

data can be obtained from these pages) are fully worked out to illustrate the methods, according as observations are made of stars, the Pole star, planets, the sun or moon. The principles of the bubble air sextant are explained and the methods of observation are described.

These volumes are eminently practical and can be strongly recommended to all navigators. They can be read in an hour or two and should help to dispel the mistaken belief that there is anything mysterious or complicated in the principles and methods of air navigation. H. S. J.

## THE TEACHING OF BIOLOGY

### (1) Animal Biology

By Robert H. Wolcott. (McGraw-Hill Publications in the Zoological Sciences.) Second edition. Pp. xxi+649. (New York and London: McGraw-Hill Book Co., Inc., 1940.) 24s. 6d.

### (2) Human Biology

By Prof. George Alfred Baitsell. (McGraw-Hill Publications in the Zoological Sciences.) Pp. xv+621. (New York and London: McGraw-Hill Book Co., Inc., 1940.) 26s.

(1) **T**HE basic themes around which this course in zoology is built are: life as a chemico-physical basis and life as a manifestation of metabolism. The choice of title is a happy one, for the course here devised is truly a biological one, and should cause most authorities responsible for general university degree courses in Great Britain to think whether their teaching is not too much based on systematics and type systems, at the expense of animal physiology.

Having got a course in animal biology (as opposed to zoology) it is not a very far cry to general biology; since Prof. Wolcott has proved possible, and even desirable, a course in animal biology up to university degree standard, it should be no more difficult to devise a course of the same standard in general biology—a course of study which is practically non-existent in Great Britain. Indeed, even in this avowedly "Animal Biology" the author has recourse to plants in such topics as tropisms, photosynthesis, alternation of generations, etc. Maybe the day will come when students in all universities can take a degree course in general biology, instead of the present botany and or zoology courses. Until that day comes, there will perforce be a lack of good teachers of biology in schools, with the consequent backward condition of the teaching of the subject. It is surely a reflection on our system of teacher training that even now many teachers of biology in schools have either not qualified in the subject or are specialists in botany or zoology, and consequently either biased or ill-informed, or both.

At this stage, therefore, we would strongly recommend all students of zoology and certainly

all teachers of biology to read Prof. Wolcott's book. Though he does not ignore zoological 'types' altogether, he does, on the other hand, lay special emphasis on general, comparative and economic aspects under such chapter headings as: energy, protoplasm, metabolism, plants and animals, behaviour, Protozoa and diseases, tissues, fertilization, reflex action, anthropoid apes and man, structure of organisms, developments, ecology, animal organisms in health and diseases, and so forth.

(2) Prof. Baitsell's book strikes an even more novel note, basing an introductory study of biology on a study of man himself. The author's reason for such a course is sound, being based on "the increasing realization . . . that the majority of students beginning work in college biology were, inherently, far more interested in acquiring knowledge about the human organism than they were concerning any other living species". We believe this to be true in the majority of cases.

Here again, plant biology is utilized in the study of certain aspects of the subject. The text is by no means medical. It is a real biology with man as the main 'type', though others are frequently called upon, for example, the development of the frog, chick, other mammals, in leading up to growth and reproduction in man.

There are an interesting chapter on disease and a very extensive appendix of ninety-three pages which will do much to prevent the student's thoughts being devoted solely to man. The appendix is unusual in being arranged alphabetically in encyclopædia fashion. It deals with such diverse subjects as acetylcholine, Amœba, Aristotle, biology of medicine, Brownian movement, colloids, diffusion, germ plasm, taxonomy, history, pneumonia, etc.

Both these books are by American biologists and therefore might with advantage be consulted by British students and teachers, since biology is an academic and cultural subject of study and has made greater progress in the United States than in Great Britain. But the live British biologists are aware of our shortcomings and will welcome the aid offered by such as these books.