ology. Probably less is known about functions of the normal cerebral cortex than about any other organ in the body. This is mainly due to the anatomical complexity of intracortical connections and intimate associations with other parts of the nervous system.

This account of the cerebral cortex is based largely on the author's own studies, in which he has developed to an elegant perfection the technique of the isolated cortical slab with intact blood supply but devoid of neural connections with either surrounding cortex or deep structures. His use of this technique has produced a frame of reference differing basically from two others widely employed in the last decade—the one recording the action potentials of large cell populations in intact cortex, the other involving unit recording within a cell population with the assumption, often tacit, that the population is histologically and geometrically homogeneous.

Although these slabs show no spontaneous activity under light anesthesia, they respond with a prolonged "burst" discharge to single shocks. The author presents a detailed account of cellular behavior during the burst. The physiologist's interest in this, as in posttetanic potentiation, hinges on the search for neural mechanisms which might explain the observed plasticity of cerebral functions, the spontaneous activity, and the possibility that prolonged changes induced by a few stimuli may bear on the problem of memory.

The latter part of the book is devoted to problems of memory. Here, with the vast gulf that is fixed between the fields of physiological and psychic phenomena, and where only the brave may venture to bring forth even so little as a personal credo, the author maintains an admirable objectiveness without pretence to an encompassing view of the brain-mind relationship.

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Bibliography of Food. A select international bibliography of nutrition, food and beverage technology and distribution, 1936–56. E. Alan Baker and D. J. Foskett. Academic Press, New York; Butterworth, London, 1958. xii + 331 pp. $11.

Baker and Foskett have compiled a large bibliography about an extensive field in a useful way.

Literature, mostly that which has appeared since 1936 but not including individual articles in periodicals, is listed by area of information in the broad field of "food." The literature is further classified by type of publication (for example, bibliography and abstracting journal), and by informational content (for example, technology, distribution and marketing, vitamins and proteins).

An interesting and useful aspect of the bibliography is the occasional annotation of an entry by the compilers.

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Thudichum, Chemist of the Brain. David L. Drabkin. University of Pennsylvania Press, Philadelphia, 1958. 309 pp. Illus. $5.

"There should be laboratories of research established in all large hospitals. In these, the purely chemical diseases, no less than the diseases caused by microorganisms, should be investigated." These remarkably prophetic words were delivered by Thudichum, the first professor of chemical pathology at St. Thomas', in his presidential address before the West London Medical-Chirurgical Society. That was in 1883, just after the identification of the tubercle bacillus and a decade before the discovery of the relationship of the pancreas to diabetes. The names of Koch and Minkowski are well known to every student of the medical sciences, but Johann Ludwig Wilhelm Thudichum, who somehow foresaw the future contributions of biochemistry to medicine and who developed the modern science of neurochemistry, is all but forgotten.

This book, by David Drabkin, himself a worthy successor to Thudichum in modern "chemical pathology," fulfills admirably its purpose of recognizing the achievements of this great man. It does more than that. With a charming literary style which makes it difficult to lay the book aside, the author traces the life and times of Thudichum by means of descriptions of a personal pilgrimage to Büdingen, his birthplace, or a tea with his daughters in his last home in London, whither he had immigrated in 1854 when his participation in the unsuccessful liberal revolution of 1848 had made his continued stay in Germany uncomfortable. From his daughters, his manuscripts, his letters, even his obituaries, we learn much about the sources of his creativity, his nonconformity, the intensity and precision with which he pursued his classical studies on the chemistry of the brain, the versatility he possessed in his encyclopedic knowledge of cookery and wines, his dedication to truth, and his impatience with authoritarianism. Not all of these qualities endeared him to his colleagues, as we learn from one patronizing obituary: "His scientific achievements seldom if ever realized the expectations which had been formed with regard to them. He must, nevertheless, be regarded as an original explorer . . . and it is by no means improbable that some of his investigations may yet bear important fruit." To read the bombastic attacks by Hoppe-Seyler or by Gamgee, two of the outstanding chemists of that time—attacks which, besides being hostile were utterly groundless—is an interesting lesson in humility.

As the author writes in his prologue, "This is not the biography of one man alone, nor the story of one time. It is the struggle of a creative mind for fulfillment." He has appropriately underlined the universality of Thudichum and his problems and tells the colorful story of his life in somewhat less than two hundred pages of interesting narrative. The remainder of the book consists of references, documentation, and appendices for special study.

This book should be of value not only to physicians, biochemists, and neurochemists, and to the general reader interested in the history of science, but also to those alert to, or concerned with, the problem of scientific creativity.

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Advances in Enzymology. And related subjects of biochemistry. vol. XIX. F. F. Nord, Ed. Interscience, New York, 1957. v + 457 pp. Illus. $9.85.

The editor has departed from usual custom in publishing two volumes instead of one during 1957. Volume 19 contains five outstanding reviews which are so detailed and extensive in their coverage of the literature that each one might be called a monograph in its own right. Unfortunately for certain American readers, two of the five chapters are in foreign languages but are well worth the trouble of translation.

In "Enzymic aspects of photosynthesis," Vishniac, Horecker, and Ochoa have done an excellent job of correlating diverse information on photosynthesis. They do especially well in their consideration of the role of carbohydrate metabolism and enzymes of carbon dioxide fixation in photosynthesis. The light-dependent reactions are covered less extensively because relatively little is known about them.

H. S. Mason, in his chapter on "Mechanisms of oxygen metabolism," contributes a remarkable achievement in his classification of oxidizing enzymes into the three categories of transferases, mixed-function oxidases, and electron-transfer oxidases. In addition, he pre-

sents a comparison of chemical and enzymatic oxidases.

