

LETTER TO THE EDITOR

46 Wilbury Rd.,
Hove 3, Sussex,
England.

25 January 1963

To the Editor of "Bird Banding",

Sir,

Radar and moon-watching in the Mediterranean.

Please excuse a belated letter, but I have only just noticed that during a series of reviews of papers on migration in the Mediterranean area last spring (*Bird-Banding* 33: 101-107) one of your reviewers gives what appears to me a somewhat misleading account of some preliminary conclusions concerning migration through Cyprus which I published in the *Proceedings of the XII International Ornithological Congress*. 127-132. In particular he omits to mention my conclusion that moon-watching is a rather unsatisfactory way of studying migration, and that radar supplies important evidence that some Palaearctic migrants make a detour around the Mediterranean on the way to Africa. Since the truth concerning the nature of migration over Cyprus has now I hope been firmly established by more detailed work by Mr. D. W. H. Adams using an improved type of radar (*Ibis* 104: 133-146), will you permit me to enlarge slightly on why our and possibly some other observations of migration obtained by watching the moon in the Mediterranean area appear to have been so unsatisfactory?

The eastern Mediterranean area is one of the first places where radar was used effectively to study bird migration, since E. G. M. Goodwin published an account of an exercise in which it was used to investigate the behaviour of large raptors taking part in a concentrated migration over Suez as early as 1947 (*Illustrated London News*, Nov. 15: 552). Birds did not attract attention to themselves by appearing on radar again until the period of the "Suez affair" in the autumn of 1956, when they caused some alarm and despondency in Cyprus by approaching this highly-fortified island in large flocks from directions between north and east. The language of the pilot who after great trouble eventually succeeded in intercepting one of these flocks is reported to have been highly picturesque, and must have provided great entertainment for anyone listening in to our radio communications. At that time the R. A. F. had a number of long-wavelength, short range radar sets distributed around the island, and I was consulted during the following winter concerning which of the phenomena detected by them might be birds. Our eventual conclusions concerning the amount of bird migration which could be detected in this area by radar at this time are quoted by Lack in the *Ibis* 100:287, while I summarize my own first impressions of the general nature of bird migration through the Middle East in the *Ibis* 101:170-176.

These first radar sets had a rather poor performance, of the sort illustrated by Drury, Nisbet and Richardson in their pictures of results obtained later by American sets (*Natural History* 70: 10-17). While this type of relatively long-wavelength radar produces excellent results when used for watching individual large birds or flocks of small birds at close quarters (page 12 in Drury *et al.*, *loc. cit.*), it lacks sufficient resolving power to reveal movements of solitary small birds clearly, except possibly under conditions of "anomalous propagation", when the radar beam is refracted by the atmosphere, and the whole screen becomes filled with masses of ill-defined echoes and it is difficult to distinguish individual birds or the directions in which they are travelling at all (the picture then looks rather like the "unusually heavy movement" figured by Drury *et al.*, pages 10-11). In the circumstances we attempted to supplement the first radar results by discovering other ways of watching bird migration at night, and largely at Dr. I. C. T. Nisbet's suggestion the late Robin Dove and I set out to watch the moon during the autumn of 1957 and spring of 1958. As your reviewer observed, the results were very modest by both American and other Mediterranean standards, and we soon gave up in disgust.

In the spring of 1958 we obtained access to a much more effective type of high-power, short-wavelength radar, comparable in performance to that used from about this time by Lack and others in Britain (*Brit. Birds* 52: 528-567). It now became possible to distinguish small birds with much greater precision at any-

thing up to twice the range possible with the original sets (compare the detail and range covered in the figures published by Lack and Drury *et al.*). Mr. Adams has now carried out a much more thorough investigation of small bird migration with one of these sets in west Cyprus during the autumn of 1958 and spring of 1959, and although he was not able to see the concentrated movements to the east as well as the personnel manning the original sets two years before, he has been able to obtain a much clearer picture of other types of migration. He reports that around Cyprus most birds seem to migrate at between 1,000 and 4,000 ft. by day and between 3,000 and 6,000 ft. by night, with some echoes up to at least 13,000 ft. (I was told birds were seen with radar at heights around 5,000 ft., and had been seen from aircraft at heights up to 19,000 ft.), and that in the early autumn most birds go SSE though some go SSW to SW later, while in the spring most return to the NNE or NE from the south, though some move on NW after resting in Cyprus or on one occasion the Lebanon.

These results are confirmed by the first radar observations from an aircraft carrier in the western Mediterranean by Lt. M. B. Casement. He reports that "between Malta and Gibraltar in early May radar showed activity every night, usually reaching a peak at 0200 hrs., in the mean direction of 040°. The height of the main streams was from four to six thousand feet" (*Sea Swallow* 15: 29).

