request that he accept the directorship of the Johns Hopkins Institute. The 15 years Sigerist spent at this institute were critical in the development of medical history in America.

The diaries enable an appreciation of Sigerist the man as well as his many travels and activities. One reads of Sigerist's hopes for medical history in America, of the energetic William Welch, of Harvey Cushing, at 62 still nervous before each operation. One encounters also Sigerist's bouts with the American press and medical profession resulting from his regard for the Soviet Union and his espousal of "the complete socialization of medicine." Finally, the reader finds Sigerist, ill, a scholar frustrated by criticism and administrative minutiae, leaving the United States to spend his last years in Switzerland.

Sigerist lived during eventful times that were generally unreceptive to his field of scholarship and his social ideas. Because he dedicated his total energies to both, Sigerist's perceptive personal writings illumine the academic and social modes of Europe and America during his lifetime and will interest the general reader as well as the medical historian.

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Superconductivity

An Introduction to the Theory of Superconductivity. CHARLES G. KUPER. Oxford University Press, New York, 1968. xxii + 301 pp., illus. \$9.60. Monographs on the Physics and Chemistry of Materials.

This is an admirable little book. In its 272 pages of text it treats almost all aspects of the theory of superconductivity. It even includes a short development of some elementary aspects of the theory of solids, including the theory of electrons in a periodic lattice, and finally works up to the theory of the electron-phonon interaction. Some of the recent aspects of the effects of various "pair-breakers" in superconductors are not treated, although the chapter on propagators in superconductors can serve as an introduction to this field. Most aspects of the presentation are clear and concise, and because of this and the small size of the book it can be taken along on trips to pass the time during the usual airline delays.

The flavor of the book is overwhelmingly English, and much emphasis is given to the work of Pippard and Frohlich in the 1950's. This treatment gives a different perspective on the development of the theory of superconductivity, especially the work of Frohlich, which is not emphasized in most recent American treatments of the subject. Another interesting case is the crucial discovery of the isotope effect. In this country credit is usually given to E. Maxwell and to B. Serin, C. A. Reynolds, and L. B. Nesbitt for simultaneous discovery. I was surprised to see Maxwell's work neglected in Kuper's discussion; instead, the work of Allen *et al.*, which is virtually unknown here, is mentioned.

A few comments about the treatment of the Ginzburg-Landau theory are in order. In general this section appears unenthusiastic and a little weak, although with the brief analysis of type II superconductors it is probably a more detailed treatment than most general texts provide. The author begins with statements of why the Ginzburg-Landau theory is less general than the Pippard theory and also includes statements to the effect that the original motivation of the Ginzburg-Landau theory is less direct than the Pippard theory. In the first case Bardeen has shown that the Ginzburg-Landau theory can be modified to yield nonlocal equations of the Pippard type. As to the motivation of the Ginzburg-Landau theory, I think that theory is as clearly motivated as the Pippard theory. In their original paper Ginzburg and Landau make their motivations quite clear, and mention that they are taking surface energies into account. Next, there seems to be some confusion in the book between Pippard coherence length and the coherence length of the Ginzburg-Landau theory, which describes the characteristic distance over which the order parameter of the Ginzburg-Landau theory changes. In surface energy arguments, such as that on page 112, the Ginzburg-Landau coherence length should appear in the expression $\xi H_c^2/8\pi$, and not the Pippard length as stated. Also, the Ginzburg-Landau expression for the free energy given on page 108 is the Helmholtz function and not the Gibbs function as stated. Almost every author says something slightly different about this point, but I think that the expression on page 108 is the Helmholtz function.

The brief discussion of Pauli spin paramagnetism and the Knight shift is weak and does not take account of the latest results. With recent new measurements on Al and the theory of spin-orbit scattering of Ferrell and Anderson there are no particularly puzzling questions left to hamper our understanding of the Knight shift.

Of course, these criticisms are rather minor, and I would like to say more about some of the other excellent features of this book. The complete treatment of second quantization and the chapters on quasi-particles and propagators make for a fairly complete introduction to the more general aspects of the theory. Another valuable feature of the book is the extended discussion of the problem of the Meissner effect in both the phenomenological theory and the microscopic theory. In general, the author does not hide problems and difficulties presented by various theoretical arguments, and this gives the reader valuable perspective on the limitations of the treatments.

