

further expedient to save bulk, the plates are printed on both sides of the leaf. It is a pity, however, that the manufacturers should not have used greater care in weeding out imperfectly registered plates, nor are the four new ones so well printed as the others.

For the purposes of the new edition, Dr. May has done a difficult task with considerable care, and has presented the reading public with an attractive volume of short sketches of eastern birds.—G. M. ALLEN.

**Niedrach and Rockwell's 'Birds of Denver.'**—The last comprehensive work on Colorado birds was that of Sclater in 1912, and the last local list for Denver was published in 1928. In the years that have since elapsed much new material has accumulated and many groups of birds have been more critically studied by Dr. Alfred M. Bailey and the authors at the Colorado Museum. This new list<sup>1</sup> comprises the birds known to occur within a radius of twenty-five miles of Denver and includes also the Denver Mountain Parks System, a short distance farther westward among the foothills of the Rocky Mountains, so that the area embraces an altitudinal range of almost a mile and a half, taking in the various life zones from Transition to Arctic-Alpine.

The introductory matter includes a sketch of the topography and a short account of the plant life of the successive zones with their characteristic birds. In another chapter the ornithological history of Colorado is briefly outlined. In the body of the work, the birds are taken up in the 'Check-list' order, giving for each the English and Latin names, the field marks, a statement of occurrence, and a paragraph of remarks, chiefly records of interest or notes on habits; finally there is an excellent bibliography and a thorough index. The many illustrations are largely from photographs of characteristic western birds and well exhibit the skillful work of Dr. A. M. Bailey and his associate Mr. Niedrach, both of whom have for a number of years cooperated in the careful study of the birds of the State. Including as it does a large number of typically western birds, the book forms an excellent field guide for visitors to this region, as well as a convenient summary of the local avifauna for the many active observers in this center.—G. M. ALLEN.

**Tinbergen's 'Behavior of the Snow Bunting in Spring'** is an outstanding field study<sup>2</sup> of this bird on its breeding grounds in southern Greenland. The author distinguishes nine successive stages in the progress of the breeding cycle, as follows: (1) the arrival of the males in flocks at a time depending on the weather conditions but averaging about March 21; the complete breeding dress is not attained until about mid-April. (2) The selection of a territory by the males and consequent breaking up of the flocks about a month later. During this stage the males daily spend a great part of the morning on the territory, singing, but often leave for foraging. (3) The arrival of the females in late April or early May. (4) The fourth period begins with the securing of a mate, who is attracted to the male by its song and display on the territory. The female is not yet ready for copulation; there is an increase in territory fighting between neighboring males, and the boundaries of territories undergo some shrinkage. Mated females drive off other females, but there is no intersexual fighting. (5) With the first coition the fifth period commences. The female's oestrus is marked by the carrying of nesting material to a selected site. (6) The female commences to lay eggs, for the nest is now ready. (7) With the

<sup>1</sup> Niedrach, Robert J., and Rockwell, Robert B. *The Birds of Denver and Mountain Parks*. 8vo, (6) + 196 pp., illustr., map; Colorado Mus. Nat. Hist., Popular Series, no. 5, 1939. \$1.25.

<sup>2</sup> Tinbergen, N. 'The Behavior of the Snow Bunting in Spring.' *Trans. Linn. Soc. New York*, 5: 1-95, 2 pls., text-figs., Oct. 1939.

seventh period the female commences and alone performs incubation, allowing a day to intervene after the last egg is laid. (8) This phase is marked by the hatching of the young and their subsequent care. (9) The last period is marked by the departure of the young from the nest.

In his account of the varying behavior of both parent birds and their relations with neighboring pairs, the author brings out many interesting facts, such as the occurrence of occasional bigamy, change of mates for a second brood where one bird of the original pair is ready for coition before the other. The matter of sex discrimination in this northern species is well analyzed and analogies are drawn with lizards and fish. Discrimination may result from the failure of the female to display—the lizard method; by difference in fighting activity when threatened; or, when both sexes display, by a difference in releasing behavior in the two sexes. Dr. Tinbergen refutes the conclusion reached by Dr. A. A. Allen in the case of Ruffed Grouse that the male does not discriminate sex in copulation, pointing out that the female reveals her sex by her attitude and by remaining still (as a stuffed bird would in the experiments). Finally there is an illuminating discussion of the functions of fighting, territory and song. The author distinguishes as 'advertising song' that performed by the male on its territory for the dual purpose of attracting a mate and warning off rivals.

A glance at the voluminous bibliography reveals that most of the pertinent literature on this new method of approach to the analysis of bird behavior is of very recent date. The older studies of the habits of birds were concerned more with generalities as seen from the observer's standpoint; the modern field study of birds must pay increasing attention to the bird's viewpoint, the real significance of its various actions as deduced from patiently gathered and critically noted observations. The paper is an excellent example of the new ornithology and an outstanding addition to our knowledge of the social behavior of an arctic passerine during the breeding cycle.—G. M. ALLEN.

McIlhenny's 'Autobiography of an Egret' is a handsome booklet,<sup>1</sup> notable for its many reproductions of photographs of the Snowy Egret (its full name nowhere appears), taken at the author's bird sanctuary in Louisiana. In its narrative a male egret recounts the story of its life from the time it saw the light of day, through the vicissitudes of the nestling period, to its first migration southward to Colombia and subsequent return to the home rookery, its first breeding season and its various doings in succeeding years, ending with a word of gratitude to the man who made the happy sanctuary where it lives. In lengthy conversations and soliloquies, the bird's intimate thoughts and emotions are laid bare and its remarkable knowledge of itself is revealed.

While the 'bedtime-story' method may be excusable in thus providing entertaining reading for children (which was doubtless the author's purpose), it leaves the more mature reader in a state of perplexity as to how far he may believe the essential points of the narrative. A somewhat more serious account of the habits of this interesting bird would have been very welcome. After all, birds are not human beings much as our sympathies would like to interpret their doings in terms of our own thoughts and feelings.—G. M. ALLEN.

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<sup>1</sup> McIlhenny, E. A. *The Autobiography of an Egret*. 8vo, vi + 58 pp., illustr.; Hastings House, New York City, 1939. \$2.00.