a first reference source for individuals who are looking for material on baboons and their use in research. It is less likely to be a major source of new biomedical information unless the information is directly concerned with baboons, for much of the material has been published in scientific journals. Researchers who contemplate the use of baboons will carefully peruse its contents; those who are considering other species should examine it to determine whether the baboon surpasses the alternative choices.

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Sir Benjamin Thompson, a Biography

Count Rumford of Woburn, Mass. W. J. Sparrow. Crowell, New York, 1965. 302 pp. Illus. $5.95.

From 1867 to 1871 George E. Ellis worked through all of the available original documents to produce his monumental *Memoir of Sir Benjamin Thompson, Count Rumford*, which was published by the American Academy of Arts and Sciences in connection with an edition of Rumford's complete works. All subsequent full-length biographies of Count Rumford have been based directly on this classic work. Some have been unscholarly rewrites like *Count Rumford of Massachusetts* by James Alden Thompson (Farrar and Rinehart, 1935). Some have been almost journalistic novels, such as *An American in Europe*, by Egon Larsen (Philosophical Library, 1953), which abounds in historical inaccuracies but which paints a most realistic picture of the Count. This present volume, which was published in England under the title *Knight of the White Eagle*, is as careful a historical study as can be made, using Ellis as a base.

Sparrow has uncovered some original material in England. Here he publishes in book form for the first time some most interesting material that he discovered in the Birmingham Assay Office in the process of doing the research for his Ph.D. thesis, which was on the life of Rumford. He was also instrumental in having the Library of the University of Birmingham buy a copy of a diary which Rumford kept in 1801. Sparrow has also made use of Sir Charles Blagden's *Diary* and of some material in the Royal Institution which Ellis did not use. Thus, Sparrow is the first one in many years who has gone back to some of the original documents.

The book is definitely aimed at an English audience. Although out of his life span of 61 years Rumford spent less than a dozen years in England, more than half the book is connected directly with his life in England. This, of course, is understandable because it is in this area that the novelty of the book resides, but it does give a rather unbalanced picture of his life. Rumford spent his most productive years in Bavaria, and he carried out many more of his scientific and technological investigations in France than in England.

It is worth commenting on the arrangement of the discussion of his scientific work, which is dealt with in two isolated chapters. I believe that one should not discuss the life of a scientist by separating his science from his everyday living. The whole interaction of a man and his environment is so much involved in the direction which his life takes that it does a disservice to a man of science to categorize his political, philanthropic, and emotional life completely separate from his scientific endeavors. Yet this seems to be common practice in writing about scientists; it is somehow assumed that their scientific contributions are separate from their living in the society of their fellows.

The American publisher is to be censured for a most misleading "come-on" on the dust jacket—"Here is the first full-length biography of Benjamin Thompson, the versatile American scientist who first recognized heat as a form of energy." This is certainly not the first full-length biography; three previously published English biographies are mentioned in this review, and there have been full-length biographies in other languages, including several in German. Also, as Sparrow points out, Thompson did not recognize heat as a form of energy but rather as being produced by the expenditure of work. No such blatant disregard for the truth is evident on the dust jacket of the British edition, *Knight of the White Eagle: A Biography of Sir Benjamin Thompson, Count Rumford (1753–1814)* (Hutchinson, London, 1964).

To summarize, one should say that this is a gentle, gentlemanly, and scholarly biography of a man who was far from gentle, gentlemanly, or scholarly. The book is definitely worth reading but one must realize that Sparrow has been even kinder to Rumford than any of his other biographers. Not only does he underplay Rumford's faults of character but he glosses over completely some of the less honorable facets of his life, for example, his mistresses and his illegitimate children. Even Ellis in the early 1870's was not that kind. It is a very friendly biography, is carefully done, and certainly serves to keep the figure of Count Rumford in the eye of the modern public.

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Animal Behavior

Advances in the Study of Behavior. vol. 1. Daniel S. Lehrman, Robert A. Hinde, and Evelyn Shaw, Eds. Academic Press, New York, 1965. x + 320 pp. Illus. $9.50.

This volume, the first of a series planned to cover recent developments in the field of animal behavior, contains six chapters written by authors actively involved with the particular topics. Although close intimacy with a particular topic sometimes prompted an individualistic perspective, the presentations are enthusiastic and sophisticated with respect to general methodological problems. This interdisciplinary volume should have wide appeal to students and investigators in zoology, ecology, human development, psychology, and anthropology.

T. C. Schneirla presents his theory of biphasic (approach/withdrawal) behavioral processes. The theory is carefully developed and encompasses a wide range of biological and behavioral manifestations (fetal behavior, "innate" perception, neural development, imprinting, contiguity, reinforcement learning, and the like).

The resurgence of research interest in the behavior of newborn infants is reviewed by H. F. R. Prechtl. Multitudinous behavioral observations dur-

ing the first week of life are combined into rather gross but reliable behavioral classifications—level of "arousal" (sleep/wakefulness), postural pattern, general motor activity, and specific responses. Prechtl emphasizes that needed standardization can be achieved by delineating arousal level, neurological integrity, and obstetrical antecedents.