In Cyprus we watched the moon from rather under 1,000 ft. on the central plain through 9 x 35 binoculars between 2200 and 2400 hrs. for an admittedly short but probably representative period on several different nights at the height of both the spring and autumn migrations. We now know that at this time most of the local migrants have already left the island, although the main evening departure southwards from Turkey to the north should then have been passing overhead in autumn, even if birds which left the south shore of the Mediterranean at dusk may not have arrived in spring. We were able to see some low-flying birds quite clearly, but failed to pick up many high-flying ones at all. It now only seems possible to conclude that we saw either birds which only started to set out from Cyprus long after dusk, or alternatively birds from the north or south which started to descend on the island in the middle of the night, while in autumn at least the main southwards migration passed over too high to be seen through ordinary binoculars. They might have escaped Newman's spotting scope as well, if he cannot see small birds further than $1\frac{1}{2}$ miles = 7,920 ft. (*Bird-Banding* 33: 107) and cannot arrange for the moon to stand still immediately over his head.

I think it is only possible to conclude that while Nisbet *et al.*, (*Ibis* 103a: 349-273, 503-516, discussed in *Bird-Banding* 33: 101-107) may be able to see small birds passing in front of the moon in fair numbers when they are leaving the north coast of the Mediterranean in autumn, or when they have made a short sea crossing north across the Strait of Gibraltar in spring, by the time these birds have set out on a longer sea crossing, and when they reach the far side, they may be flying too high to be seen easily with ordinary optical aids. This may explain why Nisbet *et al.* lost some of the birds seen flying south in north Greece when they looked for them in south Greece (if these were not the birds which turned round and flew back NNE), and also why they were unable to see them arriving in south Spain after the long sea crossing from Morocco over the western approaches to Gibraltar in spring. As pointed out by Newman, if Nisbet had been using a 20x spotting scope instead of 10x binoculars he might have seen 40 percent more birds in south Greece, and detected some of the birds which got lost on their way south; but then, how many more birds might Newman see through a 40x telescope, or even some gadget which revealed all the birds passing over him, such as a radar set?

While the discrepancy between the number of birds migrating south in north and south Greece in autumn, and between the numbers of birds migrating north at Gibraltar and Sanlucar to the west in spring could be accounted for by the fact that the birds started flying too high to be seen in south Greece and at Sanlucar, as they appear to do when flying south over Cyprus in the autumn, there is another possible explanation for at least the second of these discrepancies. It seems likely that few birds were seen passing in front of the moon or for that matter with radar in Cyprus in spring because birds leaving the south coast of the Mediterranean at dusk may not reach Cyprus until rather late in the night, after observations were terminated. It is often assumed that migrating birds travel at about 30 knots. Direct measurements by Meinertzhagen (*Ibis* 97: 81) confirmed with radar by Harper (*Proc. Roy. Soc. B.* 149: 497) and in the laboratory by

Pearson (*Condor* 63: 506, also discussed in *Bird-Banding* 33: 108) suggest that the smallest migrants which probably fly lowest and are most obvious to moon-watchers and least obvious on radar normally fly rather slowly, at speeds under 20 knots. This is too slow to reach either Sanlucar from south Morocco or Cyprus from Palestine and Egypt by the middle of the night unless they were drifted west by east winds from the region of Tangier in the first case or the Lebanon in the second, as seems to happen at times.

In view of the irregular distribution of small migrants on the ground before they take off, their possible slow speed and hence extreme susceptibility to lateral drift by upper winds of doubtful strength and direction after they take off, and the fact that it seems possible that a considerable proportion of the birds may fly too high to be seen during the middle of their passage in any case, it seems dangerous to draw too many conclusions from techniques such as moonwatching in an area like the Mediterranean. I would not presume to comment on the situation in an area which I do not know myself like the Caribbean, and this form of lunacy may be more successful there.

In addition to failing to comment on the possibly unwelcome significance of poor moonwatching results in an area where it is possible to demonstrate that much migration is taking place by other means, your reviewer fails to comment on another aspect of the radar results which I particularly tried to emphasize, the direction of the movements seen with radar. Mr. Adams' observations confirm early reports and the trend revealed by banding returns which indicate that during the early part of the autumn when many Palaearctic migrants to Africa are passing through the area the main direction of movement seen with radar is SSE although the birds' probable destination lies west of south and they start to move on SSW and SW at the end of the autumn. They also demonstrate that the main direction of arrival in spring seems to be NNE although some of the birds later go on NNW or NW after resting in Cyprus, or on one occasion at least the Lebanon. In the circumstance in spite of Mr. R. E. Moreau's reiterated commanding solitary voice of dissent (*Ibis* 103a: 373-427, 580-623, discussed in *Bird-Banding* 33: 101) I submit that it appears that whatever may happen further west a considerable number of European birds must make a detour around the east end of the Mediterranean when migrating between Europe and Africa. Since Lt. Casement now reports that they migrate NW in the western Mediterranean in May, and authorities on the area such as Marchant (*Ibis* 104: 571) are unable to substantiate Mr. Moreau's hypothesis that numerous Palaearctic birds winter undetected in West Africa, it seems quite possible that birds migrating between the Palaearctic and Ethiopian regions may also make a detour round the west end of the Mediterranean as well.

