## Hooved Animals

**Reproductive Behaviour in Ungulates**. A. F. FRASER. Academic Press, New York, 1968. x + 202 pp., illus. $8.

This book is a brief, straightforward résumé of literature on reproductive activities and their determinants in hooved animals. According to the author there are more than 200 ungulate species extant; he makes at least fleeting reference to 65 of these. Neither by intent nor achievement has he provided an exhaustive account of any one species. More space is devoted to domesticated than to wild species, as is to be expected given the relative amounts of data available.

At several points Fraser emphasizes the nice relations that can exist between a wild ungulate's behavior and its environment. For example, he points out that breeding and gestation periods are related in ways that lead to parturition during clement weather. He also suggests that synchronized parturition and temporary abandonment of the young following the first nursing are characteristic of species that give birth in relative concealment. These biological ideas are useful in bringing together data from several species.

The information presented on domesticated species points up how many interesting problems have been raised but not yet fully resolved. Behavioral synchronization of estrus, the role of female novelty in increasing the male's copulatory activity, and the mechanisms of mother-young recognition are research areas that can be pursued in several domesticated species. Also, with respect just to the pig, the issues of teat preferences and maternal cannibalism offer good research opportunities.

Several features of the organization of the book are puzzling. The first two chapters present introductory material in endocrinology, ethology, and psychology. The treatment is unnecessary for a specialist and insufficient for a beginner or second-course student. Who is the intended audience? In later chapters there are several instances in which data that ought to be together are separated. This is particularly noticeable in the treatments of the effects of both light and temperature on receptivity (pp. 36 and 67, 37 and 47 respectively) and in the treatment of abnormal maternal behavior (pp. 129 and 155).

The behavior of ungulates has not yet figured largely in the schemes of American comparative psychology. In regard to mammalian reproduction, with a few exceptions, psychological attention has been focused on an "axis" that runs from rodent to man through carnivores (meaning domestic dogs and cats) and nonhuman primates (meaning until recently a few monkey species observed in zoos and laboratories). The reasons for this neglect have nothing to do with the value of ungulates as subjects of comparative behavioral study. The truth is that ungulates are large animals while psychologists have traditionally had relatively small laboratories and even smaller inclinations to leave them for the field or the farmyard. This situation is beginning to change, and Fraser's book may, one hopes, aid the progress of this evolution.

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## Physical Performance

**Exercise Physiology**. HAROLD B. FALLS, Ed. Academic Press, New York, 1968. xiv + 474 pp., illus. $17.50.

Exercise physiology today occupies a position comparable to that of pathology a hundred years ago when Carl von Rokitansky of Vienna persuaded the Emperor of Austria to issue a decree incorporating the subject in the medical curriculum. The problem in pathology then was, as it is today in exercise physiology, what the subject was to comprise.

About 20 books on exercise physiology have appeared during the past decade, some of them good, some mediocre, some bad. On the whole, the volume edited by H. B. Falls belongs in the first category, notwithstanding the fact that its 15 chapters are of varying quality. Most of the 19 authors of the opus are nonmedical. The arrangement of the book into three sections—Basic Physiology, Special Problems, and Running and Water Sports—exemplifies the difficulties ubiquitously encountered at present in the search for the identity of the subject. The chapters by E. Asmussen on "The neuromuscular system and exercise," by R. Margaria and P. Cerretelli on "The respiratory system and exercise," and by T. Adams and P. F. Iampietro on "Temperature regulation"—all of them expertly written—could form part of any up-to-date textbook of general human physiology. A chapter by Fred Wilt on "Training for competitive running" is of interest to track coaches. P. J. Rasch and I. Dodd Wilson discuss three clinical aspects of exercise, namely "athletic pseudonephritis," "march hemoglobinuria," and "myoglobinuria." Chapters on "Nutrition and exercise" by Geoffrey H. Bourne and on "Doping and athletic performance" by Richard V. Ganslen reiterate that "the role of diet in athletic performance remains controversial" and that "we do not know of a pharmaceutical substance which will improve the athlete's biological reserves for competition." James S. Skinner, the physiologist, surveys selected portions of the literature on "Longevity, general health, and exercise." Allan J. Ryan's essay "The physician and exercise physiology" begins with a three-page summary of "historical contributions made by physicians" and continues with brief accounts of such diverse themes as "special qualifications of the physician-physiologist," "the sport physician," and "the dynamic physical examination." Ryan also refers to rehabilitation, first aid, and injury sustained in exercise activities. A model of what a chapter in a book of the kind under review should be is the one by A. R. Behnke on "Physique and exercise."

In the not-too-far-distant future exercise physiology and the various branches of sports medicine of which it partakes will have to be more clearly delineated. Clinical sports medicine *sensu strictiori* is at present in its infancy and will have to include a number of aspects of which sports medicine in the United States has so far taken little cognizance, among them applied pharmacology and neuropsychiatry. The importance of the latter discipline must have been obvious even to laymen who saw the many manifestations of cerebral hypoxia in athletes during the Mexico City Olympic Games. Also, more attention ought to be given to such fundamentally important pathophysiological issues as the enhanced susceptibility of highly trained youths to virus infections, more especially of the respiratory and gastrointestinal as well as the central and peripheral nervous system. Sports traumatology must be treated as distinct from general surgery and concentrate on surgical problems of athletes, such as head injuries in boxing and football, on which Spillane in England and Unterharnscheidt in Germany have written important monographs. The indispensable role of exercise in rehabilitation