Varied techniques that have been used to resolve the classical dilemma as to whether perception is innate or learned are described by R. D. Walk. There is an evaluation of classical monocular-binocular cues, reviews of physiological mechanisms and of recent research generated by the visual-cliff technique, and descriptions of behavioral methods where subjects demonstrate depth perception by appropriate reactions (reaching, avoidance, and the like). Some apparently consistent trends are revealed by the highly variable procedures, and the author emphasizes the need for standardized methodology.

Psychological and (especially) physiological aspects of selective perception are discussed by G. Horn. Various findings from evoked potential and electroencephalogram techniques are interrelated with major subtopics of sensory pathways and neural responses to novel stimuli. Included in the latter topic are recent findings of unit studies and a system, proposed by Horn, which incorporates much behavioral and neurophysiological data. The wealth of interacting variables that can affect propagation and coding of sensory inputs should counter tendencies to create "attentional homunculi" or to assume that attentional phenomena are attributable to hypothetical brain stem and gamma efferent activity.

K. Schmidt-Koenig reviews a considerable amount of recent research on bird orientation. The organization of the material provides a good illustration of the methodological interplay between field observation of wild birds and controlled experiments in the laboratory. A discussion of rather formidable methodological problems suggests that further significant contributions will be made only by trained investigators.

Conditions and data relevant to habitat selection in birds are described by P. H. Klopfer and J. P. Hailman. The subtle interplays among environmental conditions (temperature, foliage, and food, for example) and behavioral factors (precocity, imprinting, and social interaction) relevant to selection of habitat are clearly presented and should be of interest to scientists concerned with behavioral evolution.

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Astrophysics and Radio Astronomy

General Relativity and Cosmology. G. C. McVittie. University of Illinois Press, Urbana; Chapman and Hall, London, ed. 2, 1965. xii + 241 pp. Illus. $6.95; 50s.

Professor McVittie's book is in refreshing contrast to most recent publications on general relativity. For the past quarter century, work in this field has grown ever more formal, with little attempt to relate the theory to the observed world. In marked contrast, McVittie continues the tradition of Tolman and Robertson, drawing from the observational data, meager as they are, the vitality needed to convert formal mathematics into theory.

The past decade has witnessed a great expansion of our knowledge of the Universe and its cosmological setting, and in this second edition of his book McVittie has completely rewritten the last two chapters dealing with this problem. The experts on relativity will find this the most interesting and important part of the book.

While most modern relativists have dropped the cosmological term from Einstein's equation, McVittie has retained it and based his discussion of cosmology on an assumed nonzero value of the "cosmological constant." His argument that the constant appears naturally as a "constant of integration" is not completely convincing after one recognizes that this term does not appear in the Euler equation derived from a variational principle without the introduction, *ad hoc*, of an added term in the variational equation. Most relativists find distasteful the arbitrary introduction into the theory of a large characteristic constant length. They would prefer to drop this term until the observations clearly demand it. In my opinion the observations are not yet complete enough to demand a nonzero "cosmological constant."

McVittie has an easy flowing style that makes his book easy to read. While several important parts of the traditional presentation of general relativity are omitted from his development, the parts he treats are covered with care, and this part of the book can be recommended to the student who wants an introduction to the subject. The section on cosmology should be of interest to a very wide range of readers.

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New Books

Mathematics, Physical Sciences, and Engineering

Adhesion and Adhesives. vol. 1, *Adhesives*. R. Houwink and G. Salomon, Eds. Elsevier, New York, ed. 2, 1965. 564 pp. Illus. $24. The contributors are K. W. Kirby, A. M. Kragh, W. R. Lewis, C. A. A. Rayner, R. N. J. Saal, G. Salomon, W. Van Der Colk, W. C. Wake, J. H. Wills, and J. Wootton.

Advances in X-ray Analysis. vol. 8. Proceedings, 13th Annual Conference on Applications of X-ray Analysis (Denver), August 1964. William M. Mueller, Gavin Mallett, and Marie Fay, Eds. Plenum Press, New York, 1965. 486 pp. Illus. $20. Forty-two papers.

Aerospace Ranges: Instrumentation. Joseph J. Scavullo and Frederick J. Paul. Van Nostrand, Princeton, N.J., 1965. 473 pp. Illus. $15.75. Principles of Guided Missile Design Series, edited by Grayson Merrill.

Analysis and Fractionation of Polymers. American Chemical Society symposia (Chicago, Ill.), September 1964. John Mitchell, Jr., and Fred W. Billmeyer, Jr., Eds. Interscience (Wiley), New York, 1965. 320 pp. Illus. Paper. $12.75. Twenty-four papers.

The Art of Algebra: A Simplified Account of Numbers, Equations, Groups, and Continued Fractions. Roger North. Pergamon, New York, 1965. 228 pp. Illus. Paper. $2.95. A volume in the Commonwealth and International Library of Science.

An Atlas of Models of Crystal Surfaces. John F. Nicholas. Gordon and Breach, New York, 1965. 239 pp. Illus. $27.50. Materials Science and Engineering Program Series, edited by G. J. Dienes and A. C. Damask.

Atomic and Space Physics. Alex E. S. Green and Philip J. Wyatt. Addison-Wesley, Reading, Mass., 1965. 635 pp. Illus. $18.75. Addison-Wesley Series in Aerospace Science.

Automatic Control of Aircraft and Mis-

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