All in all, this book is one of the best elementary treatments of the subject and will be a valuable addition to the libraries not only of aficionados, but also of general readers interested in learning about superconductivity.

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Efforts toward a New Science

The Neurosciences. A study program planned and edited by GARDNER C. QUARTON, THEODORE MELNECHUK, FRANCIS O. SCHMITT, and the associates and staff of the Neurosciences Research Program. Rockefeller University Press, New York, 1967. xx + 962 pp., illus. \$17.50.

Man must understand better his own behavior. His nature requires it. He is inquisitive and moves along a path whose direction and destination are determined by a constantly shifting balance between his preserving and destroying impulses. This truism has surely been uttered in some form since the beginning of men. And it is equally sure that man has no proper science now to lead him to this urgently needed understanding.

A sense of urgency is not enough, however, to create the new science. That it is needed and that talented people are willing to help make it are also not enough. A science begins to flourish when the tools are ready and when preliminary explorations reveal where to begin. The creation of a new

science may, however, be hastened by a fresh look from the right vantage point. A regrouping of existing talents and an opening of channels between present scientific disciplines might allow that. It was in this belief that the Neurosciences Research Program was formed in 1962. Supported by federal grants, this international, interuniversity organization began by holding a continuing series of workshops, conferences, and lectures to draw out what was known about nervous systems at many levels and about behavior. Some of the results of these conferences have been published in the first volume of a projected annual series entitled Neurosciences Research Symposium Summaries (M.I.T. Press, 1966).

An essential feature of the workshops was that people already successful in the "simpler" biology should meet and draw out the experts in fields of the neurosciences. The workshops were in fact a tooling up for the month-long conference that was held in Boulder, Colorado, during the summer of 1966. The book reviewed here is a result of that conference.

The conference participants were from several countries and from many scientific disciplines. All are experts in their own fields. Morning lectures, afternoon workshops, informal conferences—all these went on for more than four weeks. The articles in this book, according to the editors, are not the lectures originally laid before the conference, but were modified by the response of the participants, their questioning, and the interaction. They are in part the pearls they were meant to be and in part the grains of sand for making into pearls.

The book is lengthy, almost 1000 pages, with 67 articles appearing in seven major sections. The titles of the sections give an idea of the scope of the book: Components of the Nervous System, Molecular Biology, Molecular Biology of Brain Cells, Neuronal Physiology, Brain Correlates of Functional Behavioral States, Brain Correlates of Learning, Interdisciplinary Topics.

Many of the articles are excellent and not only give a good survey of a subject but are written by starting at the beginning and defining terms so that an outsider can begin to look in. This is not true of them all. In any case, the lists of references are extremely useful to anyone who wants to delve further. If there is a single major criticism, it is that the articles do not show sufficient effects of the month-long interaction. Many of the ones on molecular biology, for example, are written just as they might have been for any other occasion, with very little attempted tie-up to the major business at hand. This is meant less as a criticism of the contributors than as an indication of the gap between some of the disciplines represented and the neurosciences. If the gap was closed or narrowed by the conference, it is not well reflected in the writings.

The reviewer of such a book has to ask several questions: What was the goal of the book? Did it reach it? If it did not is it worthwhile anyhow?

The goal is very ambitious: to help lay the beginning of a new science of the nervous system. Whether the book achieves this goal or not, it is a sign of the concern and interest in it and as such may be one of the precursors of success.

I believe two kinds of people are being attracted to neurosciences now. One is the—how shall I call him?—romanticist attracted by the truism mentioned at the beginning of this review. Among the other kind are the new biologists made arrogant by their collective successes, sniffing and walking around the subject, fascinated by it, looking for a soft spot, a place where an attack might be effective. For the latter at least, this book is required, for in it they will be able to see what is going on and begin to make their own judgments and, one hopes, the attack.

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Books Received

Advances in Alicyclic Chemistry. Vol. 2. Harold Hart and G. J. Karabatsos, Eds. Academic Press, 1968. xiv + 269 pp., illus. $15.

