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BRITISH BIRDS

AN ILLUSTRATED MONTHLY MAGAZINE

Edited by

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Photographic Editor: G. K. YEATES

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British Birds



JANUARY 1959

THREE SHILLINGS

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BRITISH BIRDS

THE CROSSBILL INVASION OF 1956 AND THE SUBSEQUENT BREEDING IN 1957

By F. R. SMITH

INTRODUCTION

INVASIONS of Great Britain by Crossbills (*Loxia curvirostra*) have been recorded periodically for hundreds of years, ever since 1251, and recent ones of notable size took place in 1927, 1935, 1942 and 1953 (Barraud, 1956). In view of the last, it might at first sight appear strange to find a further invasion taking place in 1956* and so it is of interest to consider the theories that have been put forward to account for these visitations.

Lack (1954) has two theories, neither of which he looks upon as being conclusive in itself:—

- (1) That invasions follow, and are stimulated by, an exceptionally successful breeding year at the western end of their breeding range.
- (2) That they ultimately occur when there is a failure in the normal food supply.

Williamson (1954) considers that the irregularity of these large-scale movements is due to the rarity with which the responsible factors coincide and relates them more closely to their meteorological environment. A strong polar high pressure system over a large part of the species' range in the period between the end of the breeding season and the beginning of the moult is, he considers, the ultimate factor, when this follows a season in which the spruce cone-crop has given a rich yield of seeds and breeding has been unusually successful.

Svärdson (1957) relates the movements much more closely to the shortage of spruce seeds, the natural and principal food of the Crossbill. He points out that in southern Sweden a rich

*It should be remembered that in 1958 there was yet another invasion of Crossbills, from the end of June onwards (*antea*, pp. 315-316).—EDS.

cone winter occurs every third or fourth year, and that the better this crop of cones is in one winter, the poorer will be the crop available in the following one. In the winter of 1952-53 the crop of spruce cones was low over the whole of Sweden and the breeding population of Crossbills was also very low. At this critical time of food shortage a large scale movement of Crossbills took place westwards through Sweden, originating from further east and probably stimulated by similar spruce-cone shortage conditions. As the movements of Crossbills normally occur after the old seeds fall from the cones in April and May and before those of the new crop ripen in August, the resulting invasion into Great Britain in the summer of 1953 is explained, the birds continuing westwards in their search for food.

The winter of 1954-55 was again rich in spruce cones throughout Sweden and a poor crop followed a year later, so that there was a minimum supply of seeds in the spring of 1956. An influx from the east therefore produced an invasion into Great Britain in the summer of 1956 in accordance with the theories advanced by Svårdson.

It would appear, then, that the weather at the time of the irruption is not the dominating factor, though it is of importance in the determination of the front along which the arrival into Great Britain takes place, the direction taken by the Crossbills being generally east to west along the breeding range, or west to east in the pendulum flights which must subsequently occur.

Reinikainen (1937) had already demonstrated that the high degree of nomadic wandering by Crossbills is related to seasons when the spruce seed yield is low, but subsequent evidence obtained by Svårdson shows that this correlation is not always as positive as the material suggested. In particular, 1942-43 was a peak cone winter and also a peak breeding season due to a 1942 invasion from the east coupled with this high spruce crop; yet this abundant season was followed by a large scale movement eastward in the summer of 1943.

A completely satisfactory explanation of the irruptions and subsequent reverse movements will be obtainable only when a full analysis of the status of the Crossbill over the whole of its breeding range is available, together with a complete knowledge of the fruiting rhythms of the spruce over the whole of this area.

THE INVASION INTO GREAT BRITAIN DURING 1956

Although not on as large a scale as the 1953 invasion, the pattern of the 1956 irruption was true to form and took place at the normal annual movement time for Crossbills. However, whereas the 1953 influx took the form of a gradual spread from a north-easterly point of origin, the 1956 arrival started about a month later as a massive east to west movement on a broad front followed by a rapid penetration into the more distant parts of England. (In this connection, it is of interest to add that the

recent 1958 movement appears, from a preliminary analysis, to have been more on the lines of 1956 than 1953.)

The first indications of the invasion were a few arrivals at the Isle of May on 1st July and flocks of 30 and 55 at Fair Isle on the 2nd and 3rd respectively. By 4th July the movement was in full swing on a broad front stretching from the Shetland Isles to Yorkshire and, although the numbers were at first small (flocks

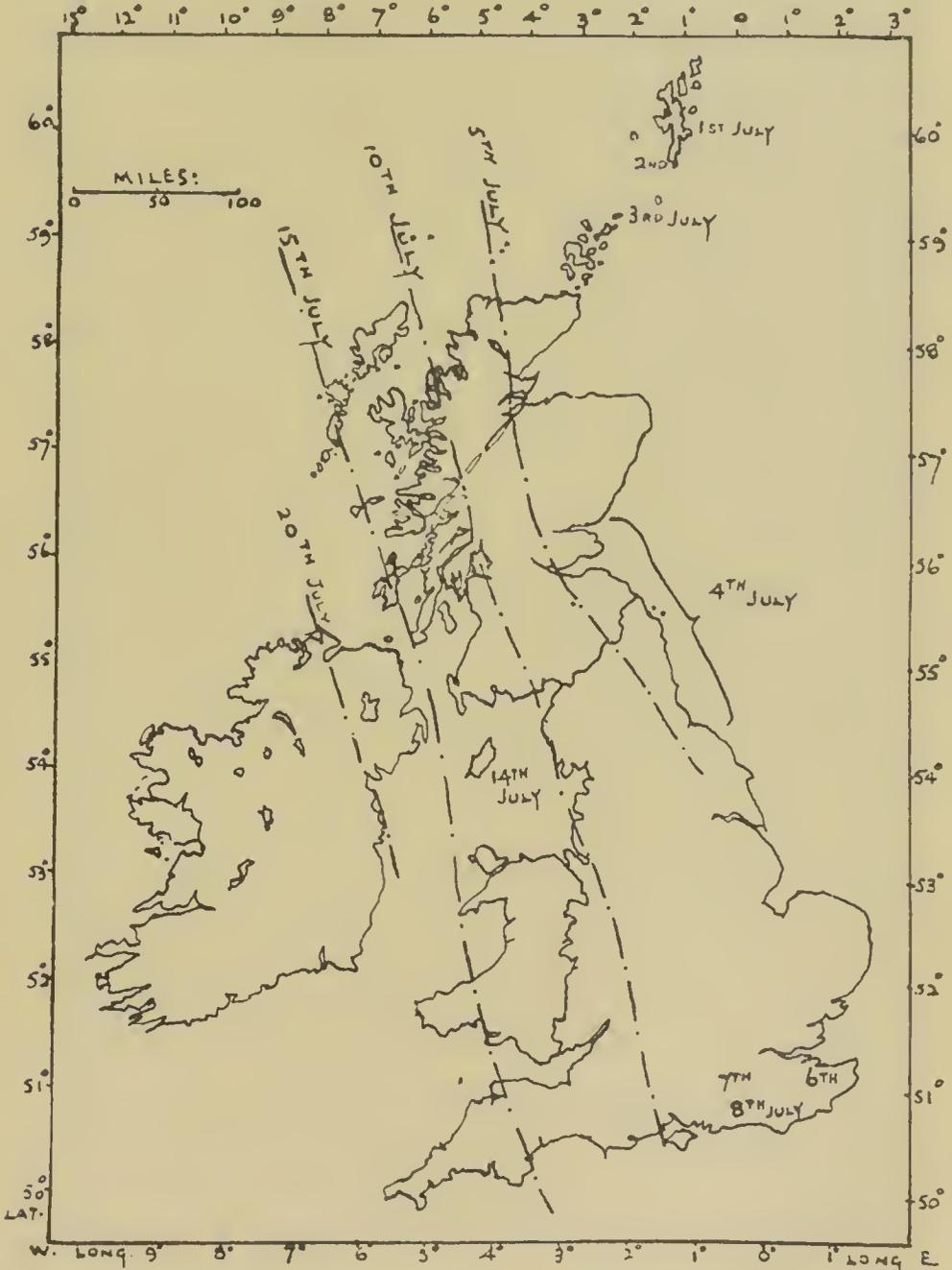


FIG. 1.—To show the westward movement of the first arrivals of Crossbills (*Loxia curvirostra*) in July 1956

of five or six birds), by 6th July 200 had been recorded at Fair Isle, flocks of 20-30 had been seen in Berwickshire, Peeblesshire, Selkirkshire, Northumberland, Durham and Yorkshire, and a party of 12 had reached as far south as Kent.

The birds passed rapidly inland (Fig. 1), parties of six or seven being seen in Surrey and Sussex on 7th and 8th July, and by 12th July they had penetrated as far as west Somerset where a flock of 40 was recorded. The Isle of Man was reached by at least 14 Crossbills on 15th July and on the same day six were seen in Worcestershire; on the 16th a small flock appeared at St. Kilda and 30 were noted in Devon. The first 10 were seen in Herefordshire on 19th July and during the next few days many of the counties further east recorded their first ones as further flocks came in: Essex, two about 20th July; Oxfordshire, six on the 22nd and 40 on the 25th; Berkshire, one on the 25th; and Buckinghamshire and Bedfordshire, several each in the last part of the month. Small flocks of up to twelve were seen in Northern Ireland on 21st, 22nd and 25th July and one or two in early August.

It is evident that the 1956 invasion differed from the 1953 influx in that it was mainly concentrated into the first half of July, with arrivals on a large scale and a broad front, though there was a smaller secondary influx from 28th August to 8th September. On Fair Isle, for instance, none was recorded between 13th July and 28th August, whereas in 1953 they were seen in considerable numbers from mid-June to mid-September. The breeding distribution of Crossbills in Europe and Asia extends northwards from a line approximately along latitude 54° (see *antea*, vol. I, p. 324, fig. 2) and it is of interest to note that the July invasion into Great Britain similarly occurred principally from latitude 54° northwards. The 1956 invasion also differed from the one in 1953 in that no Crossbills were seen in Cornwall and the numbers in Ireland were smaller.

The end of July and the whole of August was, therefore, a period of little movement, flocks being recorded in seventeen counties in areas where cones were plentiful. In Scotland, flocks of up to 60 were seen in Berwickshire, numerous flocks of up to 30 in Perthshire and Invernessshire, and several hundreds in Dumfriesshire. In Co. Durham, flocks of nearly 100 were seen until late August, but the Crossbills elsewhere in England during August were usually in groups of less than 20 with the exception of those in Northumberland (flocks of up to 40) and in Gloucestershire (flocks of up to 30).

The secondary influx began on 28th August at Fair Isle and on 4th September at the Isle of May, and numerous parties were recorded during the first week of September in Northumberland. In Norfolk, 20 were seen on Newarp Light Vessel on 2nd September and there were small parties on the coast on the 3rd and 4th. A much greater general movement was then again recorded: this involved twenty-six counties and affected southern Scotland,

almost the whole of England and part of Wales, but the flocks were small, being of less than 20 birds except in Berwickshire (flocks of over 100), Perthshire (flocks of up to 50), Wales (up to 25) and Surrey (up to 30).

A restless movement continued throughout October and November and during these months thirty counties reported small parties while several recorded larger groups. Scotland had flocks of up to 80 in Ross, Inverness, Kirkeudbright, Berwick and Peebles, while in England flocks of up to 60 were seen in Northumberland, Durham, Hereford, Wiltshire and Sussex. Crossbills were particularly numerous in Northumberland where in one locality it was estimated that at least 500 were present and at the same time in another, where the coniferous trees had just reached the cone-bearing stage, many large flocks were frequently seen.

December records from sixteen counties varied mainly from two to 14 birds. Northumberland was the exception as the large concentration of over 500 was still maintained. A steady falling off in numbers was taking place elsewhere, leaving behind small wintering flocks.

BREEDING IN 1957

The 1953 invasion was followed by a certain amount of breeding success in Great Britain in 1954 in areas where there are normally no Crossbills. The influx of 1956 was also followed by successful breeding in 1957 but on a much larger scale. This success was principally evident in England and Wales where nesting was proved in at least eight counties and suspected in an additional eight. In a further nine counties Crossbills were present during the 1957 breeding season and it seems possible that they may have nested in at least some of these without being detected. A summary of the breeding records follows (see also Fig. 2).

NORTHUMBERLAND.—A nest found in one area on 25th January 1957 contained four eggs. It was situated in a Sitka spruce at a height of about ten feet from the ground and at an altitude of 750 feet. Although an inch of snow was lying on the ground at the time, the young were successfully reared. Breeding was also strongly suspected in various areas of suitable woodland where Crossbills were present in early 1957 and also in localities where they were known to have bred after previous invasions.

CUMBERLAND.—Crossbills were seen in small groups and in pairs until April 1957 in the Thirlmere and Keswick areas and it is likely that breeding took place.

WESTMORLAND.—Crossbills bred in at least three different localities in 1957 and nest-building, incubation and feeding were closely watched. One nest was situated at a height of nearly sixty feet against the main trunk of a larch.

YORKSHIRE.—In the North Riding several parties of Crossbills were seen in June 1957. In the West Riding breeding was proved to have taken place in one area and was suspected at others.

LANCASHIRE.—In the north of the county, four nests were found in one area and there was evidence that there were very many more. Females were seen carrying building materials in other suitable localities. One nest was built on the arm of a stunted Scots pine at a height of about five feet from

the ground. These are believed to be the first breeding records in Lancashire.

CHESHIRE.—A pair of adults and two juveniles were observed in mid-June and elsewhere another juvenile was seen begging for food from an adult. As thirty were recorded in May in still another area, further nesting success may have taken place.

DERBYSHIRE.—A small number of adults and juveniles were seen in the western part of the county in mid-June.

STAFFORDSHIRE.—Crossbills were seen in small parties in the south-western part of the county until the end of March, but breeding was not proved.

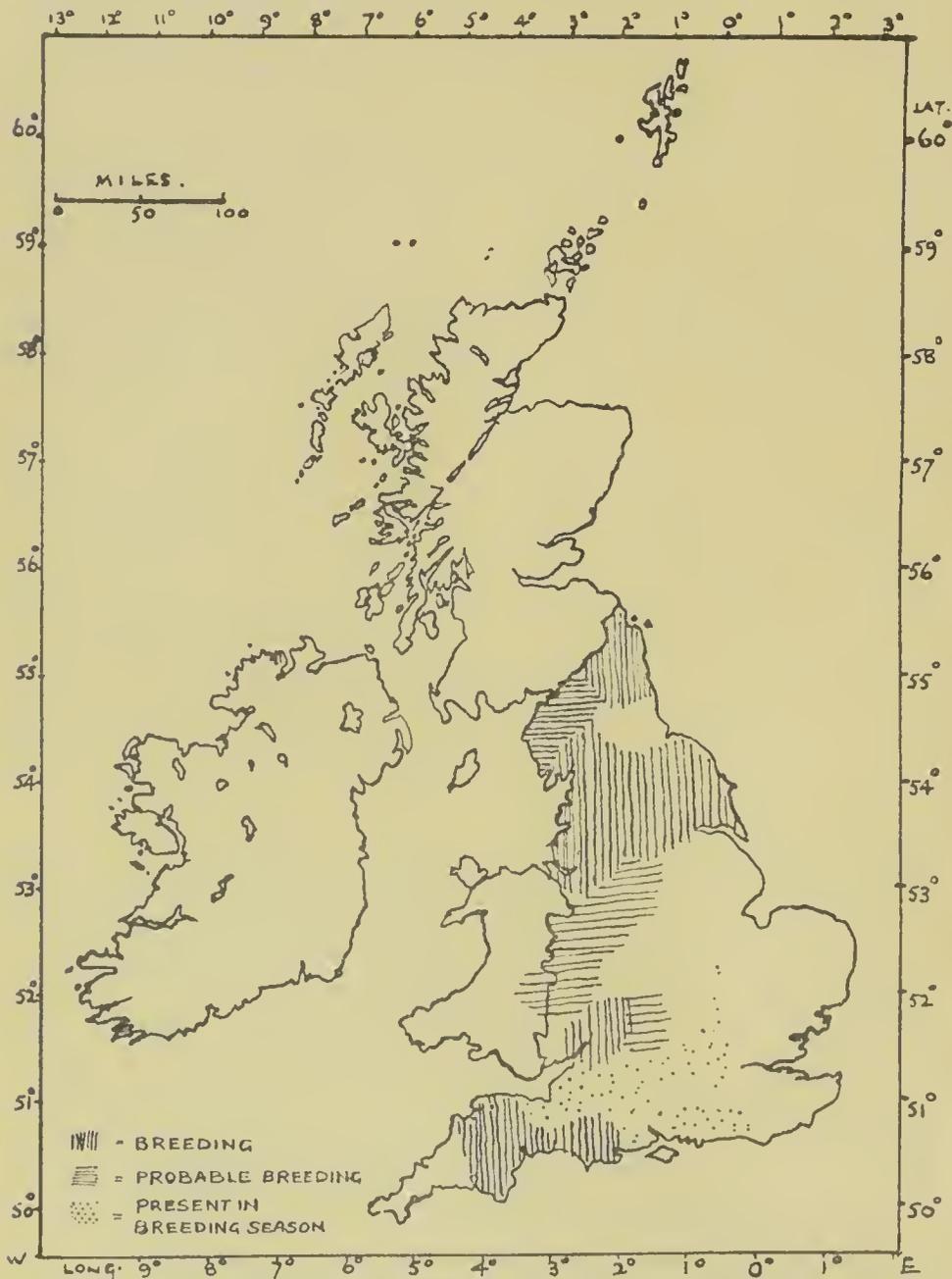


FIG. 2—To show the post-invasion breeding distribution of CROSSBILLS (*Loxia curvirostra*) in ENGLAND and WALES in 1957

- SHROPSHIRE.—Flocks of up to 30 and one of about 100 were seen in February, April and May 1957. Breeding was not proved but could well have occurred in the sparsely inhabited country concerned.
- RADNORSHIRE.—Crossbills were seen from January until May in small numbers and breeding was suspected but not proved.
- HEREFORDSHIRE.—Flocks of up to 30 were seen in a number of places from January until the end of March and two birds were seen in May. Breeding was suspected but not proved.
- BEDFORDSHIRE.—A few Crossbills were seen in March, and in May there were young birds in one garden.
- GLOUCESTERSHIRE.—Crossbills were concentrated principally in the Forest of Dean where it is estimated that up to 150 were present in the early months of 1957. Although only one nest was found, breeding of several pairs was strongly suspected in this large area which is difficult to search.
- OXFORDSHIRE.—Small parties of up to twelve were seen until May and breeding was suspected.
- HERTFORDSHIRE.—A few Crossbills occurred in February and March, but breeding was not proved.
- WILTSHIRE.—A few were recorded in February and March, but there was no proof of breeding.
- BERKSHIRE.—Small parties were seen until May when flocks of up to 25 were recorded. No evidence of breeding was obtained.
- BUCKINGHAMSHIRE.—A pair in May with fully fledged young is the nearest approach to a breeding record.
- DEVON.—A pair was observed feeding two newly fledged young and breeding was suspected in two other areas.
- SOMERSET.—Birds were seen in small numbers in two areas in January and February and there was a small party in May in another area. Breeding may have taken place.
- DORSET.—In the eastern part of the county, Crossbills were watched at six sites and breeding by single pairs was proved to have taken place at four of them in April and May.
- HAMPSHIRE.—A family party was seen in April in an area away from the New Forest (where breeding takes place regularly each year) and this suggests that additional breeding, as a result of the invasion, may have taken place in 1957.
- SURREY.—There were parties of Crossbills in each month from January to June: the largest was one of 33 and breeding was strongly suspected.
- SUSSEX.—Small parties were seen during the early months of 1957, the largest being one of 18 in April. No evidence of breeding was recorded.

In many of these counties no Crossbills were seen after June 1957 and, as the normal annual movement is during the summer months, it is likely that they were leaving Great Britain in appreciable numbers at this time and returning eastwards.

FOOD

As in previous invasions, many observers gave details of the food which they had seen Crossbills eating. The following notes represent only a brief summary of points of interest and do not in any way attempt a food analysis: the data would be insufficient to justify that and it is recognized that invasion behaviour is abnormal in any case. Readers are also referred to the useful summary in Barraud (1956, pp. 293-296).

Conifers were, of course, the principal sources of food and the areas in which spruces (*Picea* spp.) predominated were well favoured. Among other trees, there were a few records of the birds being seen feeding on the cones of alders (*Alnus glutinosa*),

though it must be remembered that it is usually difficult in these cases to be certain whether the actual seeds or insects are being taken. Plants on which Crossbills were seen included thistles (*Carduus* spp.), ragwort (*Senecio* spp.), tufts of heather (*Calluna vulgaris*) and thrift (*Statice maritima*). In Herefordshire in February they were observed feeding on beech mast (*Fagus sylvatica*); and later in another locality on young leaves of oak (*Quercus* sp.).

There were a few records of unidentified caterpillars being taken and one instance of a female Crossbill on a bird-table eating crumbs.

ACKNOWLEDGEMENTS

Grateful acknowledgement is made to the following observers and correspondents who supplied the detailed information on which this analysis is based. The list also includes the names of the numerous editors of county and other reports who rendered invaluable assistance in the collection of the necessary data. Grateful thanks are also made to any whose names may have inadvertently escaped inclusion in this list.

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P. Young.

SUMMARY

1. The pattern of past invasions of Crossbills is examined and consideration is given to the varied theories that have been put forward to account for their irregularity. The timing of the 1956 irruption is discussed in relation to the spruce crop in Scandinavia.

2. The 1956 invasion of Crossbills was concentrated mainly into the first half of July, with arrivals on a broad front from the 1st to the 15th and on a reduced scale during the third week. A secondary and lesser invasion followed between 28th August and 8th September.

3. These birds stayed in Great Britain in large numbers until the end of 1956, many wintered and some remained to nest in 1957. Successful breeding was on a larger scale than that following the 1953 invasion: it was proved in at least eight counties in England and Wales and suspected in an additional eight; in a further nine counties Crossbills were present during the breeding season.

4. Very few Crossbills were seen after June 1957.

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BREEDING OF THE ASHY-HEADED WAGTAIL AND YELLOW WAGTAIL IN NORTHERN IRELAND

By THOMAS ENNIS and HILL DICK

ON 5TH JUNE 1956 H.D. found a pair of *flava*-type wagtails at Duncrue Street marsh, Belfast, which were completely strange to him. The birds were tired and seemed newly arrived, and they permitted him to study them at close range for three-quarters of an hour. During this time he took full notes on behaviour, plumage details, etc., and finally came to the conclusion that he was watching a pair of variant Blue-headed Wagtails (*Motacilla flava flava*). The birds were seen on many occasions during the next few weeks, however, and were subsequently identified as Ashy-headed Wagtails (*M. f. cinereocapilla*). Then, after one unsuccessful attempt, they bred and reared three young birds. A few days after the first pair were discovered breeding, T.E. found a pair of Yellow Wagtails (*M. f. flavissima*) and a second pair of *cinereocapilla* breeding at Kinnegar, Holywood, two miles away to the south-east. This second pair of *cinereocapilla* reared five young successfully, as did the *flavissima* pair.

Up to this date *flavissima* had been regarded in Northern Ireland as a rare visitor in spring and autumn (formerly it was a summer resident around Lough Neagh, but it has not been noted there as a breeding bird since 1941—Deane, 1954), while the status of *cinereocapilla* in the whole of the British Isles is that of an exceptionally rare vagrant that had been recorded only twice before (Williamson, 1955; Richardson and Clarke, 1955).

DUNCRUE STREET AREA

The Duncrue Street area comprises ten acres of rough wasteland, in which the marsh is situated. This is an overflow catchment pond adjoining a sewage-station, the water-level of which is governed both by the filter-bed waste and precipitation. In summer exposed areas in the marsh are densely overgrown. The marsh is flanked on its western side by ponds and rubble, but to the east, beyond the sewage-station, is a portion of relatively even, dry ground, about one acre in extent, covered with short grass and low shrubs.

This pair of *cinereocapilla* nested twice, the first attempt being unsuccessful. The first nest, containing four eggs, was discovered on 17th June in a shallow depression amongst the sea-aster (*Aster tripolium*) in the marsh. Subsequent heavy rain swamped this, causing desertion. The nest and eggs were donated to the Belfast Museum.

The second nest belonging to this pair was found on 9th July about 300 yards to the east of the original site, containing four

young birds three days old and an infertile egg. It was well concealed in coltsfoot (*Tussilago farfara*), and the dry nature of this site made the risk of flooding practically negligible. On 19th July three young fledged, the fourth having died on the 15th.

KINNEGAR AREA

The second site embraces a portion of reclaimed land containing two rectangular ponds, the water levels of which are governed by rainfall and evaporation. The more northerly pond is never full, but usually has a small amount of water in the eastern end while the rest is rough grassy land. The southern pond is much larger and always contains water, though there is usually a portion of semi-marshy ground in the western extremity. In winter this is inclined to become waterlogged, but in summer evaporation causes the water-level to recede, thus leaving the grass relatively dry and exposing large areas of mud. The ponds themselves are separated by a runway of Sydenham aerodrome, which is constantly used by jet aircraft.

At Kinnegar one pair of *flavissima* and one pair of *cinereocapilla* bred successfully, each rearing five young. On 5th July T.E. observed a male *flavissima* at the northern pond and on the following morning found it in company with an adult male *cinereocapilla*. The latter was not about that evening, but a female *flavissima* was present. A *flavissima* nest was discovered on 12th July containing five recently hatched young. On the evening of 20th July the male *cinereocapilla* was seen again in company with a female and at 11.30 hours on 21st July their nest was found, in the southern pond, containing five fledglings. By 15.30 hours on the same day the whole family had left the nest, as had the *flavissima* juveniles.

Both families stayed at the Kinnegar site for a few days, but by 27th July the *cinereocapilla* family had left the area and were not seen again. The *flavissima* family departed from Kinnegar on 6th August. Ten days later a pair of *flavissima* with five young were found in company with the other pair of *cinereocapilla* in the Duncrue Street area. They stayed in a mixed flock until the beginning of September but by the 12th none was present.

It is possible that more than one pair of *flavissima* bred in Northern Ireland during 1956 as two adult males and a female were seen at Kinnegar on 22nd September on passage.

In the years 1957 and 1958 *flavissima* again bred in Northern Ireland, but no *cinereocapilla* were identified.

DETAILED PLUMAGE-DESCRIPTIONS OF CINEREOCAPILLA

Duncrue Street pair.

Male:—Forehead, crown, nape and ear-coverts subtly shading from cobalt blue to light blue-grey. Ear-coverts very slightly darker than crown. Lores noticeably darker, almost black. Narrow white superciliary starting behind eye. Mantle, back and rump olive-green. Tail blackish-brown with conspicuous white outer feathers. Chin and throat white, rest of under-parts bright yellow. Primaries dark brown, coverts as mantle. Two narrow white bars on wing. Bill and legs black.

Female:—Forehead, crown and nape grey brown. Cheeks grey brown with a buffish white superciliary starting behind eye. Upper-parts brownish. Tail dark brown with white outer feathers. Throat, chin, breast and belly dirty grey-white. Lower belly tinged lemon-yellow, vent area brighter yellow. Wings brown with two faint wing-bars. Bill and legs as male.

Kinnegar pair.

Male:—Forehead, crown, nape and hindneck dull ashy-grey. Lores very dark. Ear-coverts looked darker than the crown at a distance, but on close examination seemed almost uniform with the crown. No supercilium. Mantle, back and rump olive-brown, much browner than the olive-green upper-parts of Duncrue Street male. Tail blackish-brown with white outer feathers. Chin creamy off-white, breast to under tail-coverts bright sulphur-yellow (brighter than *flavissima* or Duncrue Street male). Wings, bill and legs as Duncrue Street male.

Female:—Identical with Duncrue Street female but for a dark grey-brown "V" on upper breast.

ACKNOWLEDGEMENTS

We wish to thank I. C. McDonald, S. Penney, A. R. Thompson and A. J. Tree for their co-operation. We are also indebted to C. D. Deane, R. F. Ruttledge and K. Williamson, who furnished us with identification details, skins and advice in the preparation of this paper.

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PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

XIII. TENGMALM'S OWL

Photographs by HANS KÄLLANDER, ÅKE NORBERG
and ERIC HOSKING

(Plates 1-4)

Text by HANS KÄLLANDER

PHOTOGRAPHS OF Tengmalm's Owl (*Aegolius funereus*) have been published once before in this series, in 1953 (*antea*, vol. xlv, plates 1-2, pp. 15-16), and the reader is referred to the text which appeared then for details of the world distribution and field-characters, though the latter are covered briefly in the captions to the present photographs (plates 1-4). Here it will suffice to repeat only that Tengmalm's Owl has a wide distribution, breeding in Europe from Scandinavia and southern France eastwards right across Asia and also in North America, but everywhere chiefly between latitudes 45° and 65°N.

In Sweden, where most of these photographs were taken, Tengmalm's Owl breeds locally in the south and rather more frequently in central districts. Further north it is much commoner and is the most abundant owl, appearing as far as the upper limits of the pine forests on the high mountains. In the province of Närke (Central Sweden), where I have studied and photographed the species, this owl breeds not too rarely in the large woodlands. Eggs are laid in hollow trees, usually in old nests of the Black Woodpecker (*Dryocopus martius*) and thus often in pines and poplars. However, because of the way forestry interests are thinning out such old hollow trees, there is an increasing lack of convenient natural nesting holes, particularly in the southern parts of Sweden. Perhaps for that reason, nest-boxes erected for Goldeneyes (*Bucephala clangula*) are often used by Tengmalm's Owls.

Like other owls, this species is very dependent upon the supply of rodents, its main prey (see below), and the number of breeding pairs varies in direct proportion to the density of the prey. Similarly, the sizes of the broods vary (from 3 to 6 or more) with the food supply. In the autumn, migratory birds are sometimes observed, quite frequently in such unexpected places as parks and gardens; these are mostly young birds. In certain years the numbers are such that the movement may be regarded as an invasion, and in Sweden 1919, 1935 and to a lesser extent 1950 were examples.

In large parts of Sweden 1957 was a very good rodent year and the number of breeding Tengmalm's Owls was also apparently unusually high. In the autumn of that year there was a mass movement of wood-mice (*Apodemus* spp.) in Central Sweden and, in spite of a high mortality during the winter, they were still numerous in the spring of 1958. As a result, Tengmalm's Owl was much more abundant than usual in several districts and in some areas studied in the province of Närke there was as high a density as one singing male per square mile; from districts further east even higher densities were reported.

Song could be heard from the end of February (the normal date for this latitude) and there was a maximum of activity during March, after which the volume of sound rapidly decreased during the first part of April. Later on the species could be heard only occasionally and one energetically-singing male heard in May must have been a non-breeder. In 1958 eggs were mostly laid during the first half of April the period thus corresponding with the decrease in song.

During March, in the period of highest activity, the owls began to sing about one hour after sunset, which at this latitude is quite a time before nightfall. Song continued throughout the night, but with a noticeable falling off for about two hours before midnight. The song is described briefly in *The Handbook*, but some

additional remarks may be of value here. It consists of a run of some 3-5 short liquid flute-like notes "hoo-hoo-hoo-hoo-hoo", the last ones being somewhat higher in pitch. This run is regularly repeated after a pause of 1-3 seconds. The song varies in speed as well as in pitch and when the owl is very excited for some reason, e.g. when another male encroaches upon its territory, it utters long and faster runs of this sound. Thus I have heard up to 50 notes in succession.

The normal song is loud and can sometimes be heard at a distance of up to $1\frac{1}{4}$ miles. However, this varies and the sound may be very weak at the breeding place after the eggs have hatched. Similarly, it does not reach full intensity when the owl begins to sing after a pause: then it is usually uttered in slower tempo. A variation, sharper and more barking, is used near the nest as an alarm-note and this might be written as "weck-weck-weck-weck-weck". The usual alarm-note (probably uttered by the female only) is otherwise very short and sharp and resembles the smack of a Red Squirrel (*Sciurus vulgaris*)—but with a more metallic tone like the sound of a stick hitting a railing. When disturbed in the nesting area, the female also has a thin piping sound very like the hunger-cry of the nestling.

Little is known about the habits of Tengmalm's Owl during the incubation period and unfortunately I got no opportunity to study a nest before the eggs hatched. In May and June 1958, however, I spent eight nights at two different nests, each with four young. One was in a hollow poplar and the other in a nest-box for Goldeneye. Conditions for observation were especially good at the latter because the box was on a pole in the open, on a small moss, about 30 yards from the forest edge.

By 15th June the nestlings were about three weeks old and were being energetically fed by the adults. My observations in 3 nights at this nest showed that at about 21.40 hours (i.e. about one hour after sunset) the adults would leave their roosting places which were probably about 10-15 feet up in the thick crowns of some pines. One of them (at least once it proved to be the female) would then fly out to the nest, but obviously carrying no prey. The young were first fed about an hour later (22.40 hours) and then at intervals of 20 minutes on average (varying between 5 and 40 minutes) until about 01.30 (sunrise at 03.10). Thus, during less than 3 hours some 7-10 items of prey were brought to the nest: these were wood-mice (*Apodemus* spp.) (plate 2), shrews (*Sorex* spp.) (plate 3) and at least once the nestling of some Passerine. These observations agree very well with those made by Mr. Uno Eliasson in 1957 in the province of Västergötland, about 90 miles east of Gothenburg (*Vår Fågelvärld*, vol. 17, pp. 250-252). As his studies were made a fortnight earlier in the year, the feeding period was somewhat longer as a result of the longer night, but Mr. Eliasson was mainly concerned with an

investigation of the choice of prey and this he continued during 1958 with Mr. Åke Norberg. Table I summarizes the results of their investigation during those two years.

TABLE I—REMAINS OF ANIMALS FOUND IN PELLETS FROM 5 NESTS OF TENGMALM'S OWL (*Aegolius funereus*) IN VÄSTERGÖTLAND, SWEDEN, 1957-1958

Species	Number	Percentage
Common Shrew (<i>Sorex araneus</i>)	62	22.5%
Pygmy Shrew (<i>Sorex minutus</i>)	4	1.5%
Unidentified shrews (<i>Sorex</i> spp.)	10	3.6%
Field Vole (<i>Microtus agrestis</i>)	118	42.9%
Bank Vole (<i>Clethrionomys glareolus</i>)	33	12.0%
Vole Rat (<i>Arvicola terrestris</i>)	1	0.4%
Wood mice (<i>Apodemus</i> spp.)	19	6.9%
Dormouse (<i>Muscardinus avellanarius</i>)	12	4.4%
Birds	ca. 16	5.8%

Thus it can be seen that Field Voles, and to a lesser extent Common Shrews, made up the bulk of the prey. This was due to the fact that the pellets examined all came from nests close to fields. In woodland the number of *Microtus* would, of course, be much lower. The number of dormice (plate 4 upper) is also strikingly high, but this was because these mammals are relatively common just in the district where the studies were carried out. It was possible to identify only some of the bird remains found in the pellets, but these included one Great Tit (*Parus major*), one Song Thrush (*Turdus philomelos*) (nearly as big as the owl itself!), one Robin (*Erithacus rubecula*), one warbler (*Phylloscopus* sp.), one Goldcrest (*Regulus regulus*), one Pied Flycatcher (*Muscicapa hypoleuca*), one Yellowhammer (*Emberiza citrinella*) and several Chaffinches or Bramblings (*Fringilla coelebs* or *montifringilla*). In addition, a Whinchat (*Saxicola rubetra*) was seen to be taken by the owl to one of the nests studied by Mr. Eliasson. Finally, it should be mentioned that wing-cases of beetles (Coleoptera) were also found in fresh pellets, thus indicating that Tengmalm's Owl eats insects to some extent.

TRACKING BIRDS ON TIDAL FLATS AND BEACHES

By C. SWENNEN and G. VAN DER BAAN

(Plates 5-8)

SANDY OR MUDDY BEACHES and tidal flats offer an excellent opportunity for ecological investigation. The many miles of sand or mud emerging when the tide goes out provide in their bottom fauna the staple food for thousands of waders, gulls and ducks. We see them feeding, but even for a trained observer it is often difficult to make out what exactly they are finding there.

It is not only that their swift movements are difficult to follow; we also need to know what their prey may be. For the birds it is clearly a matter of routine; they are experienced hunters and succeed in collecting a sufficient amount of food in the few hours which the movements of the tides allow.

Let us follow them at low tide and look at the tracks they leave—not only their footprints, but every sign of their activity. Combining this with observations of feeding birds and with a study of the bottom fauna—by sieving a sufficient number of samples—we may be able to guess what is their principal source of food. If possible, further confirmation should be sought by the examination of pellets, faeces and stomach contents.

The photographs on plates 5-8, all taken in Holland, illustrate a few instances of bird activities on tidal flats and it is simplest to look at these in order and use them to show how the signs may be interpreted.

Plate 5 top shows a sandy beach where Oystercatchers (*Haematopus ostralegus*) had been feeding. They did not leave any footprints in the firm sand, but they left the marks of their beaks: two double holes, which meant that the beak had been pushed into the ground *opened*. Some pecks were shallow; some were deep, showing a vigorous downward movement. Sieved samples showed that the only prey to be found in that particular spot was the worm *Nerine cirratulus*. This worm lives in a vertical position in the ground—from the surface, where its tentacles may emerge at high tide, down to about 40 centimetres (16 inches) below at low tide or when disturbed. Plate 5 centre shows the holes of this worm in the sand.

Plate 5 bottom illustrates the activity of Turnstones (*Arenaria interpres*). Part of the tidal flats south of Vlieland (Frisian islands) is covered by long strands of *Enteromorpha* sp. (one of the green algae). These are twisted together by the waves to form an enormous sheet which at low tide rests on the sand. The Turnstones will roll up pieces of this weed, rather like small carpets, with an incredibly swift and efficient movement and catch the *Gammarus locusta* wriggling about as the weed is removed. The "carpet" is pushed by beak, nape and sometimes shoulders. These rolled carpets, sometimes unrolled again by a second bird, are typically the work of Turnstones.

Plate 6 top: the Knot (*Calidris canutus*) likes *Gammarus* too, but catches them by making holes in the *Enteromorpha* carpet, as it has not mastered the trick of rolling.

The next three photographs show three feeding methods of the Shelduck (*Tadorna tadorna*). The first method (plate 6 centre) is used in wet, soft mud. The bird walks along "mowing" its beak through the mud from left to right and back again, leaving a trail like fern leaves. The prey is not known. There is a lot of edible matter in this mud, especially young worms and young



Ake Norberg

TENGMALM'S OWL (*Aegolius funereus*) IN NEST WITH YOUNG: VÄSTERGÖTLAND, SWEDEN, 26TH APRIL 1958

This owl nests in hollow trees, in old holes of Black Woodpecker (*Dryocopus martius*), and to an increasing extent in nest-boxes put up for Goldeneyes (*Bucephala clangula*) (see page 13). Here one gets an impression of the upper-parts, reddish-chocolate in colour but recalling Little Owl (*Athene noctua*) in the pattern of whitish spots (though see plate 2). The 3-6 (or more) eggs hatch in about 4 weeks and the young leave the nest 4-5 weeks later.





Hans Källander

TENGMALM'S OWL (*Aegolius funereus*): NÄRKE, SWEDEN, 17TH JUNE 1958. Note the large head, and the wide and deep facial discs—not flattened like those of the Little Owl (*Althene noctua*) (points to remember as the two species are comparable in size). In addition, the discs are conspicuously bordered with black (see also plate 3) and the crown is spotted with white (not streaked as in Little Owl). The bird here is holding a wood-mouse (*Ipodermus* sp.), a common prey of this owl which in Sweden lives mainly on rodents (see pages 14-15).



Hans Källander

TENGMALM'S OWL (*Aegolius funereus*): NÄRKE, SWEDEN, 15TH JUNE 1958
Here the tightly-held prey is a shrew (*Sorex* sp.), another regular food in Sweden (see page 15). The black border to the owl's whitish facial discs can be clearly seen here. Note also the rather mottled under-parts, much less streaked than those of the Little Owl (*Athene noctua*). Except in the far north, Tengmalm's Owl is almost exclusively nocturnal in its hunting, and very difficult to locate by day as it perches close to the trunk in dense pine-tops.



Åke Norberg

TENGMALM'S OWL (*Aegolius funereus*): VÄSTERGÖTLAND, SWEDEN, 2ND JUNE 1957
Note the long white feathers to the toes, a feature of this species among small European owls. Tengmalm's also has the wavering flight of the larger owls, though with quicker wing-beats which give it a bat-like appearance. The surprised victim here is a Dormouse (*Muscardinus arellanarius*).



Eric Hosking

YOUNG TENGMALM'S OWLS (*Aegolius funereus*): EVO, FINLAND, 3RD JUNE 1958
The first two of six young to leave their nest in a box for Goldeneyes (*Bucephala clangula*); chocolate-brown all over, except for white marks on the face and otherwise just a few whitish mottlings. After the autumn moult they become like the adults.



C. Swennen

HOLES MADE BY OYSTERCATCHER (*Haematopus ostralegus*) IN BEACH
(Scheveningen, Holland.) Holes were double, showing bird's beak was inserted
open: some were shallow, others deep (see page 16 and plate 5 centre).



C. Swennen

HOLES OF THE MARINE WORM *Nerine cirratulus* IN BEACH
(Kijkduin, near Scheveningen, Holland.) Sampling showed this worm to be
the only likely food in the area holed by Oystercatchers (above).



C. Swennen

MATS OF *Euteromorpha* ROLLED BY TURNSTONES (*Arenaria interpres*)
(Tidal flats, Vlieland, Holland.) With beak and nape Turnstones swiftly roll
up pieces of this seaweed to catch the *Gammarus* beneath (see page 16).



C. Swennen

HOLES MADE BY KNOTS (*Calidris canutus*) IN *Enteromorpha* CARPETS (Tidal flats, Vlieland, Holland.) Knots have not learnt to roll mats like Turnstones (*cf.* plate 5 bottom) and catch the *Gammarus* by making holes.



C. Swennen

TRACK LEFT BY SHELDUCK (*Tadorna tadorna*) FEEDING IN SOFT WET MUD (Tidal flats, Terschelling, Holland.) This "fern leaves" trail is left when a Shelduck walks along mowing its beak from side to side (see page 16.)



C. Swennen

MARKS LEFT BY SHELDUCK (*Tadorna tadorna*) DABBLING IN SHALLOW WATER (Tidal flats, Vlieland, Holland.) Footprints are washed away as the tide recedes, but series of dabble holes remain in firm wet mud (see page 17).



C. Swennen

TRACK BELIEVED MADE BY SWIMMING SHIELDUCK (*Tadorna tadorna*)
(Tidal flats, Terschelling, Holland.) Probably caused by swimming bird feeding with head submerged, beak touching bottom repeatedly.



C. Swennen

HOLLOWS LEFT BY BLACK-HEADED GULLS (*Larus ridibundus*) ON EBB TIDE
(Tidal flats, Vlieland, Holland.) Trampling in shallow water, gulls stir up mud and catch bottom fauna as it washes away (see page 17).



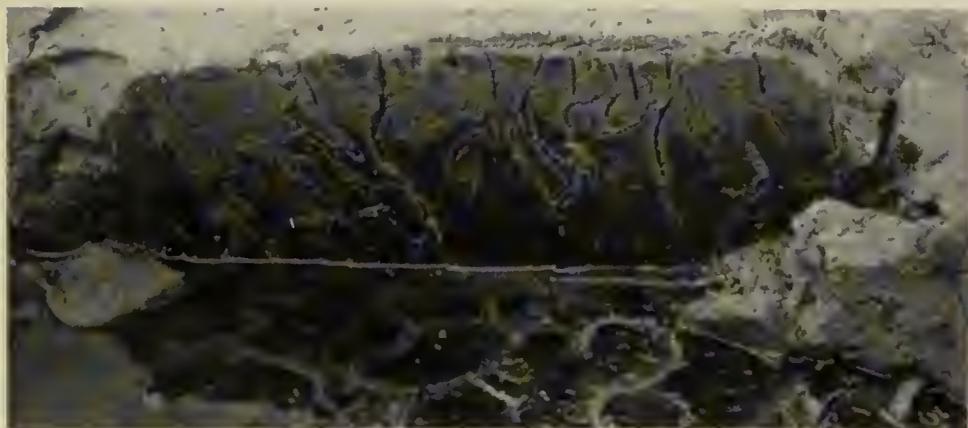
Gré van der Baan

HOLLOWS LEFT BY BLACK-HEADED GULLS (*Larus ridibundus*) ON EBB TIDE
(Tidal flats, Vlieland, Holland.) Hollows end in a W (the bird's feet after moving backwards); transverse ripples are made by the current.



C. Swennen

STARRED EFFECT ROUND HOLES OF THE WORM *Nereis diversicolor* (De Beer, near Hook of Holland.) Occupied holes often show such patterns, the worm partly emerges in various directions at low tide (see page 17).



C. Swennen

CROSS-SECTION OF HOLES OF THE WORM *Nereis diversicolor* (De Beer, near Hook of Holland.) Removal of stranded box exposed worm-holes. Only top part of mud and hole-walls were oxidized (see page 18).



C. Swennen

Hydrobia ulvae ON MUD SURFACE AND HOLES OF WORM *Arenicola marina* (Tidal flats, Vlieland, Holland.) Flash light at night shows *Hydrobia* on surface. Note "tooth-paste" faeces of the lugworm *Arenicola* (see page 18).

molluscs, and probably anything suitable is swallowed. The second method (plate 6 bottom) is also used in wet mud, but when the ground is more firm. Here the bird is dabbling at regular intervals. It leaves a series of holes, together with footprints: the latter are easily washed away, but the former still show when the mud is dry. The third method (plate 7 top) results in a curious series of holes in a straight line. We are not quite sure how these are caused but we assume that the track is left by a swimming bird, feeding with head submerged and touching the bottom with its beak every few inches.

Plate 7 centre and bottom show the hollows that are left behind by Black-headed Gulls (*Larus ridibundus*) feeding in shallow water. They face the wind (as usual) and trample on the bottom, moving backwards, gazing intently a few inches in front of them. (This trampling is not to be confused with the trampling movement in meadows which brings worms to the surface. The reaction of a marine worm would possibly be to burrow deeper, certainly not to come to the surface.) By the trampling the top part of the bottom mud is stirred up, so that the bottom fauna is exposed and caught as it washes away. At low tide these holes may be recognized by their form. They end in a W (the two feet of the gull) and show a few transverse sand ripples made by the current resulting from the trampling movement. As the mud dries they are soon covered by other tracks: the footprints of crossing birds, or the trails and holes of *Hydrobia*, *Arenicola* and other animals of the sea bottom.

For not only the birds leave tracks, so do the bottom animals themselves. Knowledge of these tracks is of the utmost importance to the birds since they may be directed by them to find their prey. It is far too early as yet to conclude how much 'beach-lore' is innate and how much is learned by experience, but from observations on the "stupid" behaviour of young birds and the efficient working methods of the old birds we may assume that experience is an important factor. We have seen an Oystercatcher taking a fledged chick for a walk over the mud-flats. Wherever the old bird stopped the young bird ran up to it, often pressing itself close to the old bird as it stared at the mud where the old bird was looking. It was not fed during this walk and it caught very little by itself. On other occasions we observed Oystercatchers feeding their grown young on the tidal flats. In most cases the prey (marine worms) was laid down in front of the young, but sometimes it was passed from beak to beak; and once an old bird pulled a worm halfway out of the mud and left the young to finish the catch.

Plate 8 top: the worm *Nereis diversicolor* often emerges partly from its hole at low tide, then draws back and emerges again in another direction. By these movements it leaves a kind of starred effect, like a tracing of twigs, with the opening of the hole for a centre. It is a sign that these holes are inhabited. The position

of this worm in the bottom is well shown in plate 8 centre. This photograph was taken after a stranded box had been pulled away. Note that only the top layer of the mud and the walls of the worm holes are oxidized: the rest is black.

Plate 8 bottom was taken at night by flash light and shows a lot of *Hydrobia ulvae* taking the air. Many bottom animals are very active after dark, far more so than during the day. They will emerge from their holes and crawl or swim about. Various species of birds feed at night as well as by day, especially if there is a moon. Among the birds observed at night on the Vlieland tidal flats are Grey Plover (*Charadrius squatarola*), Ringed Plover (*Ch. hiaticula*), Curlew (*Numenius arquata*), Redshank (*Tringa totanus*), Greenshank (*T. nebularia*) and Oystercatcher.

The well-known holes of the lugworm *Arenicola marina* are also shown in plate 8 bottom. They are L-shaped with a funnel-hole, where the sand has collapsed, at the shorter end and a "tooth-paste" mound of faeces at the other. Now and again the worm comes to the surface for a split second to defaecate and this would seem the opportunity for a bird to catch it. However, pecks were directed mostly at the funnel-hole and when we observed a worm being pulled out it was often at this end of the hole.

These observations are only the beginning of an ecological study. A very important point is the question: what part of the time do birds spend in feeding? Some birds, especially the larger species, feed only for a short period. Smaller species may not stop at all but continue feeding on the shore during high tide. Also, we know hardly anything as yet about the nutritional value of the various species of bottom fauna.

Anyone, professional or amateur, who takes up this bird tracking on the tidal muds and sands will find it a fascinating and rewarding subject. If anyone has any interesting contributions to make the authors would be glad to compare results.

NOTES

Head-stabilization by a Jay.—While ringing a Jay (*Garrulus glandarius*) caught in my garden trap at East Horsley, Surrey, on 3rd November 1957, I was struck by the bird's unusual behaviour during the process. No matter how I turned it about, it seemed to have the ability to keep its head in the same position in relation to its surroundings while its body was moved (in other words, its head remained stable in space). Naturally there were limits to the possible movements, but as the behaviour was more marked than I have noted before in other species I attempted to make some rough measurements of its extent. To do this, I held the bird in both hands with the wings close to the body—in the normal way, but so that there was not quite so much restriction around the neck. Most Jays would then peck one's hands, but

this bird appeared to fix some particular object with its eyes (I could not make out what) and I slowly moved it in each of the three normal planes in relation to its body until the head moved as well. My wife held a ruler by my hand and so was able to obtain the following rough measurements of the distances through which the body passed while the head kept still:

Backwards and forwards	4 inches
Up and down	1½-2 inches
To one side (the right)	1½ inches

(A similar figure to the last would presumably have been obtained by moving this bird to the left, but this was not measured.)

It was possible to use any combination of the movements within these rough limits and I have rarely seen a more ludicrous sight than a Jay performing Hawaiian dance movements in any of the three planes. Unfortunately, I omitted to check on the amount of the other three degrees of freedom, i.e. ability to rotate about the same axes, but there is no doubt at all the bird could cope with them to large degree.

I have since caught another Jay but was unable to get it to emulate the first. This may have been due, however, to the more restrictive hold which was necessary to prevent personal damage.

This second bird, however, had another interesting habit which I discovered while attempting to measure the angular rotation of the body with which the head could cope without itself rotating. With the head still, I slowly rotated the body so that the rump moved under the head. Ability of the order of 120° of rotation were involved, from when the rump was above the level of the head to when the rump was well under and in front of the head. The most interesting point, however, was that there appeared to be a critical angle of the body in relation to the head where the tail suddenly went forward. Although I was unable to devise any means of measuring this critical angle, it appeared to be an automatic response to the angle of the body from the horizontal. I mentally likened the movement to lowering the flaps of an aircraft to obtain a greater angle of attack to the air-stream.

From the foregoing observations it would appear that the Jay is equipped with an automatic anti-stall device as well as a completely space-stabilized control system.

Probably all birds have a certain degree of space stabilization for their heads, but so far I have detected it in the hand only in the Wheatear (*Oenanthe oenanthe*) in the fore and aft direction. It may, however, be observed in the Kestrel (*Falco tinnunculus*) and other larger birds in flight, when it can be seen that the head travels on a level path while the body is moving in accordance with the flight loads and reactions. It seems obvious that space stabilization of the eyes is an asset towards survival, but nevertheless many mammals (including Man) and possibly some birds

do not have this ability. The value of space stabilization to a hawk which spots its food from the air is fairly obvious, but it is not so clear why a Jay should be so well endowed. However, Mr. Derck Goodwin, to whom I wrote concerning the behaviour, says that he once observed one of his tame Jays, while on a swinging perch, fix a Sparrowhawk (*Accipiter nisus*) with its eye, and the head remained steady while the body swung to and fro, so that there is undoubted survival value in the ability. Presumably this is also partly the reason why Jays normally see bird-watchers before bird-watchers see Jays.

G. H. FORSTER

[This phenomenon of head-stabilization is well-known and many people will have noted how a chicken, when picked up, will keep its head in one position, even though the body is moved in various directions. However, the subject has not received as much attention as it might from ringers and from ornithologists in general. Two films that have been widely shown exhibit examples of head-stabilization. Mr. H. G. Hurrell's film of a Buzzard (*Buteo buteo*) at its nest in a slender tree includes a sequence of the adult brooding the young in a fairly strong wind: the tree, the nest and the body of the bird are all swinging through a significant arc, but the bird's head remains in exactly the same vertical and horizontal plane. Similarly, in the film "Wild Spain" a Stone Curlew (*Burhinus oedicnemus*) is seen settling on its eggs: having approached the nest with neck hunched, it lowers its body on to the eggs, but keeps its head still by extending its neck.—EDS.]

Orphean Warblers having dark eyes.—On 19th August 1954 I provisionally identified a bird at La Capelière, Camargue, S. France, as an adult male Orphean Warbler (*Sylvia hortensis*), which it resembled in all plumage features except that the eye was dark. Furthermore, a second bird seen in the vicinity shortly afterwards, presumed to be an adult female because it was merely a dull edition of the first warbler, also had a dark eye.

Again in August 1957 I had exceptionally good views of two Orphean Warblers in an open stand of pines at Bonanza, Andaluçia, S. Spain. The birds frequented 18" high scrub as much as the trees, and were viewed over long periods at close range and in good light. In both, the forehead and crown were noted as being dark grey, and the lores and ear-coverts black, with a streak of paler grey topping the lores. In one bird, seen on 7th and 8th August, the eye was black or very dark brown, and in the other, watched on the 9th, white to pale straw. These two birds differed in no further respects except that the latter individual had rather greyer flanks.

The markings of the head, especially the pale line above the lores, and the dark grey (not black) crown, indicate that these birds were probably adults in which the winter plumage was

already assumed. It would thus appear that the pale eye, so distinctive in the one individual I watched, is an inconsistent feature, although the importance of this character in identification of the Orphean Warbler is usually stressed. C. H. FRY

Feeding-methods of Long-tailed Tits with artificial food.—

Long-tailed Tits (*Aegithalos caudatus*) have been taking artificial food from the bird-tables in our garden at Woodeote, in S. Oxfordshire, during each winter since the early months of 1955. Until March 1958 they confined themselves to eating very small crumbs of food (e.g. minced peanut and bread crumbs) or to pecking at a large piece of cheese or mashed potato. At the beginning of March 1958, however, one was seen to take food away to a tree, hang upside-down and eat in that position. This occurred several times and on different days, but it was impossible to note details as the tree is a thick and bushy hawthorn. On 21st March, however, a Long-tailed Tit was seen hanging upside-down in a lily only three feet from a window. It hung by its left foot alone and proceeded to eat a piece of food which it was holding in its right foot, just as a child might eat an apple. It finished the food, returned to the bird table for more and took this to the same tree, but on the second occasion it hung in an inverted position with both feet, the food being pinned to the twig by the right claws and eaten from there. One other feeding-method was noted later: small pieces of food were taken away and the bird perched on a twig in a beak-cleaning attitude; keeping the food in its beak, it then rubbed it along the twig, eating small morsels as it crumbled.

The method of eating from one foot while hanging by the other was seen on 21st (twice), 24th and 25th March, and 3rd and 14th (twice) April by myself; and on 29th March by my husband also. It is not known whether more than one individual was involved, but only one bird at a time was observed. The tit seemed to experience no difficulty in eating in this manner, except in strong gusts of wind when its whole body was blown around. The food eaten was probably half-peanut kernels, or it could have been pieces of minced fat approximately the size of these nuts. On 14th April, when feeding on nuts and fat had been discontinued, small pieces of biscuit were taken. On three occasions the food was finished, on four occasions it was dropped before being finished, and once it might be said to have been thrown away since it left the bird's body at right angles and described an arc before dropping to the ground!

These Long-tailed Tits also fed quite readily on the ground, especially towards dusk when parties of up to eleven were often seen clearing up the minute crumbs left by other species.

JOAN HALL-CRAGGS

[Mr. Derek Goodwin tells us that he once watched some Long-

tailed Tits in captivity. When given gentles they would seize one in the bill, fly to a thin twig, hang upside-down with one foot, now holding the gentle in the other, and eat it. He adds that he has seen this only once in a wild state, but Long-tailed Tits he has watched have normally been taking only tiny prey and he suspects that this is their usual method of dealing with any largish insect.—EDS.]

SPECIAL REVIEW

Bird Numbers in Finland: A Bold Effort towards Estimating a Nation's Avifauna*

By E. M. NICHOLSON

AMONG THE MANY generous and thoughtful acts of our hosts in Finland at the XIIth International Ornithological Congress was the timely production and presentation to each member of this 181-page survey in English of the bird population of Finland. Illustrated by 131 maps of the distribution of individual species and forming a revised and rewritten version of the same author's *Suomen lintujen levinneisyys ja lukumäärä* (published in Finnish 1955), it differs from most works of its kind in not stopping at listing the individual occurrences of rarities and the general distribution and frequency of the commoner species. It aims instead, with characteristic Finnish indifference to seemingly insurmountable obstacles, at providing nothing less than a summary of the actual numbers and regional density patterns of all the regular breeding species in Finland.

It opens a window on to a rich and interesting avifauna which difficulties of language and travel have hitherto kept beyond the range of most British ornithologists, even though Finnish ornithology was partly pioneered by such Englishmen as Wolley, who just over a century ago first discovered there the nest of the Smew (*Mergus albellus*). Arranged in a Wetmore order it deals with 327 species, although these include some which have occurred only as escapes—such as the Black Swan (*Cygnus atratus*), Bar-headed Goose (*Anser indicus*), Canada Goose (*Branta canadensis*) and Demoiselle Crane (*Anthropoides virgo*)—and one or two, surprisingly including the Great Northern Diver (*Gavia immer*), which are given space only to point out that no acceptable record yet exists for them in Finland. The maps (which are provided for most but by no means all species reaching any appreciable density in any part of Finland) are elaborately prepared to convey changing status and to grade their supporting data as

*FINNISH BIRDS: THEIR DISTRIBUTION AND NUMBERS. By EINARI MERIKALLIO. *Fauna Fennica V* in series of publications by Societas pro Fauna et Flora Fennica. (Tilgmann, Helsinki, 1958). 181 pages; 131 maps. No price given.

well as to indicate density according to a frequency scale drawn up with the help of Professor O. Kalela. This distinguishes nine different frequency levels ranging from below 0.05 pairs per square kilometre ("very scarce") to above 25 pairs ("extremely numerous") in each of ten zoological regions. The necessary data are derived largely from sample transect counts along survey lines arranged in squares 4 kms. in perimeter with a width of some 50 metres for the main belt. A much broader "auditory belt" covering nearly seven times as wide a band is used for the more infrequent species. In this way transects aggregating 1,092 kms. were covered, scattered throughout Finland, and giving records of 67,321 individuals belonging to 130 species.

Most bird census work in other European countries has hitherto been based on particular conspicuous species, and few experienced counters have been willing to contemplate even on a sample basis the estimating of a national population as a whole, although certain informed guesses have been hazarded. Finnish ornithologists believe that, despite the formidable obstacles, a worthwhile degree of accuracy is attainable. Dr. Merikallio, however, is careful to point out that certain species (owing to their inconspicuousness, gregariousness, or other factors) cannot be reliably sampled by such methods and he indicates that a number of his estimates must for such reasons be considered as probably too high, too low, or simply too uncertain.

Although it must be emphasized that the book itself contains no summary census table, it gives all the necessary data for compiling the following one:

TABLE I—ESTIMATED POPULATIONS OF BIRDS BREEDING IN FINLAND

- * = Rough estimate. † = Uncertain or suspect estimate.
 + = Estimate incomplete or prior to recent increase.
 - = Estimate probably too high or prior to recent decrease.

The ten commonest species are numbered in order on the left. It appears that every regular breeding species is included, except a few whose status is still uncertain—Water Rail (*Rallus aquaticus*), Moorhen (*Gallinula chloropus*) and Terek Sandpiper (*Tringa terek*)—and certain others for which firm data are lacking—Snew (*Mergus albellus*), Snowy Owl (*Nyctea scandiaca*) and Grey-headed Woodpecker (*Picus canus*).

Species	Estimated breeding pairs
Black-throated Diver (<i>Gavia arctica</i>)	2,000
Red-throated Diver (<i>Gavia stellata</i>)	2,000
Great Crested Grebe (<i>Podiceps cristatus</i>)	5,000
Red-necked Grebe (<i>Podiceps griseigena</i>)	2,000
Slavonian Grebe (<i>Podiceps auritus</i>)	3,000
Heron (<i>Ardea cinerea</i>)	5-10
Bittern (<i>Botaurus stellaris</i>)	10
Mallard (<i>Anas platyrhynchos</i>)	160,000 (*)
Teal (<i>Anas crecca</i>)	80,000 (*)

<i>Species</i>	<i>Estimated breeding pairs</i>
Garganey (<i>Anas querquedula</i>)	1,000-2,000 (*)
Wigeon (<i>Anas penelope</i>)	40,000 (*)
Pintail (<i>Anas acuta</i>)	20,000 (*)
Shoveler (<i>Spatula clypeata</i>)	4,000 (*)
Scaup (<i>Aythya marila</i>)	1,000
Tufted Duck (<i>Aythya fuligula</i>)	40,000 (*)
Pochard (<i>Aythya ferina</i>)	5,000 (*)
Goldeneye (<i>Bucephala clangula</i>)	50,000 (*)
Long-tailed Duck (<i>Clangula hyemalis</i>)	500 (*)
Velvet Scoter (<i>Melanitta fusca</i>)	5,000-8,000 (+)
Common Scoter (<i>Melanitta nigra</i>)	500 (*)
Eider (<i>Somateria mollissima</i>)	25,000
Red-breasted Merganser (<i>Mergus serrator</i>)	10,000
Goosander (<i>Mergus merganser</i>)	4,000
Grey Lag Goose (<i>Anser anser</i>)	250 (+)
Lesser White-fronted Goose (<i>Anser erythropus</i>)	200 (*)
Bean Goose (<i>Anser arvensis</i>)	1,000
Whooper Swan (<i>Cygnus cygnus</i>)	15 (+)
Golden Eagle (<i>Aquila chrysaetos</i>)	82
Buzzard (<i>Buteo buteo</i>)	2,300
Rough-legged Buzzard (<i>Buteo lagopus</i>)	3,000 (—)
Sparrowhawk (<i>Accipiter nisus</i>)	1,200 (†)
Goshawk (<i>Accipiter gentilis</i>)	500 (†)
Black Kite (<i>Milvus migrans</i>)	50
White-tailed Eagle (<i>Haliaeetus albicilla</i>)	25-30
Honey Buzzard (<i>Pernis apivorus</i>)	1,000 (†)
Marsh Harrier (<i>Circus aeruginosus</i>)	100
Hen Harrier (<i>Circus cyaneus</i>)	600 (†)
Osprey (<i>Pandion haliaeetus</i>)	500 (†)
Hobby (<i>Falco subbuteo</i>)	2,700 († —)
Peregrine (<i>Falco peregrinus</i>)	500 (†)
Gyr Falcon (<i>Falco rusticolus</i>)	10 (†)
Merlin (<i>Falco columbarius</i>)	1,600 (†)
Kestrel (<i>Falco tinnunculus</i>)	3,400 (†)
Willow Grouse (<i>Lagopus lagopus</i>)	110,000
Ptarmigan (<i>Lagopus mutus</i>)	4,000
Black Grouse (<i>Lyrurus tetrix</i>)	310,000
Capercaillie (<i>Tetrao urogallus</i>)	214,000 (—)
Hazel Hen (<i>Tetrastes bonasia</i>)	228,000
Partridge (<i>Perdix perdix</i>)	15,000
Quail (<i>Coturnix coturnix</i>)	20
Pheasant (<i>Phasianus colchicus</i>)	20,000 (—) (1938 est.)
Crane (<i>Megalornis grus</i>)	8,500
Spotted Crake (<i>Porzana porzana</i>)	"several hundred"
Corncrake (<i>Crex crex</i>)	900 (—)
Coot (<i>Fulica atra</i>)	2,000
Oystercatcher (<i>Haematopus ostralegus</i>)	600
Lapwing (<i>Vanellus vanellus</i>)	26,000
Ringed Plover (<i>Charadrius hiaticula</i>)	5,700 (†)
Little Ringed Plover (<i>Charadrius dubius</i>)	1,000 (*)
Golden Plover (<i>Charadrius apricarius</i>)	12,000
Dotterel (<i>Charadrius morinellus</i>)	8,000-9,000 (—)
Turnstone (<i>Arenaria interpres</i>)	1,500-1,600
Snipe (<i>Capella gallinago</i>)	90,000
Great Snipe (<i>Capella media</i>)	50
Jack Snipe (<i>Lymnocyptes minimus</i>)	11,000
Woodcock (<i>Scolopax rusticola</i>)	16,000 (†)

Species	Estimated breeding pairs
Curlew (<i>Numenius arquata</i>)	44,000
Whimbrel (<i>Numenius phaeopus</i>)	43,000
Bar-tailed Godwit (<i>Limosa lapponica</i>)	0-20
Green Sandpiper (<i>Tringa ochropus</i>)	22,000
Wood Sandpiper (<i>Tringa glareola</i>)	180,000
Common Sandpiper (<i>Tringa hypoleucos</i>)	10,000 (+)
Redshank (<i>Tringa totanus</i>)	2,000
Spotted Redshank (<i>Tringa erythropus</i>)	24,000
Greenshank (<i>Tringa nebularia</i>)	30,000
Temminck's Stint (<i>Calidris temminckii</i>)	2,000 (*)
Dunlin (<i>Calidris alpina</i>)	30
Broad-billed Sandpiper (<i>Limicola falcinellus</i>)	11,000
Ruff (<i>Philomachus pugnax</i>)	7,500
Red-necked Phalarope (<i>Phalaropus lobatus</i>)	700
Arctic Skua (<i>Stercorarius parasiticus</i>)	130
Long-tailed Skua (<i>Stercorarius longicaudus</i>)	1,500 († -)
Great Black-backed Gull (<i>Larus marinus</i>)	600
Lesser Black-backed Gull (<i>Larus fuscus</i>)	4,000
Herring Gull (<i>Larus argentatus</i>)	2,300-3,000 (*)
Common Gull (<i>Larus canus</i>)	5,000
Little Gull (<i>Larus minutus</i>)	200
Black-headed Gull (<i>Larus ridibundus</i>)	20,000-30,000
Caspian Tern (<i>Hydroprogne caspia</i>)	700
Common Tern (<i>Sterna hirundo</i>)	6,000
Arctic Tern (<i>Sterna macrura</i>)	6,000
Razorbill (<i>Alca torda</i>)	750-1,000 (*)
Black Guillemot (<i>Uria grylle</i>)	1,500
Stock Dove (<i>Columba oenas</i>)	8,000
Rock Dove (<i>Columba livia</i>)	50,000 (†)
Woodpigeon (<i>Columba palumbus</i>)	164,000
Cuckoo (<i>Cuculus canorus</i>)	30,000
Eagle Owl (<i>Bubo bubo</i>)	200
Hawk Owl (<i>Surnia ulula</i>)	3,600 (†)
Pygmy Owl (<i>Glaucidium passerinum</i>)	200-300
Tawny Owl (<i>Strix aluco</i>)	2,000
Great Grey Owl (<i>Strix nebulosa</i>)	50-2,000 (*)
Ural Owl (<i>Strix uralensis</i>)	700 (†)
Long-eared Owl (<i>Asio otus</i>)	2,500 (†)
Short-eared Owl (<i>Asio flammeus</i>)	9,000 († -)
Tengmalm's Owl (<i>Aegolius funereus</i>)	1,500
Nightjar (<i>Caprimulgus europaeus</i>)	4,300
Swift (<i>Apus apus</i>)	25,000
Kingfisher (<i>Alcedo atthis</i>)	10
Great Spotted Woodpecker (<i>Dendrocopos major</i>)	95,000
White-backed Woodpecker (<i>Dendrocopos leucotos</i>)	4,000 (†† - -)
Lesser Spotted Woodpecker (<i>Dendrocopos minor</i>)	3,000 († +)
Three-toed Woodpecker (<i>Picoides tridactylus</i>)	23,000
Black Woodpecker (<i>Dryocopus martius</i>)	15,000
Wryneck (<i>Jynx torquilla</i>)	19,000
Woodlark (<i>Lullula arborea</i>)	500
Skylark (<i>Alauda arvensis</i>)	200,000
Shore Lark (<i>Eremophila alpestris</i>)	10,000
Swallow (<i>Hirundo rustica</i>)	300,000
House Martin (<i>Delichon urbica</i>)	120,000 (†)
Sand Martin (<i>Riparia riparia</i>)	300,000 (†† -)
Golden Oriole (<i>Oriolus oriolus</i>)	1,800
Raven (<i>Corvus corax</i>)	7,800

	Species	Estimated breeding pairs
	Hooded Crow (<i>Corvus corone cornix</i>)	135,000
	Rook (<i>Corvus frugilegus</i>)	3,000
	Jackdaw (<i>Corvus monedula</i>)	8,000 (+)
	Magpie (<i>Pica pica</i>)	110,000
	Nutcracker (<i>Nucifraga caryocatactes</i>)	100
	Jay (<i>Garrulus glandarius</i>)	170,000
	Siberian Jay (<i>Perisoreus infaustus</i>)	160,000
	Great Tit (<i>Parus major</i>)	410,000
	Blue Tit (<i>Parus caeruleus</i>)	18,000
	Coal Tit (<i>Parus ater</i>)	30,000
10	Crested Tit (<i>Parus cristatus</i>)	665,000
	Siberian Tit (<i>Parus cinctus</i>)	200,000
4	Willow Tit (<i>Parus atricapillus</i>)	1,400,000
	Long-tailed Tit (<i>Aegithalos caudatus</i>)	21,000
	Treecreeper (<i>Certhia familiaris</i>)	33,000
	Wren (<i>Troglodytes troglodytes</i>)	6,000
	Dipper (<i>Cinclus cinclus</i>)	400
	Mistle Thrush (<i>Turdus viscivorus</i>)	125,000
	Fieldfare (<i>Turdus pilaris</i>)	560,000
	Song Thrush (<i>Turdus philomelos</i>)	640,000
	Redwing (<i>Turdus musicus</i>)	570,000
	Ring Ouzel (<i>Turdus torquatus</i>)	20
	Blackbird (<i>Turdus merula</i>)	8,000
	Wheatear (<i>Oenanthe oenanthe</i>)	300,000
	Whinchat (<i>Saxicola rubetra</i>)	310,000
	Red-flanked Bluetail (<i>Tarsiger cyanurus</i>)	500 (*)
9	Redstart (<i>Phoenicurus phoenicurus</i>)	670,000
	Thrush Nightingale (<i>Luscinia luscinia</i>)	200
	Bluethroat (<i>Cyanosylvia svecica</i>)	27,000
	Robin (<i>Erithacus rubecula</i>)	410,000
	Grasshopper Warbler (<i>Locustella naevia</i>)	50 (+)
	Great Reed Warbler (<i>Acrocephalus arundinaceus</i>)	5-10
	Reed Warbler (<i>Acrocephalus scirpaceus</i>)	500
	Marsh Warbler (<i>Acrocephalus palustris</i>)	5-10
	Blyth's Reed Warbler (<i>Acrocephalus dumetorum</i>)	30-40
	Sedge Warbler (<i>Acrocephalus schoenobaenus</i>)	9,000
	Icterine Warbler (<i>Hippolais icterina</i>)	2,000
	Blackcap (<i>Sylvia atricapilla</i>)	10,000
	Barred Warbler (<i>Sylvia nisoria</i>)	100-200
8	Garden Warbler (<i>Sylvia borin</i>)	690,000
	Whitethroat (<i>Sylvia communis</i>)	220,000
	Lesser Whitethroat (<i>Sylvia curruca</i>)	170,000
1	Willow Warbler (<i>Phylloscopus trochilus</i>)	5,700,000
	Greenish Warbler (<i>Phylloscopus trochiloides</i>)	1,300
	Chiffchaff (<i>Phylloscopus collybita</i>)	300,000
	Wood Warbler (<i>Phylloscopus sibilatrix</i>)	36,000
	Arctic Warbler (<i>Phylloscopus borealis</i>)	700
	Goldcrest (<i>Regulus regulus</i>)	520,000
5	Spotted Flycatcher (<i>Muscicapa striata</i>)	990,000
	Pied Flycatcher (<i>Muscicapa hypoleuca</i>)	325,000
	Red-breasted Flycatcher (<i>Muscicapa parva</i>)	100
	Dunnock (<i>Prunella modularis</i>)	8,000
	Meadow Pipit (<i>Anthus pratensis</i>)	230,000
3	Tree Pipit (<i>Anthus trivialis</i>)	1,650,000
	Red-throated Pipit (<i>Anthus cervinus</i>)	300-350 (*)
	Rock Pipit (<i>Anthus spinoletta</i>)	500 (*)
	White Wagtail (<i>Motacilla alba</i>)	430,000

	<i>Species</i>	<i>Estimated breeding pairs</i>
	Yellow Wagtail (<i>Motacilla flava thunbergi</i>) ...	400,000
	Waxwing (<i>Bombycilla garrulus</i>)	5,000
	Great Grey Shrike (<i>Lanius excubitor</i>)	4,000
	Red-backed Shrike (<i>Lanius cristatus collurio</i>) ...	9,000
	Starling (<i>Sturnus vulgaris</i>)	170,000
	Greenfinch (<i>Chloris chloris</i>)	30,000
	Goldfinch (<i>Carduelis carduelis</i>)	1,000
	Siskin (<i>Carduelis spinus</i>)	410,000
	Linnet (<i>Carduelis cannabina</i>)	1,800 (+ +)
	Redpoll (<i>Carduelis flammea</i>)	470,000
	Arctic Redpoll (<i>Carduelis hornemanni</i>)	2,000
	Bullfinch (<i>Pyrrhula pyrrhula</i>)	80,000
	Scarlet Grosbeak (<i>Capodacus erythrinus</i>) ...	3,000
	Pine Grosbeak (<i>Pinicola enucleator</i>)	17,000
	Crossbill (<i>Loxia curvirostra</i>)	480,000
	Parrot Crossbill (<i>Loxia pytyopsittacus</i>)	30,000 (+ +)
2	Chaffinch (<i>Fringilla coelebs</i>)	5,300,000
7	Brambling (<i>Fringilla montifringilla</i>)	870,000
6	Yellowhammer (<i>Emberiza citrinella</i>)	970,000
	Yellow-breasted Bunting (<i>Emberiza aureola</i>) ...	100
	Ortolan Bunting (<i>Emberiza hortulana</i>)	100,000
	Rustic Bunting (<i>Emberiza rustica</i>)	380,000
	Little Bunting (<i>Emberiza pusilla</i>)	2,500
	Reed Bunting (<i>Emberiza schoeniclus</i>)	100,000
	Lapland Bunting (<i>Calcarius lapponicus</i>)	14,000
	Snow Bunting (<i>Plectrophenax nivalis</i>)	9,000
	House Sparrow (<i>Passer domesticus</i>)	500,000
	Tree Sparrow (<i>Passer montanus</i>)	100

Total for Finland: ca. 32,160,000 breeding pairs (of which 31,620,000 are terrestrial) on 337,000 square kilometres or just over 73 million acres, averaging about 85 breeding adults per 100 acres.

This most interesting Table raises many questions regarding both the picture which it presents of the Finnish avifauna and the reliability and applicability of such estimates in general and of this one in particular. Taking the figures first of all at their face value, we learn that Finland's ten commonest breeding species are (in order) Willow Warbler and Chaffinch (at very similar levels of around $5\frac{1}{2}$ million), Tree Pipit, Willow Tit, Spotted Flycatcher, Yellowhammer, Brambling, Garden Warbler, Redstart and Crested Tit. On this information alone, no ornithologist would be surprised to learn that 65% of the area of Finland is under forest and only 8% is cultivated, or that it is a northern land in which summer residents form a large part of the breeding population. The most numerous bird appreciably over six inches long is the Song Thrush which comes eleventh (outnumbering the Blackbird by 80-1). Seven other forest species and the House Sparrow are clustered fairly near the half-million mark on the table. Besides the Blackbird, several other high-ranking British species come in at very low figures, such as Starling (170,000—barely enough to populate one first-class roost), Rook (3,000), Blue Tit (18,000), Dunnock (8,000) and Wren (6,000)—in striking

contrast to the woodland Robin (410,000)—and the gulls, none of which except the Black-headed exceeds 5,000 pairs. While divers and grebes reflect the extensive inland waters (covering 9% of Finland), ducks are not strikingly numerous, the Mallard alone reaching six figures, although the estimates for this group are inevitably only rough. Birds of prey, although varied, are in disappointingly small numbers, the Golden Eagle, Buzzard (?) and Peregrine being certainly even less numerous than in Britain. On the other hand, certain temperate species are surprisingly high such as Wryneck (perhaps a thousand times more numerous than with us), Golden Oriole, Wood Warbler and Ortolan. Also, Finland is now at or near the western limit of the range of several species that are expanding from the east such as Terek Sandpiper and Blyth's Reed, Greenish and Arctic Warblers.

Coming to Finland's special attractions, who can blame the tally-hunter for lingering over the 2,000 pairs of Red-necked Grebe, 30 of White-tailed Eagle, 10 of Gyr Falcon, 8,500 of Crane, 1,500 or more of Turnstone, 50 of the declining Great Snipe, 11,000 of Broad-billed Sandpiper, 700 of Caspian Tern, 3,600 of Hawk Owl, 200-300 of Pygmy Owl, 700 of Ural and 1,500 of Tengmalm's Owl, 23,000 of Three-toed Woodpecker, 10,000 of Shore Lark and many others including 500 of Red-flanked Bluetail (an especially uncertain figure), 100 of Yellow-breasted Bunting and 3,000 of Scarlet Grosbeak. Whatever else the list may achieve it certainly kindles the imagination.

