

domestic species or others easily kept in captivity. The emphasis is on secondary sex characters and egg-laying. It is as natural that many investigators should resort to birds as experimental subjects because of their highly evolved secondary sex characters as it is that Lorenz and others should utilize birds because of their highly developed instincts.

The book is divided into five sections containing a total of twenty-four chapters, each written by a specialist in the field which is covered. There is a bibliography, sometimes amounting to several hundred references, appended to each chapter and nearly three-quarters of the chapters contain references to birds.

The only portion dealing exclusively with birds is Chapter 5, by L. V. Domm, which summarizes a great deal of experimental work on 'Modifications in Sex and Secondary Sex Characters in Birds.' Here, for example, are some of the reported effects of gonadectomy: castrated Black-headed Gulls retain the 'winter' plumage thereafter; in the Ruff, the seasonal tubercles of the head do not develop after castration; in ovariectomized examples of one of the weaver finches, any feathers which regenerate during the breeding season are male feathers, but these are replaced by normal female feathers at the fall molt; castration does not modify seasonal plumage changes in the Indigo Bunting, while castrated Mallards never have an 'eclipse' plumage, but go from one breeding plumage directly into another. There is much of interest in this chapter on the experimental modifications of feather pattern in the Domestic Fowl, and many other birds are also dealt with. This chapter is 100 pages long and concludes with a bibliography of over 300 references.

In Chapter 9, by Carl G. Hartman, are summarized the data on 'Ovulation, Fertilization and the Transport and Viability of Eggs and Spermatozoa' for the various classes of vertebrates. Among other things here we learn (p. 632) that Domestic Hens, when suddenly confined in close quarters, have been reported to cease laying for a time and may resorb the remainder of a clutch of oocytes. This is interesting in connection with the well-known fact that many wild species seldom or never lay when reduced to captivity; nor have experimental hormonal injections as yet satisfactorily overcome this state of affairs. The same chapter (p. 650) deals with Riddle's work in determining the time of ovulation in the sexual cycle of pigeons, as well as similar work by Phillips and Warren on the Domestic Fowl. Hartman reports that similar time relationships for all lower vertebrates appear as yet to be unknown. Farther on (p. 695) are summarized the few known facts regarding the viability of sperms in the genital tracts of hens, ducks and Ring Doves. It appears that all authors agree that no egg that is laid within twenty-four hours after the first mating is fertile, while the number of days thereafter during which the female in isolation may lay fertile eggs appears to be quite variable. Other chapters also contain many items of interest on the endocrinology and physiology of birds.

The literature on sex and internal secretions grows so rapidly that we wonder if the editor will be able to keep another edition down to the size of one volume! The book is well printed and indexed and contains few typographical errors.—RALPH S. PALMER.

Craigheads' 'Hawks in the Hand.'—This little book¹ is an interesting combination of the extremely ancient and the very modern. The art of falconry, or hawking, goes back to the remote or unwritten past, whereas photography by contrast is so

¹ *Hawks in the Hand: Adventures in Photography and Falconry.* By Frank and John Craighead. Small octavo, 291 pp., 57 illus. (half-tones from photographs by the authors), Boston & New York, Houghton Mifflin Company, 1939. \$3.50.

thoroughly a thing of today that any attempts to follow its very latest developments must be done through keeping up with day by day current events. Written by twin brothers twenty-three years old and sons of a Government scientist, this volume opens with the narration of the finding and capture by the authors several years ago of their first wild pets, a nest and the young of the Barred Owl in the Virginia woods along the Potomac River near Washington, D. C. Soon after, they became interested in taxidermy and practiced on Crows and Starlings and later on a Barred Owl, the killing of which later filled them with regret. Some attempts at shooting a Red-shouldered Hawk led them to abandon the practice of killing birds, but, instead, to take up the study and training of living birds. The reading of an article on falconry in an old issue of the 'National Geographic Magazine' led the authors to the study of all available books on this old, mystic art. Stimulated by their studies, by the acquisition of a pair of climbing-irons, and the coming of springtime, the brothers engaged in a series of extensive operations along the shores of the Potomac River near Washington, in various areas in Pennsylvania and elsewhere, with such birds as Cooper's Hawk, the Broad-winged Hawk, and numerous other birds. They secured data on such matters as the care and the training of hawks of various species; the use and value of the hood; flying to the hand and flying for food; experiments in tree-climbing to nests, and the like. There is detailed discussion of capture and subsequent slow, patient training of the various species of birds with which they worked, and much information was obtained and is recorded here on life history and habits, relative flying abilities and individual peculiarities, with the narration of numerous incidents illustrative of these and other attributes. All these observations of trained birds soon aroused in them a desire to know more of the habits of wild birds to compare with those of the trained birds. This led to the building of observation blinds near the nests, accomplishments that in turn led on to intensive study of nature photography. Starting with inexpensive photographic equipment and working very slowly with readily available subjects, their progress can be traced from year to year, through numerous failures, mishaps and blunders, with huge toil and pains, to the preparation of the pictures of unusual excellence which are given in the book. Its various chapters furnish detailed accounts of activities over a gradually widening field, such as the adventurous descending by rope out over Potomac River cliffs to get pictures of Duck Hawks—a performance done over and over again later on in other localities; making studies of the habits and securing photographs of the young of the Bald Eagle; searching for, and obtaining movies and stills of such birds as the Great Horned Owl, the Northern Raven, the Barn Owl, Cooper's and Sharp-shinned Hawks and the like. In addition to the birds already mentioned, there are chapters devoted to their work with the Sparrow Hawk, the Screech Owl, the Pigeon Hawk, the Osprey, the Long- and the Short-eared Owls, the Burrowing Owl, the Prairie Falcon and the Golden Eagle. There is also a chapter devoted to bird photography in which are given lists of needed equipment and valuable notes thereon based upon their own experience in practical field use of different types of apparatus, particularly with the two general sub-divisions of tree and cliff photography, of the use of blinds, and of adjustments and problems pertaining to insufficient light or to changes in light conditions. The subject of the protection of these birds also is given appropriate attention throughout the book: there are entirely too many sportsmen who think of the birds under consideration as being only something to kill. In this volume their better attributes are stressed—in fact one of its main objectives appears to be a general appeal for their protection.

