

The report begins with a narrative and a discussion of the "flora-fauna association areas." The zones that Dr. Thomson recognizes are the Mangrove, Salt Pans, Scrubby Ridges, Savannah Woodland and Forest, and Tropical Jungle and Rain Forest. The affinity of Cape York with New Guinea, which has long been recognized, is apparently stronger than had been supposed and our author states that "a man might stand in the jungle on the Rocky River, a full 240 miles from Cape York, and 320 from the nearest point of the New Guinea coast, and although he were observant and familiar with many groups of animals, he might be unable to state whether he stood in Australia or in Papua," so closely do plant and animal life agree. The Papuan element is evident throughout the peninsula and of the 183 species of birds listed only 79 are endemic Australian forms while 104 have a range extending to New Guinea or beyond and 19 of the latter may be regarded as Papuan forms that have entered the peninsula in comparatively recent times and have become isolated in the jungle area of the east coast, the coastal range acting as a barrier to migration. The list of species is well annotated and includes data on all specimens and eggs collected. We note that a purely binomial nomenclature is adopted. There are fifteen half-tone plates illustrating mainly nests and eggs and a faunal sketch map.—W. S.

Heim de Balsac on the Mammals and Birds of North Africa.—This notable work¹ is an ecological-geographical discussion of the fauna of the Sahara and the Barbary States based on the birds and mammals. It is divided into two parts the first dealing with the characteristics of the fauna of North Africa and the second with the relations of the birds and mammals to the desert environment. Eight chapters of the first part discuss the line of separation between the faunas of Barbary and the Sahara; the origin of the several elements of their faunas; the palaeogeographic relations of the faunas; a comparison of the fauna of Barbary with that of the Atlantic Islands (Canaries etc.) and of Lybia. Part two, with twelve chapters, discusses the physical features of the desert and its biological areas; the water problem of desert birds and mammals; the effect of solar radiation, temperature and wind on animal life; hibernation and aestivation; coloration and its protection; the adaptation of animals to the desert; the development of external ears and audital bullae in desert mammals. Lack of space prevents a more detailed review of this work but it should be consulted by all interested in desert life and its peculiarities. There is a bibliography of 671 titles, sixteen maps illustrating faunal or climatic areas and seventeen plates presenting characteristic mammals or scenery.—W. S.

Errington and Hamerstrom on the Northern Bob-white's Winter Territory.—Ornithologists, especially the younger members of the fraternity, who have felt that their field is overcrowded and that the opportunities for making important contributions to science are rapidly passing with the generation that has described everything in sight, should take heart from a new work² on the Bob-white that has just come out of the Midwest. For notwithstanding the facts that the Bob-white is probably the most written-about of American birds and that Stoddard's monumental volume (Stoddard, Herbert L. "The Bob-white Quail: Its Habits, Preservation, and Increase," 1931) is generally considered to represent the most complete study ever

¹ Biogéographie des Mammifères et des Oiseaux de l'Afrique du Nord par Henri Heim de Balsac Docteur ès Sciences. Paris, Les Presses Universitaires de France 49, Boulevard Saint-Michel. 1936. Pp. 1-446, maps i-xvi, pl. I-XVII. Price 125 francs. (Supplément XXI Bull. Biologique de France et de Belgique.)

² Errington, Paul L., and Hamerstrom, F. N., Jr., The Northern Bob-White's Winter Territory. Research Bull. 201, Agricultural Experiment Station, Iowa State College of Agriculture and Mechanic Arts, Ames, June, 1936, pp. 301-443, 26 text figures, 75 tables, 3 pp. of bibliography.

made of any species of upland game bird, we have here a bulletin of nearly 150 pages devoted largely to a discussion of a phase of Bob-white's life history that other writers have hardly considered although it is fundamental to intelligent management of this splendid game bird. Even more significant is the present authors' frank admission that after six years of research they are still unable to explain what actually determines the carrying capacities of Quail territories.

It is patent then that despite the vaunted richness of our ornithological lore, the new movement to make wildlife conservation dynamic through the application of sound ecologic principles has found our information sadly deficient. The wildlife managers are asking questions a plenty, but we ornithologists do not have the answers. Errington and Hamerstrom are trying to find some of them, but there are enough others to be sought to give ample scope to the most ambitious researchers, sighing for new worlds to conquer.

To those concerned with the management or administration of upland wildlife, Errington's name has been for several years a household word. Work under Aldo Leopold at the University of Wisconsin supplied the stimulus that has kept him literally on the trail of Bob-white year in and year out, and has kept his pen turning out the results of his studies in a steady stream. Hamerstrom's connection with these studies is not made plain in the publication here reviewed, but it is known to the reviewer that he became associated with Errington about two years ago and that he and Mrs. Hamerstrom carried on a considerable part of the later field work here reported.