In "Aktivierung von Aminosäuren," Wieland and Pfleiderer discuss the many mechanisms by which amino acids must be activated before they can participate in biosynthetic reactions. Special attention is given to chloride, mercaptan, and phosphate derivatives. Much attention is devoted to the mechanism of activation of amino acids by adenosinetriphosphate and the types of reactions which activated amino acids may undergo.

Kimmel and Smith, in discussing "The properties of papain," describe in detail their method of preparing crystalline papain and mercuripapain from dried papaya latex. The physical and chemical properties of the enzyme as well as its specificity toward proteins and synthetic substrates are reviewed. A consideration of the kinetics of the enzyme permits the authors to speculate on the nature of the active groups and the mode of action of papain.

In "Les voies principales de l'assimilation et dissimilation de l'azote chez les animaux" Braunstein reviews almost all of the reactions undergone by nitrogenous compounds in animals. Special attention is paid to amino acids with reference to their transamination and their deamination to keto acids and ammonia. Urea synthesis from ammonia and carbon dioxide is also reviewed and the comparative aspects of the biochemistry of nitrogen compounds in animals are discussed in detail.

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The Origins of the English Library. Raymond Irwin. Allen and Unwin, London, 1958. 255 pp. 25 s.

Few things are more perishable than books. The volumes which swell the libraries of the world are, in greatest part, the product of only the last century and a half; by contrast, the entire remains of man's first 5000 years of literary activity before the invention of printing are contained in a few rooms in a relatively small number of libraries. Their paucity is impressive evidence of the hazards which have at all times beset books and learning—hazards so numerous and so destructive that the wonder is not that so little learning was transmitted through the ages but so much.

It is out of wonder at the almost incredible fact of the transmission of knowledge under the onslaughts of fire and water, insects and molds, war and civil disorder, barbarism and orthodoxy, economic depression and simple lack of interest—and out of a curiosity about how it happened—that the present book is written. Since the writer is director of the school of librarianship and archives at the University of London, his special interest is in the role which libraries have played in the process through which the stockpile of knowledge, though suffering from erosion here and there, has, as a whole, withstood the erosion and been delivered—for the time being, safely—into our hands. And he has taken the English reader and user of libraries as the example of the modern beneficiary of this process.

If the facts of the history of scholarship are in general difficult to find and must rest to a large degree upon inference and conjecture, this is doubly true of the history of libraries. For libraries, as contributory agencies rather than ends in themselves, are generally little noticed; ("There is also a library," was Strabo's laconic addendum—quoted by Irwin—to a description of the harbor, gymnasium, paved streets, and other really remarkable features of Smyrna in the first century B.C.). And if they are infrequently noted in their heyday, libraries are even less likely to merit obituaries (thus, the fate of the greatest of the libraries of antiquity, that of Alexandria, is still a matter of conjecture). As contributory agencies, rarely do they supply *acta* for their country's chronicles (though the Alexandrine library was a notable exception in this respect, with its near-achievement of its aim to assemble all of the literature of the then known world, its primacy in the exploitation of the bibliographic art, and its participation in the editing of Homer and the translation of the Septuagint). Rather, the facts regarding the existence, the contents, and—more important—the use and impact of libraries must rest upon comments like Strabo's, upon passages from letters between scholars, and upon scraps from ecclesiastical inventories and monastic rules. Even when the use of books is apparent, it is unsafe to attribute any of the credit to a library.

In these circumstances, Irwin has wisely not attempted to write a documented history of libraries. Rather, he has given us a series of essays in which he has sketched what is known of the role of libraries in the book-based culture which unites the modern to the classical world. For this he has culled ancient and modern literature for references to libraries, for evidences of their use, and for information regarding the habits of readers at various periods under varying conditions of climate, architecture, and methods of illumination. These data he has presented in a series of vignettes which go far toward bringing to life the cultural climate of various times and the conditions under which books have been used and preserved. The result is a happy one: These sketches succeed in enabling the modern, essentially book-based, scholar to see himself, both through similarities and through contrasts, as the lineal successor of a long line of predecessors whose lot—with respect to access to the world's stock of recorded knowledge—he may in some respects deplore but, in other respects, envy; they arouse his gratitude for the mysterious processes which have made possible the inheritance on which he is able to operate and to build, and they provide a reason for hoping that the history of libraries may still be written.

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Selected Writings of John Hughlings Jackson, vol. I, *On Epilepsy and Epileptiform Convulsions.* vol. II, *Evolution and Dissolution of the Nervous System; Speech; Various Papers, Addresses and Lectures.* James Taylor, Ed. Basic Books, New York, 1958. xiv + 500 pp.; viii + 510 pp. $15 per set.

With the publication of this two-volume set, totaling over 1000 pages, the principal writings of John Hughlings Jackson, a distinguished clinical neurologist and neuropsychiatrist, are again available, after being long out of print. Hughlings Jackson was one of the very first "great clinicians" to utilize his rich clinical material and experience to study the mind-brain problem. Students of neurological science will find in these collected papers an invaluable reservoir of informative case histories, shrewd diagnostic inference, and interpretation of the beginnings of a dynamic model of brain functioning which provided amply for digital and analog concepts several decades before these terms were invented.

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The Story of Archaeology. Agnes Allen. Philosophical Library, New York, 1958. 245 pp. Illus. $4.75.

When the reader lets his eye stray from the title page to the opposite flyleaf, to read there that Agnes Allen has also written *The Story of Clothes, The Story of the Highway,* and so on, he will entertain the gloomiest anticipations of another hack work by an author whose style will reveal clandestine associations with Hollywood, or television, or the "digest" form of belles-lettres. He will have a pleasant surprise, since the author is British, and therefore literate. *The*