Book Reviews

Dynamics of Behavior. Robert S. Woodworth. Holt, New York, 1958. x + 403 pp. Illus. $5.

"The main contention of this book—seemingly a perfectly obvious and innocent view—is that behavior consists of active give and take between the organism and the objective environment. This interrelationship may be called dealing with the environment."

This short passage, in Woodworth's clear style, is the keystone of a systematic structure of psychology built through many years and presented now in fairly complete form. The statement does seem "obvious and innocent," but it tells a good deal.

In writing a general psychological theory some authors choose a "tight" system with few independent principles and many specific deductions. Others favor a more flexible scheme, with principles which are very general and have little specific implication. The first approach risks being wrong, the second, being vague. C. L. Hull, of whom Woodworth often makes telling criticisms, chose the first plan. Woodworth himself, more empirically inclined, takes the latter. The broad statement quoted tells us that behavior will not cease when the biological needs are satisfied, for there are many interactions with the environment which are primary and not derived from needs. The facts arrayed to support this are powerful. Yet the proposition does not attempt to say what objects will be "dealt with" or to state the manner of the dealing. These matters would remain, presumably, as unsystematized observed facts.

"Objects" is an important word in the statement. These lasting collections of physical properties and relations, rather than simple stimuli, are the whence and whither of behavior. Therefore there needs to be, Woodworth contends, an encoded representation of these built up in the organism, a "perception" of the environment. The most important sort of learning, if not all of it, is the learning of places, distances, and other sorts of relation, rather than the connecting of movements with stimuli.

One may also read the book as a survey and discerning critique of experimentation—much of it very recent, some of it classic, and some older but little known. This will surely cause the book to be widely studied, and the theoretical interpretation will as surely make it widely discussed. It could hardly be otherwise with a book by R. S. Woodworth.

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Mass Spectroscopy. Henry E. Duckworth. Cambridge University Press, New York, 1958. xvi + 206 pp. Illus. $6.50.

This newest addition to the *Cambridge Monographs on Physics* is a rapid scan over the spectrum of instrumental principles and physical applications of mass spectroscopy. It is not a "do-it-yourself" handbook, and it does not provide a detailed discussion of instrumental and vacuum techniques and chemical applications. Duckworth's book is more a *Reader's Digest*-type summary, in which the brevity and restriction of subject matter reflect the evolution of the mass spectrometer from the demimonde of development to the social whirl of everyday research.

The first half of the book covers ionic focusing, production and detection of positive ions, and the various kinds of mass spectroscopes, from simple direction focusing to double focusing, time-of-flight, and cyclotron resonance instruments. The treatment is authoritative, factual, and succinct, with the emphasis on actual numerical data on performance and design parameters. A general acquaintance with orthodox instrumentation and electronics is assumed, and derivations of equations are generally omitted; granted these premises, what is left is a highly condensed and well-organized summary of essential facts and references.

The remainder of the book is devoted to isotopic abundance and atomic mass determination, applications to nuclear physics, ionization and dissociation of molecules, and applications to geology. Some 25 pages are given to geological studies on radiogenic and stable isotope variations, but only the briefest survey of these rapidly expanding fields was possible in that space. [The citation of Nier's standard carbon isotope ratio (page 168) should give limestone, rather than sandstone, as the material analyzed.] A table of isotopic abundances and atomic masses, and 16 pages of references, conclude the book.

The discussion of atomic masses is of special interest because of the increasing awareness that O^{16} and $O^{(16+17+18)}$ are hardly suitable mass standards in this day and age. The author shows considerable restraint, for a mass spectroscopist, in his discussion of the mass scales, but he does indicate the importance of adopting C^{12} as a universal mass standard, emphasizing the general agreement on the C^{12} mass spectrometric mass and its unmatched utility as a standard for atomic masses. The discussion of this subject could and should have been amplified considerably; reticence on a controversial subject is unbecoming to an authority. The recent discovery by Mattauch that the discrepancies between mass spectroscopic and nuclear reaction mass data generally disappear if any standard other than O^{16} is chosen adds considerable fuel to the C^{12} fire. It does seem that chemists might be sufficiently involved in physics these days to give up their sentimental attachment to the analytical balance; and, who knows—if we can abolish the double standard for atomic weights we may even hope to get the United States on the metric system some day.

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Cunningham's Manual of Practical Anatomy. vol. I. General introduction. Upper limb, lower limb. Revised by James Couper Brash. Oxford University Press, New York, ed. 12, 1957. xii + 2394 pp. Illus. $6.

Since the 1890's the various editions of *Cunningham's Manual* have led innumerable students through countless dissections. The present 12th edition, the fourth by the same author in the last 20 years or so, attests to the conservative character of the manual. Only volume 1 is as yet available; a few new illustrations, a few new x-rays, and an adaptation to the recently modified terminology of the Paris revision (1955) represent the major changes from the preceding editions.

The text is as simple and direct as ever, the illustrations are clear and diagrammatic, the dissection procedure and precautions are nearly foolproof, and the