Coming down to earth, however, anyone who has both counted birds and seen Finland is bound to be faced with some scepticism as to the validity of such figures covering an area nearly half as large again as Great Britain and much more difficult to work. While the underlying data are candidly treated it is difficult to assess from them the adequacy of the sample on which this magnificent superstructure rests. Rather casual scrutiny indicates that each individual actually observed in the sampling is normally multiplied between 300 and 2,000 times in framing the estimate. It is clear that great ingenuity and perseverance over many years have been devoted to securing a correct definition of habitats and a representative selection both of these and of zoological regions, but at the end of the day what does the margin of error amount to?

Mr. J. G. Skellam, head of the Biometrics Unit of the Nature Conservancy, has kindly examined the basis of these estimates which is given in more detail in Dr. Merikallio's 1946 paper entitled "Über regionale verbreitung und anzahl der Landvögel in Süd- und Mittelfinnland, besonders in deren Östlichen Teilen, im Lichte von Quantitativen Untersuchungen" (*Annales Zoologici Societatis*, Tom. 12, nos. 1 and 2). Dr. Merikallio also courteously and informatively answered numerous questions on the subject. Although the material and knowledge available to us here is

evidently far more limited than that commanded by Dr. Merikallio and his colleagues, statistical examination confirms what ornithological experience would indicate, that such national bird population estimates based on samples of this type and scale are not at all to be relied upon. The margins of error are much too great, even those inherent in the sampling procedure itself being inacceptably large except for the very commonest species.

What we have here, therefore, is not to be taken as a bird census of Finland or even as a serious approach to it. The study is rather an ambitious exercise in the application of painstaking but still limited and somewhat rough sampling methods in combination with a picture of national ecological and land-use patterns in a well-worked and relatively simple but rather large area. On these bases a gossamer network of arithmetic has been thrown boldly across Finland's immense forests and innumerable lakes to catch the whole bird population, but the real avifauna escapes the net and the forests keep their secrets.

Must we then conclude that all this impressive industry has been wasted? Certainly not, provided that its limits and uncertainties are strictly understood. Being based as it is on regional samples which can be repeated periodically it will provide an excellent means of tracing future major changes in distribution of common species within Finland, possibly related, say, to climatic changes. For example, it has shown already that the decline during the 1930's and 1940's of Bramblings in middle Finland has lately been entirely reversed, so that the view put forward by O. Kalela (1952, *Fennia*, vol. 75, p. 48) of a climatically linked, clearly definable change in the mutual abundance relations of the "boreal" Brambling and the "southern" Chaffinch can no longer be sustained. Used in such ways Dr. Merikallio's figures afford measures of population density, differing perhaps for different species, but nevertheless reasonably consistent for comparative purposes in different habitats in different parts of the country.

This is a very different matter from a national bird population census in which, as Dr. Merikallio himself points out, the sampling basis becomes completely unreliable for the scarcer or more patchily distributed species, including all those breeding in colonies or fluctuating markedly from season to season. Here Dr. Merikallio's valour has outrun his discretion. Nevertheless, even if such a Table as that given above must rank at this stage as largely a work of the imagination, it is for all that a real advance. It presents us with a model of the possible eventual results of a national bird census which enables us to see more clearly what the uses, limitations and problems of such a census would be, as well as the nature of the difficulties still to be overcome and the magnitude of the effort necessary to reduce margins of error to an acceptable level. Looked at in this way the task is

certainly daunting, but modern ornithological history gives no ground for supposing that somewhere, sometime, it will not be successfully accomplished, perhaps sooner than we think. When that time comes Dr. Merikallio will deserve, and no doubt receive, the recognition due to a pioneer.

REVIEW

LIVING BIRDS OF THE WORLD. By E. THOMAS GILLIARD. (*Hamish Hamilton*, London, 1958). 400 pages; 400 illustrations (217 in full colour). 70s.

AS ITS TITLE implies, this book is a general survey of the birds of the world. The author, both as a field-ornithologist who has worked in remote parts and as Assistant Curator of Birds at the American Museum of Natural History, is well qualified for this colossal task, which he has fulfilled with distinction. The scope of the work has inevitably meant that individual birds are for the most part swamped in generalizations about each order and family. Yet it is to the author's credit that he has managed to compress so much detail into his accounts. The pattern for these, with good reason, remains much the same for each: general characteristics, number of species, range, origin, breeding, courtship, etc. With so wide a field to be compressed into small space, it would be surprising if there were not inadequacies and minor errors. One wonders, for instance, how the ranges of the Chaffinch and Reed Warbler can be made to include Iceland; and, of the Skylark, the remark that "the song for which it is famous is a long-sustained, musical chirr-r-up" is enough to make the poets turn in their graves. Yet, despite the compressions involved, the author has introduced evidence of recent developments, techniques and discoveries in all fields of modern ornithology. I suspect that the book will be an eye-opener to many readers of *British Birds*, as it was to me, in exposing to them how narrow is their knowledge of the birds of the world. So intense has been the work done on Palaearctic species that it comes as a shock to discover how little is known of a big portion of the world's birds—especially, as the author points out, of those of South America which, of all the continents, contains the largest number of families and species.

The wide scope of the book's letterpress is reflected in the illustrations. These are magnificent. In his introduction the author describes them as "probably the finest collection of bird photographs ever brought together in one volume" and few would dispute this claim. Every effort has been made to obtain representative illustrations of all bird families. Photographers from all parts of the world have contributed, and if there is a slight bias in favour of the New World, especially Central and

South America, that is not unreasonable in a book originally produced in the United States. The overall standard is of the very highest, and that of the colour photographs superb. In such a galaxy it is perhaps invidious to pick out plates for special mention, but I cannot refrain from praising the colour photographs of the Short-billed Marsh Wren and of the Rufous Hummingbird, both by Eliot Porter. It is difficult to believe that bird photography can ever improve on such results.

If the text of this book cannot be described as inspiring reading, none would disagree that it is one of the finest albums of bird photographs ever produced, and a joy to look at and to possess.

G.K.Y.

LETTERS

ON THE IDENTIFICATION OF SOME WARBLERS

SIRS,—Messrs. I. C. T. Nisbet and T. C. Smout (*antea*, vol. L, p. 204) state that all the Subalpine Warblers (*Sylvia cantillans*) they saw in S. E. Europe had buff or pinkish-buff under-parts, affording a quick distinction from Sardinian Warblers (*S. melanocephala*), some of which were otherwise similar. Might I point out that this could lead to confusion if the other less obvious differences are overlooked, as males of the race of *melanocephala* known as Ménétriés Warbler (*S. m. mystacea*), of central Asia, also have largely pink under-parts, very apparent in the field. This warbler might occur in this country. On first seeing the bird in winter in Eritrea I presumed I was watching *cantillans*, but a specimen was identified in the B.M. as *mystacea*. The Egyptian race, *norrisae*, is also described as having pinkish under-parts.

Upcher's Warbler (*Hippolais languida*) was a regular passage migrant in Eritrea. I wrote the usual note as a loud "chuck", very distinctive as W. B. Alexander comments (*antea*, vol. L, p. 203), and quite different from the sparrow-like chatter of the Olivaceous and Melodious Warblers (*H. pallida* and *polyglotta*). The bird advertises its presence by constantly flicking its tail more like some chats than a warbler. I do not know whether other *Hippolais* species do this but it was not seen in wintering *H. p. elaeica*.

K. D. SMITH

RECENT REPORTS AND NEWS

By I. J. FERGUSON-LEES and KENNETH WILLIAMSON

The items here are largely unchecked reports, and must not be regarded as authenticated records. They are selected, on the present writers' judgment alone, from sources generally found to be reliable. Observers' names are usually omitted for reasons of space and in case a report is subsequently rejected, and none of the items will be mentioned in our annual Index. Readers are asked to submit anything of interest as quickly as possible.

This summary covers December 1958 through to 11th January 1959. For

reasons of space, however, we have to confine ourselves this month to the subjects of widest and most topical interest, again holding others over to the next issue.

AN INVASION OF WAXWINGS

The most striking feature of the period has been the third sizeable invasion of Waxwings (*Bombycilla garrulus*) in a space of two years (*cf. antea*, vol. L, pp. 339, 496, 543). This was not unexpected because reports from the Continent had shown that there was an unusually large and early southward and westward movement in the Baltic area from late September throughout October, followed by a build-up in southern Scandinavia in November and an invasion in Germany in December. The first Waxwings actually reached Scotland and East Anglia in mid-November—single birds at Fair Isle on the 18th-19th and the 24th, at Colinsburgh (Fife) on the 19th and at Cawston (Norfolk) on the 20th—but it was not until 11th-13th December that there was any real influx into Britain. During the next few days there were reports of small numbers in various parts of east Scotland from Shetland to the Firth of Forth, though the only English observations were several parties in north Norfolk. This pattern continued until about 20th-21st December when there was apparently another influx, followed by a much larger one on the 26th-27th. The latter seems to have reached its most spectacular proportions in N.E. Northumberland: 65-70 were seen north of Belford on the 26th, followed by some 150 on the 27th; then, in the late afternoon of the 27th, many flocks of 30-50 were watched arriving from the east and it was estimated that at least 500 were seen; by 4th January it was thought that there were at least 1,000 in the area.

During the last days of December many were reported from East Coast areas from Caithness to Essex, but, though some were seen both then and earlier in the Hebrides (Lewis, Canna, Tiree and Mull) and other places in W. Scotland, it was not until early January that English inland counties began to come into the picture. Then two in Worcestershire on the 4th and two in Staffordshire on the 10th, as well as the first reports as far south as Kent on the 1st and 13th, showed that Waxwings may now be worth watching for anywhere. To date the only flocks of over a dozen birds reported have been in Sutherland, Inverness, Aberdeen, Angus, Perth, Argyll, Fife, Midlothian, Northumberland, Yorkshire, Lincolnshire, Norfolk, Suffolk and Essex. We should be grateful for any records of Waxwings.

THE RARER BIRDS

Particularly interesting was the Crested Lark (*Galerida cristata*) which inhabited some waste ground between two railway tracks near Exmouth (Devon) from 29th December to 3rd January, and another unexpected settler in the West Country was a Richard's Pipit (*Anthus novaeseelandiae*) at West Huntspill, near Pawlett (Somerset), from 21st December to at least 18th January. For November reports of these two species see *antea*, pp. 529-530; the Short-toed Lark (*Calandrella cinerea*) at Spurn (Yorkshire), mentioned then, stayed until 14th December. A Nutcracker (*Nucifraga caryocatactes*) at Keresley, near Coventry (Warwickshire), on 4th January may have come in with the Waxwings. That same day a near-adult Iceland Gull (*Larus glaucoides*) at Kettering (Northamptonshire) provided an unusual inland report and there was also an adult Mediterranean Black-headed Gull (*L. melanocephalus*) in Langstone Harbour (Hampshire), in another part of which an immature Iceland Gull had been seen on 13th December. A Snow Goose (*Anser caerulescens*) appeared on the North Slob (Co. Wexford) about 15th December and was still present on the 28th, while additions to those given last month (*antea*, p. 528) are one at Kingoodie, near Dundee (Angus), on 16th November and "four white geese with black wing tips" at South Queensferry (West Lothian) on 30th November. A Hudsonian Whimbrel (*Numenius phaeopus hudsonicus*) was identified among Curlew (*N. arquata*) in Dublin Bay on 8th December (*cf. antea*, vol. xlviii, pp. 379-381). Out-of-season birds included a Spotted Crake (*Porzana porzana*) at Cliffe (Kent) on 7th December, and a Balearic Shearwater (*Procellaria puffinus mauretanicus*) off St. Ives (Cornwall) on 3rd January (*cf. antea*, pp. 368, 445).

NOTICE TO CONTRIBUTORS

British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xvi, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, xlii: 129-134.

WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34.

Various other conventions concerning references, including their use in the text, should be noted by consulting previous examples.

4. Tables should be numbered with Roman numerals, and the title typed above in the style used in this issue. The title and any headings within the Table should not be underlined, because this sometimes makes it difficult for the Editor to indicate the type to be used. It is most important that the lay-out of each Table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that Tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All Tables should be self-explanatory.

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BRITISH BIRDS

THE INFLUX OF PHALAROPES IN AUTUMN 1957

By BRYAN L. SAGE and BERNARD KING

DURING THE AUTUMN of 1957, more than average numbers of Grey Phalaropes (*Phalaropus fulicarius*), together with many Red-necked Phalaropes (*Ph. lobatus*), were recorded in the British Isles. The following analysis of this influx is based on records received either direct from the observers or through the medium of the editors of county bird reports, all of whom are listed towards the end of this paper.

Enquiries were made on the Continent in an attempt to ascertain whether or not phalaropes occurred there in unusual numbers at this period. Dr. Holger Holgerson, writing from Norway, stated that the only record of which he had knowledge was of an unidentified phalarope seen at Revtangen, 20 miles from Stavanger. Dr. Finn Salomonsen, referring to Denmark, said that only one Grey Phalarope was seen and no more than normal numbers of Red-necked Phalaropes. Somewhat larger numbers of Grey Phalaropes were reported in Holland, however. There, on 4th, 8th and 10th September, parties of 10, 13 and 15 respectively were seen on the Oost-Flevoland Polder, now being reclaimed from the IJsselmeer, by Hermann Nuijen and Dr. A. B. H. Wolff, to whom we are indebted for this information. In addition, J. E. Sluiters gave us details of five additional records of Grey Phalaropes in Holland, including one on the IJsselmeer on 6th July and another at IJmuiden on 30th December. He also states that many Red-necked Phalaropes were seen in Holland during the autumn of 1957.

GREY PHALAROPES

The first Grey Phalaropes were recorded in late August—in Northumberland (Cheviot) during the 26th-28th, and in Gloucestershire on the 25th and 26th. The main influx took place in

September and the species was widely distributed during the first three weeks of that month. Fig. 1 shows the vice-county distribution of records for the period 1st-21st September. The maximum numbers were reported in the middle of the month when there were at least 25 in St. Ives Bay, Cornwall, on the 13th, as well as a minimum of 6 between Land's End and the Scilly Isles on the 13th and 14th and another 4 off St. Agnes. On 14th September there was a minimum of 5 Grey Phalaropes off the coast of Co. Wexford, and in addition a flock of 14+ not specifically identified. The maximum number reported from any other one area at this period was a total of 7 in Hampshire on

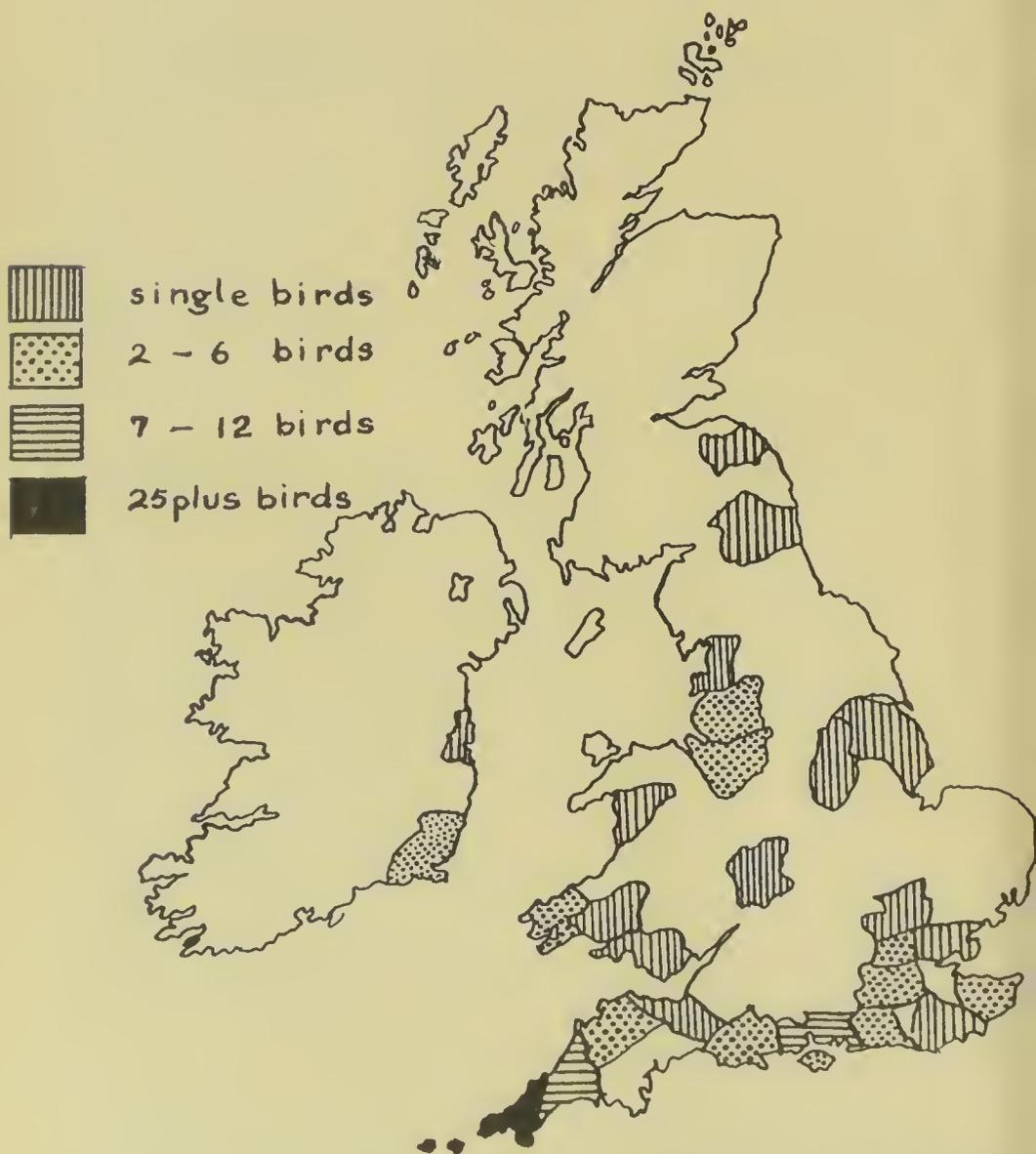


FIG. 1—MAP SHOWING THE VICE-COUNTY DISTRIBUTION OF GREY PHALAROPES (*Phalaropus fulicarius*) RECORDED IN THE BRITISH ISLES DURING THE PERIOD 1ST-21ST SEPTEMBER 1957 (see Addenda on page 39)

the 14th. During October, Grey Phalaropes were reported from Cheshire, Essex, Dorset, Glamorgan, Hampshire, Lancashire and Sussex, and also from Buckinghamshire, Durham, Co. Kerry, Norfolk and Suffolk where they were *not* recorded during September. There were November records from 9 vice-counties. The only December records were from Cornwall, Norfolk and Sussex.

It is evident that, during the main passage, Grey Phalaropes were present in Irish waters only for a very short space of time, as they were not recorded off the Wexford coast (Great Saltee) after 14th September (though a single unidentified phalarope was seen there on 24th September). There was, however, one off the Dublin coast on 14th-15th September, and 3 in that area on 25th September. It is of interest to note that at the same period the latest Cornish and west coast records were of 2 off the Scilly Isles on 24th September and 2 off Skokholm, Pembrokeshire, on the 30th. The number of October and November records of Grey Phalaropes suggests that they were held up somewhere by the weather conditions responsible for the minor peak of phalaropes in British waters in late September. The records for these two months came from widely scattered localities and indicate that movements during October were somewhat erratic. To summarise (see Appendix A, pp. 39-41), during the period August-December 1957 Grey Phalaropes were recorded from 37 vice-counties (England 28, Scotland 2, Wales 4, and Ireland 3). The maximum numbers occurred on 13th-14th September and were concentrated mainly in Irish and Cornish waters.

If we compare the 1957 influx with that which took place in the autumn of 1950 (see *antea*, vol. xlv, pp. 247-250), certain similarities emerge. In 1950 the maximum numbers occurred between 15th and 21st September and were mainly in Cornwall and Sussex. The following shows the comparative monthly distribution of individual records in the two years:—

	1950			1957		
August	5	...	...	2
September	39	...	...	67
October	9	...	...	22
November	1	...	...	15
December	—	3

RED-NECKED PHALAROPES

Red-necked Phalaropes occurred in somewhat smaller numbers, but reference to Fig. 2 shows that the numerical fluctuations of the two species were remarkably similar in pattern, both reaching their peak on 13th-14th September. The Red-necked Phalaropes during the first three weeks of September were also mainly on the west coast, with a minimum of 6+ off Great Saltee, 3 off the Lancashire coast, 3 in N. Devon and 2 in Cornwall.

However, the first individuals of this species to be recorded were all in East Anglia, single birds being seen at three localities in E. Suffolk between 14th and 28th August, and at Cley, Norfolk,

on 25th August. Unlike that of the preceding species, the passage of Red-necked Phalaropes was of very short duration, only 6 individuals being recorded later than September, i.e. 2 in October, 3 in November and one in December.

An analysis of Appendix B (pp. 41-42) shows that Red-necked Phalaropes were recorded between August and December in 20 vice-counties (England 15, Wales 2 and Ireland 3).

DISCUSSION AND WEATHER FACTORS

At the peak of the movement on 13th-14th September there were seen, including specifically unidentified birds, at least 25 phalaropes off the Wexford coast, about 44 in Cornish waters including the Scilly Isles, and about 10 off the south coast from Dorset to Sussex, a grand total of some 79 birds. Correlation of this peak and the smaller peak which occurred in late September, when there were 13 unidentified phalaropes in Cornish waters, with the weather conditions prevailing during the month suggests that the birds involved originated in widely separated areas, and were windborne to the British Isles in rather different ways.

It is probable that, at the beginning of the autumn migration period, both Grey and Red-necked Phalaropes from the Greenland breeding grounds are drifted into British and west European waters whenever there are extended spells of north-westerly winds. Such conditions are not unusual in the north-east Atlantic in the autumn: winds of this type occur frequently in the south-western sectors of depressions moving north-east towards the Iceland low pressure "minimum". Although phalaropes are of regular autumn occurrence, one must look for exceptional weather conditions when abnormal numbers are involved.

There was a spell of cyclonic north-westerly weather in the eastern Atlantic between 23rd and 27th August, with a low moving towards Norway from the Faeroe Islands; similar conditions arose again on the 4th September and prevailed almost continuously until about the 14th. The winds reached gale force on the 6th and 7th, were no more than moderate on the 9th and 10th, and were strong from the 11th to 13th. After the 10th a highly complex low pressure system, with three centres moving eastwards (one entering the North Sea on the 11th), intensified this north-westerly airstream; and when the North Sea centre reached southern Scandinavia on the 12th there were strong to gale force winds all round the western perimeter of this vast low, north-easterly between Spitzbergen and Denmark Strait, north-westerly between east Greenland and Iceland and the west and south of the British Isles. Fine and calm weather in south and east Greenland during late August and the first week or two of September probably enabled migration to get quickly under way. The phalaropes concerned in the main peak of 13th-14th September may have come south very quickly with a following wind all the way from quite far north in east Greenland, and even from as far distant

as Spitzbergen. This suggestion is supported by Fig. 2 which indicates a rapid build-up of numbers during 10th-14th September.

The minor peak of late September seems likely to have been associated with a small and intense depression which reached St. George's Channel on the 25th September. It is most improbable

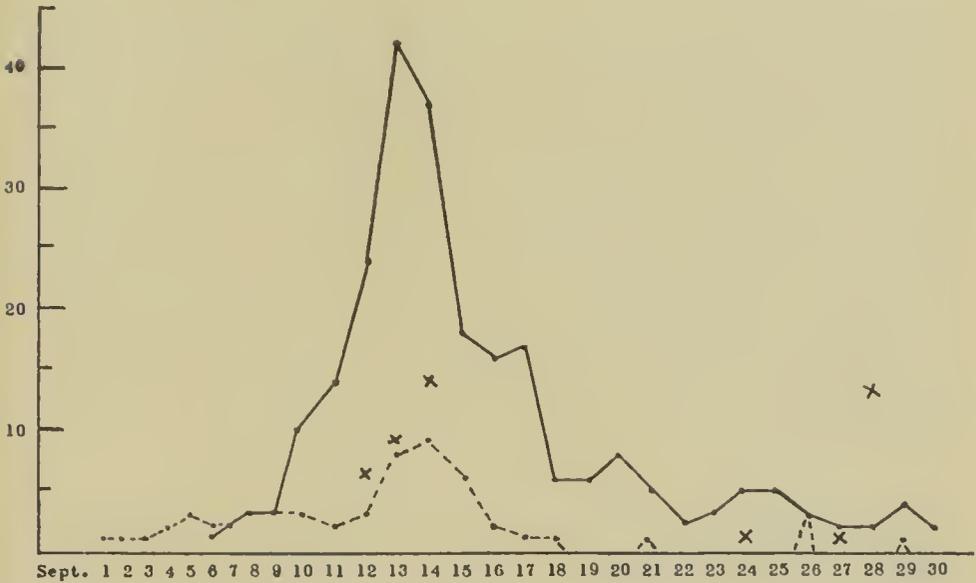


FIG. 2.—GRAPH SHOWING THE NUMBERS OF PHALAROPES (*Phalaropus* spp.) RECORDED IN THE BRITISH ISLES DURING SEPTEMBER 1957

The continuous line refers to Grey Phalaropes (*Ph. fulicarius*), the broken line to Red-necked Phalaropes (*Ph. lobatus*), and the crosses to birds which were not specifically identified (but see Addenda on page 39).

that these phalaropes, considerably fewer in number (about 20% of the total for 13th-14th September), could have come from Greenland, since, with a polar high dominating the north from the 16th, the winds between Britain and Greenland had been east or south-east. This low had first appeared midway between Bermuda and the Azores on the 20th, and had crossed the Azores, still deepening, on the 22nd. It entered the Western Approaches, with force 9 winds on its southern side, next day, and its centre was about 150 miles west of the southern tip of Ireland at mid-day on the 24th. It disappeared from the weather map on the 26th, replaced by an Azorean high, so that the time and place of its arrival make it highly suspect as the agent of the phalaropes appearance. Perhaps, following the earlier situation, there was an unusual concentration of these birds in the path of the depression as it moved towards the Western Approaches, so that numbers were swept into the comparatively calm centre by the strong circulation, to be carried along and eventually "disgorged" round the shores of the southern Irish Sea. An analysis of the distribution of the phalaropes recorded at the period of this minor peak corroborates this theory to a great extent as there are records

from Co. Dublin, Co. Wexford, Skokholm, Somerset, and the Cornish waters. It is also evident that a considerable scattering of birds took place about late September, for subsequent records are from widely separated localities many being recorded inland and on the east coast from Yorkshire to Essex and Kent.

The explanation of this minor peak as given above is admittedly hypothetical, but it is what one would expect from the structure and behaviour of a small, intense depression, and the reluctance of birds to combat strong winds. R. C. Murphy (*The Oceanic Birds of South America*, 1936, pp. 51-55) has described the remarkable concentration of birds that occurs in the calm "eye" of a tornado, and a depression of this kind is merely a tornado on a large and less vigorous scale. Many petrel wrecks are undoubtedly attributable to this cause, and indeed the main part of the wreck of Leach's Petrels (*Oceanodroma leucorhoa*) in October 1952 (*antea*, vol. xlviii, pp. 137-163) was due to a small and extremely deep depression which raced across the Atlantic to the British Isles between 26th and 28th October, though earlier and later other less vigorous depressions played their part.

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The discussion of weather factors is based almost entirely on notes supplied by Mr. Kenneth Williamson, the Migration Research Officer of the British Trust for Ornithology, and his co-operation is greatly appreciated.

In the appendices that follow we list all records that were sent to us by the correspondents listed above. We accept no responsibility as regards identification and any remarks related to this subject are those of the correspondents concerned. Nil returns were received for the following counties: Berkshire, Cumberland, Derbyshire, Herefordshire, Leicestershire, Oxfordshire, Radnorshire, Rutland, Staffordshire, Warwickshire, Westmorland and Wiltshire.

Appendix A—List of records of Grey Phalaropes (*Phalaropus fulicarius*) in the British Isles during the autumn of 1957

ENGLAND

BUCKINGHAMSHIRE.—A female ringed at Slough sewage farm on 3rd October (R. J. Johns).

CHESHIRE.—Two in the Dee Estuary during the second and third weeks of September, and one in the Weaver Estuary in mid-September (*per* E. Hardy). Single birds at Hilbre Island on 20th and 27th October (J. C. Gittins), and in the Dee Estuary on 9th and 27th October (*per* Canon G. A. K. Hervey).

E. CORNWALL.—One in Bude Harbour on 12th September and two on 17th (H. J. Chipman). [5 in Widemouth Bay on 12th September (H. J. Chipman).] Three at Gweek on 20th September (T. J. Stephens).

W. CORNWALL.—St. Ives Bay, 3 on 11th September, 8 on 12th (N. R. Phillips); flocks of 20 and 5 on 13th September (B. King and P. Pearce); 6 on 14th September (A. G. Parsons *et al.*), and one on 8th December (N. R. Phillips). One at Porth on 20th October (C. J. Stevens), and one at Porthmeor on 27th October (N. R. Phillips). Penzance to Scilly Isles, mainly between Wolf Rock and Land's End, 7 on 10th September and 6 on 14th (*per* J. L. F. Parslow).

SCILLY ISLES.—St. Agnes, 4 on 11th September, 2 on 12th, 4 on 13th, 2 on 14th, one on 15th, and 2 on 24th September (*per* J. L. F. Parslow).

N. DEVON.—One present at Northam Burrows from about 7th to 29th September (A. J. Vickery *et al.*). [One at Appledore on 18th September (R. C. Stone).] One at Braunton Pill on 10th November (A. J. Vickery).

DORSET.—[One at Radipole Lake, Weymouth, on 9th September may have been Red-necked (J. Cook).] One at Ferrybridge, Weymouth, on 11th September, and one off Portland Bill on 17th September (Portland B.O.). One at Lodmoor on 1st October (Miss H. J. Brotherton *et al.*).

DURHAM.—One on the sea off Teesmouth on 13th October (*per* G. W. Temperley).

ESSEX.—One at Hanningfield Reservoir, 21st-25th September (R. B. Warren). One at Abberton Reservoir on 2nd October (J. W. Andrews). (See *Essex Bird Report*, 1957, p. 23.)

GLOUCESTERSHIRE.—One at Frampton-on-Severn on 25th and 26th August (C. J. Tweedy and C. M. Swaine).

S. HAMPSHIRE.—One at Southsea on 8th September (R. H. Dennis). One at Brownwich Shore on 11th September, and one at Meon Shore on 12th September (S. L. White). One at Kingston Common, Ringwood, 12th-14th September (Miss F. E. Penrose). Two at Farlington Marshes, 12th-16th September (*per* G. H. Rees). Pennington/Keyhaven Marshes, 4 on 14th September, 3 on 16th and 17th, 2 on 20th, and one on 21st September (J. K. Bowers *et al.*). 6 at Stokes Bay on 3rd October (D. C. Mole). One at Brownwich Shore and another in Hill Head Harbour on 5th November (R. H. Dennis). One at Lee-on-Solent on 21st November (T. E. Brice).

ISLE OF WIGHT.—One at Grange Chine, Brighstone, on 15th and 16th September (G. A. H. Wells and D. J. Westwood). One probable Grey

Addenda.—The following records came to hand too late for inclusion in the main report. They therefore affect Figs. 1 and 2 and the figures quoted in the discussion on pages 33-36: it should be noted particularly that the numbers of Grey Phalaropes reported during the peaks on 14th and 21st September are now increased by 5 and 7 respectively.

CHESHIRE.—One on Weston Marsh, 5th September (*Merseyside Nat. Assoc. Bird Report*, 1957-58, p. 19).

S. DEVON.—One picked up dead on beach at Slapton, 11th September (*30th Rep. of Devon Bird-Watching and Pres. Soc.*, 1957, p. 26).

N. SOMERSET.—One at Steart, 15th and 17th September (*Report on Somerset Birds*, 1957, p. 23).

S. SOMERSET.—Five on Porlock Marsh, 14th September; and 7 on beach at Dunster, 21st September (*ibid.*).

Phalarope at Yarmouth on 15th September (E. Doe), and one certain on 29th September (M. C. Adams).

HERTFORDSHIRE.—One at Hilfield Park reservoir, 6th-17th September (B. L. Sage). One at Broxbourne gravel pits on 26th September, and probably the same bird at Rye Meads sewage farm during 27th-29th (T. W. Gladwin).

E. KENT.—One at Kingsdown on 15th September (J. T. R. Sharrock *et al.*) One at Shellness, Sheppey, on 26th September (D. F. Musson).

MID-LANCASHIRE.—One on Fairhaven Lake, Lytham St. Annes, 10th-16th September (P. Carah *et al.*). One off the coast on 9th November (*Field Nat.*, vol. 3, p. 7).

S. LANCASHIRE.—One on the Mersey at Liverpool on 13th September (*per* E. Hardy). One at Astley Flash near Leigh, 13th-19th September (G. W. Fallows *et al.*). One at Pennington Flash for several days about 5th October (F. A. Lowe). One on the River Alt at Hightown on 26th October (O. Shepherd).

N. LINCOLNSHIRE.—One picked up at Limber on 29th September (R. May).

MIDDLESEX.—One at Queen Mary reservoir, 15th-19th September; and 2 on 17th September (B. E. Cooper *et al.*).

W. NORFOLK.—One at Cley, 9th-10th October; 2 at Cley and 2 at Salthouse on 22nd October; one at Cley on 14th December; one at Brancaster Staithe on 2nd and 8th November (*per* M. J. Seago).

N. NORTHUMBERLAND (CIEVIOTLAND).—One at Ness End, Holy Island, 26th-28th August (*per* G. W. Temperley).

S. NORTHUMBERLAND.—One found dead near Ponteland, 12 miles inland N.N.W. of Newcastle-on-Tyne, on 13th September (*per* G. W. Temperley).

NOTTINGHAMSHIRE.—One at Nottingham sewage farm on 15th and 16th September (J. M. McMeeking).

N. SOMERSET.—One at Chew Valley reservoir on 3rd-4th November (P. Tibbs).

S. SOMERSET.—Three at Porlock Marsh, 19th-21st September (G. M. Chadwyck-Healey). One at Minehead on 23rd September (A. V. Cornish).

E. SUFFOLK.—One at Reydon on 5th October (*per* F. K. Cobb).

SURREY.—One at Island Barn reservoir, 14th-16th September (B. E. and J. F. Cooper). [One at Frensham Great Pond on 15th and 16th September (Col. R. S. P. Bates).]

E. SUSSEX.—One at Darwell reservoir, 18th-19th September (*Sussex Bird Report*, 1957, p. 14).

W. SUSSEX.—One at Thorney Island on 15th September; one at Manhood End, 15th-17th September; one dead at Pilsea Island on 27th October; one off Lancing Beach on 30th October; one off Selsey Bill on 2nd November; one at Shoreham on 5th November; one off Lancing Beach and another off Littlehampton on 6th November; and one at Southwick on 18th December (*Sussex Bird Report*, 1957, p. 14).

WORCESTERSHIRE.—One at Upper Bittell reservoir on 11th September (J. Lord).

S. E. YORKSHIRE.—One at Brotherton Ing on 24th September (C. Winn). One at Spurn on 2nd and 3rd November (A. E. Platt *et al.*).

WALES

CARMARTHENSHIRE.—One near Llanstephan on 20th September (*Nature in Wales*, vol. 4, p. 561).

GLAMORGANSHIRE.—One at Llanishen reservoir, Cardiff, on 13th September (Col. H. Morrey Salmon). One on Rhaslas Pond about 1,500 feet above sea-level on 19th October (Ivor Jones). One at Eglwys Nunydd Pool, near Port Talbot, on 20th October (D. Griffin). One found dead at Rhossili, Gower, in October (Gower Orn. Soc.). 3 offshore and possibly more further out off Sully Island, Swanbridge, on 3rd November (M. R. Edmunds).

MERIONETHSHIRE.—One at Aberdovey, 13th-16th September (*Nature in Wales*, vol. 4, p. 561).

PEMBROKESHIRE.—4 in Milford Haven on 17th September (*Nature in Wales*, vol. 4, p. 561). 2 at North Haven, Skokholm, on 30th September (*Skokholm Bird Obs. Rep.*, 1957, p. 9).

SCOTLAND

ARGYLLSHIRE.—One seen in September, date ? (R. H. Allen).

BERWICKSHIRE.—One at Hule Moss, 11th-19th September (R. Murray).

IRELAND

Co. DUBLIN.—One at Dun Laoghaire on 14th September and 3 there on 25th (*per* Major R. F. Ruttledge).

Co. KERRY.—One on Akeagh Lough on 23rd October and 20th November; one at Blennerville on 1st and 2nd November (F. King).

Co. WEXFORD.—An adult at Kilmore Quay on 13th and 14th September, and an immature bird on 14th September (F. King and A. J. Tree). Great Saltee, one on 12th and 13th September, and 3 on 14th, but probably more than this present (*per* Major R. F. Ruttledge) (see Appendix C).

Appendix B—List of records of Red-necked Phalaropes (*Phalaropus lobatus*) in the British Isles during the autumn of 1957

ENGLAND

CAMBRIDGESHIRE.—One at Cambridge sewage farm, 25th September-3rd October (*per* A. E. Vine).

W. CORNWALL.—One in St. Ives Bay on 14th September (A. G. Parsons *et al.*), and 8th December (N. R. Phillips). One at Cremyll on 14th September (A. C. Sawle).

SCILLY ISLES.—One at St. Agnes on 9th September, and one between the Wolf Rock and Land's End on 14th September (St. Agnes Bird Obs.).

N. DEVON.—At least 3 birds present: two on the River Taw at Barnstaple on 14th September (Mrs. D. Wilson *et al.*), and a single bird seen there by R. C. Stone on the same day may have been one of these two; two seen on the Taw at Fremington Pill on 16th September by R. C. Stone were in different plumage to the single bird seen on the 14th.

S. DEVON.—One on the River Tamar on 15th September (A. C. Sawle), and one in Plymouth Sound on 3rd November (S. C. McCullough).

DORSET.—One probably of this species off Portland Bill on 13th September (Portland Bird Obs.).

S. HAMPSHIRE.—One at Stokes Bay on 10th and 12th September (D. C. Mole).

E. KENT.—One at the Brooks, Dungeness, on 4th October (*Kent Bird Report*, 1957, p. 21).

S. LANCASHIRE.—3 at Southport on 15th September (A. A. K. Whitehouse).

LINCOLNSHIRE/NORFOLK BORDERS.—One at Wisbech sewage farm, 29th September (*per* A. E. Vine).

W. NORFOLK.—Single juveniles at Cley on 25th August, 2nd-15th and 18th September, and 2 present on 14th September; one dead at Salthouse on 27th October (*per* M. J. Seago).

NORTHAMPTONSHIRE.—One at Byfield reservoir on 15th September (*per* R. Felton).

SHROPSHIRE.—One at Monkmoor sewage farm on 21st September (*per* E. M. Rutter).

S. SOMERSET.—One at Porlock Marsh on 26th September (A. V. and H. A. Cornish).

E. SUFFOLK.—[One at Buss Creek, Southwold, about 16th August (E. G. Staunton).] One at Reydon on 14th August and 26th September; one at Minsmere, 24th-28th August; and one at Havergate on 1st September (*per* F. K. Cobb).

E. SUSSEX.—One at the Midrips, 4th-9th September; and one in Newhaven Harbour on 11th and 12th September (*Sussex Bird Report*, 1957, p. 14).

S.E. YORKSHIRE.—One on the River Aire at Brotherton Ing on 3rd November (D. J. R. Potter *et al.*).

WALES

CARDIGANSHIRE.—One at Aberystwyth on 17th September (*Nature in Wales*, vol. 4, p. 561).

CARMARTHENSHIRE.—One at Llanelly on 5th November (*Nature in Wales*, vol. 4, p. 561).

IRELAND

Co. DOWN.—One at Kinnegar on 5th September (*per* Major R. F. Ruttledge).

Co. DUBLIN.—One at Booterstown Marsh, 8th-10th September (*per* Major R. F. Ruttledge).

Co. WEXFORD.—Great Saltee, 6+ on 13th September and one on 14th September (*per* Major R. F. Ruttledge).

Appendix C—List of specifically unidentified phalaropes (*Phalaropus* spp.) recorded in the British Isles during the autumn of 1957

ENGLAND

W. CORNWALL.—On 28th September, 3 off the Runnel Stone, 9 near the Wolf Rock lighthouse, and one near the Scilly Isles (*per* J. E. Beckerlegge).

W. KENT.—3 at Allhallows on 9th November (D. F. Musson).

MID-LANCASHIRE.—One at Bolton-le-Sands on 27th September (Miss A. M. Mackintosh).

IRELAND

Co. WEXFORD.—At Great Saltee, 6 on 12th September, 8+ on 13th, 14+ on 14th, and one on 24th (*per* Major R. F. Ruttledge).

**THE STATUS OF THE RED-CRESTED
POCHARD IN THE BRITISH ISLES**

By G. A. PYMAN

INTRODUCTION

THE FACT that for several years past apparently wild Red-crested Pochards (*Netta rufina*) have occurred with some regularity and in significant numbers in Essex prompted the writer to collect all available British records of this duck from 1948 onwards, and also to seek information on the present status of the species elsewhere in north-west Europe, in an attempt to throw some light on their origin. Enquiries were also made with a view to obtaining some indication of the number of Red-crested Pochards that have "escaped" during recent years from the many waterfowl collections in which this handsome species is now represented.

This paper sets out to summarise the results of the various enquiries, to analyse the available data, and to examine the status of this pochard in the British Isles at the present time.

OCCURRENCES IN THE BRITISH ISLES

Records up to 1942.

Witherby *et al.* (1939, amended 1941 and 1944) describe the Red-crested Pochard as a rare vagrant to the British Isles, encountered chiefly between September and March, and list upwards of 40 occurrences, apparently involving somewhere in the region of 150 birds, up to and including 1942. Included in this approximate figure, however, are three parties, the smallest of 13 and the largest of 18, seen in Norfolk, at the mouth of the

Thames and in Sussex respectively, and a remarkable assembly of about 40 birds on the Tring reservoirs in 1889 or 1890. The same authors cite only one instance of nesting in the wild state—by a pair in Lincolnshire in 1937—which they conclude had in all probability wandered from Woburn, where it is stated the species had been reared and allowed to fly for a number of years.

Records from 1948 to 1958.

During the period of 11 years—from 1948 to 1958 inclusive—for which records of this species have been collected, it is known that a total of at least 135 birds have occurred in the British Isles away from the London area; there, in view of the known local wanderings of full-winged birds from the London parks (Homes *et al.*, 1957), all records of Red-crested Pochards must be regarded as highly suspect. Of the minimum total of 135 birds, no fewer than 85 have been recorded on or near the east coast, mainly in the autumn or early winter. At least 73 of these (more than half the total) have been seen in Essex, all but about 12 of them at Abberton reservoir, near Colchester. The words “at least” are used advisedly since the actual total may have been distinctly higher, the concentrations which were noted at Abberton in the autumns of 1956 and 1957 being represented in the total by the maximum number counted at any one time in each year, whereas during the period of the pochards’ stay numbers fluctuated considerably and the birds present in the early stages could quite conceivably have moved on and been replaced by fresh arrivals.

Such is the importance of the comparatively large number of Essex records that it is considered necessary to list them in some detail. In addition to a fairly obvious “escape” which frequented Abberton reservoir from December 1949 until April 1951, the *Essex Bird Reports* from 1949 to 1957 mention the following occurrences:—

- 1951: Abberton reservoir, one on 24th November.
- 1952: Abberton reservoir, one from 21st September to 14th December; at least 4 from 23rd December onwards.
- 1953: Abberton reservoir, single individuals on 16th January, in the “early autumn”, and on 22nd November.
- 1954: Abberton reservoir, single individuals on 23rd February, 24th October and 8th November.
- 1955: Abberton reservoir, one from 16th October to 4th December; up to 3 from 26th December onwards.
- 1956: Abberton reservoir, one on 31st August; another on 7th October, then a gradual increase to 13 by the 27th and 22 by 25th November; still 11 on 2nd December; last seen (2) on 16th December. Salcott creek, 7+ on 9th November.
- 1957: Abberton reservoir, 4 on 18th August; 1-4 from 22nd August to 14th September; 13 on 15th September and maximum of 16 on the 19th; numbers then fell to 11 by the 29th September and 5 by 4th October; apparently absent from 5th to 19th October; 3 on the 20th and a second peak of 10 from the 26th to the 31st; 2-6 during 10th-26th November; one on 22nd December.
Hanningfield reservoir, one from 31st July to 3rd August; 2 on 6th and 27th September; 4 on 9th October.

Additionally, it is now known that a small party* was seen at Abberton in February 1957.

The only Essex records for 1958 concern individuals at Abberton in early June and on 7th October.

Records of Red-crested Pochards noted elsewhere in the British Isles during the period are shown in Table I which indicates the counties from which the birds have been reported and the months and years in which they have been seen.

TABLE I—RECORDS OF RED-CRESTED POCHARDS (*Netta rufina*) IN THE BRITISH ISLES (EXCEPT ESSEX AND THE LONDON AREA) DURING 1948-1958

The figures in parentheses indicate the years concerned. Where any bird is known to have made a protracted stay it is shown only under the month in which it was first recorded. Certain counties are grouped together because in some cases either the bird(s) occurred on a water lying across the county boundary or the same bird(s) appeared on waters in neighbouring counties.

County	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<i>England:</i>												
Cambs		1(54)										
Cheshire		1(48)										
Cornwall	1(52)		1(56)									1(52)
Devon	1(53)											
Dorset												1(50)
Herts				2(48) 1(56)								
Lancs								1(57)	1(53)			
Leics												
Northants	2(56)		2(58)								1(55)	
Warwicks												
Lincs											1(57)	
Norfolk			1(54)		1(51) 1(56)							
Northumb		1(50)										
Notts								1(55) 1(50)			1(56)	
Somerset									1(53) 1(55)			
Staffs							1(49)					1(48)
Suffolk	1(51)	1(50)						1(57)				
Sussex		2(56) 1(58)								1(48)		1(57) 1(58) 1(54)
Wilts												
Yorks			1(54)			9(57)	1(57)		1(57)		3(57)	
<i>Scotland:</i>												
Fife										1(56)		
Midlothian										1(58)		
Peebles												
Roxburgh												
Selkirk												1(57)
<i>Ireland:</i>												
Galway											2(52)	
Meath	1(58)											
Waterford												1(52)
Wexford	2(49)											

*The exact number involved is not known, but for the purpose of the various totals given throughout this paper the figure of four is used.

Table II shows the number of birds recorded in each of the years under review, divided into four-month periods. The Essex total for each year, while included in the fifth column, is shown separately in the sixth column.

TABLE II—NUMBERS OF RED-CRESTED POCHARDS (*Netta rufina*) RECORDED IN THE BRITISH ISLES IN EACH FOUR-MONTH PERIOD DURING 1948-1958

Note the peak in the last part of the year. Though given separately in an extra column on the right, the Essex figures are also included in the preceding columns.

Year	Jan.-April	May-Aug.	Sept.-Dec.	Total recorded in year	Total recorded in Essex
1948	3	—	2	5	—
1949	2	1	1	4	1
1950	2	—	2	4	—
1951	1	1	1	3	1
1952	1	—	9	10	5
1953	1	—	4	5	2
1954	4	—	2	6	3
1955	—	—	7	7	4
1956	6	2	31	39	30
1957	4	16	24	44	25
1958	4	1	3	8	2

It is not proposed to analyse the records at this stage as they will be discussed at some length later.

NORTH-WESTWARD EXTENSION OF RANGE IN EUROPE

No paper on this subject would be complete without an account of the north-westward extension of the Red-crested Pochard's European range in recent years.

In north-west Germany it has bred since 1920 on Fehmarn Island in the Baltic (Jauch, 1950)—from which according to G. A. Radtke (personal communication), 10 pairs were reported in 1951. In recent years, also, Red-crested Pochards have nested regularly on the Dümmer See, north-east of Osnabrück, in Lower Saxony (Requate, 1954). In 1940 for the first time the bird was found nesting in Denmark (Jespersen, 1952), and then in 1942 it was first proved to have bred in Holland (van IJzendoorn, 1950). In Denmark, the nesting area was Nakskov inner fjord on the island of Lolland, and today about 20 pairs breed annually in that locality while odd pairs have been found in summer elsewhere on the island (H. Johansen, personal communication). Although, as stated, the first proof of nesting in Holland was not forthcoming until 1942, van IJzendoorn (1950) records that birds of this species were frequently shot in Zuid-Holland, chiefly in August, up to 40 years earlier and sent to Leiden museum. Today, it appears to be well established in the Botshol, south of Amsterdam, where about eight breeding pairs were located both in 1955 and 1956, and broods have been seen from time to time in several other areas during the past 12 years (J. A. Eygenraam, personal communication).

In Belgium, the Red-crested Pochard is still regarded only as a scarce visitor (J. Maebe, personal communication), although a pair bred there in 1905 and another attempted to do so in 1934 (Verheyen, 1952). In France, it is resident in a number of localities in the eastern and southern parts of the country but is known only as a vagrant elsewhere (Mayaud, 1936, 1953). Several birds have, however, recently been noted in the late summer or early autumn in the area of the Somme estuary (R.-D. Etchécopar, personal communication). It should also be mentioned that recent research in the Camargue, in southern France, has established that the resident population is augmented in winter by immigrants, up to 4,000 birds having been counted in the area (L. Hoffmann, personal communication). In the absence of any previous reference to the species as a winter visitor to this area it is possible that this seasonal influx is a comparatively recent development or at any rate that it is now on a larger scale than was previously the case.

At the end of the breeding season, the chief haunt of Red-crested Pochard in W. Europe is usually the Zwarte Meer, a nature reserve of 4,500 acres, north of Kampen in Holland. (There is no evidence that the existence of the long established and much larger autumn concentration on the Lake of Constance (Bodensee) in central Europe affects recent developments in the British Isles.) The birds begin to arrive at the Zwarte Meer in July and peak numbers are reached at any time between late August and early October; most of them move on during the second half of October, and after the end of November few are to be seen. It would appear that the species has only concentrated here in recent years, for in 1947 only a few birds were seen whereas in 1953 no less than 400 were counted at the end of August and 650 in late September: these figures have not since been equalled, but peaks of 150-200 were noted in each year from 1954 to 1956. In 1958, however, there is but one record for this area—of four birds in November. The Red-crested Pochard is still a considerable rarity in Holland in the winter, although odd birds or small parties have occasionally been seen (J. A. Eygenraam, personal communication).

In Schleswig-Holstein (N. Germany), where small flocks (which later disperse in a south-westerly direction) are to be found after the breeding-season, a larger concentration of 239 birds occurred on Fehmarn Island on 4th October 1953 (Schmidt, 1955); and E. Jahn (personal communication) counted about 250 birds on the Grosser Binnensee, near Lütjenburg, in late September 1958—a significant observation in view of the extreme scarcity of the species in Holland in the autumn of that year. In both north and west Germany (R. Drost, personal communication), however, as well as in Denmark (H. Johansen, personal communication), this pochard is of rare occurrence during the winter months.

In *British Birds* for 1952 (*antea*, vol. xlv, p. 105) there is an editorial note to the effect that up to 500 Red-crested Pochards winter on the IJsselmeer (Zuider Zee). This statement, for which no authority is quoted, is clearly incorrect. The Dutch can produce

no evidence that the species has ever been seen in any numbers on this water at any season and the note is apparently a confused reference to the *autumn* flock on the Zwartc Meer which, prior to the reclamation of certain areas of the Zuider Zee, formed part of that still vast expanse of water. [We regret this error.—EDS.]

RINGING DATA

Ten Red-crested Pochards have so far been ringed in the British Isles under the scheme managed by the British Trust for Ornithology (R. Spencer, personal communication). Six of these birds, ringed in St. James's Park, London, were progeny of stock introduced to that water and two of them were subsequently recovered as follows (Thomson and Leach, 1953):

<i>Date ringed</i>	<i>Date and place of recovery</i>
18.vii.52	16.viii.52: Trentham, nr. Stoke-on-Trent, Staffs (130 miles N.W.).
1.ix.52	3.i.53: Hoogeveen, Drente, Holland.

The remaining four birds were trapped at Abberton reservoir in December 1949; December 1952; September 1957 and June 1958 respectively. The 1949 bird, which was retrapped at the reservoir on several occasions up to April 1951, has earlier in this paper been referred to as a likely "escape". The bird ringed in December 1952 was found dead at the reservoir in the following month. One of the arrivals at Abberton in the late summer of 1957 bore a silver-coloured ring but efforts to trap it were unsuccessful (C. B. Wainwright, personal communication). It is pertinent to mention at this juncture, however, that the blue coating on the Avicultural Society's rings (with which many waterfowl are marked) is stated to wear off in the process of time.

From enquiries that have been made it seems fairly certain that the Danish islands, the Camargue and (on the strength of a bird trapped in a fishing net in 1955) the Bodensee (southern Germany) are the only other localities in Europe (excluding Russia) in which this pochard has been ringed. In Denmark, one bird was marked near Copenhagen in 1955 and eight in the breeding area on Lolland in 1956: one of the latter, ringed in August 1956, was shot a few miles away in September 1958 (H. Johansen, personal communication). 100 birds have been ringed in the Camargue during the past few years, but apart from a few purely local recaptures none has so far been recovered (L. Hoffmann, personal communication).

THE RED-CRESTED POCHARD AS AN ORNAMENTAL WATERFOWL IN THE BRITISH ISLES

The Red-crested Pochard is now one of the most popular species with collectors of ornamental waterfowl in the British Isles. The current price of a pair is only £8 and there can be no doubt that the total population of "ornamental" birds of this species has reached fairly substantial proportions. Peter Scott (personal

communication) has indicated that, although the species was fairly common in collections before the 1939-45 war, it seems to have bred much more freely since the war, and has suggested that the same (?climatic) influence which has resulted in the extension of the species' wild range may be responsible for its cheap avicultural price and, consequently, for the more frequent occurrence of "escapes".

In an attempt to obtain some indication of the number of birds currently kept in collections, an enquiry was addressed in July 1958 to the 250 collectors known to the Wildfowl Trust. 153 replies were eventually received and these produced a total of about 260 birds in 60 collections. The same replies also revealed that about 42 Red-crested Pochards in the collections concerned were full-winged (this figure excluding a small number of ducklings which were later to be pinioned) and that, ignoring "escapes" from St. James's Park, London, to which reference will be made later, only 41—mostly birds of the year which their owners had been unable, or had made no attempt, to pinion—had flown away since 1948.

Obviously, before these figures could be used to advantage, some means of assessing the degree of completeness of the Wildfowl Trust's list had to be found. It was considered that this could best be done by compiling a list of all collections which had come to light from other sources during the course of the enquiry and comparing it with the Trust's list. This second list was found to comprise 40 collections of which only 12 (30%) were not known to the Trust. The figure of 250, representing the number of collections on the Trust's list, was then increased by the same percentage and the resultant figure of 325 adopted as the very approximate number of collections in the British Isles. By this means, the 153 collections (containing some 260 Red-crested Pochards) about which information was received in response to the enquiry can be taken as rather less than half the total. Thus, on a proportional basis and after allowing a liberal margin of error (of close on 10%) in either direction, the total number of birds of this species in *all* collections can be roughly assessed at between 500 and 600, of which probably not more than 100 (including young birds) would have been unpinioned at the time of the enquiry.

It only remains to consider the number of birds that have "escaped" from collections since 1948. As stated, the replies received from the 153 collectors revealed that a total of 41 birds, in addition to the indeterminate number that had left St. James's Park, had flown away during that period and, if the same basis as was used in assessing the total number of *rufina* in collections is adopted in this case also, the relatively low maximum figure of 100 (again taking no account of "escapes" from St. James's Park) results.

In the case of the St. James's Park collection, it has to be

accepted that a few young birds have flown away in most, if not all, years since 1950 (when the species was re-introduced there), although the actual numbers are not known. W. G. Teagle (personal communication) states that breeding success in the park has often been quite high and although efforts have been made, especially during the past four years, to pinion the young birds (which have then either been left in the park or transferred to other collections), a few have usually remained full-winged. Some of these must obviously have left since counts carried out after the close of the breeding season in late years show that the number of birds in the park has remained fairly constant.

However, even if due allowance is made for the birds that have flown away from St. James's Park and for the possibility that a few of these as well as other "escapes" may subsequently have paired and raised young in the wild state (although in point of fact only one such instance—a pair at St. Osyth, Essex, in 1958—has come to light during the course of the enquiry), it is fairly evident that the number of feral Red-crested Pochards at large in this country *at any given time* must still be comparatively small. In short, the available evidence does not support the belief, which has gained some currency during recent years, that considerable numbers of these birds are wandering about the British Isles.

The collections from which Red-crested Pochards are known to have "escaped" during the 11-year period are widely scattered and from only three of them (in addition to that in St. James's Park) have a significant number of "escapes" been reported. These three collections are situated near St. Neots (Huntingdonshire), Horsham (Sussex) and East Dereham (Norfolk) and the "escapes" number 12, 9 and 6 respectively. In each case the birds have left gradually over a period of years but none has flown away from the last-mentioned collection since the early 1950's.

In view of the publicity that Woburn (Bedfordshire) has received in connection with this species in the past, it is worth recording that no Red-crested Pochards have been kept there for a number of years.

DISCUSSION AND CONCLUSIONS

It will already be apparent that in attempting to assess the probable status—genuinely wild or feral—of the comparatively large number of Red-crested Pochards that have been seen in the British Isles during recent years, two factors—namely, the north-westward extension of the species' range in Europe and the increasing (if still quite small) number of "escapes" from collections—must be constantly borne in mind.

If genuinely wild birds *are* now reaching this country in significant numbers it is highly probable that most of them come from Holland where it has been shown that the species usually concentrates in the late summer months. It should be

remembered that these birds leave the Zwarte Meer, where they have collected, well before the end of the year and that the species is rarely seen in the Netherlands or elsewhere in north-west Europe in winter. Fairly obviously, therefore, most of the north-west European population, which can be expected to number several hundred birds at the close of the breeding season, is migratory and it must be assumed that the birds' winter quarters lie somewhere to the south or south-west of their autumn concentration area.

Witherby *et al.* (1939) gave the species' European winter range as the eastern part of the Mediterranean, and Wardlaw Ramsay (1923) as chiefly east of Sardinia. It is possible, however, that the majority of the birds now to be found at the end of the breeding season in north-west Europe winter in the western part of the Mediterranean basin. It has been stated earlier that in recent years, at least, the resident population of the Camargue has been augmented at this season by immigrants and this area of southern France, which lies some 650 miles S.S.W. of the Zwarte Meer and forms a refuge for vast numbers of wildfowl, may well prove to be the main winter quarters of the north-west European birds. While other suitable, although mostly less extensive, wintering areas exist in south-west Europe there is as yet no evidence that any of them are visited by Red-crested Pochards, but the possibility that a few birds may winter in the British Isles—particularly in western areas—remains and will be discussed later.

If it is a fact that most of the birds which have colonized north-west Europe migrate to winter quarters lying to the south or south-west, then it is quite conceivable that some of them pass through eastern England. The large Abberton reservoir, well known as a sanctuary for thousands of duck and situated in close proximity to the Essex coast about 220 miles W.S.W. of the Zwarte Meer, is ideally placed as an alighting point for wildfowl arriving from the Netherlands and this reservoir is, in fact, the only water at which ostensibly wild Red-crested Pochards have been seen in any numbers. Furthermore, the only other localities (both in Essex) from which parties of these pochards have been reported in the late summer or autumn lie not far away: these are the new and extensive Hanningfield reservoir (17 miles S.W. of Abberton) where up to four birds were present in 1957, and Salcott creek near Tollesbury where, on 9th November 1956, there occurred a flock of at least seven birds which could conceivably have flown out from Abberton (less than three miles to the north) but which, in view of the fact that the species does not readily resort to tidal water, were perhaps more likely to have been newly arrived immigrants from the low countries. The one Suffolk record for this period—of an individual at Minsmere in August 1957—is also a significant one since the date of the bird's arrival coincided closely with that of the initial influx at Abberton in that year.

That some relationship existed in the autumn and early winter

of 1956 between the departure of the birds from the Zwarte Meer and the influx at Abberton is evident from Table III. Unfortunately, no counts were made in Holland in the autumn of 1957, the other year in which Red-crested Pochards appeared in Essex in some strength. The fact that only one bird appeared in Essex in the autumn of 1958, when the species was virtually absent from the Zwarte Meer, is also of some significance.

TABLE III—NUMBERS OF RED-CRESTED POCHARDS (*Netta rufina*) ON THE ZWARTE MEER (HOLLAND) AND ABBERTON RESERVOIR (ESSEX) IN THE AUTUMN AND EARLY WINTER OF 1956

Week	Number reported from Zwarte Meer	Minimum number present at Abberton
3rd week Sept.	190	—
4th " "	100	—
1st " Oct.	*	1
2nd " "	50	5
3rd " "	25	5
4th " "	*	13
1st " Nov.	15	15
2nd " "	5	11
3rd " "	*	12
4th " "	*	22
1st " Dec.	*	11
3rd " "	*	2

*No figures available.

The only other possible explanation for the presence between the late summer and early winter in recent years of significant numbers of Red-crested Pochards at Abberton reservoir is that the birds came from waterfowl collections. It was realised that the most likely source from which any "escaped" birds might have wandered to Abberton is St. James's Park, London, which lies only about 50 miles S.W. of the reservoir. The two ringing recoveries previously cited show that the park birds are capable of travelling considerable distances, while flocks from the park have frequently visited other waters in central London. On the other hand, there are few records (and none of a flock) for the reservoirs surrounding London (R. C. Homes, personal communication) although it is possible, since the presence of full-winged birds in St. James's Park is well known, that a number may have gone unrecorded.

Whether or not the movements of the bulk of the St. James's Park birds are of a purely local character, a series of counts carried out in the park by W. G. Teagle in 1956 between September and December revealed that the number of birds (about 30, of which some two-thirds were unpinioned) remained virtually constant. It is, therefore, established that the birds which were present at Abberton in the late autumn of that year did not fly there direct from St. James's Park, while there is not the slightest evidence that any other collection in the country could

have produced (or had lost) anything approaching the number of full-winged birds noted on the Essex reservoir. Consequently, if all the Abberton birds *were* "escapes", there remains only the unlikely hypothesis that they had flown into that water in ones and twos from all directions and—since only a few individuals were noted elsewhere in the British Isles during the ensuing winter—dispersed in the same way after they left the reservoir.

It is, therefore, the writer's considered opinion that the majority, at least, of the birds which concentrated at Abberton (and were also noted elsewhere in Essex) in the autumns of 1956 and 1957, together with the individual which appeared in Suffolk in August of the latter year, were almost certainly wild immigrants, as in all probability were the odd birds and small parties noted at Abberton in the autumn or early winter in other years. Furthermore, if these autumn visitations continue, serious consideration will need to be given to this species being accorded the status of a regular autumn visitor to the British Isles instead of that of a rare vagrant.

As the Red-crested Pochard now breeds as far north in Europe as *ca.* latitude 55°, i.e. that of Newcastle, there must be a distinct possibility that the five individuals reported during the autumn or early winter from the vicinity of the east coast from Lincolnshire northwards were also genuinely wild birds. Two of these records deserve special mention. The bird that arrived in Fife (the furthest north from which the species was reported during the period) in October 1956—and, incidentally, spent the winter in the area—was described as "very shy" and almost certainly wild; and it may or may not have been pure coincidence that the individual reported from Lincolnshire in November 1957 was seen on the very day that another bird appeared on migration near the Dutch coast in Zeeland.

Reports concerning the winter months of January and February have brought to light another small series of east coast records (including that of the small party at Abberton in February 1957) comprising a total of about 10 birds. These occurrences may possibly have been due in some instances to a hard weather exodus on the part of a few birds that had remained in Holland and/or neighbouring countries, and in others (particularly those in the second half of February) to a return passage to breeding grounds in north-west Europe: the breeding areas apparently begin to be re-occupied in the early spring since (to quote one example) 12 birds had arrived in the Botshol, in Holland, by 16th March 1954 (J. A. Eygenraam, personal communication).

Occurrences of *rufina* over the remainder of the British Isles during the period from September to February have been confined to western areas (from Lancashire round to Dorset as well as Ireland), to the Midlands and to West Sussex, as indicated in Table IV.



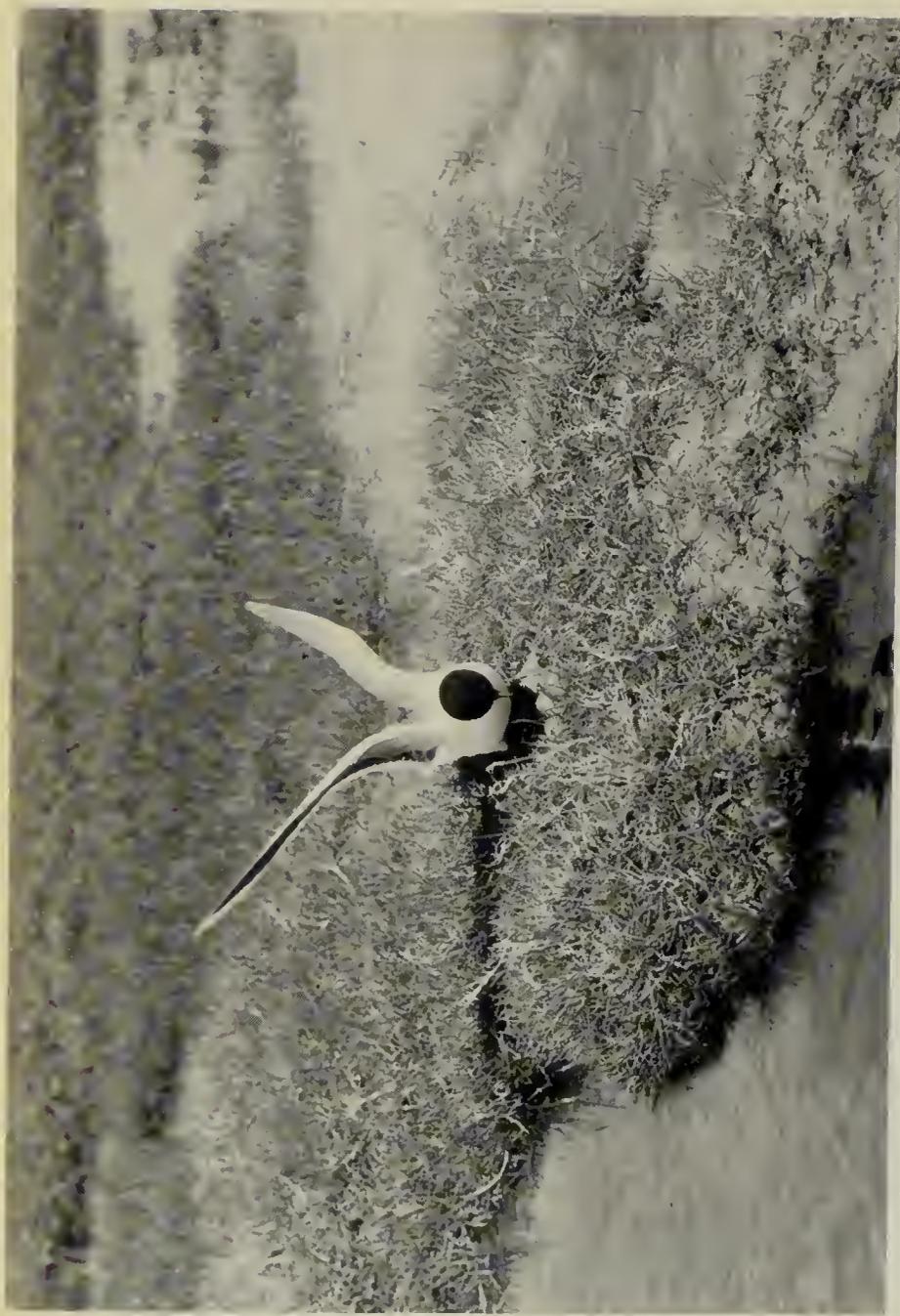
J. B. and S. Bottomley

HABITAT OF LITTLE GULL (*Larus minutus*): N. JUTLAND, DENMARK, MAY 1958
 The foreground, with reeds, was a feeding-area and the nests were on the flat, partly flooded, saline grazing-land beyond. Some 10-20 pairs of Little Gulls were estimated among hundreds of Black-headed Gulls (*L. ridibundus*).
 Common Terns (*Sterna hirundo*) and waders (see pages 57-58).



J. B. and S. Bottomley

LITTLE GULL (*Larus minutus*) INCUBATING: N. JUTLAND, DENMARK, MAY 1958
 This shows the general pattern of velvet black head, white body, and pale blue-grey wings and mantle. Note the absence of black on the wing-tips, though some second-summer birds in otherwise adult plumage do have dark patches on the primaries (see page 59).



C. C. Doncaster

LITTLE GULL (*Larus minutus*) ALIGHTING AT NEST: N. JUTLAND, DENMARK, MAY 1958
The immediate area of the nest on a hummock of short grass surrounded by shallow water: the nest itself was merely a small hollow thinly lined with dead grasses and contained three eggs. Two or three tern-like eggs form the normal clutch and scanty nests appear to be typical in such sites, or on sand-banks and bare islands. However, where the habitat is overgrown with rank vegetation, larger roughly-built structures



CLOSE-UP OF LITTLE GULL (*Larus minutus*) ALIGHTING AT NEST: N. JUTLAND, DENMARK, MAY 1958
 Here is shown to full advantage the diagnostic dark slate-grey under-wing with the broad white rear edge; this is usually conspicuous in flight, even at long range. Note also the rounded wing; this blunt shape and the bird's buoyant flight give a moth-like effect. Both sexes incubate; at this nest they were easily separable as one only had the rosy flush below that is characteristic of full breeding plumage. The legs in summer are a striking vermilion.

C. C. Doncaster



C. C. Doncaster

JUVENILE LITTLE GULL (*Larus minutus*): W. JUTLAND, DENMARK, AUGUST 1957
The juvenile is a very different-looking bird, with its blackish crown and ear-coverts, sooty brown upper-parts, and completely white under-parts except for a dark patch on each side of the breast. The white tail has a subterminal black band.



C. C. Doncaster

JUVENILE LITTLE GULL (*Larus minutus*) WITH BLACK-HEADED (*L. ridibundus*)
The same bird giving a useful size comparison. It should be remembered that at this age the underwing is white and, indeed, it does not become fully dark until the third winter. Recognition is made easy in first-year plumage, however, by a black diagonal across the open wing.

TABLE IV—NUMBERS OF RED-CRESTED POCHARDS (*Netta rufina*) RECORDED DURING 1948-1958 BETWEEN SEPTEMBER AND FEBRUARY IN AREAS AWAY FROM THE EAST COAST

Month	Western areas (including Ireland)	Midlands (including S. Yorkshire) .	West Sussex
Sept.	2	1	—
Oct.	2	1	1
Nov.	2	5	—
Dec.	4	1	2
Jan.	5	2	—
Feb.	1	—	3

Of the 11 birds noted in western parts of the British Isles between November and January, no fewer than six (three of which were shot) were reported from Ireland. When it is recalled that observer coverage over much of that country is very poor it will be evident that this figure is unlikely to represent more than a small proportion of the number of Red-crested Pochards that have occurred in Ireland during the winter months.

While it is appreciated that the numbers involved are too small to be of other than minor significance, it is nevertheless felt that the figures given in Table IV, when considered in conjunction with the detailed list of occurrences appearing in Table I, do tend to suggest the possibility that at least in some years a small scale movement of north-west European birds across the British Isles may take place in the late autumn or early winter and that a small wintering population of wild birds may be dispersed over suitable areas in Ireland and, to a lesser extent, some southern and western English counties. More intensive observations in Ireland, if that were possible, would obviously be of considerable value in helping to prove or disprove this theory.

Of the few spring records—involving a total of only 10 birds between March and May—three concern individuals seen in Norfolk, but the remainder are from widely scattered localities. As these records do not conform to any recognisable pattern it is impossible to draw any conclusions regarding the origin of the birds concerned. The same remarks apply to those occurrences for the summer months of June and July. That the total of 12 birds for these two months is as high as it is, is due to the record of a party of nine near Leeds in Yorkshire in June, 1957, which it is felt may well have flown off from some local collection the existence of which was not discovered during the course of the enquiry. At the same time, however, there is no reason why some of these spring and summer birds should not have been of wild stock.

From the foregoing it can be asserted with some confidence that a reasonably high proportion of the Red-crested Pochards recorded since 1948 have been genuinely wild and, therefore, that the species has increased in numbers as a visitor to the British Isles during the past few years. In view of its recent

gains elsewhere in north-west Europe, this trend can be expected to continue despite the paucity of records in the autumn of 1958, and there is surely no valid reason why this attractive diving duck should not nest on this side of the North Sea in the foreseeable future.

SUMMARY

1. Past records (up to and including 1942) of the Red-crested Pochard in the British Isles (where this species is known as a rare vagrant) are summarized. The one instance of breeding (in 1937) was thought to have been the act of "escaped" birds.

2. Since 1948, at least 135 possibly wild Red-crested Pochards have been noted in the British Isles. 85 of them appeared on or near the east coast, mainly in the autumn or early winter. 73 birds (more than half the total) have been seen in Essex where, at Abberton reservoir, concentrations of 22 and 16 birds respectively occurred in the autumns of 1956 and 1957.

3. Details are given of the north-westward extension of the species' range in north-west Europe in recent years. The Red-crested Pochard now breeds regularly in Denmark and Holland and increasingly in north-west Germany. After the breeding season it usually concentrates on the Zwanne Meer, in Holland, but evacuates this water before the end of the year. Similar concentrations also occurred in Schleswig-Holstein (N. Germany) in 1953 and 1958. Few birds winter in north-west Europe.

4. Ten Red-crested Pochards have been ringed in the British Isles: two of them, progeny of imported stock and ringed in St. James's Park, London, were subsequently recovered in the Midlands and in Holland respectively. The Danish Islands, the Camargue (southern France) and the Bodensee (southern Germany) are believed to be the only localities in Continental Europe in which birds of this species have been marked: the few recoveries to date have been local ones.

5. It is roughly estimated that between 500 and 600 Red-crested Pochards are currently kept in collections in the British Isles: probably not more than 100 of them are full-winged. The number that have "escaped" during the past 11 years is believed to be quite small—this figure also would probably not exceed 100 if it were not for the small but indeterminate number that have flown away in most years since 1950 from the flourishing collection in St. James's Park.

6. The suggestion is made that many of the birds which disperse from north-west Europe in the late autumn may winter in the western part of the Mediterranean region—the Camargue is mentioned as a likely area.

7. It is suggested that the majority of the birds that arrived at Abberton reservoir and in neighbouring areas in the autumns or early winters of 1956 and 1957 had originated in north-west Europe and were on their way to winter quarters lying to the south or south-west. Other records for Abberton and occurrences else-

where on or near the east coast during the same period of the year may well also refer, in the main, to wild birds. Serious consideration should, therefore, soon be given to the species being classified as an annual autumn visitor to the British Isles. The occurrence of a number of birds near the east coast in January and February may have been due partly to a cold weather exodus on the part of a few birds remaining in north-west Europe, and partly to an early return to breeding grounds in that area.

8. While numbers are too small to be of other than minor significance, the pattern and distribution of records between September and February for the remainder of the British Isles tend to suggest the possibility that in some years, at any rate, a small scale westward movement may take place across the country and that a small wintering population may be found in Ireland and possibly also in some southern and western English counties.

9. It is not possible at present to draw any conclusions regarding the origin of the birds recorded in the British Isles during the spring and early summer months.

10. It is suggested that the Red-crested Pochard has increased as a wild visitor to the British Isles during the past few years, a trend which can be expected to continue. There is every possibility that it may eventually nest on this side of the North Sea.

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PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

XCIV. LITTLE GULL

Photographs by C. C. DONCASTER and J. B. and S. BOTTOMLEY
(Plates 9-12)

Text by I. J. FERGUSON-LEES

THE LITTLE GULL (*Larus minutus*) is a purely Palaearctic species with a not particularly extensive breeding range in the eastern half of Europe and in two apparently quite separate regions of the U.S.S.R.—the first as far south as the Volga-Ural Steppes and as far east as Lake Zaisan, the second (after a gap in Central Asia) eastwards from the region of Lake Baikal—but (*pace The Handbook*) it is doubtful whether the species nests as far across as the Sea of Okhotsk, north of Japan (Dementiev and Gladkov, 1951; Harber, 1955). It nests chiefly between latitude 50° N. and the Arctic Circle and may thus be considered a northern bird, though there are some colonies in south-east Europe (in Rumania and at Lake Sevan in Armenia and, probably more sporadically, in Hungary, the Crimea and the Sea of Azov). Outside the U.S.S.R. it is mainly confined as a breeding species to Denmark and eastwards from the southern and eastern shores of the Baltic, as far north as most of the Finnish coast of the Gulf of Bothnia.

Like the Black-headed Gull (*L. ridibundus*), it nests both near the sea and far inland, but throughout its whole range it is somewhat local and nearly everywhere in small numbers. For example, Merikallio (1958) estimates the total population for Finland as only 200 pairs, though a casual comparison between the maps in the *Field Guide* (p. 184) might suggest that it was almost as numerous there as the Black-headed (for which Merikallio gives 20-30,000).

The species has never been proved to breed in Britain, but it is a regular winter visitor in small numbers to much of the east coast, as it is to all coasts of western Continental Europe from the southern Baltic to Spain and from Spain to the eastern Mediterranean. It appears to have increased in the last twenty years—an increase which bore fruit in the establishment of a small breeding colony in Holland in 1942 (Haverschmidt, 1946)—and it is therefore worth briefly reviewing the present status in Britain, since it differs somewhat from the outline given in *The Handbook*. On the east coast of England the status has not altered much, though in most of those counties there are now more records each year than was formerly the case. This might be thought to be due to the greater number of observers, but parties of Little Gulls are now regularly seen up as far north as Aberdeen and, particularly since 1948, groups of 20 and 30 and even flocks in excess of a hundred have established themselves in winter on the coasts of Angus and Fife (e.g. Boase, 1954). On the south coast of England, Sussex and Kent now each have more than 20 or 30 records annually, and there have been over a dozen in Hampshire and Dorset in some years. Even in Devon and Cornwall several Little Gulls appear annually (6 and 10 respectively in 1956, a good year) and western counties like Somerset, Lancashire and Cheshire have had one or two in most recent years, chiefly on autumn passage. Kennedy, Ruttledge and Scroope (1954) were able to list only 20 or 21 records for the whole of Ireland to the end of 1952, but now, perhaps partly as a result of increased watching, there are a few occurrences each year (2 birds in 1954, 2 in 1955, 7 in 1956, 1 in 1957—see *Irish Bird Reports*). Although the species is still only occasional inland in Britain, some counties like Staffordshire, Nottinghamshire and Berkshire can each produce records for several recent years. Mid-August to early April is still the period which sees the majority of the Little Gulls in Britain, but immatures and even a few adults in full plumage very occasionally appear on the east and south-east coasts during May-July.

