nomic, and social factors. Kaplan's paper demonstrates the fundamental nature of the relationship of these three factors to the subject of meat hygiene. As is brought out in the other papers of the monograph, the hygienic, economic, and social factors all exert a profound influence on what might be referred to as the European meat-hygiene story.

The remaining papers sparkle with history, narrative, and philosophy concerning European practices and programs relating to the handling of food animals, their slaughter, and the preparation and handling of meat products. Papers by R. I. Hood and H. H. Johansen of the World Health Organization Regional Office for Europe describe, in detail, European meat-hygiene practices.

A paper by M. J. J. Houthuis (director, Municipal Slaughterhouse, Rotterdam, Netherlands) emphasizes the importance of ante-mortem inspection as the first step in the proper processing of food animals through a meat-packing plant.

Very informative papers on stunning methods are given by T. Blom (department chief, Royal Veterinary Board, Stockholm, Sweden) and Phyllis G. Croft (biochemist, Mile End Hospital, London). Electrical stunning, a subject now receiving considerable attention, is covered in detail.

Municipal abattoirs are discussed by G. Scaccia Scarafoni, (Istituto Superiore di Sanita, Rome) and Roger Benoit (director of abattoirs, Lausanne, Switzerland). These papers contain a very interesting discussion of the history of the development of municipal abattoirs in Europe and of the problems connected with their adjustment to present-day needs and standards.

H. Thornton (chief veterinary officer, City and County of Newcastle-upon-Tyne, England), who is a recognized authority in the field of applied meat-hygiene practices, emphasizes the importance of meat-hygiene programs being in the hands of properly trained and experienced inspectors, functioning methodically.

A paper by A. Jepsen (Royal Veterinary and Agricultural College, Copenhagen) is a real contribution to the monograph. In his lucid style, Jepsen points out the importance of inspectors having available adequate laboratory services. At the same time he cautions that the laboratory cannot be substituted for the inspector. He calls for the closest possible coordination and cooperation between the laboratory and field staff.

The World Health Organization is fortunate in being able to include in its monograph a paper by a man of the stature of F. Schönberg (Tierarztliche Hochschule, Hanover, Germany). He draws attention to the controls that must follow the meat as it leaves the slaughtering department and pursues its somewhat tortuous route to the consumer.

Worthy of special mention is the paper by S. O. Koch (chief veterinary officer, City of Aarhus, Denmark). Koch develops the subject of local control, which is frequently the weak link in the total meat-hygiene program. He not only writes convincingly on the subject of hygienic controls applied locally but he also heads up, in the city of Aarhus, a program that effectively applies the principles he describes.

The paper by V. E. Albertsen (chief veterinary inspector, Danish Veterinary Service, Copenhagen) deals with the subject of disposal of by-products. His paper gives emphasis to what has been mentioned incidentally in other papers—that the official functioning in an effective meat-hygiene program must be prepared to discharge responsibilities that cover a wide range of subject matter.

The monograph is complete, with an array of references, an appendix consisting of 146 pages, and a selected bibliography on meat hygiene.

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Advances in Enzymology and Related Subjects of Biochemistry. vol. 18. F. F. Nord, Ed. Interscience, New York, 1957. v + 435 pp. Illus. $9.

The 1957 volume of *Advances in Enzymology* lives up to the very high standards established over a period of 18 years. The present volume includes review articles by nine different authorities in various fields of enzymology and related subjects and will be of great value to chemists, biologists, and medical research workers as well as to biochemists.

In his review of cytochrome in higher plants, Hartree has pointed out the similarity of the cytochrome system of plants to that of animals, at the same time pointing out minor differences peculiar to plant systems.

Singer, Keaney, and Massey have reviewed the complex and controversial literature on succinic dehydrogenase and have related its function to electron carriers of the cell. They have also discussed the stepwise purification of succinic dehydrogenase from mitochondrial preparations.

Sir Rudolph Peters, in a review of the mechanism of toxicity of an active constituent of *Dichapetalum cymosum,* has shown that the toxic component is fluoroacetate, which in the animal organism undergoes a lethal synthesis to fluorocitrate, As a specific inhibitor of aconitase, fluorocitrate interferes with animal respiration by blocking the citric acid cycle.

The purification and properties of deoxyribonucleoprotein have been reviewed by Butler and Davison. In addition, these authors have briefly discussed its function in heredity and in protein biosynthesis.

Arthur Kornberg has surveyed the role of pyrophosphorylases and phosphorylases in biosynthetic reactions. In this outstanding review, a vast amount of diverse and apparently unrelated material has been correlated for the first time.