On the whole, the book is a thoroughly creditable production, particularly when the factors of the youth of the authors and the difficulties under which they worked, are considered. A performance of this kind tends to strengthen one's optimism and to increase one's faith that there still abide in our American youth the good old-fashioned, wholesome, sterling qualities that in the past have made America great.—J. S. WADE.

Canby's 'Thoreau.'—The steadily growing popularity of the writings of Henry David Thoreau (1817–1862), American naturalist, educator, poet and philosopher, is a source of gratification to the steadily growing number of readers who appreciate and enjoy them. As has been frequently pointed out, during his life-time Thoreau was comparatively unknown and such of his works as had been published had an exceedingly limited circulation. In the seventy-seven years which have elapsed since his death, much hitherto unpublished material by him has been issued, and his writings and his unique philosophy of life, decade by decade have spread abroad until he has become known and his writings have been loved in every important country of the world. It will be remembered that it was in the fields and woods of his birthplace, Concord, Massachusetts, that he learned the love and worship of Nature which later became a great passion of his existence. Of these he has written in phraseology of such exquisite beauty that presently it becomes like a haunting melody in the memory of his readers. A graduate of Harvard University, he was a valued friend of the famous naturalist, Louis Agassiz, and made various biological collections for him. In 1845, Thoreau began his now famous experiment in simplification of living. He retired to a self-built hut in the woods by the shores of Walden Pond near his native village, and there for two years he made studies and wrote of birds and plants, insects and other animals, and of the various philosophical and other themes in which he was interested. At various times he also made explorations to other places, notably to Canada, Maine, Cape Cod, Minnesota and elsewhere, and wrote of most of these in detail, with intermingling of factual and mystical observations of Nature. He never married, but one of the great friendships of his life was with Ralph Waldo Emerson, and they were of life-long inspiration to each other. Thoreau died of tuberculosis at the early age of forty-five, and his remains rest today in the Sleepy Hollow Cemetery at Concord, Massachusetts, near the grave of his associate, Emerson. All these and many other facts pertaining to Thoreau's career have been narrated with great fidelity to detail in the newly issued biography¹ by Dr. Canby. The principal biographies of Thoreau which appeared in the years after his death and with the increase of his fame, were those by Emerson, 1863; Channing, 1873, revised 1902; Page, 1877; Japp, 1878; Sanborn, 1882, revised 1910; Salt, 1890 and 1896; Marble, 1902; Van Doren, 1916; Edward W. Emerson, 1917; Sanborn (a second and larger biography), 1917; Bazalgette, 1924; Atkinson, 1927; and Crawford, 1934. Since there is always room on our Thoreau shelves for still another volume of this type when of genuine excellence, it is a pleasure to welcome this latest addition, the product of long years of research and toil on part of its distinguished author. It is a delightfully written, well-balanced, well-rounded, well-documented production. It is predicted that it will prove to be one of the outstanding biographies of the year. It is not unlikely that, through its well-deserved popularity, it may serve to introduce thousands of new, appreciative readers to the charms of Thoreau's own writings. If so, all such

¹ Thoreau. By Henry Seidel Canby. 8vo, 508 pp., 16 illus., Boston and New York; Houghton Mifflin Co., 1939. \$3.75.