The photographs on plates 9-12 were obtained in Jutland. Not only are we greatly indebted to Mr. Doncaster and Mr. and Mrs. Bottomley for providing us with this series, but also for putting summaries of their observations at our disposal. The background of plate 9 upper gives some indication of the habitat in which they found their birds—a large, flat area of closely-cropped, saline grazing-land, some three by four miles in extent and partly

flooded. The place was heavily populated with Black-headed Gulls, Common Terns (*Sterna hirundo*) and many waders, including Lapwings (*Vanellus vanellus*), Redshanks (*Tringa totanus*), Oystercatchers (*Haematopus ostralegus*), Avocets (*Recurvirostra avosetta*) and Black-tailed Godwits (*Limosa limosa*). The gulls and terns showed little tendency to dense colonial concentration, but were rather thinly scattered over the nesting areas, and it was very roughly estimated that there were some 10-20 pairs of Little Gulls dotted about among hundreds of Black-headed. Such scattered nesting, or nesting in very small groups, seems to be a characteristic of the Little Gull: for example, in his paper on the Dutch birds Haverschmidt (1946) gave details which showed that in each of the years 1942-44 a total of 15-18 pairs nested in five separate little groups of from one to 7 pairs. The habitat, on the other hand, may differ very much from that shown in plate 9 upper: sometimes sandbanks, sometimes islands of rank grass or reed-beds surrounded by deep water, and sometimes marshes covered completely by dense vegetation such as water soldier (*Stratiotes aloides*). Though *The Handbook* describes the nest as carelessly built, other authors refer to it as a solid and neat structure, and the amount of material used clearly varies very much: some of Haverschmidt's photographs show fairly bulky nests in dense *Stratiotes*, but the two found on this Jutland marsh were simply, as can be seen from the one on plates 10 and 11, small hollows thinly lined with dead grasses. A group of 7 nests seen by the writer in Finland in June 1958 were small and neatly built of dead reeds and grasses: these were on an "island" of the previous year's reeds, which was about 50 yards in diameter, and were grouped in the middle of a colony of much larger nests of Black-headed Gulls; around the edge of the island was a surprising concentration of nests of Great Crested Grebes (*Podiceps cristatus*), some 23 in all, of which at least 15 were then occupied.

Both the male and the female Little Gull build the nest (Haverschmidt, 1946) and both sexes sit on the surprisingly tern-like eggs, of which there are usually two or three, sometimes only one and occasionally four or more. These are usually not laid before the end of May and early June (*Handbook*), but in 1942 Haverschmidt's birds had full clutches "some days before May 23rd" and at the Danish nest in these photographs there was one egg on 18th May and the complete three by the 21st. Incubation there, as is normal, began with the first egg. The change-over at the nest is described by J. B. Bottomley (*in litt.*) as follows: "The change-over took two forms. In one, the relieving gull would fly over the nest-site calling with a subdued 'kek' note which the sitting bird answered; the relieving bird would then fly down to the edge of the nest and at the same moment the incubating one would depart. In the second method, the sitting gull, after answering the call from the one above, would fly off without waiting for the relief to land. I twice saw the unoccupied

bird bring nesting material (dead grass) which it placed on the nest edge. There was no change-over on these occasions and the sitting bird apparently ignored the material just brought." Haverschmidt stated that the nests he studied in Holland were kept up well during the whole of the breeding-season.

Identification features are given prominence in the legends under the photographs—see plates 9 lower, 10 and 11 for adults, and plate 12 for juvenile and size characters—but there remain one or two special points which are well worth mentioning. The most important is the fact that second-summer birds may be completely indistinguishable from full adults (although the under-wing is normally paler) except that they retain to a varying extent the dark subterminal spots and bands on the primaries that one associates with first-year plumage. Haverschmidt draws attention to this feature with two photographs (*antea*, vol. xxxix, plates 3 and 4) of nesting birds with black on the primaries and cites Berg (1937) as being the first to establish that Little Gulls actually breed in this plumage. The dark spots may be found on any or all of the second to sixth primaries inclusive, and it is worth bearing this point in mind because these feathers may not be moulted until September or even October—with the result that a small adult gull with dark on the wing-tips may be a pitfall for the unwary. In this connection, too, it must be emphasized that it is not until the third winter that the underwing of the Little Gull assumes the full depth of dark slate-grey (see plate 11). Another point raised by Haverschmidt is that on three occasions in May and June (in three different years) he saw in the colony a bird which was fully adult but in complete winter plumage with grey crown and nape and otherwise white head. Similarly, on 18th May 1958 C. C. Doncaster (*in litt.*) saw a Little Gull in the Jutland colony, which was still apparently in first-winter plumage. There should, however, never be any real difficulty over identifying this species, even if the plumage is irregular, for its rounded wings (plate 11) and buoyant flight give a moth-like effect which is quite characteristic. First-summer birds retain the dark tail-band of juvenile plumage (see legend to plate 12 upper), and have brown on the wings and a black hood spotted with white.

A useful flight-photograph, by Arthur Christiansen, showing the dark underwing and rounded tips, was published in *British Birds* in 1949 (vol. xlii, plate 22).

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NOTES

Pintails diving.—Among the large number of tame waterfowl at the Wildfowl Trust, Slimbridge, Gloucestershire, on 8th November 1958, there were at least 150 wild "surface-feeding" ducks in the enclosures. Three of these, a male and two female Pintails (*Anas acuta*), surprised us because they continually dived below the surface of the water on the Orchard Pond. Before diving they brought their heads and necks well back over their shoulders and then, as they quickly plunged forward, they slightly opened their wings and used them to drive their bodies below the surface. They remained completely submerged for periods of up to ten seconds or more. This interesting behaviour lasted about eight minutes, during which time each Pintail dived two or three dozen times, and then the three ducks flew off in the direction of the River Severn.

The Handbook states: "Diving does not seem to be recorded except when wounded or incapable of flight during moult, or in captivity". The only comparable record we can trace is R. H. Ryall's observation of a drake Pintail diving on the River Thames near Isleworth, Middlesex, on 24th January 1943 (*antea*, vol. xxxvi, p. 201). It may well have been that the three ducks at Slimbridge were feeding on stray corn which had sunk to the bottom of the pond during the previous feeding of birds in the Trust's collection.

STEPHEN CHAPMAN, BERNARD KING and NIGEL WEBB

[Mr. Hugh Boyd of the Wildfowl Trust tells us that Pintails have been repeatedly noted diving in this way at Slimbridge, since at least 1954, but that it has never been put on record. Other dabbling ducks (non-British) also dive occasionally there and it is confirmed that the birds are doing so for grain.—EDS.]

Lesser Black-backed Gull nesting on a bush.—On 2nd and 3rd May 1958, during a visit to Steepholm Island in the Bristol Channel, with a party from the Gull Research Group of the Bristol Naturalists' Society, we noted that a number of adult Lesser Black-backed Gulls (*Larus fuscus*) were in the habit of perching on low privet bushes on the southern slopes of the island. A number of nests of this species were found on the bare ground between these bushes, but we were surprised to see that one was actually built on a bush some three feet above the ground.

Mr. J. A. G. Barnes informs us that he knows of no record of this species nesting in or on bushes.

J. D. R. VERNON and C. AVENT

Jay killed by Weasel.—In Wytham Wood, Berkshire, on 25th February 1958, I saw a Jay (*Garrulus glandarius*) killed by a Weasel (*Mustela nivalis*). There was about two inches of snow on the ground where the Jay was standing looking at a baited trap about five yards away. The Weasel approached the trap, saw the Jay, ran round in a half-circle and attacked it from behind.

The ensuing fight lasted for about half to three-quarters of a minute, during which time it was difficult to see exactly what happened. It appeared that the Weasel gripped the Jay by either the right wing or the base of the right leg. Eventually the Jay fell over, whereupon the Weasel quickly changed its grip and bit the bird in the back of the neck, killing it almost immediately. Examination of the dead Jay showed no marks in the wing or leg, but two deep punctures in the back of the skull. The Jay weighed 176 gm., and Weasels average about 90 gm. C. M. PERRINS

Male Robin taking part in nest-construction.—Up to the spring of 1958 we had always noted that the female Robin (*Erithacus rubecula*) alone constructs the nest, and we had never observed the cock taking any part, however small. Moreover, all authors give this as the rule, although Dr. David Lack in *The Life of the Robin* (1943, p. 81) did qualify this by stating: "Rarely a cock was seen to pick up a piece of nesting material, but usually he dropped it again soon afterwards, and on one occasion when a cock came near the partly built nest the hen chased him away, as also observed by Kirkman. It is difficult to see why the cock should take no part in building, and from the above instances it is evident that he possesses a small trace of building behaviour."

We were therefore greatly surprised when on 3rd March 1958 we found that both birds of a pair of Robins were carrying material into a nest-box in our garden at Elbeuf, Seine Maritime, France. This nest-box was installed there about 25 years ago and Robins had frequently nested in it, as had Redstarts (*Phoenicurus phoenicurus*). The next day we observed the birds from 7 a.m. and their behaviour was the same. The male was not content with carrying the material and he entered the box just like the female. We could not be sure that he was actually *building*, because we could not see him once he was inside the box, but certainly both birds remained inside for about equal periods of time. Often one of the pair would perch on top of the nest-box and wait till the other came out, to enter in its turn.

The same behaviour continued on 5th and 6th March, and on the latter day the two birds continued to build during heavy rain between 7 and 8 a.m. On 7th March, however, a cold spell started and this entirely stopped the work of construction. I never saw the pair again and the nest-box was not used any more that year; eventually, on opening the box, I found a typical Robin's nest which appeared to be complete.

I must add that I never saw the pair working in the afternoon, but as I was always out for a while at this time there may have been some activity which I missed. The dates 3rd-7th March are very early for this species to be nest-building in Normandy, but it should be noted that in the spring of 1958, although the winter was very prolonged, several species arrived in this part of northern France before the usual date and others began nesting earlier.

GEORGES OLIVIER

REVIEW

WITHERBY'S SOUND-GUIDE TO BRITISH BIRDS. By Myles North and Eric Simms. Produced with the co-operation of the British Broadcasting Corporation, from recordings by Ludwig Koch, Eric Simms, Radiotjänst, B.B.C. Regional Services, J. R. Kirby, Carl Weismann, Myles North, A. E. Soper, H. E. Axell, I. J. Ferguson-Lees, L. J. Kinlen and D. I. M. Wallace. (Witherby, London, 1958). 2 vols., Part I (non-Passerines) with 7 double-sided 10-inch gramophone records (speed 78) and Part II (Passerines) with 6 records. Boxed with book and records; each part £5 10s. net.

EVER SINCE the pioneer work of Ludwig Koch and the subsequent formation of the B.B.C.'s library of bird recordings, there has been a natural and insistent demand for a really comprehensive and well-selected series of songs and notes of British birds to be made generally available. The difficulties were serious, but the delay in overcoming them has at least had the result of enabling the job to be really well done in the end. This *Sound-Guide*, carrying the authentic voices of 195 species of birds on the British list, is indeed something altogether beyond the dreams of pre-war students of bird-song and bird vocabulary.

The criteria for success in such an undertaking are formidably exacting. First, a very wide range of individual birds must be located uttering sounds at places where they can be closely approached with adequate equipment, and recorded free from extraneous noises of civilization, wind, water or even too much of rival voices of nature. They must not be too remote from the microphone to reproduce strongly, nor so near or shut in as to give a distorted effect. They must be typical of their kind, not poor or peculiar performers, and they must emit an adequate range of utterances to yield for the listener a satisfactory body of audible material on both songs and call-notes.

However the recording is done, the skill, equipment and processing employed must be first-class, and any inconsistencies arising from different techniques must be ironed out in the finished product. The arrangement, separation, identification, explanation and the packing and protection of the finished and edited collection must be such that each species can be readily reproduced with undiminished performance over a period of many years, given reasonable care, on a wide variety of sound-reproducing apparatus. To ensure worth-while distribution the design of the whole must be convenient and attractive, and the price must not be prohibitive.

While at certain points and in some of these respects the *Sound-Guide* falls short of perfection when judged by the most exacting standards it approaches sufficiently closely to that goal to command admiration. As regards design and production there is little to criticize except possibly the numbered interleaving between the

records, which is hardly stiff enough for durability. The box and the format of the descriptive book are unusually pleasing.

The text of the book, although thoroughly adequate, leaves something to be desired. The slightly old-fashioned air of the verbalized renderings of notes is inevitably accentuated by continual comparison with the much more authentic and subtle versions recorded by the birds themselves, and the recourse to human musical analogies is not always necessary or helpful. Where, as often inevitably happens, the ostensible subject of a recording is accompanied or interrupted by voices of one or more other species, the fact is only sometimes pointed out in the explanatory text, and this may well be confusing to those who do not know or are unskilled in separating the unannounced and undesired extra performers.

Quantitative data for durations, intervals and frequency ranges are given in only a few cases, and there is no use of, or even allusion to, sound spectrograms, which could help to illustrate critical distinctions. Within its limits, however, the text is clear, informative and helpful.

The sound recordings in Part I cover the non-Passerines, beginning with excellent but brief recordings of the divers and fairly representative selections of calls of the Great Crested, Slavonian and Little Grebes. Notes of Leach's and Storm Petrel follow at some length and, although good, are much too loud relatively to the Manx Shearwater, Fulmar and Gannet which come next. This failure to adjust volume of sound on the records to relative loudness of voices in nature is one of the few repeated weaknesses of the work. The Cormorant, Shag, Heron, Bittern and most of the ducks are excellent, although the Goosander is confused and the Garganey detracted from by extraneous noises. The geese are an outstandingly good and valuable series covering ten species; the swans except the Mute are less satisfying, and although the falcons are excellent the Buzzard calls seem to lack "edge". The grouse and other game-birds are of outstanding quality, although the two partridges are unfortunately somewhat confused with background sounds. The rails are another first-rate series, including Spotted, Baillon's and Little Crakes; rather surprisingly, the Corncrake makes the least realistic impression. A very high proportion of the long series of wader calls reach an excellent standard, the Lapwing, Little Ringed Plover, Golden Plover and Snipe being among the best; the Avocet sounds decidedly thin and the Oystercatcher and Stone Curlew also fall short of expectation. While the Arctic Skua and also the Arctic Tern come over extremely well the rest of the skuas, gulls and terns are less satisfying recordings, and among auks only the Puffin stands out. Another disappointment for a very easy voice is the Woodpigeon, but the Stock Dove is excellent and the British recordings of Collared Doves are a notable success. Among owls the space allotted to the Tawny seems excessive. While the

Nightjar, Hoopoe and Wryneck are excellent, the Green Woodpecker is oddly faint and untypical, and justice is not done to the call of the Great Spotted.

Part II gets off to an unimpressive start with a Woodlark, which by no means lives up to the praise lavished on its song in the text, and an unduly brief snatch of Skylark. The House Martin and Sand Martin are also unimpressive, but the Swallow is excellent, and with the Golden Oriole and Raven a first-class standard is regained. The notes given for Carrion and Hooded Crows suggest considerable differences which are not generally typical, as the text rightly warns listeners. While the inevitably limited selection of Great Tit language is excellent and the voices of Crested and Marsh Tit come over well, the representation of the Willow Tit by song alone seems an error of judgment when the call-note is available, and is of such great diagnostic importance. The Coal Tit sounds thin, as does the song of the Treecreeper and the omission of the highly characteristic "tupp" of the Long-tailed Tit is another unexpected gap. The Bearded Tit calls do not ring true, but the Nuthatch vocabulary is good and comprehensive, and the Wren song excellent: why, however, was the alarm of the last not included?

The Dipper song sounds unduly harsh; and, while the Mistle Thrush song is excellent, the alarm and also that of the Song Thrush, and the Fieldfare calls, are unsatisfactory. The song of the Ring Ouzel and the calls of Wheatear and Stonechat disappoint, and a rather poor rendering of Redstart song and call-note ends an unaccountably bad patch in the selection.

The song of the Black Redstart is adequate and the Nightingale—recorded north of the Forth!—is so good that more would have been welcome; the alarm of this species is also well rendered, but that of the Robin is disappointing, although the contrast of its spring and autumn songs is well brought out.

The subtle, but definite, distinction between the songs of Grasshopper and Savi's Warbler is also demonstrated in a way which, considering the immense technical difficulties, represents a triumph and is of exceptional value to field ornithology. The Moustached Warbler and Great Reed and Reed Warblers come over well, but the Marsh Warbler is unfortunately an untypically poor singer and the Sedge Warbler also is not a success. The Icterine Warbler picks up after a poor start and the Blackcap song is good, although this can hardly be said of the call-note. Both the Garden Warbler and Whitethroat songs are excellent, but it is curious that the most characteristic Whitethroat call is omitted, while the Dartford Warbler call, although good, is cited as "the most important guide to the bird's presence" without any warning of the danger of mistaking for it a similar and unreproduced call of the Whitethroat. The Lesser Whitethroat's and Chiffchaff's songs given are not entirely typical, but those of the Willow and Wood Warblers are excellent, and the Goldcrest's is good considering its difficulties.

The Pied Flycatcher's song is well conveyed, but that of the Dunnock does not succeed well, and the Meadow Pipit's is rendered with a vigour and robustness more reminiscent of a Rock Pipit; the Tree Pipit's, on the other hand, is very typical. The wagtail calls are not very satisfactory, those of the Grey and Yellow, in particular, lacking their characteristic "edge". The mimicking song of the Red-backed Shrike is characteristic, but most surprisingly the Starling's is a disappointing performance and the finch songs, except those of the Redpoll, Crossbill and Chaffinch are not very satisfactory. Among the buntings, the Corn, Girt and Reed are reproduced with excellent fidelity and those of the Yellowhammer and Snow Bunting well enough. Of the concluding sparrow notes the House Sparrow selection is excellent, but the timbre of the Tree Sparrow comes over less perfectly.

The *Sound-Guide* challenges the most critical listener and it is interesting to find that even on a deliberately exacting assessment as many as half the recordings, for example, in Part I have passed muster as "excellent". If there are gaps and imperfections they are largely inevitable at this stage of sound-recording development and, while some are surprising, the unexpected excellence of a number of the most difficult is easily more remarkable. The *Sound-Guide* will be an unflinching and agreeable aid to improved recognition of bird voices, a stimulus to further progress in this important branch of ornithology, and a lasting monument to the skill and patience of all those who have contributed to it. E.M.N.

LETTERS

AN ERROR IN "THE BIRDS OF THE BRITISH ISLES"

SIRS,—May I be permitted to correct a serious error which occurred in my *The Birds of the British Isles*, Vol. V, p. 299, under Honey Buzzard (*Pernis apivorus*). I quoted Col. C. F. Scroope as having written in *The Birds of Ireland* (1954) that this buzzard was formerly "a wide-spread breeding species" in Ireland. That, of course, is quite untrue and Col. Scroope wrote nothing of the kind. How this unfortunate mistake arose is quite inexplicable to me, but I would beg those in possession of my volume to make the necessary correction and I would ask you to allow me, through the medium of your widely read journal, to make my humble apology to Col. Scroope for misquoting him in this way.

DAVID A. BANNERMAN

LIST OF NORTHAMPTONSHIRE BIRDS

SIRS,—I am compiling a list of the birds of Northamptonshire. To make this as complete as possible, I should be glad to receive

any unpublished records for the county, especially concerning irregular passage-migrants and the rarer nesting species, at 120 Bush Hill, Northampton.

L. S. TAYLOR

GAME RESEARCH CONGRESS IN HOLLAND

SIRS,—May I draw the attention of your readers to the next congress of the International Union of Game Biologists? This organization was formed only a few years ago to co-ordinate the results of research work on game conservation, and to act as a clearing house for scientific information on this subject.

The 4th meeting to be held will take place at Arnhem in the Netherlands from 28th September to 3rd October 1959. The meeting is open to anyone who is scientifically occupied with game or wildlife management. Would persons wishing to present papers, films, or demonstrations, write to the Organizing Secretary (Dr. J. A. Eygenraam), c/o I.T.B.O.N., Game Management Division, Kemperbergerweg 11, Arnhem, Netherlands, before 1st March, telling him of their intention to participate. The texts of any contributions (with summaries) should reach Holland before April 1959.

During and after the meeting excursions will be made to the National Parks (Red Deer and Moufflon), the new polder "Oostelijk Flevoland" (waterfowl) and the Delta-works in the province of Zeeland.

More detailed information on the congress will be available in due course.

c/o Game Research Station,

C. L. COLES

Burgate Manor, Fordingbridge, Hants. (Liaison Officer for U.K.)

RECENT REPORTS AND NEWS

By I. J. FERGUSON-LEES and KENNETH WILLIAMSON

The items here are largely unchecked reports, and must not be regarded as authenticated records. They are selected, on the present writers' judgment alone, from sources generally found to be reliable. Observers' names are usually omitted for reasons of space and in case a report is subsequently rejected, and none of the items will be mentioned in our annual Index. Readers are asked to submit anything of interest as quickly as possible.

The first sections of this summary deal mainly with January, particularly from the 12th to the 31st but to some extent overlapping with our last outline (*antea*, pp. 31-32). The remainder give details of reports received as a result of observations in the December number (*antea*, vol. li, pp. 528-532)—e.g. late summer-visitors—and also cover some of the subjects postponed then for lack of space.

THE WAXWING INVASION

Since last month's summary of Waxwings (*Bombycilla garrulus*)

—in which we showed that the December influxes had resulted in good numbers in all east coast counties from Caithness down to Essex, though few further west except in Scotland—we have received many other reports indicating that January saw a southward movement down the east coast, a small spread inland in England, and a passage down the Irish Sea from north and west Scotland. In Essex, which had very few records until the middle of January (except for 30 near Harwich early in the month), at least 100 appeared near Thundersley on 18th January and were still present on the 29th, while smaller parties were seen in other districts. Similarly, though we have now received three December reports from Kent—the first was of two birds in the Dungeness area on the 10th—it was not until the second and third weeks of January that there were several observations in that county, and only one flock of over 20 was reported before the 25th and 26th; by the end of January, however, there were 40 or more at Sandwich. Almost every east coast county can now boast having had at least one flock of more than twenty Waxwings and several have reported concentrations of up to fifty or more. By contrast, though some areas in the west of Scotland have had large parties, the majority of reports from the rest of England and Wales are of ones, twos and threes, with 15+ at Burwell (Cambridgeshire) on 25th January the only group of double figures apart from a party of 21 or more in Westmorland.

The spread to other parts of England and Wales is best indicated by listing the counties involved with the dates (all January) of the first reports received. In chronological order, these are: Worcester (4th), Cornwall (4th), Cumberland (“first week”), Cheshire (7th), Isle of Man (7th), Lancashire (“about 8th”), Stafford (10th), Cambridge (11th), Carmarthen (12th), Nottingham (14th), Devon (15th), Hertford (17th), Westmorland (18th), Somerset (18th), Buckingham (18th), Oxford (19th), Surrey (19th), Berkshire (20th), Flint (21st), Denbigh (22nd) and Middlesex (25th). This list is doubtless incomplete and we hope that we shall receive further reports which will help to make the pattern clearer. Different directions of spread and chance of observation make for a patchy distribution, but it is interesting to note the coincidence of the first dates in the group of counties from Surrey to Oxford, and the tendency to a southwards succession in the west.

A certain number of reports have been received from Ireland—from Cos. Antrim, Down, Dublin, Westmeath, Cork and Clare—and these seem to fall into two groups, some very early in the month and the others at the beginning of the third week. One would, of course, expect that birds from the west of Scotland would spread down into Ireland, via the short 20-mile crossing of the North Channel, sooner than others would move into inland districts from the east coast of England. Reports from the south-west of Scotland (Ayr, Wigtown, Kirkeudbright, Dumfries and Roxburgh) show that good numbers were in that part of the country early

in January. In east Roxburgh (area of Yetholm) there were few seen in early January, but 87 were counted on the 25th and there were comparable numbers to the end of the month: Yetholm is some 20 miles west of Belford in Northumberland (*antea*, p. 32).

However, these details should not be taken to indicate that the birds have all moved away from the east coast, for the berry crop is very good in many areas and in the last week of January a majority still seemed to be well settled in many eastern counties.

THE RARER BIRDS IN JANUARY

One thinks of January as a time for wildfowl and gulls, and all but one or two of the few rarity reports refer to these groups. An apparently wild Red-breasted Goose (*Branta ruficollis*) appeared among the White-fronted Geese (*Anser albifrons*) by the River Severn at Slimbridge (Gloucestershire) on 24th January and was still present on 1st February. There are only fifteen accepted records of this species in the British Isles and it will be remembered that there was one in the same place in January 1954 (*antea*, vol. xlviii, pp. 136-137), but the possibility of such birds being escapes can never be entirely ruled out. The present one is considered to be an adult. Up to the end of January no Lesser White-fronted Geese (*A. erythropus*) had appeared at Slimbridge, but one was seen on 31st January and 1st February at the same locality in Kirkeudbrightshire where this species has appeared among Bean Geese (*A. arvensis*) in several previous years (e.g. *antea*, vol. li, p. 84). A female Red-crested Pochard (*Netta rufina*) which arrived at Chichester gravel-pits (Sussex) on 7th December (see p. 44) was still present on 18th January.

Iceland and Glaucous Gulls (*Larus glaucoides* and *hyperboreus*) are both rare inland in England and so it is of interest to note that an immature of each species was observed on a rubbish-tip near Cambridge on 24th January. A first-winter Glaucous Gull was also seen at Queen Mary Reservoir (Middlesex) on 11th January, and it will be remembered that a near-adult Iceland Gull was reported from Northamptonshire on 4th January (*antea*, p. 32). The Sussex Iceland Gull (*antea*, pp. 444, 530) continues its stay at Southwick and we have received a few other reports of this species from the east and west coasts. There was only one Iceland Gull on St. Kilda at this time, an immature from 11th December throughout January; an adult Glaucous appeared there on 18th January. The only Mediterranean Black-headed Gull (*L. melanocephalus*) reported in January was the one that is again wintering at Hartlepool (Co. Durham) (*antea*, pp. 529-530), but others have doubtless remained in the two or three usual East Anglian and south-eastern localities. A Snowy Owl (*Nyctea scandiaca*) was identified on the Deben estuary (Suffolk) on 24th January, and on 31st January the Somerset Richard's Pipit (*Anthus novaeseelandiae*) (*antea*, p. 32) was still present.

In dealing with American species in the last four months of 1958 (*antea*, pp. 445, 528) we purposely summarized more than

usual because we hope to publish a more adequate analysis of 1958 Nearctic birds in the near future. However, in connection with the Killdeer (*Charadrius vociferus*) in Norfolk on 1st December (*antea*, p. 528), which at the time seemed to be an isolated occurrence, we would mention here two belated reports of American waders in Ireland that have only recently come to hand (see also *antea*, p. 32). A Killdeer stayed at Blennerville (Co. Kerry) from 20th November to 2nd December, and then on 3rd December there was a Dowitcher (*Limnodromus griseus*)—the third in the British Isles in 1958—at the same place.

AVOCETS, SWANS AND OTHER LESS COMMON WINTERERS

Among the regular but less common wintering species, it is worth mentioning that the Avocets (*Recurvirostra avosetta*) on the Tamar estuary (Devon) (*antea*, p. 530) built up to 43 in late December and remained at that total throughout January (the corresponding number in January 1958 was 46). Apart from Devon and Kent, single Avocets are also wintering at Foulness (Essex) and Burnham-on-Sea (Somerset). In addition, two were present at Rushbrooke (Co. Cork) in late December.

The position with regard to wild swans is, however, more obscure at the time of writing. The peak of Bewick's Swans (*Cygnus columbianus*) on the Ouse Washes in Cambridgeshire and Norfolk and at Earith in Huntingdonshire (*cf. antea*, vol. li, p. 84) was only about 150 in January, although the birds arrived earlier than is sometimes the case. Correspondingly few Bewick's Swans (compared with the previous four winters) have been reported from other counties in the southern half of England, but there have been several parties of up to 25 Whoopers (*C. cygnus*) in the south—including 23 over Staines and King George VI reservoirs (Middlesex) on 10th January. It is therefore less wise than in other recent winters to expect that a party of a dozen or more wild swans in southern England will prove to be Bewick's.

The Marsh Harrier (*Circus aeruginosus*) is now a more regular winter-visitor to south-east England (Norfolk to Kent) than *The Handbook* suggests, though the number of birds is of course very small and few are seen outside this area. However, this winter an increased number of reports includes three of special interest. Far inland, there was one at Sonning Eye, near Reading (Berkshire), on 19th December; and over on the west coast, one near Glandovey (Cardiganshire) on 23rd December. But most surprising of all are winter occurrences, possibly of one bird, up to the end of January at least, in Kirkcudbrightshire.

Lapland Buntings (*Calcarinus lapponicus*) are again wintering in numbers on the coast of north Norfolk (over 100 at Morston) and there are smaller parties in counties as far apart as Kent, Essex and Co. Durham—which confirms the impression gained in recent years that eastern England should be regarded as a regular wintering area for this species (*cf. Field Guide*). Lastly on this subject,

over 100 Twites (*Carduelis flavirostris*) have been between Parkgate and Neston on the Cheshire Dee since November: we understand that there has been a flock there in each of the past four winters and it would be interesting to know if there are any other places on the west coast where this happens (*cf. Handbook*).

Two Long-tailed Ducks (*Clangula hyemalis*) on Cannock reservoir (Staffordshire) on 7th December are the only inland reports of this species that have reached us this winter (*cf. antea*, vol. li, p. 208).

HARD-WEATHER MOVEMENTS

In the latter part of December there were comments on the unusual numbers of Lapwings (*Vanellus vanellus*) from various parts of East Anglia and Kent. During the period 6th-11th January we received several reports of large movements of Lapwings travelling west and south-west in Buckingham, Oxford, Hertford, Berkshire, Nottingham, Lancashire and Cheshire. The peak seems to have been on 9th, 10th and 11th January and the coincidence in dates is very marked. It is interesting to note that the large numbers of Lapwings in Kent seemed to disappear in the first week of January, and there were mass arrivals in Devon during this period. Various other species were observed moving west at the same time: these are too numerous to list, but particularly included Golden Plovers (*Charadrius aprivarius*), Fieldfares (*Turdus pilaris*), Redwings (*T. musicus*) and gulls in the south, and Skylarks (*Alauda arvensis*), Meadow Pipits (*Anthus pratensis*), Chaffinches (*Fringilla coelebs*) and thrushes in the north.

A less spectacular return movement of some of these birds was commented on in Wiltshire and Oxfordshire on the 18th and 19th, and in Lancashire and Cheshire on the 18th, the birds all going east and north-east.

Redwings in particular, and also Fieldfares, were apparently exceptionally numerous in East Anglia and the Home Counties in mid-January and the second half of the month. Over a score of comments to this effect varied from "the largest numbers for several years" to "the biggest ever".

LITTLE AUKS, SHORT-EARED OWLS AND CROSSBILLS

Little Auks (*Plautus alle*) have not been particularly in evidence this winter. Small numbers were reported from various parts of the east coast in November, particularly the middle of the month, but most of these had apparently left British waters by the beginning of December and the only interesting December/January reports have been from the south and west coasts: 6 flying west off St. Ives Head (Cornwall) on 14th December; at least six reports off the Devon coast in mid-December; one off Selsey (Sussex) on 26th December; one at West Huntspill, near Pawlett (Somerset), on 2nd January.

Reports from several south coast counties (Kent to Devon), but not East Anglia, suggest that this is a good winter for Short-

cared Owls (*Asio flammeus*). The species has also been seen with some regularity in at least Middlesex, Surrey and Buckinghamshire, and we should be interested in comments on this point.

Similarly, it is worth drawing attention to the considerable parties of Crossbills (*Loxia curvirostra*) that are still in the country as a result of last summer's invasion (*antea*, pp. 315-316). The larger numbers appear to be in parts of the western half of England, and of course south-west Scotland, but there seems to have been some reappearance in eastern districts in the last three months. It is now worth watching out for nests of this very early breeding species: in fact, one was being built in Kirkcudbrightshire at the beginning of January, and there was a fledged juvenile at least one week out of the nest on 1st February in Suffolk.

LATE SWIFTS AND OTHER SUMMER-VISITORS

Following the summary in the December number (*antea*, p. 531), we have received a number of further reports of October Swifts (*Apus apus*). These include several for the first six days of the month—among them one as far north and west as Dalry (Kirkcudbrightshire) on the 3rd, and a series of observations in Yorkshire on the 6th (Redcar, Whitby, Spurn). Then the following correspond to the individual records listed before:

- 7th October: 2 at Spurn (Yorkshire).
- 9th October: 1 at Cley (Norfolk).
- 12th October: 1 at Havering (Essex).
- 14th October: 1 in Whitby area (Yorkshire); 1 at Stapenhill Park, Burton-on-Trent (Staffordshire).
- 17th October: 1 at Spurn (Yorkshire).
- 30th October: 1 at Rhoose, near Barry (Glamorgan).

Similarly, we have various further reports of other late summer-visitors (*cf. antea*, pp. 531-532) in October and November, and even in December and January:

- Quail (*Coturnix coturnix*): three, West Ilsley (Berkshire), 17th January.
- Turtle Dove (*Streptopelia turtur*): one, Portland (Dorset), 5th October; 5, Portland, 10th October; 2, Purbeck, near Poole Harbour (Dorset), 10th October (*cf. Dungeness dates, antea*, p. 531).
- Nightjar (*Caprimulgus europaeus*): one, Farlington marshes (Hampshire), 23rd November.
- Swallow (*Hirundo rustica*): one, Margate (Kent), 2nd December; one, South Benfleet (Essex), 24th December.
- Ring Ouzel (*Turdus torquatus*): male, Queen Mary Reservoir (Middlesex), 11th January.
- Whinchat (*Saxicola rubetra*): one, Purbeck, 10th October; one, Portland, 10th October; one, near Llandrindod Wells (Radnor), 20th October; one, St. Osyth (Essex), 7th-8th November.
- Nightingale (*Luscinia megarhynchos*): one, Fownhope (Herefordshire), 18th October, was heard singing from 7.30 a.m. to 9.30 a.m. and occasionally after (*cf. antea*, vol. xli, p. 215); adult male picked up recently dead, Long Melford (Suffolk), 20th December.
- Grasshopper Warbler (*Locustella naevia*): 3, Portland, 6th October; 2, Portland, 9th; 2, Portland, 11th.
- Sedge Warbler (*Acrocephalus schoenobaenus*): one, Coate Water, near Swindon (Wiltshire), 12th October.
- Blackcap (*Sylvia atricapilla*): several reports of wintering birds included a male at Dornoch (Sutherland), 10th-26th January. It was first seen on eighth day of severe frost and snow, remained through brief thaw

during 17th-20th January, and was finally seen just before a night of exceptional frost; it fed on crumbs and was very aggressive towards other birds. This is perhaps the most northerly observation in the British Isles during mid-winter (*cf. Bird Study*, vol. 3, pp. 251-257; vol. 4, pp. 53-54), but there is also an unconfirmed report of a male at Golspie (Sutherland) "early in January". Late migrants were seen on Fair Isle on 19th and 23rd November.

Garden Warbler (*Sylvia borin*): one, Fair Isle, 22nd-26th November (later than any date in *The Handbook*; *cf. also antea*, p. 532).

Whitethroat (*Sylvia communis*): the one at Ruxley, near Sidcup (Kent) (*antea*, p. 532), was seen on several days in December up to 28th; also one in Devon in late December.

Willow Warbler (*Phylloscopus trochilus*): one, Brentwood (Essex), 9th December.

Chiffchaff (*Phylloscopus collybita*): this species winters regularly in the south-west, but 8 on one sheltered beach, together with a female Black-cap, on 10th January on St. Agnes (Isles of Scilly), seem noteworthy. In the south-east the species is comparatively seldom recorded in winter, but we have the following: one, near Dungeness (Kent), 25th December; one, Ruxley, several occasions to 28th December; 3, Beddington sewage-farm (Surrey), 2nd-7th January, and one to at least 25th; one, Dungeness, 17th January. Also one, St. Kilda, 6th and 8th December (suspected *Ph. c. tristis*).

Yellow Wagtail (*Motacilla flava*): one, Leewick beach (Essex), 15th November (race?).

Late observations of passage waders included a Whimbrel (*Numenius phaeopus*) at Ince Blundell, near Liverpool (Lancashire), on 9th December and what was perhaps the same bird at Formby Moss on 28th December. A Wood Sandpiper (*Tringa glareola*) was seen at Altrincham (Cheshire) on several occasions in December and was still present on 4th January. There have been a number of reports of wintering Spotted Redshanks (*T. erythropus*). Common Sandpipers (*T. hypoleucos*) are, of course, regular winterers in small numbers now, but a Green Sandpiper (*T. ochropus*) as far north as Northumberland is worthy of note: one was present for some days up to 6th January four miles north of Morpeth. A Grey Phalarope (*Phalaropus fulicarius*) was seen at South Shields (Co. Durham) as late as 14th and 18th January. In connection with the Black Terns (*Chlidonias niger*) mentioned in the December issue (*antea*, p. 532), we received one other report for 18th October (Staines reservoir, Middlesex) and one rather later one from Chichester (Sussex) on 3rd November.

Some details of late nests and winter song will have to be held over until the next issue.

ERRATA

We now understand that the Snow Goose (*Anser caerulescens*) in Co. Wexford (*antea*, p. 32) was first seen on 8th December, not 15th. More serious, however, is the confusion that has taken place over the Surf Scoters (*Melanitta perspicillata*) off North Bull (Dublin) and in Dublin Bay (*antea*, p. 528): the first bird was an immature (sex unknown) from 3rd to 16th November, and this same individual (or a similar one) reappeared on 20th December after a gale; the second bird was an *adult* male and was seen only on 9th November.

NOTICE TO CONTRIBUTORS

British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

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3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlvii, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

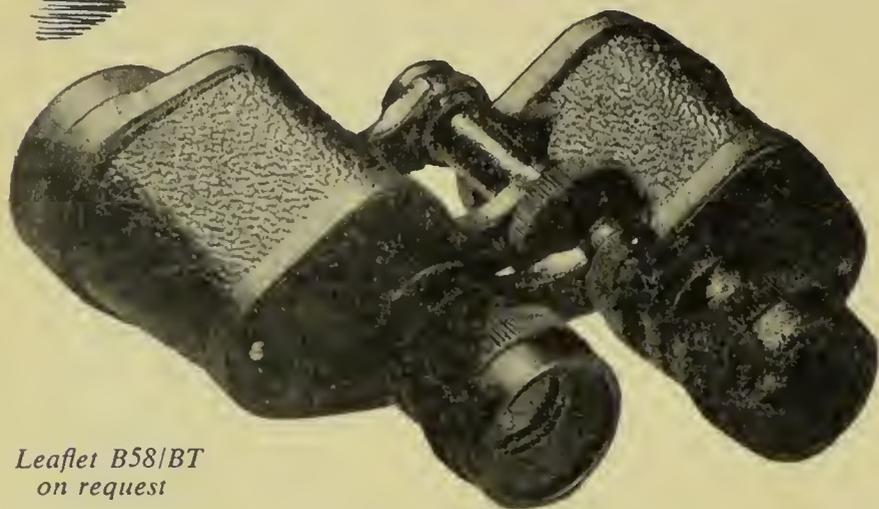
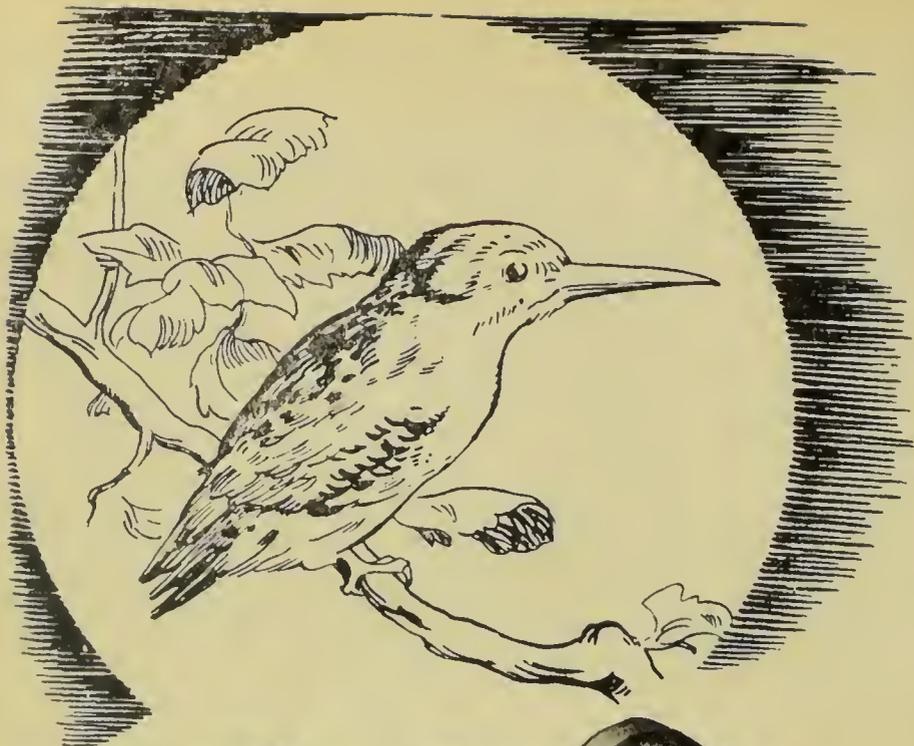
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1959



BRITISH BIRDS

EDITORIAL

Centenary of the British Ornithologists' Union

ONLY EIGHTEEN MONTHS after the first publication of *British Birds*, its editors had the agreeable task of recording the jubilee meeting of the British Ornithologists' Union in December 1908. Now, having passed our own jubilee two years ago, we have the even greater pleasure of greeting the Union's centenary, and also of welcoming *The Ibis* in its new and ampler format. The January 1959 issue of that journal is a special centenary one containing fifteen contributions from officers and other leading members of the Union, on the history, especially in recent times, of British ornithology. This interesting series ranges from reminiscences to precise analyses of past activities and past contents of *The Ibis*, and also appraisals of general trends and British contributions in special fields of ornithology. It is a most valuable record of facts and at the same time a revealing witness of the attitudes and opinions of the present day, which will doubtless be quoted with suitable comment at the Union's next centenary.

It is satisfactory to know that, having taken two-thirds of a century to reach a total of five hundred members, the Union has passed the thousand mark in time for the completion of the hundred years. The centenary is most appropriately to be celebrated by a meeting at the Union's place of foundation, Cambridge, beginning on Friday 20th March with an account of the Union's two centenary expeditions to the Comoros and Ascension; then continuing on the Saturday with discussions on systematics and behaviour, and on the Sunday with others on migration, orientation and population ecology. After a final lap on the Monday morning on breeding biology and physiology, the Ibises will migrate to the City of London for a Centenary Banquet that evening in the Fishmongers' Hall. Among leading overseas ornithologists taking part will be Professor F. Bourlière (Paris), Professor Ernst Mayr (Harvard), Professor G. P. Baerends (Gröningen) and Professor G. Kramer (Wilhelmshaven). Among

those present, too, will be several who have recently been celebrating in New York, under Professor Mayr's presidency, the 75th anniversary of the American Ornithologists' Union, which gave rise to a most interesting and successful meeting.

We offer our warm congratulations and most cordial good wishes to both Unions: we trust that they may both go forward with continuing and increasing success, and may contribute together towards the advancement and unity of world ornithology.

EARLY BREEDING IN 1957

By M. J. GOODACRE and DAVID LACK

(*Edward Grey Institute, Oxford*)

INTRODUCTION

FROM FEBRUARY 1957 onwards, reports appeared in the press suggesting that birds were nesting unusually early in that year, so an enquiry was launched in *British Birds* and *Bird Study*. The long delay in preparing this paper was inevitable, for, though some observers responded immediately to the appeal, many others wrote out their records only at the end of the year, and then either sent them to their County Recorder or put them on Nest Record Cards; information from these two latter sources did not reach the writers until the summer of 1958, and in one important case not until the late autumn. By that time, the original organizer (D.L.) had become heavily committed to other work, so he had to pass on the extensive analyses in Table II and Appendix I to a second author (M.G.) who is solely responsible for these sections.

Once the information had been received, a further difficulty became obvious, that of defining an "early" laying. For most British species, there is not nearly enough published information to determine whether the early clutches in 1957 were really abnormal and, if so, to what extent. Fortunately there are 11 species, as set out in Table I, for which accurate quantitative comparisons can be made with previous years. All of these were post-war studies, most were carried out near, or organized from, Oxford, and all save one were by professional ornithologists. Yet this type of work would seem eminently suitable for amateurs resident in one place for a period of years.

For the remaining species, Table II must suffice, showing the number of early layings recorded in 1957 together with the total number of Nest Record Cards examined, and this will enable a future worker to see whether the proportion of early nests in 1957 was unusual. Perhaps the chief value of this paper will be to show that the day of the occasional early-nesting record is over, and that further long-term studies of common species by resident observers are badly needed.

THE WEATHER

The most unusual feature of the weather between December

1956 and the spring of 1957 inclusive was not its exceptional warmth at particular times, but the fact that, throughout this period, there was no really cold weather at all. In addition, the monthly summaries of the Daily Weather Reports of the Meteorological Office showed that February was "notably mild over England and Wales", and that in March the maximum and minimum temperatures were unusually high and there were few ground frosts, though the sunshine was below average. The weather was especially warm and sunny during 11th-13th March, and on 12th March the noon temperature at Mildenhall, Suffolk, reached 69°F., the normal maximum for June. April was unusually dry and sunshine was above average, but maximum and minimum temperatures were only slightly above average; indeed, from mid-April onwards the spring of 1957 was not exceptionally mild.

LONG-TERM BREEDING STUDIES

In examining Table I, it should be kept in mind that the results from one locality may not have been representative for England as a whole, especially since in the three species for which data were available from two localities, the mean laying time differed markedly. In addition, most species were not studied so far back as 1948, which was the last early-nesting season prior to 1957.

Two of the largest species in Table I, the Tawny Owl and Rook, habitually nest in March, and both species laid their eggs 12 days earlier than the average for previous years (which did not, however, include 1948). The mean date of laying for the Tawny Owl approached the figure of 1957 only in one previous year, 1950, while in five previous years the mean date of laying for the Rook had been fairly constant around 19th March.

The fullest available figures are for the Great and Blue Tits in Marley Wood, near Oxford, where in 1957 both species laid 10-12 days earlier than the mean for 10 previous years. In only one year, 1948, did breeding take place earlier than in 1957, but then it was as much as 7 days earlier in the Great Tit and 5 days earlier in the Blue Tit. However, in Alice Holt wood, Surrey, only some 60 miles south of Oxford, the mean date of laying of the Great Tit in 1957 was only 4 days earlier than the mean for previous years, while the mean date for the Blue Tit there in 1957 was only 2 days earlier than usual. Figures for these tits in several other woods, published elsewhere (Lack, 1958), gave mean dates in 1957 intermediate between those for Marley on the one hand and Alice Holt on the other. Such local variations in the time of laying were found in a few, but not most, other years, and their cause is not known. There were no obvious differences in 1957 in the mean temperature or other weather factors measured at Alice Holt and Oxford respectively, but in both cases the weather station was a mile or two from the wood. The oak trees appeared to come into leaf later in Alice Holt than Marley, so it seems likely

TABLE I—COMPARISON OF DATES OF LAYING IN 1957 WITH PREVIOUS YEARS FOR ELEVEN SPECIES IN LONG-TERM STUDIES

Species	Locality (observer)	1957		Before 1957		Difference in days
		Number of clutches	Mean date 1st egg	Other years studied	Mean of mean dates of 1st egg	
Kittiwake (<i>Rissa tridactyla</i>)	North Shields (J. C. Coulson)	35	18 May	'52-'56	19 May (14-25.v)	1
Tawny Owl (<i>Strix aluco</i>)	Oxford (H. N. Southern)	14	14 Mar.	'49-'56	26 Mar. (16.iii-10.iv)	12
Swift (<i>Apus apus</i>)	Oxford (D. Lack)	28	31 May	'48-'56	28 May (23.v-2.vi)	-3
Rook (<i>Corvus frugilegus</i>)	Oxford (D. F. Owen)	48	7 Mar.	'52-'56	19 Mar. (15-23.iii)	12
Jackdaw (<i>Corvus monedula</i>)	Oxford (D. F. Dorward)	68	19 Apr.	'52-'56	25 Apr. (24-27.iv)	6
Great Tit (<i>Parus major</i>)	Oxford (D. F. Owen)	49	17 Apr.	'47-'56	29 Apr. (10.iv-10.v)	12
" "	Alice Holt (D. F. Owen)	55	25 Apr.	'48-'56	29 Apr. (14.iv-9.v)	4
Blue Tit (<i>Parus caeruleus</i>)	Oxford (D. F. Owen)	32	15 Apr.	'47-'56	25 Apr. (10.iv-6.v)	10
" "	Alice Holt (D. F. Owen)	83	23 Apr.	'48-'56	25 Apr. (11.iv-3.v)	2
Coal Tit (<i>Parus ater</i>)	Thetford (F. T. S. Lynford)	83	9 Apr.	'49-'56	20 Apr.	11
Long-tailed Tit (<i>Aegithalos caedatus</i>)	Oxford (D. Lack)	6	1 Apr.	'49-'51, '55-'56	12 Apr. (30.iii-21.iv)	11
Pied Flycatcher (<i>Muscicapa hypoleuca</i>)	Forest of Dean (B. Campbell)	47	11 May	'48-'56	14 May (6-22.vi)	3
House Sparrow (<i>Passer domesticus</i>)	Stockton-on-Tees (D. Summers-Smith)	29	30 Apr.	'55-'56	12-15 May	13
" "	Durham (J. C. Coulson)	27	6 May	'56	12 May	6

that, as usual, the breeding season of the tits coincided with the appearance of the defoliating caterpillars for their young (Lack, 1955), but the factor responsible for this local adjustment is not known.

In the conifer plantations of Thetford Chase, Norfolk, the Coal Tit laid 11 days earlier in 1957 than the average for 8 previous years (which did not include 1948). The Long-tailed Tit was likewise 11 days earlier than usual in Marley Wood, but the mean date in 1957 was similar to that in 1949. The only other species in Table I that normally breeds in April, namely the Jackdaw, laid 6 days earlier than usual at Oxford, in 1957. This was a smaller difference than for the other April-breeding species, but not proportionately so in view of the fact that the mean date of laying of the Jackdaw had varied by only 4 days in the five preceding years.

By late April, as already mentioned, the spring weather had returned to normal. Of the species breeding in May, the Pied Flycatcher in the Forest of Dean laid 3 days earlier than the average for 9 previous years, but it had been rather earlier (mean date 6th May) in both 1948 and 1949. The House Sparrow in Durham laid earlier in 1957 than in the two previous years, but the latter may have been unusually late, so figures are needed for further years to determine whether this species bred unusually early in 1957; moreover, there was a marked difference between two near-by localities. Finally, Table I shows that two other species breeding in May, the Kittiwake and Swift, did not lay earlier than usual in 1957.

One other species, the Woodpigeon, has been the subject of a long-term study, by S. Cramp in London, but with a species laying one clutch after another, with many replacements after losses, it is hard to give a meaningful figure for the average date of first layings, unless one is dealing with a colour-ringed population. In 1957 Cramp found two nests in which laying started in February, whereas he located no nests with eggs in February in any of the five preceding years. Further, of a total of 93 nests found in 1957, 11% were laid up by the end of March, as compared with 6% of 176 nests found in the five previous years. Clearly, breeding started earlier than usual in 1957. This is confirmed for one previous year by R. K. Murton in eastern England, chiefly Cambridgeshire, where no pairs laid before the second half of April in 1955 or 1957, but in 1957 2.6% of 417 nests found contained eggs in the second half of April, as compared with 0.1% of 702 found in 1955.

Finally, in the Heron (*Ardea cinerea*)*, D. F. Owen found enough clutches at Buscot, Oxfordshire, to know that the mean date of laying was decidedly earlier there in 1957 than in his fuller studies during five previous years, but he was prevented by illness from getting exact figures in 1957.

*All other scientific names appear either in Table I or Table II and its Appendix.

The importance of these long term studies is in showing, not that there were occasional early nests in 1957, but that in all 10 species studied which normally breed in March and April, the mean date of laying of a whole population was decidedly earlier in 1957 than in most other years.

OTHER SPECIES

Extensive data received for other species are summarized in Table II. This includes all species for which over 35 Nest Record Cards were examined, irrespective of whether early breeding was suspected. In Table II, the first (left-hand) number in each column is the number of Nest Record Cards in which laying started in the week in question, while the additional (right-hand) figures, preceded by a plus sign, are the early layings in the same week recorded independently of the Nest Record Scheme. The latest of these sets of figures for each of the species concerned denotes the point after which dates of laying have not been specifically tabulated. The figure at the right-hand end is the total of Nest Record Cards in 1957 examined for the species concerned. By comparing the number of early layings on Nest Record Cards with the total number of cards examined (i.e. omitting the independent records), a figure is obtained for the proportion of all nests found in 1957 that were early; but unfortunately there are in nearly all species no figures for other years with which to compare them. Finally, in the Appendix to Table II are set out the records of early layings, but only the early layings, for all species for which fewer than 36 Nest Record Cards were examined.

Although quantitative comparisons cannot be made, Table II and its Appendix show that early breeding was widespread in 1957. In only one species, the Blackbird, was laying recorded before February, one nest in Northamptonshire (R. Felton) and one in Wiltshire (E. V. Forbes) having eggs in late December, and young being reared from both (2 out of 4 in Northamptonshire). Six more Blackbirds' nests were recorded with eggs in January: some of these were deserted, but others later contained young. Table II and its Appendix show that eggs were recorded in February in 10 species, Mallard, Lapwing, Stock Dove, Woodpigeon, Tawny Owl, Jackdaw, Mistle Thrush, Song Thrush, Blackbird and House Sparrow, while to these Rook and Heron can be added from the long-term studies, making 12 species in all. This is certainly not normal, though it doubtless happens in other early springs.

Five more species, Golden Eagle, Moorhen, Coot, Barn Owl and Robin, were recorded with eggs in the first week of March, and five others, Great Crested Grebe, Woodcock, Dunnoek, Yellowhammer and Reed Bunting in the second week of March. Further, a large number of nests had been found with eggs before mid-March in the cases of Song Thrush and Blackbird, and a fairly large number of nests had been found with eggs before the end of March in the cases of Great Crested Grebe, Moorhen, Lapwing,

TABLE II—NUMBERS OF CLUTCHES OF EGGS STARTED EACH WEEK DURING EARLY 1957, INCLUDING ALL SPECIES FOR WHICH OVER 35 NEST RECORD CARDS WERE EXAMINED

Columns show dates of laying of first eggs, calculated if necessary from details provided. Numbers on their own, or the left-hand ones where there are two in a column, are based on B.T.O. Nest Record Cards: numbers preceded by a plus sign are records received from other sources. The end column on the right shows the total numbers of 1957 Nest Record Cards examined.

	Feb.		March			April			-May-		Total Cards
	1-7	8-14	15-21	22-28	29-4	5-11	12-18	19-25	26-2	3-9	
Mallard (<i>Anas platyrhynchos</i>)	1+1	1+1	+1	5+1							52
Mute Swan (<i>Cygnus olor</i>)				2+1							40
Moorhen (<i>Gallinula chloropus</i>)		2+2	2	8+1							279
Coot (<i>Fulica atra</i>)		+1		+1	2	4					47
Oystercatcher (<i>Haematopus ostralegus</i>)						1		1	6		93
Lapwing (<i>Vanellus vanellus</i>)	1		1	11+3	21+2						304
Stock Dove (<i>Columba oenas</i>)	1					6					43
Woodpigeon (<i>Columba palumbus</i>)	1+3	+1		1	5	7	10				211
Skylark (<i>Alda arvensis</i>)						1+2	6				88
Swallow (<i>Hirundo rustica</i>)									6	9	246
Carrion Crow (<i>Corvus corone</i>)				1	2						40
Magpie (<i>Pica pica</i>)	+1			2	1	1					48
Wren (<i>Troglodytes troglodytes</i>)						5	12				229
Mistle Thrush (<i>Turdus viscivorus</i>)	+2	1		3+1							78
Song Thrush (<i>Turdus philomelos</i>)	2+8	7+4	41+1								1068
Blackbird (<i>Turdus merula</i>)	2+19	2+5	39+2								1815
Redstart (<i>Phoenicurus phoenicurus</i>)									3+1	2	46
Robin (<i>Erithacus rubecula</i>)		+1	5		11+2	19+1					300
Whitethroat (<i>Sylvia communis</i>)							2+1				130
Willow Warbler (<i>Phylloscopus trochilus</i>)								1	1	4	98
Chiffchaff (<i>Phylloscopus collybita</i>)							2	5	5	7	281
Dunnoek (<i>Prunella modularis</i>)			4	14+1	25+3						473
Meadow Pipit (<i>Anthus pratensis</i>)						4	2				69
Pied Wagtail (<i>Motacilla alba</i>)						1+1	2	1			63
Starling (<i>Sturnus vulgaris</i>)				1	9						176
Greenfinch (<i>Chloris chloris</i>)						2+3	4	6			245
Goldfinch (<i>Carduelis carduelis</i>)							1		3		36

	Feb.		March			April			May		Total Cards
	1-7	8-14	15-21	22-28	29-4	5-11	12-18	19-25	26-2	3-9	
Linnet (<i>Carduelis cannabina</i>)			1	3+4	18						309
Bullfinch (<i>Pyrrhula pyrrhula</i>)								1	11		110
Chaffinch (<i>Fringilla coelebs</i>)				+2	4+1	13					291
Yellowhammer (<i>Emberiza citrinella</i>)		+1					1	9			118
Reed Bunting (<i>Emberiza schoeniclus</i>)		+1			2	3+1	3	11			245
House Sparrow (<i>Passer domesticus</i>)	+1			+1	1	7+3	14				273

NOTE: Spotted Flycatcher (*Muscicapa striata*)—May 3-9 : +1
 May 17-23 : 1
 May 24-30 : 4
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APPENDIX TO TABLE II—EARLY LAYINGS IN SPECIES FOR WHICH ONLY A FEW NEST RECORD CARDS WERE SUBMITTED

February 28 :	3 Tawny Owl (<i>Strix aluco</i>), 1 Jackdaw (<i>Corvus monedula</i>).
March 1-7 :	1 Barn Owl (<i>Tyto alba</i>), 1 Tawny Owl, 1 Golden Eagle (<i>Aquila chrysaetos</i>).
March 8-14 :	6 Great Crested Grebe (<i>Podiceps cristatus</i>), 1 Woodcock (<i>Scolopax rusticola</i>).
March 15-21 :	3 Golden Eagle, 1 Short-eared Owl (<i>Asio flammeus</i>), 2 Stonechat (<i>Saxicola torquata</i>).
March 22-28 :	1 Shelduck (<i>Tadorna tadorna</i>), 1 Buzzard (<i>Buteo buteo</i>), 2 Grey Wagtail (<i>Motacilla cinerea</i>).
March 29-April 4 :	2 Pheasant (<i>Phasianus colchicus</i>), 1 Water Rail (<i>Rallus aquaticus</i>), 1 Ringed Plover (<i>Charadrius hiaticula</i>).
April 5-11 :	6 Buzzard, 1 Little Grebe (<i>Podiceps ruficollis</i>), 2 Kestrel (<i>Falco tinnunculus</i>), 1 Ringed Plover, 5 Nuthatch (<i>Sitta europaea</i>), 2 Treecreeper (<i>Certhia familiaris</i>).

Robin and Dunnock. Other resident species which Table II suggests started early in 1957 were Mute Swan, Wren, Starling, Greenfinch, Linnet and Chaffinch. Indeed, every species listed in Table II may have been earlier than usual, while the records in the Appendix extend this list further. Laying definitely started earlier than usual in the few resident species for which analyses of Nest Record Cards have been published before, namely Robin (Lack, 1948), Song Thrush (Silva, 1949) and Greenfinch (Monk, 1954).

The Passerine summer visitors form a specially interesting group because, except for the Chiffchaff, they arrived in England in 1957 when the unusually mild weather was nearly over. Table I shows that the Pied Flycatcher laid only slightly earlier in 1957 than usual, while Table II suggests that, by comparison with statements in *The Handbook*, the Swallow and Whitethroat were definitely early, the Willow Warbler and Chiffchaff were probably on the early side, and the Spotted Flycatcher was definitely not early. Comparison with Cramp's (1955) data on Nest Record Cards shows, however, that the Willow Warbler was not early in 1957, so obviously one cannot attach great value to the generalizations in *The Handbook*. The data of Summers-Smith (1952)

confirm that the Spotted Flycatcher was not early in 1957. None of the rather few records received for other species of Passerine summer visitors was unusually early. The Swift, as shown in Table I, was definitely not early. Nor was any evidence received suggesting that the colonial sea-birds nested earlier than usual in 1957.

DISCUSSION

Table I shows that, after the unusually mild winter and early spring of 1957, various resident Passerine species and one species of owl definitely bred earlier than usual, the mean date of laying being in most cases 10-12 days earlier than the average for 5-9 previous years. But in the only two species, Great and Blue Tit, for which records extend back to 1948, breeding occurred earlier in 1948 than in 1957. Table II and its Appendix suggest that many other resident species probably started laying earlier than usual in 1957, and that this held not only for Passerine birds but for Limicoline species, pigeons, three families of freshwater aquatic species, and perhaps some other bird families. Indeed, early breeding may have been general among those British resident species that normally lay their eggs in March and April, since no information was received suggesting that any species in this category did not breed early. Of the summer visitors, however, only two, the Swallow and Whitethroat, were definitely early, though some others were probably a little early, and yet others were definitely not early.

What this paper documents is a fact already known in general for a long time, that if the first part of the spring is mild birds tend to breed early, and if it is cold they tend to breed late. In this connection, it is reasonable to suppose that temperature acts directly on the birds, rather than through some secondary influence, such as the appearance of green leaves. In support of this view, in 1957 several species laid eggs in February, although there was by then no obvious change in the amount of greenery. Further, the summer visitors bred very little earlier than usual, though by late April the vegetation was far more advanced than usual. That the summer visitors bred any earlier was perhaps because they returned to Britain rather earlier, but quantitative studies of this point were not made.

Finally, some earlier references to this subject may be listed. The correlation in the Great Tit between the time of laying and the temperature in March and April, and its adaptive relationship to the food supply, has been discussed by Kluijver (1951) and Lack (1955). The influence of temperature on the laying-time of British breeding species of *Turdus* has been treated by Myres (1955). The unusually mild winter of 1953-54 produced considerably more mid-winter breeding than in 1956-57 (Snow, 1955), these records showing that any possible effect of increasing day-length on the gonads may occasionally be outweighed completely by high temperature. Conversely, the effect of an unusually late cold

spring in delaying the development of the gonads was established for four British resident Passerine species in 1947 by Marshall (1949). Clearly, temperature has an important secondary influence on the reproductive physiology of various British resident birds, and this influence is presumably adaptive, resulting in the breeding season being so timed that the birds find their food abundant when they have young.

In conclusion, this paper is extremely meagre, but the remedy lies with the readers of it, because to obtain data of the type summarized in Table I is both easy and enjoyable for anyone long resident in one place.

SUMMARY

1. Following the unusually mild winter and early spring of 1957, 7 resident Passerine species and one resident owl laid their eggs 6-12 days earlier than usual, and many other resident species of diverse families almost certainly bred earlier than usual.

2. Some summer visitors nested a little early, but others did not.

3. Temperature perhaps acts directly on the birds, rather than through its influence on the vegetation.

ACKNOWLEDGEMENTS

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BREEDING SEASON CALLS OF THE CHAFFINCH AND GREENFINCH

By DEREK C. HULME

FOR TWELVE YEARS I have noted the days on which the "chwit" call of the Chaffinch (*Fringilla coelebs*) and the "tsweee" call of the Greenfinch (*Chloris chloris*) have been heard; both are usually described as "spring" or "spring and summer" calls. I had intended to compare the call season with each species' breeding and song seasons, but other projects have postponed this study. As *The Handbook* gives an indefinite period for these calls, however, the following observations may be of value now.

Most of my time is spent in Derbyshire, but in each of these dozen years except 1947 (when I went to the Channel Islands) I have taken two or three weeks holiday between mid-June and mid-August in Scotland. The two calls were heard regularly in that country, except in 1953 and 1955 when Shetland was visited, and were usually recorded on my return home, so that the seasons shown on the diagram (Fig. 1) can be regarded as correct for the north Midlands.

CHAFFINCH CALL

The Chaffinch call concerned here is the one described in *The Handbook* as a rather penetrating "tsit" or "chwit". The latter is perhaps the best rendering though both "tsit" and "swip" are satisfactory alternatives. *The Handbook* also mentions a clear, loud "wheet". Surely this is synonymous with the "chwit" note, or at least a local variant of it? A disyllabic version, "chwit-it" (T. A. Coward's "tchissik"), is occasionally heard, seemingly more frequently in Scottish localities than in south Derbyshire.

The call is uttered by the male *only* from any song-perch, including ridge tiles of buildings, on the ground and in flight (a few notes *en route* to a perch on one occasion only). It has been recorded in light to moderate rain, a light fall of snow and when the temperature was as low as 29°F. Normally the bill is opened as each note is produced, but once a calling bird was seen with a caterpillar in its bill.

Sessions extend over several minutes with a note roughly once a second. Sometimes the monotonously regular delivery is

interrupted by a missed note, an interjected "chwink" (Coward's "pink"), or even a snatch of song. Timings of 71, 62, 56 and 59 notes in four successive minutes are typical, but rarely a bird will call at a rapid pace of over 80 per minute (I have records of 80 regularly-spaced notes in a minute followed by 53 erratically-delivered notes in the following minute and also, from another bird, 82 in a minute, plus an interspersed of a "chwink-chwink" and four "chwink" calls).

Listening to a Chaffinch uttering this call, one gets the impression that the bird is simply "ticking over": that is, idly using the call as a substitute for the more exhausting song. When the bird's mate or rival appears in view the caller immediately bursts into his full vigorous song.

The date of commencement has ranged from 19th February (in 1950) to 29th March (1958) while the closing date has varied from 16th June (1949) to 31st July (1958). The period covered by the extreme dates consists of 163 days. In reality the season has had a maximum of 143 days twice (8th March to 27th July in 1952 and 3rd March to 22nd July in 1955) and a minimum of 96 days (22nd March to 25th June in 1947) which, it will be remembered, was the season following an exceptionally protracted cold winter); the average season has covered 123 days. The call has been heard on between 31 and 80 days a season with an average over the twelve years of 56 days.

GREENFINCH CALL

The familiar nasal "tswee" (Coward's "dwee") call of the male Greenfinch is delivered at a considerably more leisurely rate

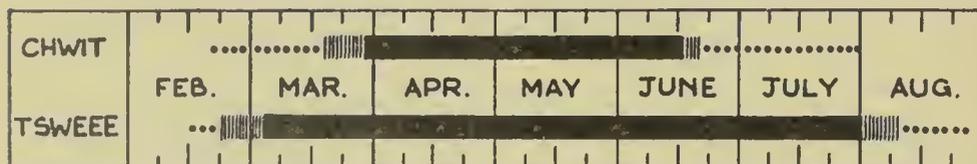


FIG. 1—THE PERIOD OF THE "CHWIT" CALL OF THE CHAFFINCH (*Fringilla coelebs*) AND THE "TSWEE" CALL OF THE GREENFINCH (*Chloris chloris*): DERBYSHIRE, 1947-1958

The black line denotes that the call was heard at that period in all years (except 1947 in the case of the Greenfinch); the strokes show that the call was heard practically daily at that time in at least three of the years; and the dots indicate odd dates only.

than that of the Chaffinch's "chwit". Intervals of ten and thirteen seconds between notes in a series are commonplace, though undistracted birds often settle down to a steady twelve or thirteen notes a minute. Again all the bird's song-posts are utilized, these including wire and cables (commonly), gable-end ridge tiles of houses and walls; and though the mention of the call invariably conjures up hot summer days it has been heard in mid-February when two inches of fresh snow has been lying upon

the ground, in thick fog with a temperature of 27°F., in a strong N.W. wind and in light rain.

Variants are legion, perhaps the most delightful being the "p'tsee-oo-wee" call, but I have always listed these separately and only unadulterated sessions of "tsweee" notes figure in the following statistical data.

The note, as is well known, is commonly introduced into the twittery song and it is again not difficult to regard the repeated call as serving as a make-shift song for the species.

The starting date has varied from 14th February (in 1953) to an exceptionally delayed 22nd March (understandably, in 1947: cf. Chaffinch, above). The next latest start was on 3rd March (1956) and in Fig. 1 this date is taken as the beginning of the positive season. The season has extended to 1st August (1956) at the earliest and 29th August (1948) at the latest. The extreme dates embrace a period of 197 days, though the actual longest season has fallen short of this figure by nine days (14th February to 20th August in 1953). The shortest season was 152 days (3rd March to 1st August in 1956) and the average works out at 173 days. The total of days on which the call has been recorded in a season ranges from 53 to 149 (but was less than 95 in only two years) with an average of 104. The low minimum was in 1947 when the Greenfinch was scarce locally, having suffered a great reduction in numbers in the preceding severe and prolonged winter.

SUMMARY

1. The "chwit" call of the male Chaffinch and the "tsweee" call of the male Greenfinch extend over an average season of three and nearly six months respectively. The diagram (Fig. 1) shows the season of both calls, compiled from the records of twelve years.

2. The calls appear to be substitutes for full song.

3. The "wheet" call of the Chaffinch is most probably synonymous with the "chwit" call.

PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

XCV. TEREK SANDPIPER

Photographs by ERIC HOSKING

(Plates 13-20)

Text by I. J. FERGUSON-LEES

HOW MANY OF US, while turning the pages of *The Handbook*, have not paused at the plate of the Terek Sandpiper (*Tringa terek*) and imagined seeing this bird? For, more than most of the rarer waders on the British list, it seems to hold a special fascination.

At the moment there is no great likelihood of coming across it in Britain or, indeed, in the western half of the Continent, and, though it has occurred in most European countries at one time or another, an indication of its rarity is given by the fact that there are only four Swedish records, while the first one to be reported from Denmark was not until 1951 (Poulsen, 1951). The three or four British records during the past 40 years are from Sussex and Suffolk in 1951 (Betts, 1952; Benson, 1952), from Co. Durham in 1952 (Evans, 1953) and probably from Norfolk in 1957. Yet Terek Sandpipers may eventually occur here with greater frequency, because this is one of the several primarily Asiatic species which are pushing westwards at the present time (see Harber, 1955, quoting from Dementiev and Gladkov, 1951). ...

The main range in Europe is in north and central Russia from within the Arctic Circle as far south as approximately the same latitude as East Anglia. Eastwards from there it extends the 10,000 miles right across Siberia to Anadyr and the shores of the Bering Sea; its northern limits reach almost to the mouths of the Pechora, Ob, Yenisei and Kolyma rivers, all of which flow directly or indirectly into the Arctic Ocean; and to the south the bird is found at Lake Baikal and along the more northerly parts of the Amur river (see map in Dementiev and Gladkov, 1951, p. 250). Its breeding range is thus almost entirely confined between latitudes 52° and 68°N., but like a number of other northern waders it is a species which travels vast distances and it winters in Australia, southern Asia (particularly the Malay Archipelago) and South Africa. (It is not known to breed or winter on the Terek river, which flows from the Caucasus to the Caspian, but it gets its name because the type specimen was found there, probably on passage, in the 1770's.)

Dementiev and Gladkov (1951) qualified their statement that the Terek Sandpiper was extending its range westwards (see above) by adding that it did not yet breed outside the Soviet Union. At that time this was correct, for, in spite of the fact that *The Handbook* includes the Bothnian coast of Finland in the breeding range, it is only recently that the evidence has suggested regular nesting in that country. Up to 1955 only some half-dozen nests had been found in Finland (in 1884, 1894, 1895 and 1913), but in that year a pair was seen scolding on an islet in the Gulf of Bothnia near Oulu, and in 1957 a nest with four eggs was found there (Merikallio, 1958). Then in 1958 two pairs bred on this islet and it is these birds which appear in the accompanying plates. The two nests were thus probably only the eighth and ninth to be recorded outside the Soviet Union; and so the small party, including the writer, which was enabled to spend three days on the islet (17th, 28th and 29th June 1958), is particularly indebted to Nils Fritzen and J. Siira: it was they who found the nests in both 1957 and 1958, and they who introduced us to the birds.

The habitat (plate 19 lower) was rather different from that

described in *The Handbook* and most other works of reference which, though mentioning small islands, lay the emphasis on the presence of scrub, particularly willow (*Salix*), and show that marshy grasslands and stunted tree-growth are the usual associations. Harber (1955), quoting from Dementiev and Gladkov, says that the species is very numerous in the Siberian taiga—the high coniferous forest zone which is characteristic of the cool regions bordering the treeless tundra and of which narrow marshy valleys thickly strewn with boulders are often a feature. The Finnish islet, by contrast, had no scrub and the only dominant vegetation, apart from three birch trees (*Betula*) at one end (see plate 19 lower), was short or shortish grass and a thin and scattered growth of the rush *Juncus balticus*. The ground was sandy and dotted with many stones, large and small. The slight rise and fall of the sea was sufficient to cover and expose a fair expanse of mud and large boulders which provided a suitable feeding area for the Terek Sandpipers and also for the rest of the islet's considerable population of breeding birds.

The bird population, in fact, was sufficiently heavy for it to have a bearing on the ecology of the Terek Sandpipers and so is worthy of brief review. Not more than 300 yards long, less than 250 yards wide and only some 10 acres in extent, the islet nevertheless had about 100 pairs of 21 species nesting on it in mid-June 1958. These included 4 species of ducks (10 pairs), 3 of gulls (11 pairs), 2 of terns (about 14 pairs), 4 of Passerines (14 pairs) and 8 of waders (about 52 pairs). Apart from the Tereks, the last group included Ringed Plovers (*Charadrius hiaticula*) and Redshanks (*Tringa totanus*), smaller numbers of Turnstones (*Arenaria interpres*), Ruffs (*Philomachus pugnax*), Temminck's Stints (*Calidris temminckii*) and Oystercatchers (*Haematopus ostralegus*), and one pair of Dunlin (*C. alpina*). Friction was frequent between the Terek Sandpipers and some of the other waders nesting near-by (see below).

One of the two Terek nests was near the middle of the islet, over 100 yards from the water's edge; the other was near the southern shore and only some 25 yards from the high water mark. Both were in areas of short grass among stones and the similarity of the two sites can be seen from a comparison between plates 16 and 17, while one gets a fuller impression of the surroundings from plate 20. The nests themselves were quite open and (see plate 15) were simply hollows lined with a few bits of birch bark and dead vegetation (grass in one case, tide-wrack in the other) together with a number of small pebbles. The clutches consisted of three and two eggs respectively, but four is generally considered to be the normal and the nest found by Fritzén and Siira on this islet in 1957 did indeed contain four eggs. The eggs are illustrated and described on plate 15.

On incubation, *The Handbook* has: "Incubation-patches only recorded from males and birds shot from nests by H. L. Popham were all males". On the other hand, Harber (1955) translated

from Dementiev and Gladkov (1951) as follows: "Probably only the female incubates, but the male keeps near the nest all the time and is usually first to fly up when it is approached, while the female feigns injury. The female has one incubation-patch". At No. 2 nest in Finland in 1958 it seemed that only one adult was sitting on 17th and 29th June. The same applied at No. 1 nest on the 17th, but there on the 28th the two birds were covering the eggs in turn, and plate 20 shows the change-over about to take place. Perhaps the second adult sits on the eggs only in the last stages of incubation: this is the time when nest-relief most often occurs in certain other waders. The change-over was continuously accompanied by a soft and sweet warbling noise that sounded more like the sub-song of a Passerine than the call of a wader: the sitting bird would begin to utter this sound when its mate was still some distance away and it would be continued throughout the period (sometimes up to a minute) that the pair were together in the vicinity of the nest.

Like a number of other sounds used in similar circumstances—from the secondary songs of some Passerines to the bill-clattering of the White Stork (*Ciconia ciconia*)—this warble was essentially an expression of excitement, for it served not only as a greeting-call, but was also used when the young were being brooded and, more significantly, during threat-displays at other birds, particularly Ringed Plovers and Turnstones, which came too close to the nest. Whenever another wader came too near, one of the Terek Sandpipers would make a series of rapid darts at the intruder—with tail spread and head down and forward (almost touching the ground) but wings at sides, uttering the warble continuously. Ringed Plovers had nests only a few feet away from each of the Terek sites, and Turnstones and Temminck's Stints were breeding within a matter of yards of No. 1 nest, so that threats of this kind were frequent; at times actual fighting took place with a flurry of wings, beaks and tails.

The normal alarm-note, used when humans were near the nest, was a particularly distinctive rolling trill and a lower intensity alternative was a liquid double "turrr-lip"—both quite different from the common flight-notes which were a soft and melodious "tütütütü" or "tühu-tühu-tühu" and a quiet trill. When we first visited the islet, on 17th June, the Tereks were not particularly demonstrative when one was near the nest: in fact, they usually retired to the shore or at most they perched, bobbing, some 30-50 yards from the nest. But by our second visit, eleven days later, they were much more aggressive as the time of hatching drew near. In fact, at 09.00 hours (local time) on this day two of the eggs in No. 1 nest were "starred" and the third had a distinct hole through which the chick could be seen; two eggs had hatched by 18.30 that evening, and the third chick was out by 08.20 next morning (the 29th) though still wet. At No. 2 nest the eggs were "starred" on 29th June and presumably hatched at some time on the 30th. Neither of these nests was found until after incubation had started, which is unfortunate as the incubation-period of this species does not appear to be known,



Eric Hosking

TEREK SANDPIPER (*Tringa terek*) ON BREEDING ISLAND: FINLAND, 28TH JUNE 1958

This gives a good impression of the general shape—long upturned bill, long body and shortish legs—and it also illustrates, by the contrast in shade between the pale (yellow-orange) legs and the all-dark bill, the fact that none of the four birds on this island (plate 19 lower) had any orange colour at the bases of their beaks (cf. *Handbook* and see page 90). As the Terek runs about, it recalls a large Common Sandpiper (*T. hypoleucos*) and has the same bobbing actions.



