

Alpha-to-Omega of conservation. With both sides in doubt as to the infallibility of their own past dogmas, we might actually hang together long enough to save some wild life. At present, we are getting good and ready to hang separately.—ALDO LEOPOLD.

#### PUBLICATIONS REVIEWED

PICKWELL ON THE PRAIRIE HORNED LARK.\*—This thin volume is apt to prove, in the history of ornithology, one of the first and best fruits of the new life which has been infused into the old science of bird-watching.

It is to be expected that the new understanding of certain principles of bird behavior—if not of their nature or history—will be tested first and most thoroughly in studies of easily-observed birds, and that these studies will dominate the science for a long time. Examples are Selous's colonial sea-birds, Verwey's herons, A. A. Allen's blackbirds, Friedmann's cowbirds, Miller's shrikes, and the present volume. All represent brilliant pioneer opportunities, but none more than the Prairie Horned Lark. A bird with a deep-seated abhorrence of cover is a great ornithological convenience; and one which devotes six months of the year to breeding simply trebles, for the time-being, the life of the ornithologist. When to these practical advantages are added a list of startling peculiarities—the semi-precocial nature of the young, the hopping stage, the towering flight-song, the nest-digging and -paving, the endurance of spectacular weather conditions, the great historical extension of range—the problem takes on prismatic color.

About half the book is devoted to the long section on reproduction. The bird "selects the bleakest barrens available in every locality in which to nest" and through the long season retreats before the single intolerable factor of *verdure*. The season of song in the species extends from mid-January in Kansas for *praticola* to at least August 29, near Great Slave Lake, for *hoyti*. At Evanston, Illinois, for *praticola*, it extended from January 10 to July 14, 1926. "There is probably no other passerine bird that can equal this record."

\*Transactions of the Academy of Science of St. Louis | Volume XXVII | The Prairie Horned Lark | Gayle B. Pickwell | Issued August, 1931. | Post octavo (125 x 228 mm.), pp. 153 + Table of Contents and Index (unnumbered), Plate I (frontispiece) + Plates II to XXXIV (bound at end), 18 figures and 24 tables in text.

May is the month of most frequent song, and frequency may be affected by weather. The flight-song, strangely ignored in comparison with the related exhibition of the Skylark, is delivered at heights of between 270 and 810 feet, and is responsive to certain obvious stimuli such as the repulse of an invading male, or human disturbance. The author believes the song a proclamation of territory, and not intended for the ears of the female. At Evanston, territory was delimited and fought for by a male on February 7, 1926, and at Ithaca subsequent nestings were found as nearly on the original territories as increasing vegetation would permit. Territories are compressible in size under pressure of numbers, though impalpable boundaries, wider but still definite, exist when competition is lacking.

Both sexes make journeys afield, but feed for most of the time in the territories. Combat is invariably aerial and involves strange rules and conventions. Four February nests are recorded in the literature, and "March nests are the rule from Kansas to Manitoba, from Manitoba to the Atlantic", though with a somewhat low average of successes. This is earlier, in an absolute sense, than even the southern *giraudi* or *chrysolæma*. A temperature of from 40 to 45 degrees Fahrenheit, usually extending for two days, is an initial requirement, but great resistance to ensuing severe weather is shown. "This seems to have more than a little of precience in it"—namely, "that of more than thirty nests, nearly all should have the protection [usually a tuft of grass] on the west and northwest." But the reviewer must apologize for being led so far into mere sampling of this fine material.

A heavily documented historical section of twenty pages is largely devoted to the story of the northward extension of range, for the most part since 1870, with a parallel, drawn from Gätke and criticised by Naumann, in the problematical recent northern extension of *O. a. flava* in Europe. Both the northern extension of *praticola* and its possible genetic derivation from a southern race are suggested as throwing some light on the grotesquely early breeding—a hypothesis not likely to find favor, especially in the light of other well-supported evidence of a dependence upon temperature rather than upon a rigid physiological cycle, but which we must in fairness admit is hardly more than suggested.