As the bulletin expressly attempts to bring up to date the knowledge of individual covey ranges or wintering territories of the Bob-white, it is to be regretted that the authors did not present more of the history of their studies, for the benefit of the growing army of young wildlife managers who do not have access to Errington's earlier papers.

Seemingly too, in a work of this magnitude a few paragraphs might have been devoted to acknowledgements, for numerous quotations from letters indicate that the authors enjoyed a considerable correspondence with their co-workers and otherwise had access to information beyond that contained in the seventy-seven works listed in the bibliography. However, these are minor criticisms of a very important document that strives to throw all possible light on the fundamental questions of territorial carrying capacity and its determinants.

The work is divided into four parts, the first of which, under the caption "Introductory Remarks and Technique," among other things, defines and discusses carrying capacity and its measurement, behavior of wintering Bob-whites and covey composition, census methods and interpretation of data, and the technique of tracing mortality. In their treatment of the last item the authors give evidence of a commendable conservatism in designating causes of mortality, that all workers in the wildlife field would do well to emulate.

In Part II is detailed the survival data obtained during six winters from seventy specific Bob-white territories, or groups of territories, in Iowa and Wisconsin agricultural communities; and in Part III, carrying capacity, as suggested by these data, is analyzed. This is by far the most significant part of the work. Very good arguments are presented to prove that the capacity of a given covey territory to winter Bob-white is definitely limited to a rather constant maximum number of birds irrespective of favorable weather conditions or lack of predation. In fact the authors hold that predation is an expression of habitat deficiency—not a measure of numbers, skill, or ferocity of predators; that Bob-white in excess of carrying capacity of their

particular territory will disappear even though there may be a complete absence of predators.

This of course knocks into a cocked hat the old arguments for predator control that have been advanced by the sportsmen *ad nauseum*, and places in the hands of the zoophile a powerful scientific weapon with which to combat the intolerant persecution of some of our finest birds and most interesting mammals.

But the authors play no favorites, and go on to show that by reasonable shooting, the fall *surplus* of Bob-whites *above winter carrying capacity* of their range may be utilized instead of being annually lost. In their own words: "Shooting is not a biological necessity [as has been asserted so often by sportsmen]; neither is it a practice necessarily detrimental to the species, if wisely regulated." However, they point out that "whether it endures may be contingent upon the progress which its followers are able to make in the elimination of the social and biological abuses which have hitherto attended it."

Another generally accepted idea that now seems in need of revision concerns the role of "buffer" species, for on page 377 it is stated, "We have no evidence which would lead us to suspect that fluctuations in buffer populations have played any part in either mitigating or increasing predator pressure on the particular bob-white populations with which we have been working."

The fourth and last part of the bulletin is devoted to management of the Bob-white's winter territory, and includes discussions of food, cover, predator control, management of shooting, and so on. The novice may find these discussions somewhat disappointing, for the authors do not lay down detailed directions for the execution of specific operations. His disappointment will turn to dismay when he reads that Quail "with or without evident cause may not use territories provided for them." But the trained wildlife manager will find here much thought-provoking material; for example, evidence that the nearer the peak a population is maintained, the higher must be the ratio of brood stock to winter population, just as progressively increased horsepower per knot is required to drive a liner at higher speeds.

The authors get right down to fundamentals when they write: "The bob-white thrives best in agricultural communities, and its fortunes in the long run are essentially the fortunes of the soil. Bob-white management may be to a large degree correlated with erosion control. Management of this, as well as other wild species of similar requirements, may reasonably be dove-tailed into sound agricultural practice over wide areas of land.

"Finally, effective bob-white management is not necessarily a matter of what is done; more often it seems to be a matter of what is *not* done. The truth and significance of this thought may possibly be more readily appreciated when one considers that, of the usual practices which evict Quail populations from many farms, not a few are practices which work to evict human populations, ultimately and permanently, from the same land."

Could there be a more impressive argument for the preservation of Bob-white?—E. G. H.

Parker's Ethics of Egg Collecting.—During the years 1934 and 1935, a lively controversy was carried on in the columns of 'The Field' (London) on the subject of egg collecting, in the course of which hundreds of letters were received. The editor, Eric Parker, has digested these and has presented a summary in most interesting book form¹ All of the arguments for and against the practice with which

¹ Ethics of Egg-Collecting | By Eric Parker, M. B. O. U. | with a foreword by | The Right Hon. Lord Desbrough, K. G. | Published by | The Field | The Field House, Bream's Buildings | London, E. C. 4. | Pp. 1-120 + i-iv. Price 5 shillings net.