Eric Hosking

INCUBATING TEREK SANDPIPER (*Tringa terek*) PANTING IN SUN: FINLAND, 28TH JUNE 1958

In winter the bird is mainly grey-brown above and white below, with inconspicuous dark streaks on the upper-parts and breast. In summer, however, after a moult during February/May, the feathers of crown, nape and mantle have broader shaft-streaks of dark brown and some of the scapulars have very broad central markings of blackish-brown: the resulting pattern is well shown here where the wing is drooped, but these markings and the ground colour are rather variable (see plates 16 and 17).



Eric Hosking

TEREK SANDPIPER (*Tringa terek*) RETURNING TO NEST: FINLAND, 28TH JUNE 1958.

The eggs are stone-coloured, unevenly and rather sparingly marked with dark brown, reddish-brown and ashy-grey: 4 is the normal clutch, but the two nests on this island had 2 and 3 eggs. The egg nearest the camera here is chipped (dark hole in upper surface): all three had hatched 24 hours later. Note the bird's pure white under-parts, brown-streaked on the throat and sides of breast (see also plate 19 upper). The short web between the toes is more marked than in most other species of *Tringa*.



Eric Hosking

TEREK SANDPIPER (*Tringa terek*) ON NO. 1 NEST: FINLAND, 28TH JUNE 1958. This is the nest shown in all these photographs except plate 17. The two sites were similar: both were completely open in short grass among large stones; both were slight hollows lined with bits of bark (see plate 15) and dead grasses or tide-wrack. The bird's bill is nearly twice as long as its head, but is neither as long nor as thin as is sometimes depicted; it is very wide at the base and perhaps more upturned than it seems in these photographs (see page 80).



Eric Hosking

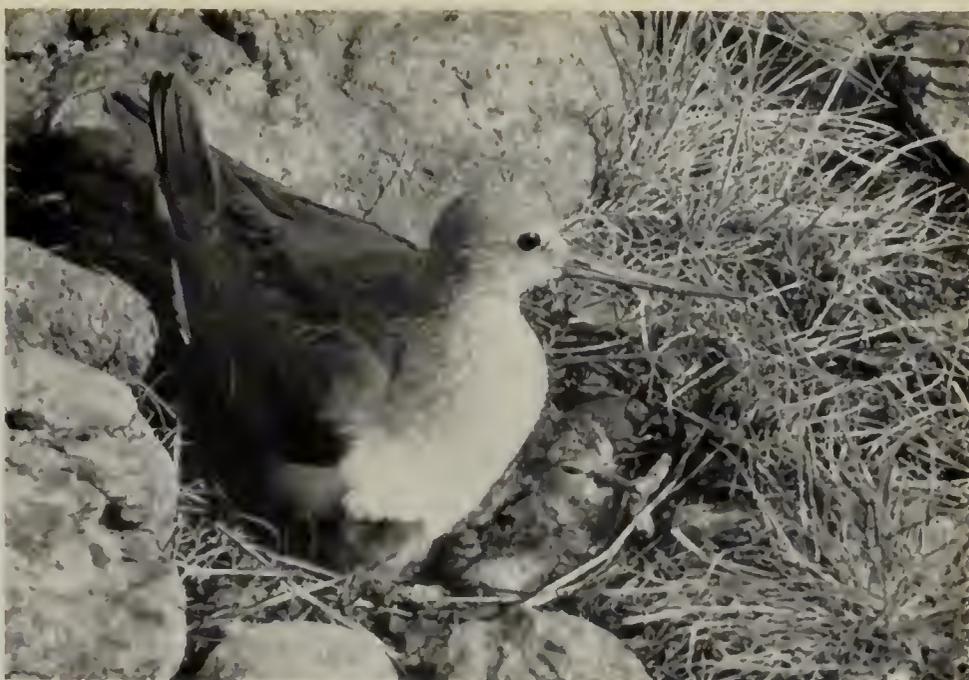
TEREK SANDPIPER (*Tringa terek*) ON NO. 2 NEST: FINLAND, 29TH JUNE 1958. A comparison between this photograph and the one on plate 16 illustrates the variation which may be found in this species: apart from being paler and greyer with, therefore, more contrasting dark marks, this bird at No. 2 nest was much shyer and more conscious of the hide. Here one can see especially well the shaft-streaks on the mantle and the black stripes formed by the dark-centred scapulars.



Eric Hosking

TEREK SANDPIPER (*Tringa terek*) AND CHICKS: FINLAND, 29TH JUNE 1958

The newly-hatched chick is pure white below; above, the down varies from buff to golden and is flecked with grey as a result of blackish bases and tips; there is also a striking dorsal stripe of brownish-black from bill to tail, and a narrow line of the same colour through the eye (see also page 89). Note the white eye-rim of the adult: at close range this was more marked than the streaky white forehead and short pale superciliary which can be seen in most of these plates.



Eric Hosking

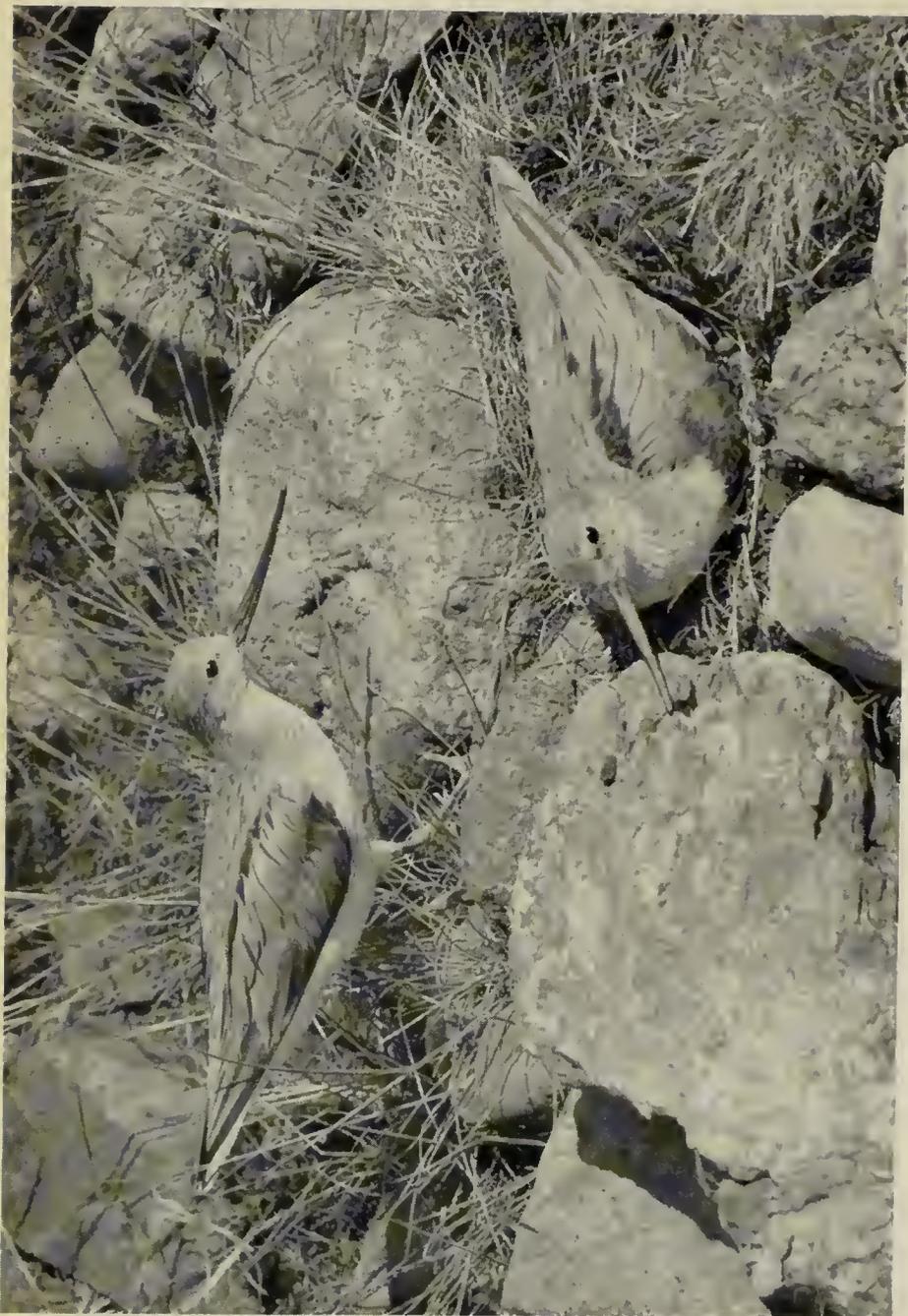
TEREK SANDPIPER (*Tringa terek*) AND CHICKS: FINLAND, 29TH JUNE 1958



Eric Hosking

FINNISH HABITAT OF TEREK SANDPIPERS (*Tringa terek*): 17TH JUNE 1958

The island where Tereks nested in 1957 and 1958, and probably 1955, is only ten acres in extent, some 300 yards long and less than 250 yards across at its widest point. Yet 21 species of birds, totalling over a hundred pairs, were breeding there in June 1958. Sandy soil, large stones and a broad surround of wet mud are features of this flat island on which the main vegetation, apart from three birches (*Betula*), consists of short grasses and the low rush *Juncus balticus* (see pages 86-87).



Eric Hosking

PAIR OF TEREK SANDPIPERS (*Tringa terek*) CHANGING OVER AT THE NEST: FINLAND, 28TH JUNE 1958
 Both sexes will sit on the eggs (page 88 and cf. *Handbook*). Observations at these nests were mainly during the last two days of incubation and, as is then usual with many waders, the change-over was frequent. During these periods of up to a minute when the pair were together in the vicinity of the nest, they uttered a soft and most unwaderlike warble (see page 88). Note here the effect of the wing being outlined with blackish, which was sometimes very noticeable.

though Harber (1955) quotes Dementiev and Gladkov as giving it as "apparently 21 days".

After the hatch at No. 1 nest, on 29th June, the young remained in the scrape and were brooded by one of the adults (plate 18) until the sun was high and they had all dried out. They were then called away by their parents and in a matter of a few hours had been taken to the sand and mud on the northern shore of the island, a distance of about 140 yards through fairly short rough grass. There, both adults remained with the young for the rest of the day, our last on the islet—but one was very much more demonstrative than the other, coming within a few yards if any of us approached, while its mate remained more quietly at a distance of 30-50 yards.

Although *The Handbook* describes the Terek Sandpiper as "usually tame and approachable", we found them rather shy except when the eggs were hatching or when they had young. They would tend to leave the nest when anyone came within about a hundred yards—but, conversely, they usually returned to it within two or three minutes of an observer's being left in the hide. In this connection Browne (1949) found that some of the birds in winter at Aden were tame, but "on another occasion a single bird flew off at 200 yards".

The nestling is shown and described on plate 18, and in any case there is a detailed account in *The Handbook*, but it might be added here that the three young from nest No. 1, when less than twenty-four hours old, had short straight bills of a greyish-black colour, while their legs and feet were pinkish-grey on the upper sides and orange at the rear of the tarsi and on the soles of the feet.

The legends beneath the photographs on plates 13-20 draw attention to most of the main plumage features of the adult Terek Sandpiper, but it is worth enlarging on the general field impression and emphasizing certain points where our experience differed from statements in *The Handbook*. In brief, the species is an exaggeration of the Common Sandpiper (*Tringa hypoleucos*): it is larger and paler, and has of course a much longer bill, but the long body and shortish legs are essentially on the same pattern (see plate 13); it has a similar (though more deliberate) way of moving the hind part of its body up and down; and it has a comparable shallow flicking action in flight. The Redshank-like flight-pattern produced by the white tips of the secondaries and the wholly off-white tail has been commented on in *The Handbook*, but this feature can be over-emphasized: owing to its ashy back and only slightly browner wings, all very pale, the Terek does not have anything like the same contrast between light and dark. The orange legs and feet, which varied in the four Finnish birds from a deep and almost dirty orange to a bright orange-yellow, were conspicuous at considerable distances and the upturn on the bill was always quite noticeable, but somehow the bill never seemed quite so long, so slender or even so upturned as we had expected. The shape of the bill is well brought out in plates 13, 14, 16 and 17, though from the angle at which all these photographs were

taken, looking down on the bird, a little of the upturn is perhaps lost (compare plate 14 with *antea*, vol. xlv, plate 12, which shows a Terek Sandpiper trapped at Ottenby, Sweden). In all four birds the bill was completely dark (see plate 13 and *cf. Handbook*): in this connection it is worth noting that published descriptions of individual birds (e.g. Betts, 1952; Evans, 1953) refer to their having black bills, though Benson (1952) mentions that at close range it was possible to see that the "base of bill (was) rather lighter than remainder": perhaps there is some seasonal or age variation here.

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SHELDUCK COUNTS IN WINTER IN EAST SCOTLAND

By HENRY BOASE

DURING THE YEARS 1947-1954, counts of Shelduck (*Tadorna tadorna*) were made by several observers at Edenmouth on the east coast of Fife. During the same period the writer worked Montrose Basin in Angus and continued the counts at Kingoodie in Perthshire, on the north shore of the upper Tay estuary. These counts have been plotted as three graphs, all on the same scale, so that direct comparison is simple (see Figs. 1-3).

At Edenmouth the autumn counts consist almost entirely of juveniles of the year and these tend to drift away as winter approaches. In December/January there is a build-up of incoming birds which reaches a maximum in late January or February; this is followed by a slow reduction from mid-March and an abrupt drop in numbers in late March or early April, the usual summering count of 250-300 remaining by late April. At Montrose, and in the Tay, there is no wintering group, but each station shows a slow build-up in February/March. Tay has a fairly definite fall in mid-March almost every year, and a further rise in numbers

during April-May. The varying counts at these stations suggest a succession of movements during the early months of the year.

The Shelduck has been found to have an unusual moult-migration. Hoogerheide and Kraak (1942) gave the first account of this behaviour as found on the Dutch coast, and Coombes (1950) and others in England have worked on the movement on this side of the North Sea. Apparently the Knechtsand, a maze of sand-banks and channels off the German coast between Bremerhaven and Cuxhaven, is the main moulting area in western Europe; and there is a less important station on the Bristol Channel. Hoogerheide and Kraak have shown that there is a return movement of mature birds westwards along the Dutch coast in October/November and that the usual winter total is reached in early December. They report that in severe weather many depart but return almost at once when milder conditions set in. There are rapid variations in numbers from mid-February to mid-March.

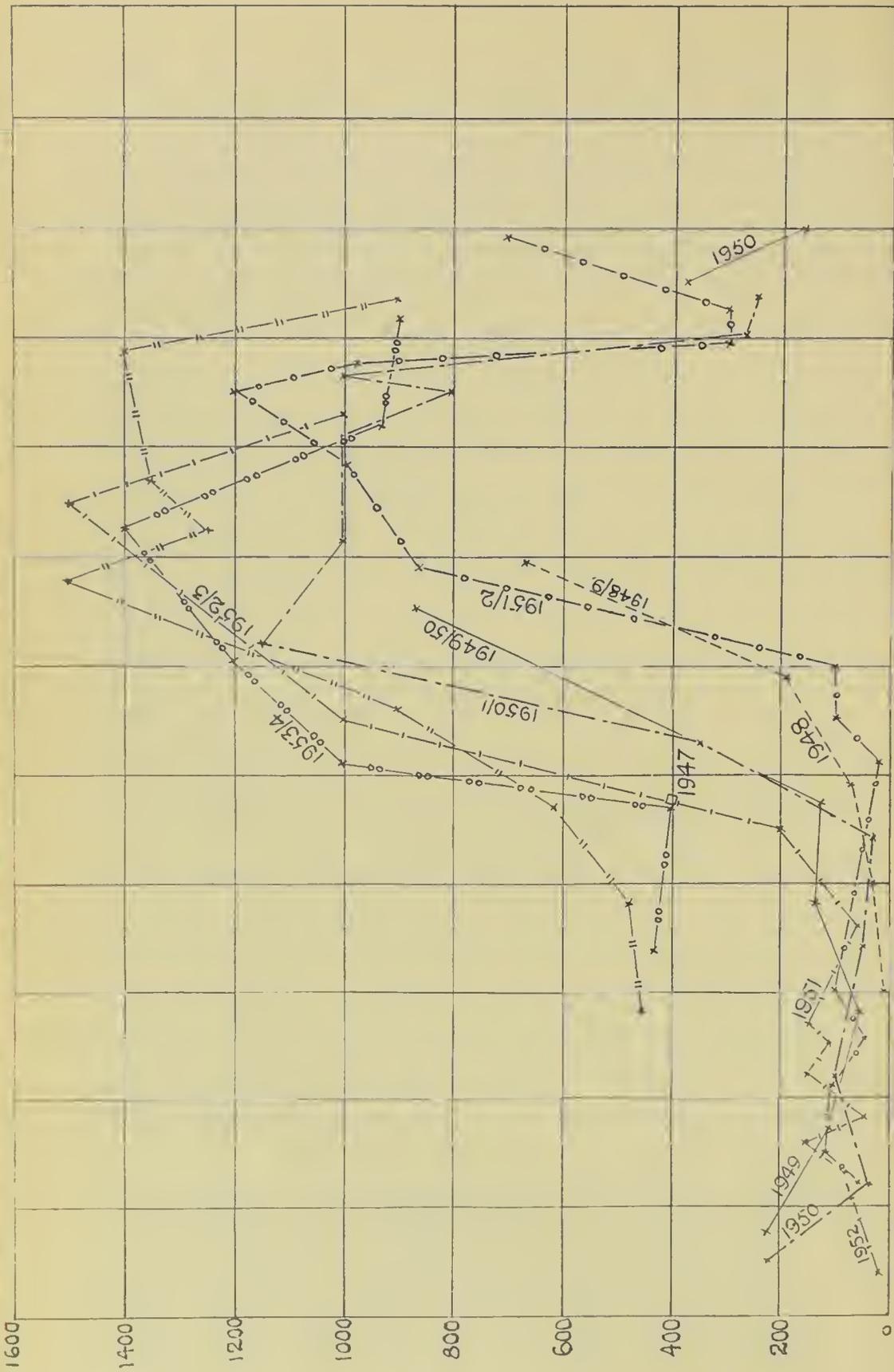
In north-east Kent, Gillham and Homes (1950) have found a big increase in numbers during November, with four-figure counts by mid-December and the peak in the last days of December or the first few days of January (though in mild conditions the main influx may not develop). There is a loss in numbers before the end of January; and by February, counts may be down to one third of the peak. There are fluctuations in March and normal summer numbers are attained in April.

It is interesting to find that weather conditions affect the counts on the Dutch coast and in N.E. Kent, and yet the build-up at Edenmouth takes place during the roughest weather of the year.

At all stations there is a rapid reduction in numbers in late June and early July when most of the summering birds depart to moult. Some mature birds remain with the juveniles of the year and so pass through the moult in the breeding area. The juveniles change during October/December to a plumage similar to that of the adult, but they retain the juvenile flight-feathers and some coverts, by which they can be identified as yearlings under favourable conditions.

The wintering population must consist of several categories. It is established beyond doubt that many Shelduck do not breed in any one year although present at the nesting area. It is not yet certain at what age the young birds can and do breed. It is reasonable to assume that the wintering birds could be grouped as follows:—

- (a) Potent adults attaining breeding condition.
- (b) Adults which for reasons unknown will not breed in the ensuing spring; males in this category may show their want of sexual vigour by the lack or poor development of the knob on the bill.
- (c) Birds of two summers (about eighteen months old) which are probably sexually immature although paired in some instances.



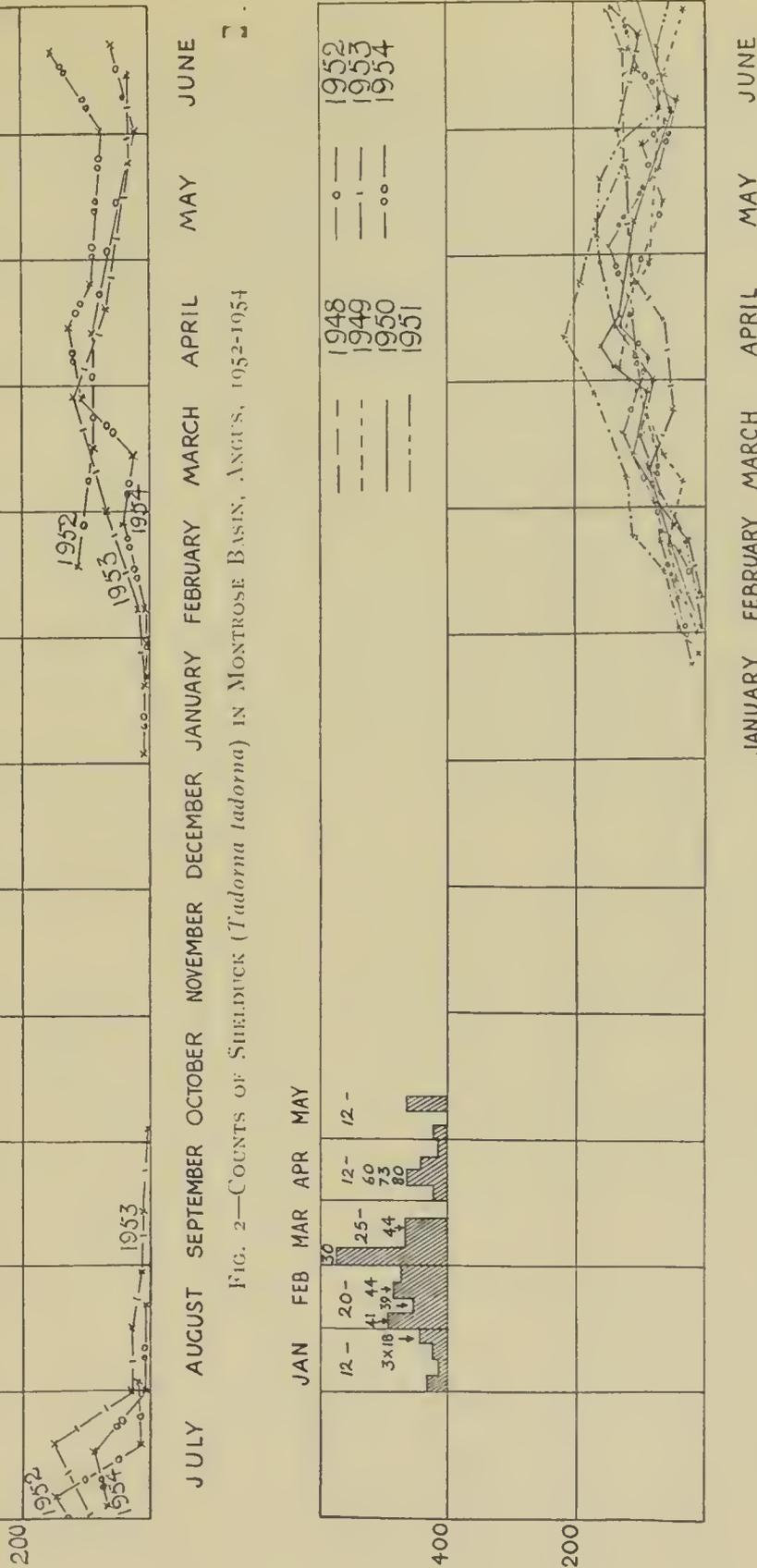


FIG. 2.—COUNTS OF SHIELDUCK (*Tadorna tadorna*) IN MONTROSE BASIN, ANGUS, 1952-1954

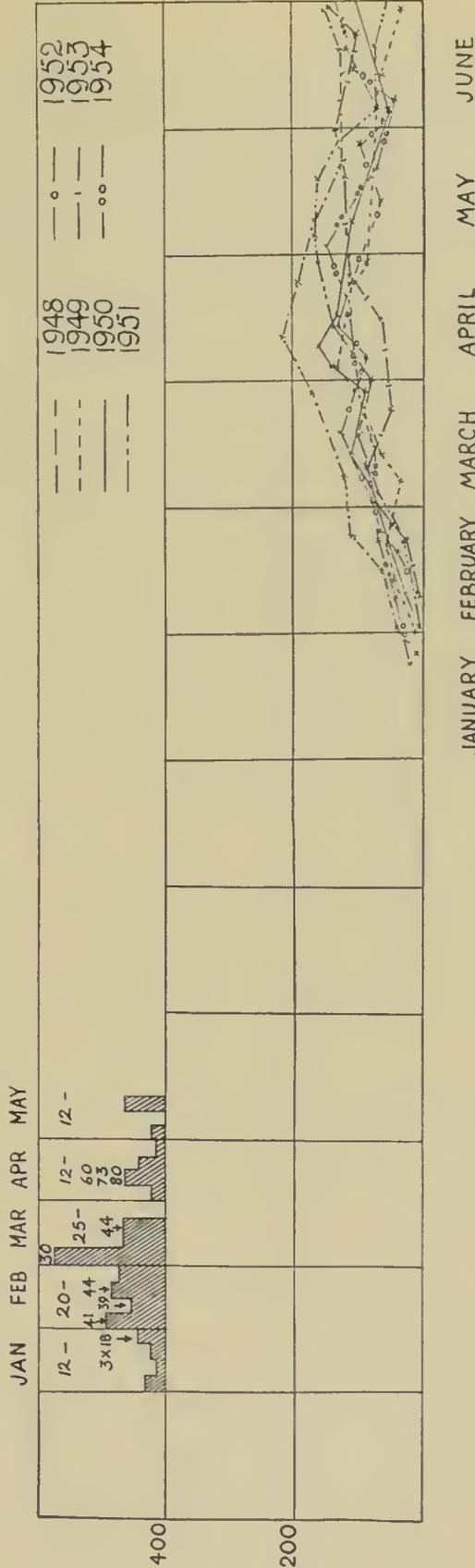


FIG. 3.—COUNTS OF SHIELDUCK (*Tadorna tadorna*) IN THE TAY ESTUARY, 1948-1954

The inset diagram in the top left corner of this figure shows the incidence of parties and is based on the records of about twenty years: it bears no direct relationship to the main graphs. In it the figures 12-, 20-, etc., heading the monthly sections, refer to the usual range of counts of parties in these periods, i.e. 12 or less, 20 or less. The other figures show what larger groups were seen. For example, there are three records of large groups in the 2nd week of April, but otherwise only parties of 12 or less were found in that month.

- (d) Birds of the year (six or seven months old); these may be present, but the records of them are very few.

In the reviews of behaviour given by the Dutch and English observers quoted above, there is agreement that the return to the breeding areas is gradual and in small parties: there is no mass return. This behaviour is also found at Montrose and in the Tay estuary. As to the time of return, there is like agreement that the main arrival is in February and March, and, according to Baxter and Rintoul (1953), this is so even in the western and northern islands of Scotland. On enquiry from Dr. Holger Holgersen, it was learned that the return on the west coast of Norway was also in March. It is therefore notable that the assembly at Edenmouth is still almost intact up to the third week of March.

The records for the Tay estuary go back for more than twenty years and these notes have been searched for records of parties.

The block diagram on the Tay graph (Fig. 3) shows the relative number of parties, and the approximate numbers in these, found in the records for the months January/May. It illustrates the presence of smaller groups in February and March, and the occurrence of larger groups in late March and early April. There is also a re-appearance of groups in May at a time too early to be explained by the onset of the moult migration.

The records of yearling Shelduck, identified by the white-tipped secondaries or the absence of the chestnut breast-band, are few and refer only to the upper Tay estuary. The records include one report in January, one in February, two in March, two in April, and eight in May.

The foregoing are the main points of the available records. The underlying behaviour appears to be as follows:—

- (1) After the moult at the main moulting area, birds from the west move along the Dutch coast in October/November and many pass over to south-east England in November/December. If the weather is unusually mild, the movement is less obvious, possibly because the more ardent birds press on to the breeding places.
- (2) During October/November, and probably later, the juveniles of the year are dispersing from the breeding areas where they have remained after the departure of the adults in July. Some may remain or may join the passing groups of adults. Three ringing records indicate a possible wider dispersal:

<i>Ringed</i>	<i>Recovered</i>
Mellum (Germany): 24.7.33 (pull.)	Ile d'Oberon (Charente-Maritime, France): 10.12.33
Jaeren (S. Norway): 1.7.46 (pull.)	Dungarvan (Co. Waterford, Ireland): 1.1.47
Aberlady (East Lothian, Scotland): 2.8.53 (pull.) 	King's Lynn (Norfolk, England): 6.1.54

- (3) The return to the breeding places is in progress all over western Europe in February/March, yet the main body at

Edenmouth remains almost intact. It seems probable that the birds with the greater sexual vigour will seek the breeding areas at an earlier date than those less advanced. Early arrivals in the Tay have shown well marked development of the frontal knob, whereas late arrivals may show little or no knob, although paired. The earliest arrivals in the Tay have appeared in the first days of January, and there is a regular arrival in February; yet at Edenmouth the build-up of the pack may still be in progress. The first fall in the numbers of the pack may mark the final dispersal of the ardent breeders other than the local nesting group, the remaining birds being the non-breeding birds which move away in large parties to summering places elsewhere. In the Tay the non-breeding group appears to occupy a definite feeding ground while the breeding pairs seem to be much more scattered along the north shore of the estuary.

- (4) The reported fluctuations in numbers during February and March mentioned for the more southerly stations may refer to the passage of breeding birds, but the later and more marked changes are more likely to refer to the non-breeding flocks on their way north. The graph for the Tay shows a fall in numbers during March, and the flock diagram on Fig. 3 confirms the drop in parties after early March. The early April outlines show the rising numbers, and the greater number of parties, due to the share of departing birds from the Fife coast.
- (5) The rise in numbers in the Tay continues into May (Boase, 1950). Reference has been made to the occurrence of obvious yearlings in May. These immatures will make their first moult-migration in July, and may well tend to seek as a starting point the place of their up-bringing. Much is surmise, as little is known of the movements of the young Shelduck, or where they pass the winter.
- (6) There is no evidence at present of any direct return from the moulting station on the German coast to British shores. It appears, therefore, that the return to Great Britain consists of a coastwise passage, varying in urgency with the physical state of the individual.

It is as well to point out that the proportion of actual breeding pairs at Edenmouth and at Montrose Basin appears to be at least double that found on the north shore of the upper Tay estuary. In the writer's earlier paper (Boase, 1950), mention was made of a large crop of juveniles which seemed to be reflected by an increase in summering birds two years later. In 1954 there was an exceptional crop of juveniles at Edenmouth. In 1956 there was a record number of summering birds (223) in the Tay and also a record crop of juveniles. This may be mere coincidence or it may mark the presence then of young vigorous breeding birds.

Baxter and Rintoul (1953) give various reports of winter flocks

in Solway and in the Moray area. Unfortunately, the records are too vague to associate in any way with the Eden statement. It is clear, however, that Solway must have a much larger population of Shelduck in February than in May. The writer has worked the Carsethorn/Wigtown Bay/Luce Bay coast (Kirkcudbright and Wigtown) for several years in May and only at Carsethorn have there been numbers exceeding one hundred birds. Numbers at Wigtown Bay and Luce Bay have been small—less than twenty. Once only, there were at least twenty pairs in the Fleet Estuary.

ACKNOWLEDGEMENTS

The writer is indebted to Miss E. V. Baxter, Dr. J. S. Carter and John Grierson for the details of the Eden counts; and Dr. Holger Holgersen, of Stavanger Museum, was good enough to report on the arrival of Shelduck on the west coast of Norway. Without their assistance, it would not have been possible to find an explanation of the Tay records.

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NOTES

Display of Little Grebe.—A display by a Little Grebe (*Podiceps ruficollis*) near Wath-upon-Deerne, Yorkshire, on 4th May 1957, seems to have been a form of penguin-dance (*antea*, vol. L, pp. 269-270) and does not appear to be covered by the account in *The Handbook*. A single bird rose up on to its tail and legs with wings fluttering rapidly and legs paddling hard. It scuttered along in this position for about fifteen feet and stopped in front of another Little Grebe where it slowly rotated through three-quarters of a circle still in the upright position with wings fluttering. The second bird took no notice of this display, which lasted for a few seconds, after which the first bird swam off. There were about six pairs of Little Grebes present and much chasing was taking place.

D. R. WILSON

Kittiwakes attacking Grey Seals carrying fish.—On two occasions in April 1958, I witnessed attacks by Kittiwakes (*Rissa tridactyla*) on Grey Seals (*Halichoerus grypus*) that were carrying large fish: both instances were off the coast of Northumberland. On 13th April, at the Farne Islands, three Kittiwakes in first-summer plumage were seen attacking a seal which surfaced with

a large fish: they settled on the water near the seal and then fluttered over it making little lunging stabs at the mammal's head. When the seal submerged, the Kittiwakes continued to hover over the disturbed water. On 15th April a very similar performance, involving four Kittiwakes, was seen off Dunstanburgh.

ROGER HARKNESS

Display by Swifts.—At 12.50 p.m. (B.S.T.) on 10th July 1958, in warm clear, still weather, after a long unsettled spell, my attention was attracted by the behaviour of two Swifts (*Apus apus*) in my garden at Cambridge. They followed each other in flight about 20-25 feet from the ground, the leading bird swooping towards the overhanging gutters of the house, the other following and checking, poising in the air and changing course a few inches from the gutters about a second after the leader, as if mimicking its movements. Eventually, after some minutes of this aerial follow-my-leader, one bird alighted for a few seconds below the gutter, the other clinging momentarily on the wall beside and touching it. There is a small cavity, occupied by House Sparrows (*Passer domesticus*) but unsuitable for Swifts, a few feet away from where the birds alighted, but the Swifts showed no interest. There is indeed nowhere on the building for Swifts to nest, although the procedure looked as if it would be appropriate to nest-site selection. Twice during these activities one of the birds arrested its flight about 40 feet from the house and made a burring noise with its wings, but there was no screaming. At least on one occasion the following bird became the leader.

EDWARD A. ARMSTRONG

[We showed this note to Dr. David Lack, in view of his study of the Swift (see *Swifts in a Tower*, 1956) and he commented: "While one cannot be sure with unmarked birds, this behaviour strongly suggests that of a pair of yearlings in search of a nesting-site. Such birds often appear at the University Museum Tower in Oxford, sometimes staying to nest and sometimes passing on." —Eds.]

Blackbirds feeding on marine worms.—On 3rd June 1957, I watched two male Blackbirds (*Turdus merula*) catching marine worms on the shore near Lee-on-Solent, Hampshire. The birds spent much time hunting, both on the open mud and amongst drifts of *Enteromorpha* weed, and appeared to be taking three species of worm. The first was a greenish errant polychaete worm, the second one of the nemertines, and the third seemed to be a species of *Arenicola*. This last species was tugged vigorously from its burrows. *The Handbook* does not include any of the marine worms in the diet of the Blackbird; nor does it refer to the species taking any marine organism on the littoral zone. The weather at the time was very warm and dry.

ROGER HARKNESS

Pied Wagtail remaining on ship from Thames estuary to Mediterranean in spring.—A male Pied Wagtail (*Motacilla alba yarrellii*) remained on board the S.S. Orcades from Tilbury, Essex, from which we sailed at about 14.30 hours on 28th March 1956, until well into the Mediterranean, where it was last seen on board at 18.00 hours on 31st March off Cabo de Gata, Spain. The weather throughout was calm and overcast, with rain and sleet at Gibraltar, where the ship berthed for several hours on the morning of 31st March. The coast of Portugal had been in sight for much of the previous day. It is remarkable that a Pied Wagtail should allow itself to be carried so far south at this season, out of its breeding-range, when for much of the voyage land was in sight and at Gibraltar only a few moments' flight away. E. J. M. BUXTON

House Sparrows feeding on young Frogs.—In 1958 an open tank in the courtyard of the Department of Zoology and Comparative Anatomy at Oxford contained a large number of Frog tadpoles (*Rana temporaria*). By 14th July most of these had metamorphosed and were clustering round the sides of the tank just above the waterline. On this and subsequent days they were regularly preyed upon by House Sparrows (*Passer domesticus*). The birds would hop down a sloping board into the tank, pick the frogs off the sides, and carry them off to the roof near-by to dismember and eat them. I can trace no previous record of House Sparrows feeding on small Frogs. R. G. B. BROWN

[During July 1958 there were large numbers of young Frogs in my garden at Bedford and on about six or eight occasions I watched a House Sparrow carry one off to eat it.—I.J.F.-L.]

REVIEWS

EXTINCT AND VANISHING BIRDS OF THE WORLD.
By JAMES C. GREENWAY, Jnr. Illustrated by D. M. REID-HENRY.
(Special Publication No. 13, American Committee for International Wild Life Protection, New York, 1958). 518 pages; a coloured frontispiece and 86 ink drawings; maps and diagrams.

THIS IS A DISPASSIONATE BOOK, but it loses no effect through the almost completely factual treatment of its subjects. Mr. Greenway has chosen as his part that of a chronicler; that his book will succeed in doing more than merely cataloguing the losses to world avifauna is mainly due to the unimpeded view that such a treatment allows of the birds that are gone for ever and those likely to follow them.

The book is divided into an introduction and summary of the species included, a section on the geography of extinction, separate accounts of all extinct and vanishing forms, a full bibliography, and an appendix listing the museums which contain remains of extinct birds. The professional ornithologist and

students of natural history will welcome the ease of reference that the book affords and, if they cannot find all the details that they may wish, the many footnotes and references included will cut down the time of their search for them elsewhere. For the lay reader, the chapter on the geography of extinction will be the most readable, but, if he needs encouragement, the illustrations will lead him on through the species section. Mr. Reid-Henry's style is at times meticulous but always very pleasing. Few living ornithologists will be able to comment on the accuracy of his drawings. However, those who know, for example, species of the genera *Pterodroma*, *Grus*, *Rallus* and *Zosterops* may well ponder, seeing his representations of certain rarer individuals of these groups, on the difficulty of the task that he was given.

Just to turn a few leaves of the book may tempt European ornithologists and bird-watchers merely to regret the passing of the Great Auk (how many of us have at one time cherished fancies of finding this species alive again) and then pass on to note with dissatisfaction the much more numerous losses in other parts of the world. Going deeper into the text they must realise, however, just how large a part was taken in the total erosion and decimation of so many species and sub-species, both avian and terrestrial, by the fore-runners of western civilisation. Not so much perhaps from their actions of exploration and economic development (these can be justified, for Man will always be the world's most needy species), but from what they took along with them and carelessly left behind them. Hungry sailors and pigs, cats and rats and that arch enemy, the Mongoose, can all be counted in this category. Isolated and uncommon species were in many cases defenceless when confronted by such indiscriminate predators and the speed of extinction was then incredible. In others Man merely removed entirely the necessary minimum of habitat. Mr. Greenway includes some interesting factor correlations on this subject. Some species have successfully contended with these and other sorts of pressure; others have adapted themselves to a new environment but they are comparatively few. The scene is still set for further extirpation. As the manuscript was finished in 1954 and publication was not until 1958, certain recent attempts at preservation and re-establishment, notably the Ne-Ne project at Slimbridge, find scant mention. Such action, still largely unsubsidized in Britain but sensibly supported in North America, points the way. The target for reclamation is immense. One or two breaches have been sandbagged, but disturbance is still at a dangerously high level.

One new factor needs comment, the part to be played by the great number of modern bird-watchers. We should not be innocents. This book will help us all to gain real regret for those species that are gone and which we will never see, and to accept a share of the responsibility that our enjoyment of those that remain to us entails.

D. I. M. WALLACE

THE BIRDS OF BRECKNOCK. By GEOFFREY C. S. INGRAM and H. MORREY SALMON, C.B.E., M.C. (Published by *The Brecknock Society*: reprinted from *Brycheiniog*, Vol. III, 1957). 78 pages. 5s.

THIS AUTHORITATIVE LIST is the result of a painstaking collection of records which goes back for over 30 years. It is based on the only previous list for the county, that of E. Cambridge Phillips (1899), and includes the thoroughly sifted observations of many observers. The authors themselves have explored every corner of the county and are able to give us their personal view on the status of every species. A full introduction summarizes the county's ornithological history and describes its topography.

The list includes 207 species and 4 subspecies which are made up as follows: breeding residents, 75; breeding summer visitors, 26; regular visitors and passage migrants, 18; occasional visitors, vagrants, etc., 92. Eight other species are in square brackets, and perhaps the 1903 report of Rock Pipits breeding in this inland county would have been better placed in square brackets too. There is a useful appendix of place-names with their 4-figure map-references.

A comparison of the present status of the breeding birds with that at the turn of the century shows that, while about two dozen have appreciably decreased, only one dozen have shown a significant increase. A striking feature of these decreased species is that, whereas in the past Man has been clearly responsible for reducing bird numbers, very few of those that have declined in Brecknock this half-century have done so because of any obvious human interference. Of those decreased some have done so in common with many other counties: Merlin, game-birds, crakes, Lapwing, Nightjar, Wryneck, Stonechat, Red-backed Shrike and Gull Bunting. Other decreases are surprising and presumably very much more local: Coot, Curlew, Common Sandpiper, Tawny Owl, Swallow, Jay, Ring Ouzel, Wheatear and Meadow Pipit (and concurrently Cuckoo). The sharpest decline of any has been that of the Nightjar which has changed from abundant to rare in the last 25 years. The most noteworthy increases include Buzzard, Black-headed Gull, Great Spotted Woodpecker, Raven and Nut-hatch. Others which were always numerous and are now probably even more abundant are Pied Flycatcher, Willow Warbler, Garden Warbler, Blackbird and Yellowhammer.

As to the future, one can foresee a continuing decrease of marsh birds, through drainage, and probably of some woodland species, such as Wood Warbler, through the replacing of oak-woods by conifers. On the other hand the conifers are probably favouring such species as Black Grouse, Long-eared Owl, Goldcrest and others.

With the appearance of this hand-list ornithologists are placed further into debt to the remarkable Ingram and Salmon partnership which has already provided them with invaluable bird-lists

for five other South Wales counties. It is to be hoped that the present work will stimulate bird-study in what is a most interesting and attractive county which is very poorly off for serious bird-students and bird-ringers.

W.M.C.

LETTER

"SUB-SONG" AND "SECONDARY SONG"

SIRS,—With regard to the paper by Miss P. M. Pilcher and myself on "The nature of sub-song" (*antea*, vol. li, pp. 509-514), I very much regret to find that we were incorrect in stating that the term "sub-song" was used by Mr. M. D. Lister (*antea*, vol. xlvi, pp. 139-143) merely to indicate volume difference. In fact he used the term "secondary song" for this purpose and proposed to restrict the term "sub-song" in very much the same manner as we were advocating.

W. H. THORPE

RECENT REPORTS AND NEWS

By I. J. FERGUSON-LEES and KENNETH WILLIAMSON

The items here are largely unchecked reports, and must not be regarded as authenticated records. They are selected, on the present writers' judgment alone, from sources generally found to be reliable. Observers' names are usually omitted for reasons of space and in case a report is subsequently rejected, and none of the items will be mentioned in our annual Index. Readers are asked to submit anything of interest as quickly as possible.

This summary is primarily concerned with February, from the 1st to the 22nd, but it includes a number of observations that are additional to the various sections in our last issue (*antea*, pp. 66-72).

THE WAXWING INVASION

The Waxwings (*Bombycilla garrulus*) became so widespread that it would be pointless to attempt to assess the situation any further until all the available records are in and a proper analysis can be made. However, we should perhaps give the additional counties (all England and Wales) from which reports have been received since the previous list (*antea*, p. 67) was completed. In chronological order with, as before, the date of the first report received, these include Herefordshire (5th January), Bedfordshire (10th), London ("about 14th"), Derbyshire (15th), Northamptonshire (17th), Leicestershire (17th), Hampshire (18th), Cardiganshire (28th), Warwickshire (30th) and Pembrokeshire ("first week February"). In addition, reports from Surrey and Westmorland on 3rd January are both earlier than the first dates given last month, and a few odd December reports from inland counties are being checked. The position on the East Coast became somewhat obscured by the breaking up of the big flocks, but it is clear that many of these moved off inland or farther south, in spite

of the fact that some East Coast districts still had large numbers in mid-February. The trend is illustrated by the fact that there have been no large numbers in Essex since flocks of 60 and 30 on 1st February, while the reports from Kent have been steadily increasing (we have, incidentally, now received 2 more December reports from Kent).

A WRECK OF KITTIWAKES?

On 22nd February some 17 Kittiwakes (*Rissa tridactyla*) were seen flying west over Queen Mary Reservoir (Middlesex), and between mid-day and 1 p.m. three parties totalling about 115 passed W.S.W. over the watercress beds at Leatherhead (Surrey). These two observations alone might suggest a small, but curious, passage across southern England from the Thames estuary, but on that same day, 22nd February, there were over 80 Kittiwakes at Pitsford Reservoir (Northamptonshire) and a total of 10 at Bartley Reservoir (Warwickshire). We should be glad to receive any relevant observations.

GEESE AND LAPWING MOVEMENTS

Reports from Lincolnshire (Stamford), Leicestershire and Nottinghamshire on 24th and 25th January seem to show that there was a strong north-west movement of grey geese (*Anser* sp.) inland in central England at that time. Skeins of 100-300 were reported from a total of 7 localities in those counties, all moving north-west, or between N. and W.N.W., and further observations would be interesting. Three groups were identified as Pink-footed Geese (*A. brachyrhynchus*).

Last month (*antea*, p. 70) we commented on the coincidence in dates and directions of Lapwing (*Vanellus vanellus*) movements in a number of counties from Berkshire to Lancashire. After that was written, but before it was published, we received several further independent observations of strong westward movements of Lapwings and to the list of counties quoted last month should be added London, Surrey, Hampshire and Shropshire. The peak still appears to have been during 9th-11th January, but flocks were passing west throughout 7th-13th. We should be grateful if all relevant observations could be sent to E. L. Jones, Willowbank, Eynsham, Oxford.

RARER BIRDS AND THE LESS COMMON WINTERERS

Two White-billed Divers (*Gavia adamsii*) were identified during February in Inverness Firth near Avoch Harbour (Ross-shire): both were first seen on 4th February, one until the 11th and the other to at least the 18th: the two birds did not apparently associate and were a mile apart on the 8th. The Lesser White-fronted Goose (*Anser erythropus*) in Kirkcudbrightshire (*antea*, p. 68) was seen again on 3rd February with Bean Geese (*A. arvensis*) and Greylags (*A. anser*), but could not be found during the following week. We now have fuller information about the Marsh Harrier

(*Circus aeruginosus*) observations in the same area (*antea*, p. 69): a number of reports of an immature from 28th December to at least 15th February show that either one bird ranges over about 5 miles of river and marshes or there may be two individuals.

In contradiction to the last comment on Bewick's Swans (*Cygnus columbianus*) (*antea*, p. 69), it now appears that in mid-February (and very probably earlier) there was a total of about 450 on the Ouse and Nene Washes (Cambridgeshire and Norfolk). There have been a few more reports of parties of up to 30 in various counties of the southern half of England, but not as many as in several recent winters.

A Spotted Crake (*Porzana porzana*) was identified at Warsash (Hampshire) on 29th January, and we have recently learnt that one was seen at Porlock Marsh (Somerset) on 9th December (*cf. antea*, p. 32). A Grey Phalarope (*Phalaropus fulicarius*) at Cromer (Norfolk) on 17th January is of interest in connection with the other January report received (*antea*, p. 72). An immature Iceland Gull (*Larus glaucoides*) at Ruxley, near Sidcup (Kent), from 31st January to at least 8th February, was the third interesting inland report this winter: the one at Cambridge (*antea*, p. 68) was seen at the sewage-farm there in early February.

The Richard's Pipit (*Anthus novaeseelandiae*) at West Huntspill (Somerset) (*antea*, pp. 32 and 68) was more difficult to locate during February, but was still present on the 12th, by which time it had been there for about eight weeks.

Although, as is usual, there was quite an influx of Firecrests (*Regulus ignicapillus*) last autumn, we have received only two winter observations: one at Tilmanstone (Kent) on 10th January, and one at St. Ives (Cornwall) on 23rd January.

LATE NESTS AND WINTER SONG

During October and November late nests of a number of species were reported (*antea*, p. 532); we have now received several further observations of nests in November and some even in December. It is not unusual for Mallard (*Anas platyrhynchos*) to be breeding as late as November, but among the reports received was one of 7 ducklings being hatched as far north as Carsebreck (Perthshire) on 15th November (only one survived a subsequent snowstorm); and at Malmesbury (Wiltshire) there were two nests in December: the first of these had ten eggs on 15th November and 1st December, and two eggs (one chipped) on 9th December; the second nest had 13 eggs on 10th December, but these had disappeared by the end of the month. A brood of young Moorhens (*Gallinula chloropus*) about a fortnight old was reported from St. Neots (Huntingdonshire) as late as 19th December, and in this connection it is interesting to note that a Coot (*Fulica atra*) was sitting on four fresh eggs on Frensham Pond (Surrey) on 15th October, after which a juvenile was seen there on 1st January. Two young Wood-pigeons (*Columba palumbus*) left a nest near Bury St. Edmunds (Suffolk) as late as 3rd December.

A pair of Song Thrushes (*Turdus philomelos*) had a nest near Swindon (Wiltshire) in December, but the eggs were taken at or just before Christmas. Song Thrushes were also incubating a full clutch of eggs at St. Neots (Huntingdonshire) until snow fell on the night of 9th/10th December. Three of five young Starlings (*Sturnus vulgaris*) in a nest at Hemel Hempstead (Hertfordshire) were found dead beneath it on 2nd December, but the remaining two apparently fledged on 8th/9th December. A fresh Starling's egg was found on the ground at Saltford, Bristol, on 19th January—but this seems to be a regular habit of Starlings even in winter!

At the other end of the scale, more properly regarded as a sign of early breeding, was the St. Kilda Wren (*Troglodytes t. hirtensis*) which on the remarkable date of 21st January was building a nest in a 3-lb jam jar lying in an enclosure behind one of the cottages on Hirta. By the 26th the feather lining had been started in spite of three days of snow and low temperatures.

Winter song and display must also be briefly mentioned, although the data are insufficient for many definite statements. From East Anglia, the Midlands and the South came a number of reports of unusual outbreaks of full song in late October and November, in the second half of December and early January, and in late January and February. Most of the species which are normally regarded as irregular or exceptional songsters in mid-winter were involved, but what stand out are the several reliable instances of Blackbirds (*Turdus merula*) in good song in November and December. And from Leicestershire, Surrey, Hampshire and Buckinghamshire came reports of Little Grebes (*Podiceps ruficollis*) trilling in December and early January.

Black Grouse (*Lyrurus tetrrix*) do not normally show any signs of display before the middle and end of February, or the beginning of the month at the earliest, but a low intensity display was reported on 22nd December from near a lek in the area of Simonsbath (Somerset): only two of a party of 7 males took part and the action lasted no more than two minutes.

COLLARED DOVES

Last October (*antea*, pp. 406-407) we briefly reviewed the 1958 status of the Collared Dove (*Streptopelia decaocto*) and showed that the species had nested in Norfolk, Kent and Morayshire. Since then we have had a breeding report from Hertfordshire and strong circumstantial evidence from Northumberland (though there is no proof of nesting in the latter). In Hertfordshire a nest with two nearly fledged young was found in a pine on 6th July and at least one adult was still in the area in early August. In Northumberland four birds were located in September (two of them probably juveniles) and three, if not all four, were there to at least 9th February.

ADDENDUM

As we go to press, we learn that a Killdeer (*Charadrius vociferus*) has appeared at Little Paxton (Huntingdonshire): first seen on 7th March, it was still present on the 9th (*cf. antea*, pp. 528 and 69).

NOTICE TO CONTRIBUTORS

British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

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2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlv, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, xlii: 129-134.

WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London, p. 34.

Various other conventions concerning references, including their use in the text, should be noted by consulting previous examples.

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BRITISH BIRDS

THE BREEDING BIOLOGY OF THE IVORY GULL IN SPITSBERGEN

By P. P. G. BATESON and R. C. PLOWRIGHT

(Plates 21-24)

INTRODUCTION

IN THE SUMMER of 1958 R. E. Hitchcock, J. L. Cutbill and ourselves spent just over three weeks at a colony of Ivory Gulls (*Pagophila eburnea*) in the Spitsbergen area. As the ice conditions were abnormally bad, our arrival at the colony was delayed until 17th July when the breeding season was already well advanced.

The Ivory Gull has been recorded as breeding in great numbers on the ground, but, unfortunately, we were forced to work at a relatively small colony nesting on a steep cliff (plate 21). Though we were principally concerned with the study of Ivory Gull behaviour we made a number of more general observations which should add to the information already given in *The Handbook of British Birds*.

THE BREEDING CLIFF

The colony at which we worked was on a cliff about half a mile inland from the south shore of Wahlenbergfjord in North-East Land; it was almost certainly visited by Montague (1926) in 1924. The position according to the Norsk Polarinstitut chart is $79^{\circ}41'30''N.$, $20^{\circ}57'E.$ The cliff was a little over a thousand feet high and was formed by a sill of dolerite, about 100-150 feet thick, above a limestone scree. The cliff continued for three or four miles to the west of the colony, but only about half a mile to the east it turned sharply inland where a dead glacier descended from the ice-cap. For most of its length the cliff faced in a northerly direction.

The main part of the colony was spread over about a quarter of a mile of the cliff. At the eastern end of the colony the Ivories were breeding among a few Kittiwakes (*Rissa tridactyla*). About a hundred yards from the western end there was a larger colony of

about 100 pairs of Kittiwakes, mainly concentrated round one chimney. Half a mile west of this Kittiwake colony a few more Ivory Gulls were nesting. In all, there were between 35 and 40 pairs of Ivory Gulls, although it was difficult to arrive at an exact figure as the number of nests fluctuated owing to predation by the Arctic Fox (*Alopex lagopus*).

Besides Kittiwakes a certain number of Black Guillemots (*Uria grylle*) were also breeding on this cliff. Glaucous Gulls (*Larus hyperboreus*) were infrequently seen at the colony and when they did appear were quickly driven away by the Ivories. Arctic Skuas (*Stercorarius parasiticus*) were occasionally seen flying past the cliff, but only rarely did the Ivories take any notice of them.

NEST SITES

The ledges on which the gulls nested tended to be on the upper part of the cliff. The distance from the top varied from 10 to 60 feet, the average being 32 feet. Although the spread was appreciable the majority of nests were noticeably about the same distance from the top (standard deviation = 12). These results agree well with those of Montague (*op. cit.*) who found nests between 15 and 80 feet down. The ledges varied considerably in size but, as a rule, were considerably wider than those used by Kittiwakes. The largest ledge was probably three feet broad and the smallest site a cubby-hole recess, the measurements of which were estimated to be 15 inches across, 10 inches high and 12 inches deep.

Where there were two nests on the same ledge they were much further apart from each other than is usual with Kittiwakes.

NEST CONSTRUCTION

The nests were bulky structures, loosely made of moss, lichen and saxifrage; these materials were collected chiefly from the plateau at the top of the cliff, although there was also some stealing. As the Ivories did not use mud in the manufacture of their nests, as did the Kittiwakes, large amounts of material fell off. Although the nests were still large when we left, owing to the incessant additions made by free birds before and after nest relief, it is understandable that Dalgety (1932) and Montague should have found nests on practically bare ledges. An impression of the nest and nest sites can be obtained from the plates.

TIMES OF LAYING AND HATCHING

It proved very difficult to keep a regular check on all the nests in the colony. We were unwilling to descend the cliff on a rope, partly because we were all inexperienced climbers and partly because we did not want to disturb the birds too much. For these reasons we were never able to examine some nests which were not visible from the top of the cliff. In addition, it was not always possible to check the contents of nests which were visible from the top of the cliff because the birds often refused to fly off. Finally, we were unable to examine the nests at all from 7th

August to 13th August owing to a blizzard which not only increased the reluctance of the birds to leave their nests but also made it very dangerous to approach the edge of the cliff.

When we first arrived at the colony there were more than 35 nests. At least three more nests appeared during the course of our stay; the times at which the eggs in these nests were laid are shown in Table I. Obviously the number given for eggs laid before 17th July is only a minimum figure. The times of hatching are also shown on the table.

TABLE I—TIMES OF LAYING AND HATCHING IN COLONY OF IVORY GULLS (*Pagophila eburnea*) IN SPITSBERGEN, 1958

Date	Number of eggs laid	Number of young hatched
Up to 16th July	51	1
17th July-20th July	1	7
21st July-24th July	1	2
25th July-28th July	—	3
29th July-4th August	1	14
Number of eggs unhatched on 4th August		22
Number of eggs lost and not known to have hatched		5

Four nests were robbed on 21st or 22nd July, which might account for the late layings, and another was found empty on 4th August. The figures from all of these nests that were visible are included in the table. In addition, 5 clutches of 2 lost one member of the clutch, but, as we are not certain whether the missing eggs hatched before disappearing, they are not included in the table.

It is perhaps interesting that the first ten chicks which hatched were all from a group of nests at one end of the colony. Although nearly half the eggs had not hatched on 4th August, all those laid before 17th July that were fertile must have done so on or before 13th August, assuming a constant incubation period (see below).

Summing our data with those of Collett (1888), Dalgety (1932), Montague (1926) and Sladen (1932), it seems that chicks are not likely to hatch before the middle of July and that the peak period will be at the end of July and the beginning of August, with the last chick appearing around the third or fourth week of August. The Kittiwakes seemed to have begun to breed about a fortnight earlier than the Ivory Gulls.

INCUBATION AND FLEDGING PERIODS

The only reference that we can find to the incubation length of the Ivory Gull is in Dementiev and Gladkov (1951), where it is

given as a little less than a month. Three eggs were laid after we reached the colony. Of these the one that was laid between 19th and 20th July was chipping on 13th August, when we had to leave. The chipping egg had a hole of roughly half an inch in diameter and it was reckoned that it would have hatched about six hours after our final observation. Thus the incubation period for this egg was between $24\frac{1}{4}$ and $25\frac{1}{4}$ days.

When we left the colony the eldest chicks were little over half grown. When Montague visited the colony on 29th August 1924, he found that all the chicks were still in down, having hatched out at least four weeks earlier according to other members of his expedition. Thus it seems that the fledging period is not less than five weeks.

CLUTCH SIZE

A clutch size of two is most usual at both ground and cliff colonies, but one egg is fairly common; only occasionally are there three eggs in a clutch, although this is evidently less rare in some years than others (Collett, 1888; Dalgety, 1932; Malmgren, 1863, in Newton, 1865; Manniche, 1910; Montague, 1926; Sladen, 1932; Wright, 1866). We recorded 22 nests with a clutch of two and 10 nests with a clutch of one.

An average clutch size of two or less is unusually small for a gull and, among Palaearctic species, is otherwise only found in the cliff-nesting Kittiwake. However, as ground-nesting Ivory Gulls also have a small clutch size, this difference can hardly be due to the cliff-nesting habit as Cullen (1957) has suggested is the case for the Kittiwake. Dalgety (*op. cit.*) made the very interesting observation that in 1930, when there was very little ice, half the occupied nests he found had one egg; and that in 1931, when the ice was much as usual, he found in the same colony only three nests with one egg and one nest with three eggs, the remainder having clutches of two. Lack (1947) has already suggested that there might be a correlation between the amount of food available and the clutch size, a plausible explanation in view of the supposed ecological connection between the Ivory Gull and the ice (see below).

BROODING BY BOTH SEXES

While studying Ivory Gull behaviour we often observed nest relief (plate 23). To study this more fully three pairs were watched continuously for 24 hours. The results were rather surprising (Fig. 1) and might explain the mystery which hitherto had been attached to the Ivory Gulls' nesting habits. Montague wrote: "The feeding of the nestling Ivory Gull is a problem. I spent between nine and ten hours continuously at the colony and not once in that time, though I was on the watch for it, did I see a bird arrive at or depart from the cliff, nor did I ever see two birds tending one brood". Dalgety, concurring with these observations, remarked that he had only once seen a bird arrive

at or leave a colony. Our results show that although nest relief was comparatively common during the early part of the watch, during the latter part some birds spent more than eleven hours on the nest and their mates were nowhere to be seen. It is possible that Montague had the misfortune to watch the colony during one of these spells of sitting. Regrettably we were never able to repeat such a watch and so establish if there was any rhythm in the occurrence of these long spells of sitting or whether it was just a result of mist and rain.

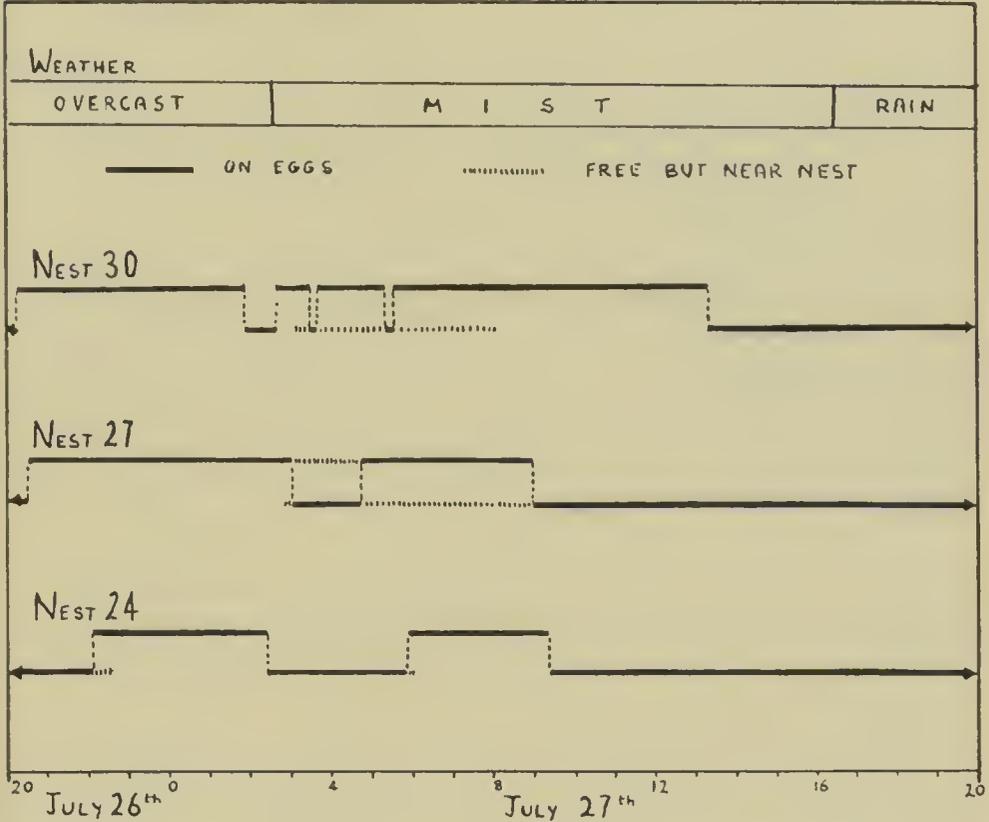


FIG. 1—To show the time spent by each adult of three pairs of IVORY GULLS (*Pagophila eburnea*) ON THE EGGS OR NEAR THE NEST DURING A 24-HOUR WATCH, SPITSBERGEN, 1958

In each case the upper line represents the female and the lower the male.

We saw Ivory Gulls coming to and going from the colony on a great many occasions. However, it should be mentioned that these movements were not apparently confined to any particular time of day.

As there have been a number of references in the past to the Ivory Gull possessing only one brood patch, it should be made clear that the bird probably always has three. We shot five birds (three males and two females) and each of these had three brood patches. According to Tucker (1943) a given species always has

a constant number of brood patches. Admittedly the two lateral patches are much less conspicuous than the median patch, which probably accounts for the earlier records.

These five birds had a great deal of subcutaneous and peritoneal fat, which may be an adaptation to long spells of sitting.

FOOD

The scavenging habits of the Ivory Gull are well known and it is probable that much of their food in the winter is derived from carcasses left by the Polar Bear (*Thalarctos maritimus*). Reference is also often made to the Ivory Gull eating the faeces of the large Arctic mammals. More often than not, however, this information appears to be based on inference rather than direct observation. It is certainly true that the gulls congregate where seals are lying out on the ice, but this might be in anticipation of the slaughter of one of the seals by a Polar Bear. Even if the gulls do feed on faeces, which they might well do when they are hungry, it is hardly likely that this could be a staple source of food.

In the summer the Ivory Gull appears to feed to a large extent on marine food. Manniche (1910) examined several stomachs of birds shot in Greenland and found fish bones and remains of crustaceans as well as pieces of seal and chironomid larvae. Montague found fish in some of the stomachs he examined. Hartley and Fisher (1936) observed Ivory Gulls feeding with Kittiwakes and on shooting one found that its stomach was full of the crustacean *Thysanoessa*.

Food that we observed being passed to young birds was frequently vermilion and sometimes silvery, which suggests that the birds had been feeding on crustaceans and fish. Of the five birds we shot, three had empty stomachs; the remaining two contained fish which were later kindly identified by Dr. E. Trewavas of the British Museum as Polar Cod (*Boreogadus saida*).

As Hartley and Fisher have pointed out, the Ivory Gull is an inefficient marine feeder because it is extremely unwilling to settle on the water and picks up food as it hovers. It is possible that the gulls fly north, as Montague has suggested, to feed among the pack ice, and that they obtain food for their chicks and perhaps supplement their own diet from the more local marine food. Montague has also suggested that the Ivories obtain their fish from below Kittiwake and Black Guillemot nesting places. This might be the case, but we have no observations of Ivory Gulls scavenging below Kittiwakes' nests.

PREDATION

The Arctic Fox appears to be the only serious predator on the Ivory Gull. The activities of this fox may have driven the gulls from the ground to nesting on cliffs. Even this has not brought complete safety, however, as the Arctic Fox is a remarkable climber: at least four nests were robbed by the fox in our colony.

T. S. Winsnes (personal communication) found a colony of twelve pairs of Ivory Gulls in 1957 on a cliff six miles east of Bodley Bay in Wahlenbergfjord. When we visited this colony at the beginning of August 1958 all the nests were empty, but it seemed inconceivable that they could have been robbed by an Arctic Fox. The only other possible predator was the Glaucous Gull. There was at least one pair nesting near-by and also several unattached birds. We saw Glaucous Gulls being driven away from our colony, but it is quite likely that the big gull occasionally manages to steal clutches, especially when only a few Ivory Gulls are breeding together.

CALLS

The calls and postures of the Ivory Gull will be dealt with in much greater detail in another paper, but a brief description of the most common calls might be of value here.

The Call Note is commonly heard both at the colony and away from it, and has even been heard in England (Cusa, 1951). It is a fairly shrill, disyllabic note, rather tern-like in quality and given once or repeated a few times, both in flight and on the ground. We transcribed it as "kree-ar" or "pree-ar", but the transcription "keer" in Peterson, Mountfort and Hollom (1954) is quite satisfactory. The Long Call may also be heard away from the colony although much less commonly than the Call Note. This call is in some ways similar to the scream of a Black-headed Gull (*Larus ridibundus*), but is less harsh and is sustained for a much greater length of time.

MOVEMENTS

Generalizations about the movements of Ivory Gulls are very difficult to make as the birds are so rarely seen away from their breeding-grounds. However, it seems fairly clear from the reports of a great many observers that the gulls remain in the vicinity of the pack ice where they presumably scavenge in the wake of Polar Bears and human sealers.

The gull moves southwards in winter and Snyder (1957) refers to those movements as "limited migration". If, however, the gulls move with the ice this description is scarcely very apt. Nevertheless a fair number of birds wander considerably further than the southern limit of the pack ice. Nearly eighty birds have been recorded from the British Isles alone. It has been recorded as far south as N. France; Holland; Lake of Geneva, Switzerland; Lake Ontario, Canada; Long Island and Massachusetts, U.S.A.; Hokkaido, Japan; and Shantung, China (Witherby *et al.*, 1941, and others). Although the stragglers are more often seen on the coast they have been recorded hundreds of miles inland in Canada and the Soviet Union.

When analysed, the British records reveal a peak in February, which is suggestive as this is the month when the pack ice extends furthest south. Unlike some of the other Arctic gulls, more adults than immature birds have been recorded in temperate latitudes.

Naturally enough there are only a few records of the return of Ivory Gulls to the latitude of their breeding area. Nansen (1898), overwintering at the north of Franz Josef Land, recorded the first Ivory Gulls on 12th March and noted that they became more and more numerous throughout April. Clarke (1898) in the same group of islands saw the first spring arrivals on 10th April.

The immature birds, as might be expected, do not usually return to the colony. We did not see a single immature bird throughout the summer we were in Spitsbergen, although some observers have seen small numbers there. In the unusual ice conditions of 1947 a great number of Ivory Gulls were recorded off Bear Island in mid-June (Williamson, 1948) and the majority of these birds were immature. It would seem, therefore, that the immature birds roam among the pack ice throughout the breeding season as do all ages in the winter. In the extensive literature of the birds of Spitsbergen there are a considerable number of records of single adults or small parties, flying round the coast or across the ice-caps in summer. We saw about six birds in the course of our boat journey round the north coast of Spitsbergen. The larger congregations of Ivory Gulls, however, have usually been seen in the vicinity of the pack ice, although Løvenskiold (1954) records 50-100 birds scavenging in the mining settlement of Sveagruva.

DECLINE IN NUMBERS

A few colonies in the Spitsbergen area have been revisited after their numbers were first estimated. A colony on Storöya, off the east coast of North-East Land, was visited in 1887 and found to have between 100 and 150 nests (Collett, *op. cit.*); Dalgety visited the same colony in 1930 and found only 11 nests. A colony in Palander Bay, North-East Land, which Dalgety visited in 1930 and 1931, then contained about 30 pairs, but when visited by us had no birds breeding. Finally, the colony which both Montague and ourselves worked at contained 100 pairs in 1924 and under 40 pairs in 1958. Admittedly this may be only an isolated trend, but it is difficult to escape the conclusion that the retreat of the ice is causing a decline in numbers. Apart from direct effects on its food supply, the retreat of the ice may expose the Ivory Gull to increased predation from the Arctic Fox and increased competition from other Arctic birds. Although the Kittiwake may not compete with the Ivory Gull, it is perhaps symptomatic that the Kittiwake colony on the cliff at which we worked has nearly doubled in numbers in the past thirty years.

The decline observed in Spitsbergen may not be general, however, and there is the possibility that fresh areas in the North American islands are being colonized.

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Whilst in Spitsbergen we received a great deal of help from the Norsk Polarinstitut and we should like to take this opportunity of thanking them for their kindness and consideration.

Finally we wish to express our sincere gratitude to Dr. Niko Tinbergen for the advice and encouragement which he so freely gave us.

SUMMARY

1. The authors spent just over three weeks in July and August 1958 at a colony of about 35 pairs of Ivory Gulls in the north-east of Spitsbergen. The gulls were breeding on a steep cliff in association with Kittiwakes. However, the nesting ledges and territories of the Ivory Gulls were much larger than those of the Kittiwakes. Also in contrast with the Kittiwakes, the nests were loosely-made, bulky structures.

2. The peak of hatching was at the end of July and the beginning of August. The incubation period for one egg was between $24\frac{1}{4}$ and $25\frac{1}{4}$ days; the fledging period was estimated to be not less than five weeks. The clutch size of both ground- and cliff-nesting Ivory Gulls is most often two but commonly one. Both sexes were found to brood and might spend from a few minutes to over eleven hours on the eggs.

3. The stomachs of two birds that were shot contained Polar Cod and food that was given to chicks appeared to consist of fish and crustaceans. The gulls may rely more on marine food in summer than has hitherto been suggested.

4. The most serious predator is the Arctic Fox, but Glaucous Gulls may also occasionally take eggs and chicks.

5. Although stragglers appear in temperate latitudes, the Ivory Gull seems to be tied to the pack ice in winter. For the most part the immature birds remain at the pack ice in summer as well and the breeding areas are never far removed from ice.

6. In Spitsbergen, at least, the numbers of the Ivory Gull appear to be declining. This may be correlated with the melting ice caps.

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NOTES ON THE DISPLAY, NESTING AND MOULT OF THE MUTE SWAN

By HENRY BOASE

FOR SOME YEARS the writer has recorded the variations in numbers of Mute Swans (*Cygnus olor*) at stations in and around the Tay estuary, in east Scotland. The cycle of changes found during this period suggested complex movements of age-groups, and a study of their behaviour revealed some matters of interest relating to display, nesting, moult, voice, bathing and feeding.

DISPLAY

The account of the display of the Mute Swan given by F. C. R. Jourdain and B. W. Tucker in *The Handbook of British Birds* is rather vague about the preliminaries to pair formation. In the Tay estuary, the records of numbers led to the conclusion that the summering groups there consist mainly of immatures in their second and third summers. Some showed a marked improvement in bill colour in the period June/August, indicative of advance to maturity*, and a watch was kept on the behaviour of these older birds to determine if possible whether any display is given and whether pairs are formed in late summer. That there is display, and that pairs are formed at this time, there is no doubt, but the performance is not very noticeable.

The forms of display of the Mute Swan are as follows; most of them are common to both sexes:

- (1) An attitude with the neck erect and almost straight, the bill held level and the head turning from side to side; in

*In the opinion of the Wildfowl Trust, there may be seasonal changes in the colour intensity of the Mute Swan's bill, as is the case with the Shelduck (*Tadorna tadorna*): if that is so, then some of the conclusions in this paper would need to be reviewed.—EDS.

mutual display each bird may turn to its right and to its left in unison.

- (2) An attitude with the neck erect and sharply curved near the nape, and the head and bill hanging down vertically—the pendant attitude. In mutual display, each bird may turn to its right and to its left in unison.
- (3) An attitude with the neck erect, the head and bill level and jerked upwards to about 40 degrees in a sharp movement—the bill-toss display.
- (4) A form of false preening, where the side of the head is rubbed along the line of the greater coverts and secondaries of the closed wing.
- (5) A dipping motion which may range from a dropping of the head for a few inches, with the bill pointing down, to an actual immersion of the bill or, in its extreme form, to a position where the whole neck is immersed. The rate of dipping also varies: often the more deliberate the dip the deeper it is, and, as a preliminary to treading, it may decrease in depth of movement as the rate of dipping (the number of dips per minute) increases.

These are the main displays used in pair-formation, and in themselves they are not very noticeable in the scattered group of Mute Swans on open water. The accompanying diagrammatic sketches (Fig. 1) may help to define the various attitudes used during display.

There is a further action which may or may not be display. It has the appearance of a deliberate drinking or sipping of the tide: the bill is immersed almost horizontally with the neck curved; the head and neck then straighten in line at an angle of 60-70 degrees, and the bird returns to a normal swimming attitude. The action may finish with the bird's rising on the water as the neck is stretched upwards, and the wings may or may not be raised from the sides and even partly opened (but not flapped). It has been noted as a group behaviour; once two birds side by side carried out the simpler form without the rise on the water. Owing to the range, it has not been possible with certainty to sex the birds so behaving, but most appeared to be males. This behaviour recalls the bill-toss salute of the Shelduck (*Tadorna tadorna*), which seems a general, rather than a particular, display directed to an individual bird. The final attitude is used in the "triumph" display when the male returns to his mate after repelling an invader into their territory; in a more vigorous form, it is part of the post-copulatory display.

The familiar attitude of the Mute Swan with curved neck and raised secondaries does not appear to be used in sexual display. It might be described as an attitude of interest or attention. There is also the more exaggerated form of this, with the neck pressed back and the bill resting on the frontal curve so formed; this

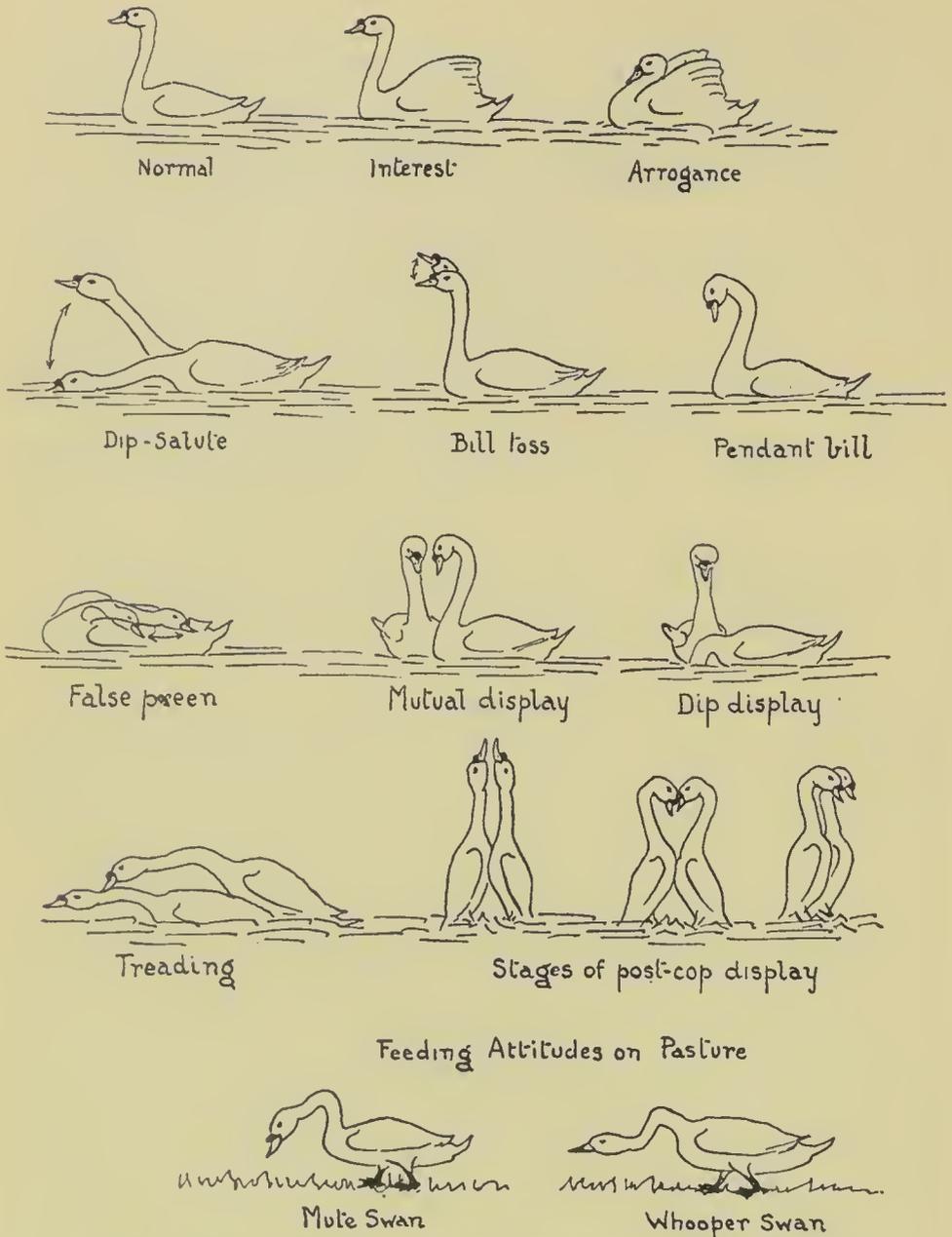


FIG. 1.—DISPLAY ATTITUDES OF THE MUTE SWAN (*Cygnus olor*)

attitude is one of defiance, and progression becomes a series of spurts consequent on paddling with both feet together (instead of the normal alternate strokes).

