of response, goes unmentioned, but "Skinner box" (p. 353) and "schedules of reinforcement" (p. 354) are mentioned. Admittedly, Pavlov and Skinner themselves have contributed to the kind of confusion reflected in this book, Pavlov by physiologizing and Skinner by emptying the organism and misdirecting his criticisms at the apparatus and procedures of others. Nevertheless, a comprehensive survey of the sort attempted by Altman should do more than perpetuate confusion.

The parallelism in the concluding paragraphs in James's *Principles* (*2*, vol. 2, pp. 688–9) and Altman's text (p. 469) is startling. Both give empirical and logical priority to structure ("nervous system," "neurology"). Both are at great pains to point out how little we know about mental function ("psychogenesis," the "psychic"). Both end on a note of despair (" 'utter night'," and "cannot be resolved"). In view of the despair of both James and Altman, it is my opinion (*6*) that physiological psychologists, indeed all scientists, should consider assigning the same reality status to function as they do to structure.

The feeling one has as one reads the book is that it is a solid (structural) book, solid to heft and solid to own. It contains separate author and subject indices, a 36-page bibliography, lists of suggested general readings, many illustrations, and much information. It should prove useful for teaching and for the researcher who wants to know what has been happening recently in physiological and comparative psychology.

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2. W. James, *The Principles of Psychology* (Holt, New York, 1890; 2 vols.).
3. V. G. Dethier, *Science* **143**, 1138 (1964).
4. I. P. Pavlov, *Conditioned Reflexes* (Oxford Univ. Press, London, 1927).
5. B. F. Skinner, *The Behavior of Organisms* (Appleton-Century, New York, 1938).
6. W. C. Stanley, "A Mathematical Analysis of the Function-Structure (Wave-Quantum) Problem in Science," in preparation. Compare Dethier's statement that ". . . there is more to the behavior of insects than systems analyses and unit neurological analyses reveal" (*3*, p. 1145).

Mathematical Activity in England

E. G. R. Taylor's **The Mathematical Practitioners of Hanoverian England, 1714–1840** (Cambridge University Press, New York, 1966. 519 pp., illus. $16.50), a sequel to her *Mathematical Practitioners of Tudor and Stuart England* (Cambridge University Press, 1954; shortly to be reissued) is the swan song of a remarkable woman who did much to create the modern science of geography in the early years of this century and subsequently developed a consuming historical interest in cartography and navigation. Her *Haven-Finding Art* (1957) will be familiar to many, and indeed it was as an offshoot of her researches into navigational techniques, maps, instruments, and teaching methods in post-medieval England that her interest in the lower echelons of practicing mathematicians developed.

Taylor's earlier volume on mathematical practitioners struck a rich vein in chronicling en masse the many mathematics teachers, textbook writers, map- and instrument-makers, and engineers who during the 16th and 17th centuries, it could be argued, laid the foundation for England's maritime supremacy and scientific prominence by 1714. Skillfully filling in the background of a period she knew so well, Taylor unearthed a great deal of informatory detail relating to the life and work of the humble practitioners to whom she was determined to accord due recognition. The pattern she there established, in which a set of prefatory general essays introduce a series of lists of potted biographies and a calendar of books and pamphlets published, is now (with some modification) repeated in this continuance of the story up to 1840. Over the preceding century and a quarter the careers of some 2270 who, for want of a better phrase, "practiced" mathematics are traced. Taylor, it would be fair to say, does not refute the accepted view that 18th-century England was a mathematical backwood, but at least she reveals that the wood was alive with activity, not usually well directed, of all kinds.

The two volumes share a basic weakness. The mathematical practitioners they study were never more, at any time, than an ill-assorted, motley group with no real unifying bonds of education, social class, political influence, or intellectual parity: indeed, they achieved true identity only about the beginning of the 19th century when they splintered into the autonomous professions of surveyor, architect, engineer, actuary, draftsman, and others. The net which seeks to trap discordant elements must perforce be both wide and full of holes. Taylor has inevitably, in her determination to miss not a one, caught some surprises in hers, from Isaac Newton and Benjamin Franklin down to William Herschel and the infamous Captain Bligh of the *Bounty*, but has lost, for example, the émigré Huguenot Abraham de Moivre, who trod the streets of London many long years between the houses of his pupils. In the more conventional entries, too, a certain incompleteness of information and false emphasis are apparent. (We are not told that John Harris in 1702 wrote the first vernacular tract on fluxions or that Edmund Stone's greatest gift to his contemporaries was his English version of L'Hôpital's *Analyse*.) On the whole the fine, flowing prose of the more general essays hides their tendency to be mere scrappy running commentary on particular events or situations (the activities of the Admiralty's Board of Navigation, typically, or particular refinements in contemporary instrumentation). No profound assessment is made of the dampening effect of the lack of systematic mathematical education in either school or university, or of the cumulative influence of the writers of popular textbooks in bowdlerizing mathematical taste. Like its predecessor, the newer book will find its main use as a directory but is not adequate to do more.

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Statistical Mechanics

During the last few years the literature on general statistical physics has been enriched by various contributions. It is, however, only in relatively few of the monographs that one finds a serious attempt towards a synthesis of the macroscopic concepts of non-equilibrium thermodynamics and the concepts of statistical mechanics based on the ensemble theory. Wolfgang Yougrau, Alwyn van der Merwe, and Gough Raw's **Treatise on Irreversible and Statistical Thermophysics** (Macmillan, New York, 1966. 288 pp., illus. $9.95) constitutes a valuable attempt in this direction. At the same