account of scientific discovery. But these personal idiosyncrasies do not hide a great deal of valuable behavioral observation, psychological insight, surgical competence, and complex experimentation based on already well-established techniques, including cerebral probing. Yet in being so frank about his early failures, his treatment of the dolphins, and his personal sacrifices, it may be questioned whether he has not done his cause a disservice. It may be noted that Kellogg has deliberately eschewed vivisection with his dolphins, preferring to work with the whole mammal.

A substantial part of both sets of investigations was based on training procedures similar to those which have been used with other animals, such as chimpanzees, dogs, rats, and fish. It seems that dolphins, like dogs and humans, have temperaments, and that account must be taken of these, as Pavlov did, when interpreting the results. Derivative support for the validity of their conclusions on sonar ranging and dolphin vocalization is sought by both authors in the large size of the eighth cranial nerve and the complexity of its central connections. Comparable though much simpler elaborations occur also in some fishes, for example, Triglidae and Mormyridae, and suggest that these may repay further study along these lines. Subjectively, the dolphin's vocalizations for finding and recognition in circumstances where visual localization is thought to be impossible are described as pings, clicks, or creaks. There is a further wide range of vocalizations which Lilly regards as a kind of "dolphinese" language. Kellogg confines himself to his rigid examination of the dolphin's sonar system, but Lilly goes into vivid speculation, expressed graphically and with extreme self-confidence, that these dolphins, through their language and because of the known great size and complexity of their brains, may be the first nonhumans with whom man may learn to communicate. Here his book is more reminiscent of Algernon Blackwood's imaginative fantasies than of legitimate scientific inference; but—to quote his own expression—he "sticks his neck out" so deliberately and provocatively that it would be a pity to harm it, and it should indeed be taken as a warning, though perhaps not in the sense he intends.

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Vistas of Anthropologists

They Studied Man. Abram Kardiner and Edward Preble. World, New York, 1961. 287 pp. $5.

Indeed, they studied man, and from different points of view. This diversity of viewpoint is considered very desirable in this day when interdisciplinary (not multidisciplinary) studies are being advocated. Here, however, we see these representatives of the several disciplines studying man in their own ways, and their efforts are described as seen through the professional eyes of two scholars trained in, and practicing, psychiatry.

The authors state that their interest is not historical but that they "have attempted to relate the seminal hypotheses of the few great innovators in the development of a 'science of man' to the ethos of the times and to the specific lives of these innovators." Their innovations are seen by Kardiner and Preble as cultural responses to "collective interests and needs," but also as "the products of idiosyncrasies and genius."

The word "They" in the book's title refers to the nine scholars Kardiner and Preble chose to discuss. These include Darwin, the evolution-minded naturalist, and Herbert Spencer, the English philosopher who championed such theories as that of orderly social evolution and social functionalism. Tylor, the "founder of modern anthropology," emphasized the psychic unity of man and the concept of animism in understanding primitive religions. In regard to Sir James Frazer, author of the monumental work, *The Golden Bough,* I am inclined to agree with the authors when they say "It is not easy to determine Frazer's reputation in the history of anthropology." The principal influence of the French sociologist, Emile Durkheim, was in terms of his basic functional approach in the study of culture and society. Franz Boas, trained as a physicist, "chose instead to study man." The authors point out, very correctly, that Boas' "methods and attitudes" have shaped the course of modern anthropology, particularly in the United States. Bronislaw Malinowski, also a functionalist, was a very controversial figure because he "did not simply disdain the usual customs and proprieties, he took a positive pleasure in violating them." Alfred Kroeber became, in fact, the dean of American anthropologists. He was an accomplished field ethnologist and an authority on the theoretical nature of culture and culture change. Ruth Benedict, at once a poet and a scientist, was basically a functionalist, who emphasized the cultural configuration approach. I feel it can be fairly said that the work of Sigmund Freud had little direct effect on cultural anthropology. Rather, there have been strong indirect influences based largely on the concepts of the basic personality and the relation of psychodynamics to culture.

The authors suggest that there may be disagreement regarding "our selection of anthropologists." While each one of the scholars discussed had a strong influence on the development of anthropology, they were not all anthropologists. I wonder why such men as Lewis H. Morgan and Radcliffe-Brown were omitted.

