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.

A. R. MILLER
Agricultural Research Service, U.S. Department of Agriculture

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
Massachusetts Institute of Technology

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