REVIEWS and ABSTRACTS

Twelfth Annual Report of the Australian Bird-banding Scheme, July 1965 to June 1966, by D. Purchase, 1969. Division of Wildlife Research Technical Paper No. 16 CSIRO Melbourne 1969.

All data up to 30 June 1966 are included in the statistical section of this report. During the year covered, 93,814 individuals of 426 species were banded bringing the total for the Scheme since its inception in 1953 to 642,986 birds of 620 species. Two-thirds of the birds banded in 1965-66 were taken by mist net.

Despite an increase in the number of active banders since the last report from 169 to 176, the number of individual birds banded was 39,200 less than in the previous year. This is attributed to drought conditions over much of south-eastern Australia in 1965-66, and a change in banding policy arising from a meeting of Regional Organisers held at Canberra in January 1966. This conference recommended restricting banding to specific projects approved by a committee of amateur and professional ornithologists associated with the scheme.

A list of 25 papers based upon banding activities is included, these being published in *The Australian Bird Bander* and *The Emu*.

Full data on 92 selected recoveries dealing both with distance travelled and age of individuals are given: a Little Egret (*Egretta garzetta*) banded at Balranald, N.S.W. on 14 December 1963 recovered at Ashburton, New Zealand on 1 February 1964, 1630 miles ESE, and a Southern Skua (*Catheracta skua lonnbergi*) banded at Macquarie Island on 7 January 1965 and recovered at Maroubra Beach, N.S.W. on 20 July 1965, 1440 miles NNW represent two interesting foreign recoveries.

Long distance recoveries within Australia list principally non-passerines and reflect in particular the high mobility among Australian waterbirds. Of the passerines most information is available on the Eastern Silvereye (*Zosterops lateralis*), this species accounting for the highest total banded for the fifth consequetive year.

ERIC LINDGREN, Port Moresby, T.P.N.G.

Radar Ornithology, by Eric Eastwood. Methuen, London, 1967. 290 pp., 24 plates plus text figures. 75 shillings (sterling).

The advent of radar has provided a most potent tool to the ornithologist studying migration. Dr Eastwood is well qualified to write this book as he is Director of Research of the English Electric Group and Chief Scientist to the Marconi Company. He has also made a major contribution to the literature of bird migration.

This book can be divided into two parts, one dealing with radar technology and the other with the results obtained. Radar was developed for military purposes and one of the most fascinating aspects is the account of the detective work that identified the puzzling 'angels' that appeared on the radar screen with echoes received from birds.

Radar studies have necessitated a revision of many aspects of migration theory and it is this part of the book that should be read by all interested in migration. Radar has, for example, shown that long non-stop flights are commonplace and that step-by-step or short-hop migration may not be the dominant method of progress it was once thought to be, at least in those parts of the world where radar studies have been undertaken. Again, radar studies have called into question such long held concepts of wind drift. They have also shown that birds are capable of maintaining a constant track under conditions of complete overcast when neither terrestrial nor celestrial objects are visible to the birds. The volume of migration and the height distribution under these conditions show little difference from migration under clear skies.

While radar studies have provided the answers to some problems they have posed as many questions as they have answered. While radar cannot replace banding the results that have been obtained from radar studies must be taken into account when analysing banding data.

D. G. THOMAS, Moonah, Tas.

Radar in Orientation Research, by Frank Bellrose. Proceedings of the XIV International Ornithological Congress, Oxford 1966, edited by D. W. Snow, pp. 281-309. Blackwell: London 1967.

The results of radar research from two locations in Illinois are presented. Although there are differences between spring and autumn, additional evidence is given that, with favourable winds, migrants are capable of maintaining a constant track under conditions where astral clues are lacking and that landscape features are largely ignored as aids to migration. The theory is advanced that the wind is used as an orientation reference. Certainly migrants appear to select wind velocities and reduce their flight speed somewhat as wind speed increases. Thus the speed over the ground remains fairly constant and a given distance is covered in constant time but with less expenditure of energy as wind speed increases. This selection of wind speed may well account for the altitudinal distribution of migrants. Passerines appear to select winds below 10 knots, waterfowl and waders winds above 30 knots. As wind velocity increases with altitude passerines would be expected to migrate at lower altitudes than waders, a phenomenon that has been observed in many radar studies.

This paper should be read in conjunction with Radar Ornithology by Eric Eastwood, also reviewed in this issue, as answers are suggested to some of the questions posed by Eastwood.

D. G. THOMAS, Moonah, Tas.

Night Flight with a Thrush. Richard R. Graber. 1965. *Audobon Magazine*, 67:368-374.

Migratory Flights of Hylocichla Thrushes in Spring: a Radiotelemetry Study. W. W. Cochran, G. G. Montgomery, and R. R. Graber. 1967. *The Living Bird*, 6:213-225.