One excellent feature is the biographical sketch, given at the beginning of the discussion, of each of the scholars. The book will be valuable to those interested in the social sciences, both students and laymen.

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Broad-Brush Picture

Pioneer Microbiologists of America. Paul F. Clark. University of Wisconsin Press, Madison, 1961. xiv + 369 pp. Illus. $6.

Pioneers consists of 18 chapters arranged in five sections—Foundations of Early Bacteriology (4 chapters); The Atlantic Seaboard (8); The Central Valley (2); Our Western Lands (2); and Perspective (2)—plus 23 pages of bibliographic notes and an index of almost 1100 entries. Photographs of 37 of the many bacteriologists discussed utilize ten pages; the photographs are the more interesting because the age of the individual at the time the photograph was taken is given. Thus, the eager boyishness of Novy at 35 contrasts with the maturity of Vaughan at 59—two individuals, Thom and Karl Meyer, are ageless. Following 79 pages on the beginnings of bacteriology (abroad and in America) and on epidemiology and epidemics, the author discusses pioneer bacteriology in the East, including the contributions made

by workers in federal agencies. The section on the central valley recalls early times in Michigan, the Chicago area, Wisconsin, and briefly in Ohio, Indiana, Minnesota, Iowa, Kansas, and Texas. The section on our western lands includes the Rocky Mountain area and California and the coastal area. Chapter 17 is a chronological review of societies and journals—the means of communication. The "Epilogue" permits the author to "look out his laboratory window" and philosophize a bit.

Clark writes with charm and with an accuracy based on study of the records and personal knowledge of most of the "pioneers." His portrayals are sympathetic, concise, and interesting. The cut-off date is 1919, but in some instances, which he must be forgiven since he is writing history and not a card file, he goes much beyond that date—for example, in the discussion of homologous serum jaundice induced by a virus in yellow fever vaccine (1941, 1942).

Very few worthy personalities are omitted. Some familiarity with the material involved leads me to say this volume is a remarkably accurate, interesting, and valuable book which should be read by all bacteriologists. More such books should be written in this and in other fields. It is one thing to write a great man's biography but quite another to take a whole era and to set into its record the trends, the actors, and the accomplishments—and to do this in proper perspective and accurately. This Clark has done.

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Essays on Psychiatry

Lectures in Psychiatry. Pittsburgh Bicentennial Conference. Henry W. Brosin, Ed. University of Pittsburgh Press, Pittsburgh, Pa., 1961. x + 361 pp. $7.50.

This volume is a compilation of lectures given at a conference on experimental psychiatry at the Western Psychiatric Institute and Clinic in March 1959. Essentially the volume amounts to essays on various topics by well-chosen experts. Accordingly, the book is far more readable than other published symposia based upon edited tape recordings of lectures.

All of the lectures are well done, and together they present an excellent overall view of the principal avenues along which research in modern psychiatry is progressing. The reader, depending upon his scientific biases, will enjoy some of the lectures more than others, but he can profit from all of them.

Examples of the content of the volume are as follows: discussion of the interaction of genetic and experiential variables in child development by John D. Benjamin; a review of the history, development, and implications of psychopharmacology by Joel J. Elkes; a conceptual analysis of the organization of human behavior by David McK. Rioch; and an account of recent developments in cybernetics by Warren S. McCulloch.

I recommend this book highly to anyone interested in the behavioral sciences.

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New Books

Biological and Medical Sciences

Advances in Tuberculosis Research. vol. 11. Hans Birkhauser, Hubert Block, and G. Canetti, Eds. Karger, New York, 1961. 279 pp. Illus. $18.

Adaptation. Bruce Wallace and Adrian M. Srb. Prentice-Hall, Englewood Cliffs, N.J., 1961. 124 pp. Illus. Paper, $1.50.

Animal Diversity. Earl D. Hanson. Prentice-Hall, Englewood Cliffs, N.J., 1961. 128 pp. Illus. Paper, $1.50.

Biotic Principles. Herbert L. Stahnke. Merrill Books, Columbus, Ohio, 1961. 671 pp. Illus. + plates.

Canadian Cancer Conference. Proceedings of the fourth Canadian Cancer Research Conference, 1960. vol. 4. R. W. Begg, Arthur Ham, C. P. Leblond, R. L. Noble, and R. J. Rossiter, Eds. Academic Press, New York, 1961. 477 pp. Illus. $12.