Advances in Astronomy and Astrophysics. Vol. 6. Zdeněk Kopal, Ed. Academic Press, New York, 1968. xv + 322 pp., illus. $17.50.

Advances in Control Systems. Theory and Applications. Vol. 6. C. T. Leondes, Ed. Academic Press, New York, 1968. xiv + 321 pp., illus. $15.

Advances in Macromolecular Chemistry. Vol. 1. Wallace M. Pasika, Ed. Academic Press, New York, 1968. x + 434 pp., illus. $16.50.

Advances in Particle Physics. Vol. 1. R. L. Cool and R. E. Marshak, Eds. Interscience (Wiley), New York, 1968. x + 497 pp., illus. $18.95.

Algebraic Coding Theory. Elwyn R. Berlekamp. McGraw-Hill, New York, 1968. xiv + 466 pp., illus. $17.50.

The Alkaloids. Chemistry and Physiology. Vol. 11. R. H. F. Manske, Ed. Academic Press, New York, 1968. xvi + 552 pp., illus. $26.

Analog-to-Digital / Digital-to-Analog Conversion Techniques. David F. Hoeschele, Jr. Wiley, New York, 1968. xviii + 462 pp., illus. $15.95.

Analysis in the Chemical Industry. L. A. Haddock. Pergamon, New York, 1968. xii + 220 pp., illus. $5.50. Commonwealth and International Library.

Analytical Calorimetry. Proceedings of the American Chemical Society Symposium, San Francisco, April 1968. Roger S. Porter and Julian F. Johnson, Eds. Plenum, New York, 1968. x + 322 pp., illus. $15.

Anderson's Laboratory Experiments in Biochemistry. Gordon H. Pritham. Mosby, St. Louis, Mo., 1968. xii + 147 pp., illus. Spiral bound, $4.95.

Animal Societies. From the Bee to the Gorilla. Rémy Chauvin. Translated from the French edition (Paris, 1963) by George Ordish. Hill and Wang, New York, 1968. xii + 281 pp., illus. $6.50.

Animals for Research. A Directory of Sources of Laboratory Animals, Fluids, Tissues, Organs, Equipment and Materials. National Academy of Sciences, Washington, D.C., ed. 7, 1968. viii + 125 pp. Paper, $3.25. NAS Publication No. 1678.

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Annual Review of NMR Spectroscopy. Vol. 1. E. F. Mooney, Ed. Academic Press, New York, 1968. x + 353 pp., illus. $14.

Annual Review of Physical Chemistry. Vol. 19. H. Eyring, C. J. Christensen, and H. S. Johnston, Eds. Annual Reviews, Palo Alto, Calif., 1968. ix + 645 pp., illus. $8.50.

Art and Science of Dental Caries Research. Robert S. Harris, Ed. Academic Press, New York, 1968. xx + 428 pp., illus. $17.50.

An Atlas of Biological Ultrastructure. John D. Dodge. Elsevier, New York, 1968. 80 pp., illus. $10.50.

Atlas of the Pacific Northwest. Resources and Development. Richard M. Highsmith, Jr., Ed.; Jon M. Leverenz, Cartographer. Oregon State University Press, Corvallis, ed. 4, 1968. vii + 168 pp., illus. Paper, $5.

Atlas zur Geologie. Erich Bederke and Hans-Georg Wunderlich, Eds. Bibliographisches Institut, Mannheim, 1968. xx + 77 pp., illus. Meyers Grosser Physischer Weltatlas.

Atoms and Elements. A Study of Theories of Matter in England in the Nineteenth Century. David M. Knight. Hillary House, New York, 1968. vi + 168 pp. $4.50. The History of Scientific Ideas.

The Audubon Illustrated Handbook of American Birds. Edgar M. Reilly, Jr. Olin Sewall Pettingill, Jr., Ed. Drawings by Albert Earl Gilbert. Sponsored by the National Audubon Society, McGraw-Hill, New York, 1968. xx + 524 pp., illus. Through 31 Dec. 1968, $19.95; thereafter, $25.

Autobiography of Charles Caldwell, M.D. Harriot Warner, Ed. Da Capo (Plenum), New York, 1968. xii + 458 pp.

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