Reviews

Western Ornithology.—Though the April, 1950, number of the *Western Australian Naturalist* contains no full-length bird papers, there is a valuable contribution by Dr. J. Gentilli, 'Bioclimatic Changes in Western Australia,' which will be of interest to all studying bird distribution and the factors controlling it. He traces changes in the forest belts and position of the desert border consequent on alterations in the rainfall. An increase of 1 inch in the annual rainfall would bring back into the semi-arid zone some 120,000 square miles of country now classified as desert, and decrease of 5 inches would lose 190,000 square miles of country to the desert. The importance of the south-west and the north-west Kimberley as biological refuges during extremely arid cycles is shown by a map demonstrating that even a lowering of the annual rainfall by as much as 30 inches would still leave small habitable tracts in these parts of the country. Short bird notes include observations on the flying speed of the Twenty-eight Parrot, and the occurrence of Rock Parrots at Fremantle (by D. Reid), the flocking habit in Willie Wagtails (Angus Robinson) and food washing by the Common Sandpiper (Eric Sedgwick). This number completes volume 2 and full title-pages and a comprehensive index are provided.—D.L.S.

Factors Determining the Breeding Seasons of Birds.—Mr. R. E. Moreau of the Edward Grey Institue of Ornithology, Oxford, and Editor of *The Ibis*, has produced a volume of that journal (vol. 92, No. 2, 1950) which must place in his debt everybody who is interested in the seasonal sexual phenomena of vertebrate animals. The whole issue is devoted to papers on the breeding seasons of birds and one cannot but stress how valuable an antidote are much of their contents to the often uncritical photostimulation experiments that, in some places, have built up an entirely lop-sided view of the importance of light as an initiator (as distinct from a forwarding agent) of the avian sexual cycle.

The papers consist of a brief introductory statement by Dr. A. Landsborough Thompson followed by five contributions dealing with Central America (A. F. Skutch), Africa (R. E. Moreau), and Galapagos (David Lack), Indonesia (K. H. Voous) and — a huge task, most ably done — Europe (Lack). From some of these contributions there emerges more data stressing the primary importance of food for the young (as pointed out by Schafer in the early years of the century) as an ultimate factor in the timing of the breeding cycle of many species, though there are indicated puzzling cases where correlation between special food availability and the ovulation date will surely be hard to demonstrate. What does emerge with great clarity is the incredible malleability of the organism in that it can develop specific responses (often differing among subspecies living part of the year in the same locality) to external stimuli that somehow become part of the genetic make-up of the race and thus time the sexual cycle so that the species will reproduce (as Heape postulated half a century ago) at the period most propitious for the survival of the young—and, it follows, for the survival of the species.

The work of the present writer (review in press, *Wilson Bulletin*) leads him to believe that some of the above-mentioned authors may still attach too much importance to light variation as an initiating agent; but that is merely a point of view and in no way detracts from the enormous value of the great body of information that has been presented. It is within the province of the naturalist to discover which external stimuli influence the exteroceptors of different species under natural conditions. In this, the professional laboratory worker must always be ready to learn from him. And it is only by interpreted work of both schools that, some day, the final problem of breeding seasons will be solved.—A.J.M.

Orientation of Birds during Migration.—Man has speculated on problems of bird migration since ancient times and now, half way through the twentieth century, there is still no general agreement on (a) why birds migrate, (b) what factors, external and/or internal, start them off towards their breeding ground and later, send them away from it, and (c) how birds know which direction to go and how to find their way to their objective once they begin the journey. The following publications are concerned with (c), namely—Kramer, G. (1950)—'Orientierte Zugaktivität gekäfigter Singvögel.' *Die Naturwissenschaften,* Heft 8, S. 188; and 'Weitere Analyse der Faktoren, welche die Zugaktivität des gekäfigten Vogels orientieren,' *Ibid,* 16, 317/78.

In the last few years a highly speculative hypothesis has come from Ising and Yeagley and in it the migrants and homing birds are required to be able to use Coriolus forces. But Thorpe and Wilkinson of Cambridge appear to have put this notion out of court before it has had opportunity to gain adherents. The recent work of Dr. Gustav Kramer of the Max-Planck-Institut fur Meeresbiologie, Wilhelmshaven, however, requires no 'mysterious' perceptive mechanism in birds and it supports the contention of the many naturalists who have felt that birds probably find their way on hereditarily-determined journeys primarily by the aid of the sun or other natural sources of light.

Dr. Kramer has put the matter on an experimental basis. In an ingenious series of experiments he confined flying passerine migrants in a large, round, wind-protected cage in which they could be observed through a transparent bottom. They exhibited a definite preference to congregate in a direction towards the nearby lighted town when they were placed in position after dusk. But, if put in position before dark, the birds regularly turned to a direction conforming to the traditional migratory orientation of the species. Further, they did this in localities where large masses of iron rendered a compass needle utterly unreliable, and so the birds could not be held to be guided by magnetic forces as some people have speculated in the past.

In the case of the day-flight *Sturnus vulgaris,* interference from artificial light sources did not arise. The birds regularly congregated on the sides of the cages nearest their normal migratory direction. By a system of mirrors, sunlight was re-directed to the extent of 90 degrees and the directional trend of the birds changed immediately by 90 degrees also! Also — a matter of equal importance — the direction was maintained by the Starlings independently of the time of day, suggesting that they are able to estimate, and to allow for, the movement of the sun during their migratory flight.

Following this achievement of Dr. Kramer's, we may expect a great deal of experimental work from Wilhelmshafen and elsewhere designed to confirm or disprove the initial findings. We are indebted to him for a new and useful technique for the study of an age-old problem.—A.J.M.

The Takahe.—No. 5, vol. 4, of *Notornis* is principally devoted to a series of articles on this bird, with numerous illustrations, designed to give the latest news on this recently-rediscovered species. The articles include accounts of food of the chick, notes on winter observations, and a communication regarding protection. Not more than two eggs are laid, families seem limited to one chick, the percentage of fertile eggs may be low. These points caused Dr. Falla to consider that the position was precarious, but the protection report indicates that the birds are now known to occupy seven different valleys, in four of which they are known to breed, and that the known number of birds is between 30 and 40.—C.E.B.

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