Since 1957, Dr Graber and colleagues from the Illinois Natural History Survey have intensively studied various aspects of nocturnal migration. Their data include radar observations on film, audio records on tapes, specimen data from television tower casualties and field censuses of migrants. To these data can be

added the lunar studies organized by others. The present two papers give the results of studies using radiotelemetry techniques. In "Night Flight with a Thrush", Dr Graber describes how a miniature transmitter of only 2.5 grammes was developed by the group, and one of these transmitters was glued to the back of a Gray-cheeked Thrush (*Hylocichla minima*). The bird was caught at noon on 24 May 1965. As indicated by radio signals, the thrush remained in the orchard for the rest of the day and took off at 7.55 p.m., followed shortly afterwards by Dr Graber in a plane. On a clear night, the thrush flew steadily at an air speed of about 33 mph; assisted by a wind of 22 knots, the thrush had a ground speed of 50 mph. The thrush was followed from Urbana to over the city of Chicago, when contact was lost at 10.15 p.m. Extrapolation of the line of flight indicated that if the bird held its course and speed, it would be at Evanston at 10.37 p.m.: and contact was made as predicted. The bird had then flown 140 miles in less than three hours. Past Evanston the bird flew steadily on over Lake Michigan; the plane had to divert westwards over land and contact was lost. Further extrapolation of the flight line showed that the thrush would pass over the length of Lake Michigan, some 250 miles, if the original course was adhered to. The plane patrolled the Door County Peninsula at the north end of Lake Michigan from 2 a.m.: amazingly at 2.48 a.m. radio contact was re-established. The thrush had then flown over water for some 200 miles. Further tracking had to be abandoned due to an approaching storm. The thrush had thus been tracked for about 340 miles in less than 8 hours.

The second paper describes how 21 Hylocichla thrushes of three species were fitted with miniature transmitters, and part or all of their migratory flights were then followed by plane or truck. The range of reception varied for a few miles for a bird flying at an altitude of a few hundred feet, to over 12 miles for birds at 3,000 to 5,000 feet. Bird headings were plotted and extrapolated, and truck routes were selected to enable the truck to be in position at expected cross-over points. Bird locations are considered to be accurate to within ± 1 mile. One nocturnal flight is plotted in detail, showing bird route, truck route, and cross-over times and locations. The tracks of all birds followed for 20 or more miles are mapped. Results are discussed at some length. All thrushes observed were sedentary during the day, and it is concluded that these three species do not migrate during daylight in spring and in the particular area of study. Departure times started from 45 minutes to 2 hours after sunset, and movement ceased at dawn. Departures could sometimes be stimulated by disturbing the birds, but these artifically stimulated flights appear to be of relatively short duration. Most flights are at air speeds between 25 and 35 mph and some individuals migrated on successive nights. On long flights the birds fly at altitudes of 2,000 to 6,000 feet. Straight flights are maintained for 100 miles or more under overcast skies. It is emphasised that the study reports the actions of radio-tagged birds, and these may differ from non-tagged birds.

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Recent Literature

BANDING AND RECOVERY REPORTS

Recoveries in Great Britain and Ireland of Birds Ringed Abroad. Robert Hudson. 1969. *British Birds*, 62:13-22.

During 1967, 632 recoveries of foreign banded birds were reported. A tabulation lists the 69 species recovered in 1967, together with the total recoveries of each species since 1906. As usual the list of recoveries reported in full is highly selective, and includes data for 61 species.

ANALYTICAL STUDIES

A Theory of Phasmatid Release. J. L. Readshaw. 1965. *Aust. J. Zool.*, 13:475-490.

Estimates of the Size of the Winter Flocks of the Pied Currawong, *Strepera graculina*, from Mark-recapture Data—a New Approach. J. L. Readshaw. 1968. *Aust. J. Zool.*, 16:27-35.

The Distribution, Abundance, and Seasonal Movements of the Pied Currawong, *Strepera graculina*, an Important Bird Predator of Phasmatidae, in eastern Australia. J. L. Readshaw. 1968. *Aust. J. Zool.*, 16: 37-47.

Outbreaks of the native stick-insect (*Didymuria violescens*) have caused very severe defoliation of eucalypts in eastern Australia in recent years, particularly in the mountain forests between Canberra (A.C.T.) and west Gippsland (Victoria). The first of these papers outlines the biology of the phasmatid and summarizes the southwards movement of the outbreaks between 1948 and 1964. Outbreaks occur in alternate years. Wasps parasitize the eggs, and may play an important part in the limitation of population increase, particularly in warm situations with low host density. Large insectivorous birds, and the Pied Currawong in particular, are major predators of the older nymphs and adults, and phasmatids may constitute up to 100% of the contents of gizzards of some insectivorous birds. Bird predation tends to be severe at times of low phasmatid abundance, but birds have negligible effect during years of outbreak. Birds are attracted into the outbreak areas, and the populations of phasmatids in the low density areas surrounding the outbreak area may then be released from control by the birds.

The second paper discusses methods of estimating the size of winter flocks of currawongs at Albury, New South Wales by using banding-retrap data. A new method of flock-size estimation using cumulative catch and retrap data is developed for closed populations, and the method was confirmed by computer simulation.