Wiame, in his review of the tricarboxylic acid cycle in microorganisms, has shown that this cycle is not only important in respiration but is also involved in the synthesis of many important biochemical compounds in bacteria.

James has reviewed the reaction patterns in the respiration of the higher plants and has shown the basic similarity of these pathways to those typical of animals. It is unfortunate that the role of cytochrome in higher plants, discussed by Hartree, is repeated in this article by James.

Reed has reviewed all of the literature on the chemistry and function of lipoic acid and has indicated certain enzymatic systems in which lipoic acid plays a role in living organisms.

In the final article, Schubert and Nord have examined the scattered and fragmentary literature on lignification and have considered the biosynthesis of lignin from vanillin, syringaldehyde, and *p*-hydroxybenzaldehyde, which are derived from shikimic acid.

With the number of enzyme systems now approaching 1000, it is unfortunate that an annual review can consider so few. In order to cover a wider diversity of enzyme systems, it would seem wiser to revert to the original pattern of the early volumes of *Advances of Enzymology,* in which reviews were only 20, instead of 42, pages in length. This would have the added advantage that the nonspecialist would not be plagued by the reading of so much unimportant detail.

IRWIN W. SIZER
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Heat Transfer and Fluid Mechanics Institute, 1957. Preprints of papers. Held at California Institute of Technology, Pasadena, California, June 19–21, 1957. Stanford University Press, Stanford, Calif., 1957. vii + 439 pp. Illus. $8.50.

This publication contains 21 papers, in the areas of heat transfer and fluid mechanics, presented at the tenth meeting of the Heat Transfer and Fluid Mechanics Institute at California Institute of

Technology, 19–21 June 1957. The articles primarily present recent developments in high-speed research, including heat transfer at extreme temperatures. Approximately half of the papers are devoted to problems in heat transfer, and the remainder to studies in the field of fluid mechanics.

The volume contains 439 pages. The size of type used and the excellent figures included make each paper highly readable. According to a statement in the preface, many of the papers will also be published in the technical journals of the five sponsoring societies—American Institute of Chemical Engineers, American Society of Mechanical Engineers, American Society of Refrigeration Engineers, Institute of the Aeronautical Sciences, and Society of Automotive Engineers.

The purpose of the 1957 Institute was to make available, in the West, a program devoted to advanced fundamental research in heat transfer and fluid mechanics. An inspection of the individual papers indicates that the objective has been attained. The authors of the papers were not necessarily from the West, as is evidenced by a broad geographical distribution within the United States. Several of the authors were from Canada—a fact which reflects the wide interest in the Institute meetings.

David Fultz of the University of Chicago and E. R. G. Eckert of the University of Minnesota were invited to present lectures. The titles of their lectures are listed in the table of contents, but the text material has not been included.

In addition to the five professional societies, the following universities were also cosponsors of the 1957 Institute: California Institute of Technology; Santa Clara University; Stanford University; University of California, Berkeley and Los Angeles; and the University of Southern California.

G. A. HAWKINS

Purdue University

The Exploration of the Colorado River. John Wesley Powell. University of Chicago Press, Chicago, 1957 (abridged from the first edition of 1875). xxi + 138 pp. Illus. $3.75.

John Wesley Powell (1834–1902) was the founder and first director of the Smithsonian Institution's Bureau of Ethnology, second director of the U.S. Geological Survey, and author of the classic *Report on the Lands of the Arid Regions of the United States* (1878). He was also leader of the Geographical and Geological Survey of the Rocky Mountain Region (the Powell Survey), which explored and mapped the Plateau Province in the 1870's.

Powell made his first trip into the Plateau Province in the summer of 1869, when he led the first exploration of the Colorado River, boating down the Green and Colorado from Green River, Wyoming, to the mouth of the Virgin, below Grand Canyon. He made his second journey down the river in two stages in 1871 and 1872, having spent the year 1870 obtaining support and finding accessible crossings where supplies could be cached for his second expedition.

Powell's narrative of his adventures in the canyons of the Green and Colorado, which was published in book form in 1875 as the first part of *Exploration of the Colorado River of the West and Its Tributaries,* is now reprinted, together with some of the original illustrations. The account was originally published serially in *Scribner's Monthly* (1874–75), and it is written as a report of the first trip. However, the account is actually based not only on the first trip but also on the second, and it contains, in addition, the story of Powell's 1870 trip south through Pipe Spring, Arizona, into Grand Canyon, to which in turn is tacked a description of his 1872 journey down Parúnuweap Canyon into what is now Zion National Park. Some may object to this "tampering" with the facts; those who will allow an author some license will enjoy the book for what it is, a good story of "white-water" boating in unknown waters in heavy, cumbersome craft.—R.V.O.

Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

Records of Oceanographic Works in Japan (Special number for the Oceanographic Research Project by the Japanese National Commission for UNESCO). Compiled by the Pacific Science Liaison Committee of the Science Council of Japan. 208 pp. *Oceanographic Papers in Japan* (Annotated bibliography, 1873–1938). Koji Hidaka *et al.* 235 pp. Japanese National Commission for UNESCO, Tokyo, 1957.

Histology. H. G. Q. Rowett. Rinehart, New York, 1957. 47 pp. $0.95.

Current Medical Research. A reprint of the articles in the report of the Medical Research Council for the year 1955–56. Her Majesty's Stationery Office, London, 1957. 56 pp. 2s. 6d.

The Pseudococcidae (Hom.: Coccoidae), Described by H. C. James, from East Africa. Bulletin, Entomology, vol. 5, No. 5. G. De Lotto. 50 pp. 15s. *A Revision of the Genus Neozephyrus Sibatani and Ito (Lepidoptera: Lycaenidae).* Bulletin, Entomology, vol. 5, No. 6. T. G. Howarth. 40 pp. 15s. British Museum (Natural History), London, 1957.

The Meigs Creek No. 9 Coal Bed in Ohio. pt. III, *Further Study of the Chemical and Physical Properties and Washability Characteristics, with a Brief Review of New Methods Employed.* Bulletin No. 165. Peter O. Krumin. Ohio State University, Columbus, 1957. 373 pp. $3.

Fire Research 1956. Report of Fire Research Board and the report of the Director of Fire Research 50 pp. $0.77. *Food Investigation, 1956.* The report of the Food Investigation Board with the report of the Director of the Food Investigation Organization. 68 pp. $0.68. Department of Scientific and Industrial Research, London, 1957 (order from British Information Services, New York).

The Typical Muscid Flies of California (Diptera: Muscidae, Muscinae). Bulletin of the California Insect Survey, vol. 6, No. 1. Bruce F. Eldridge and Maurice T. James. 17 pp. $0.50. *The Conopid Flies of California (Diptera).* vol. 6, No. 2, Sidney Camras and Paul D. Hurd, Jr. 31 pp. $0.75. *The Embioptera of California.* vol. 6, No. 3. Edward S. Ross. 7 pp. $0.50. University of California Press, Berkeley, 1957.

A New Race of Wood Rat (Neotoma) from the Gulf Side of Central Baja California, Mexico. Transactions, vol. XII, No. 15. Laurence M. Huey. 2 pp. *Late Pleistocene Faunas from the Northwestern Coast of Baja California, Mexico.* vol. XII, No. 16. James W. Valentine. 20 pp. *Type Material of Eucalodium Orcutti Dall (Gastropoda: Pulmonata) from Oaxaca, Mexico.* vol. XII, No. 17. Robert J. Drake. 2 pp. San Diego Society of Natural History, San Diego, 1957.

Le Regime Alimentaire des Poissons du Lac Kivu (Congo Belge et Ruanda). Et l'exploitation des resources naturelles du lac. Exploration hydrobiologique des Lacs Kivu, Edouard et Albert (1952–1954). vol. III, pt. 2, *Resultats Scientifiques.* Jean Verbeke. Institut Royal des Sciences Naturelles de Belgique, Bruxelles, 1957. 221 pp.

Heredo - Retinopathia Congenitalis. Monohybrida Recessiva Autosomalis. A genetical-statistical study. *Hereditas, 43.* Carl Henry Alstrom and Olof Olson. Mendelian Society, 3 Adelgatan, Lund, Sweden, 1957. 178 pp.

Midwest Research Institute, 12th Annual Report of the President to the Trustees. Midwest Research Institute, Kansas City, Mo., 1957. 16 pp.

First Conference on Manufacturing Automation. Purdue University, 22–24 Oct. 1956. Automation, Cleveland, Ohio, 1956. 96 pp.

U.S. Research Reactors. Prepared by Battelle Memorial Institute for U.S. Atomic Energy Commission, Washington, 1957 (order from Office of Technical Services, U.S. Department of Commerce, Washington). 73 pp. $1.50.

Salaries and Earnings of Engineering Teachers 1956. William H. Miernyk and Morris A. Horowitz. American Society for Engineering Education, Urbana, Ill., 1957. 19 pp. $0.25.

The American Heart Association, Proceedings of the 30th Scientific Sessions. 25–28 Oct. 1957. American Heart Assoc., New York, 1957. 128 pp.

The Air Pollution Bibliography. vol. 1. Jack R. Gibson, Wave E. Culver, Mary E. Kurz. Technical Information Division, Library of Congress, Washington 25, 1957. 150 pp.