In the summering and wintering packs, the "interest" attitude is used very sparingly; once it was adopted by the apparent male of a pair still in company with juveniles, which as a group had been keeping aloof from the main pack. The latter had come up on the flood tide and had surrounded this family party; the male swam to and fro, keeping away intruding birds as they came near.

Probably the jealousy of the male was fading and so the "defiance" attitude was not developed.

Quarrelling among the birds of the pack is also exceptional. The few instances of attack and retreat have been seen in late August and in September. The attack is made in a sudden rush with out-stretched neck and the retreat a hasty flutter of wings and splash of feet.

Display among summering birds at Montrose Basin, Angus, has been seen on at least six occasions during August and September. On 15th August 1953 two or more couples showed display: in particular, two birds were facing each other with the bases of their necks touching, their actual necks very erect and their bills level. First one and then the other made as though to dip its bill, but then did not lower its head much more than half way. This was repeated five or six times. The birds may have been nodding their heads before the dipping began. On 4th August 1954 the "salute" was used by individuals in scattered groups. Two birds were also displaying together, sometimes side by side, sometimes at varying angles, using the "pendant bill" attitude, and dipping the head and upper neck into the water, sometimes together, sometimes alternately; now and then the actions were interrupted with momentary preening pretence (just lifting a feather or two) or even the cheek-rubbing behaviour. This display went on for five or six minutes. On this date 132 birds were present on the tide and, of these, about sixteen appeared to be grouped in couples; yet on 11th September following, with a like number present, there was no sign of pairs. In 1955 a group of only thirty birds appeared to include six couples, and during the watch at least one pair gave the "pendant bill" and "dip" displays for several minutes. On other occasions in late August and in September, other minor performances have been noted. The latest observed date of display was 11th October 1953, when two birds were on the tide facing each other with stiffly-erect straight necks, heads and bills held level and turning from side to side, recalling the similar behaviour of the Great Crested Grebe (*Podiceps cristatus*).

In field observation it is difficult to be positive as to the probable age of these displaying birds. Some years ago two birds turned up at a small storage pond in late June and both showed such poor bill colouring as to suggest that they may have been only in their second summer, and to leave in doubt whether they were actually male and female.

During the spring of 1955 it was possible to watch in some detail the reactions of one pair to the intrusion of a second pair into their territory. The site was a flooded quarry, all deep water, where nesting and the rearing of young would be well-nigh impossible; yet a pair came and went from this water and defended it vigorously on several occasions. When the watch began, there was a period of inaction. Presently, the defending cob assumed

the arrogant attitude with raised wings and bill depressed on the curve of the back-pressed neck, and set out to chivvy the intruding male, progressing in spurts by the thrust of both feet together. Occasionally, the second pen got in the way and was chased, but immediately the pursuer noticed the other male he turned upon it. The intruding bird, or birds—they kept close together most of the time—swam away without any attempt to challenge the defender, scudding now and then with a stroke or two of wing to keep out of reach. Sometimes the defending cob reached out as if to seize the other, sometimes held his wings partly open as if in readiness to fly, and, when opportunity offered, did fly a few yards to close on the retreating male. When the latter found the pace too hot and flew some distance, the defender turned and swam to his mate with raised wings and open curved neck (the attention attitude) and greeted her with a dull rattling or snoring sound (as of wood knocking on wood); they then faced each other, bases of necks touching, both with raised secondaries, necks erect and slightly curved, and bills level, each turning together to its right or left several times, after which there followed one or more “cheek-rubbing” false-preening motions. On two occasions the pair rose on the water together, with necks extended and bills pointing up at 70 degrees or so, with or without open wings. Once at least, the pen of the defending pair pursued the intruding female on her own; she also joined her mate when the intruding pair came near together, driven by the cob.

As has been already mentioned, the real “arrogance” display is exceptional on tidal water; on the rare occasions it was seen it lasted only a few seconds. Arrogance against intruding birds was seen at Clunie Loch on 6th October, when the male chased a strange pair which had landed on the water. This assertion of territorial rights so late in the season may be brought about by the dispersal of third-summer pairs which appears to take place in autumn.

The copulation of the Mute Swan gives rise to quite elaborate posturing. Two instances were watched on tidal water at Montrose Basin on 23rd April 1955, a date by which most breeding pairs would be established in suitable sites and have built their nests. It may be, however, that these particular birds were actually nesting only a little way up river from the tidal basin and that they had fed down with the tide among the group linking the wintering and summering packs, as two broods of small young were found at the river inflow in early June.

When first noted, the first pair was giving the dipping display, one bird immersing its neck completely, the other only partly doing so. The two swans were displaying alternately (or approximately so) and now and then, instead of dipping, one or the other would cheek-rub along the wing. At each withdrawal from dipping, the neck was drawn up into a narrow “S” bend with the bill pendant. Gradually the rate of dipping increased, the

birds keeping close together, sometimes side by side, sometimes at approximately right angles. Finally, the pen laid her neck along the water (but without touching it) and the cob mounted. As the cob slipped off, both rose erect on the water, breast to breast, with necks extended and bills pointing upwards at 70-80 degrees, and stood so for two or three seconds. Then both settled on the water and after preening for a minute or two, resumed feeding.

A few minutes later, a second pair was noted near-by, swimming side by side, and presently these two birds also began the dip display, immersing their heads and only a few inches of their necks, both breaking the rhythm at intervals to give the cheek-rub. As before, the rate of dipping increased and in two or three minutes the male mounted. Immediately on parting, both rose on the water, apparently one behind the other, and retained this attitude for ten seconds at least; at the last moment the leading bird turned and faced the other, each still retaining the original erect attitude with neck and head in approximate line. After settling on the water, both preened for a short time and then resumed feeding.

In neither instance were the wings opened or even raised from the sides; the erect position appeared to be maintained by treading the water.

The most elaborate tread-display seen was that of a pair on the tidal river at the north-west angle of Montrose Basin. This was on 28th May 1955, a very late date for such behaviour, as at this date most young are already swimming. The preliminaries were not seen in detail. A few minutes before, however, two birds had been displaying quietly with the bases of their necks touching and their bills pendant, turning from side to side more or less in unison; presently they started the dip display, going more than half-neck deep, but then they lost zest and appeared to be feeding. A little later, however, two birds were noted in mid-stream, the one pushing against the other as they swam in the current. The active bird was a male trying to mount, and presently the female sank low in the water with extended neck held flat; the male mounted her, holding on to the feathering of her neck near the nape and arching up to make contact. This accomplished, he slipped aside and both rose breast to breast with extended necks erect and bills pointing upwards, wings against sides. After two or three seconds, while still facing, each neck was bent sharply near the head with the bill pendant, each turning to its right and left in unison two or three times. Then, still with necks erect and bills pendant but now side by side, they moved a few yards down stream, probably carried by the current. Both birds then resumed the normal floating attitude though retaining the pendant bill and erect neck; each in turn rubbed its cheek on its closed wing almost to its tail at least twice, and then relaxed to the normal swimming attitude. No call was heard although the displaying birds were only about fifty feet away.

The dip display was seen on one occasion at the early date of 1st February 1943, at Dundee, Angus. Unfortunately, it was watched from a moving train and the time of observation was only about thirty seconds. The birds were side by side, dipping and rising together, each making a deep dip and pausing after every immersion with its bill pendant.

Copulation display was seen at Loch Leven, Kinross, on 11th March 1956, a date far too early for actual nesting. The various dates given show the wide extent of the period for this behaviour.

At Perth on 22nd April 1954 two juvenile Mute Swans, both still retaining some brown feathers in the mantle and the blue-grey bill colour, gave a display like that of the white summering birds. The two birds were swimming close together, sometimes side by side, sometimes almost facing, with necks straight and erect, heads turning from side to side with bills level; one gave the cheek-rub display at least once. One bird then gave the dip display, immersing the whole neck at least a dozen times, but the other did not respond, though remaining alongside. Both birds then returned to the shore together. This behaviour may account for the existence of apparent pairs whose very poor bill colour suggests they are birds of less than two years old, at which age the sex cannot be determined in the field.

There was an instance of possible "display" nest building at Montrose Basin on 24th April 1954. A female in a scattered group, apparently not associated with any one of the four or five swans in the immediate vicinity, tore seaweed from stones and piled it up as if trying to build a nest. It may be that the behaviour was like that of a paired pen with a well-grown brood—she tore up and piled water plants at the family loafing place, perhaps merely to provide a dryer spot on which to doze and preen.

NESTING

Reference has been made elsewhere to the rather wide range of dates covered by the arrival of breeding pairs, and also to the wintering at nesting places of single birds which seem to await the arrival of a mate; all those seen by the writer have apparently been females. The earliest date of piling nest material known to the writer is 16th February, in this instance the work of a pair. Interest in nesting seemed to wax and wane until a more vigorous attempt to complete the nest was made on 3rd May, but in spite of the long sustained activity no brood was hatched. In another instance, a single bird had wintered alone at a small pond and started to pile up weed on 23rd March. Though alone, it began to sit on the nest on 20th April, but it was then driven from the pond by an intruding pair which started to build at another spot on 26th April. The dispossessed bird lingered in the vicinity for a day and then departed. The invading pair had at least one egg on 20th May, and the female sat until 12th July, long after the egg

or eggs were due to hatch. Neither bird exhibited any further interest in the nest after 16th July.

This pair showed poor bill colour and may have been second-summer birds. They remained on the pond right through the following winter, and the female was piling nest material near the old site on 1st April. She was sitting on 6th April and during the day-time sat continuously until 4th May when she was seen off the nest for a short spell about midday; after that she repeatedly left the nest during the remainder of the incubation. On 25th May this female was sitting with her wings raised from her sides, and two days later the young were seen beside her on the nest. The brood was on the water on 29th May, four days after the presumed hatch. This was a brood of eight and at least one egg was left in the nest. The family remained on the pond until 9th September, by which time the young were about fifteen weeks old and still not able to fly. The tidal water near-by gave sanctuary to them.

In contrast to the long stay of these adults and young, a brood reared at this pond in 1946 departed after about eight weeks, and again in 1956 the adults led the brood to tidal water when it was only about ten days old. This pair had returned to the pond on 1st March. By 23rd April a nest was built and the female was sitting. On 5th June the young were seen on the nest. This brood was seen on tidal water up to 25th June, but probably perished in a storm soon afterwards. Two adults returned to the pond on 5th July and one remained during the ensuing autumn and winter; there was of course no certainty that this was one of the two parent birds.

The forty-one broods known to the writer in Angus and east Perth included three of 1 young, three of 2, seven of 3, ten of 4, nine of 5, six of 6, two of 7, and one of 8.

The family parties may remain intact until the end of the year, sometimes into January. The writer has no certain record of the parent birds driving away their full-grown offspring at any time during the winter or early spring. A pinioned pair breeding on a small pond were said to have chivvied the immatures until they departed, but this does not appear to apply to full-winged pairs on larger waters. There are movements of family parties (that is, two adults and fledged juveniles) long before frost or territorial jealousy could have been the driving force. In 1953 at Montrose Basin, two family parties came in between 19th September and 3rd October, and these had moved on by 17th October. In the following year, an arrival between 14th and 21st August departed in the period 16th/30th October. Frost is often severe in November in east Scotland and may compel departure from more exposed water long before the presence of the immatures could arouse jealousy in the parents. The writer has one instance where the presence of a brown immature on a small pond at the end of January caused resentment on the part of a prospecting pair. There was nothing to show that the immature

was other than a wanderer seeking a quiet haven from the spring storms.

MOULT

At an early stage of the enquiry into the numbers at Montrose, it was found that the summering birds showed moult. It appeared from their bill colour that most or all of these were immatures, and the moult, as is usual with non-breeders, was prolonged. Birds with all the flight-feathers freshly moulted were seen on 1st July 1950 and on 25th June 1955. Actual feathers (primaries and secondaries) were found on the shore on 5th July 1952, and a flightless bird was noted on 18th July 1953. The moult of the contour feathers was later, during August apparently, and some birds seemed still to be flightless in late August and early September, as was shown by their walking over the flats to reach open water instead of flying. The summer pack must consist of birds in their second and third summers, and it may be that the moults of these two age-groups are timed differently. The distinction between second- and third-summer birds is a matter of bill colour, confused admittedly by sex differences, and is much more marked from late August onwards: some, presumably second-summer birds, still show a greyish undertone in the orange of the bill at this time.

There are wide differences in the period of the moult from the brown juvenile plumage to the immature white plumage. Brown juveniles may show patchiness early in December, due to the replacement of brown coverts. In 1950, two broods hatched about 27th May were showing moult on 9th December, when about six and a half months old. Others were in moult on 2nd January 1953 and these were entirely white by late March, only the slight brownish tint of the flight-feathers indicating the ages of the birds. Yet other brown birds may go right into the spring without any trace of change, even to late May. The moult must then come swiftly as the writer has no record of a brown juvenile in June. The change in colour of the bill also varies quite independently from the plumage, for brown-patched birds may show obvious orange-yellow in the bill and yet a white immature may have a blue-grey bill (a colour which sometimes comes between the pinkish-grey of the juvenile and the greyish orange-yellow that is normal for the white immature).

The moult of the breeding adults in charge of a brood appears to be late. There was no indication of moulting flight-feathers in a pair on a small pond up to the first week of September 1955. A few contour-feathers were dropped, but probably no more than the normal wastage due to preening.

Two instances of the moult of pairs which had attempted to nest and failed to hatch a brood were noted. One pair was found in hiding among over-hanging bushes in a small tidal stream near the nest site: both birds had lost most of the primaries on 17th August 1941, and those remaining were reduced to the rachis

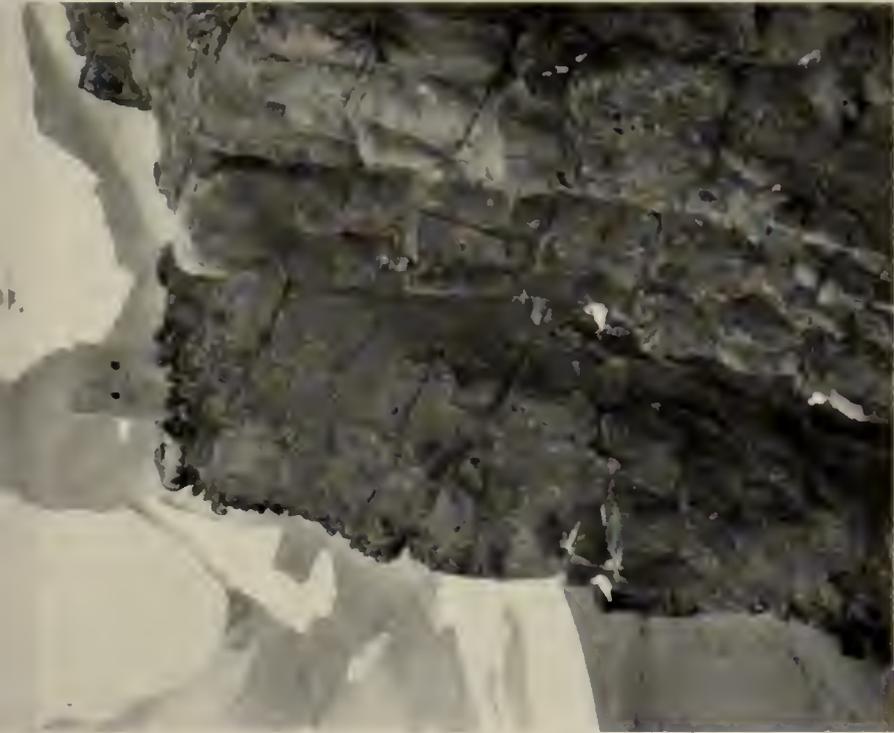


J. L. Cutbill

CHICK LEAVING ADULT TO DEFECATE

IVORY GULLS (*Pagophila eburnea*): SPRITSBERGEN, AUGUST 1958

These gulls were nesting with Kittiwakes (*Rissa tridactyla*) at the top of a thousand-foot cliff that was also occupied by Black Guillemots (*Uria grylle*) (see pages 105-106). The hide from which most of the photographs were taken was perched on a small buttress overlooking nests on either side. The other photograph shows the pale grey chick leaving its parent; when it reaches the edge of the nest it turns round, defecates and hurries back to the adult.



HIDE ON TOP OF BREEDING-CLIFF



J. L. Cutbill

IVORY GULL (*Pagophila eburnea*) AT CLIFF-TOP: SPITSBERGEN, JULY 1958
 The totally white plumage and dark eye are immediately obvious. The shortness of the black legs and the dense feathering give the bird a rather ungainly appearance. Note the short, stout bill which is yellowish with a grey-blue base and a reddish tip (see page 124).



R. E. Hitchcock

IVORY GULL (*Pagophila eburnea*) THREATENING: SPITSBERGEN, JULY 1958
 The bird on the right is adopting the Oblique threat posture; as it does so it emits the Long Call, a long-drawn and rather shrill scream (see also page 111). The other gives a good impression of the long, pointed wings and the feathering almost to the "knee".



J. L. Cutbill

IVORY GULL (*Pagophila eburnea*) CHANGE-OVER: SPITSBERGEN, JULY 1958
 Both sexes incubate the eggs and may spend anything from a few minutes to over eleven hours on the nest (see page 109). Nests are loose, bulky structures and in this colony were made from moss, lichen and saxifrages collected on the plateau above (see page 106).



J. L. Cutbill

IVORY GULLS (*Pagophila eburnea*) THREATENING INTRUDER: SPITSBERGEN, 1958
 The bird on the nest and its mate on the left resemble Ptarmigan (*Lagopus mutus*) as they threaten the intruder into their territory. This posture was adopted very often in such territorial disputes and is the most common of the threat displays.



BIRD THREATENING MATE

Ivory GULLS (*Pagophila eburnea*): SPITSBERGEN, AUGUST 1958
 Although taken on different occasions these two photographs illustrate a common behaviour sequence. On the left the standing bird has just landed and is giving the Oblique threat posture. On the right the lower bird, after relaxing from the threat posture, has begun to toss its head in appeasement. In these photographs it will be noted that the nesting-ledges were considerably wider than those normally used by Kittiwakes (*Rissa tridactyla*) (see page 106).



BIRD APPEASING MATE

J. L. Cutbill

only, at which they were pulling repeatedly as if to remove them. The other pair had nested but failed to hatch (they appeared immature on bill colour) at a small pond with much thick cover at one point. The pair had stamped out a small clearing in a thick clump and sat there preening during daylight hours from 19th August until 14th September 1954. Only once were they seen on open water during that period. The clearing was littered with the cast plumage, but the actual flightless period could not be determined. The writer has instances of the disappearance of pairs without broods in August and their subsequent re-appearance in September: similar retiring behaviour might well account for the apparent coming and going.

CALLS

For the most part, the Mute Swan is a silent bird. The ordinary call is a hoarse "yrrumf"—usually a dull sound, but sometimes with a shrill ring in the opening phrase (as "yerrumf"). This call may be used in flight.

Reference has been made to the dull rattling call used in the "triumph" display given after the repulse of an intruder into the territory.

Immature birds forming the summer pack were heard to give a soft "wirr" or "yrrr" when passing down stream to meet the rising tide.

BATHING

On two occasions, Mute Swans have been seen bathing and playing on tidal water. In addition to the usual ducking and splashing, individuals rolled over backwards and also sideways, apparently with open wings, pausing for a moment of wild splashing when inverted. The action appeared to be under the stimulus of the flood tide bringing up clean sea water.

FEEDING

Most of the food of these Mute Swans on tidal water appears to be sought under water in the shallows, but some seek food in the shallow pools on the mud. In recent years small parties have been found feeding at sewer outfalls in company with gulls.

In summer, small numbers have been seen grazing on rough grass beside a tidal estuary, sometimes moving around, sometimes squatting and feeding on whatever was within reach.

CONCLUSION

These notes are only a tentative approach towards defining the behaviour of the Mute Swan. It may be possible to establish more definitely the activities of the different age groups. If it is normal for pairs to be formed in late summer among the third-summer birds, there is something more to be learned about the pairs which appear to be second-summer birds. The single immatures which winter at breeding sites and attempt to build nests provide another puzzle. If the proposed ringing attempts prove successful, some of these difficult matters may be resolved.

PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS XCVI. IVORY GULL

Photographs by J. L. CUTBILL and R. E. HITCHCOCK

(Plates 21-24)

Text by P. P. G. BATESON

THE IVORY GULL (*Pagophila eburnea*) is probably the most consistently northerly bird in the world as it nests only above the 70th parallel (chiefly between 75° and 85°N.) and remains, for the most part, at the edge of the pack ice in winter. Most colonies have been recorded in the Spitsbergen archipelago, chiefly in the north and east, but several other nesting areas are known in widely separated parts of the Arctic Ocean. In the west it has been found breeding on Prince Patrick, Melville, north Baffin and Ellesmere Islands in the Canadian Arctic and at the extreme north of Greenland (see *The Handbook*). East of Spitsbergen, it nests on Franz Josef Land and probably at about latitude 75° on Novaya Zemlya, though the actual site there has yet to be found according to Dementiev and Gladkov (1951; see Harber, 1955). The same authors confirm that, further east still, it breeds on Lone Island (Einsamkeit) and Severnaya Zemlya, but they state that there does not seem to be any fresh information about nesting on Bennett, Herald and Polynia Islands, where a few pairs were recorded in 1856.

Nests are usually in colonies, though isolated pairs have been found, and this species is interesting in that it breeds both on the level ground (sometimes in enormous numbers) and on precipitous cliffs (see page 105 and plate 21 left). Ground nests, as well as cliff ones, were illustrated in *British Birds* in 1932 (Dalgety, 1932).

The most distinctive field-characters of the adult Ivory Gull are its pure white plumage and its short black legs which are feathered almost to the tops of the tarsi (see plates 22 upper and lower). There is a red eye-ring which, however, we found difficult to see in Spitsbergen in 1958, unless we were very close; the eye itself is dark brown. The base of the bill is grey-blue and in our experience does not appear dark in the field (as it is stated to look in *The Handbook*). The remainder of the bill is yellowish shading to a tip which can vary from a very noticeable red to a faint orange.

The immature bird is mostly white, but the face is often smudged with sooty-brown. The primaries during the first summer and winter are tipped with dark brown and spots are scattered over the remainder of the wing, back, neck and under-parts with great individual variation. There is also a dark sub-terminal bar on the tail. The eye-ring at this stage is black and the bill varying

shades of grey. Photographs of an immature Ivory Gull were published in *British Birds* in 1951 (Kay, 1951).

The Ivory Gull is about the size of a Common Gull (*Larus canus*), but when settled it gives the impression of having much longer wings (see plates). The bill is stout and fairly short in relation to the head. The feathering is very dense, which gives the bird a rather plump appearance; this character, together with the rather small rounded head, has caused it to be compared with pigeons and Ptarmigan (*Lagopus mutus*) (plate 23 lower).

The flight of the Ivory Gull is characteristically buoyant and is somewhat tern-like, though its wing-beats are not so accentuated. The trailing edge of the wing, where it is formed by the ends of the primaries, is curved to give the outer part of the wing a blade shape. We found that this character combined with the wing-beat makes the flight quite distinct from that of other gulls.

Although this species will readily settle on ice or land, where it walks or runs in a curious manner without flexing the toes of the raised foot, it is extremely reluctant to come down on water. But there are a number of records of Ivory Gulls swimming and Kay (1951) describes an immature Ivory Gull bathing in the normal gull manner in Shetland. This suggests that the Ivory Gull may not acquire its aversion to water until, probably during its first winter, it has experienced the icing of the feathers which would be prone to occur after a bathe. As a result of this aversion this gull, when it feeds over water, hovers above the surface to pick up morsels.

As a rule the Ivory Gull is totally unafraid of Man. If it reacts to his presence near the nest it will either give long sustained screams from the ground and in flight or will actively attack by stooping like an Arctic Skua (*Stercorarius parasiticus*). A fuller discussion of the breeding habits is given in the accompanying paper (Bateson and Plowright, 1959).

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NOTES

Orientation of migrants over sea in fog.—On 26th March 1958 Miss Jennifer Bak and I were on board the Marine Biological Association's ship "Sarsia" off Plymouth, Devon, near the Eddystone lighthouse, and saw a large migratory movement of birds: in 4¼ hours' observation we counted some 1,600, mostly small

Passerines. Visibility at the start of the period was $\frac{1}{2}$ to 1 mile, but the fog closed down to 100 yards at one stage. At no time was land visible, although we were only 10 miles out at the start of the period of observation and steamed around slowly so that at the end of the penultimate $\frac{1}{2}$ -hour we were no more than 5 miles from the shore.

Birds were deflected off course by sighting the ship and then re-orientated themselves. Analysis of their directions of flight away from the ship has been made both in terms of flocks and in terms of individuals: the two methods agree very well, and the percentage of birds leaving in directions between north-west and north-east has been taken as a measure of accuracy of orientation. In terms of individuals, this was 99% while visibility was moderate; for the first $\frac{1}{2}$ -hour of reduced visibility (150 yards) it was 97%, and for the next, 20%; then for about $\frac{1}{2}$ -hour at 100 yards visibility the accuracy rose to 58% and for another $\frac{1}{2}$ -hour at 150 yards it was 20% again. For the last $\frac{1}{2}$ -hour, although visibility was much the same, accuracy was over 99%: this was probably due to our near approach to land, as at the start of this period we were only some 3 miles from Plymouth breakwater and approaching it fairly fast.

The figure of 58% for the half hour of 100-yard visibility must be treated with reserve, since we found it most difficult at that time to determine with accuracy the direction of flight. Also, in this period especially, the birds would frequently fly out in one direction and disappear into the fog, only to re-appear a minute or less later and then set out again in a different direction: this is a further possible source of error, as we could not always be sure when a flock was a new one and when a repeat.

Our evidence seems to show, however, that these migrants were able to orientate very well while visibility was moderate, in spite of the fact that no land or sky could be seen, but were lost when the fog closed right down. The wind was south-east, force 2, so that there were small waves consistent in direction: I would suggest that it is easy to align oneself using such waves as a guide, providing visibility is moderate; but when it is down to 150 yards the view obtained of the waves is not extensive enough to allow any accuracy. This type of effect is a common experience in fog on land also. These observations may therefore lend support to the idea of visual orientation by migrants over the sea when the sky is obscured: but this must mean that they have previously observed the direction of the waves in relation to their determined course.

J. M. B. KING

Predation by Great Spotted Woodpeckers on nestlings in nest-boxes.—According to *The Handbook*, the food of the Great Spotted Woodpecker (*Dendrocopos major*) includes young birds from nests of House Martin (*Delichon urbica*), House Sparrow (*Passer domesticus*), Lesser Spotted Woodpecker (*D. minor*) and

tits (*Parus* spp.). As no reference is made there, however, to the methods by which the young of these hole-nesting species are obtained, on the receipt of two independent accounts of depredations by Great Spotted Woodpeckers on nest-boxes containing young tits has prompted a brief survey of the literature and the preparation of this note.

What was presumably one of the first observations of this species feeding on young birds was that of Jourdain (1929) who, with W. M. Congreve, on 9th May 1890, saw a Great Spotted Woodpecker in the cork woods at Almoraima, Spain, go to the nest of a Blue Tit (*Parus caeruleus*), from which it "extracted a big unfledged young bird". Jourdain also quoted Gurney (1890) as having reported that an immature Great Spotted Woodpecker, which had been shot, contained the remains of two or more young birds "which in Mr. T. Southwell's opinion were those of a Titmouse, probably the Blue Tit". Frost (1927) stated that a "Spotted Woodpecker" was seen to take a young sparrow from a nest and tear it to pieces. Next, Schnurre (1936) quoted more than a dozen cases of Great Spotted Woodpeckers killing young birds, both of hole-nesting species and ones breeding out in the open and including an old record from Brehm's *Tierleben* of a bird which was shot carrying a nestling tit to its own young. Steinfatt (1937), Franz (1940) and Kierski (1940) reported instances of hole-nesting species being preyed on in this way, and then Watson (1941) described a Great Spotted Woodpecker removing the young of a Treecreeper (*Certhia familiaris*), which is equivalent to a hole-nesting bird. With the exception of Schnurre's summary most of these were scattered observations, but Siivonen (1942) drew attention to this woodpecker as a regular enemy of small birds and their nests. Hodgetts (1943) made one of the few observations that there have been of a Great Spotted Woodpecker actually feeding a nestling (unidentified) to its own young.

Pihl and Knudsen (1945) considered this species a spoiler of nest-boxes, and in the next year Johnston (1946) gave an account of a female Great Spotted Woodpecker enlarging a nest-box entrance hole—in vain, as the young Blue Tits in the box were safely reared. An editorial note referred to a similar observation at Oxford "some years ago", but W. B. Alexander tells us that that attempt was foiled by the fitting of a metal ring round the box entrance. Cohen (1947) saw a Great Spotted enlarge the entrance hole of a nest-box containing young Blue Tits about 4-5 days old and remove one young; he had to go away the next day, but later evidence suggested that the woodpecker returned and removed the remainder of the brood. Other instances of these kinds were recorded by Tomasz (1950), Pfeifer (1952), Bāsecke (1954), Oldenburg (1954) and Keil (1954), Pfeifer's case concerning the nest of a Wood Warbler (*Phylloscopus sibilatrix*) and Keil's including nests of Wren (*Troglodytes troglodytes*) and such open breeders as Greenfinch (*Chloris chloris*) and Robin (*Erithacus rubecula*). Dr. Monica M. Betts tells us that she foiled two

attacks by a Great Spotted Woodpecker while watching Pied Flycatchers (*Muscicapa hypoleuca*) at a glass-backed nest-box in the Forest of Dean, Gloucestershire: in that case the woodpecker reached through the entrance hole and pulled at the nest material. Attacks reported have thus seemed to be chiefly on hole-nesting species, though this is probably because predation on an open nest would take comparatively few moments and so not be seen. At the same time, most published accounts have been of attacks centred on the entrance hole—so much so that it has been suggested that deep nesting boxes would solve the problem. The two series of observations which follow, however, involve attacks on other parts of the nest-boxes.

Since 1954 the Nuneaton Bird-Watchers' Club has maintained a nest-box scheme at Higham Grange, Leicestershire: we are indebted to M. A. Arnold and D. E. Jebbett for details. In 1954 there were several boxes in the neighbourhood of a Great Spotted Woodpecker's nest, and on 11th June a brood of Great Tits (*P. major*) disappeared without trace. The box had a large entrance hole, but there was no actual evidence that the young had gone to the woodpecker. In 1955, however, when there were eight occupied and five unoccupied boxes near to the woodpecker's nest, several broods of young tits were taken by the woodpeckers, including three broods of Great Tits and one brood of Blue Tits—though never a clutch of eggs or any odd addled ones remaining in the nest. In three cases the woodpecker drilled a hole in the side of the box, and in the fourth the entrance was enlarged. The box containing Blue Tits was covered with wire netting as protection, but the young birds were extracted through it. A further box was attacked when a Great Tit's nest was three parts finished: the resulting hole was in the side of the box and the nest was abandoned. In 1956 a Great Spotted Woodpecker made a hole beneath the entrance to a Great Tit's nest containing eggs; the hole was stopped effectively with a stone. In 1957 and 1958 there was only superficial damage to boxes by woodpeckers.

The second series of new records has been sent in by M. H. Waddicor who had tits' nests in his garden at Kingswood, Surrey, attacked by Great Spotted Woodpeckers during 1958. A woodpecker made a small hole in the bottom of a box containing young Blue Tits. The hole was then patched and the box was covered by a wire-netting cage and, though the woodpecker made several further attacks, the young left safely except for two which were dead in the nest. One of these, however, may well have been a victim of the woodpecker's first attack, for subsequent examination revealed that after making its first hole it had pulled through the leg of a nestling: this was one of those that died. A second box, containing young Great Tits, was first attacked a day before the nestlings left. The woodpecker continued to attack the box after they had all flown, making a hole in the side about $1\frac{1}{2}$ inches from the bottom; through this it extracted the nesting material, which it immediately flung away. At a third box, containing

Blue Tits, there was one attack on a split in the wood two inches below the entrance hole; this was not repeated, however, and the young flew some six days later.

In conclusion, we should like to draw attention to the British Trust for Ornithology's new Great Spotted Woodpecker Enquiry, organized by Mrs. P. V. Upton, Park Lodge, Margaretting, Ingatestone, Essex (see *Bird Study*, vol. 6, pp. 28-29). One of the aims of this Enquiry is to investigate the question of attacks on nest-boxes and so anyone who has any relevant observations, past or present, is asked to get in touch with the organizer.

R. A. O. HICKLING and I. J. FERGUSON-LEES

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Feeding behaviour of Ravens and Choughs.—During recent years there have been a number of notes in *British Birds* on the hiding and recovery of food: a list of these appears in the bibliography at the end of the paper by T. J. Richards on "Concealment and recovery of food by birds, with some relevant observations on squirrels" (*antea*, vol. li, pp. 497-508). The species involved have included several members of the crow family—Carrion and Hooded

Crows (*Corvus corone*), Rook (*C. frugilegus*), Jay (*Garrulus glandarius*) and Magpie (*Pica pica*) among British species—and so I am prompted to report my own observations on captive Ravens (*C. corax*) and Choughs (*Pyrrhocorax pyrrhocorax*).

I have two Ravens in an aviary. When deprived of food they become very active and vociferous, but when food is supplied (usually offal or carrion) a particular pattern of behaviour invariably follows. The dominant birds "A" begins to feed*, pausing only to attack its fellow violently if the other attempts to approach the food. When "A's" hunger has been satisfied to some extent, further food is gorged into the throat until it is grossly distended and the beak is also completely full. This bird then leaves the source of food and rapidly makes for one of the number of holes in the earth floor which have previously been made during random searching for food. (It is noteworthy that all the holes are situated at the bases of the upright posts of the aviary walls and at the bases of tree trunks placed inside as perches.) "A" promptly disgorges into one of these holes and then searches feverishly for dead grass and loose earth which it carries furtively and presses down on top of the disgorged food. This done, "A" returns to the food supply and battles with "B" who has been making the most of "A's" absence, and then the former procedure is repeated. In time, "A's" activity wanes and "B", having eaten a little, now follows "A's" example and buries food.

Frequently "B" observes the other burying food and attempts to steal it as soon as "A" returns to the source of supply for more. "B" may be caught in the act, in which case battle ensues. If "B" is successful, it reburies the food in another hole, unless it is very hungry, when it will eat it. Sometimes "A" anticipates "B's" intention to steal, digs up its own food again, threatens "B" and then, as "B" retreats, buries it elsewhere.

On some days, the two birds seem to be on one level in the social hierarchy, and neither dominates. When this happens, it is simply a race to bury food with a minimum of fighting. Ultimately all the food, about 1-2lbs. of flesh, is buried. It does not appear that the birds have their own hiding places permanently, but it is a case of the dominant one possessing the largest and most desirable.

When the birds again become hungry they may be seen recovering the food. This may well not be until the following day, as they are never fed more than once in 24 hours and sometimes less, depending on the amount given at any one time. Quite frequently, pieces will be dug up and reburied. After all the buried food has been recovered, the holes being left open, both birds frequently inspect the places and dig in them, but they seldom make any new holes.

I have also seen one of my Choughs dig a hole and bury a piece of food, cover it up, and run off around the aviary. A second Chough may then approach the spot to investigate, whereupon the

*Usually when one bird is dominant it is the same individual, but this is not invariable.

first one returns and recovers the food, eating it before it can be stolen. The behaviour of the second Chough is only as might be expected, as I have found that when one of these birds performs almost any positive action, such as digging, feeding or bathing, the others invariably follow suit.

BRIAN C. TURNER

Melanistic adult Great Tit and brood of young.—During the winter of 1955-56 a melanistic Great Tit (*Parus major*) was seen several times by Donald Parr and the writer at Hersham sewage farm, Surrey. The bird had black cheeks which gave it a very striking hooded appearance; the rest of the plumage was very much darker than normal, being grey-black, with the under-parts nearly all black fading to greyish on the flanks. In April 1956 it was singing and had apparently taken up a territory, but it has not been seen since in spite of a repeated watch being kept for it.

However, on 26th May 1957, at the same place a female Great Tit of normal colour was seen with a brood of nine young which had just fledged. One of these young was quite typical, but the other eight were similar to the one described above. Unfortunately, the male of this family was not seen. One of the young was caught and photographed.

C. M. PERRINS

[B. L. Sage, who has for some years been collecting data on albinism and melanism (*antea*, vol. xlix, p. 512), writes as follows: "I mentioned two British cases of melanism in the Great Tit in my note in *Bull. B.O.C.*, vol. 76, pp. 130-131, and since then have received three more records: a bird with the entire head and neck black in the area of Oxshott, Surrey, from 24th December 1945 to 1957; an entirely black individual at Huddersfield, Yorkshire, in the late summer of 1955; and one with the head, cheeks and nape entirely blackish at Ashtead, Surrey, in early July 1957. It is interesting to note that three of these other five cases are, like the present one, from Surrey. The adult bird described by Mr. Perrins is fairly typical of melanistic types of Great Tit, the black 'hood' having been common to all but one of the records received, but this case is especially interesting in view of the circumstantial evidence connecting the melanistic adult and the brood of which eight-ninths were also melanistic: melanism is generally a dominant character".—EDS.]

Downwind immigration of British Whitethroats.—I have for some years suspected that many Whitethroats (*Sylvia communis*) native to north Norfolk, and doubtless to a larger area of eastern England, arrive each spring, not across country from the Channel coast as one might reasonably suppose but directly in from the Low Countries.

At Cley the peak arrivals from the sea of these Whitethroats and other common British warblers coincide with light to moderate easterly winds in late April and May, conditions which at first sight suggest drift migration but which can only be described as downwind immigration.

An examination of the Cley Bird Observatory records for the past seven years has produced evidence which shows that easterly winds prevailed on 13 of the 16 occasions that a local Whitethroat was re-trapped on arrival home in the spring.

In the following table the dates of re-trapping can confidently be taken to represent the approximate date of arrival, since the trap in question is worked several times a day during periods of peak migration and it is unlikely that a bird would escape detection for long in the limited area of the trapping thicket.

TABLE I—RINGING AND RECOVERY DETAILS OF BRITISH WHITETHROATS (*Sylvia communis*) IN NORTH NORFOLK TO SHOW WIND CONDITIONS ASSOCIATED WITH RETURN

All were ringed at Cley and, with one exception, all were recovered there as re-traps; the exception is KE 812 which was found dead below the lighthouse at Cromer, about 10 miles from Cley in a straight line.

Ring. no.	Date ringed	Age/sex	Recovery date	Wind	Remarks
NR 620	12.8.51	?	4.5.53	Light N.E. since 3.5.53	Locally bred
KE 812	6.7.52	Juv.	4.5.54	Light S.E. since 1.5.54	Locally bred
KE 854	16.7.52	Juv. ♂	4.5.53	Light N.E. since 3.5.53	Nested where re-trapped
KE 920	12.8.52	Juv. ♀	6.5.53	Light N.E. on 4.5.53	Locally bred
B 34846	26.8.53	Juv. ♀	9.5.54	Light S.E. since 7.5.54	Hatched where ringed and recovered
B 34868	8.8.53	?	3.5.55	Light variable S.	Nested where re-trapped
A 56898	31.7.55	♂	{ 18.5.56 30.4.57	Moderate N. Moderate N.E. since 23.4.57	Nested locally Nested locally
A 56669	28.5.56 (Light E.)	♂	{ 15.5.57 10.5.58	Following 6 days of S.E. S.W.	Nested locally Nested locally
A 56731	23.4.57 (Mod. N.E.)	♂	23.4.58	S.	Nested locally
C 31664	26.6.57	Juv.	1.5.58	E.	Locally bred
C 31390	18.5.57	1stS. ♂	2.5.58	Day after E.	Nested locally
C 31705	21.7.57	?	5.5.58	Day after S.E.	Nested locally

One bird, an adult male not included in the table, is known to have arrived with easterly winds for two successive years. He was originally met with on breeding territory in the trapping thicket in 1951 and was the most accomplished mimic for a White-throat that I have yet encountered, his repertoire including, among other species, Jackdaw (*Corvus monedula*), Partridge (*Perdix perdix*), Common Tern (*Sterna hirundo*), Heron (*Ardea cinerea*), House Martin (*Delichon urbica*), Swallow (*Hirundo rustica*), Pied Wagtail (*Motacilla alba*), Greenfinch (*Chloris chloris*), Linnet (*Carduelis cannabina*) and Yellowhammer (*Emberiza citrinella*).

That first season passed without our succeeding in catching him, but in 1952 he returned during two days of light easterly winds, on 13th April to be captured immediately and ringed ME 767. He remained to breed and to treat us again to the identical medley of imitations. 1953 saw him home (for probably at least the fourth

year running) on 25th April after eight days of light east winds, but a younger male usurped his territory and ME 767 was never seen again.

Another male, ringed A 12038 on 27th April 1955 during a big influx of warblers on a S.E. wind, was re-trapped at Bradwell Bird Observatory, Essex, on 22nd May 1955. That the bird was still in eastern England (though 80 miles south) twenty-five days later suggests it was not a drift migrant which would surely have re-orientated itself well before then.

Finally there is the interesting case of the male "Helgoland 9435010" trapped at Cley in heavy moult on 27th June 1952. He had been ringed as a migrant on Wangeroog, eastern-most of the E. Frisian Islands, on 29th April of the same year and a glance at the Cley Weather Log showed that five days of moderate easterly winds followed the date he was ringed, terminating on 4th May with the brief note in the General Remarks column, "Many migrants in".

R. A. RICHARDSON

Unusual site of Goldcrest's nest.—On 21st May 1957 my brother, Rev. F. J. Wootton, and I watched a Goldcrest (*Regulus regulus*) collecting food in an oak wood in a combe on Exmoor, Devon. As there were no conifers in the wood, nor even any ivy-clad trees that we could see, we were interested to discover what site had been chosen for the nest. The trees in which the bird was hunting were tall and growing close together, without branches except for the top 15 feet or so. About 25 feet up one of them were the hollow remains of an old branch, not more than a foot long, covered with lichen, and with a small fern sprouting out. It was into this hole that the Goldcrest disappeared and we could just see the tip of its tail through the binoculars as it fed the young. We watched both adults for nearly an hour bringing food and removing faecal sacs. It is perhaps worth adding that, apart from its lack of normal nest-sites for this species, the wood impressed us with the abundance of insect food available: the oaks were infested with huge numbers of caterpillars and the sunshine glinting through the trees would show up hundreds swinging on their gossamer threads. The whole wood was alive with birds and we were able to watch six different insectivorous species in various stages of breeding, without having to move at all.

A. G. WOOTTON

[Both the Goldcrest and the Firecrest (*R. ignicapillus*) sometimes nest against tree-trunks in ivy and other creepers, quite commonly so in some parts of Europe, but we can trace no previous record of nesting in such a hole or recess.—EDS.]

REVIEWS

TALES FROM THE VIENNA WOODS. By LILLI KOENIG. Translated from the German by MARJORIE LATZKE. With a foreword by KONRAD LORENZ. (*Metheum*, London, 1958). 159 pages; 24 photographs and many line drawings. 18s.

THE AUTHOR of this delightful book combines a scientific attitude

with a warm love of animals. Together with her husband, Otto Koenig, she runs the "Biologische Station Wilhelmineberg" in the Wiener Wald near Vienna. This private research station, which since the war has produced a number of first-rate publications on animal behaviour, has a unique history that characterizes the Koenigs. When Otto Koenig returned from the war, his only possessions were an old Leica camera and a number of miraculously saved negatives; his wife had kept the letters he had written her during campaigns in Mediterranean countries. Together they turned these possessions into (a little) gold by publishing a book based on the letters, and illustrated by the photographs and Mrs. Koenig's drawings. They decided to use the money to found a little private research zoo. Recruiting a group of young biologists they quite illegally took possession of an abandoned Flak-site, and in no time turned it into an ethological bee-hive. The Koenig's unflagging enthusiasm and incredible energy nursed the station through its many teething troubles. No adversity (and there were many) has been able to quench their *joie de vivre*, their love of animals, or their thirst for understanding.

This book, totally devoid of any affectation or pretence (save, perhaps, for the translator's quotations at the heads of chapters), is of a singularly appealing innocence, charm and dignity. At the same time it has considerable scientific value by showing how, through keeping animal pets the Lorenz way and watching them in a variety of partly natural, partly unnatural situations, one can learn a great deal about the way their behaviour is organized and what ends it serves. The most valuable observations are perhaps those that show how many complicated behaviour patterns in birds and even mammals are non-learned, such as the story of the hand-raised Badger which suddenly turned from an appealing milk-sucking baby into a fierce and competent killer the first time it saw the Koenigs' treasured Turkey poult. On the other hand, the human environment revealed where learning usually occurs, by causing many animals to learn the wrong things: a human imprinted Turkey cock made a nuisance of itself by following all passers-by to court their shoes; eleven large Guinea Fowl persistently followed a tiny Bantam cock just because they happened to have been raised together.

The book is illustrated by excellent photographs and by numerous beautiful line drawings by the author. The translation by Marjorie Latzke is of her usual high quality. N. TINBERGEN

THE BIRD BAZAARS OF NOVAYA ZEMLYA. By S. M. USPENSKI. (*Translations of Russian Game Reports*. Vol. 4, Ottawa, 1958). 159 pages. Available from the Queen's Printer, Ottawa. \$1.

DURING THE LAST YEAR OR TWO the Wildlife Service of the

Canadian Department of Northern Affairs and National Resources has issued four volumes of *Translations of Russian Game Reports*. The translations have been done by Dr. J. M. MacLennan, until recently on the staff of the Canadian Wildlife Service, and the first three dealt with fur-bearing mammals. The fourth is on *The Bird Bazaars of Novaya Zemlya* and is a complete translation of a work by S. M. Uspenski. The foreword points out that almost all the species discussed are found on the coasts of Canada as well as on those of the U.S.S.R., and so are of interest to the Canadian Government which is responsible for their protection. Since most of the species are more or less familiar in this country also, a summary may interest readers of *British Birds*.

The term "bird bazaars" refers to the colonial nesting places of guillemots, gulls and various other sea-birds. These are of considerable economic importance in the Russian far north where it is difficult to provide the population with fresh food; the eggs, meat and skins are also exported from northern Russia to other parts of the country. These industries are most developed in the Novaya Zemlya bird bazaars, the largest in the U.S.S.R., and a vivid description is given of the tremendous density of their bird populations. The main feature of these colonies is the nesting of the Brünnich's Guillemots (*Uria lomvia*). In most of the bird bazaars, however, there also breed big numbers of Kittiwakes (*Rissa tridactyla*), Black Guillemots (*Uria grylle*) and, in places, Common Guillemots (*Uria aalge*), Little Auks (*Plantus alle*) and Puffins (*Fratercula arctica*). Everywhere, also, Glaucous Gulls (*Larus hyperboreus*) make their nests. A table gives a list of 47 bird bazaars containing a total of at least about 1,900,000 Brünnich's Guillemots and over 30,000 Kittiwakes, in addition to the other species above mentioned. An account is given of the methods used in making the censuses. Two chapters are devoted to detailed discussions of the life-histories, dietary, parasites, eggs and general bionomics of each species.

The economic utilization of the bazaars as a regular custom dates from about the middle of the nineteenth century. The very incomplete data available indicate that during the period 1930-1950 at least 3,000,000 eggs and 500,000 birds were shipped from Novaya Zemlya. The three economically valuable species are Brünnich's Guillemot (by far the most important), Common Guillemot and Kittiwake. The final chapter discusses the methods to be adopted for further development of the industry while at the same time avoiding over-exploitation. Though written throughout from the economic angle, the work contains many data of biological interest.

COLIN MATHESON

LETTERS

CROSSBILLS AT FAIR ISLE, 1956

SIRS,—May I point out some inaccuracies in the data concerning Crossbills (*Loxia curvirostra*) at Fair Isle in 1956, as given by Mr. F. R. Smith in his interesting paper "The Crossbill

invasion of 1956 and the subsequent breeding in 1957" (*antea*, pp. 1-9). I hasten to add that the inaccuracies, which are no fault of Mr. Smith's and which arise from errors in the information supplied to him, do not alter the picture he so ably presents.

The first birds appeared on Fair Isle on 1st July and there were ca. 200 on the 2nd-3rd (not the 6th). Birds had decreased to 80 by the 5th and 50 by the 9th, and declined still further to between 20-30 over the next four days.

The second influx began with a single bird on 28th August, 10 being present next day. This was followed by renewed movement of at least a dozen on 4th September. Another arrival of 10 occurred on 8th September, and the last birds were seen on the 11th.

KENNETH WILLIAMSON

[It has also been pointed out that the breeding records for Lancashire in 1957 were not, as stated, the first for that county. C. Oakes in *The Birds of Lancashire* (1953) gives details of a pair found nesting at Hutton, near Preston, in March 1887.—EDS.]

INFORMATION WANTED ON PRATINCOLES AND BEE-EATERS IN FRANCE

SIRS,—I am at the moment collecting information on the Pratincole (*Glareola pratincola*) in the south of France. Since colonies of these birds are unusually conservative about their nesting locality—each colony seems to return to one of a small number of places each year—it should be possible to gather some interesting information on the occupation of the colonies for some time back in the past. I should be grateful if anyone who has any relevant notes on colonies of this species, in any year, in the Camargue or Crau, would be kind enough to send them to me at Christ Church, Oxford. Information should, if possible, include the exact locality, the number of pairs, the date, and whether eggs or young were actually seen. All information received will, of course, be treated with the necessary secrecy.

At the same time, if any reader has a breeding record of the Bee-eater (*Merops apiaster*) in France, other than in the Camargue and the area immediately surrounding it, I should be very pleased to hear of it.

J. J. SWIFT

[Mr. Swift was working under Dr. L. Hoffmann at La Tour du Valat in the Camargue during 1958, and we very much hope that readers will support his request.—EDS.]

THE BEHAVIOUR AND BREEDING ENVIRONMENT OF THE ST. KILDA WREN

SIRS,—Mr. Kenneth Williamson's conclusions (*antea*, vol. li, pp. 369-393) and mine (1953a, b; 1955) in regard to the behaviour of the St. Kilda Wren (*Troglodytes troglodytes hirtensis*) and other insular subspecies do not differ substantially, but while unprecedented opportunities are available for studying and comparing the Wren on St. Kilda and Fair Isle it may be useful to indicate

some points on which there is still uncertainty or difference of opinion, in order that problems concerning the differentiation of races may be further investigated and, if possible, resolved.

Neutral Areas.

It is difficult to reconcile the existence of such extensive neutral ground, implying incomplete exploitation of much of the Village area, with the postulated relatively unfavourable nature of the habitat. The occurrence of such large undefended or unexploited areas would be surprising in view of what is known of the Wren's behaviour elsewhere and is not supported by my own observations on Hirta in 1951. On the occasion of my visit there were at least nine, and probably ten, territories where Williamson found seven, so it is unlikely that I underestimated the size of what I called "neutral or disputed areas". Future observers might pay attention to the extent to which song stances vary and birds feed beyond them. The Village may indeed be a less favourable habitat than some portions of the cliffs, though it is less exposed to high winds than some areas on them, but the latest accounts and photographs suggest that the Village has recently deteriorated as a Wren habitat. In view of this area's being occupied by about ten pairs, even when the total population appears to have been relatively low, it seems misleading to refer to "the marginal Village environment". As I have pointed out, it probably provided, and may still provide, an "overflow" of birds in some years available to breed later, when density is greater, in the marginal habitats, such as the slope above the Village which was tenanted by Wrens in 1948 (I. J. Ferguson-Lees, *in litt.*).

Foraging.

Shetland Wrens (*T. t. zetlandicus*) sometimes feed their nestlings on comparatively innutritious prey (Armstrong, 1952). This may apply to St. Kilda Wrens, especially on the cliffs. Two St. Kilda Wrens made about the same number of visits to their nestlings in a day as one Wren of the typical race made to its chicks on comparable dates before fledging (Bagenal, 1958; Armstrong, 1955). This suggests that food is less readily available on St. Kilda and is in contradiction with Bagenal's conclusion that "it cannot be said that the St. Kilda Wren lives in such a bleak habitat that food shortage significantly increases the time necessary for foraging". The relatively long nestling period is also unfavourable to this conclusion. The monogamy of the St. Kilda Wren is an adaption to lesser availability of food.

Density-dependent Pair-bond.

If the views I have put forward concerning the integration of the whole breeding behaviour complex are sound it would be misleading to speak of the pair-bond being density-dependent. This concept is more applicable to invertebrates than to birds. If occasional bigamy were to be recorded of some populations of normally monogamous Wrens, as I would expect, this would not weaken the thesis I have maintained. In future work to determine

the factors playing a part in speciation, it is important to obtain data relating size and nature of territory to the amount and character of food brought to the nest. I would predict that in marginal mainland habitats, where food for Wren broods is less available than elsewhere, the birds will be found to be monogamous.

Climate and Extreme Habitats.

The comment that when writing on this topic (1953b) I did not realise how different northern insular habitats could be in their effect on Wren survival does not seem justified as I pointed out how wind and snow probably affect populations differentially on various islands. I gave the St. Kilda Wren as "an extreme case" (not "the extreme case") because more data were available for it than other island races. Conditions on Fair Isle may, perhaps, be more extreme than on other islands of Shetland, but it has not been convincingly shown that Fair Isle birds differ in their behaviour from those of other comparable Shetland isles. In view of the trapping of Wrens from elsewhere on Fair Isle (including presumed *T. t. zetlandicus*), it is going beyond the evidence to class Fair Isle Wrens with those of St. Kilda in regard to isolation. Williamson estimates a population of two pairs on Stac an Armin, but there is no evidence that Wrens have ever bred there. Eagle Clarke did not claim that they did. EDWARD A. ARMSTRONG

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SIRS,—I do not understand why Mr. Armstrong insists that we must use the behaviour of the mainland Wren (*Troglodytes t. troglodytes*) as a yardstick for interpreting the behaviour of the St. Kilda Wren (*T. t. hirtensis*), especially as he himself has shown, in several contributions, how widely their habits differ.
Neutral Areas.

It is precisely because so much of the Village enclosure is unsuitable as a St. Kilda Wren habitat that there are extensive neutral or unexploited areas. Naturally, if 9 (or 10) pairs occupied this enclosure in 1951, it is obvious that the neutral zones must have been rather less extensive than in 1957. Even so, I do not see how Mr. Armstrong could have correctly estimated their size in only 7 hours ashore, and his conclusions in this respect—leading to the misapprehension that the Village was "a congested area"—must have been based largely on his knowledge of Wren behaviour elsewhere.

In criticizing the original draft of my paper, Mr. Armstrong disagreed with my conclusion that the Village has probably deteriorated as a Wren habitat since about 1953: I am glad to see that he now accepts this point. There is no evidence to support his contention that when the 9 (or 10) pairs occupied this area in 1951 "the population appears to have been relatively low". If Mr. Armstrong believes that the Village is less exposed to high winds than some parts of the cliffs, he should live there in a tent during the Wren's breeding-season! The turbulence in Village Glen during west and north-west gales (which are by no means infrequent in summer) has to be experienced to be believed.

To sum up, the Village Wrens establish a territory sufficient for their needs; and, since this is a marginal habitat, embracing a lot of exposed and otherwise unsuitable ground, the territories tend to be larger than in the optimal cliff environment, and there is in the Village enclosure more unoccupied ground than in areas of comparable extent on the Puffin-haunted cliffs.

Foraging.

Surely this comparison between the circumstances of the mainland and St. Kilda Wrens is purely academic. The island form has adjusted its breeding behaviour and cycle to meet the requirements of a special environment; the processes of adaptation have enabled it to exploit this relatively less fertile environment with a high degree of success, and Bagenal has made the point that, bearing this in mind, the St. Kilda Wren has no more difficulty in raising a brood than the mainland Wren.

Density-dependent Pair-bond.

Boyd merely suggested this as a possibility to draw attention to the dangers of generalizing on the basis of observations made in a marginal habitat like the Village area. The complete picture will not be available until such time as the breeding behaviour in an optimal puffinry habitat like Carn Mor has been studied.

Climate and Extreme Habitats.

Mr. Armstrong has mis-read me: I said we did not appreciate, at the time of the earlier correspondence, that northern insular habitats—not "climates"—could differ so widely. The Fair Isle Wrens (*T. t. fridariensis*) differ in behaviour from Shetland Wrens (*T. t. zetlandicus*) in the manner described in the second paragraph on p. 387 of my paper, and on p. 177 of *The Birds and Mammals of Shetland*, by L. S. V. and U. M. Venables (Edinburgh, 1955).

Presumed Continental *T. t. troglodytes* are trapped occasionally in autumn at Fair Isle, but the fact does not invalidate my conclusion that the Fair Isle Wren is as well isolated as the St. Kilda one. It is a habit of migrant birds to pass on, and not to linger, if their traditional habitat is wanting; and, in the event of an odd bird remaining (or turning up in the spring), it is conceivable that isolating mechanisms founded on differences in habitat and food preferences, and the quite different song, would prevent interbreeding.

Stac an Armin.

I have sailed under Stac an Armin. I have also spent much time on similar terrain on the Hirta cliffs, studying the distribution of *hirtensis*, and Mr. Armstrong has not. And in view of what I have learned I see no reason to doubt the integrity of Dr. Eagle Clarke's information or my own. It is difficult to imagine what singing Wrens would be doing there in the breeding season if not nesting in the vast puffinry. KENNETH WILLIAMSON

RECENT REPORTS AND NEWS

By I. J. FERGUSON-LEES and KENNETH WILLIAMSON

The items here are largely unchecked reports, and must not be regarded as authenticated records. They are selected, on the present writers' judgment alone, from sources generally found to be reliable. Observers' names are usually omitted for reasons of space and in case a report is subsequently rejected, and none of the items will be mentioned in our annual Index. Readers are asked to submit anything of interest as quickly as possible.

At the time of writing (8th April) numerous reports of arrivals and movements during late February and March were still reaching us every day and it would have been premature to have attempted any general picture. The paragraph which follows is therefore no more than the briefest of interim summaries.

Wheatears (*Oenanthe oenanthe*) were on the south coast on 9th March, and there is some evidence of a small fall of Chiffchaff's (*Phylloscopus collybita*) as early as 20th-25th February. The first real movements of summer-visitors, however, appear to have taken place on the nights of 19th/20th and 20th/21st March, particularly in the west, and in the next week Wheatears and Chiffchaffs were reported from many areas. A feature of this time was the exceptional arrival of Garganey (*Anas querquedula*): the earliest ones came about 16th March, but between the 22nd and the first few days of April abnormal numbers were reported from Devon, Cornwall and parts of Wales across the Midlands to East Anglia; we should be glad to have all observations of this species. Other March summer-visitors included three reports of House Martins (*Delichon urbica*), the earliest in Somerset on the 23rd. Black Redstarts (*Phoenicurus ochruros*) were widespread and locally numerous on the coasts of the south-east, but in general neither they nor Firecrests (*Regulus ignicapillus*) were anywhere near as common as in 1958 (*antea*, vol. li, pp. 203-205); only one Bluethroat (*Cyanosylvia svecica*) was reported, from just over the Essex border near Bishop's Stortford on 31st March. Waxwings (*Bombycilla garrulus*) were still in the country in the last days of March, here and there in sizeable groups. Crossbills (*Loxia curvirostra*) were breeding in several counties. Rarities included a male Red-footed Falcon (*Falco vespertinus*) at Leigh (Lancashire) on 15th March and a Crane (*Megalornis grus*) flying up the River Severn at Slimbridge (Gloucestershire) on 4th April.

NOTICE TO CONTRIBUTORS

British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of papers in particular especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlvii, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

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WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34.

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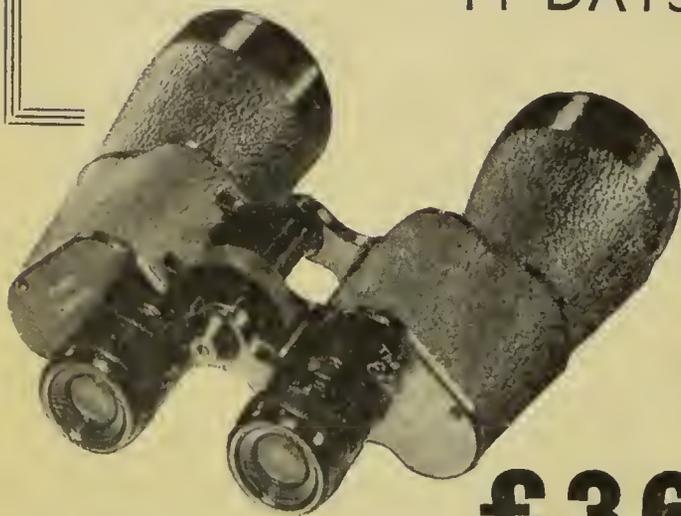
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British Birds



MAY 1959

THREE SHILLINGS

BRITISH BIRDS

AN ILLUSTRATED MONTHLY MAGAZINE

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1959



BRITISH BIRDS

SURVEY OF HOUSE MARTIN COLONIES IN EAST LANCASHIRE

By L. E. BOULDIN

INTRODUCTION

IN THE SUMMER of 1958, the East Lancashire Ornithologists' Club carried out a local survey of the nesting-sites of the House Martin (*Delichon urbica*), with a view to ascertaining their distribution and the factors controlling it.

The area chosen for study was that bounded by a circle of 15 miles radius from the centre of Accrington (Fig. 1). This area intrudes into Yorkshire as far as Slaidburn and Paythorne in the north, and to Hebden Bridge in the east. Running roughly south-west to north-east across the centre of it is the industrial belt Blackburn/Accrington/Burnley/Nelson/Colne, which lies mainly in the valley of the River Calder. To the north-west of Nelson and Burnley the mass of Pendle Hill (1,831ft.) obtrudes between this industrial belt and the Ribble Valley (Longridge/Ribchester/Clietheroe/Gisburn/Skipton), which in turn gives on to rising moorland (Longridge Fell/Easington Fell) and the Hodder Valley around Slaidburn in the north. Much of the eastern and southern parts encroach on high and bleak moorland (Stanbury Moor/Wadsworth Moor/Heptonstall Moor) in the east and the so-called Forest of Rossendale in the south. The whole is a largely moorland zone embracing a central industrial belt, with minor townships in the north and south, and intersected by a number of prominent river valleys with their accompanying roads, railways and built-up areas. The Leeds and Liverpool Canal also runs diagonally across the area through the industrial belt. Woodland is scarce, but there are some 40 reservoirs, the majority south of the industrial belt. The whole area embraces some 452,000 acres in north-east Lancashire and the overspill into Yorkshire.

Individual returns showed that the part east of the Clietheroe/Whalley environs and north of Ramsbottom in the south had been well covered, but unfortunately little information was received for

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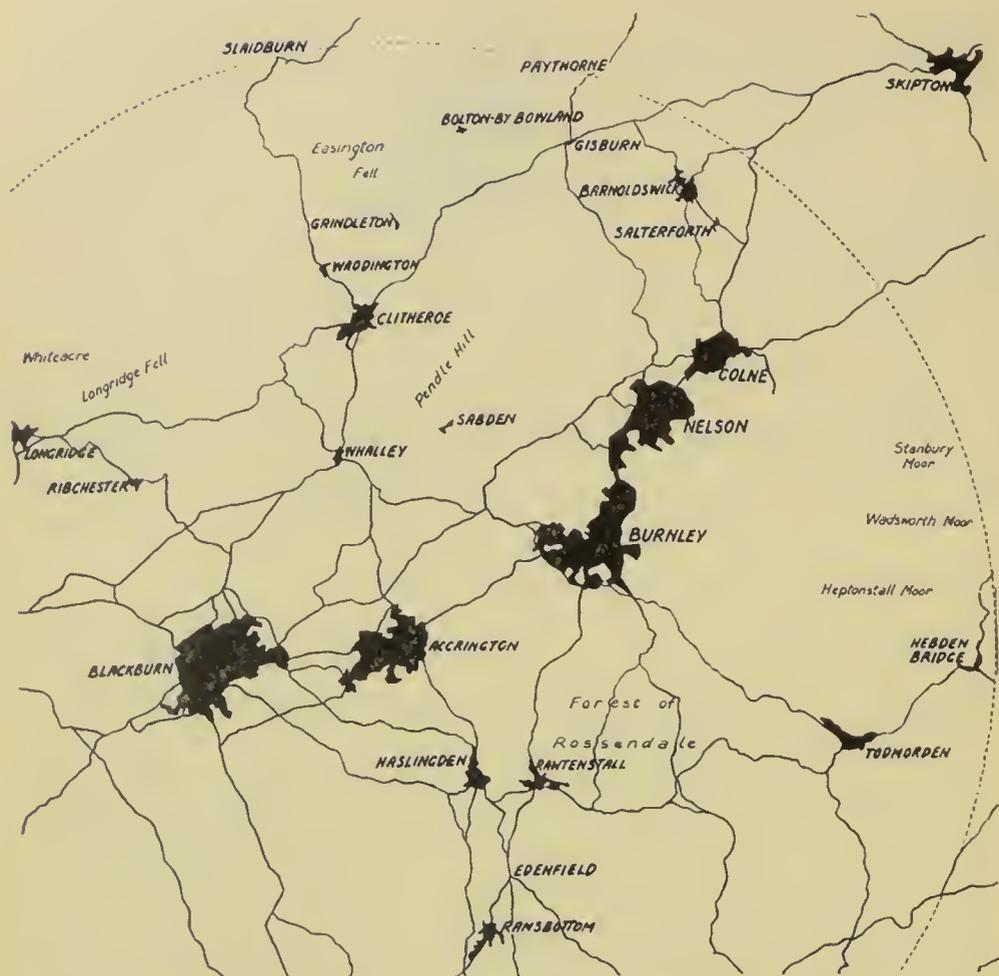


FIG. 1—SURVEY OF HOUSE MARTINS (*Delichon urbica*): MAP OF TOWNS AND OTHER PLACE-NAMES IN TEXT

The dotted line shows the boundary of the area of the survey: a circle of 15 miles radius from the centre of Accrington, Lancashire. Other lines are main roads.

the western half of the area, records of only six sites coming to hand. Thus the value of this survey has been limited by lack of full coverage over the whole of the area chosen for study, but it is possible to assess results from the returns for the eastern half of the area north of a line Hebden Bridge/Todmorden/Ramsbottom. Apart from the wet summer which may have restricted observations and which doubtless had some effect on breeding, the only other factor which should be mentioned is the possible tendency for observers to have concentrated on the various built-up areas in the valleys to the exclusion of outlying hamlets and farmsteads, but many remote rural areas were fully covered, some with negative results.

PREVIOUS WORK

So far as can be ascertained, this is the first large-scale survey

of House Martin colonies carried out in East Lancashire, but there have been previous studies in other parts of the country with which this one may be compared. Hurrell (1930) organized a survey of House Martins in Devon and Cornwall. Then a census was carried out in the Oxford area in 1931 and 1932 (Alexander, 1933), and in the next year (Cramp and Ward, 1934) there was a similar study for the Manchester area. The national sample census of Swallows (*Hirundo rustica*) in 1934 and 1935 (Boyd, 1935, 1936) included some data on House Martins, and finally there was a sample census in 1949 of Swifts (*Apus apus*), Swallows and House Martins in certain parts of London (Cramp, 1950).

NUMBERS OF BREEDING PAIRS

A total of 486 nests were located in 122 colonies, nearly a quarter of which consisted of isolated single nests; this gives an average of a fraction under 4 (3.98) nests per colony. The largest colony contained 31 nests on two adjacent farm buildings at Whiteacre (Map Ref. 612402). The numbers of nests per colony are set out in Table I.

TABLE I—SIZES OF COLONIES OF HOUSE MARTINS (*Delichon urbica*) IN EAST LANCASHIRE IN 1958

No. of nests per colony	1	2	3	4	5	6	7	8	9	10	11	12	13	14	21	31
No. of colonies	28	31	19	16	5	3	3	3	3	3	0	3	0	3	1	1

Thus over three-quarters of the colonies were of from 1 to 4 nests, though much larger groups occurred. The site with 21 nests was suburban and that with 31 nests was rural.

DENSITY

The density of nests for the whole of the study area (452,000 acres) was found to be only 1.08 per 1,000 acres. All but 71 of the nests, however, were located in the greater eastern section of the study area which included the Clitheroe, Whalley and Waddington environs and totalled approximately 333,000 acres: in this part the density figure averaged 1.25 nests per 1,000 acres. Further, by map-plotting nests in this eastern section it became obvious that most were located in five main zones, i.e.:—

- (A) South-east of Burnley.
- (B) South, west and north of Nelson.
- (C) North and south of Rawtenstall and Halsingden.
- (D) Between Whalley and Sabden in the south of the area, and Waddington and Grindleton in the north.
- (E) In the arc Colne/Salterforth/Barnoldswick/Gisburn/Bolton-by-Bowland in the north-east.

Records for these five main zones are shown in Table II.

TABLE II—COLONY-SIZE AND DENSITY OF HOUSE MARTINS (*Delichon urbica*) IN FIVE ZONES OF EAST LANCASHIRE IN 1958

The zones are detailed in the preceding paragraph (see also Fig. 1).

Area	Approx. acreage	No. of colonies	No. of nests	Av. nests per colony	Density per 1,000 acres
A	5,000	16	65	4.06	13.0
B	3,000	25	112	4.48	37.3
C	10,500	19	52	2.74	4.94
D	13,500	27	87	3.22	6.46
E	18,000	14	52	3.72	2.9
	50,000	101	368	3.64	7.36

GENERAL DISTRIBUTION

That the House Martin is a suburban rather than an urban or rural breeding species has been well illustrated in previous surveys and is generally confirmed in the present study. Cramp and Ward (1934) and Oakes (1953) recorded the species as decreasing as an urban nester in the Manchester area. Cramp (1950) found the bird absent from Central London and his density figures for the inner suburbs were over 15 times greater than those for the outer suburbs which in turn were nearly twice those for the outskirts. Alexander (1933) for Oxford, found there were three times as many nests in urban and suburban areas as in rural.

The plotted results of the present survey indicated clearly that the greatest concentrations of colonies occurred in the suburbs of the large towns, while the species was mostly absent from their centres. On the other hand, there were thriving colonies in purely rural areas, in which category, however, such small centres of human population as Whalley, Waddington, Grindleton, Gisburn and Bolton-by-Bowland, somewhat remote from the large industrial towns, are included.

For the whole of the study area it was found that only 4 colonies (8 nests) were strictly urban, 60 colonies (224 nests) were suburban and 58 colonies (254 nests) were rural. It will be noticed there is no marked difference between suburban and rural totals, but this is due to the great size of the rural area included. The totals show that, while most colonies were suburban in location, these tended to contain less nests than those in rural areas, i.e. 3.73 nests per suburban colony as against 4.38 per rural colony.

DIRECTIONS FACED BY NESTS

Aspects were recorded for 448 of the 486 nests; 193 of these faced from south to west, 145 from west to north, 157 from north to east, and 135 from east to south (the sum of these four figures exceeds the total number of nests because in each case, for reasons of convenience, both the limiting directions of the 90° arc have been included: in other words, the number of nests facing due west

is included in both the south-to-west and the west-to-north totals). In more detail, most nests faced south (63), south-west (52), north-east (51), west (48), east (43) and north (28). Thus it seems that direction has little significance and it is thought that the slight bias in favour of the south-to-west quarter is probably as much a reflection of the general direction faced by houses as of any preference on the part of the birds. By comparison, Hurrell (1930) found that 44 of 65 nests in Cornwall faced south, and that all of 126 nests in Devon looked south, south-east or south-west.

FRONTS, SIDES OR BACKS OF BUILDINGS

Particulars of the position of the wall concerned were given for 451 of the 486 nests, and 342 (75.8%) of these were at the fronts of buildings while 87 were at the sides and only 22 at the backs. Thus there were $3\frac{1}{2}$ times as many nests at fronts as at sides and backs together. Any tendency for observers to check fronts alone is not considered to have been sufficient to influence unduly a clear preponderance of frontal sites. In the next section it will be noted that more nests were sited on terraced houses than on detached and semi-detached together, as might be expected with a majority of colonies in suburban areas where there are many terraced dwellings. This does, of course, restrict the number of "sides" available, but, on the other hand, it must be remembered that detached or semi-detached houses provide twice as many sides as fronts. Eaves at backs of houses seem frequently to be less suitable, being narrow or even non-existent.

Of the 108 back and side nests for which the directions faced were given, 69 had a southerly aspect; and only 14 of the 63 such nests for which the necessary details are available overlooked no form of road.

TYPES OF BUILDING COLONIZED

The type of building on which the nests were sited was recorded for all the 122 colonies (Table IV), but in the cases of 59 of them it was not clear from reports whether they fell under the category "detached", "semi-detached" or "terraced": these are classed as "unspecified" in Table IV and are detailed in Table V.

TABLE IV—BROAD CATEGORIES OF BUILDINGS COLONIZED BY HOUSE MARTINS (*Delichon urbica*) IN EAST LANCASHIRE IN 1958

Type of building	Colonies	Nests
Detached	14	57
Semi-detached	18	46
Terraced	31	134
Unspecified	59	249
Totals	122	486

TABLE V—BREAKDOWN OF NEST-SITES OF HOUSE MARTINS (*Delichon urbica*) CLASSED AS "UNSPECIFIED" IN TABLE IV

Type of building	Colonies	Nests
Chapels and schools	3	20
Post offices	1	4
Mills and warehouses	3	12
Railway stations	4	18
Police stations	1	2
Sheds and barns	8	32
Inns and hotels	4	14
"Residences"	20	70
"Farms" and "farmhouses"	13	44
Outbuildings	2	33
Totals	59	249

The variety in the types of buildings indicates that the House Martin is catholic in its choice of nesting-site, providing suitable eaves and other essentials such as food and mud supplies combine with reasonably open aspect. No preference for any particular style of eaves was evident, nor did the colour or surface of the surrounding wall (such as pebble-dash) seem to have any significance. It was frequently noted that many apparently ideal eaves with good approaches were not used when seemingly less adequate ones near-by were occupied. One observer suggested that the aspect of the nest holes might have some significance. He found that, where nests were built side by side under the same eaves, entrance holes were in different positions and apparently arranged to avoid having converging approaches with neighbouring nests. At a late check of the 21-nest site, however, though this variation in the position was confirmed, it was clear that the entrance holes of adjoining nests as often converged as not.

PROXIMITY TO WATER

Of the 122 recorded colonies, 70 (304 nests) were located close to main rivers or to their tributaries: 17 of these were adjacent to such waters while the other 53 averaged 350 yards from them. Of the remaining 52 colonies, details for one (3 nests) were not given, but 51 (179 nests) were all near some ample water-supply such as a reservoir, canal or major stream, 15 colonies being adjacent and the other 36 averaging 280 yards away. Distances of nests from water are given in Table VI, and show that 419 of the 483 nests for which there are appropriate details were within 400 yards of some major water supply; after this distance there is a sharp drop in the numbers and only two nests (one colony) were as much as 800-880 yards away. Thus the present study seems to confirm the correlation with food supply shown by Alexander (1933), Cramp and Ward (1934) and Cramp (1950). However, an alternative correlation might in this case be made with the availability of sites, for in Pennine areas the built-up parts largely follow the river valleys.

TABLE VI—DISTANCES FROM WATER OF NESTS OF HOUSE MARTINS (*Delichon urbica*) IN EAST LANCASHIRE IN 1958

Distance from water	No. of nests
Adjacent	120
Less than 100 yards	76
100-200 yards	77
200-300 yards	86
300-400 yards	60
400-500 yards	15
500-600 yards	15
600-700 yards	25
700-800 yards	7
800-880 yards	2
Unknown	3
Total	486

DISTURBANCE OF COLONIES

In the majority of instances where nests were known to have been destroyed, human interference was responsible. Such nests were mostly either removed by tenants of houses or by visiting window-cleaners, and gutter-clearance and exterior redecoration accounted for twelve at a single site. Three nests on a farm building were deserted through the attentions of a cat which had near access via a ladder. Only twelve nests were known to have been usurped by House Sparrows (*Passer domesticus*).

PARASITES

A number of ectoparasites were collected both from nests and dead birds. Examples from Edenfield included the flea *Ceratophyllus h. hirundinis* (Curtis) and the flat-fly *Stenepteryx hirundinis* (L.), the latter new to Lancashire. Fleas from Slaidburn included *Ceratophyllus h. hirundinis*, *Ceratophyllus f. farreui* (Roths.) and *Ceratophyllus rusticus* (Wagner), the last new to Yorkshire. Slaidburn, like Edenfield, also provided *Stenepteryx hirundinis* and in this connection it is interesting to note the reference to this species in Boyd (1936, p. 111): there it is quoted as being the commonest parasite of Swallows and House Martins in France, though it was not recorded from Swallows' nests in the British Isles during the 1934-35 Enquiry. Parasites were determined by R. S. George of Gloucester.

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SUMMARY

1. A survey of House Martin colonies was carried out by members of the East Lancashire Ornithologists' Club in an area of 15 miles radius from the centre of Accrington in 1958.

2. Owing to incomplete coverage of the study area (452,000 acres), returns for an eastern section of 333,000 acres were mainly considered. For the larger area, however, 122 colonies totalling 486 nests were located.

3. Over three-quarters of the colonies consisted of from 1 to 4 nests, but the remainder included groups of 14 (three), 21 and 31 nests.

4. Breeding was found mainly in five distinct zones totalling approximately 50,000 acres and mostly in centres of heavy human population. These zones contained 101 colonies with a total of 368 nests, the density of breeding pairs being 7.36 per 1,000 acres, as against 1.25 for the eastern section as a whole and 1.08 for the complete study area.

