

ago. The third section, a full bibliography of California fossil birds, completes the work.

To the specialist in the field of paleornithology this paper is of exceptional value, supplying in one volume all essential data relative to the published work on the subject for the state of California. As a matter of fact, information is not limited to this state, for in many instances, reference is made to similar occurrences elsewhere. Inclusion of all recorded avian fossil material even if only generically or tentatively assigned—with appropriate comments as to status—is welcomed. Such records, which may lead to important future correlations, might otherwise be easily overlooked.

The paper is more than a check-list or bibliography. It carries throughout its pages interesting and illuminating sidelights on avian habits, structure and the like, reflecting Dr. Miller's long experience in ornithological research.—HILDEGARDE HOWARD.

Inaugurating a new series of publications, the National Audubon Society has issued its Research Report No. 1, "The Ivory-billed Woodpecker," by James T. Tanner (October, 1942; 111 pp., 22 figs., 20 pls., colored frontispiece). The admirable plan of the Society for careful study of vanishing species with a view to ascertaining underlying biologic causes for their precarious states could have selected no better subject for the initial effort. Tanner evidently made good use of his opportunity for field work supported by the Society and he has rendered an informative and worthy report; the only criticism that need be levied is that it is somewhat repetitious in places.

It turns out that the Ivory-billed Woodpecker has an extremely narrow ecologic niche, in that it is dependent for food on insects living just beneath the bark and these may be obtained in sufficient quantity by this large bird chiefly in trees that are still standing but that have been dead from two to four years. Maintenance of the necessary succession of suitable dead trees conflicts sharply with timber interests and with customary practices in forestry. With this economic conflict, the Society and others interested in saving the Ivory-bill face an exceedingly difficult problem in conservation. The prospect for the Ivory-bill is not good, especially in Louisiana.

Apart from the applied aspect of the study, sight should not be lost of another service it performs. A record of the natural history of this species has been made which may never again be possible. More could have been found out about the biology of a less rare species with the same expenditure of time and money, but there is a real satisfaction here in having grasped a research opportunity that may some day be

yond reach. This also is conservation.—ALDEN H. MILLER.

Joseph Grinnell's *Philosophy of Nature* (University of California Press, 1943) is a compilation of twenty-eight of the shorter papers of the great California naturalist, with a four-page preface by Alden H. Miller. In this preface we are told of Grinnell's plan, that upon retirement he would write a book of general scope which would present his outlook on geography and evolution, the aspects of natural history most related to his own research. He had, in fact, outlined chapter headings for such a work, these headings, ten in number, being listed by Miller. It was undoubtedly a great loss to science that this plan was ended by Grinnell's untimely death.

According to the Grinnell Club Newsletter of February, 1943, Jean M. Linsdale was primarily responsible for the idea underlying the present volume. After studying Grinnell's lengthy bibliography, Linsdale submitted a tentative list of papers that might be used in the projected compilation. This list was carefully studied by Mrs. Joseph Grinnell, Alden H. Miller, E. Raymond Hall and Seth B. Benson and suggestions were made which resulted in some titles being added. It was decided that the order of the papers should be chronological, and that, instead of including only those of definitely related subject matter, the selection should be illustrative of the wide scope of Grinnell's interest in and knowledge of many different features connected with the science of vertebrate zoology.

The elapsed time between publication of the first and last papers is thirty-three years, from 1903 to 1936. As would be expected by those familiar with Grinnell's work, a majority of titles (fifteen) and even greater preponderance of subject matter pertain to geography, evolution and kindred subjects.

Control of the range of a species by atmospheric humidity, and variation within the species due to the same influence is demonstrated in "The origin and distribution of the chestnut-backed chickadee" (1904). In "Composition of the Prince William Sound avifauna; discussion of its origin" (1910) typical birds of the Hudsonian and Alpine-Arctic life-zones are listed, and the affinities of the avifauna with the Yukon region to the north and the Sitkan district to the south are discussed. Two discussions published in 1914, "The Colorado River as a highway of dispersal and center of differentiation of species," and "The Colorado River as a hindrance to the dispersal of species," present many facts substantiating the claims set forth in the titles. An example cited in the latter paper is the case of two species of ground squirrels (*Ammospermophilus*), the ranges of which in one section are