on the theories which explain the action of drugs in terms of synaptic transmission in the central nervous system. Nevertheless, strong support for these theories was given by the discovery that reserpine depletes some nerve terminals of their transmitter (noradrenaline, dopamine or 5-hydroxytryptamine). If we remember, as Aghajanian points out in his chapter, that neurones containing monoamines represent less than 1 per cent of all brain neurones, we can be optimistic about the future of psychopharmacology. For the time being, "Clark and del Giudice" provides a balanced, clear and comprehensive introduction to existing knowledge.

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WORK FOR BIOLOGY TEACHERS

Nuffield Advanced Science

Biological Science. (Penguin: Harmondsworth, Middlesex, 1970. Published for the Nuffield Foundation.)

Maintenance of the Organism

A Laboratory Guide. Edited by C. F. Stoneman. Pp. xii+158. 16s.

Organisms and Populations

A Laboratory Guide. Edited by John H. Gray. Pp. ix+142. 16s.

Teachers' Guide

Vol. 1: Maintenance of the Organism, Organisms and Populations. Pp. xiv+213. 25s.

Topic Reviews

Circulation. By W. H. Freeman. Pp. 43. 5s. Control of Breathing. By Margaret K. Sands. Pp. 17. 12s. Metabolism. By C. F. Stoneman. Pp. 35. 5s.

Key to Pond Organisms

By Alison L. Brown. Pp. 45. 6s.

THESE publications are those so far issued by the Nuffield A-Level Biological Science Project. The mass of printed material devised for the A-level trials has crystallized out into a modest set of interrelated books and it is only regrettable that all could not have become available simultaneously because together they form an integrated programme of work and, incomplete, the careful system of cross-reference and flexibility of treatment proposed by the promoters to some extent breaks down. Moreover, any review of present publications can only be an interim evaluation and might be considered premature.

The full set of materials will include, in addition to

those reviewed here: for students, two more *Laboratory Guides* (*The Developing Organism* and *Control and Co-ordination in Organisms*), a *Study Guide* (*Evidence and Deduction in Biological Science*) and at least nine further *Topic Reviews*; for teachers, *Teachers' Guide 2*, complementary to the second two students' *Laboratory Guides*, *Teachers' Guide 3*, for the students' *Study Guide*, a *Laboratory Book* and *Projects in Biological Science*. A number of film loops will also be available.

The current *Laboratory Guides* are compact, clearly printed, systematic work books which fulfil their claim to provide a coherent treatment of a series of biological topics based on laboratory investigations. This enquiry approach leads students to gain information for themselves and, in doing so, to get some understanding of the processes whereby biological knowledge is acquired. Each set of investigations is preceded by an explanatory introduction and is followed by questions which give direction to the enquiry and by a bibliography which suggests supplementary reading and includes reference to the relevant *Topic Reviews*. In addition to this basic practical work, there is also optional "extension" work.

The *Students' Guides* are unusually and refreshingly explicit about certain points too often taken for granted, such as the interpretation of sections in relation to three dimensional structure and the detailed explanation of the successive stages in various technical procedures. The *Key to Pond Organisms* is simple and well illustrated by small line drawings. It has a generous bibliography and will obviously be of use as a ready means of identification in many ecological contexts. The *Topic Reviews* are concise and self-contained. They include much interesting information related to their particular subjects and have further bibliographies of their own. Although the standard of accuracy is high throughout, *Circulation*, page 7, paragraph 3, states that, "In a double circulation the left side of the heart always receives oxygenated blood". Presumably the writer refers to mammalian double circulation only and not to birds, although these are mentioned in a previous paragraph.

The *Teachers' Guide 1* is complementary to the two *Students' Laboratory Guides* with which it is linked by numerical cross-references. It distinguishes between students' elementary and main work and explains how the *Laboratory Guides* should be used. Each investigation is treated under five headings. (1) "Associated Materials", which refers to complementary work in the *Study Guide* and to appropriate visual aids; (2) "Principles", which gives an outline of the aims of the investigation; (3) "Teaching Procedure", which suggests approaches, gives links with work in the *Laboratory Guide* and pinpoints possible difficulties; (4) "Practical Problems of Teaching"; and (5) "Questions", which delineates expected answers to the questions posed in the *Students' Laboratory Guide* and suggests possible further discussion.

It is justly claimed that these materials do not represent a rigid syllabus. They could be used in a variety of ways related to the different circumstances found in schools, and the varied abilities, backgrounds and aspirations of students. "A flexible approach has been adopted for presenting biological science as an interesting and important subject related to the potential biologist and non-biologist alike." A teacher with access to the complete set of materials should certainly be able to "develop that balance between the theoretical and practical best suited to his own students". All the same, I suspect that this programme could be just as much of a strait-jacket as the traditional external syllabus and the work makes stringent demands on teacher and student. Still, the priorities are right, investigation is paramount and biology really could come to life as a relevant, exciting and absorbing pursuit for individual study at a level appropriate to the previous experience and future prospects of the sixth-former concerned. The onus is on the teacher.

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