5. Most colonies were in the suburbs of the industrial towns, only two being strictly urban. While there was not a great difference in the total numbers of colonies between suburban areas and rural areas, this was due to the great size of the rural area included. Colonies in rural areas, however, tended to contain more nests than those in suburban areas.

6. Aspects of 448 of the 486 nests seemed to show that direction had little significance, with possibly a slight tendency to face the south-to-west quarter.

7. Analysis of 451 nests showed that numbers on fronts of buildings were $3\frac{1}{2}$ times greater than the sum of those on sides and backs.

8. The survey confirmed that the House Martin is catholic in its choice of the type of building to colonize.

9. 419 of 483 nests were within four hundred yards of some major water supply and only two nests were further than eight hundred yards from such water.

10. Human interference was the chief cause of nest-failure and only 12 nests were known to have been taken over by House Sparrows. A number of ectoparasites were collected and some details are given.

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OBSERVATIONS ON ARCTIC TERNS IN SPITSBERGEN

By P. J. K. BURTON and M. H. THURSTON

DURING THE FIRST HALF of August 1957, observations were made at a colony of Arctic Terns (*Sterna macrura*) in the vicinity of Kapp Linné, on the south side of the entrance to Isfjord, West Spitsbergen (Lat. 78°3'N.). This colony has been described by Løvenskiold (1954). It is situated on the north and east shores of the lake known as the Fyrsjøen. To the north of the colony, along the shore of Isfjord, lie the buildings of the Isfjord Radio Station (Fig. 1).

The nesting area is on a stony stretch of fjaeldmark, of the type described by Summerhayes and Elton (1928). Typically, most of the nests are situated on a moss-lichen crust. During the time of the visit nearly all the eggs had hatched, and many young were already fledged. The size of the colony was estimated at some 600 pairs, but due to the late date a count of brooding birds could not be used to give a more accurate figure.

Observations covered three main aspects: diurnal rhythms; inter-relationships with predators and other species in the area; and food and feeding behaviour.

DIURNAL RHYTHMS

The daily behaviour of birds in the continuous light of the Arctic summer has been studied by a number of workers. Their results have been well summarized by Cullen (1954) and Armstrong (1954). Most of these studies have been carried out south of latitude 71°N. The daily activities of Arctic Terns south of the Arctic Circle have been investigated by Hawksley (1957) in the Bay of Fundy and by Rollin (1958) in Northumberland.

Marshall (1938) found a quiescent period for a number of species at Klaas Billen Bay, West Spitsbergen; these included Arctic Tern, Eider (*Somateria mollissima*) and Arctic Skua (*Stercorarius parasiticus*). In the colony at Kapp Linné, the existence of a rest period was obvious from the silence which fell over the area around midnight; a similar hush was also found during periods of cold, windy or rainy weather, in support of Marshall's observation. Fulmars (*Fulmarus glacialis*) in this area also exhibited a

ISFJORD

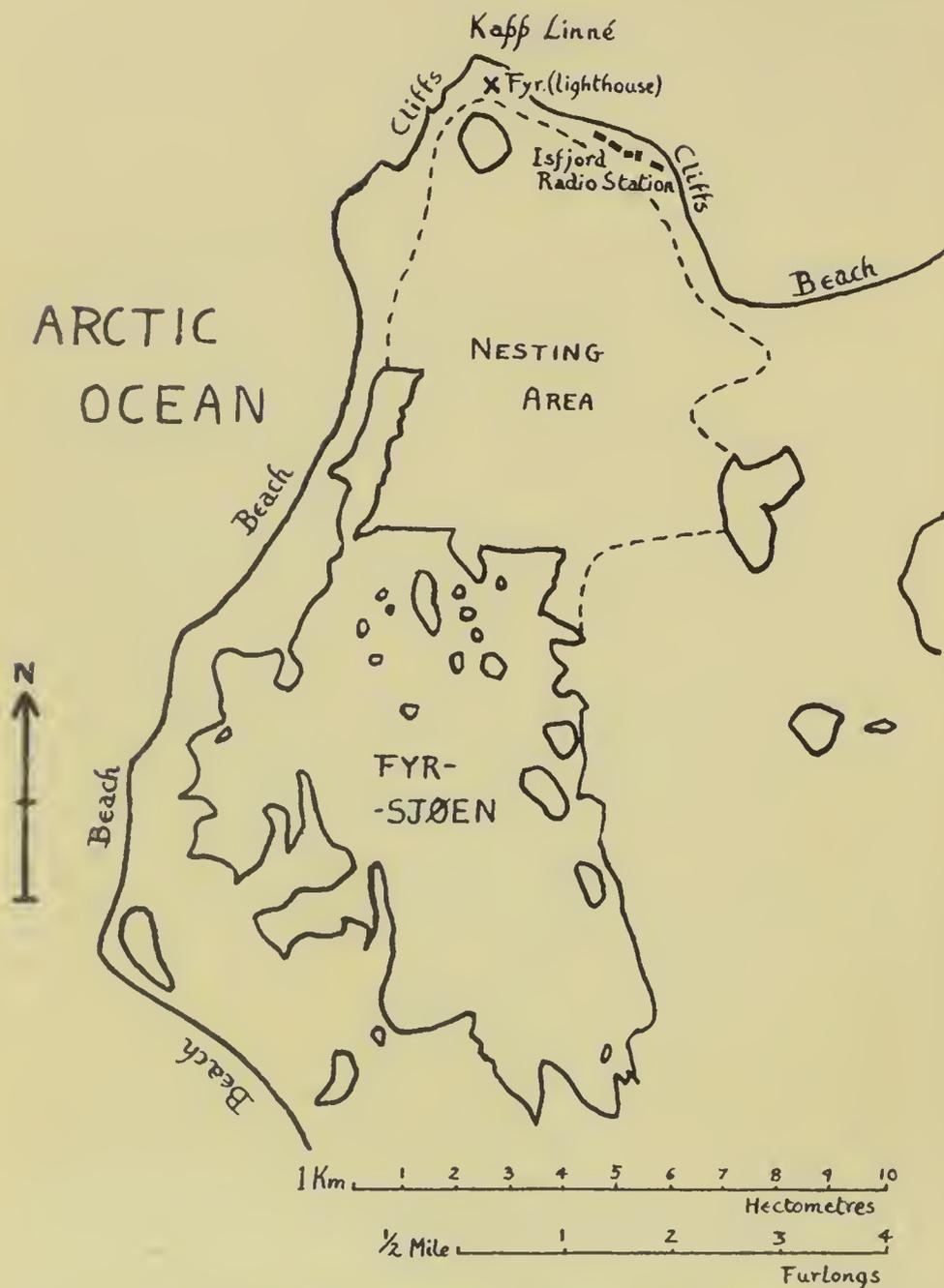


FIG. 1—MAP TO SHOW POSITION OF COLONY OF ARCTIC TERNS (*Sterna macrura*) STUDIED IN SPITSBERGEN IN AUGUST 1957

The colony was on the south side of the entrance to Isfjord, West Spitsbergen, and situated on the north and east shores of the lake Fyrsjøen. Note positions of radio station and lighthouse.

marked daily rhythm, moving south down the coast in the morning and back north again towards evening.

In an effort to discover the extent and duration of the resting

period of the terns, observations were made overnight on 5th/6th August. It was intended to watch the colony for 24 hours, but heavy rain after 17 hours made the completion of this task impossible. However, a distinct pattern was revealed and it is hoped that future expeditions may extend these observations. Commencing at 30 minutes past each hour, two main methods of recording activity were used.

The first employed a telescope mounted in a fixed position overlooking the densest part of the colony. Each hour, the number of birds entering and leaving the telescope field of vision in a 15-minute period was recorded. A histogram of visits recorded against time of day is shown in Fig. 2.

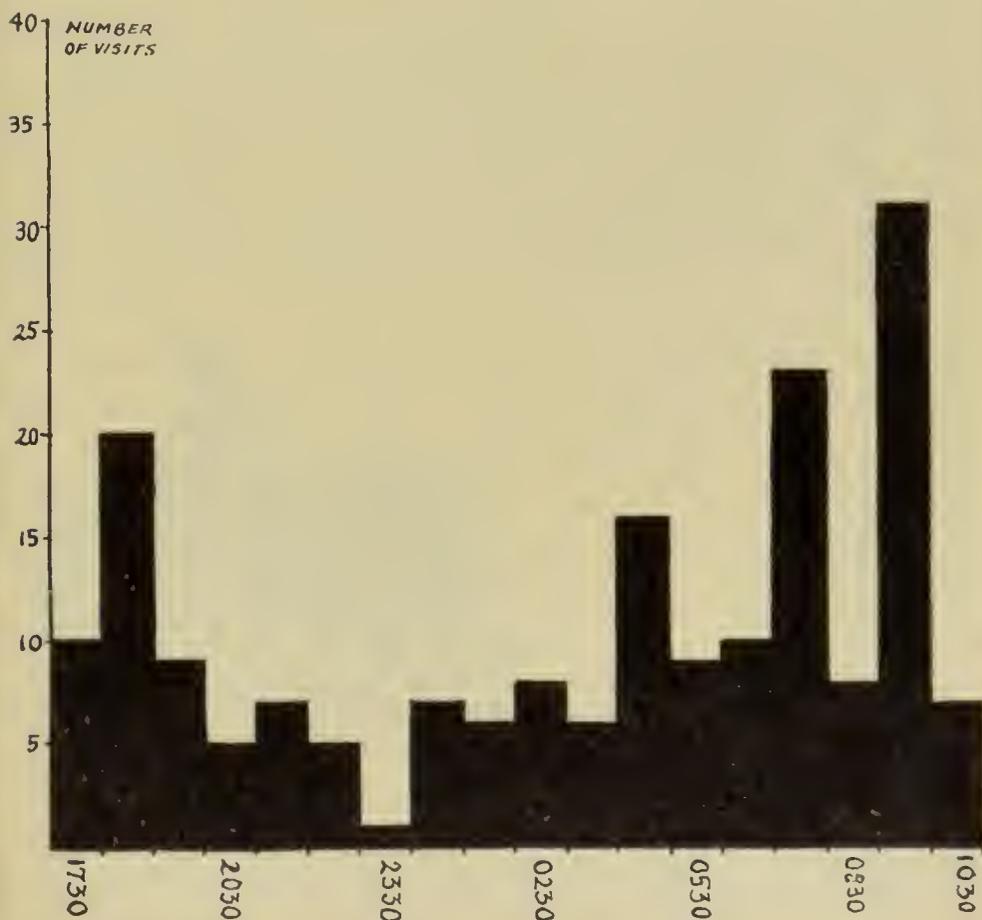


FIG. 2.—VISITING RATE OF ARCTIC TERNS (*Sterna macrura*) TO SPITSBERGEN COLONY, 5TH/6TH AUGUST 1957

In a 15-minute period in each hour the number of birds entering and leaving the field of a fixed telescope overlooking the densest part of the colony was recorded. This histogram shows the number of visits against the time of day (G.M.T.).

The second technique was intended to investigate changes in behaviour throughout the 24 hours. Following each period spent

counting visits, the colony was scanned by telescope and the behaviour of 50 individuals at the instant each came into view was noted. The telescope was then returned to its fixed position. A number of categories of behaviour were recognized, such as standing, walking, preening, landing and taking off. Other than the last two, birds in the air were not counted.

The numbers of visits in the 15-minute watches (Fig. 2) fall into a well-marked cycle with its low point at 23.30 hours G.M.T., and a period of reduced activity for about 4 hours on either side. Though only one set of observations is involved, application of the χ^2 test shows the probability of this distribution having arisen by chance to be less than 0.001 ($\chi^2 = 138$ with 17 degrees of freedom).

The behaviour counts reveal principally a marked reduction in the number of birds preening between 21.30 and 01.30, with a corresponding increase in the number sitting quiescent (Fig. 3), followed by a period of bathing for about five hours after this. This early morning bathing was, on subsequent days, found to be a regular phenomenon; at this time, up to 30 birds could be seen bathing and preening in the shallow water along the north bank of the Fyrsjøen. Bathing was rarely observed at other times of the day.

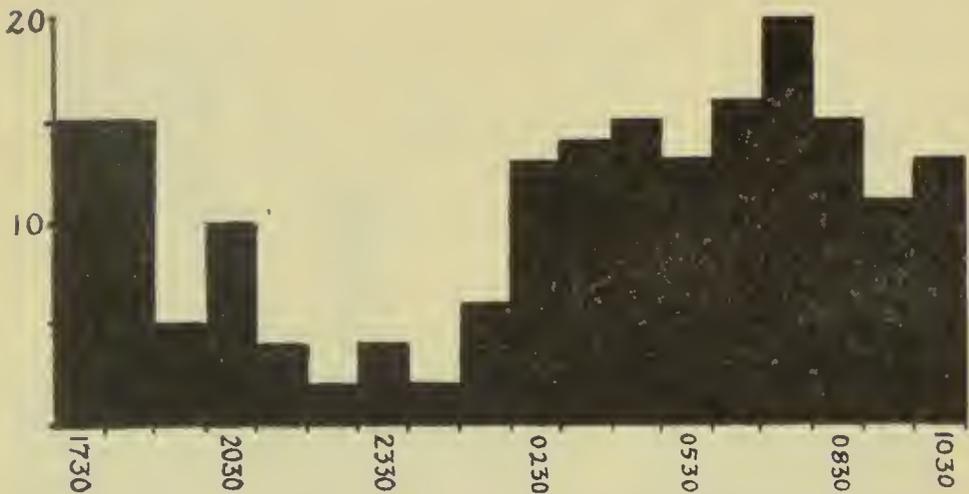


FIG. 3—PREENING BY ARCTIC TERNS (*Sterna macrura*) IN SPITSBERGEN COLONY, 5TH/6TH AUGUST 1957

The colony was scanned by telescope once in each hour and the behaviour of 50 individuals at the instant each came into view was noted. Preening was one of several categories into which behaviour was divided, and this histogram shows the number of birds preening in each sample of 50 against the time of day (G.M.T.).

We did not see any social flights such as are observed in colonies south of the Arctic Circle at sunrise or sunset (Hawksley, 1957). Also, our observations on predation did not agree with the statement of Marshall (1938) that during the quiescent period species which are habitually mobbed by the terns were allowed to fly over

unmolested. However, Marshall was referring to an earlier part of the season when the terns were sitting on eggs.

PREDATION

The predators in the area are limited to five vertebrate species: Glaucous Gull (*Larus hyperboreus*), Arctic Skua, Arctic Fox (*Alopex lagopus*), Greenland Dog and Man.

Only the Glaucous Gull and Man were of importance during our stay at Kapp Linné. Løvenskiold has described predation on this colony by dogs from the Radio Station, but we witnessed nothing of the kind, the dogs being kept well under control. Arctic Skuas were seen only three times in the vicinity of the colony and an Arctic Fox only once; these species were not considered important in relation to the colony. Possibly the colony at Kapp Linné is spared fox predation due to the presence of the Radio Station, whose occupants would certainly shoot any fox seen in the vicinity.

During our stay a considerable amount of mortality was also due to a small boy from the Radio Station who occasionally killed stooping terns with a stick and frequently caused much disturbance in parts of the colony. Efforts to correct him had little effect.

The importance of Glaucous Gulls as predators was revealed by analyses of the stomach contents of 12 gulls shot by men at the Radio Station. These are summarized in Table I.

TABLE I—ANALYSIS OF STOMACH CONTENTS OF 12 GLAUCOUS GULLS (*Larus hyperboreus*), SPITSBERGEN, SUMMER 1957

	% by volume	No. of stomachs
Young Arctic Tern (<i>S. macrura</i>) remains	40	9
Crab (<i>Hyas</i> sp.) remains	25	7
Echinoid plates and spines	15	3
Garbage	15	3
Fish remains	5	1
Egg shell (? Eider, <i>Somateria mollissima</i>)	trace	1
Ascidian test (? <i>Ciona</i>)	trace	1
Plant (largely Phaeophyceae)	trace	5

Gulls entering the colony were violently mobbed by the terns. They congregated outside it in two main places to the north and south, and when passing from one point to the other usually flew high; in general it was found that birds of any species flying over about 150 feet above the colony were not attacked.

Any Glaucous Gull engaged in predation flew first to a rubbish tip overlooking the colony; this was used as a vantage point and sometimes as a source of food in the form of garbage. If it was discovered there by terns it was attacked and driven away, but frequently it would remain unnoticed, in which case it would eventually fly quickly down into the colony, settle for a few seconds, and then leave hotly pursued by a cloud of terns. Only once were two gulls seen to enter the colony together. Tern chicks were killed and, as far as could be seen, swallowed whole. Frequently, however, a gull would be driven off before it could

eat the young tern. This was indicated by the large number of mutilated chicks found. Although young terns are occasionally killed by adults into whose territories they have strayed, the degree of mutilation could only be the work of gulls. It seems unlikely that the gulls took chicks already dead through other causes, since these are exceedingly well camouflaged and are probably noticed by the gulls only when they move. 56 dead chicks were collected and, of these, 13 (23%) were mutilated. It therefore seems possible that attacks by Glaucous Gulls may account for as much as 20-30% of fledging mortality in this area.

Attacks on chicks almost certainly resulting in death were estimated to take place at the rate of about three or four per day. In addition, there were a large number of unsuccessful sallies by single gulls which were driven off before landing. These took place at the rate of about two every hour, regardless of the time of day. The disturbance they caused was considerable and may well have contributed to fledgling mortality. Attacks on other species caused far less extensive disturbance. Only two sucked terns eggs were found; far more sucked eggs were those of Eiders.

The nearest breeding place of Glaucous Gulls was at the top of some cliffs five miles away. The number of gulls around the ternery was almost invariably about 50. This figure decreased to 5 or so during four days of intensive shooting by men from the Radio Station, but returned to normal the day after that activity stopped.

The number of stomachs containing tern remains appears too great in relation to the observed rate of predation on the colony. It is possible, however, that a few gulls were more persistent predators than the rest: since almost all of those obtained were shot on the rubbish tip overlooking the colony, the sample might be expected to consist largely of the active predators using it as a vantage point. Possibly, also, gulls obtained young terns from smaller colonies breeding to the west and south.

RELATIONS WITH NON-PREDATORY SPECIES

Several authorities have noticed the association between nesting ducks and terns. Løvenskiold (1954) commented on the association of nesting Eiders with Arctic Terns in Spitzbergen; Summerhayes and Elton (1928) recorded that the islands studied by them in Spitsbergen were shared for breeding by Arctic Terns, Eiders and Brent Geese (*Branta bernicla*); and Hawksley (1957) stated that the Long-tailed Duck (*Clangula hyemalis*) is commonly found nesting with Arctic Terns in North America. The factors involved have been discussed by Durango (1949).

This relationship was well illustrated at Kapp Linné. About 400 Eiders were present in the area, and some 50 broods had been raised. A large number of old Eider nests were found in the tern colony, and moulting adult Eiders and families with young

congregated along a stretch of beach favoured by adult and fledged juvenile terns. Three families of Long-tailed Ducks were present on the Fyrsjøen, and a nest of this species had been found in the colony before our arrival. On the other hand, association of King Eiders (*Somateria spectabilis*) with Arctic Terns seems doubtful: we found one nest just outside the colony, and three families which were present in the area only occasionally used the Fyrsjøen or other stretches of water favoured by the terns.

The association of nesting ducks with terns has been commonly thought to be protective in function, though Bergman (1941) believed social instinct to be the basis of this behaviour. At Kapp Linné neither ducks nor terns occurred without each other, despite large surrounding areas of apparently suitable tundra. This cannot be explained merely by similar habitat preferences, and the most important factor seems to be the protective one. A large number of sucked Eider eggs were found and there is little doubt that, without the protection of the terns, egg-stealing by predators would even further reduce the breeding success of these ducks. No aggressive behaviour of terns towards Eiders was seen, and only once towards Long-tailed Ducks. However, attacks by Arctic Terns on Eiders have been noted in the Farne Islands, Northumberland (J. M. Cullen, personal communication).

Paget-Wilkes (1922) discovered Grey Phalaropes (*Phalaropus fulicarius*) nesting on an island in Liefde bay, Spitsbergen, with Arctic Terns; and Løvenskiold (1954) also gave these birds as associates. In the Kapp Linné area in 1957, about forty Grey Phalaropes and four Red-necked Phalaropes (*Ph. lobatus*) frequented a shallow part of the Fyrsjøen near the tern colony and two families of the former species were seen. Mobbing of a Grey Phalarope by a tern was once noted; otherwise, small waders were ignored by the terns.

Fulmars crossed the colony regularly from the bay east of Kapp Linné to the sea on the west, and vice versa, in the course of daily movements up and down the coast. They were invariably mobbed by terns, sometimes quite heavily, but usually kept straight on, avoiding the terns by banking. Occasionally, however, they were compelled to turn or dive, and a Fulmar found drowned in a pool of mud in the colony may well have been forced down by their attacks. Sometimes attacking terns would follow the Fulmars some way out to sea, and terns fishing along the coast were observed to stoop at passing Fulmars.

Kittiwakes (*Rissa tridactyla*), another species harmless to terns, were also violently attacked on a number of occasions, in spite of the fact that large numbers frequented the area and were regularly seen resting, often among the terns, on islands in the Fyrsjøen. Mobbing was mainly confined to individuals and small parties of Kittiwakes. Twice, individuals flying over the Fyrsjøen were attacked and forced down into the water by up to eight terns at once. However, the congregation of Kittiwakes in the

vicinity of the terns may have been ultimately self-protective, since skuas were abundant outside the colony and harassed Kittiwakes unmercifully on all possible occasions. By contrast, skuas rarely approached the tern colony and those that did were quickly driven away.

Various other species present in the area—Snow Buntings (*Plectrophenax nivalis*), divers and auks—were not seen to be mobbed, and showed no signs of association with the terns.

MOBBING BEHAVIOUR

Methods of intimidation used by the terns appeared to fall into two general types. The normal one was the familiar stoop, from a height usually of 6 to 15 feet above the victim. It might involve striking with either the bill or the hind end of the body, and always included a sharp call "käääk" uttered close to the victim's head. Stoops of this kind might be repeated many times, with metronomic regularity, usually about every three to four seconds: Glaucous Gulls on the ground subjected to such treatment were able to judge the moment of each strike and duck their heads to avoid it. Each stoop would be preceded by a hover, lasting about one second. A less frequent modification was an approach from the predator's front, usually at about head height; the appearance of the approaching tern greatly enhanced the intimidatory effect of this attack. Both types were frequently accompanied by defecation.

In our experience repeated stoops, both at ourselves and at gulls on the ground, were made from behind. During brief periods of bright sunny weather there also appeared to be a tendency to attack out of the sun. However, we did not observe any correlation between direction of attack and direction of wind as might have been supposed. This was borne out in experiments with dummy gulls, in which stoops were made from behind, reversal of the dummy causing reversal of the terns' attacks.

Both types of attack were modified with decreasing intensity. Half-hearted stoops would level out a yard or more above the victim's head, and would often not include a call. In low-level, head-on attacks of reduced intensity a bird would rise too high or swerve to one side, and would often similarly not use any vocal accompaniment.

Prolonged hovering without stooping was noted in some circumstances—in attacks upon ourselves when we retaliated by looking up at the bird and gesticulating; in the early stages of attacks on gulls; and as a reaction to the injury of another tern. Behaviour in this last instance was similar to that observed when a dead adult tern was mounted on a stick (see page 158). Such hovering might last ten seconds, with several drops in height during the time. This behaviour, and the conditions under which it occurred, suggests a state of ambivalence between fear and aggression.

Attacks were almost entirely carried out by adult terns; juveniles

associated with mobbing birds, but only on rare occasions made a feeble stoop. Adults with fledged young attacked as readily as those with flightless chicks.

Any gull landing in the colony was attacked by many terns and driven off. The attacks were continued on the flying bird, which would attempt to avoid them by sideslipping and diving. Invariably it would show itself to be in a condition of panic, and would fly erratically backwards and forwards over the colony, pursued by a cloud of terns; usually about two minutes would elapse before it found its way out. Gulls were fairly often struck and on one occasion one was seen shedding a trail of feathers as it fled. A gull that had apparently been killed by terns was found in the colony on 7th August.

EXPERIMENTS

Using Glaucous Gulls shot by the men at Isfjord Radio Station, we were able to observe the extent of the disturbance caused by the presence of a predator in the colony. Also, by use of isolated parts of gulls, some of the stimuli releasing aggressive behaviour were investigated.

The method in all cases was to carry a dummy (wrapped in cloth) into the colony, set it up quickly, and retire to a suitable vantage point to watch. Then the number of stoops made at the dummy per minute were recorded until a steady situation was reached, when the dummy was retrieved. The experiments were made in various parts of the colony with intervals of two or more hours between them. Results are shown in Table II.

TABLE II—RESULTS OF MOBGING EXPERIMENTS WITH ARCTIC TERNS (*Sterna macrura*), USING DUMMIES OF GLAUCOUS GULL (*Larus hyperboreus*), SPITSBERGEN 1957

The figures show the average numbers of stoops per minute in successive five-minute periods, compiled from one or more numerical trials. X signifies that observation was discontinued.

Type of dummy	No. of trials	Successive five-minute periods														
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th
Stuffed gull skin	2	40	42	26	23	17	13	16	15	20	15	6	0	0	X	X
Complete lead gull	4	40	37	52	44	31	42	32	49	41	42	30	30	26	37	44
Lead only	1	33	36	33	27	21	24	33	23	7	14	6	9	X	X	X
Model head	1	20	23	20	27	40	38	31	27	27	X	X	X	X	X	X

When a dead gull was set up, mobbing was initiated by the pair of birds whose young were closest to it; the process of alarm communication has been described by Palmer (1941, p. 95). This pattern was still followed in areas frequented by adults with their fledged young—notably the beach to the west of the colony. A disturbed juvenile would usually circle around over the intruder, while its parents and neighbouring adults attacked.

About one minute after attacks by the first pair of terns began, a cloud of some 60 to 70 birds had usually gathered. A peak in the rate of stooping was reached at the same time, the maximum being about 75 to 80 stoops per minute. This rate could be maintained by as few as 20 terns and larger numbers were unable to attack at a greater rate. The birds stooped in a more or less orderly succession, though when large numbers were present collisions occasionally occurred. The number of attacking terns fell to about 10 in twenty minutes, and was thereafter continued by about 3-15 birds for as long as the watch went on (the maximum period of observation being an hour and a half). The attacking rate fell to about 35 with occasional outbursts.

Earlier experiments utilized stuffed skins, but it was found that these gradually sagged and slumped forward, and the attacking rate fell correspondingly to nil (see Table II). One dummy was knocked over after 85 seconds and mobbing ceased after 7 minutes. Dead gulls placed upside down, or in various unnatural positions, did not elicit mobbing. This capacity to recognize "death" is of considerable value, since, if a gull was killed in the colony (as apparently on 7th August) and an unnecessarily prolonged disturbance resulted, this would cause heavy mortality among the fledglings.

Further experiments were made with isolated parts of gulls:

Pairs of wings only—Sporadic mobbing by one pair of terns for seven to ten minutes.

Headless body—Did not elicit mobbing.

Head alone—The head of an adult Glaucous Gull mounted on a stick 16 inches above the ground (about the natural height for this gull) produced continuous mobbing at a rate of about 30 to 40 stoops per minute, falling off gradually. A head half this height above ground was mobbed by a few birds for five to ten minutes, and a head at ground level caused no response. This suggests that head height may be involved in the terns' ability to tell a well set-up ("life-like") dummy from a sagging ("dead") one.

Model head—A two-dimensional paper model of a gull's head, twice life size, was found to produce continuous mobbing, but when the red spot on the bill was missing there was no response in the three tests made. Similarly, a mounted Kittiwake's head (yellow bill without spot) produced no response. It may be that a head lacking the spot is not sufficiently conspicuous, but possibly such a spot is of special significance. Palmer (1941, p. 97) noted that terns showing a bloody spot were subjected to social attack by their fellows.

Some other experiments may be briefly mentioned. A dead tern mounted on a stick caused the assembly of a huge milling crowd of some 200 terns; similar behaviour was observed towards an



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MALE YELLOW-BREADED BUNTING (*Emberiza aureola*) AT NEST: KEMPELE, FINLAND, 9TH JULY 1958

The male in breeding plumage is unmistakable and the general pattern is well shown here: dark chestnut above and yellow below, with a narrow chestnut band across the breast, a black face and a conspicuous white patch on the wing. The amount of black on the face varies and does not stand out from the chestnut except at closer ranges, so that the chestnut division of the yellow under-parts and the white wing-patch are the most striking features.





Eric Hosking

FEMALE YELLOW-BREASTED BUNTING (*Emberiza aureola*): FINLAND, JULY 1958
The female is yellowish-brown above, broadly streaked with black on the mantle and scapulars, with a chestnut tinge to the rump; the under-parts are mainly unmarked yellow more or less tinged with buff, with purer buff on the sides and under-tail, and streaking only on the flanks. The general effect is of a very pale bird with a noticeably streaky back, two pale and narrow wing-bars and a conspicuous pattern of light and dark stripes on the head (see plate 28 and pages 162-163).



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MALE YELLOW-BREASTED BUNTING (*Emberiza aurcola*): FINLAND, JULY 1958
 This shows the inconspicuous second wing-bar formed by the buffish-white tips to the greater coverts, but except in fresh plumage it is less distinct than many book illustrations suggest. Note also the broad chestnut-black streaks on the flanks. There is a white band across the outer tail-feathers (see plate 25), but this is usually seen only in flight when it adds to the bird's shape and wing-patch to give the male a superficial resemblance to a Chaffinch (*Fringilla coelebs*).



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FEMALE YELLOW-BREASTED BUNTING (*Emberiza aureola*): FINLAND, JULY 1958

The upper photograph shows the two wing-bars which are often too inconspicuous to be very useful as a field-character, and the lower the singularly stripy head. The yellowish-brown crown-stripe is bordered with blackish, which in turn gives way to the broad yellowish-buff eye-stripes; a dark line through and behind the eye, and a dark line below the brown ear-coverts, add to an effect which with the streaky back recalls an Aquatic Warbler (*Acrocephalus paludicola*).



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YELLOW-BREASTED BUNTING (*Emberiza aureola*) HABITATS: FINLAND, JULY 1958
 The surroundings of the photographed nest (upper) were open; the nest itself was in a tangle of grass and other rank vegetation such as horsetails, 1½-2 feet high, in which shoots of willow were growing, but it was some 30 yards from the bushes in the background. By contrast, the lower shows the site of another nest which was well inside and under a thicket of willow 6-9 feet high (see page 162); dead twigs such as those on the left were favourite song-perches.



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PAIR OF YELLOW-BREADED BUNTINGS (*Emberiza aureola*): FINLAND, JULY 1958
 Both sexes feed the young and here the female is about to remove a faecal sac; these may be swallowed or taken away. Food at this nest consisted of hover-flies, clegs, crane-flies, lacewings and various caterpillars. Note again the broad buff eye-stripe of the female. There were six young here and this appears to be a commoner clutch and brood-size than *The Handbook* suggests (see page 162). The nestlings have blood-red interiors to their mouths.



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MALE YELLOW-BREASTED BUNTING (*Emberiza aureola*): FINLAND, JULY 1958
Incubation is mainly by the female, but both sexes take turns in brooding the young. Nests are made of dead grasses lined with finer grasses and sometimes a few hairs (no feathers). Contrary to the statement in *The Handbook*, most nests in Finland are on the ground, in more or less dense vegetation with or without bushes (see plate 29 and page 162). This is one of the smaller buntings and it has a fairly short tail, but it does not seem strikingly small in the field.



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MALE AND FEMALE YELLOW-BREASTED BUNTINGS (*Emberiza aureola*) AT NEST: KEMPELE, FINLAND, 9TH JULY 1958
 In each case the parent bird has adopted the familiar air of expectancy with which Passerines wait, after feeding their young, for the passing of a faecal sac. Note how the yellow above the male's chestnut breast-band extends conspicuously on to the sides of the neck; the second wing-bar and the extent of the dark streaking on the flanks are also well shown here. The beak is dark brown on the upper mandible, paler at the base and on the lower mandible.

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injured tern. Turner (1934) performed a comparable experiment with Common Terns (*Sterna hirundo*), and Palmer (1941, p. 97) also noted this behaviour in cases of injury, again among Common Terns. A notable difference, however, is that, whereas these two observers commented on the silence of the cloud of terns, we found the Arctic Terns at Kapp Linné continually uttered the alarm note. A dead chick mounted in the colony was not mobbed. A pair of gulls set up simultaneously, 20 yards apart, resulted in a reduced sum of mobbing—a feature also noted in the case of living gulls: the cause is probably indecision as the terns waste a good deal of time flying to and fro between the two dummies. A dead Fulmar set up gave no response.

In all experiments, the entry of a genuine gull into the colony caused the birds to forsake the dummy, returning after the gull had been driven out.

These experiments suggest that a number of simple sign stimuli are concerned in releasing mobbing, although many factors must obviously be involved. For instance, juvenile Glaucous Gulls (we had no specimen) which entered the colony were attacked as fiercely as adults, yet they lack the adult head pattern. Also, Fulmars and Kittiwakes, which did not give results in these experiments, were attacked when flying over the colony. Apparently any medium or large bird of approximately the shape of a gull will release mobbing.

FEEDING

Fishing was mainly carried out up to about 100 yards offshore. A number of birds were also to be found feeding on the Fyrsjøen (brackish) and a fresh water tundra lake near-by. Counts of birds feeding in different areas on different days revealed a marked preference for feeding in waters sheltered from the wind. Concentrations of food were nowhere sufficiently dense to cause the assembly of rotating flocks as described by Palmer (1941, p. 98). The observation of Marshall (1938) that fine sunny periods interrupted feeding was not supported.

Analyses were made of the stomach contents of dead birds found. The contents of 12 adult stomachs are shown in Table III.

TABLE III—ANALYSIS OF STOMACH CONTENTS OF 12 ADULT ARCTIC TERNS (*Sterna macrura*), SPITSBERGEN, 1957

	% by volume			No. of stomachs
Gammarids	trace (1)	1
Euphausiids	20	1
Unknown Crustacea	65	7
Polychaeta (setae)	15	2
Pycnogonida	trace (1)	1
Feathers	trace (3)	2

The carotenoids from the crustaceans eaten give the birds' droppings a pink colour; this is also shown by auks (Alcidae) in

Spitsbergen. Løvenskiold (1954) stated that pteropods, known as "Kruttåte", form an important part of the food of this species in Spitsbergen.

Twenty young birds found dead were examined. Fourteen of these had empty stomachs, while the remainder held a few items each as feathers, dead moss, small leaves and stones. Palmer (1941, p. 90) stated that young Common Terns frequently peck objects such as pebbles and sticks, but rarely try to eat them. Hence this emptiness, and the useless objects taken, seems to indicate hunger; possibly these young had been separated from their parents. Hawksley (1957) found that starvation accounted for nearly a third of the total chick mortality in the Arctic Tern colony he studied, and Austin (1945) considered much mortality to be due to parental neglect, food shortage being a negligible factor. The straying of chicks undoubtedly results in heavy mortality, and it is doubtless a means by which predator disturbance decreases breeding success, even if actual predation is small.

ACKNOWLEDGEMENTS

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SUMMARY

1. Observations were made in the summer of 1957 at a colony of Arctic Terns at Kapp Linné, Vest-Spitsbergen ($78^{\circ}3'N$). A marked diurnal rhythm was found, and is described and discussed.
2. Glaucous Gulls were the most important predator species. Their predation tactics are described, and the extent of predation is indicated. The disturbance created by gulls is thought to be important as an indirect cause of chick mortality.
3. Eiders and Long-tailed Ducks nested within the colony, but King Eiders showed little evidence of this. The association is thought to be protective in function. Phalaropes also show association with terns.
4. Mobbing tactics of terns are described. Experiments with dummies were made to investigate the stimuli concerned in releasing mobbing. Some harmless species, especially Kittiwakes and Fulmars, were violently mobbed when crossing the colony.
5. Feeding behaviour is mentioned, and stomach analyses of adults and fledglings are given.

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PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

XCVII. YELLOW-BREASTED BUNTING

Photographs by ERIC HOSKING

(Plates 25-32)

Text by I. J. FERGUSON-LEES

OF THE THIRTY species of true buntings (*Emberiza*) in the Palaearctic, only five have breeding distributions which straddle the whole width of Asia and extend into Europe, and one of these is the Yellow-breasted (*E. aureola*). It is true that in Europe, outside Russia, it is confined to Finland as a breeding species, but from there it extends right across Siberia to Manchuria, Korea, Japan and Kamchatka, chiefly between about latitude 50°N. and the Arctic Circle. Further, it appears to have extended its range in Finland during the present century from the ceded territory of Karelia to the shores of the Gulf of Bothnia and, though the Finnish population is still estimated at not more than 100 pairs (Merikallio, 1958), some colonies have been discovered only in the last ten years. Thus it may continue to spread westwards, though, as the species has a south-easterly migration and appears to be confined in winter to S.E. Asia, it is unlikely at the moment to occur with much greater frequency in western Europe: to date there are only eleven British records and a small scattering from Continental countries as far west as the south of France.

The first Yellow-breasted Buntings to be found in the west of Finland were located in the Oulu area in 1920 and there were inland records in the 1930's and 1940's, but it was not until 1952 that the first of the larger colonies in the marshland on the eastern shores of Liminganlahti Bay was located: this held 15 pairs in 1952, 19 in 1957 and about the same in 1958. Other pairs and colonies have still more recently been located in the same general area south of Oulu and in one or two other districts on the Bothnian coast. With much help from Nils Fritzén and J. Siira, to whom we are particularly grateful for introducing us to the birds, and from C. J. Booth, three nests were found at the beginning of July 1958: two in the original colony on the shores of Liminganlahti Bay and the third about four miles away near Kempele. It is the last nest that appears in these photographs which, with the exception of the habitat ones, were all obtained on 9th July.

The typical Finnish habitat is the vicinity of willow thickets or birch scrub in marshland or sometimes in adjacent grassland; but elsewhere, according to *The Handbook*, dry scrub and steppe country are also favoured. The three nests we found in Finland in 1958 were in a variety of sites, but all were on the ground and not "in low bushes, on stumps . . . usually 2 or 3 ft. from ground" as described in *The Handbook*: ground-nesting appears to be normal in Finland. One nest was among a tangle of rank grass, reed and meadowsweet growing several yards inside a willow thicket 6-9 feet high (plate 29 lower). The other two were 25-30 yards from the nearest bushes, one in rank vegetation 1½-2 feet high (plate 29 upper) and the other in quite short grass right out in the open. Thus the site seems to be as variable as it is with Reed Buntings (*E. schoenichus*) which, incidentally, were common in the thickets and surrounding marshland where the Yellow-breasted Buntings were. A description of the nest itself appears under plate 31, but it might be added that one of the nests we found was little more than a scantily lined hollow. *The Handbook* gives the normal clutch-size as "4-5, rarely 6", but two of the three nests contained 6 eggs and 6 young respectively and the third was not revisited after the day on which its fifth egg was laid: we understood that 6 eggs appeared to be the usual clutch in Finland. Both sexes are said to incubate and the male was flushed from the nest with the incomplete clutch on one occasion. "Injury-feigning" was observed when a female was flushed from a nest in the twilight of the sub-arctic night. The male assists in brooding the young (plate 31) and in feeding them. According to Dementiev and Gladkov (1954; see Harber, 1955), incubation takes 13 days and the young leave the nest when 13-14 days old.

Details of the breeding plumages are given in the captions to the plates and need not be repeated here, except in so far as it is worth drawing attention to the distinctive head-pattern and colouring of the female (see especially plates 26 and 28): the

striped head is quite noticeable in flight and with the black-streaked yellowish-brown back the general impression is not unlike that of an Aquatic Warbler (*Acrocephalus paludicola*), though, of course, the shape and size are very different. With the additional distinction of the unmarked breast, the whole appearance is paler and more contrasting than is the case with the female Yellowhammer (*E. citrinella*) or Cirl Bunting (*E. cirlus*). The double wing-bar which is often quoted can be very inconspicuous, particularly in worn plumage; the second wing-bar on the male is similarly rather indistinct (plates 27 and 32 left). There is only one British record of a male in full plumage (*antea*, vol. xlv, p. 230; *Scot. Nat.*, vol. 63, pp. 186-187) and so it should be remembered that in the winter male much of the black on the face is lost, the chestnut upper-parts and breast-band are partly obscured by buff tips, and the wing-patch is buffish freckled with dusky marks.

The song, though simple in pattern, is unusually melodious for a bunting: though often likened to the song of the Ortolan (*E. hortulana*), it is faster and much more liquid and musical, with a considerable carrying power of up to a quarter of a mile in good conditions. It is often uttered from exposed twigs in the willow thickets (plate 29 lower). More important to observers in this country, the normal call-note is a very distinctive "tick" that is astonishingly like that of a Robin (*Erithacus rubecula*).

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NOTES

Fulmar incubating eggs of Great Black-backed Gull.—During a visit to North Rona, Scotland, on 3rd June 1958, I found a Fulmar (*Fulmarus glacialis*) incubating three eggs of the Great Black-backed Gull (*Larus marinus*). The nest was that of the gull and was built among rocks on comparatively flat ground on the Fianuis promontary. The Fulmar was flushed and was back on the eggs within five minutes, during which time I had moved only 10 to 15 yards away. On the rocks close to the nest were a number of Great Black-backed Gulls, but none was seen to molest the Fulmar while it was incubating. Other Fulmars were nesting in the immediate vicinity.

The site was visited on each of the next two days and the Fulmar was sitting on both occasions. A close inspection showed that the bird was unable to cover the eggs completely and that the two of them towards the back were cold by comparison with the one under the breast feathers.

J. MORTON BOYD

Great Black-backed Gull attacking migrant Blackbird.—On 30th March 1958, while on board the Mid-Barrow light-vessel in the Thames approaches ($51^{\circ}35'N.$, $1^{\circ}10'E.$), I watched a Blackbird (*Turdus merula*), probably a weak migrant, flying towards the light-vessel with about 40 Herring Gulls (*Larus argentatus*) and one or two Great Black-backed Gulls (*L. marinus*) mobbing it. The Blackbird was forced to come down on the water and one of the Great Black-backs made for it while the Herring Gulls settled near-by. The Blackbird made several attempts to escape, but each time it took wing the gulls rose also and it was forced to settle again. Eventually the Great Black-backed Gull picked up the unfortunate Blackbird in its beak and five times dropped it from a height of about 20 feet into the sea, following it down and pouncing on it. Presumably the Blackbird was eventually eaten, but I was not able to witness this as the current carried the whole scene beyond my ken.

GEORGE GAMBLE

Swallow persistently following man to catch insects disturbed from ground.—At the end of May 1956, six or eight Swallows (*Hirundo rustica*) on passage spent a day on Fair Isle. It was cold and windy, and they were flying very low over the grass where swarms of small black insects were sheltering from the weather and were reluctant to take wing. As I was walking across the pasture one Swallow began to fly very near to my legs, passing again and again so close that I found myself involuntarily stopping for fear of colliding with it. This continued for so long that I began trying experiments. First, I walked to the windward side of a wall: when the Swallow could no longer pass round my legs it abandoned me for the moment, but as soon as I left the wall it returned. Later, I came to the edge of a cliff and stood there: again, as I was no longer stirring up insects for it to catch, it deserted me; but after two or three minutes, when I began walking through the grass again, it returned. It then continued passing within a foot of my legs every two or three seconds until I finally joined the road. I reckoned that it had been accompanying me in this way for about 20 minutes. Once, for about a quarter of a minute, a second Swallow also flew very close, but it soon left me and none of the other half dozen hunting in the same area made any attempt to use me in catching their elusive food.

H. G. ALEXANDER

Co-operative preening by Carrion Crows.—On 13th August 1958, at Stockton-on-Tees, Co. Durham, two Carrion Crows (*Corvus corone*) were perched on a roof. After remaining motionless for about 15 minutes one of them began to peck at the other's nape and crown; this latter bird crouched and retracted its head, thus adopting a submissive posture. The active bird appeared to be removing something from the feathers (possibly parasites) and eating it. This continued for about two minutes when the

active bird moved away along the roof and preened. After a short interval the other bird moved up to it, again adopting the submissive posture. It was ignored by its partner, which moved away. This was repeated several times and eventually the previous behaviour was carried out again; this time the active bird searched the area of the crown, nape and upper back, apparently collecting and eating something. After a few minutes the birds flew off.

D. SUMMERS-SMITH

[We showed this note to Mr. Derek Goodwin and he commented: "I think this head-preening may be normal in crows (*Corvus*), though it seems to occur less frequently than in pigeons (*Columba*), coots (*Fulica*) and parrots (Psittacidae). Pigeons certainly at times remove small objects and eat them when doing this (see *Bird Study*, vol. 3, pp. 25-37). I have seen a captive pair of Ravens (*C. corax*) doing it and they lifted each other's neck and head feathers carefully and peered among them, apparently searching for parasites. I also noted Hooded Crows (*C. corone sardonius*) preening each other's heads in Egypt, oddly enough only about the same time of year as the above observation, i.e. after the breeding season. But I have not studied mutual preening in crows, so do not know how far it parallels the same behaviour in pigeons".—EDS.]

Hen Blackbird killing young.—During the period 10-11 a.m. on 7th June 1956, a female Blackbird (*Turdus merula*) was seen to kill the four half-feathered young from her nest which was situated among boxes stored in the packing house of the Avonholme Nurseries, near Evesham, Worcestershire. The Blackbird carried three of the young from the nest and killed them by pecking them and knocking them on the concrete floor, and the last she killed in the nest. This was witnessed by Mr. J. C. Eewens, owner of the Nurseries, and by two of his employees at work in the packing house. The male Blackbird was not seen in or near the building at any time. Subsequently the female built another nest which contained two young and one infertile egg by the end of June.

ANTONY J. HARTMAN

Early nesting of Reed Warbler.—On 9th May 1958, I found a nest of the Reed Warbler (*Acrocephalus scirpaceus*) containing four eggs in a reed bed at Marbury Mere, Great Budworth, Cheshire. With the exception of one new green reed all the reeds to which it was attached were old. The nest seemed to be rather shallower and of more flimsy construction than usual. On 19th May two eggs had hatched and on the 20th, when A. W. Boyd and I visited the nest, it held four young ones. As the period of incubation is 11-12 days we may conclude that this clutch was complete not later than 7th or 8th May. This evidently is remarkably early to judge from records published in this journal (*antea*, vol. ix, pp. 48, 121; vol. x, p. 20; vol. xxxix, p. 347):

these refer to a partly built nest on 4th May, and to clutches of four eggs on the 14th, 15th and 16th, and one of five eggs on the 15th.

G. TRELFA

[It will be remembered that in 1958 the late spring resulted in a late breeding season among the resident species, but that the summer visitors recovered well from a late arrival and started laying on normal or even early dates (*antea*, vol. li, pp. 405-406).—EDS.]

Early breeding of Crossbill.—On 1st February 1959, I found a fledged juvenile Crossbill (*Loxia curvirostra*) in a row of Scots pine trees in the Breckland of Suffolk; the nest from which it had come was located about 100 yards away. Judging by the growth of the rectrices and of the bases of the primaries, I estimated that the bird had been out of the nest at least one week. I know of only one earlier record in Britain—the late Commander A. W. P. Robertson's (*antea*, vol. xlvi, pp. 380-381). He found juveniles which had been not less than four days out of the nest on 14th January 1952, about a fortnight earlier than the present observation.

In my experience the date of fledging in this species is normally early March, not late March and April as inferred by *The Handbook*.

R. E. HITCHCOCK

Male Chaffinch apparently feigning injury.—On 12th May 1956, a section of the Fylde Naturalists' Society visited the area around Salwick, near Preston, Lancashire. When a party of some six of us mounted from a canal bank on to a bridge above it, we saw a cock Chaffinch (*Fringilla coelebs*) by the side of the road. It was apparently in considerable distress as it allowed us all to gather round about three yards from it. Its breast was on the ground, its body was tilted away from us and partly supported by the open right wing, and its tail was pointing vertically upwards; one eye was staring steadily at us. I approached the bird with the intention of picking it up, but by hobbling and flopping with both wings more or less spread it kept its distance. When I stopped, the Chaffinch stopped and assumed the original position again. This went on for about 20 yards when, after allowing me to approach to within a yard, it rose and made a perfect flight.

N. HARWOOD

REVIEW

PHENIX RE-BORN. By MAURICE BURTON. (*Hutchinson*, London, 1959). 244 pages; 17 photographic plates (one in colour) and 26 drawings. 25s.

BASED mainly on the author's unique and fascinating, though limited, observations on a few corvine birds anting with burning materials, this is the first book to be devoted largely to the topic of anting. It sets out modestly to examine the phoenix myth, and its possible origins in anting behaviour, and for this as good

a general case is made out as could be expected. But then the book develops into a sweeping *tour de force* designed to revolutionize conventional thinking on anting problems and even on behaviour in general. In this it fails and, though not without some merit, is a great disappointment.

The most valuable part of the book concerns the peculiar behaviour of the two captive Rooks, Niger and Corbie, and the captive Jay, Jasper. Niger the real "phoenix" of the three, would not ant with ants but performed frequently and at great intensity on burning straw. Corbie was known to be attracted by hot materials before the author acquired him. In the aviary he would ant with cigarette-ends and matches and also, eventually, with ants. Jasper at first showed no interest in ants, but later anted with cigarette-ends and matches and then, finally and exclusively, with ants. Many interesting facts are given about the behaviour of these three birds, with fine photographs of Niger and Jasper, and some briefer notes on a tame Magpie and Carrion Crow. We could wish for many more details, however, in order to understand better the phenomena involved. It is clear that captive corvines, especially the Rook and Carrion Crow, will ant with a variety of hot objects, which act as abnormal (probably super-normal) stimuli, and that wild Rooks, at least, will sometimes ant in chimney smoke. The reviewer is far from convinced, however, that such behaviour occurs at all regularly in nature.

In contrast to the space given to what might be called "fire-anting", there is nowhere in the book an adequate treatment of typical "active" anting, though this is very necessary for balance and a proper appreciation of the other phenomena. In fact, it seems doubtful whether the author's experience of typical anting is sufficient to help him in his discussions of anting problems. Also, the myrmecological information is extremely sparse and often incorrect. We are seldom told in the text which species of ants were being used by the bird (though, in the case of the Jay at least, this is probably a most critical point) and there is no cross-reference to the list of ants in the appendix.

Perhaps the least satisfactory part of the book, though, is the sketchy review of the anting literature. The author did far better than this in a previous book (*Animal Legends*, 1955); in the present one, judging by the number of misquotations, inconsistencies and omissions, his reading seems very superficial. Particular reference is made to the work of Ivor, Goodwin and Poulsen, though all are misquoted to a greater or lesser extent, but the literature after about mid-1957 (the time when Niger started his phoenix tricks) is barely touched upon though its influence is apparent in places. Mistakes abound. For example, on page 57 we are told that 112 species of 53 families have been recorded as anting; then on page 71 the number of species is given as 129, while in the appendix some 150 species of 28 families are listed. Much more seriously, however, the work of Poulsen is badly misrepresented. On page 63 he is credited with

the ridiculous suggestion that so-called anting is no more than the birds' removing of ants from their plumage, the author again referring to this in a most insulting manner on page 139. Poulsen was supposed to have advanced this idea at an International Ornithological Congress in 1955 before he had done any study of anting. In truth, Poulsen had already done much work on the subject by 1954, when he spoke at Basle, and his suggestion was really that anting is an innate reaction to irritating stimuli on the head. On page 65 Poulsen's valuable experiments with fine sprays of formic acid, etc., are wrongly reported to almost the opposite effect of his findings, while on page 98 these experiments by a most experienced student of bird behaviour are rejected as misinterpreted. Yet elsewhere in the book the casual observations of people "whose knowledge of natural history was virtually non-existent" are accepted without question where these fit in with the author's own peculiar theories. Another serious misrepresentation concerns the important paper of Mrs. L. M. Whitaker (*Wilson Bull.*, vol. 69, pp. 195-262). This is referred to only once in passing and yet her scholarly lists of the ant species used by anting birds and of the bird species recorded as anting are re-printed (minus references) as appendices to the present work—without any acknowledgements whatsoever or any indication but that they are the work of the author.

Because of the book's general looseness, inconsistency and inaccuracy, one needs to approach the author's findings and conclusions with considerable caution. His approach is quite unanalytical. As he sees it, anting is a very diffuse type of behaviour not confined to Passerines but likely to be found in some form throughout the bird kingdom (and in mammals as well). This conclusion seems to be demanded, not so much by existing facts, but by details of the phoenix legend which make the phoenix itself a non-Passerine, a pheasant, bird-of-prey or parrot. Anting is a "modified form" of preening and is not a special reaction to ants, as such, but behaviour that can either (1) be induced by a great variety of stimuli, possessing the common character of producing heat or the impression of heat in the mouth, or (2) arise "autochthonously" (spontaneously) at moments of unusually intense excitement. Such excitement is not specific but can be caused by a multitude of factors and, thus, one is likely to see a bird "anting" at any time when it is merely at a "peak of excitement". It is not surprising, then, that the author criticizes the normal term "anting" as being quite unsuitable. As Dr. Burton uses it in the later parts of his book, it is quite meaningless. Further, one can understand, too, why he believes that anting is functionless and indulged in purely for the pleasure it gives. As a final check on his theories, Dr. Burton massaged his own spine for half an hour with a clothes-brush. This induced later "a deep feeling of well-being" and eventually he found himself "doing very much the same as a bird does when preening".

Such a critical review may seem inappropriate and unfair to a work of this kind, but it is justified both by the controversial nature of the book and by the favourable notices it has had in the popular press. *Phœnix Re-born* cannot be recommended by this reviewer as a reliable or worthwhile addition to the anting literature, even on a popular level.

K. E. L. SIMMONS

LETTERS

THE INFLUX OF PHALAROPES IN AUTUMN 1957

SIRS,—I wish to correct two errors which unfortunately appeared in the paper on the above subject by myself and Bernard King (*antea*, pp. 33-42). In the introduction on page 33 the records of phalaropes on the Oost-Flevoland Polder in Holland should refer to the Red-necked (*Phalaropus lobatus*) and not to the Grey (*Ph. fulicarius*). In Appendix A the records of Grey Phalaropes at Bude, Cornwall, in September should be attributed to H. J. Clase and not to H. J. Chipman.

BRYAN L. SAGE

INFORMATION WANTED ON MARKED SWALLOWS

SIRS,—During recent months we have been catching large numbers of European Swallows (*Hirundo rustica*) in their winter quarters in the vicinity of Cape Town, South Africa. These have been ringed and, in addition, their breasts have been stained with special long-lasting stains. As the stains have been applied after the moult of the breast-feathers is complete, these birds must have coloured breasts when they return to their breeding territories in the north. We are seeking your co-operation in asking British bird-watchers to be on the look-out for these Swallows and to report (a) the colour of the breast and (b) the date and locality, when they see any. If they can also catch any of these birds to check the ring numbers, that would be most useful. I should be grateful if any information could be sent to me at the Zoology Department, University of Cape Town, Rondebosch, South Africa. The Swallows leave Cape Town between the end of March and the first days of May.

G. J. BROEKHUYSEN

LIST OF FLINTSHIRE BIRDS

SIRS,—Mr. P. Hope Jones and I are compiling a list of the birds of Flintshire. To make this as complete as possible, I should be grateful if any records for the county could be sent to me at Bryn Gobaith, St. Asaph, Flintshire. Information is especially needed on irregular passage-migrants and the rarer nesting species. Breeding localities of the latter will, of course, be treated in strict confidence.

P. D. WALTON

RECENT REPORTS AND NEWS

By I. J. FERGUSON-LEES and KENNETH WILLIAMSON

The items here are largely unchecked reports, and must not be regarded as authenticated records. They are selected, on the present writers' judgment alone, from sources generally found to be reliable. Observers' names are usually omitted for reasons of space and in case a report is subsequently rejected, and none of the items will be mentioned in our annual Index. Readers are asked to submit anything of interest as quickly as possible.

This summary follows that in the March issue (*antea*, pp. 101-104) and covers the period from 22nd February to 5th April, with some additions to 12th April, though it is confined to the regular spring migrants.

THE FIRST SUMMER-VISITORS

Although some Chiffchaffs (*Phylloscopus collybita*) winter regularly in the British Isles, particularly in the south-west of England, so that it is often difficult to be certain whether the first ones seen in early spring are new arrivals or not, it does seem clear that there was a small fall of these birds on the south coast during 20th-25th February—possibly ones which had been wintering in France. Chiffchaffs seen at Rye Meads (Hertfordshire) on 14th February, at Leatherhead (Surrey) on the 14th and 22nd (in song on the latter date), at Elmers End (Kent/Surrey border) on the 22nd and at Eastbourne (Sussex) on the 16th were probably wintering birds, but the sudden appearance of three together at Stanpit March (Hampshire) on 20th February and a number of observations about 25th February and during the next three weeks between Keyhaven and Milford-on-Sea (Hampshire) seems conclusive. Possibly single birds at Exmouth (Devon on 1st March and at St. Leonards (Sussex) on 28th February (the latter in song) were part of the same movement (though a wintering *Phylloscopus* had been seen in another part of St. Leonards on 24th December and 26th January). Another interesting Chiffchaff was one singing at Tittensor (Staffordshire) on 1st March.

The first real arrival of summer-visitors apparently took place on the night of 8th/9th March in the south-west. This included more Chiffchaffs and was reflected in an increase of reports of these birds in southern England in the next few days; in addition, single ones were ringed on Bardsey Island (Caernarvonshire) on 10th, 11th and 14th March, two were in song as far north as Chillington (Staffordshire) on the 12th and there was another at Aqualate (Staffordshire) on the 15th. The first Wheatears (*Oenanthe oenanthe*) came as part of the same movement, but the numbers were small: seven at Portland (Dorset) on the 9th formed the largest concentration (these had gone by the 14th/15th) and movement up the Irish Sea was indicated by one on Bardsey on the 11th. The south-east of England did not apparently take much share in this particular movement, though there were single Wheatears in the Dungeness (Kent) area on the 11th and 15th and a few records of Chiffchaffs. However, three Hoopoes (*Upupa epops*) were seen in Norfolk on 12th March—two at Wheatfen, near Norwich, and one at Aylsham—and there was one in Surrey soon afterwards. These

were the first Hoopoes of the year, with the possible exception of two unconfirmed reports in Surrey and Middlesex on 28th February and in the first week of March respectively (which are mentioned because of their possible connection with the February Chiffchaffs).

A much bigger movement at the end of the third week of March probably reached its peak on the night of 20th/21st, for, though the 21st was a Saturday, reports from regularly manned areas seem to show that arrivals during the previous two nights were on a smaller scale. Newly-arrived Wheatears were reported from Sussex and Kent on the 19th and 20th, and there were single birds at Cromer (Norfolk) and Burnham (Somerset) on the latter day, but on the 21st good numbers were observed along the south coast from Devon to Sussex, and to a much lesser extent in Kent and East Anglia. There were as many as 35-40 at Portland (Dorset) and 50 at Hengistbury Head, near Christchurch (Hampshire). The movement north was then rapid. Until the 20th the only Wheatears reported were on the south and west coasts, apart from ones at Seahouses (Northumberland) and in the Moorfoot Hills (Midlothian) on the 16th, in Essex on the 18th and at the Brent Reservoir (Middlesex) on the 19th. There were then, however, a succession of reports from East Anglia; Surrey and Glamorgan were reached by the 21st, Somerset, Warwickshire and Ayrshire by the 22nd, Staffordshire, Lancashire and Cumberland by the 23rd, Nottinghamshire by the 24th. There were several reports from Yorkshire by the 23rd, and by the 29th males were in territories in Wharfedale. From 24th-26th onwards there were scattered reports from S.E. Scotland. Movement up the Irish Sea started at the same time as the fall on the south coast: there were about 9 Wheatears on Bardsey (Caernarvonshire) on the 21st and this species was then seen there daily, with a peak of 20+ on the 29th. This last reflected further falls on the south coast during 26th-29th March, which extended to Kent. Other Irish Sea observations about this time included Anglesey and Co. Antrim on the 27th and Copeland Island (N. Ireland) on the 29th.

Apart from Wheatears, the nights of 19th/20th and 20th/21st March produced a good fall of Chiffchaffs, again particularly from Hampshire westwards, extending up the Irish Sea to Bardsey, and the first arrivals of several other summer-visitors. Reports of Chiffchaffs from Surrey, Buckingham, Bedford, Hereford, Warwick and Northern Ireland on the 22nd, Somerset and Stafford on the 23rd, Berkshire, Essex, Suffolk, Flintshire and Anglesey on the 24th, Worcester on the 25th, Glamorgan and Huntingdon on the 26th, Copeland Island and Northumberland on the 27th, and Caernarvon on the 28th, with Ross and Dunbarton by 3rd and 5th April respectively, are indicative of the movement northwards through the country. By the end of March the species was widespread in counties up to Oxfordshire, Warwickshire, Bedfordshire and Huntingdonshire, having been given a fillip by further influxes on the south coast on the 24th and 26th-28th. Chiffchaffs were daily on Bardsey from the 22nd onwards, with peaks on the 24th, 27th, 29th and 31st.

Further small influxes took place on the south coast in the first days of April, particularly during the night of 31st March/1st April, and then came another much bigger fall on the night of the 4th/5th. The latter was the most significant influx of the period under review—in that it not only produced a peak of Wheatears and more particularly Chiffchaffs and Willow Warblers (*Ph. trochilus*), but also the first real arrival of a number of other summer-visitors like Redstart (*Phoenicurus phoenicurus*), Nightingale (*Luscinia megarhynchos*), Sedge Warbler (*Acrocephalus schoenobaenus*) and Whitethroat (*Sylvia communis*). The arrivals of these and other species of summer-visitors are treated below under specific headings, so that they can be viewed against the general picture already painted:

Garganey (*Anas querquedula*): First arrivals on 12th, 15th and 16th March, followed by exceptional influx between 21st March and early April (see separate section).

Little Ringed Plover (*Charadrius dubius*): Single birds at two localities in Kent on 14th and 27th March, and at a Bedfordshire breeding site on 24th March, were the first reported. The species had reached a Lincolnshire nesting-area by 12th April.

Whimbrel (*Numenius phaeopus*): Early passage up the Irish Sea is indicated by reports from Bardsey (Caernarvonshire); one there on 8th March was followed by 3 on the 16th, several during the period 16th-24th, 5 on the 27th and 5 more on 1st April. One at Wembury (Devon) on 28th February.

Common Sandpiper (*Tringa hypoleucos*): Single birds now winter in southern England to an ever-increasing extent and there was a good scattering of reports during November-February. The origins of the various ones seen in March, which included a single bird as far north as a hillside reservoir near Burnley (Lancashire) on the 11th, are therefore uncertain. However, the indications are that there were probably a few arrivals at the time of the Passerine influx of 20th-21st March.

Stone Curlew (*Burhinus oedicephalus*): Likewise possibly confused by winterers and it is not clear in what category the first arrival at Minsmere (Suffolk) on 11th March belongs. However, the simultaneous arrival in several other East Anglian breeding haunts from Cley (Norfolk) to Dungeness (Kent) about 29th March seems suggestive. In connection with the question of wintering, we should be grateful for any reports of this species between November 1958 and mid-March 1959.

Great Skua (*Catharacta skua*): Earliest reports were of one exhausted at Dawlish Warren (Devon) on 29th March and one at Portland (Dorset) on 1st April.

Little Tern (*Sterna albifrons*): Three early ones at Slapton (Devon) on 2nd April.

Sandwich Tern (*Sterna sandvicensis*): As usual, the first appeared off several coasts in the last 10 days of March. The earliest reported were two off Exmouth (Devon) on the 22nd and 2 at Porthkidney Beach (Cornwall) on the 24th, but there were 25 at Cley (Norfolk) on the 30th, five days after the first arrivals there, and small numbers were seen on the coasts of Cornwall, Devon, Hampshire, Sussex and Suffolk on the 28th and 29th. One inland at Burghfield and Sonning Eye, near Reading (Berkshire), on 9th and 10th April. As far north as two localities near Dunbar (East Lothian) by 12th April.

Cuckoo (*Cuculus canorus*): The Bulletin of the Kent Ornithological Society gives two cases of birds being heard in March, on the 25th and 31st, but no other March reports were received. Next records were from Jersey on 4th April, Herefordshire on the 7th and 8th, and Dorset on the 8th.

Wryneck (*Jynx torquilla*): First reports were all from Kent, at Hythe on

- 25th and 31st March, at Murston on 28th March (3), and at Dungeness on 1st April.
- Swallow (*Hirundo rustica*): Small numbers were seen in the south-west, especially Devon, from 24th March and in the south-east from about the 28th, but on the whole this species was not early and there were still only rather few in the first days of April; apparently became locally numerous in the south in the second week of April. Earliest report was of one at Larkfield (Kent) on 16th March, followed by one at Shoreham (Sussex) on the 22nd; two as far north as Earlswood (Birmingham) on 31st March should perhaps be mentioned, though Ross-shire was reached by 3rd April.
- House Martin (*Delichon urbica*): One at Berrow, near Burnham (Somerset), on 23rd March, singles at Lundy (Devon) and at Cemlyn Bay, Anglesey, on 27th March, and three at Portland (Dorset) were all early (but *cf. antea*, vol. li, pp. 205 and 206).
- Sand Martin (*Riparia riparia*): Like the Swallow, the main arrival appears to have been on the late side of average and gatherings of 40-50 were not reported until the influx of 5th April, though nest-hole excavation was observed in Cheshire on that date. First reports were of single birds at Lymptstone (Devon) and Hershham (Surrey) on 15th March and Portland (Dorset) on the 21st; then from the 22nd onwards there was a trickle of observations in various south coast counties. Berkshire was reached by the 24th, Essex, Herefordshire, Bedfordshire and Staffordshire by the 25th, Hertfordshire and Huntingdonshire by the 27th, Leicestershire and Lincolnshire by the 28th, Copeland (N. Ireland) by the 30th, Lancashire by the 31st, Bardsey by 1st April, Selkirk by the 4th, Peebles and Midlothian by the 5th.
- Ring Ouzel (*Turdus torquatus*). Little information received. With the exception of the wintering male at Queen Mary Reservoir (Middlesex) (*antea*, p. 71), which was ringed on 8th March and still present on the 30th, the earliest report came from Moorfoot Hills (Midlothian)! A single bird was seen there on 15th March and three males in the same place on the 22nd. Singles arrived at Dungeness (Kent) on 21st and 27th March and 5th April, and at Portland (Dorset) there was one on 2nd April and 4 on the 3rd. In the west, Flintshire had been reached by 31st March and Herefordshire by 5th April, while one at Bardsey (Caernarvonshire) on 1st April was followed by up to 4 on the 2nd, 3rd and 4th.
- Redstart (*Phoenicurus phoenicurus*): As in other recent years (*antea*, vol. xviii, pp. 238-284; vol. li, p. 205), a few arrived in late March and single birds were noted at Pitsea (Essex) on the 27th and at St. Margaret's (Kent) on the 29th and 30th, followed by one at Dungeness (Kent) on 1st April. There were odd reports on the south coast in the next few days and then a small influx on the 5th (including a peak of 14 at Portland); on that day, too, single males were observed inland in such counties as Somerset, Herefordshire and Berkshire.
- Nightingale (*Luscinia megarhynchos*): First arrivals on 5th April at Selsey Bill (Sussex), Dungeness (Kent) and Foulness (Essex).
- Grasshopper Warbler (*Locustella naevia*): One singing at Clifton (Bedfordshire) on the very early dates of 8th-10th April. First in Devon and Somerset on 13th April; influx on the 14th.
- Sedge Warbler (*Acrocephalus schoenobaenus*): First arrivals on 5th April on south coast and at Abberton (Essex) and Aldermaston (Berkshire), extending as far west as the Exe estuary (Devon) on the 6th. At Cley (Norfolk) by the 7th and generally distributed in a number of southern localities by the 8th when presence in hedgerows indicated passage. In Nottinghamshire by 10th April.
- Blackcap (*Sylvia atricapilla*): A number of reports from the southern half of England in February and March, including birds in song at two localities in Somerset on 19th and 20th March, at St. Ives (Cornwall) on several days from 21st March, and at various places in Devon from the 22nd, but these presumably all refer to winterers. First arrivals from the Continent are thus difficult to distinguish, but there may have been

a small fall in the south-west on 4th and 5th April; one as far north as Baginton (Warwickshire) on the latter day was more probably a British winterer moving north, however.

Whitethroat (*Sylvia communis*): First reported at Ingatestone (Essex) on 29th March, at Benacre (Suffolk) on 1st April, at Slapton (Devon) on 2nd April (2), at Southwick (Sussex) on 3rd April and at Epsom (Surrey) on 4th April. Small influx from Sussex westwards—e.g. 4 at Portland (Dorset), 3 at Hengistbury Head (Hampshire)—as part of the influx of 5th April. Widely scattered in southern England by the end of the second week of April.

Willow Warbler (*Phylloscopus trochilus*): One singing at Fardon (Nottinghamshire) on 14th March may have been a winterer. There was one at Southwick (Sussex) on 25th and 26th March, and then on the 27th single birds were reported from Bardsey (possibly more than one), Copeland, Somerset, Sussex and Kent. On the 28th the species was noted in Essex and two were singing at each of two localities in Nottinghamshire. By the 30th the species had been reported from such areas as Suffolk, Leicestershire, Staffordshire, the Birmingham area and even Yorkshire, but there were still very few and, for example, one at Elmers End (Kent/Surrey border) on the 29th was the only report from the well-watched London area at this time. Numbers were increased by a small influx from Kent to Hampshire on 1st April and a larger one from Hampshire, Somerset and the south-west to Skokholm (Pembrokeshire) and Bardsey on the 3rd and 4th: on the 4th Skokholm and Bardsey had peaks of about 130 and 100 respectively, and the first reports came from Merioneth and Flintshire. A still bigger arrival, affecting much of the south coast from Essex and Kent to at least Dorset and probably Cornwall, took place on 5th April: that day the species became well distributed in such counties as Somerset, Surrey and Hertfordshire, and locally up to Staffordshire. By the 7th Berkshire, Worcestershire and Leicestershire had come into the picture with widespread reports, and on the 9th/10th there was a sudden appearance in the Lincoln area.

Spotted Flycatcher (*Muscicapa striata*): Early one at Holy Island (Northumberland) on 30th March.

Tree Pipit (*Anthus trivialis*): A report of 3 in song at Skipton (Yorkshire) on the remarkable date of 24th March is being checked, but it gains support from other evidence of an early arrival of this species, like the Yellow Wagtail, in central and northern England. A Tree Pipit was in full song in the Malvern area (Worcestershire) by 30th March (ten days early), and single birds were reported from Attenborough and Langar (Nottinghamshire) on 2nd and 4th April respectively. Early reports of this overlooked species in the south were few: one at Portland (Dorset) on 2nd April, and one at Sand Point (Somerset) on the 3rd which was followed by more on the 4th and several setting out for the Welsh coast on the 9th; one at Hershaw (Surrey) on the 5th.

Yellow Wagtail (*Motacilla flava*): Only March reports were at Chew Valley Reservoir (Somerset) on the 22nd (1), at Abberton Reservoir (Essex) on the 25th (1), 26th (1) and 27th (3), at Brent Reservoir (Middlesex) and Foulness (Essex) on the 30th (1 each) and a single bird as far north as Hilbre Island (Cheshire) on the 29th. However, 2 males at Edenfield (Lancashire) and one at Gouthwaite (Yorkshire) on 4th April were very early records for those two counties; there was also a male at Burnley (Lancashire) on the 5th and males at Harrogate (Yorkshire) on the 5th and 6th. There was then apparently a trickle of arrivals in the south during 5th-10th April, including a male with the characters of the Ashy-headed form (*M. f. cinereocapilla*) at the Hythe, Colchester (Essex), on the 7th and 8th. This was followed by a general influx about the 11th-12th and the species was well distributed by the 14th.

EXCEPTIONAL INFLUX OF GARGANEY

As briefly mentioned last month (*antea*, p. 140) the great feature of the early spring was the exceptional arrival of Garganey (*Anas querquedula*). Normally this duck is chiefly confined to the south-eastern quarter of England from East Anglia round to Hampshire

and Dorset. The last year in which there was a conspicuous movement further west was 1955 when Devon and Cornwall had 18 and 10 birds respectively; in 1956 and 1957 these two counties could muster a combined total of only 5 birds. Against this background can be seen the significance of the fact that this year Devon had as many as 21 on the Taw estuary alone on 22nd March and Cornwall no less than 20 on Marazion Marsh on 3rd April, each county having smaller numbers in other places and on other days.

The earliest Garganey were reported from Northward Hill (Kent) on 12th March (2 males); followed by single records of 1-3 birds in Essex, Glamorgan, Somerset and Jersey, on the 15th, and in Dorset and Sussex on the 16th, with as many as 8 at Gwithian (Cornwall) on the latter day. They were then noted at various places in East Anglia about the 17th; and there were parties of 1-6 at three localities in Cornwall and a single bird at Barnstaple (Devon) during 18th-20th. The real influx seems to have begun on the 21st and 22nd, about the same time as the Passerine arrival. On the 21st, apart from increases in Kent, Sussex, Norfolk and Suffolk, there were more in Glamorgan and the species reached Staffordshire (3 or 4) and Huntingdonshire. On the 22nd the Jersey total rose to 4 pairs, there were 5 (4 males) at Chew Valley Reservoir (Somerset) and as many as 11 near Cambridge; on that day, too, over 30 were recorded in Devon, including the 21 on the Taw and 6 on the Exe—the largest movement ever known in that county. These are just the peak numbers, but it is worth adding that on the same day the species reached Lincolnshire (2 males near Mablethorpe) and a pair was recorded in Sweden, an exceptionally early date for that country. In the next ten days Garganey in parties of 2-7 appeared in various localities in Somerset, Gloucestershire, Oxfordshire, Berkshire, Hertfordshire, Northamptonshire, Staffordshire, Anglesey, and even Lancashire; there was a pair as far north as the Teesmouth area of Co. Durham on 25th and 26th March and 8 at Fulbourn Fen (Cambridgeshire) on 29th March, the numbers on the Exe estuary rose to 13 by 27th March (with others elsewhere in Devon) and parties of up to 7 were seen in the Isles of Scilly (Tresco, St. Mary's and St. Agnes). 13 appeared near Wadebridge (Cornwall) on 24th March and there was a pair on the North Slob (Co. Wexford) on the 29th. There were nine more in Jersey on 2nd April and these foreshadowed a further influx into England and Wales about 3rd-5th April when the Marazion Marsh numbers rose to 20 (14 males), the Chew party to 10, and the total at two localities in the Port Talbot area from 8-9 on the 2nd to between 13 and 20 during the 4th-6th. There were as many as 8 at Walton Reservoir (Surrey) on 4th April, and the other counties of the Midlands and South continued to report abnormal numbers; even the total of 4-5 pairs in the Cley area in early April was unusual. We should be glad to have all observations of Garganey in March and April.

FIRECRESTS, BLACK REDSTARTS AND OTHER SPRING MIGRANTS

A year ago the early spring movements included the passage of

an unusual number of Firecrests (*Regulus ignicapillus*) and Black Redstarts (*Phoenicurus ochruros*) and hordes of such birds as Robins (*Erithacus rubecula*) and Blackbirds (*Turdus merula*) (see *antea*, vol. li, pp. 203-205). This year the same species were represented, but for the most part in much smaller numbers.

There were a few Firecrests in early March—the Naze (Essex) on the 3rd (1) and 13th (2), Foulness (Essex) on the 15th (1), Dungeness (Kent) on the 7th (1) and 12th (2), Hengistbury Head (Hampshire) on the 14th (2+) and Portland (Dorset) on the 15th (2)—and then a small influx on the 21st which produced a little scattering of reports in Essex, Kent, Sussex, Hampshire and Dorset from then to at least 5th April. Regularly watched areas like Dungeness and Portland, however, reported “fewer than usual”. There were 6 and 8 respectively, on the other hand, with other immigrants (see below) at Minsmere (Suffolk) on 24th and 25th March, and one was seen as far north as Blakeney Point (Norfolk) on 3rd April. Small numbers of Goldcrests (*R. regulus*) arrived about the same time in East Anglia, on the south coast and in the Irish Sea area, with peaks about 11th, 21st and 31st March and 3rd April—but generally many less than in 1958.

Apart from wintering birds, Black Redstarts were first reported from Jersey (Channel Islands) on 18th March and from Portland (Dorset) on the 21st and 22nd, the dates of the first peak of summer-visitors; then from various places in Dorset, Hampshire, Sussex, Kent, Essex and Norfolk from the 23rd, and Suffolk and Lincolnshire from the 24th. These same counties usually have the bulk of the Black Redstart passage, but three or more appeared at Hartlepool (Co. Durham) on the 30th and 31st, while the Irish Sea area was represented by one at Copeland on the 31st and 2 “almost certain” at Bardsey on the 25th. There were 16 at Sheringham (Norfolk) on the 27th and “far more than usual” (a total of 22 in 16 days) at Portland, but the numbers reported generally were not as great as in 1958. A few inland reports came from such counties as Berkshire, Surrey and Cambridgeshire. Black Redstarts at Sandwich Bay (Kent) from 25th March to the end of the month were accompanied by an influx of Continental Robins (*E. r. rubecula*), and those at Minsmere (Suffolk) were also with Robins, Firecrests, Blackbirds, Goldcrests and White Wagtails (*Motacilla alba alba*). White Wagtails began to pass through Cornwall about 16th March, Somerset about the 12th and 22nd, Anglesey on the 29th, and Kent and East Anglia about the 24th-26th. In contrast to 1958, only one Bluethroat (*Cyanosylvia svecica*) was reported (see *antea*, p. 140 and *cf.* vol. li, p. 205).

As in 1958 (*antea*, vol. li, p. 208), though again on a smaller scale, there appeared to be an influx of Water Pipits (*Anthus s. spinoletta*) and other Continental populations of the Rock Pipit in late March and early April. The first was at Queen Mary Reservoir (Middlesex) on 15th March, then at various places from Somerset to Sussex and Essex from the 22nd, including one in Lincolnshire near the end of the month. A peak of 11-13 was reached at Chew Valley Reservoir (Somerset) on 29th March.