The identity of the birds which make a detour around the east end of the Mediterranean is not always clear because they do not all halt in Cyprus. It is well known that the European population of the Lesser Whitethroat *Sylvia curruca* prefers to halt in the Lebanon, for example (Brickenstein-Stockhammer and Drost, *Volgelwarte* 18: 197-210), and although many of these birds must pass over Cyprus on migration and it is by no means uncommon on the ground there, there are still only four banding recoveries in the island, although there are a large number from the Lebanon. But as I tried to make clear, the identity of one species is well known because there is a long-established custom in Cyprus of catching them for food when they halt there after flying SSE from Europe to refuel in the local fig-gardens before flying on SSW to Africa. This is the Blackcap *Sylvia atricapilla*, which Mr. Moreau omits altogether from his list of Palaearctic birds migrating to Africa although he has mentioned in a previous paper (*Ibis* 95: 329-364) that it is curiously scarce at sea in the Mediterranean, and it is apparently widespread in winter in the Ethiopian region. There are now some 28 banding recoveries of Blackcaps in Cyprus, 22 percent of all local banding recoveries of any sort, while the species appears to form about 80 percent of the birds caught there by bird-liners. All except one of these birds was banded in directions between NW and north, mainly to the NNW in central Europe, and the exception was banded to the SSW in Egypt. All except two were recovered in Cyprus between 16 September and 6 November, and the exceptions were not taken in the winter, when the species is very scarce in Cyprus, but when it reappears on the return passage in mid April and early May. It appears that whereas the west European Blackcaps which were shown by Brickenstein-Stockhammer and Drost (*loc. cit.*) to migrate SW to the western Mediterranean area

in autumn may winter where they land, the central and east European Blackcaps which migrate SE to the eastern Mediterranean in autumn to feed on figs do not stay there when the climate deteriorates later in the year, but change their movement and pass on SSW around the east border of the Sahara to winter in Africa.

As Mr. Moreau has taken pains to point out (*J. Animal Ecology* 21: 250-271) a vast number of birds breeding across the whole width of the northern hemisphere from the Canadian arctic through Europe and Asia to Alaska winter in Africa. A great many of these birds perform long migrations before they ever approach the final long desert crossing to the Ethiopian region, and must then refuel for the desert crossing, where as Mr. Moreau so rightly observes they are assisted by the NE trade-winds in autumn but opposed by them in spring. In the area between 30° and 45° latitude where they refuel much space is occupied by mountain ranges, steppes, and seas swept by sudden small local storms, described by Admiral Lynes, a man who as a result of his profession seems likely to be a sound authority on the subject (*Brit. Birds* 3: 36 et seq.; it is curious how Mr. Moreau omits to mention this paper, though he does mention the storms whenever they provide evidence for broad front migration across the Mediterranean by causing birds to descend in large numbers on ships). In autumn there are few large areas in this zone where birds can refuel in large numbers, and the most important of these appear to be the west coasts of Iberia and Morocco, and the eastern shores of the Mediterranean where they are moistened by westerly winds off the sea. In spring the conditions for birds in this zone are better after winter rain, but the birds are now very tired after crossing the desert against the wind, and they again make for much the same refuges to refuel before passing on to the breeding grounds.

After omitting inconvenient species such as the Blackcap, Mr. Moreau provides a table to demonstrate that many birds appear to be evenly distributed across the width of the Mediterranean area on migration. But this table seems highly misleading, because the area of land and sea is not evenly distributed across this zone, but is much greater at each end than in the middle. SW Iberia and west Morocco or Cyprus and Egypt (or preferably Asia Minor and the Lebanon) are both larger and more fertile than Malta and Tripoli, for example. It follows that if birds such as Redstarts *Phoenicurus phoenicurus* or Common Whitethroat *Sylvia communis* appear equally abundant across the whole of this area, many more must be passing around the ends of the Mediterranean than across the middle. Thus the evidence provided by direct observation appears to support that provided by various banding analyses by Continental European (mainly German) workers in suggesting that there must be a "migratory divide" in parts of Europe between populations of birds which pass round one end of the Mediterranean and Sahara on passage, and populations which pass round the other end. It seems possible that if your reviewer were to obtain access to a radar set he might be able to find evidence for such phenomena in North America as well.

W. R. P. Bourne.

RECENT LITERATURE

BANDING

(See also numbers 22, 23)

1. **Report on Bird-Ringing for 1961.** Robert Spencer. 1962. *British Birds*, 55: 493-543. . Ringing Supplement 1962. 1961 was a banner year in the number of birds ringed, species ringed and recoveries reported. An exciting new species, ringed in Ireland, is also the first record for the British list—a Fox Sparrow (*Passerella iliaca*). The first British ringed bird ever found in Australia is a Manx Shearwater (*Procellaria puffinus*) from Skokholm, Wales. Interesting ages were a Blue Tit (*Parus caeruleus*) of 8 3/4 years, a Great Tit (*P. major*) of 10 years, and an Arctic Tern (*Sterns macrura*) of 22 years.—M. M.Nice.