collaboration with Ernest Moody ("The Medieval Science of Weights", Madison, Wisconsin, 1952), may be considered (except for new discoveries) the definitive exposition of our present knowledge of the subject. The huge volume is divided into four parts, the first of which contains the essential contents of the former volume with some important supplements. Parts II and III are devoted to kinematics and dynamics respectively and Part IV is an extremely useful summary of the whole subject of medieval mechanics. After an introduction the author generally gives an English translation of the documents at issue, followed by a lucid commentary and by the original text.

The most important subjects treated are: (1) the work of Gerard of Brussels, the importance of which was appreciated some years ago by the author and discussed by him in vol. 12 of *Osiris* (73–175; 1956); (2) the contribution of the scholars of Merton College, Oxford, especially Thomas Bradwardine, William Heytesbury, Richard Swineshead and John of Dumbleton, towards the kinematics of uniformly accelerated motion; (3) the application of plane geometry to kinematics in the graphical method, resulting in a geometrical proof of the so-called Mertonian rule for uniformly accelerated motion, formerly called Oresme's rule by Duhem; (4) Bradwardine's dynamic law of movement, which, though not valid, contributed essentially to the rise of mathematical physics; (5) the theory of impetus and its application in the explanation of the acceleration of free fall and of the movement of celestial bodies; (6) the daily rotation of the Earth, as discussed by Buridan and Oresme, who both advanced strong arguments in favour of it, without, however, bringing themselves to accepting it.

The way in which all these subjects are treated by the author deserves our admiration and assures him a prominent place among the authorities on medieval mechanics. E. J. Dijksterhuis

PHYSIOLOGY OF REPRODUCTION

Reproduction in Domestic Animals

Vol. 2. Edited by H. H. Cole and P. T. Cupps. Pp. xi+451. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1959.) 13 dollars.

FORMERLY the physiology of reproduction was studied mainly in small laboratory animals, but, with the increasing economic importance of the larger domestic animals, during the past two decades much work has been done in this field. The second volume of the book on "Reproduction in Domestic Animals" emphasizes the differences which exist between species in the details of their reproductive process.

Six of the eleven chapters, each written by an expert on the subject, deal with the male: spermatogenesis by Ortavent, biochemistry by Mann, libido and storage of semen by Rowson, insemination by Almquist, and the fowl by Lorenz. These present a most comprehensive review of recent literature on the subject. Among many interesting subjects dealt with are calculations of the daily sperm production, species differences in semen characteristics, factors affecting libido and semen quality, the deep-freezing of semen, differences in the technique of insemination in different species, and the effects of œstrogens on the cock. Among the other chapters, one on nutrition by Moustgaard is an important contribution, for among other things it gives a very good account of the nutrient requirements for fœtal development in different species, a subject which has hitherto received but little attention. The effects of underfeeding of the various food constituents, including vitamins and minerals, on the development and viability of the offspring as well as on the functions of the reproductive organs are also described.

In another chapter, by Clegg and Ganong, other environmental factors affecting reproduction in different species are outlined. These include the effects of variation in daylight hours, temperature and humidity together with 'social stimuli', such as that of the sexual display in birds. The physiology of the female fowl is described by Van Tienhoven, and this includes sections dealing with behaviour in mating and broodiness; the effects of different hormones are also reviewed. A chapter on anatomical and physiological factors affecting fertility by Mixner deals with intersexuality and such things as testicular and ovarian hypoplasia, hernias, cystic ovaries, and embryonic mortality. Hart and Osebold describe the infectious diseases of bacterial, virus and protozoan origin.

The book should be most useful to agriculturists and veterinarians, as well as to those engaged in human medicine, for many of the experimental results reviewed are fundamental to the physiology of mammalian reproduction. J. Hammond

HISTORY OF BIOLOGY

A History of Biology to about the Year 1900

A General Introduction to the Study of Living Things. By Dr. Charles Singer. Third and revised edition. Pp. xxxvi+580. (London and New York: Abelard-Schuman, Ltd., 1959.) 50*s*. net.

WHEN writing or talking about biology there are two schools of thought, namely the one which maintains that to try to learn or understand the history of the subject is a waste of time, and the other which holds that to understand any subject one must appreciate and know its beginnings and its development. These two differing attitudes can be reconciled by the assumption that biology only found itself as a science about 1850 and what went before is 'irrelevant and immaterial'.

To this reconciliatory suggestion Dr. Singer has produced a stimulating reply in the third and revised edition of "A History of Biology", which is based on the thesis that "the man of science must work backwards for a space . . . for unless we adopt a wide historical outlook we shall find ourselves unable to grasp the nature of the great problems which we are discussing".

After an introduction in which the claims of the historical approach are advanced, the book is divided into three parts. The first part, entitled "The Older Biology", treats aspects of the subject from Hippocrates to Harvey and the circulation of the blood in 1628. In the second section, the "Historical Foundations of Modern Biology" are laid by the development of experimental method in the works of Bacon and Descartes, and followed through the ideas of taxonomy and evolution into the immediate post-Darwin era. There is a number of topics of general interest in the third section such as "Cell and Organ-

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