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1959



BRITISH BIRDS

EDITORIAL

FIFTY YEARS AGO our issue of 1st June 1909 began with an Editorial announcing "with great satisfaction" the names of two "excellent ornithologists" who would thenceforth assist in the task of editing the magazine. One of these was Dr. Norman F. Ticehurst, M.A., F.R.C.S., M.B.O.U. His name appeared at the head of the contents then, and it has stood there on every one of the six hundred issues since. We are sure that our readers will wish to join with us in congratulating him on this great record, remarkable not only for its length but for its broad and varied contribution to British ornithology. We are delighted that his services should have been so aptly recognized by his recent election as Vice-President of the British Ornithologists' Union at its most successful Centenary Meeting at Cambridge during March. One of Dr. Ticehurst's special interests has always been the history of ornithology; by his long and fruitful activity he has made history as well as written it.

MIGRATION NOTES FROM THE WESTERN APPROACHES, SPRING 1958

By IVOR MCLEAN (*Meteorological Office, Air Ministry*) and
KENNETH WILLIAMSON (*Migration Research Officer, B.T.O.*)

INTRODUCTION

DURING THE MONTH from 13th April to 13th May 1958 the first-named author did a tour of duty as meteorologist at the ocean weather-reporting station "Kilo" in the Western Approaches, at approximately latitude 45°N. , longitude 16°W. This position is about 500 miles south-west of Land's End, Cornwall, and 600 miles west of the Biscay coast of France. Considerably more migration was witnessed than during the first three weeks of April 1957 (*antea*, vol. li, pp. 351-353), and altogether some 72 individuals of a dozen species were seen. The material has been prepared for publication by the second author, and the comments on the weather and the probable origins of the birds have been the subject of joint consultation. We are grateful to Major R. F. Ruttledge, Mr. J. L. F. Parslow and Mrs. Kate Barham for notes

on migrants during this period at, respectively, Great Saltee (Co. Wexford), St. Agnes (Isles of Scilly) and Skokholm (Pembrokeshire); and to the Controller of H.M. Stationery Office for permission to use weather-charts based on the *Daily Weather Report* of the Meteorological Office (Air Ministry).

SYSTEMATIC LIST

KESTREL (*Falco tinnunculus*).—A female appeared at 17.35 hours on 30th April (wind 120°/08) and circled the ship until dusk, when it settled for the night on the balloon shed deckhead. It spent much of its time there the next morning and would quickly return if disturbed. It was not seen to take water, or scraps of raw meat put out for it, and was last noted in fair weather at 13.40 hours on 1st May (wind 280°/08).

WHIMBREL (*Numenius phaeopus*).—Two parties appeared on 29th April, and a single exhausted bird on 1st May (Table I). The parties circled close to the ship, and even settled on it momentarily on several occasions: they flew off to the north and E.N.E. respectively. The tired bird was not easily disturbed, and if forced to fly returned very quickly to the ship. It was not observed to take ants' eggs or water put out on deck. At 17.30 hours on the 2nd it fell into the sea and was drowned.

TABLE I—MIGRANT WHIMBRELS (*Numenius phaeopus*) AT OCEAN WEATHER-SHIP AT "KILO", SPRING 1958

Date	Time (G.M.T.)	Wind direction and force (knots)	Visibility (miles)	No. of birds	Remarks
29 April	10.20	080°/15 (E'ly)	12	2	Circled 30 mins, calling
	12.12	090°/19 (E'ly)	12	3	Circled 23 mins
1 May	08.54	160°/08 (S.S.E.)	12	1	Settled aboard (see text)

DUNLIN (*Calidris alpina*).—Two in summer plumage circled for about a quarter of an hour from 08.40 hours on 30th April (wind 120°/09), when one settled on the forecastle and the other disappeared. The one on board was disturbed by a passing Arctic Skua (*Stercorarius parasiticus*) and was not seen again. A Dunlin also circled for 35 minutes from 12.40 hours on the same day (wind 150°/08).

RUFF (*Philomachus pugnax*).—No fewer than 17 birds came under notice between 10.35 hours and 14.45 hours on 30th April, and all appeared somewhat fatigued (Table II). The first three groups circled the ship before passing on, and frequently took brief rests on the surface of the sea close to the vessel, usually staying for less than 30 seconds but once close on a minute. One of the birds in the third party became water-logged whilst resting in this way and drifted helplessly away from the ship, to be pounced upon and killed by a Lesser Black-backed Gull (*Larus fuscus*). The survivors were not seen after 13.00 hours. The last two birds were exhausted; one died at 11.20 hours and the

other at 18.55 hours on 1st May. Both took water and ants' eggs whilst on board, and at death one bird weighed 56 gm. (wing 153 mm., tail 55 mm., bill from feathers 32 mm.).

TABLE II—MIGRANT RUFFS (*Philomachus pugnax*) AT OCEAN WEATHER-SHIP AT "KILO", SPRING 1958

Date	Time (G.M.T.)	Wind direction and force (knots)	Visibility (miles)	No. of birds	Remarks
30 April	10.35	150°/08 (S.S.E.)	12	4	Circled 20 mins (see text)
	11.45	120°/09 (S.E.)	12	3	Circled and settled frequently on sea (see text)
	12.28	120°/08 (S.E.)	12	8	Circled and settled frequently on sea (see text)
	14.45	180°/05 (S.)	12	2	Settled aboard, eventually died

SABINE'S GULL (*Xema sabini*).—An adult in summer plumage settled on the sea close to the ship and stayed for a quarter of an hour from 16.03 hours on 10th May (wind 290°/18). The slate grey head, forked tail and distinctive wing-pattern were well seen; the bill was black with a yellow tip and the legs grey.

TURTLE DOVE (*Streptopelia turtur*).—Several birds were encountered between 30th April and 3rd May, mostly in the early part of each day (Table III). Perhaps the first two records refer to one and the same individual, as the bird of 09.34 hours was not actually seen to leave; and one of the two found roosting in the funnel may have been the bird of the previous evening. The dead bird on 2nd May weighed about 100 gm. (wing 176 mm., tail 110 mm.).

SHORT-TOED LARK (*Calandrella cinerea*).—A small, light-coloured lark settled on the forecabin, where it preened for several

TABLE III—MIGRANT TURTLE DOVES (*Streptopelia turtur*) AT OCEAN WEATHER-SHIP AT "KILO", SPRING 1958

Date	Time (G.M.T.)	Wind direction and force (knots)	Visibility (miles)	No. of birds	Remarks
30 April	09.34	100°/08 (E'ly)	12	1	Circled 10 mins
	11.12	100°/08 (E'ly)	12	1	Settled on aerial; still on board at dusk
1 May	11.16	120°/05 (E.S.E.)	12	1	Circled 5 mins
	08.40	160°/08 (S'ly)	12	2	On ledge inside funnel; flew, not seen again
	15.10	340°/04 (N'ly)	12	1	Settled on yard-arm; dead beneath perch 07.30 hrs 2nd
3 May	05.40	075°/17 (E'ly)	12	2	Settled forecabin; stayed 1 hour

minutes, at 18.55 hours on 20th April (wind 100°/12). The white under-parts, with an ill-defined buff band across the breast and dark markings at the sides of the neck were well seen, and the generally tawny appearance of the upper-parts suggested the south European subspecies *brachydactyla*. When disturbed it fluttered round the ship at deck level and entered a cabin through an open porthole, where it was caught and identification confirmed by plumage and wing-formula examination. The bird weighed approximately 21 gm. (wing 92 mm., tail 58 mm.), and the legs and small, blunt bill were light brown. When released at 19.15 hours it flew away directly down-wind.

SWALLOW (*Hirundo rustica*).—A marked passage of Hirundines, nearly all Swallows, was in progress at "Kilo" between 30th April and 6th May, birds appearing singly or in small parties at all times of the day (Table IV). Altogether 32 birds were seen, and they usually stayed with the ship for a short spell of between 5 and 25 minutes before passing on. Those which entered the balloon shed perched on ledges and made short flights outside during their stay. Two late arrivals roosted on board, but another (6th May) continued its migration at 22.35 hours. The first arrival on 4th May flew into cabins and alleyways and was seen to catch several house-flies; it died at 16.45 hours, and this and two others caught in the balloon shed the same afternoon weighed only 14 gm. each.

TABLE IV—MIGRANT SWALLOWS (*Hirundo rustica*) AT OCEAN WEATHER-SHIP AT "KILO", SPRING 1958

Date	Time (G.M.T.)	Wind direction and force (knots)	Visi-bility (miles)	No. of birds	Remarks
30 April	08.40	120°/09 (E.S.E.)	12	1	Circled 10 mins
	12.40	150°/08 (S.S.E.)	12	1	Circled 20 mins
	16.14	170°/02 (S'ly)	12	1	Circled 10 mins
1 May	06.30	140°/06 (S.E.)	2	2	Circled 25 mins
	09.50	230°/13 (S.W.)	12	1	Circled 10 mins
2 May	15.30	060°/20 (E.N.E.)	6	1	Circled 5 mins
	16.30	060°/19 (E.N.E.)	6	1	Circled 7 mins
	22.05	060°/20 (E.N.E.)	6	1	Roosted on board
3 May	05.40	075°/17 (E'ly)	12	5	Found aboard; stayed 20 mins
	16.25	150°/13 (S.S.E.)	12	1	Circled 20 mins
4 May	08.05	140°/15 (S.E.)	12	1	Found dead 16.45 hrs (see text)
	15.10	160°/25 (S.S.E.)	6	3	Flew into balloon shed; stayed 1 hour
	23.00	220°/24 (S.W.)	12	2	Found roosting aboard
5 May	09.00	220°/22 (S.W.)	6	4	Flew into radar cabin; stayed 15 mins
	10.20	220°/20 (S.W.)	6	5	Flew into balloon shed; stayed 3 hours
6 May	08.56	190°/21 (S'ly)	6	1	Settled on lifeboat; stayed 5 mins
	22.15	160°/30 (S.S.E.)	6	1	Flew into balloon shed; stayed 20 mins

Other Swallows were seen when the ship was returning to port through the Irish Sea on 13th May. Two passed by to the north, flying at deck level, and at 11.00 hours another flew past heading for Ireland, which was clearly visible. Later a fourth passed to the north.

HOUSE MARTIN (*Delichon urbica*).—One was found on the balloon shed deck at 14.05 hours on 5th May (wind $190^{\circ}/22$): it was easily caught, and its weight was approximately 14 gm. (wing 110 mm., tail 56 mm.). It was placed on a ledge, whence it had flown half an hour later.

SAND MARTIN (*Riparia riparia*).—One, in company with a Swallow, circled the ship for 10 minutes from 08.40 hours on 30th April (wind $120^{\circ}/09$).

WILLOW WARBLER or CHIFFCHIAFF (*Phylloscopus* sp.).—One flew aboard at 07.30 hours on 13th April when the ship was in the Irish Sea; it was very active and restless, and had gone an hour later. Another flew aboard at 09.57 hours on the 15th (latitude $49^{\circ}41'N.$, longitude $08^{\circ}31'W.$), but stayed only 4 minutes, flying away low to the S.E. A leaf-warbler was aboard at "Kilo" at 11.20 hours on 30th April (wind $120^{\circ}/05$), and stayed for 15 minutes; it was very active and was seen to take two small flies during its stay.

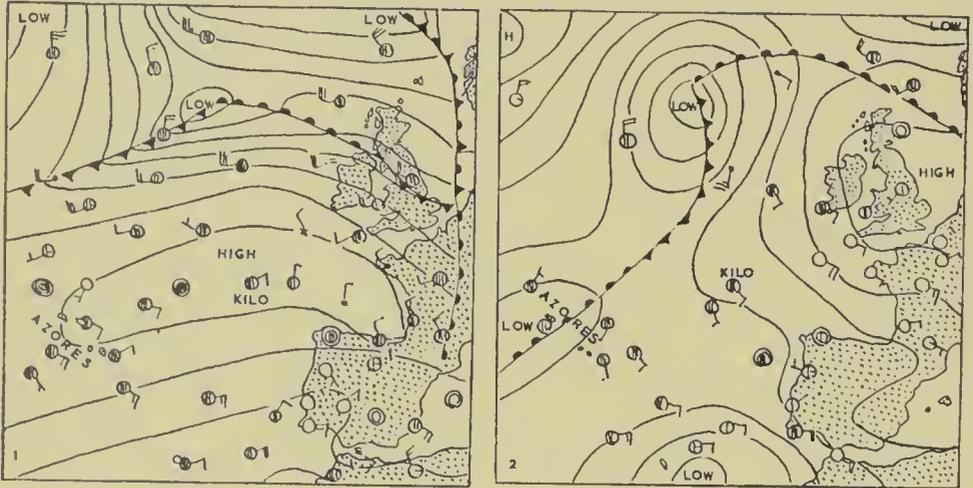
WOODCHAT SHRIKE (*Lanius senator*).—This easily identifiable bird settled aboard at 11.40 hours on 22nd April (wind $360^{\circ}/15$). Although restless and easily disturbed on the 22nd, it was more approachable next day, when it was seen at 15.30 hours in fair weather (wind $295^{\circ}/17$). Water and ants' eggs were available at several parts of the ship, but it was not observed to show interest in them. It roosted overnight on the balloon shed deck-head.

THE WEATHER

A depression, approaching from the Atlantic, was centred on "Kilo" late on 19th April and during the 20th, with southerly wind backing easterly over Biscay and the Western Approaches. The Short-toed Lark may well have originated in the Iberian Peninsula, but the Woodchat Shrike of 22nd April could have come from as far north as the Channel region, then dominated by the southern part of an English anticyclone. With the low pressure moving towards North Africa on the 21st there was an east to north-east flow south of the English high, affecting most of the Biscay coast, Finistère and Cornwall. This easterly air-flow broke down late on the 22nd, and for several days afterwards, with an Azorean high to the west of "Kilo" and a depression near Iceland, the wind at the weather-ship was westerly and no birds appeared.

This high moved slowly north-eastwards, so that by 28th April "Kilo" was near its centre and there was again easterly wind to the south, between the Iberian Peninsula and the Azores (Fig. 1). Next day, with the centre of the high in sea-area Finistère, this

easterly airflow was maintained and birds began to arrive. The first to do so, from mid-morning of the 29th, were Whimbrels; then the Dunlins and first Hirundines appeared early on the 30th, followed by a Turtle Dove, and soon by the Ruffs and a *Phylloscopus* warbler. In the evening the female Kestrel arrived



FIGS. 1 and 2—WEATHER SITUATIONS IN THE WESTERN APPROACHES AT MID-DAY ON 28TH AND 30TH APRIL 1958

Fig. 1: Probable anticyclonic drift from Mediterranean region to Azores.

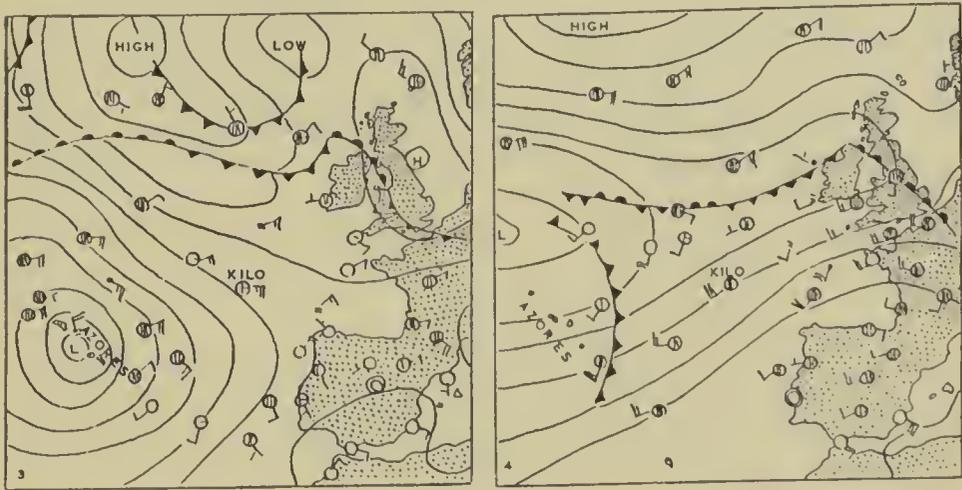
Fig. 2: Passage of Ruffs (*Philomachus pugnax*), Turtle Doves (*Streptopelia turtur*), Swallows (*Hirundo rustica*), etc., at "Kilo".

(Fig. 2). The passage of Swallows continued throughout 1st May, with another Whimbrel and more Turtle Doves, under similar weather conditions, though with the high now over the southern part of the North Sea and a low covering the Azores. The airstream from the Iberian Peninsula and North Africa was south-easterly. There was little change in the pressure-distribution on the 2nd and 3rd, and there was evidence at "Kilo" that the anticyclonic drift of Swallows out to sea continued (Fig. 3).

An interesting change took place late on 4th May, the deepening Azores depression expanding north-eastwards and bringing a veer of wind to the south-west at "Kilo". From the afternoon of the 4th it held in this direction, and there was in fact a direct airstream from the Azores to the Channel region between this low and a Mediterranean high (Fig. 4). Yet in this period of south-westerly weather Swallows continued to pass the ship, mostly in small parties, and the likeliest explanation is that they were part of a strong re-determined passage of birds which had drifted west to the Azores in the anticyclonic airflow of the previous few days. Although this weather was maintained during the 7th and 8th the passage, as observed at "Kilo", finished on the 6th.

A complex low-pressure situation developed over the eastern Atlantic on 8th and 9th May, with centres south of Iceland and

off the Cornish coast. The effect of this change was to impose a north-westerly airstream across the ocean between Greenland and the Western Approaches, and this may well have brought the Sabine's Gull which was observed on the 10th.



FIGS. 3 and 4—WEATHER SITUATIONS IN THE WESTERN APPROACHES AT MID-DAY ON 3RD AND 4TH MAY 1958

Fig. 3: Continuing passage of Turtle Doves (*Streptopelia turtur*) and Swallows (*Hirundo rustica*) at "Kilo". Fig. 4: Re-determined passage at "Kilo" of Swallows from the Azores.

MIGRATION AT IRISH SEA BIRD OBSERVATORIES

St. Agnes, Scilly Isles.

The migration at St. Agnes at the end of April and in early May shows a number of interesting similarities with that observed at "Kilo". The main spring movement of Whimbrels started on 27th April and showed a well-defined peak on 1st May (42) and 2nd (39). Ruffs, passing at "Kilo" on 30th April, were represented at St. Agnes by a single bird on 1st-2nd May, with 2 on the 3rd. One Dunlin arrived on the 29th at 19.00 hours, and next day the number was up to 10, declining on 1st May but building up again to 29 on the 3rd-4th, a spring passage peak. Nine Turtle Doves arrived at mid-day on 29th April and 7 more came in the afternoon; 8 were present next day, 7 on 1st May. They did not put in an appearance till mid-day on 2nd May, when 10 were seen, and from 5 to 7 were present daily from the 3rd to the 9th, except the 6th.

The main spring passage of Swallows took place between 1st and 4th May, with from 40 to 55 each day, this corresponding with the Great Saltee peak (see below). The next movement was not until 10th May, with over 70 birds. As regards Sand Martins, 10 on 29th April were the first for six days, and the same number was recorded on the 30th and on 1st May; one or two House

Martins appeared between 1st and 4th May, but the strongest passage in this period was between the 5th and 9th.

Great Saltee, Co. Wexford.

Great Saltee was manned during part of this period, from 3rd May onwards. Swallows were below average strength at the time, with no big peaks of up to 200 birds as in most years: there was a maximum on 3rd-4th May of 50-75 birds; the number then dwindled, to rise to a minor peak of 30 or so on 8th May. Some of the birds in this later movement appeared to be exhausted: one ringed on 6th May was found dead on the 7th, and of two found dead on the 10th one had been ringed the day before. These birds, and another caught during the period, were very light, suggesting a long overseas migration; and it is possible that this movement has a link with the passage seen at "Kilo" from late on 4th May to the 6th in south-westerly weather.

Turtle Doves passed through Great Saltee in ones and twos from 4th May to the 9th, Whimbrels were in their usual small numbers for the time, and Dunlins were more in evidence than usual with 4 on 3rd May, 7 on the 4th and 3 on the next day. Ruffs were not seen.

Skokholm, Pembrokeshire.

There was an improvement in Whimbrel passage between 29th April and 1st May, and after a week's lapse Dunlin movement recommenced on the 30th and was strong during the first few days of May. Ruffs were not recorded, but the first Turtle Dove arrived on the 30th and 2 were present on the 3rd, with another on the 6th-7th. Swallow passage, building up since the 27th, reached a peak with 500 birds on the 30th and was rather less strong till the 3rd, declining afterwards except for a minor peak of 25 or so between the 7th and 9th. House and Sand Martins were most in evidence from 30th April to 2nd May, the latter predominating: and the peak of Willow Warbler passage was on the 29th-30th with about 50 on the latter day.

SUMMARY

1. A list is given of a dozen species of migratory birds observed at an ocean weather-ship at "Kilo" in the Western Approaches (latitude 45°N., longitude 16°W.) between 20th April and 10th May 1958.

2. Swallows were the most numerous species, followed by Ruffs, and there were several Whimbrels, Dunlins and Turtle Doves. Occurrences of Short-toed Lark, Woodchat Shrike and Sabine's Gull are of interest.

3. A number of birds came aboard the ship to rest, a few roosting overnight. Whimbrels circled the vessel, alighting on it only momentarily; Ruffs preferred to rest for a few seconds on the sea close to the ship, though in one case this proved fatal. Most of the Hirundines stayed for periods of from 5 to 25 minutes

before continuing their migration. One Whimbrel, two Ruffs and a Swallow died from exhaustion. Water and ants' eggs were put out, but were apparently ignored by most birds.

4. Considering the isolation of the ship, migration was heavy over the Western Approaches from 29th April to 6th May. During the first few days this was due to offshore drift in an easterly anticyclonic airstream; but from late on 4th May there was a south-west cyclonic wind between the Azores and the Channel region, and continuing movement of Swallows was probably due to re-determined passage of birds which had previously reached the Azores.

5. Irish Sea movements at the end of April and early May 1958 are given for comparison.

PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

XCVIII. SQUACCO HERON

Photographs by ERIC HOSKING

(Plates 33-36)

Text by I. J. FERGUSON-LEES

DISTRIBUTION

THE HERONS AND BITTERNS (*Ardeidae*) are a world-wide family of some fifty-nine species, and all but four of the fifteen in the Palaearctic have extensive breeding ranges that take them much or all of the way across Asia and Europe, while ten of these are also found in Africa, five of them in Australia and four of them in America. The Squacco Heron (*Ardeola ralloides*) is no exception to this, although its range is more limited than some. In the south of Europe, where it is a summer visitor, it breeds from Spain to the Balkans and south Russia, and from there it extends across Asia Minor, Iraq and Persia to Turkestan; at the same time it nests in Morocco and Tunisia, and over the southern half of the African continent including Madagascar. However, in Europe, and indeed over much of its range, it is scarce or even rare and forms but a small fraction of the great mixed colonies of, for example, Little Egrets (*Egretta garzetta*), Cattle Egrets (*Ardeola ibis*) and Night Herons (*Nycticorax nycticorax*), in which it invariably nests. According to Dementiev and Gladkov (1951; see Harber, 1955), it is numerous in the area of the lower Dnieper and along the Kura in Transcaucasia, and in some years in the Astrakhan sanctuary, but "elsewhere over its range it is rare". In 1956 James Fisher and the writer estimated only some 60-90 pairs of this species in the huge Coto Doñana heronry in Spain, in a grand total of nearly 7,000 pairs of small heron species. Curiously, on the other hand, it has occurred nearly a hundred

times in the British Isles—the last in Cambridgeshire and Glamorgan in 1954 (*antea*, vol. xlviii, p. 129)—and thus much more frequently than the other vagrant herons from southern Europe, with the exception of the Night Heron, though in the last eight years the Little Egret is the one that has become of annual occurrence.

FIELD-CHARACTERS AND DISPLAY

The Squacco is a bird of contrasting plumage: settled, particularly when on the ground, it appears predominantly yellowish-brown (and rather dingy at a distance), but the moment it takes the air it shows large areas of white and thus it seems almost as if it changes colour in a flash. This is because the white of the back, rump, tail, wings and lower under-parts is almost completely concealed by the long cinnamon feathers of mantle, scapulars and breast when the bird is at rest. The Cattle Egret always looks mainly white on the ground and so there is no chance of confusion between these two species as might be suggested by the plate in the *Field Guide*. In flight, even at a distance, the Squacco's head always looks dark and stripy.

At close range the Squacco has a strikingly serpentine appearance at times, due to the combination of a small and narrow head and a long, if thin, neck (plate 33) which merges into the body rather like a Bittern's (*Botaurus stellaris*). The serpent effect is somehow enhanced by the zebra-striped crest (plates 34 and 35) which is always present except in juvenile and first-winter plumages. In these plumages, and in the adult winter, the yellowish-buff of neck and throat is striped with more or less blackish lines, but in adult summer the throat and neck, as well as the long feathers of the lower throat and upper breast and the even longer filmy scapulars, become a uniform golden-buff—while the mantle changes to a rich pinkish, almost purplish-pink. All these feathers, and the crest, are raised in times of excitement at the nest (plate 34): they may be used in actual sexual display as well as in appeasing ceremonies during nest-relief, though the matter needs further study. As with the Little Egret, the feathers of mantle and scapulars have long, loose rami: these give a filmy effect to the raised spray of gold and pink, which because of these colours seems even more beautiful than the Little Egret's white tracery.

COLOUR-CHANGES IN SOFT PARTS

More striking, however, than the summer plumage changes are those of legs and bill. In the last few years it has become increasingly realized that a number of heron species with soft parts that are brown, yellow or green tend to develop red, pink or orange legs and bills (and sometimes eyes as well) for a short period at the beginning of the breeding-season. Apart from a few isolated references to common Herons (*Ardea cinerea*) with red or orange legs, bills and eyes—of which one of the earliest appears to have been that quoted in Salter (1904)—this phenomenon

was almost entirely overlooked until it was brought into prominence by Gough (1945)*. Her observations on common Herons in Co. Galway in 1944 were developed tentatively for this species by Ruttledge (1949) and Tucker (1949), the former from systematic work at one colony and the latter from summarizing a number of isolated reports from various parts of the British Isles; Tucker at the same time quoted Binsbergen (1941) as evidence from Holland and drew upon his own experience in Spain with Cattle Egrets (see also Tucker, 1936). A more detailed account, again with particular reference to the common Heron, then appeared in Lowe (1954) who summarized his own extensive observations and discussed the closely allied carotenoid pigments of yellow and red and the chemical changes involved. Lowe also showed that at times of excitement some reddening is momentary and akin to the human blush. Apart from common Herons and Cattle Egrets, other European species which have these changes include Little Egret (feet only), Night Heron (legs and feet) and Little Bittern (*Ixobrychus minutus*). Our own work on the Coto Doñana suggested that the changes were entirely confined to the pre-nesting period and early stages of incubation, and this is confirmed by the observations on other species in India by Abdulali and Alexander (1952) and in Surinam by Haverschmidt (1953), though Gush (1952) in East Java gave records of four species which were mostly after the main local breeding-season.

Reverting to the Squacco Heron, this has very marked colour changes. In winter, and indeed for most of the year, the legs and the basal half of the bill (including the bare loreal patch) are varying shades of yellowish-green, while the tip and top of the bill are blackish and the eye is pale yellow. Our observations in Spain seem to show that most, if not all, breeding Squacco Herons develop bright red or at least pinkish-red legs at the onset of the nesting-season. These fade, as incubation advances, through dull pink and pinkish-brown to yellowish-brown and the normal off-season yellowish-green. The birds at the nest in these photographs (plates 33-35) were noted by Roger Peterson to take $2\frac{1}{2}$ weeks to change from "red" to "greenish-yellow". (No "blushing" was seen in this species, though momentary colouring was frequently noted in the Cattle Egrets in the Coto Doñana colony.) At the same time as the reddening of the legs, or more probably a little earlier (see below), the bill and loreal patch apparently become a clear bright blue; this evidently fades more quickly until by the time the eggs are laid a typical individual has the distal third of the bill black (plates 33-35), shading through grey and grey-blue to bright blue at the base, which in turn gives way to a bright

*It is interesting to note, however, that some earlier writers, describing herons of various species from birds shot at breeding colonies, used the word "reddish" not infrequently—and Seebohm (1884), for example, generalized on the soft parts of the Squacco Heron from a stage which must have been not far past the peak of colour.

emerald green on the loreal patch and round the eye. There is considerable variation in the amount of blue, perhaps indicative of the development of the individual, and in some cases the green of the loreal area extends to the base of the bill. As far as the writer knows, the first people to comment on this blue colour-change, as recently as 1953, were Dr. P. R. Westall and John Wightman who visited the Coto Doñana colony on 26th April of that year: breeding was not so far advanced as it was in 1956 ('few, if any, completed clutches of any herons were present') and they found that every one of about 20 Squaccos seen in the colony had 'a uniform brilliant Cambridge blue bill without any noticeable dark tip'. It is interesting to note that all the Squaccos seen by Westall and Wightman still had yellowish-green legs, supporting our impression that in this species the reddening of the legs begins later than the colour change in the bill. In 1956, when most of the herons had eggs by the time we arrived, we saw only two Squaccos with completely blue bills, but the leg colour was evidently at its peak. Also in 1956 there were a few Squaccos in the colony with the normal off-season yellowish-green bills and legs, and these were thought to be either first-summer or other non-breeding individuals. In 1957 when few herons and no Squaccos were nesting on the Coto Doñana, owing to drought conditions, only a small percentage of the Squaccos showed any blue on the bill or red on the legs, and only three (out of over a hundred examined) were in a condition approaching the incubation-stage colours of the previous year. At all stages the iris of the Squacco Heron appears to remain lemon-yellow.

HABITAT AND NESTING

Although *The Handbook* describes the habitat as similar to that of the Little Egret, there are distinct differences in Spain in the foraging zones and there, too, the Squacco Heron is more specialized in its choice of nest-site. Whereas the Little Egret feeds particularly in the open shallows and the Cattle Egret on dry or wet grassland, the more skulking and crepuscular Squacco Heron is found chiefly in lush water-meadows where it feeds mainly on aquatic insects and some fish (see also Mountfort, 1958; Valverde, 1958). Single birds may also be seen in stagnant ditches or vegetable plots, feeding on beetles, dragonflies and other insects.

In other parts of its range the Squacco breeds in trees and reeds, as well as bushes, and a photograph of a more arboreal nest was published in *British Birds* in 1952 (vol. xlv, plate 64). But on the Coto Doñana, nests of this species are confined to denser parts of the tangles of bramble (*Rubus*) and tree-heath (*Erica arborea*), and are seldom, if ever, to be seen in the surrounding cork oaks (*Quercus suber*) like some of those of the Cattle and Little Egrets and Night Herons. The Squacco is slightly later than these others in settling down to breeding, though it had eggs in the Coto Doñana colony in the first week of May in 1956 (*cf. Handbook*).

It is clearly irregular in its nesting-season and seems dependent on an established colony of other species. Nests vary from the extremely flimsy to the quite substantial. The light greenish-blue eggs are smaller than those of the other European herons; the clutch is usually 4-5, though quite often 6 eggs may be found. Incubation is by both sexes and the period is probably 21-22 days, though this needs confirmation. The nestling has been described in detail by Valverde (1953).

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THE PLUMAGE AND LEG COLOUR OF THE KITTIWAKE AND COMMENTS ON THE NON-BREEDING POPULATION

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INTRODUCTION

It is an advantage in ecological studies to be able to divide a population into age groups or into mature and immature stages. In the Laridae (gulls and terns), where the majority of species have a distinctive "immature" plumage, it has been assumed in some publications that a bird in the plumage which resembles that of the breeding population is necessarily an adult bird, i.e. one capable of breeding. This misconception probably arose, in part, from the name given to the final plumage—the adult plumage. It is now well established that sexually immature birds of many species may be found in apparent "adult" plumage, e.g. Fulmar

(*Fulmarus glacialis*) (Fisher, 1952), Herring Gull (*Larus argentatus*) (unpublished observations) and Kittiwake (*Rissa tridactyla*) (Coulson and White, 1956). To avoid this confusion, the term "final plumage" is used in this present paper in preference to "adult plumage".

Stokoe (1958) has recently pointed out that the leg colour of the Kittiwake is not as constant as suggested in *The Handbook* (Witherby *et al.*, 1938-41). He recorded that a proportion of the birds present at a colony had yellowish markings on the legs.

The present paper presents observations made on the plumage and leg colour of Kittiwakes captured for ringing. The association of leg colour with age and the presence of non-breeding birds in the colonies is discussed. The birds examined in the present study were captured at Dunbar (East Lothian), the Farne Islands and North Shields (Northumberland) and at South Shields (Co. Durham). Observations on non-breeding birds were made at the Kittiwake colonies at Marsden (Co. Durham).

PLUMAGE

First year and second winter.

During the first year of life, the young Kittiwake is in the characteristic "tarrock" plumage with brown-black wing-bar, collar and tip of tail. This plumage is moulted in July and August of the year following hatching, i.e. the "first summer" of the confusing notation in *The Handbook*. The characteristic tarrock plumage is lost during this moult in the first summer, and, from August onwards, the birds then resemble the "adult winter" bird in *The Handbook's* plate. However, close examination and particularly examination in the hand show the following differences:

- (i) *Bill*—Usually yellowish-green with dark tip to the upper mandible.
- (ii) *Wings*—Brown-black tipped feathers, often present in primary coverts, lesser coverts, or inner median and great coverts. These are probably unmoulted feathers and are the remnants of the broad black wing-bar of the tarrock plumage.
- (iii) *1st primary*—Usually brown-black along entire outer web (see later).
- (iv) *3rd primary*—Outer web with black tip usually penetrating from 3 to 12 cm. further than on inner web (Fig. 1).

Second summer.

The characteristics of the second winter plumage are retained with the exception that the majority lose the dark tip to the bill. The dark nape, which in the breeding birds is lost during February or March, is often retained until June or July. These characteristics have been checked by examination of three birds ringed as nestlings and therefore of known age.

Adult (breeding).

The Handbook refers to the orbital ring being orange-red. In



Eric Hosking

SQUACCO HERON (*Ardeola ralloides*) ALERT: COTO DOÑANA, MAY 1956

Apart from the Little Bittern (*Ixobrychus minutus*), this is the smallest European heron, only half the size of the common Heron (*Ardea cinerea*). A small, narrow head combines with a rather thick neck to give a serpent effect. The back, tail and wings are white; the rest is mainly yellowish-brown, striped on the neck, in winter and plain golden-buff and pinkish in the summer. White parts are conspicuous in flight, but at rest are concealed by the scapular plumes (see page 186).



Eric Hosking

Squacco Heron (Ardeola ralloides) display: Coro Doñana, May 1956

The feathers of crown and nape are whitish edged with black, and very long—thus forming a crest of zebra ribbons which make a striking spray when raised. During nest-relief the long golden-buff feathers of the throat and upper breast, and the filmy pink and gold plumes of the mantle and scapulars, are also raised (even more than in this photograph) and make this one of the most beautiful heron displays (see page 186). Both sexes incubate the 4-6 greenish-blue eggs.

*Eric Hosking*

SQUACCO HERON (*Ardeola ralloides*) AT EASE: COTO DOÑANA, MAY 1956
As with some other herons, the yellowish-green legs become red early in the breeding-season, but in this species the bill (with the bare loreal region) changes from black-tipped yellowish-green to a clear light blue (see page 187); the bill is soon black-tipped again (as here) and fades to blue-grey, while the loreal area becomes emerald green. The iris remains pale yellow. The often rather flimsy stick-nests were 3-8 feet above ground in thickets of bramble and tree-heath.



Eric Hosking

SQUACCO HERON (*Ardeola ralloides*) PERCHED: COTO DOŠANA, MAY 1956

Nests may be in reeds, bushes or trees, though in this Spanish colony the species breeds only in the thickets. Like other small herons, the Squacco clammers about and clings to the most flimsy perches: here one is balancing on some dead twigs of tree-heath (in time the vegetation is mostly killed in the densest parts of the colony). The head always looks dark and stripy, and this is useful in flight when the bird might otherwise be confused with the Cattle Egret (*A. ibis*).

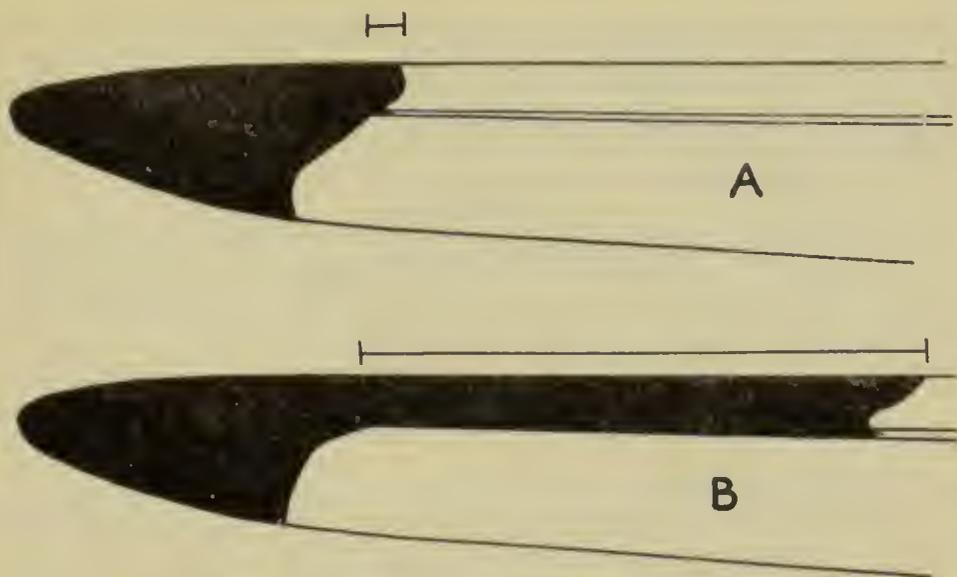


FIG. 1—THE 3RD PRIMARY OF THE KITTIWAKE (*Rissa tridactyla*)
 A is a breeding bird and B the second-summer. Note the extended base to the black tip of the latter. Lines show the measurements that have been taken of captive birds: from the base of the black on the inner web to the base of the black on the outer.

Scale: about half natural size.

a series of birds in final plumage, and caught in late August, the orbital ring was either very dark red or black. I have not examined, at this time of year, colour-ringed birds which are known to have bred, to confirm that these changes take place in breeding birds.

VALIDITY OF THE DISTRIBUTION OF DARK PIGMENTS ON 1ST AND 3RD PRIMARY AS A MEANS OF AGING

Breeding birds.

Colour-ringed breeding birds at North Shields and Dunbar were examined in 1958. Table I shows that only one of 21 breeding birds had more than 3 cm. of additional black coloration on the outer web of the 3rd primary.

Birds with dark-tipped covert feathers (second summer).*

Table II shows that the majority of the birds in this group differed from the breeding birds shown in Table I. Only three out of 20 of these immature birds had less than 3 cm. of additional black coloration on the outer web of the 3rd primary.

The data in Tables I and II suggest that it may be possible to distinguish second summer birds which have not retained dark coverts feathers from older birds with about 90% confidence.

Non-breeding birds captured in breeding colonies and at a non-breeding resting site.

Table III shows the condition of the 1st and 3rd primaries of non-breeding birds captured at a breeding colony, while Table IV

*It has not been possible to show that all third summer birds lack dark-tipped covert feathers, but no breeding birds have been found in this condition.

gives similar information for birds captured at a non-breeding resting site. In both areas, birds in typical second summer as well as birds in final plumage were present, but there was a higher proportion of second summer birds in the resting area where no breeding takes place.

LEG COLOUR

The leg colour of breeding Kittiwakes is almost exclusively dark brown-black (Table V). As Stokoe (1958) has pointed out, there are Kittiwakes in final plumage which have aberrant leg

TABLE I—DISTRIBUTION OF BLACK ON 1ST AND 3RD PRIMARIES OF BREEDING KITTIWAKES (*Rissa tridactyla*)

1st primary	3rd primary	
	Amount by which black on outer web exceeds that on inner web	
	Less than 3 cm.	More than 3 cm
Colour of outer web		
All dark	1	0
Half dark	3	1
All light grey	16	0

Only two birds out of the 21 examined are above the diagonal line, i.e. 10%.

TABLE II—DISTRIBUTION OF BLACK ON 1ST AND 3RD PRIMARIES OF NON-BREEDING KITTIWAKES (*Rissa tridactyla*) WITH DARK TIPPED FEATHERS IN COVERTS (SECOND SUMMER)

1st primary	3rd primary	
	Amount by which black on outer web exceeds that on inner web	
	Less than 3 cm.	More than 3 cm
Colour of outer web		
All dark	2	14
Half dark	0	3
Light grey	1	0

Only one bird out of the 20 examined falls below the diagonal line, i.e. 5%.

NOTE:—Three birds in this table had been ringed as nestlings and were second summer.

colour. Table V shows that the birds which have greenish-yellow markings on the legs (usually only on the outside of the tarsus) are probably immature birds in final plumage. Table V also shows

that the leg colour of first summer birds is usually medium grey (lead grey) although *The Handbook* describes it as brown.

Out of 174 birds examined in the hand, and of several hundred birds examined in the field through binoculars to see if they carried colour-rings, only one bird had outstandingly abnormal leg colour (other than the greenish-yellow already mentioned). This bird was seen at Marsden on 25th April 1956: it had conspicuous orange-red legs and feet and was almost certainly a non-breeding bird. It alighted on a number of unoccupied ledges

TABLE III—DISTRIBUTION OF BLACK ON 1ST AND 3RD PRIMARIES OF NON-BREEDING KITTIWAKES (*Rissa tridactyla*) CAPTURED IN A BREEDING COLONY OF COLOUR RINGED BIRDS

1st primary Colour of outer web	3rd primary	
	Amount by which black on outer web exceeds that on inner web	
	Less than 3 cm.	More than 3 cm
All dark	2	13
Half dark	12	5
Light grey	26	0

34% are above the diagonal line and these represent the second summer birds.

66% have plumage resembling that of the breeding population.

No birds in first summer plumage were captured, or seen in the colony.

TABLE IV—DISTRIBUTION OF BLACK ON 1ST AND 3RD PRIMARIES OF ALL KITTIWAKES CAPTURED AT RESTING SITE (SOUTH SHIELDS PIER)

1st primary Colour of outer web	3rd primary	
	Amount by which black on outer web exceeds that on inner web	
	Less than 3 cm.	More than 3 cm
All dark	8	22
Half dark	12	4
Light grey	14	0

57% are above the diagonal line and these represent second summer birds.

43% have plumage which represents that of the breeding population.

NOTE:—In addition to the birds recorded above, 10 in the first-summer plumage (i.e. tarrocks), which increases the proportion of those with immature plumage to 63%.

and nests on the edge of the colony and was seen in two different colonies in the area on this day, but has not been seen since. The field record of the leg colour of this bird agrees closely with that recorded at the Bass Rock by Andrew T. Macmillan (Stokoe 1958), and may have been the same bird, since Coulson and White (1958a) have shown that non-breeding birds move from colony to

TABLE V—LEG COLOUR OF KITTIWAKES (*Rissa tridactyla*) ACCORDING TO AGE

	Black	Medium grey	Green-Yellow	Red, yellow or brown	Total
Breeding adults	121	0	1	0	122
Non-breeding birds in adult plumage	21	0	2	0	23
2nd summer birds	11	2	6	0	19
1st summer birds	1	9	0	0	10

colony. The possibility that this bird was a Red-legged Kittiwake (*Rissa brevirostris*), a species which breeds in the North Pacific, can be ruled out. The Red-legged Kittiwake has bright red legs and darker grey plumage than the "Atlantic" Kittiwake, while the bird seen at Marsden did not differ in wing colour from the neighbouring typical birds.*

PROPORTION OF NON-BREEDING BIRDS IN THE POPULATION

Coulson and White (1958b, 1959) have published information on the breeding success of the Kittiwake and also on the first-year and adult mortality. From these data it is possible to calculate the proportion of non-breeding (immature) Kittiwakes in the population as follows:

Assuming that the breeding population remains approximately constant,

Then 100 breeding pairs (year A) lay	...	...	205 eggs
56% of the eggs produce fledged young	...	...	115 young
By the next breeding season (year A + 1), 21% of these have died, leaving	...	...	91 tarrocks
By the next year (A + 2), a further 12% have died, leaving	...	...	80 birds
In the next year (A + 3), two-thirds of these birds will breed for the first time, while the remaining one-third (after allowing for a further year's mortality) are still non-breeding, that is	...	...	23 birds

From these figures, which can be taken to represent the proportion of non-breeding birds in any year, it can be seen that during the early part of the breeding season there are 194 non-

*Note that the Herring Gull occurs in forms which have either flesh or yellow coloured legs.

breeding birds for every 200 breeding birds. Thus, 49% of the total population is non-breeding. At the end of the breeding season, with the addition of the birds of the year, there are 309 non-breeding birds to every 200 breeding Kittiwakes or 61% non-breeding.

Of the 49% of the population which is non-breeding during the

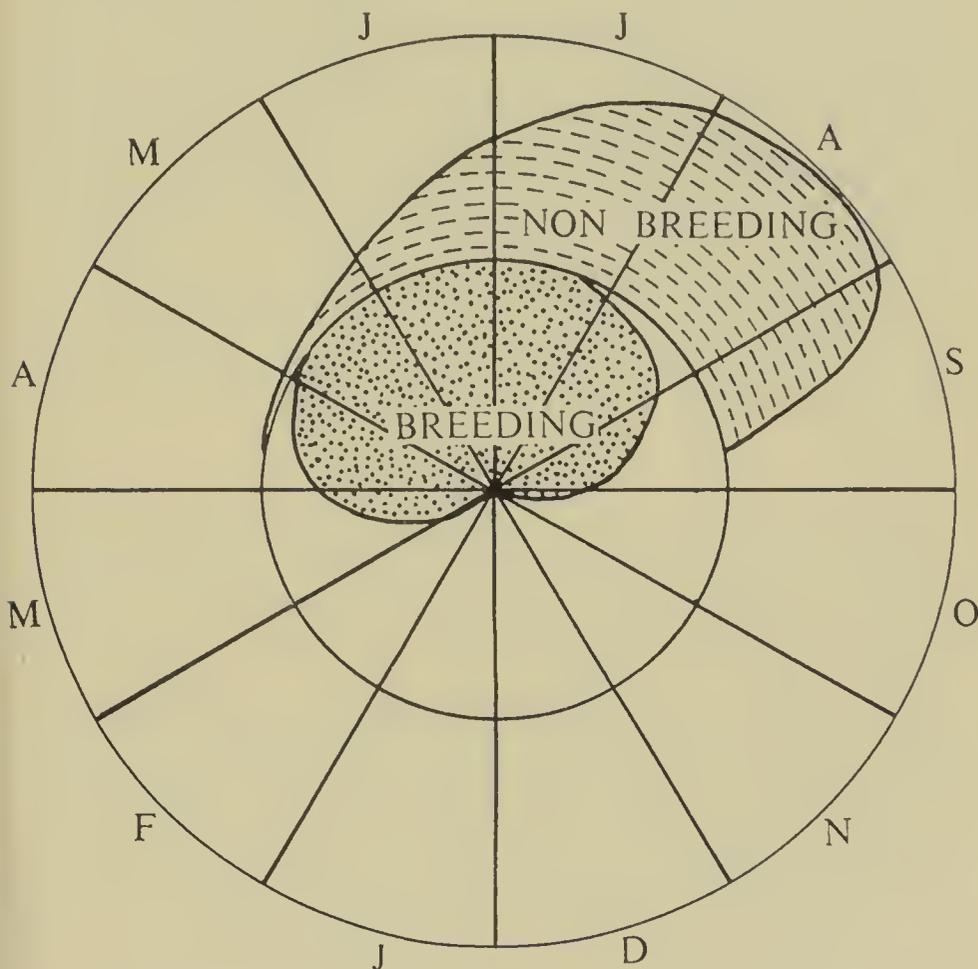


FIG. 2—MONTHLY CHANGES IN THE NUMBERS OF BREEDING AND NON-BREEDING KITTIWAKES (*Rissa tridactyla*) PRESENT AT A COLONY AT MARSDEN, CO. DURHAM. Note that the breeding birds reach their peak in May while the non-breeders increase in numbers until August.

breeding season, over half (58%) are in a plumage which, in the field, is unlikely to be distinguished from that of the breeding birds. By the end of the breeding season, the one-year-old birds have moulted out of the tarrock plumage and can also be confused with the breeding birds.

The general trends of the numbers of breeding and non-breeding birds at a colony are shown in Fig. 2 (based on data in Coulson and White, 1956, 1958a, and unpublished data). It has also been

shown that the proportion of non-breeding Kittiwakes differ from colony to colony (Coulson and White, 1956), but the seasonal trends are the same; the majority of the non-breeding birds appear in the colony while the breeding birds have eggs or young.

BEHAVIOUR OF NON-BREEDING BIRDS

When the young have fledged, the breeding birds spend less time at the nests and these are often left unoccupied for short periods. These unoccupied nests are usually rapidly taken over by non-breeding birds. In addition, non-breeding birds take up sites on suitable ledges, both on the edge and within the colony. Thus there appears to be competition for suitable nest sites. On one particular nest site at Dunbar, seven different non-breeding birds were captured within twenty minutes; one of these had been ringed as a nestling two years previously.

Non-breeding birds often spend only a few minutes on a suitable ledge before flying off, circling several times and landing on the same or different site, an action which may occur repeatedly. Thus there is probably a higher proportion of non-breeding birds amongst birds flying about a colony, than there are in the colony as a whole.

DISCUSSION

Non-breeding Kittiwakes, which in the field are often indistinguishable from breeding birds, frequent colonies in large numbers and occupy suitable ledges, unoccupied nests, and even nests which contain eggs or young from which the parents are absent. These non-breeding birds and particularly the second summer birds, have a proportion of their members with greenish-yellow markings on the legs or feet. The majority of non-breeding birds appear in the colony during June and July and reach a peak in August. These findings may supply an explanation of the observations of Stokoe (1958), who, on 27th July 1958, observed that at least 12 out of 100 birds flying about the colony at St. Bee's Head, Cumberland, had yellow markings on the leg. This observation was made at a time when it might be expected that there were a large number of non-breeding birds in the colony, and particularly amongst the birds flying about and alighting in the colony.

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NOTES

Increase in a Shetland Fulmar population.—During our residence in Shetland we took counts about once a week for two years of Fulmars (*Fulmarus glacialis*) on an area of cliffs in south-west Mainland. The counts are given in full and discussed in *The Fulmar* (1952) by James Fisher (pp. 347 and 482-488).

These Fulmar cliffs form part of the huge Fitful Head colony and, during subsequent visits to the district, we have gained a strong impression that the colony is still increasing. In 1958, therefore, we duplicated the counts during the first half of June and found a decided increase over our census area as a whole. The increase, however, is not an even one: Villas and Blue Geo have gone up, North Geo is roughly unchanged and Stack of the Noup has gone down.

COUNTS OF "NEST-SITES": FIRST HALF OF JUNE

1948	319	
	305	
	317	Average 310
1949	331	
	329	Average 330
1958	416	
	408	Average 412

The figures given refer to "nest-sites", not to birds (two or even three birds often sit at the same "nest-site"). No counts were taken during strong onshore winds or seas.

L. S. V. and U. M. VENABLES

Frightened Common Scoters diving from the wing.—During an attempted aerial survey from a light aircraft of wildfowl and waders in the Wash on 12th January 1958, we passed a flock of about 30 Common Scoters (*Melanitta nigra*) flying 100 feet below us, very close to the surface of the sea. Although some birds scattered as the plane overtook them, most dived into the sea from the wing—a remarkable sight. Diving from the wing (under natural conditions) has been recored in some other sea-duck, e.g. Long-tailed Duck (*Clangula hyemalis*) (see *Handbook*). C. H. FRY

Golden Eagle with tuberculosis and aspergillosis.—At the end of April 1958, I was sent the body of a Golden Eagle (*Aquila chrysaetos*) which had been found lying dead in an eyrie in Perthshire. I forwarded it at once to the Veterinary Laboratory, Eskgrove, Lasswade, Midlothian, for a post-mortem examination, as it appeared to be in good condition and there was no evidence that it had been shot. The examination showed that the bird was affected with advanced and generalized tuberculosis and aspergillosis. Both lungs contained very large necrotic areas, and the air sacs were distended with large masses of tuberculous

material. The liver and spleen were both affected, and there were lesions of tuberculosis in the heart muscle: this last is a very rare site of tuberculosis infection. Mr. J. E. Wilson, who carried out the examination, said that it was surprising that a bird so badly affected with tuberculosis had remained in such good condition and apparently lived quite normally. It weighed 8 lbs., an average weight for a Golden Eagle. Mr. Wilson concluded his report by stating, "I have not examined many Golden Eagles, but this is the second one I have found to be affected with generalized tuberculosis".

GEORGE WATERSTON

Kestrel's unusual boldness in taking earthworms.—*The Handbook* includes earthworms in the list of foods of the Kestrel (*Falco tinnunculus*), but the following incident seemed unusual. At St. Ishmael's, Pembrokeshire, on 25th November 1952, an immature female Kestrel used a fence-post, near which I was digging, as a look-out and repeatedly dropped down to take the freshly revealed earthworms from within 10 feet of me. This continued for about an hour. A cat frightened it away at one point, but it returned as soon as the cat disappeared. It was eventually driven off by a passing dog that chased it and it did not then return. I took it to be a bird on passage. T. A. W. DAVIS

Great Black-backed Gull diving from a height and submerging in an inland water.—During very cold weather at Cheddar Reservoir, Somerset, in December 1949, a Great Black-backed Gull (*Larus marinus*) was seen by the writer attacking a Coot (*Fulica atra*) which had become separated from many hundred of its companions. The latter, trying to escape, was forced to dive so often that it became exhausted and appeared slowly to be drowning. The gull, meanwhile, would sometimes rise to heights of 10-20 feet and then dive to attack its victim, with the result that it occasionally submerged partially or completely.

The writer can trace no other record of Great Black-backed Gulls diving and submerging in an inland water, but a previous note (*autea*, vol. xli, pp. 93-94) describes their doing so in two localities on the Pembrokeshire coast—with the editorial comment that "This habit is locally regular amongst Herring Gulls (*L. argentatus*), and Mr. J. E. Flynn has . . . frequently observed Great Black-backs diving for fish at sea. We have, however, no records for the latter species of the habit being observed close to land, although no doubt favourable conditions are all that are needed to evoke it".

BERNARD KING

The separation of Subalpine and Spectacled Warblers in juvenile and first-winter plumages.—There is a very close similarity between juvenile and first-winter Subalpine Warblers (*Sylvia cantillans*) and Spectacled Warblers (*S. conspicillata*). Since only the former is at present on the British list and described in *The Handbook*,

there is a danger that *couspicillata* in one of these plumages might be identified as *cantillans* by an observer in this country.

The best difference between the two species in these (and indeed in all) plumages is the colour of the closed wing. In *couspicillata* the greater coverts, primary coverts and outer webs of primaries, secondaries and especially tertiaries are chestnut brown, forming a conspicuous patch of colour that is reminiscent of a Whitethroat (*S. communis*) and usually distinct in the field. The tertiaries and inner secondaries have black centres bordered with a broad band of chestnut. In *cantillans* there is some brown on the closed wing due to the pale brown edges of the outer webs of the flight feathers (especially the tertiaries). It is, however, a rather pale brown, unlike the chestnut of *couspicillata*, and is hardly present on the inner webs; on the coverts it is very inconspicuous.

The outer tail feathers of *couspicillata* are pure white on both webs, while those of *cantillans*, although sometimes white on the outer web, are usually suffused with brown/black.

The length of the first primary is sometimes an indication of the species. In *cantillans* it is only rarely more than 3 mm. longer than the primary coverts, while in *couspicillata* it is often 4 mm. longer. Otherwise the wing-formulae are identical. The following wing-measurements are all of live birds trapped at La Tour du Valat in the Camargue:

Subalpine Warbler (*Sylvia cantillans*): 57-62 mm., and one each of 54,
55, 63 and 66 (90 measured)

Spectacled Warbler (*S. couspicillata*): 53-62 mm. (28 measured)

It might also be added that these differences are valid for females of both species at all seasons of the year. J. J. SWIFT

Abnormal growths on Starling's head.—On 3rd April 1955, I watched a Starling (*Sturnus vulgaris*), trying to get into a baited trap in my garden at Woreester Park, Surrey. The bird walked along the side of the trap, passing an open funnel leading to the bait, and not until it turned and retraced its steps did it see the bait through the funnel and enter the trap: I caught the bird and found that its head—particularly the right side—was covered with growths to such an extent that it was sightless in the one eye. This probably accounted for the way in which it had missed the entrance funnel the first time. The growths were dark grey and wart-like in appearance and did not have the "tufts" or incisions as those on a Dunnock (*Prunella modularis*) described by George Edwards (*antea*, vol. xlviii, pp. 186-187).

The beak was held open permanently by a growth at the back of the mouth and, as the bird would therefore starve, I killed it. Unfortunately I did not send the bird to a pathologist. W. D. PARK

House Sparrows soaking hard bread to soften it.—Our garden at Felixstowe, Suffolk, is well equipped to serve the needs of garden-loving birds and we have, besides a pool, a large earthenware saucer. We give the birds a variety of foods, but not hard

pieces of stale bread. These must be provided by one of our neighbours and are a source of difficulty for the small birds. In May 1957, however, I noted that one cock House Sparrow (*Passer domesticus*) was having no trouble: he would fly over the fence into our garden with a piece of hard bread, land on the lawn, hop to the earthenware saucer and drop the bread into the water. He would sometimes pick it out and drop it in again as many as four times. After wetting it, he would nibble the edible parts off the surface. The pieces were usually sufficiently large and softened for him to satisfy his appetite at once and depart, but he was seen on more than one occasion to take a piece of bread back to the saucer and drop it in again. If, as sometimes happened, the saucer became dry, the sparrow would try it first and, on finding it useless, would carry the piece of bread to the water at the edge of the pool. As far as we saw, however, he never did this without trying the saucer first, perhaps because the water-level of the pool made it more difficult to retrieve the bread there.

This behaviour was seen on a number of occasions during the summer of 1957, then again in 1958, when it was first noted on 12th May, and he is at it again this May (1959). G. L. PURSER

[Dr. J. D. Summers-Smith has drawn our attention to very similar behaviour reported by G. C. W. Clarke in *Country Life* in 1949 (vol. 105, p. 1131). Both observations are most interesting and it is to be presumed that the habit arose from the accidental discovery that water would soften bread, in the same way that tits (*Parus* spp.) learnt to open milk-bottles.—EDS.]

LETTERS

FEEDING METHODS OF LONG-TAILED TITS WITH LARGE FOOD

SIRS,—I was interested to read Mrs. J. Hall-Craggs's description, together with Mr. Derek Goodwin's comments, of Long-tailed Tits (*Aegithalos caudatus*) eating largish morsels of food whilst hanging upside-down. I recall my own, evidently similar, observations on Long-tailed Tits feeding on spindle berries (*Euonymus*) in late winter near Oxford, of which I recorded (*Ibis*, vol. 96, p. 533): "Longtailed Tits first took the berries from the twigs, then later from the ground. Whereas the *Parus* species always clamped the berry to a branch between their feet to eat it, Longtailed Tits grasped the berry in one foot whilst hanging from a twig by the other. The leg with the food was usually unsupported, but was sometimes steadied against a twig". This agrees well with the observations of Mrs. Hall-Craggs and Mr. Goodwin; and I also agree with Mr. Goodwin that this is a fairly usual method for Long-tailed Tits to use in dealing with large morsels of food—but only if these are rather tough. They deal with equally large, but soft-bodied, caterpillars, for instance,

by holding them in the bill and beating them against their perch: this is presumably the alternative method mentioned by Mrs. Hall-Craggs, when the bird was "in a beak-cleaning attitude". This, too, is the procedure adopted by Chaffinches (*Fringilla coelebs*) and by many other small birds that have not the *Parus* tits' unusual ability to clamp food morsels to their perch, between their feet, to prepare them (*cf.* Gibb, *Ibis*, vol. 96, p. 532). I have also watched Long-tailed Tits eating in the third way described by Mrs. Hall-Craggs, namely by clamping large morsels to the perch with their feet, whilst hanging upside-down.

These attempts by Long-tailed Tits to deal with outsize morsels of food are certainly ingenious; but I was greatly impressed by their inefficiency compared with the adept behaviour of the *Parus* tits when confronted with identical foods. Long-tailed Tits cannot really hack at their food whilst hanging upside-down, in the way that other tits do when standing upright with the whole weight of their bodies behind each stroke; they are clearly better adapted for coping with their more usual, small-sized foods, which they can eat whole without preparation.

Dr. W. H. Thorpe (*antea*, vol. xlix, p. 389) has stressed the value of detailed observations on the feeding-habits of birds; and this is a field in which amateur observation can play a prominent part (*see* Gibb and Hartley, *antea*, vol. L, p. 278). JOHN GIBB

PHALAROPES IN 1957

SIRS,—Reading the paper by Bryan L. Sage and Bernard King on "The influx of phalaropes in autumn 1957" (*antea*, pp. 33-42), I note that no reference is made to the place of origin of the first two waves of Red-necked Phalaropes (*Phalaropus lobatus*) that apparently arrived in S.E. England during the periods 14th-16th and 24th-28th August in that year.

Both these periods marked the termination of short interludes of predominantly south-easterly weather on the east coast, with establishment of col conditions across the North Sea ahead of depressions moving in from the Atlantic. The first of these periods saw the arrival of the first Little Stint (*Calidris minuta*), Wood Sandpiper (*Tringa glareola*), Spotted Redshank (*T. erythropus*) and Ruffs (*Philomachus pugnax*) of the autumn in north-eastern coastal regions, while the second produced a second Spotted Redshank and numbers of Bar-tailed Godwits (*Limosa lapponica*), all birds of Scandinavian origin. Furthermore, during these periods considerable numbers of Black Terns arrived in eastern coastal waters.

The evidence, then, appears to indicate that the first influx of Red-necked Phalaropes originated in Scandinavia, and this conclusion is substantiated by the absence of any numbers of Grey Phalaropes (*Ph. fulicarius*) in these early movements.

Later influxes of waders (traceable to a Scandinavian origin) occurred on or about 13th and 22nd September, and it is possible that these may also have augmented the numbers of Red-necked Phalaropes along the eastern seaboard. JAMES D. PARRACK

SIRS,—As a meteorologist, I was extremely interested in the recent analysis of the influx of phalaropes (mainly Grey Phalaropes, *Phalaropus fulicarius*) in September 1957 (Sage and King, 1959). As Kenneth Williamson does not say in his comments quoted there, I am wondering whether he deduced the origin of the birds by plotting trajectories? I feel that two points ought to be appreciated by the reader.

Firstly, a study of the weather chart, which only indicates what is happening at any one instant, does not necessarily show the trajectory of the air arriving at any one point, as this must also depend upon the changing pattern of the weather charts. Secondly, the birds may not travel passively with the wind, but may fly on a heading, in which case their trajectory will be the vector resultant of the wind and the heading.

Recently Lack (1958) has shown that, for the short North Sea crossing, birds do maintain a constant heading by means of their sense of direction, but make no allowance for wind drift. From Fisher and Lockley (1954) it can be implied that Grey Phalaropes normally head between south-east and south-west to their winter quarters. If it is assumed that they head due south at 25 m.p.h., this gives a second trajectory which, in general, would diverge from the corresponding air trajectory. However, birds probably do not keep on such a constant heading indefinitely; hence in such instances when they are forced by strong winds to fly long distances they probably set off on a constant heading, but eventually give up and drift downwind. If this is true, then the birds' real route will be, in general, somewhere between the air trajectory and the idealized trajectory just proposed. The above two trajectories arriving in Cornish waters on 12th and 13th September 1957 were not significantly different.

Surely the depression which is suggested to have caused the minor peak on 28th September would have forced birds to arrive in the south-west of the British Isles from the 23rd to the 25th? This depression caused south to south-west winds of 23-34 m.p.h. in the south-western coastal districts on 24th and 25th September. By the 26th the wind was north to north-easterly and 16-23 m.p.h., decreasing to about 5 m.p.h. as the depression moved eastwards and died out.

The minor peak on 28th September occurred during a period of mainly anticyclonic conditions which began late on the 26th and continued to the end of the month with north-westerly winds of 5-17 m.p.h. Looking back to the major peak on the 13th-14th, a decrease in wind from about 23 m.p.h. on the 14th to 10 m.p.h. on the 15th produced a sharp fall in the number of phalaropes

(less than half on the 15th). Normally only small numbers of these birds occur in the autumn in the British Isles, and phalaropes migrating southwards over the sea would not be expected in this country unless the winds were strong (probably greater than 20 m.p.h.), and had a westerly component. During the period 27th-30th September an anticyclone extended almost from Iceland to the Azores, so that new arrivals of Grey Phalaropes into the British Isles would not be likely.

Is it not possible that the birds in the south-west could have dispersed during the period 14th-17th September, mainly up the English and Bristol Channels, or even back to the Atlantic? This is partly supported by the data which show a small wave of birds appearing first in Cornwall and Co. Wexford on the 13th-14th, in Somerset on the 14th and in Hampshire and the Isle of Wight on the 14th-16th. After these dates there were only sightings of ones and twos except for ten in Somerset on 21st September (col on the 19th-20th, wind increasing from south to about 5-15 m.p.h. on the 21st), and thirteen in Cornwall on 28th September. It is significant that these higher counts occurred at week-ends.

PETER F. ABBOTT

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RECENT REPORTS AND NEWS

By I. J. FERGUSON-LEES and KENNETH WILLIAMSON

The items here are largely unchecked reports, and must not be regarded as authenticated records. They are selected, on the present writers' judgment alone, from sources generally found to be reliable. Observers' names are usually omitted for reasons of space and in case a report is subsequently rejected, and none of the items will be mentioned in our annual Index. Readers are asked to submit anything of interest as quickly as possible.

This month's summary is confined to the observations of rarer birds during the period 22nd February-3rd May.

UNUSUAL OCCURRENCES

The most remarkable event of the period was the trapping on Fair Isle, on 27th April, of a Song Sparrow (*Melospiza melodia*) which was still present—and singing—on 7th May. This American bunting has not previously been recorded in Europe and it appears to be almost unknown in captivity in this country. Another American occurrence, which is also considered very unlikely to have been an escape, was the male Ring-necked Duck (*Aythya collaris*) which appeared in the area of Reading (Berkshire) on 19th April and remained until the 27th, chiefly on gravel-pits at Theale and Burghfield. During the course of its stay it was

watched by dozens of observers. There is only one previous fully authenticated record of this species in Britain (*antea*, vol. xlviii, p. 377; vol. xlix, plate I), though it is interesting to note that one was reported from Holland during March.

Other rarities have included a White-winged Black Tern (*Chlidonias leucopterus*) off Selsey Bill (Sussex) on 18th April and a probable Caspian Tern (*Hydroprogne caspia*)—unfortunately the details are incomplete—at the same place on the 25th. A Moustached Warbler (*Luscinola melanopogon*) was identified at Lundy (Devon) on 2nd May, but on the whole, southern species were poorly represented during the period though there were unconfirmed reports of a Woodchat Shrike (*Lanius senator*) near Penzance (Cornwall) on the early date of 31st March and of two Black-winged Stilts (*Himantopus himantopus*) at Holy Island (Northumberland) on 13th April. Also there was a Purple Heron (*Ardea purpurea*) within a few miles of Cambridge from 4th to 6th April.

Among more northern species, a Great Snipe (*Capella media*) was identified on Farlington Marshes (Hampshire) on 4th April and what was presumably the same bird was also seen on 16th March and 21st April. As in 1958, there have been several reports of Cranes (*Megalornis grus*), following the Slimbridge observation already mentioned (*antea*, p. 140), but these are being followed up to make sure that the possibility of escaped individuals of other species of crane can be ruled out. A Spotted Crake (*Porzana porzana*) at Cliffe (Kent) on 1st February was the second observation there during the past winter (*cf. antea*, p. 32), and the total of records of this species in recent months was brought to 5 by the ones which were picked up dead in Plymouth (Devon) on 23rd March and near Knightwick (Worcester) on 8th April: the latter was an adult male in breeding condition. A Dipper on Foula on 1st April was thought to be the Black-bellied form (*Cinclus c. aquaticus*).

All other observations are being held over until our next issue.

PURCHASED
5 JUL 1959



NOTICE TO CONTRIBUTORS

British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlvii, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

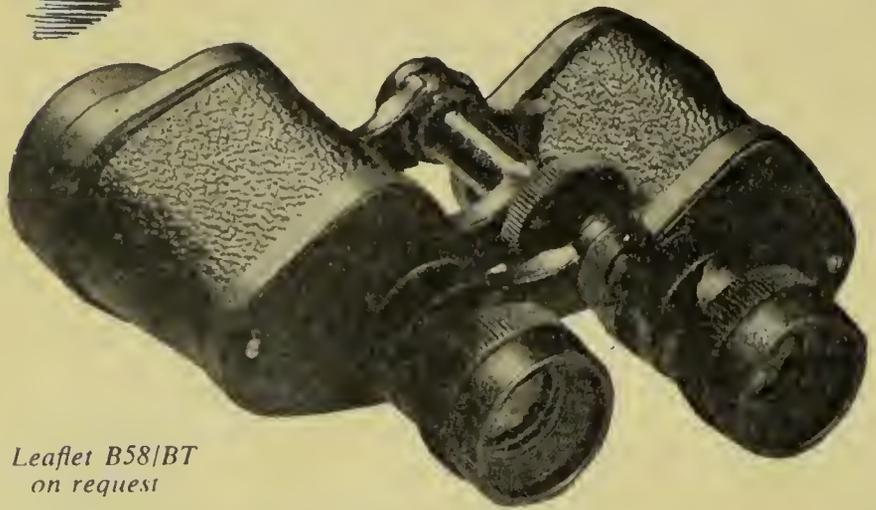
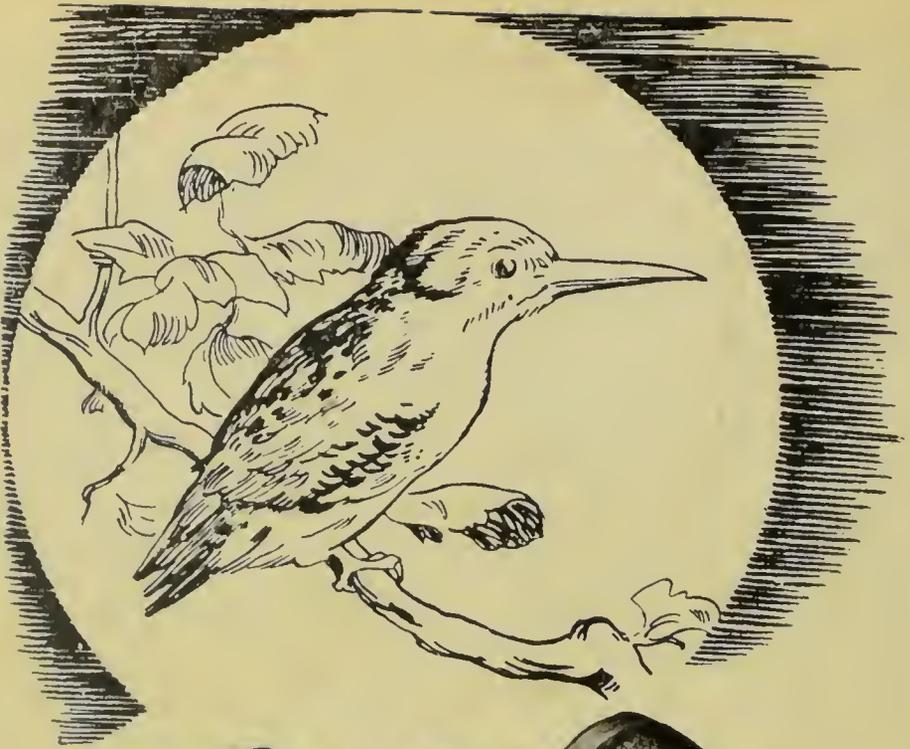
TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, xlii: 120-134.

WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34.

Various other conventions concerning references, including their use in the text, should be noted by consulting previous examples.

4. Tables should be numbered with Roman numerals, and the title typed above in the style used in this issue. The title and any headings within the Table should not be underlined, because this sometimes makes it difficult for the Editor to indicate the type to be used. It is most important that the lay-out of each Table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that Tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All Tables should be self-explanatory.

5. Figures should be numbered with Arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in Indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4" width the original should be 8" wide); sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of Indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman. The publishers regret that, owing to rising costs, it will in future be only in exceptional cases that they can undertake to have lettering inserted.



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BRITISH BIRDS

WADER MIGRATION IN NORTH AMERICA AND ITS RELATION TO TRANSATLANTIC CROSSINGS

By I. C. T. NISBET

IT IS NOW generally accepted that the American waders which occur each autumn in western Europe have crossed the Atlantic unaided, in many (if not most) cases without stopping on the way. Yet we are far from being able to answer all the questions which are posed by these remarkable long-distance flights. Why, for example, do some species cross the Atlantic much more frequently than others? Why are a few birds recorded each year, and not many more, or many less? What factors determine the dates on which they cross? Why are most of the occurrences in the autumn? Why, despite the great advantage given to them by the prevailing winds, are American waders only a little more numerous in Europe than European waders in North America? To dismiss the birds as "accidental vagrants", or to relate their occurrence to weather patterns, as have been attempted in the past, may answer some of these questions, but render the others still more acute.

One fruitful approach to these problems is to compare the frequency of the various species in Europe with their abundance, migratory behaviour and ecology in North America. If the likelihood of occurrence in Europe should prove to be correlated with some particular type of migration pattern in North America this would offer an important clue as to the causes of transatlantic vagrancy. In this paper some aspects of wader migration in North America will be discussed from this viewpoint.

SOURCES OF INFORMATION

The basic source of information on the distribution of North

American birds is the *Fifth A.O.U. Check-List* (1957). Brief accounts of migration routes of some species are given by Bent (1927-29), Pough (1951) and Snyder (1957); these have been supplemented by numerical data drawn from the state and regional avifaunas listed at the end of this paper, and by unpublished information and comments supplied privately by friends. British records are quoted from *The Handbook* (Witherby *et al.*, 1941), later information being derived largely from records published and abstracted in this journal. No claim is made to accuracy in detail, since much of the information used is unpublished or unquantitative, and the author is not competent to judge the accuracy of many of the records of the rarer species. Minor errors in the data used will not impair their statistical validity.

I am greatly indebted to Messrs. H. H. Axtell, J. Baird, J. A. Hagar and C. S. Robbins for their invaluable assistance in the preparation of this paper.

AUTUMN MIGRATION PATTERNS IN NORTH AMERICA

At the risk of oversimplification, the waders of eastern North America can be divided into six classes on the basis of their autumn migration patterns there. Spring migration will be discussed in a separate section.

CLASS I. Coastal breeding birds of temperate and subtropical regions, usually with fairly short migrations. These include the following species, listed with their northern limits in summer and winter: American Oystercatcher* (39°N. to 35°N.), Eastern Piping Plover (51°-34°), Wilson's Plover (38°-28°), Eastern Willet (45°-37°) and Black-necked Stilt (32°-23°).

CLASS II. Temperate and subarctic breeding species of the interior ("prairies", etc.), which occur east to the Atlantic coast (more commonly towards the south) on autumn passage. These include: Western Piping Plover, Long-billed Curlew (increasing but still rare on the Atlantic coast), Western Willet, Marbled Godwit (rare), American Avocet (rare but increasing) and Wilson's Phalarope (rare).

CLASS III. Temperate and subarctic species of inland habitat, which occur commonly on migration near the Atlantic seaboard but are less common on the coast itself: Killdeer, American Woodcock, Wilson's Snipe, Upland Plover, Spotted Sandpiper, Solitary Sandpiper.

CLASS IV. Arctic or subarctic species of eastern or central Canada, which migrate in large numbers down the Atlantic coast and include the most numerous species there: Hudsonian Whimbrel, Greater and Lesser Yellowlegs, Short-billed Dowitcher, Least, Pectoral and Semipalmated Sandpipers. A few of these

*Scientific names are given in an appendix; subspecific names are used where relevant to the discussion.

species, notably the Pectoral Sandpiper and the Lesser Yellowlegs, also occur in large numbers in fresh-water habitats inland. A number of Holarctic species (e.g. Ringed and Grey Plovers, Turnstone, Knot, Dunlin and Sanderling) also belong to this group, but fall outside the scope of this paper.

CLASS V. Western arctic species whose main migration route is through the centre of the continent, but which occur in greater or lesser numbers on the Atlantic coast in autumn: American Golden Plover (immatures), Long-billed Dowitcher, Stilt Sandpiper, Western Sandpiper and Buff-breasted Sandpiper (rare on the coast). Baird's Sandpiper, although breeding east to north-west Greenland, also has an overland migration route and rarely wanders east to the Atlantic coast.

CLASS VI. Western or central arctic species whose autumn migration is considered to be largely offshore from eastern Canada to South America; these occur with varying degrees of abundance in the north-eastern United States but are rare in the south-east: American Golden Plover (adults), Eskimo Curlew, Hudsonian Godwit and White-rumped Sandpiper. Many Hudsonian Whimbrel also use this route, as does the Nova Scotia population of Eastern Willets, while some Pectoral Sandpipers and Lesser Yellowlegs probably use a shorter over-water route from the eastern United States to the West Indies.

Each of these categories is somewhat arbitrarily defined, and some species may qualify for inclusion in more than one. For example, Pough (1951) suggests that most of the species in Class V use the over-water route of Class VI, at least in small numbers, but he gives little evidence except their sporadic occurrence at Bermuda. A more detailed analysis of the migration routes of North American waders would require more data than are at present available.

Quantitative information.

To supplement the above accounts with comparative numerical data, Table I has been constructed. This gives the size of some of the larger flocks or concentrations of each species which occur nowadays in four well-watched areas: the coasts of Massachusetts, New Jersey and Maryland, and the shores of Lake Erie near Buffalo, New York. The figures should on no account be used as quantitative measures of relative abundance, since they have been collected in widely different ways, but they do give a rough idea of the comparative status of the various species in different parts of the eastern United States. Historical changes in abundance, which have been profound in many species, are indicated briefly in the list for Massachusetts, but are less thoroughly known elsewhere. For comparison, the total numbers of British records of each species are also included in the table, and these will be discussed in the next section.