The most interesting parts of the con-

cluding sections on the ecology of the nest site with reference to other birds were the episodes which showed the perfect indifference of the breeding males of *praticola*, in April, to intruding *O. a. alpestris* (birds of the latter race were obviously ignored as belonging physiologically to another world), and the ecological series, passing from the frequenters of the heaviest to those of the scantiest vegetation—Dickcissel, Bobolink, Savannah Sparrow, Meadowlark, Vesper Sparrow, Prairie Horned Lark. The Vesper Sparrow, too, suffers displacement by increase of vegetation, and, "Of all resident birds the Vesper Sparrow is nearest the Prairie Horned Lark ecologically."

Results of compression are evident and leave us sometimes not quite satisfied. There are a few curious omissions. For instance, no direct information, beyond what is implied in the diagrams of territories and in their discussion, is given on the maximum or average number of broods brought off by the subspecies, nor the relation of the old to the new breeding activities. We are not told how the identity of the same pairs on the successive territories at Ithaca was established. Isolated statements, such as "the development of feathers depends entirely upon growth in weight, that is, upon amount of food", or "the age of the young at nest-leaving depends upon the manner and amount of food they have received", suggest the existence of valuable data for the presentation of which no room was found.

Probably no other work is so important in the advancement of the science of birds as such unified and modern studies of behavior and its relationship to the surroundings. The time is not far off when we shall compare such factors throughout our avifauna as readily and as concretely as we compare birdskins today, and build new and hardly less trenchant doctrines on the results. Yet this alone is not enough. The perfect combination will be reached when such work is done *inter-dependently* with laboratory investigations of comparative anatomy and ontogenesis, each bent upon a common, and not merely descriptive, end. Then and only then can we hope to explain, as well as to describe, the peculiarities of the Horned Larks—perhaps even of the Prairie Horned Larks.

It is a pity that a piece of work of such permanent and unquestionable importance should have been marred by slovenly editing. The following are a few of the minor

atrocities which reached final printing. "Nutall" twice on page 4; "From a territory such as this, a male bird will not leave" on page 50; a printer's jumbling renders a quotation from Sutton incoherent on page 58; "the initiatory temperatures was" on page 62; April 9 should read April 19 on page 73; a "the" is omitted and the phrase "first heard in April 21" occurs, both on page 114; etc., etc.—T. T. MCCABE.

**THE RIDDLE OF MIGRATION.\***—This latest contribution of Rowan's to the study of bird migration is a summarization of his experiments and arguments on the subject. The presentation of new data seems not to have been the object of the book, for the material used has appeared in several shorter papers by the author in various scientific journals. These papers unfortunately are not cited or listed in a bibliography. The chief preliminary paper (Experiments in Bird Migration) I have already reviewed in these columns (Condor, xxxii, 1930, pp. 166-168). The book before us for consideration is written in a style which should make for easy understanding on the part of amateur bird students. The biologically trained ornithologist probably will overlook certain descriptions of the commonplace in his appreciation of the ingenious and thoroughly valuable discussions.

Opening with an esthetic picture of the marvel of northern migration in the section headed "Prologue," the author turns to a matter-of-fact viewpoint in the first chapter which deals with the living bird. Here for the sake of biological background is an interesting running discussion of certain features of avian structure and physiology, with special emphasis on the nervous system, sense organs, powers of flight, and endocrine glands. The large amount and the ease of flight performed by species or individuals that may be entirely non-migratory is emphasized as indicating the potentialities for migration. His contentions that birds are undoubtedly more successful in the air than bats and that the spectacular migrations of birds are unknown to the latter are rather sweeping and are open to criticism.

Under a section on "Environment, Past and Present," he proposes to pay particular attention to the well-known migra-

\*The Riddle of Migration, by William Rowan. Baltimore, The Williams and Wilkins Company. 1931. xiv+161 pages, 11 figures in text.