Coffee. Botany, cultivation, and utilization. Frederick L. Wellman. Hill, London; Interscience, New York, 1961. Illus. $13.

Comparative Animal Physiology. C. Ladd Prosser and Frank A. Brown, Jr. Saunders, Philadelphia, Pa., ed. 2, 1961. 697 pp. Illus. $15.50.

Ergebnisse der Bluttransfusionsforschung. vol. 6. R. Stahl. Karger, New York, 1961. 396 pp. Illus. $16.

The Eucalypts. Botany, cultivation, chemistry, and utilization. A. R. Penfold and J. L. Willis. Hill, London; Interscience, New York, 1961. 571 pp. Illus. + plate. $13.25.

Formation and Breakdown of Haemoglobin. C. P. Stewart, Ed. Elsevier, New York, 1961 (order from Van Nostrand, Princeton, N.J.). 71 pp. Illus.

Gnetum. Botanical Monograph No. 1. P. Maheshwari and Vimla Vasil. Council of Scientific and Industrial Research, New Delhi, India, 1961. 154 pp. Illus. + plates.

Heredity. David M. Bonner. Prentice-Hall, Englewood Cliffs, N.J., 1961. 126 pp. Illus.

The Merck Manual of Diagnosis and Therapy. Charles E. Lyght, Ed. Merck Sharp and Dohme Research Laboratories, Philadelphia, Pa., 1961. 1923 pp. Illus.

Oncogenic Viruses. Ludwik Gross. Pergamon, New York, 1961. 404 pp. Illus. $12.

The Ontogeny of Insects. Acta Symposii de Evolutione Insectorum, Prague 1959. I. Hrdy, Ed. Czechoslovak Acad. of Sciences, Prague; Academic Press, New York, 1960. 406 pp. Illus. $10.

Pharmaceutical Analysis. Takeru Higuchi and Einar Brochmann-Hanssen, Eds. Interscience, New York, 1961. 863 pp. Illus. $28.50.

Physiology of Reproduction and Artificial Insemination of Cattle. G. W. Salisbury and N. L. VanDemark. Freeman, San Francisco, 1961. 651 pp. Illus. $12.50.

Saliva and Its Relation to Oral Health. D. Ofonsky. Univ. of Alabama Press, University, 1961. 809 pp. $12.

Samson Wright's Applied Physiology. Cyril A. Keele and Eric Neil. Oxford Univ. Press, London, ed. 10, 1961. 562 pp. Illus. $13.50.

Some Aspects of Life in Fresh Water. Edward J. Popham. Harvard Univ. Press, Cambridge, Mass., 1961. 135 pp. Illus. $2.25.

Translocation in Plants. A. S. Crafts. Holt, Rinehart, and Winston, New York, 1961. 192 pp. Illus. $5.

Vertebrate Speciation. W. Frank Blair, Ed. Univ. of Texas Press, Austin, 1961. 658 pp. Illus. $8.50. Twenty-one papers covering isolating mechanisms, evolution of behavior, polymorphism and polytypic species, population dynamics, and age and origin of species. The papers were read at a 5-day conference held in October 1958 at the University of Texas.

General

Ancient, Medieval, and Modern Christianity. Charles Guignebert. University Books, New York, 1961. 539 pp. $7.50.

Divinity and Experience. The religion of the Dinka. Godfrey Lienhardt. Oxford Univ. Press, New York, 1961. 336 pp. Illus. $6.75.

Emotion. A comprehensive phenomenology of theories and their meanings for therapy. James Hillman. Northwestern Univ. Press, Evanston, Ill., 1961. 328 pp. $6.

Intervention and the War. Richard H. Ullman. Princeton Univ. Press, Princeton, N.J., 1961. 376 pp. Illus. $7.50.

Physicist and Christian. William G. Pollard. Seabury Press, Greenwich, Conn., 1961. 191 pp. $4.25.

Science and the New Nations. Ruth Bruber, Ed. Basic Books, New York, 1961. 329 pp. $6.50.

Science Awakening. B. L. Van der Waerden. Translated by Arnold Dresden. Oxford Univ. Press, New York, 1961. 306 pp. Illus. $7.50.