TABLE I—HIGH COUNTS OF AMERICAN WADERS ON AUTUMN MIGRATION IN VARIOUS AREAS, WITH TOTAL NUMBER OF AUTUMN AND WINTER RECORDS IN THE BRITISH ISLES

Data from Massachusetts and Maryland are the highest numbers normally expected in the more favoured coastal areas, those from New Jersey and Lake Erie are the maximum numbers observed in sample counts during 3 and 15 years respectively. Published data from Bailey (1955), Griscom and Snyder (1955), Urner and Storer (1949) and Stewart and Robbins (1958); unpublished estimates by J. Baird (Massachusetts), C. S. Robbins (Maryland) and H. H. Axtell (Lake Erie).

Class	Species	Massachusetts	New Jersey	Maryland	Lake Erie	Britain to 1940	Britain since 1940
I	American Oystercatcher	—	1	1 h	—	—	—
	Piping Plover (subsp.)	20 bc	75	10 h	—	—	—
	Wilson's Plover	—	1	2 h	—	—	—
	Eastern Willet	— e	— e	100 f	—	—	—
	Black-necked Stilt	—	—	—	—	—	—
II	Long-billed Curlew	— b	1	—	—	—	—
	Marbled Godwit	2 b	2	5	—	—	—
	Western Willet	10	51 f	— e	1	—	—
	*American Avocet	—	—	1	—	—	—
	Wilson's Phalarope	1	2	—	—	—	1
III	*Killdeer	60 bc	53	50 g	637	8	4
	*Wilson's Snipe	12 a	10	10 g	—	1 e	1 e
	American Woodcock	5 a	1 g	— g	—	—	—
	*Upland Plover	4 a	45	—	—	15	1
	*Spotted Sandpiper	6 a	48	12	673	5 e	— e
	*Solitary Sandpiper	8	3	2	6	5	4
IV	*Hudsonian Whimbrel	50	1,414	75	11	—	2
	*Short-billed Dowitcher	1,500 bc	2,600	75	12	—	—
	*Lesser Yellowlegs	1,500 c	500	150	113	13	c. 30
	*Greater Yellowlegs	250 d	900	25	14	4	5
	*Least Sandpiper	100	300	300	253	4	1
	*Pectoral Sandpiper	40	135	40	160	62	c. 90
	Semipalmated Sandpiper	20,000	4,000	1,500	1,348	1	2
V	Long-billed Dowitcher	15	40	— e	—	24 f	11 f
	*Baird's Sandpiper	1	3	—	20	5	2
	Western Sandpiper	12	152	75	5	—	—
	Stilt Sandpiper	10	22	25	6	—	1
	Buff-breasted Sandpiper	2	1	—	1	18	10
VI	*American Golden Plover	40 bd	38	5	360	4 e	1 e
	*Eskimo Curlew	— b	—	—	—	8	—
	Hudsonian Godwit	20 bd	2	1	1	—	—
	*White-rumped Sandpiper	50 d	35	10	10	14	13

NOTES—a: has decreased in recent years.

b: decreased greatly in nineteenth century.

c: has increased in last 50 years.

d: has increased in last 25 years.

e: probably overlooked.

f: arbitrarily listed as this species, although it is not yet officially admitted to British list.

g: more common in winter.

h: more common in summer.

* denotes a species that has been recorded in Greenland.

RECORDS IN GREAT BRITAIN

In Table I the British records are separated into those made before 1940 (largely specimen records) and those made subsequently (largely sight records). The differences in relative frequency between the two sets of data (e.g. the decrease in records of the Upland Plover and the increase in those of the Lesser Yellowlegs) are thought to be due mainly to real changes in the relative frequency of the occurrence of the species, although other changes, such as the decline of indiscriminate shooting in the late nineteenth and early twentieth centuries, are doubtless also important.

It is necessary, however, to realise the bias inherent in both sets of data. "Rarity-hunting" has always been concentrated on fresh waters inland and on lagoons and marshes along the coast, and this has preferentially favoured detection of birds characteristic of those habitats, against those which prefer open flats (Short-billed Dowitcher and Semipalmated Sandpiper) or drier ground (e.g. American Golden and Upland Plovers). Moreover, those species which closely resemble common European birds (e.g. American Oystercatcher and American Golden Plover) are much more likely to be overlooked than the others.

With these factors borne in mind, perusal of Table I reveals two striking facts. In the first place, some species which have occurred in Britain are little more than vagrants to the Atlantic coast of North America (e.g. Baird's and Buff-breasted Sandpipers and Wilson's Phalarope). The Buff-breasted Sandpiper, indeed, is almost as common in Britain as in any area of similar size in eastern North America! In the second place, many of the species which are most abundant on the North American coast are either unrecorded in Britain (Willet) or extremely rare there (Hudsonian Whimbrel, Short-billed Dowitcher*, Semipalmated Sandpiper).

Of these commoner coastal species (Classes I, III and IV), the Killdeer needs special consideration, since it usually occurs in Britain in winter, not in autumn like the other species. The Killdeer is in fact unique in that it is sometimes carried northward up the Atlantic coast by late autumn and winter storms (Chadbourne, 1889; Palmer, 1949; Griscom and Snyder, 1955): occurrences in Britain may well derive from similar weather situations. Among the other species, Table I shows that those most frequent in Britain are birds of inland and fresh-water habitats (Group III plus the Pectoral Sandpiper and Lesser Yellow-

*British specimens of dowitchers have not yet been critically examined (see *Ibis*, vol. 98, p. 168 and vol. 100, p. 300), but the dates of occurrence suggest that they must consist largely, if not entirely, of the Long-billed species (cf. Pitelka, 1950; Griscom and Snyder, 1955). This is confirmed by the field notes on some of the more recent birds (*antea*, vol. xl, pp. 153-154; vol. xlv, pp. 315-316; vol. xlv, pp. 425-426; etc.), which include all the diagnostic field-characters of this species.

legs), while the truly coastal species (Group I and the rest of Group IV) are comparatively poorly represented. In particular, the two species from this group with long over-water migrations (the Eastern Willet and Hudsonian Whimbrel) are extremely rare in Europe in autumn: the former has never been recorded in Britain at all, although there is one record in France (Mayaud, 1938). Thus little support can be found for the "drift" theory of transatlantic vagrancy (Williamson, 1954, 1955), for drift should act selectively on the species with coastal and over-water migration routes rather than on the inland forms. It could, of course, be argued that the coastal species are more likely to be overlooked in Britain than the others, but this could not apply to the Willet, Greater Yellowlegs or Short-billed Dowitcher, nor could it explain the extreme rarity of some of the other species. It seems safe to conclude that the inland species show a much greater tendency towards transatlantic vagrancy than the others, a point which will be discussed later.

Turning to the arctic and subarctic birds (Classes IV, V and VI), it is surprising to find that the western species (Classes V and VI) are much more frequent in Britain than the species of more eastern distribution (e.g. Baird's, Least and Semipalmated Sandpipers and the Short-billed Dowitcher). It is interesting to note that all these western species overlap on one area—the MacKenzie river delta in north-west Canada, which forms the western limit of the White-rumped Sandpiper and the eastern limit of the Long-billed Dowitcher—and that this area is also the only place on the arctic coast where the Lesser Yellowlegs and the Solitary Sandpiper breed. Indeed, as Mr. J. A. Hagar has pointed out to me, the MacKenzie delta is the *only* place in North America where most of the species which occur in Great Britain with the greatest frequency can be found together. The shortest route from the MacKenzie delta to southern England (*via* northern Greenland and Iceland) is less than 3,500 miles, and it is tempting to suggest that some birds from this area might be caught up in arctic storms and fly directly—perhaps even non-stop—to western Europe.

This theory is attractively simple, but it has certain fatal disadvantages. In the first place, records from Greenland (Table I) do not support such a theory of vagrancy from the western arctic. Secondly, the distribution of records in Europe, with a concentration in south-west England and extremely few in Norway or Iceland, suggests that the birds arrive from the W.S.W. rather than from the N.N.W., and the few records of the weather preceding arrivals of American waders in Europe fully support this interpretation (Boston *et al.*, 1949; Anon., 1951, 1955a; McLean and Williamson, 1958; Williamson and Ferguson-Lees, in press). Thirdly, the MacKenzie delta enjoys relatively calm weather in autumn, the main storm track being well to the south and east, over Hudson Bay and the Gulf of St. Lawrence (Anon., 1955b).

It is in this area that we should look for the source of trans-atlantic vagrants, as Williamson and Ferguson-Lees (in press) have emphasized. However, we should not overlook the suggestion that many of the birds reaching Britain may derive ultimately from breeding areas in north-west Canada and Alaska, even though some of the species concerned also breed much farther east.

Perhaps the most plausible explanation of the fact that the species of Classes V and VI are relatively more frequent in Europe than those of Class IV is that in all the former species a part of the population undertakes a long north-west to south-east (or W.N.W. to E.S.E.) migration within North America before turning south to its wintering ground. It might be surmised that birds with such a migration are more likely to wander eastwards over the Atlantic than birds following the coast southwards; alternatively (or additionally), they might be more likely to continue eastwards once they have crossed the coast. In either case, once over water they would be likely to be picked up by Atlantic depressions and be carried E.N.E. to the British Isles.

A theory of this kind would be the only possible explanation of the frequent occurrence in Europe of the Long-billed Dowitcher* and the Buff-breasted Sandpiper. It would explain why the Pectoral Sandpiper, which often wanders east of its migration route in the arctic (Snyder, 1957), is far more frequent in Britain than Baird's Sandpiper, which is much more numerous in Greenland (Salomonsen, 1951), but whose straggling takes the form of a southward rather than an eastward flight. It could easily be extended to the Lesser Yellowlegs, whose breeding range extends north-west to the MacKenzie delta and which presumably migrates from there to the south-east. Finally, it derives strong support from the occurrence in Britain of Wilson's Phalarope, a southern species which is rare on the Atlantic coast and which could hardly have reached Britain in any other way. It does not, however, apply to the Upland Plover and other southern species of inland habitat, which have reached Britain with surprising frequency, but which are not known to have a west-east migration route within the continent. It seems likely that these species, which occur very widely at inland localities in North America, have less precisely determined migration routes than the coastal species, and may hence be more likely to wander over the sea.

EUROPEAN SPECIES IN NORTH AMERICA

The best support for the above arguments arises from the fact that exactly the same conclusions apply in reverse to the occurrences of European waders in North America. Although fewer details of these records are available, the regular occurrence of the Ruff and the not infrequent occurrence of the Lapwing, Curlew Sandpiper and European Woodcock in autumn in eastern

*See footnote on page 209.

North America combine with records of the European Curlew (2), Bar-tailed Godwit (3), European Snipe (several) and Jack Snipe to lay emphasis on species with extensive east-west migrations in Europe. Moreover, at least one of the transatlantic crossings by the Lapwing was proved to have resulted from a westward movement within the British Isles (Witherby, 1928). *Per contra*, many breeding-species of south-west Europe have never been recorded in North America, while of the breeding birds of Iceland there is only one record of the Black-tailed Godwit, only three of the European Whimbrel and none at all of the European Oystercatcher, Faeroe Snipe or Redshank!

The surprising frequency of transatlantic crossings by European birds in face of the adverse prevailing wind may thus result merely from the great abundance of the species involved in the east-west movement. The species which migrate eastwards in North America are much less numerous.

TRANSATLANTIC OCCURRENCES IN SPRING

The few records of American waders in Britain in spring, listed in Table II, present a still more striking contrast to their status in North America. The Buff-breasted Sandpiper, for example, has *never* been recorded on the Atlantic coast of North America in spring, Baird's Sandpiper has occurred there only a very few times, and Wilson's Phalarope is not even recorded annually! Likewise the Lesser Yellowlegs, the American Golden Plover, and the White-rumped, Pectoral and Western³ Sandpipers are all more or less scarce on the coast (the spring migration routes of all these species are through the centre of the continent), while abundant coastal species such as the Least and Semipalmated

TABLE II—SPRING¹ RECORDS OF AMERICAN WADERS IN THE BRITISH ISLES

Killdeer	...	...	...	5
American Golden Plover	...	...	...	1
Dowitcher (sp.) ²	...	...	...	1
Hudsonian Whimbrel	...	...	...	1
Spotted Sandpiper	..	...	...	6
Solitary Sandpiper	...	...	...	3
Lesser Yellowlegs	...	...	...	7
Greater Yellowlegs	...	...	...	2
Baird's Sandpiper	...	...	...	1
White-rumped Sandpiper	...	...	...	4
Pectoral Sandpiper	...	...	...	6
Western Sandpiper ³	...	...	...	1
Buff-breasted Sandpiper	...	...	...	1
Wilson's Phalarope	...	...	...	2

NOTES—1: "Spring" is defined as the period mid-March to mid-June.

2: The other spring record in Europe was *L. g. griseus* (Salomonsen, 1957).

3: For identification see Nisbet (in preparation); not yet officially admitted to the British list.

Sandpipers are not yet represented by a single spring record in Britain.

The spring records of European waders in North America are equally striking, including the regular occurrence of the Curlew Sandpiper and the Ruff, and one or two recent records of the Spotted Redshank.

The only plausible interpretation of such discrepant records is that they do not represent transatlantic migration at all, but are of birds which have crossed the Atlantic much earlier—perhaps the previous autumn, perhaps between South America and Africa—and have migrated north on the wrong side of the Atlantic. That such an explanation is possible is shown by several cases of Killdeers and Lesser Yellowlegs wintering in Great Britain, and by records of American Golden Plover, Pectoral, Baird's and Buff-breasted Sandpipers in Africa, and of Curlew Sandpiper and Ruff in South America (*A.O.U. Check-List*; also Williams, 1952, and Bourne, 1955).

SUMMARY

1. The relative frequency of occurrence of various American waders in Great Britain is compared with the available information on their migration patterns and abundance in North America. Some species which have occurred in Britain are rare on the American coast, while there are especially few British records of the species which are most abundant there. Species of inland habitat are relatively more frequent than those of the coast; long-distance migrants are more frequent than short-distance migrants; and species from western arctic America are much more frequent than species from eastern arctic America. Transatlantic vagrancy occurs mainly in those species in which a part of the population has an extensive west-to-east movement within North America.

2. Spring records in Britain bear still less relation to the relative abundance of the species concerned in eastern North America. It is suggested that the birds have either wintered in the Old World or crossed from South America to Africa on spring migration.

3. Similar conclusions apply in reverse to the records of European waders in eastern North America.

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APPENDIX—SCIENTIFIC NAMES OF SPECIES MENTIONED IN THE TEXT

Names used in the *A.O.U. Check-List* (1957), where different, are included in brackets.

European Oystercatcher	<i>Haematopus ostralegus</i>
American Oystercatcher	<i>H. palliatus</i>
Lapwing	<i>Vanellus vanellus</i>
Eastern Piping Plover	<i>Charadrius m. melodus</i>
Western Piping Plover	<i>Ch. m. circumcinctus</i>
Ringed Plover	<i>Ch. hiaticula</i> (& <i>Ch. semipalmatus</i>)
Wilson's Plover	<i>Ch. wilsonia</i>
Killdeer	<i>Ch. vociferus</i>
American Golden Plover	<i>Ch. (Pluvialis) dominicus</i>
European Golden Plover	<i>Ch. (P.) apricarius</i>
Grey Plover	<i>Ch. (Squatarola) squatarola</i>
Turnstone	<i>Arenaria interpres</i>
Great Snipe	<i>Gallinago (Capella) media</i>
Wilson's Snipe	<i>G. (C.) gallinago delicata</i>
European Snipe	<i>G. (C.) g. gallinago</i>
Faeroe Snipe	<i>G. (C.) g. faeroensis</i>
Jack Snipe	<i>Lymnocyptes minimus</i>
European Woodcock	<i>Scolopax rusticola</i>
American Woodcock	<i>Philohela minor</i>
Long-billed Curlew	<i>Numenius americanus</i>
European Curlew	<i>N. arquata</i>
European Whimbrel	<i>N. ph. phaeopus (islandicus)</i>
Hudsonian Whimbrel	<i>N. ph. hudsonicus</i>
Eskimo Curlew	<i>N. borealis</i>
Upland Plover	<i>Bartramia longicauda</i>
Short-billed Dowitcher	<i>Limnodromus griseus</i>
Long-billed Dowitcher	<i>L. scolopaceus</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Bar-tailed Godwit	<i>L. lapponica</i>
Marbled Godwit	<i>L. fedoa</i>
Hudsonian Godwit	<i>L. haemastica</i>
Spotted Sandpiper	<i>Tringa hypoleucos (Actitis macularia)</i>
Solitary Sandpiper	<i>T. solitaria</i>
Redshank	<i>T. (Totanus) totanus</i>
Lesser Yellowlegs	<i>T. (Totanus) flavipes</i>
Greater Yellowlegs	<i>T. (Totanus) melanoleuca</i>
Spotted Redshank	<i>T. erythropus</i>
Eastern Willet	<i>Catoptrophorus s. semipalmatus</i>
Western Willet	<i>C. s. inornatus</i>
Knot	<i>Calidris canutus</i>
Least Sandpiper	<i>C. (Erolia) minutilla</i>
Baird's Sandpiper	<i>C. (E.) bairdii</i>
White-rumped Sandpiper	<i>C. (E.) fuscicollis</i>
Pectoral Sandpiper	<i>C. (E.) melanotos</i>
Dunlin	<i>C. (E.) alpina</i>
Curlew Sandpiper	<i>C. testacea (E. ferruginea)</i>
Semipalmated Sandpiper	<i>C. (Ereunetes) pusilla</i>
Western Sandpiper	<i>C. (E.) mauri</i>
Ruff	<i>Philomachus pugnax</i>
Stilt Sandpiper	<i>Micropalama himantopus</i>
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>
Sanderling	<i>Crocethia alba</i>
American Avocet	<i>Recurvirostra americana</i>
Black-necked Stilt	<i>Himantopus mexicanus</i>
Wilson's Phalarope	<i>Phalaropus (Steganopus) tricolor</i>

MIGRATIONS OF THE OYSTERCATCHER

By D. G. ANDREW

A—DEDUCTIONS FROM RINGING RECOVERIES

ONE OF THE tentative conclusions reached in E. J. M. Buxton's paper on this subject (*antea*, vol. L, pp. 519-526) was that mature Oystercatchers (*Haematopus ostralegus*) "do not move so far away from their breeding area as immature birds". This conclusion came as something of a surprise in view of the fact that one so often sees Oystercatchers in late summer migrating in family parties. It may be, of course, that these family parties break up before the migration flight is completed, but at least it is worth while reconsidering the evidence available.

Buxton gave (p. 522) a list of six recoveries of birds ringed as full-grown (not necessarily mature) and commented that only one of these "seems to have travelled any distance from its presumed breeding area". On referring to this list, however, it is at once apparent that of these recoveries the first (ringed 30th September), the second (ringed 21st September), the fifth (ringed 29th September—not May as stated by Buxton) and the sixth (ringed 19th January) all refer to birds that were marked either in winter quarters or at least on passage, and the location of their breeding areas cannot be known. The Faeroese bird mentioned by Buxton, which was recovered in Wigtownshire, had covered a very average (for that population) distance of 500 miles. The only recovery in the list which supports Buxton's conclusion is the Fair Isle bird recovered in Orkney in mid-winter. This will be discussed later.

The ringing recoveries of this species had previously been studied by Kenneth Williamson (*Edinburgh Bird Bulletin*, vol. 2, p. 52) who pointed out that birds from different breeding areas tend to favour different winter quarters. From this it follows that there is little point in using the ringing recoveries to compare the relative distances covered on migration by adult and immature Oystercatchers unless due account is also taken of the origins of birds involved.

It has therefore seemed desirable to review the available information and in Table I the ringing recoveries have been split up to distinguish between the main breeding areas where the birds have been ringed and the main areas where they have been recovered outside the breeding season. This table incorporates (a) all immature birds recovered between the October of their first year and the February of their third year (i.e. from approximately 3 months to $2\frac{3}{4}$ years old, during which period these birds appear to remain in what may be described as their "nursery areas"); and (b) all birds recovered as adults from the age of $3\frac{1}{4}$ years upwards between the months of October and February (when they

TABLE I.—RECOVERIES OF RINGED OYSTERCATCHERS (*Haematopus ostralegus*) SPLIT UP TO SHOW THE WINTERING AND "NURSERY" AREAS FAVOURED BY THE DIFFERENT BREEDING POPULATIONS

Breeding areas where ringed	North Scotland	West Coast (Clyde/Dee)	Recoveries from wintering or "nursery" areas				Total	Average miles
			Ireland	Wales & S.W. England	France & Spain	East Scotland			East England
Iceland	imm. ad.	2	1	1			5	900 600
Faeroes	imm. ad.	3 2	9		1		15 2	520 562
Shetland/ Orkney	imm. ad.	2 1	6	2		2	14 3	481 347
Scotland north of Grampians	imm. ad.	12 2	6 2	2			20 4	270 264
E. Scotland south of Grampians	imm. ad.	5	4	1		1	12	248 —
Solway/Dee	imm. ad.	17 4	1		1		19 4	68 35
Isle of Man	imm. ad.	1	1	5		2	9	216 —
Wales	imm. ad.			2		10 1	12 1	303 450
Norfolk	imm. ad.					3	6 1	151 170

may be presumed to be in their winter quarters). A few September and one or two August records have also been included where the facts very strongly indicate that the bird had reached the end of its migration. All immature birds have been grouped together, as a more detailed analysis of the recoveries has revealed no clear tendency on the part of birds in their third winter to be found any further north than birds in their first or second winters.

Looking first at the recoveries as a whole, without having regard to age, it is at once apparent that the average distances covered on migration vary widely among the different breeding populations. As might be expected, the Icelandic birds perform the longest migration and the distances covered shorten as one comes further south until in the Solway/Dee breeding area only one bird out of the 23 ringed and subsequently recovered had travelled more than 110 miles from the place of ringing. In fact, six of the birds ringed in this area were actually recovered north of the place of ringing, and it seems clear that a large part of the Solway/Dee breeding population is not migratory at all, the movements being more in the nature of a random dispersal. In brief, Ireland and the Solway/Dee area provide wintering grounds for the great majority of the birds breeding in and to the north of these areas (on the basis of the ringing recoveries this proportion is in the region of 80%). On the other hand, birds breeding to the south of the Dee show a marked preference for France as a winter resort, with some individuals getting as far as the north coast of Spain, and the distances covered on migration are consequently higher than those covered by the birds breeding immediately to the north of them. One minor point of interest is that birds from the Isle of Man largely ignore the Solway/Dee and Irish wintering areas and migrate appreciably further south than those breeding on the mainland opposite. In this respect they show a much closer affinity with the Welsh breeding population. The Norfolk population is partly resident and partly migratory to the south coast of England and to France.

It is clear from Table I that the place of origin must be taken into account in attempting to draw conclusions as to the relative distances covered on migration by the different age groups. Unfortunately, when the information available is split up in this way the number of recoveries from each area proves too small for anything but the most tentative deduction. The recoveries from the Solway/Dee area as shown in the table might seem to support the theory that immature birds migrate further than adults, but the picture may be unduly distorted by one recovery of an immature bird that had moved as far as France, travelling 440 miles further than any of its colleagues. Moreover, this breeding area does seem to differ fundamentally from all the others (with the sole exception of Norfolk) in that a substantial proportion of the locally-bred birds are not migratory at all. The only other breeding areas for which more than one adult recovery is shown

in Table I are the Faeroes, Shetland/Orkney and north Scotland. In the case of the Faeroes and north Scotland recoveries the distances covered by adult and immature birds show a most striking similarity which may well prove characteristic, at least of the genuinely migratory populations. The Shetland/Orkney group would show an equally close correlation between the two age-groups if it were not for the one recovery previously referred to as having been mentioned by Buxton—a bird ringed as a breeding adult on Fair Isle in May 1954 and found dead (in a fresh condition) in Orkney in December 1955, only 60 miles distant from the place of ringing. Until more data are available one can only reserve judgement on this recovery, which is in such striking contrast with the other recoveries from this area.

One can only conclude that the evidence at present available does not support the suggestion that immature Oystercatchers migrate further than adults.

B—CROSS-COUNTRY MIGRATION IN SOUTH SCOTLAND

This seems an opportune moment to draw attention to one aspect of Oystercatcher migration which does not seem to have been properly recorded. *The Handbook's* description of this species (Vol. IV, p. 417) as "Irregular and very scarce visitor on passage inland" may hold true in other parts of Britain, but in autumn it is both regular and abundant as a passage migrant across south Scotland. An indication that this must be the case is given in Table I which shows that, out of 12 birds ringed in east Scotland south of the Grampians (and so unlikely to use the Great Glen as a through route to the west), all but two were recovered on the west coast of England or in Ireland. The existence of this overland route has been widely known for many years to ornithologists living in Edinburgh, who are accustomed to hearing birds passing over the city on their way south, but even the published references—e.g. Eagle Clarke, *Studies in Bird Migration* (1912), vol. 1, p. 98—seem to have been overlooked and it is desirable to publish a fresh summary of what we know about these movements.

The most comprehensive records come from Gladhouse Reservoir, lying 12 miles south of Edinburgh at a height of 900 feet above sea-level. Weekly visits made by R. W. J. Smith and myself since 1949 have shown that, although the numbers observed vary a good deal from year to year, there is always a substantial passage of Oystercatchers during the months of July and August. No year has yet passed without at least 25 birds being recorded on one visit during these two months and on five occasions the numbers present have exceeded 100. As much of the migration takes place at night and as these migrant parties seldom stay long at the reservoir, the numbers recorded at Gladhouse can only represent a very small proportion of the birds passing through. The Gladhouse records, taken in conjunction with the very many

records of birds seen and heard passing over Edinburgh, indicate that there is a heavy and regular passage of Oystercatchers in autumn proceeding more or less due south from the Forth to the Solway estuaries. The distance involved is about 70 miles in a straight line, and it will be remembered that the head of the Solway estuary actually lies east of Edinburgh. The great bulk of this passage takes place during the last three weeks of July and the first three weeks of August, with stragglers continuing up until the middle of September.

This passage may proceed along a broad front, but the observations point to the existence of at least three main routes:

- (1) From Musselburgh up the South Esk to Gladhouse, and from there probably up the head waters of the Tweed and so down to the Solway through Annandale.
- (2) From Musselburgh up the North Esk, along the south side of the Pentlands and so through to the head waters of the Clyde, over the watershed at Elvanfoot (where Eagle Clarke, *op. cit.*, mentions a record of Oystercatchers on passage) and down Annandale and possibly also Nithsdale.
- (3) Over Edinburgh and along the north side of the Pentlands (where there are many records from the local reservoirs) to join up with the last-mentioned stream at the head of the Clyde valley.

In contrast, there is an almost complete absence of comparable records in spring and it seems probable that a completely different route may be followed at that season. Where this may lie is, at the moment, pure speculation. Possibly the hill-masses in south-west Scotland divert the birds further to the west than in the autumn so that the birds come into the Forth area from the west through the Clyde/Forth valley. Certainly the impression we have gained at Gladhouse is that our small breeding population of Oystercatchers comes in from the north in spring (as appears to be the case with the other species of waders breeding in the area).

It should perhaps be emphasized in conclusion that this cross-country migration is something quite distinct from the inland colonization of the big river valleys. There are no such valleys in the Lothians and the Oystercatcher is a decidedly scarce breeding species in all three counties.

My thanks are due to Kenneth Williamson and R. W. J. Smith for reading and commenting on this paper in draft; to Robert Spencer of the British Trust for Ornithology for making available the unpublished ringing recoveries; and to the many bird-watchers in the Edinburgh area who have supplied me with their records of birds seen or heard on passage.

PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

XCIX. ALPINE SWIFT

Photographs by E. BENZ and F. OBERHOLZER

(Plates 37-42)

Text by HANS ARN-WILLI

THE ALPINE SWIFT (*Apus melba*) is paler and considerably larger than its more wide-spread cousin, the Common Swift (*A. apus*). It is brown instead of black, and has a white belly separated from a white throat by a brown breast-band (plate 38 upper). On average it is 21.5 cm. long and spans 52-56 cm. (about 20½-22 inches) with outstretched wings, while its weight of around 100 gm. is nearly 2½ times that of the Common Swift (*cf.* Lack, 1956). Males and females look alike, but the smaller of a pair is liable to be the female.

The species is a summer-visitor to southern Europe and southern Asia as far east as India and Ceylon; it also nests in the mountains of north-west, central and southern Africa, where it winters. The European breeding range is shown in the distribution map in the *Field Guide* and is confined to the south from Spain to the Balkans and S. Russia, though there is evidence that it is undergoing some northward extension at the present time. Since 1952, for example, Alpine Swifts have bred at Freiburg in Germany, whereas previously there were no colonies north of the Jura mountain range. *The Handbook* describes the species as a rare vagrant to Britain and shows that there were only about 50 records by 1938, but Mr. I. J. Ferguson-Lees tells the writer that in the last few years there have been three or four records annually.

The following summary of the breeding biology of the Alpine Swift is based on the author's observations since 1932 at colonies in the Jesuit church and the Bieltor at Solothurn in Switzerland. A much fuller account is shortly to appear in a book (Arn, in press).

The Alpine Swifts do not come back from their winter quarters to their breeding haunts in large parties like the Common Swifts. They appear first in Switzerland in the second half of March and their numbers increase gradually until the last arrivals come in May. One ringed bird retrapped at the nest on 6th July 1957 (when it was feeding 3 young) had been caught at Tangier on 28th April 1957 on its return journey from Africa. Its first egg in 1957 was laid on 12th June and it bred again in the same nest the following year.

After being silent at first, the birds begin to indulge in play and utter their loud chattering calls (quite different from the screams of the Common Swifts) once the group has grown to 20 or 30 strong and the weather is fine. The Alpine Swift in normal flight catches

insects at 60-100 kilometres an hour (37-62 m.p.h.) and it is estimated that the speed in wild chases and perhaps on journeys must reach up to 250 kilometres an hour (155 m.p.h.). It is calculated that in its daily flights this species must cover at least 350 miles and in some cases up to as much as 600 or more. The aerial play of these birds is a delightful sight to watch.

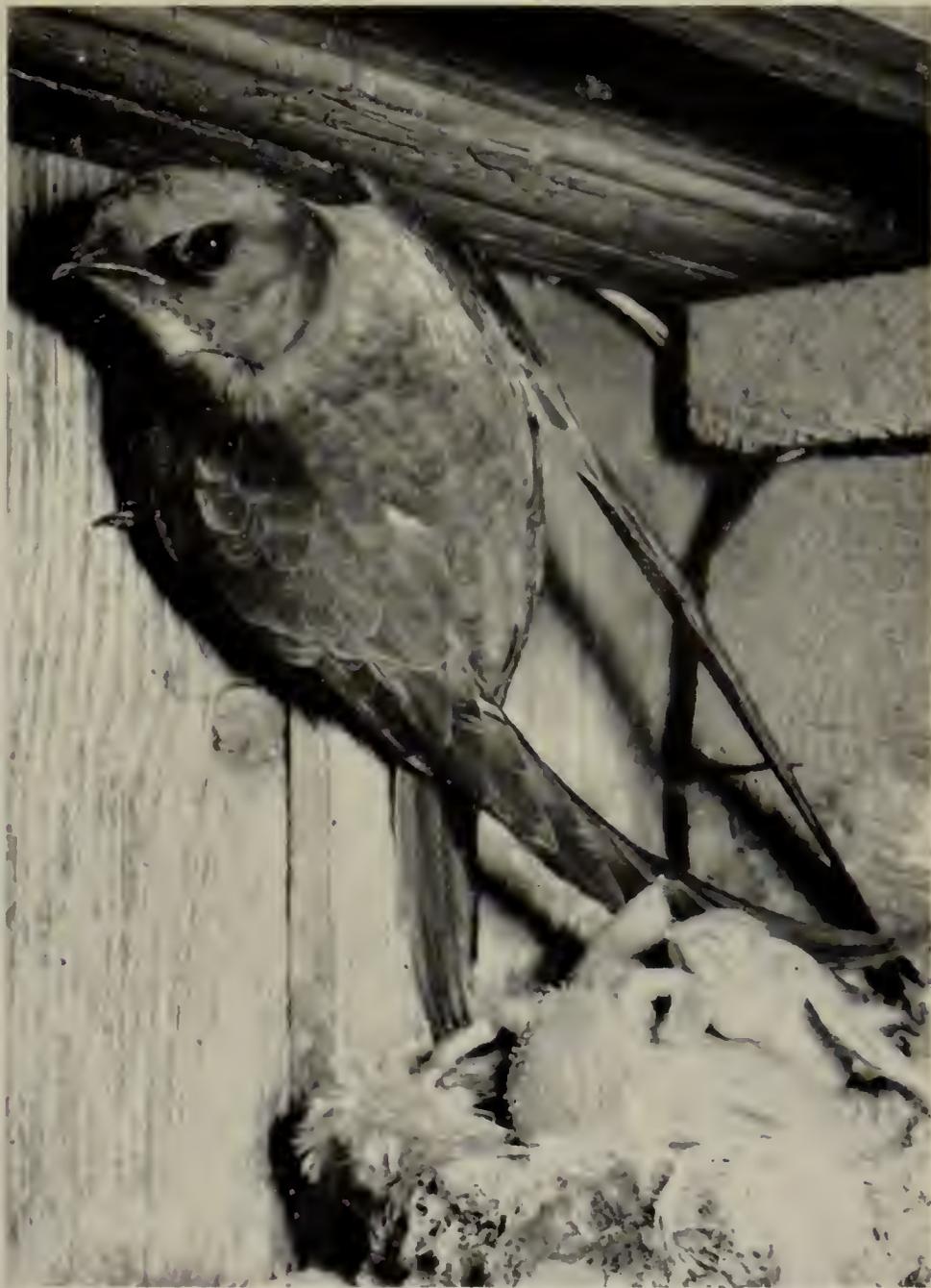
After their summer stay of some six months on average, the last Alpine Swifts have departed from Solothurn again by the middle of October. Both observation and ringing recoveries confirm that the young are the first to begin the journey to winter quarters. We have recovery reports of young birds from the south of France at the beginning of September, and checks at the breeding places have shown no young remaining there after the middle of that month. Late broods are very uncommon.

It is the nature of this bird to eat and feed its young only on insects taken on the wing. Analysis of food pellets gives a general picture of its diet. From aphid to butterfly, the prey includes the following main groups: Coleoptera (beetles), Lepidoptera (moths and butterflies), Diptera (flies), Hymenoptera (ants, bees and wasps), Hemiptera (bugs and aphides) and Arachnida (spiders). The spiders and other wingless prey, such as certain grasshoppers (Orthoptera), are always taken in flight as the bird skims under the eaves or low over the ground.

As its name implies, the original breeding habitat of the Alpine Swift was in high mountains, on steep crags. For this reason its urban colonies are in buildings which permit easy free-flying access, as is illustrated by the case of the colony in the Lucerne water tower (plate 38 lower).

The nest is small in proportion to the bird (plate 41). Basically it is a shallow, round saucer-shape with an inside diameter of 10.5 cm. and a cup-depth of about 3 cm. In more than 80% of cases a flat site is preferred (plate 39 upper). Provided that the nesting material is not eaten by mites and other parasites, and thus loosened from its foundations, a nest may be used for decades. All nest material is caught in the air and built in with sticky saliva. When the same nest is used year after year by the same pair—11 years is the known maximum—we must not be misled into speaking of constancy to one mate. Too many examples point the other way and rather is it a case of faithfulness to a chosen breeding place. One Alpine Swift bred in the same nest for 17 years; it returned again in the 18th year, but was found dead in the nest at the beginning of the breeding season. This one was a male.

The Alpine Swift's egg is pure white and the measurements of 115 eggs gave an average of 30.45×19.29 mm., very similar to the figures in *The Handbook*. While much statistical material shows that the female normally lays a clutch of three eggs annually, there are often exceptions to this rule. Investigations have shown that the prevailing climatic conditions influence the



E. Benz

ADULT ALPINE SWIFT (*Apus melba*) AND NEST: LUCERNE, SWITZERLAND

As it clings to the wooden wall by its nest in the water-tower (plate 38 lower), one can see the faint greyish tips on its mouse-brown upper-parts, not so conspicuous as in the juveniles (plate 40). The down just breaking through the skins of the young shows that they are 7-8 days old (see page 223); when first hatched (plate 39 upper) they are smooth and rosy, and the feather arrangement appears as black dots under the skin from the 3rd to 4th day.

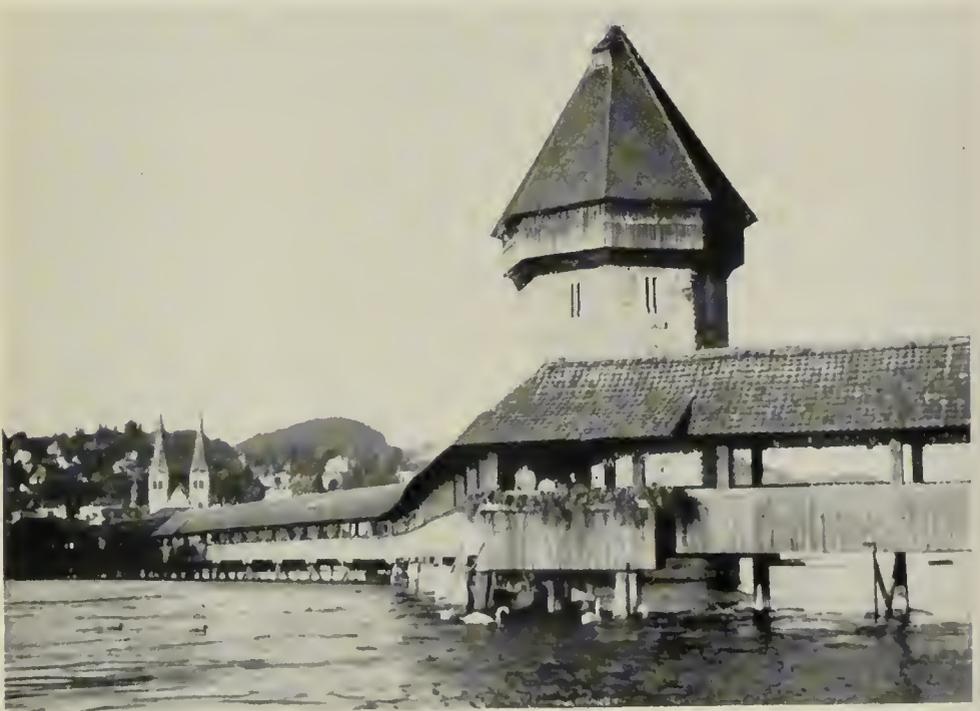




F. Oberholzer

ADULT ALPINE SWIFT (*Apus melba*): SOLOTHURN, SWITZERLAND

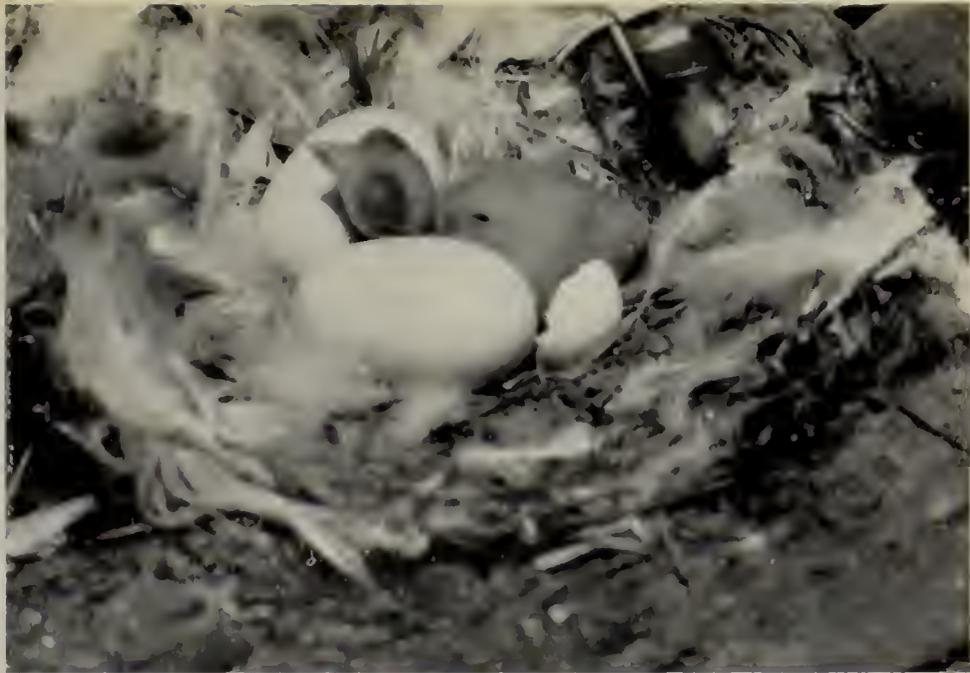
Note the brown breast-band dividing the white throat-patch from the white belly which is a clear distinction from the Common Swift (*A. alpinus*). It is also a much bigger bird, with a wing-span of up to 22 inches, and weighs $2\frac{1}{2}$ times as much on average (see page 221).



E. Benz

BREEDING-SITES OF ALPINE SWIFT (*Apus melba*): LUCERNE, SWITZERLAND

In the foreground is the water-tower where plates 37 and 42 lower were obtained, and there is another colony in the twin spires of the Hofkirche behind. Urban colonies are usually in buildings like these which permit easy free-flying access (see page 222).



E. Benz

NEST OF ALPINE SWIFT (*Apus melba*): LUCERNE, SWITZERLAND

Most nests are on flat sites like this (but cf. plate 42 lower). Built of straws, grasses, leaves and feathers cemented together with sticky saliva, they are flat saucers about $1\frac{1}{4}$ inches deep and a fraction over 4 inches across the cup (see page 222).



F. Oberholzer

NESTLING ALPINE SWIFTS (*Apus melba*): SOLOTHURN, SWITZERLAND

The fledging period averages 57 days (see page 223), so that these three four-weeks-old young are only about half-developed, although they are already completely feathered. This nest is stuck to the wall and is half overlapping unsupported.



F. Oberholzer

YOUNG ALPINE SWIFTS (*Apus melba*) NEARLY FLEDGED: SOLOTHURN, SWITZERLAND

In the last days before flying the young of many broods cluster near the entrances to the tower (see page 224). There they are fed and it is thought possible that the adults may not be able to distinguish their own off-spring. At these times many attractive groups like this one may be seen. Note the distinct white edges to the feathers, which characterize the juvenile birds; otherwise they are very like the adults, with the same brown breast-band and white belly.

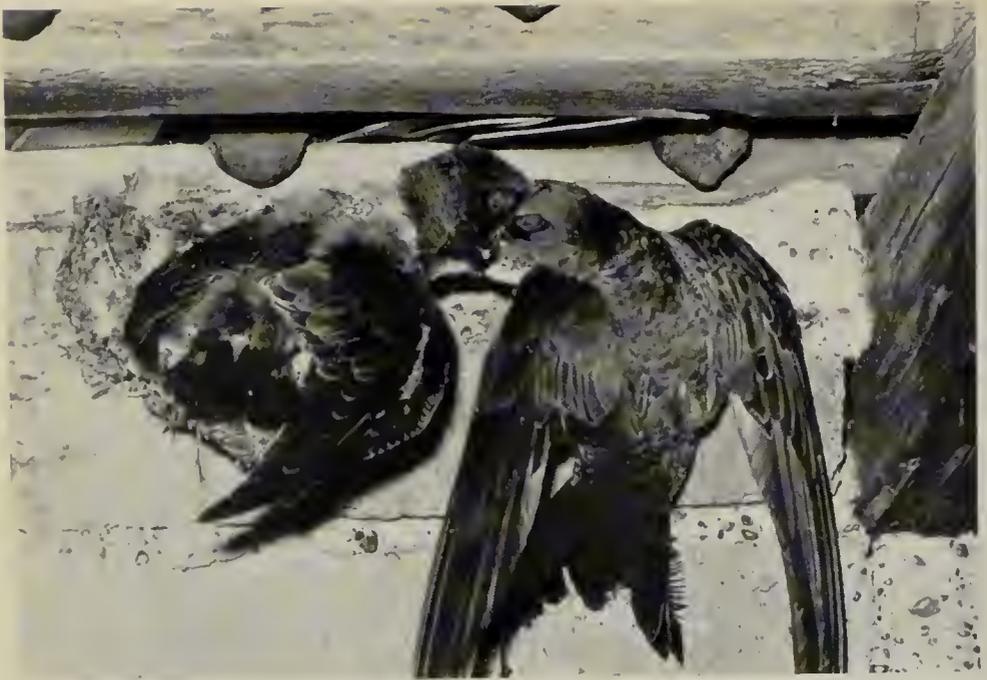


F. Oberholzer

ADULT ALPINE SWIFT (*Hirundo melba*) ON NEST: SOLOTHURN, SWITZERLAND

This bird is brooding a newly-hatched chick and two eggs. The eggs are pure white and at Solothurn two-thirds of the nests contain clutches of three (see page 223). Incubation is by both sexes and begins with the last egg. The young are brooded for three weeks, and for the first ten days this is uninterrupted while the parents relieve each other to search for food. At these times photographs like this can be taken repeatedly without the bird flying away.





F. Oberholzer

ALPINE SWIFT (*Apus melba*) FEEDING YOUNG: SOLOTHURN, SWITZERLAND
 As the food-ball of up to 600 insects is passed (in just a few seconds) both adult and young have their eyes closed. The adult's beak is thrust inside the nestling's gape and the latter draws in the food-ball with its tongue (see page 224).



E. Benz

ALPINE SWIFTS (*Apus melba*) ROOSTING: LUCERNE, SWITZERLAND
 Looking up vertically at a group under the roof of the water-tower during a rainy period. Note the nest built out bracket-wise from a roof-tile. Some birds roost at the nest and non-breeders spend the night clinging near the entrances to the tower (see page 224).



1 and 2: She arrives at the pipit's nest, turns and goes forward



3 and 4: There is no egg in her beak before she looks into the nest



5 and 6: She picks up one of the pipit's eggs and pauses a moment

CUCKOO (*Cuculus canorus*) LAYING IN NEST OF MEADOW PIPIT (*Anthus pratensis*)
30TH MAY 1922—1

Photographs by Oliver G. Pike (see pages 226-228)





7 and 8: With the pipit's egg in her beak she moves on to the nest



9 and 10: She lays her own egg and raises her tail to turn and leave



11 and 12: A spring into the air and she flies off with the pipit's egg

CUCKOO (*Cuculus canorus*) LAYING IN NEST OF MEADOW PIPIT (*Anthus pratensis*)
30TH MAY 1922—11

Photographs by Oliver G. Pike (see pages 226-228)

clutch size. At the same time, the young females in their second year, which is when they first breed, lay only two eggs. There are also females which occasionally lay four, and one which bred in the same nest for nine years laid such a clutch on four occasions. Analysis of 2,661 clutches at Solothurn shows that 0.9% had four eggs, 64.5% three eggs, 28.6% two eggs and 6.0% one egg.

In a normal clutch of three, the eggs are laid at intervals of one day, but where there are only two eggs a day is invariably missed and they are laid with an interval of two days. Two-thirds of the eggs are laid before 9 a.m. and the remaining one-third between 9 a.m. and 6 p.m. Egg-laying normally begins, according to the weather, in the middle or last ten days of May, but exceptionally it can be delayed until June. Incubation begins with the laying of the last egg whether the clutch is of two, three or four. Both male and female take part in incubation and the period averages 20 days, with 17 and 23 the extremes recorded. With few exceptions, the young of one brood hatch within a period of 24 hours.

The young Alpine Swift emerges entirely naked from the egg (plate 39 upper). During the embryo stage before hatching, from the 10th to the 18th day of incubation, it shows a pimply pattern of the feather arrangement, but this disappears again shortly before the nestling emerges and its skin is then entirely smooth and pale rose in colour. From the 3rd to the 4th day of the fledging period it shows little black points under the skin: these then develop into lines and on the 7th day break through the skin as the first down (plate 37). The young bird becomes fully feathered after about 4 weeks (plate 39 lower). The fledging period averages 57 days and by then the young bird is full grown. It can, however, be distinguished from the adults by the distinct white edges to the feathers (plate 40).

The young bird weighs 5-6 gm. on hatching. After two-thirds of the fledging period it reaches its peak weight of up to 120 gm., and then falls back to the normal adult weight. As Professor Portmann has shown (Arn, 1945), the excess weight can be attributed to the growth of a reserve of fat for the last stage of development. The extremities grow in proportion as the young bird has to use them: by the 18th day, for example, the breadth of the bill is already fully developed because this is made necessary by the technique of taking in food (plate 42 upper).

It is an unforgettable experience to see the day's doings from 7 a.m. through until 8 p.m. in the Jesuit church at Solothurn. From the observation post in the apse one can watch unobserved, at a range of 6-8 yards, the family life that is going on simultaneously at about 100 nests (in all, there are over 150 breeding pairs in this church).

The young are brooded up to the age of three weeks. In the first 10 days brooding is uninterrupted (plate 41) and the parents

relieve each other to forage for food. The young of late broods are not left alone by the adults at all, even when their upbringing lasts until the end of September.

Food is brought to the young in balls of saliva in the throat pouch. In the first few days each ball is divided up among all the occupants of the nest, but before long it is given whole to one of them. A food-ball can contain up to 600 insects. The number of feedings depends on the age of the young, on the occurrence of insects and also on the individual activity of the parent birds. In the technique of food transfer there is no set pattern. On arrival of the parent with food, the hungriest chick normally begs the most eagerly. The adult then usually thrusts its bill into the nestling's wide gape which is still further enlarged by the regurgitation of the food-ball. The chick draws in the food with its strong tongue and passes it to its crop by purposeful swallowing movements. Old and young keep the eyes shut during this act (plate 42 upper). The whole performance is carried through in a few seconds with great proficiency. In very bad weather the parents cannot be persuaded to sally forth, no matter how vigorously the young beg them.

In the early days the excrement is carried off and swallowed by the parents. By the 7th day, however, the young begin to evacuate the lightly packed blob of excrement by shooting it over the edge of the nest.

Before and after the breeding season the Alpine Swifts' daily routine is to emerge between 8 and 9 a.m., then to play and hunt for a time over the city before flying away until between 5 and 6 p.m., when they return, play for a while and fly into the tower for the night. During the breeding season the adults take wing between 7 and 10 a.m., according to the weather, and do not give up the search for food until about 6 or 8 p.m. The breeding birds spend the night at the nest, while non-breeders remain near the entrance to the tower, clinging to the wall, either inside or outside directly under the eaves (plate 42 lower). The time each bird takes before venturing forth in the morning is not spent in leisure. It preens with a thoroughness and care which surprises the observer. To anyone who has seen this species only in flight it is remarkable with what tranquillity its domestic life is conducted, being interrupted only by the loud cries of the assembly outside.

As soon as the young are three weeks old, they start to climb out of the nest and move about in the neighbourhood. The nest, however, always remains the base. In the last few days before flying, the young cluster near the entrances to the tower and there arise many amusing and attractive scenes (plate 40) when a parent flies up with food from outside.

The influence of weather on various phases of the breeding activity has already been mentioned several times. Just as prolonged periods of bad weather with low temperatures hold

back the appearance of flying insects, so are heat-waves unfavourable to the development of the insect fauna, and this has been confirmed by a comparison between the annual figures. Even the living conditions within the separate colonies and the resulting indoor "climate" can result in measurable differences, as is shown in the following table which compares the 25-year averages from the Solothurn colonies in the Jesuit church and the Bieltor:

	Jesuit church	Bieltor
Total number of nests, 1932-56	1,992	668
Average number of eggs per nest	2.56	2.72
Average young hatched per nest	2.10	2.41
Average young fledged per nest	1.53	1.79

Lack (1956) made a comparison between the breeding success of the Common Swift in Switzerland and in England. In this species clutches of three also preponderate in Switzerland (as with the Alpine Swift and in a similar proportion) and he attributed the contrastingly low results in England to the generally chillier climate.

The following brief summary of the investigation of clutch-size and mortality of young in the Alpine Swift is taken from an abstract of Lack in Arn (in press):— Of the clutches whose young hatched up to 30th June (normal broods) nearly three-quarters were of three eggs, average 2.7. Of those hatched in July (late broods) nearly two-thirds were of two eggs, average 2.3. Mortality in late broods is greater than in normal broods: in the normal broods 16% and in the late broods only 11% of the ringed young were afterwards accounted for. Alpine Swifts form a stable population with an annual adult mortality of 17.8%.

By statistical analysis of capture-recapture data the expectation of life has been calculated at 5.6 years (Lack and Arn, 1953). The average age of ringed Alpine Swifts found dead was 5.95 years: of these birds six were 18 years old and two 19.

Ringling totals provide further evidence of the Alpine Swift's great attachment to its breeding place. Of those which were ringed as nestlings and later accounted for as breeding birds in Solothurn, 75.2% (149 out of 198) bred three or more years in the same nest. Of those which were ringed as adults and found in the same colony in another year, 76.1% (121 out of 159) came back to the same site.

Swiss Alpine Swifts begin their full moult in May, carry it on during the breeding season and do not finish it until they are in their winter-quarters; a juvenile moult does not occur (see Arn, in press).

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AN HISTORIC SERIES OF CUCKOO PHOTOGRAPHS*

By OLIVER G. PIKE, Hon. F.R.P.S.

(Plates 43-44)

IN 1918 the late Edgar P. Chance began making an intensive study of the habits of a female Cuckoo (*Cuculus canorus*) on Arley Common, Worcestershire, and in the autumn of 1921 he offered to the film trade a ciné-film with the title "The Cuckoo's Secret". This had been taken in the previous spring and summer by a commercial ciné-photographer who had had no previous experience with birds. It showed several views of the forty-acre furze-covered common and, in addition, there were several shots of a female Cuckoo, with no egg in her beak, going to thick furze bushes, remaining out of sight for ten to thirty seconds, then emerging with an egg in her beak.

After viewing the film at Chance's invitation I was terribly disappointed, for I could realise what opportunities had been missed to show what actually happened at the nest itself. I therefore asked Chance to allow me to spend part of the next spring and summer with him on the common, for I had then had eighteen years' experience of photographing birds with a ciné-camera. He accepted my offer and during May and June 1922, when the female Cuckoo was visiting the same territory for the fifth successive year, I had the most wonderful experience of my life in looking on and photographing one of the first serious attempts at detailed bird research.

The common was an ideal site: it was a wonderful open space for observation and it was the only breeding ground of Meadow Pipits (*Anthus pratensis*), the fosterer used by this particular female Cuckoo, for two or three miles. Chance had brought his observations to such a pitch of perfection that he was able to predict, almost without fail, in which Meadow Pipit's nest and on which day the Cuckoo would deposit her next egg. With a party of from four to twelve friends he kept the female Cuckoo in view on her laying days from early morning to about 8 p.m. and recorded all her movements.

*Nearly forty years ago, great interest was aroused by the experiments and investigations carried out by the late Mr. Edgar P. Chance into the problems connected with the laying of the Cuckoo, and in 1922 a film showing the successive actions of a female Cuckoo visiting the nest of a Meadow Pipit was made by Mr. Oliver Pike. It has so happened that the full sequence of the twelve stills reproduced on plates 43 and 44 has never been published in one place, though parts of it have appeared in books by Mr. Pike and Mr. Chance and in *Illustrated London News*. Mr. Pike filmed the laying of the Cuckoo in a Meadow Pipit's nest on 7 occasions, but only this once was he able to obtain a side-on series showing every movement. We are sure that our readers will welcome Mr. Pike's initiative in putting the whole of this unique sequence on record. We, for our part, are glad to be able to publish these photographs, and the accompanying text which Mr. Pike has kindly provided, as a tribute to one of our pioneer bird-photographers.—Eds.

There were thirteen pairs of Meadow Pipits on the common in 1922 and all the nests were located, numbered and marked on a map. Chance had discovered that the Cuckoo laid her eggs at intervals of two or occasionally three days and on this basis he made sure that there was always a Meadow Pipit's nest with fresh eggs for the Cuckoo to use. He did this by destroying the existing pipit nests at intervals of two to three days in rotation until well into June. Usually from five to ten hours after each nest had been destroyed, the owners began their second nests, and these were also numbered, and marked on the map. When the new nest of the first pair contained one, two, three or four eggs the Cuckoo used this for her first egg, for it was the only pipit nest on the common containing newly-laid eggs. Two days later the new nest of the second pair was ready for the Cuckoo, and so it went on. Directly each Cuckoo's egg had been deposited, it and the pipit's clutch were taken. Some pipits then built a third nest and in that year, thanks to the ever-ready supply of nests with fresh-eggs, that female Cuckoo laid the amazing total of 25 eggs.

When I started photography I had the greatest difficulty in persuading Chance to open up the surroundings of the nests sufficiently to show what actually happened when the Cuckoo visited them. He wanted the Cuckoo's egg more than the photograph, for he was anxious to find out the greatest number of eggs that a Cuckoo could lay in one season. However, I pointed out that, if he wanted to prove his then disputed theory that the Cuckoo laid direct into the fosterer's nest, it was essential that a ciné-film should be taken to record all her movements. Chance eventually agreed and the nests I filmed, seven in all, were partly exposed. Even then, however, I had another difficulty to contend with, for I found that the Cuckoo approached the nest from the front, covering all her actions with her body, and it was not until my fifth attempt, on 30th May 1922, that I was able to devise a scheme which I hoped would overcome this. On the Cuckoo's laying days she always first settled on a tree, post or other prominent place where she was within gliding distance of the pipit's nest, usually within fifty to two hundred yards, and on this occasion the only likely perch was a tree about eighty yards away. I therefore fixed my hide and camera at right angles to the glide, so that when she settled the only place was just to the right of the nest.

My ruse was successful and she did exactly what I had hoped for. She made two glides to the nest without settling, each time returning to her tree, and then on the third glide landed sideways to the nest. She went quickly towards the nest as though she could not contain the egg any longer, rapidly picked up one of the pipit's four eggs, slipped on to the nest, remained there for barely four seconds, and then sprang into the air to fly away with the stolen egg. From the moment she settled (photograph 1 on

plate 43) to the time she flew off (photograph 12 on plate 44), just ten seconds passed.

I was thrilled with my success: it was my greatest moment in a long experience of bird photography. My ciné-camera, taking twenty frames per second, had recorded every action of the Cuckoo and at last, after more than a thousand years of doubt and confusion, had stolen her secret from her. On this particular day Chance was away in London, but he was equally thrilled when he got my two-word telegram "SUCCESSFUL PROFILE" and in his book *The Truth about the Cuckoo* (1940) he described it as "perhaps the most remarkable egg-laying film ever taken".

Chance, and friends of his, watched Cuckoos lay their eggs direct into over a hundred nests of eight different species, and I myself observed this interesting event eleven times. Edgar Chance's whole collection of Cuckoo eggs is now at the British Museum (Natural History), together with enlargements of the twelve photographs reproduced on plates 43 and 44. The only three other sets of these photographs in existence now have been deposited with the Nature Conservancy, the Royal Photographic Society and the London Natural History Society.

VISIBLE MIGRATION IN N.E. NORFOLK IN NOVEMBER 1956

By R. K. MURTON

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INTRODUCTION

IN THE LATE AUTUMN of 1956 my wife and I watched for visible migration near Cromer in north-east Norfolk on thirteen days during the period 31st October-15th November. Our actual observation point was the cliff top at East Runton which is about two miles west of Cromer. The numbers of all species seen during the watches were recorded, also their time of arrival and direction and height of flight, and these results are presented here.

With the exception of the early work of Rivière (1930), and various isolated records in report form which were published in *British Birds* up to 1935, little information on visible migration in November is available for north-east Norfolk. The main movement during the autumn has been recorded as an immigration from the east. Rivière described the movements seen from light vessels as being west or north-west off the north coast of Norfolk and west or even south-west into the Wash when seen off the Wash coast. His watches on the coast itself often revealed the arrival of birds from the north and north-east, but only a small proportion travelling in these directions was noted at the light vessels situated to the north. Rivière suggested, therefore, that many birds flying on an east to west course and passing along the north coast turned on sighting land in order to arrive immediately

at it. I noted a similar reaction during a month's watch from the South Goodwin Lightship, three miles off the south-east Kent coast (paper in preparation), and other workers have recorded the same effect. The appreciation of such a situation is important in interpreting the movements observed in Norfolk or for that matter at most coastal stations.

MOVEMENTS IN GENERAL

During the period of watching, all birds were first noted arriving from points between north and east—from points about north-east on most days and for most species. At any particular time, a few birds might be seen arriving direct from the sea, i.e. flying south, and simultaneously coasting from the east. On arrival at the coast, birds turned and continued by coasting west towards the Wash.

The influence of weather on the numbers of migrants observed was noticeable. For many days, unfavourable weather conditions with strong north/north-west winds prevailed and no migrants were seen (Table I). With a change to light southerly winds there was a marked increase in the amount of visible migration. This is seen from Table II where the numbers of the different migrants passing between 06.00 hours and 12.00 hours are given for each day. We arrived at the end of a depression on 31st October. From then until 5th November anticyclonic conditions existed over the whole of the North Sea, bringing a northerly airstream, and during this period little or no movement was noted. On 6th November a series of depressions broke up this anticyclone; winds changed to being predominantly southerly and it was then that most visible migration took place.

Flight direction varied with the prevailing wind and this was most noticeable on the good days. Thus on 7th November, with light west to south-west winds after 09.30 hours, nearly all birds arrived from the east. On 8th, 9th and 10th November when winds were light to moderate south-east and south-west, birds were arriving from the north and north-east. On the 12th, with light westerly winds, most arrivals were again from the east.

The peak arrival times varied slightly for different species, but on most days were usually from about 07.00 hours to 09.00 hours. 6th and 7th November were exceptions as arrivals were mainly from the east, with a peak around 10.00 hours which was later than usual for all species. On these days migrants would have encountered head winds and this might have delayed their arrival, although on 15th November with strong head winds migrants were not arriving late.

SPECIES ARRIVING

STARLING (*Sturnus vulgaris*).—This was the commonest migrant seen. The birds arrived travelling just above the cliff-top (ca. 70 feet above sea level). On 8th, 9th, 10th and 13th November large numbers were moving west, usually following the coast. The

TABLE I—WEATHER CONDITIONS AT EAST RUNTON, NORFOLK, FROM 31ST OCTOBER TO 15TH NOVEMBER 1956

Date	Wind direction	Force (Beaufort Scale)	Cloud	Visibility	General conditions
Oct. 31st	N.E.	6	High	Good	Sunny
Nov. 1st	N.W.	5-6	High	Good	
Nov. 2nd	N.-N.W.	6	Medium-low	Fair-moderate	Rain in early morning
Nov. 3rd	N.W.	4-5	Low	Fair-poor	Light rain
Nov. 4th	N.W.	1-2	Medium (overcast)	Fairly good	
Nov. 5th	—	—	—	—	—
Nov. 6th	N.W.	1-2	High (little)	Moderate (misty)	Sunny
Nov. 7th	W.-S.W.	0-1	High (little)	Poor-fair (misty)	Sunny (blue sky)
Nov. 8th	S.W.-S.S.E.	3-4	High (little)	Moderate-good	Blue sky, frost
Nov. 9th	S.-S.E.	4-5	High (little)	Good	Clear and sunny
Nov. 10th	S.E.	4	High	Fairly good	Clear and sunny
Nov. 11th	—	—	Low	Bad	Heavy rain
Nov. 12th	W.	1-2	Medium (little)	Good	Bright and sunny
Nov. 13th	S.W.	1-2	Low (overcast)	Fair	Misty
Nov. 14th	S.W.	7-8	Low (heavy)	Poor	Heavy rain
Nov. 15th	W.	5	High	Good	Bright and sunny

TABLE II—NUMBERS OF MIGRANTS SEEN BETWEEN 07.00 AND 12.00 HOURS AT EAST RUNTON, NORFOLK, OCTOBER/NOVEMBER 1956

Date	Starling (<i>Sturnus vulgaris</i>)	Lapwing (<i>Vanellus vanellus</i>)	Rook (<i>Corvus frugilegus</i>)	Skylark (<i>Alauda arvensis</i>)	Chaffinch (<i>Fringilla coelebs</i>)	Other species	Main direction from which birds arrived
Oct. 31st	55	0	0	3	0	0	N.E.
Nov. 1st	0	17	0	4	64	1	N.E.-E.
Nov. 2nd	0	0	0	0	0	0	
Nov. 3rd	0	0	0	22	0	0	N.E.
Nov. 4th	—	—	—	—	—	—	
Nov. 5th	—	—	—	—	—	—	
Nov. 6th	25	43	0	40	0	18	N.E.-E.
Nov. 7th	1,290	243	496	265	48	63	N.E.-E. after 09.00
Nov. 8th	186	3	1	49	0	5	N.
Nov. 9th	725	1	11	37	7	20	N.
Nov. 10th	672	90	167	61	4	31	N.E.
Nov. 11th	—	—	—	—	—	—	
Nov. 12th	6	0	6	0	26	2	E.
Nov. 13th	103	12	4	11	1	76	N.E.
Nov. 14th	—	—	—	—	—	—	
Nov. 15th	4	749	0	5	4	6	E.

On 4th and 14th November we were at different observation points, but no migration was seen. Heavy rain on the 11th made watching impossible. No observations were made on 5th November owing to absence from the area.

maximum number observed was between 07.00 hours and 08.00 hours on 1st November when 2,000 passed, coasting west. The movement usually started at about 07.00 hours and finished by about 08.00 hours, and was rather puzzling as all the other species seen during this period on these days arrived from quite different directions, usually north and north-east. This was not a local roosting movement, being absent on other days. It could presumably, however, have originated from migrants which had arrived the previous day and were continuing their passage soon after daybreak. A few Skylarks also did the same thing but to a much lesser extent. Rivière referred to similar coasting movements. Omitting this west-flying group, a peak in other Starling arrivals also occurred at around 07.00 hours to 09.00 hours.

LAPWING (*Vanellus vanellus*).—Lapwings were very noticeable migrants in Norfolk and were the second commonest species seen. Most birds arrived between 08.30 hours and 09.30 hours. They first appeared flying from north and north-east on 8th, 9th and 10th November and from the east on 7th and 15th. They arrived in steadily flying, compact flocks of up to fifty birds. On arrival they continued by coasting west towards the Wash. Large flocks were also counted in the surrounding countryside, feeding and roosting in suitable places, such as Cley. Increasing numbers in the area suggested that many birds were arriving unseen by us.

ROOK (*Corvus frugilegus*).—The peak arrival time of Rooks was between 09.30 hours and 10.30 hours on 7th November, but was one hour later on 10th November. Like the Lapwings, they arrived directly from the north and north-east on most days. However, on 7th November they arrived from the east, as did other migrants. In Kent, Rooks were usually the earliest to arrive; here they were later than Chaffinches or Lapwings, but usually earlier than Skylarks or Starlings. On 7th November, 210 arrived in half an hour in spread-out flocks of up to 70 birds flying about 100 feet over us; they often called in flight as they passed overhead. Soon after day-break we also saw numerous Rooks which had left a roost near-by (further inland), but these movements ceased by 07.30 hours and were quite distinct from those of the true migrants.

SKYLARK (*Alauda arvensis*).—On 8th, 9th and 10th November Skylarks reached a peak in numbers between 07.00 hours and 09.00 hours. On these dates, like the other migrants, they arrived from points about north/north-east. However, on 6th and 7th November, when all birds including the Skylarks arrived from the east, their peak was between 09.00 hours and 10.00 hours. They arrived in small parties of up to five birds.

CHAFFINCH (*Fringilla coelebs*).—Few Chaffinches were seen and both Deelder (1949) and Lack (1954) have suggested that this species normally flies higher than others and so is less often visible. There were more Chaffinches on days when few other species were seen (Table II) and bad weather conditions may have

caused them to fly lower. Our arrivals were from the north-east and east, and most were seen between about 08.00 hours and 09.00 hours.

OTHER LAND-BIRDS.—Of these, Snow Buntings (*Plectrophenax nivalis*) were the most interesting. The largest flock was of about 50 individuals which arrived at 10.07 hours on 7th November and which, when first noted, were coasting west over the sea. Altogether we recorded about 120 birds arriving and during the period a flock of about 70 birds was present at Cley. Snow Buntings have a limited breeding range on the Continent, roughly extending along the mountain chain of Norway and Sweden, but not breeding further south than about latitude 61°N. The most direct migration route to Norfolk would be across the sea from the southern tip of Scandinavia. Snow Buntings were less often observed in Kent, which supports the view that they followed a different route from that used by the other species which reach there. Other species seen arriving in Norfolk in smaller numbers were Heron (*Ardea cinerea*), Hooded Crow (*Corvus corone cornix*), Fieldfare (*Turdus pilaris*), Redwing (*T. musicus*), Blackbird (*T. merula*), Robin (*Erithacus rubecula*), Meadow Pipit (*Anthus pratensis*), Linnet (*Carduelis cannabina*), Redpoll (*C. flammea*), Brambling (*Fringilla montifringilla*), Yellowhammer (*Emberiza citrinella*) and Tree Sparrow (*Passer montanus*).

SEA-BIRDS.—Sea-birds were seen frequently, but their movements seemed to be in random directions. Razorbills (*Alca torda*) and Guillemots (*Uria aalge*) were often noticed coasting, but a movement west might immediately be followed by other birds going east. The same situation applied to Common Scoters (*Melanitta nigra*). However, Mallard (*Anas platyrhynchos*) were observed arriving only from the points between north and north-east on some days. Three swans, believed to have been Whooper Swans (*Cygnus cygnus*), were seen coasting west on 7th November. We also saw seven Long-tailed Ducks (*Clangula hyemalis*) coasting east on 6th November. The last species was also recorded at Cley where five were seen by several observers during the period of our stay (see *Norfolk Bird Report*, 1956).

DISCUSSION

Birds arrived from various directions and this seemed to depend on the wind direction. Most frequent arrivals were from around the north-east although on 7th and 12th November, when larger numbers of birds were seen, they arrived from the east and there was also a later arrival peak on these days. Normally a peak occurred between 07.00 and 09.00 hours. The situation is in contrast to the movements recorded in Kent and the east coast of Suffolk (Lack, *loc. cit.*), in which immigrants were mostly from the east or south-east. The arrival peak for Starlings in Kent was at about 09.00 hours and was

progressively later further north so that at Minsmere in Suffolk it was at 11.00 hours. Other species had similar arrival times. On 1st and 2nd November 1958, two watches were carried out from the cliff tops at Corton, near Lowestoft, Suffolk. Starlings were the commonest species and they arrived from the east/east-south-east. Skylarks and Rooks were also frequent arrivals, and a few other species were noted. On 1st November the peak arrival times were around 11.00 hours and movements continued until 15.00. Virtually no immigrants were seen before 10.00 hours. On 2nd November 42 Starlings arrived between 09.00 and 10.00 hours, 295 between 10.00 and 11.00 hours, and 68 between 11.00 and 11.07 hours, when we stopped watching. These results help to confirm the late arrival peak in Suffolk compared with north Norfolk. Lack has explained this situation in terms of a dawn departure from the opposite part of the Continent and the distance between the two coasts.

The Norfolk results suggest that on some days the migrants were not leaving the nearest part of the Continent at dawn (had they done so, peak arrivals would be expected after 11.00 hours) as seems to have been the case for the Kent and Suffolk birds. If, as Rivière maintained, immigrants came from the east-north-east, the closest point of departure would have been the west coast of Schleswig-Holstein, about 320 miles away, in which case birds would pass along the north Friesian coast of Holland. Allowing a flight speed of 25-30 miles per hour, this would necessitate a dusk departure, from the Baltic area, for those birds arriving at about 07.00-09.00 hours. Alternatively, if migrants were from the north-east, as seemed possible, the nearest departure point would be the southern tip of Norway, about 400 miles away. A dusk departure from there would also cause an arrival peak between 07.00 and 09.00 hours. The nearest point to the Norfolk coast is the east coast of Holland, a distance of about 150 miles, and if birds left there at dawn then the arrival peak should have been around 11.00 hours, or before daybreak if they had left at dusk. The facts are more consistent with a dusk departure from the Baltic region or Scandinavia.

Lack (1959) has recently produced evidence, based on radar studies, for a direct migration of birds from Scandinavia to Norfolk. His records relate to various thrushes (*Turdidae*), but the possibility seems high of other species making such flights. Further investigations would seem worth-while.

SUMMARY

1. A watch for visible migration was made from 31st October to 15th November 1956, at East Runton in north-east Norfolk. Migrants were seen arriving from points between north and east, but predominantly from the north-east. Immigrants turned on arrival at the coast and continued by coasting west towards the Wash.

2. Both flight direction and the numbers of birds seen arriving varied with the weather conditions. Most visible migration coincided with light southerly winds, and little or no movement was seen during strong north/north-west winds.

3. Starling, Lapwing, Rook and Skylark were the commonest species seen. Movements of the same species have been observed in Kent and Suffolk by various workers, but the peak arrival times for those seen in Norfolk were not consistent with these others and apparently they did not come from the nearest parts of the Continent. Reasons for this argument are presented.

4. The possible origin of the migrants seen in Norfolk is discussed and the conclusion made that some of the arrival peaks indicated a dusk departure from the Baltic or from Scandinavia.

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NOTES

Duration of dives of Black-throated Diver.—In Sutherland on 25th May 1955 we were able to make continuous observations for nearly four hours on the diving of a Black-throated Diver (*Gavia arctica*). The site was a loch half a mile wide and seven miles long. The bird, one of a pair, was first seen at 12.45 p.m. as it made its way up the loch by a series of long dives. Our subsequent observations were then made in an area about half a mile square, which was fed by two substantial mountain streams. Here the bird began diving repeatedly, presumably for food, and after some 15 minutes we began to record the duration of both dives and rests. We continued this for 3 hours 25 minutes until at 4.35 p.m. the diver was finally lost to view in rough water. During this period there were 201 dives and only three relatively long periods of rest—of 1½, 8 and 7 minutes respectively.

The Handbook quotes the maximum diving times recorded for this species by four observers and these vary from 43 seconds to 2 minutes. The last was when a bird was travelling a distance of a quarter of a mile and we suggest that the duration of dives greatly depends on whether the bird is feeding or travelling. During our observations the longest single dive was 63 seconds, the shortest 5 seconds and almost half (96 out of 201) were between 48 and 50 seconds. The rests were mostly of 10-18 seconds. Consecutive dives of 50 seconds and over were always followed by a series of dives of under 40 seconds and rests of over 18 seconds. In all, 2 hours 17 minutes 33 seconds were spent

underwater for 1 hour 8 minutes 25 seconds on the surface. The three long rests were not spread evenly over the period. In the short rests the bird often dipped its bill in the water, shook its head, stretched its neck and gave an occasional cry. In the long rests it also preened feathers of breast, back and rump for anything up to two or three minutes. IRENE A. JOYCE and ALAN E. JOYCE

Hobbies attacking Peregrines.—On 1st May 1955, I was walking with one of my brothers near Fécamp, Seine-Maritime, France, when our attention was drawn to two Hobbies (*Falco subbuteo*) flying near a clump of pines. While we were watching them, two Peregrines (*F. peregrinus*) came into view and began to hover as they reached the breeze from the valley below. After hovering for a few seconds they flew round in a circle and began again. At that moment the two Hobbies launched themselves upon one of the large falcons. The latter avoided the attack and tried to strike its assailants with one of its talons—as Buzzards (*Buteo buteo*) often do when attacked by Rooks (*Corvus fugilegus*) or other birds of prey. The two Hobbies attacked ten or twelve times and one of the Peregrines tore out several feathers from one of them. After about five minutes the Peregrines flew off in the direction of the sea.

Apart from the fact that I had only once before seen a Peregrine hovering, this was the first time that I had ever observed a determined attack by a bird of prey of any kind upon this falcon. Hobbies nest regularly in that area, but not of course until June.—

GEORGES OLIVIER

Flightless Woodpigeon fed by another.—When I approached an ivy-covered tree at Patcham, Sussex, on 1st October 1955, a Woodpigeon (*Columba palumbus*) flew out and another was seen sitting very still with neck stretched out, in the "frozen" attitude. This bird made no attempt to fly and, when I shot it, proved to have no primary feathers at all except the outer one (the 2nd) in each wing; the others were newly growing, being about $1\frac{1}{2}$ - $2\frac{1}{2}$ inches in length. The pigeon was warm and fat and had a half crop of barley grain. There was no barley field within half a mile and I estimated that the bird had probably not been able to fly for at least ten days, perhaps more. It seemed obvious that the other pigeon had been feeding it, although it was an adult bird with white neck-patches, etc. M. J. DAWSON

Aggressive behaviour of feral pigeon towards House Sparrow.—On 21st September 1958, I was at an open-air café in a London park, surrounded by a hopeful flock of House Sparrows (*Passer domesticus*) and about a dozen feral pigeons (*Columba livia*), all awaiting crumbs after some food had already been distributed. A shrill, squealing note from a sparrow drew my attention to a pigeon which was giving it several vigorous pecks for no obvious

reason. A moment later I heard the same note and was in time to see the same pigeon seize another waiting sparrow by a bunch of its mantle feathers and lift it high into the air, shaking it from side to side. I reacted with a sudden movement and both birds flew off.

This would appear to be a case of aggressive behaviour prompted by competition for a limited food supply. C. J. O. HARRISON

Myrtle Warblers crossing the Atlantic on board ship.—The following report may be of interest in connection with the appearance of the Myrtle Warbler (*Dendroica coronata*) in Devon in January 1955 (*antea*, vol. xlviii, pp. 204-207). Miss Wynne Waite of Bognor Regis Training College told me that in September 1954, while crossing the Atlantic from Canada on the "Empress of France", she saw on the ship a bird which she recognized as an American warbler. She first noticed it on 10th September 1954 (ship's position for that date was 54°N., 46°W., or approximately 400 miles east of the Straits of Belle Isle). She saw it on board during most of the rest of the voyage, but not after the ship sighted the Irish coast on 13th September. She described it to me as being greyish-brown in colour, with light under-parts streaked with dark markings and with yellow patches on the sides of the breast. In flight it showed a conspicuous yellow rump and some white towards the edges of the tail-feathers. At the time she gave me this description Miss Waite had not heard that a Myrtle Warbler had been observed in Devon.

In January 1956, Miss Waite came with me to the Natural History Museum where I showed her specimens in various plumages of the eastern North American wood warblers (Parulidae) with yellow or yellowish rumps. Miss Waite chose an adult male Myrtle Warbler in autumn plumage as similar to the bird she had seen. She had noted all the field marks with the exception of the yellow on the crown. KATHARINE TOUSEY

On 24th May 1955, my wife and I set sail from Montreal on the "Saxonia" and landed in Liverpool a week later. Soon after we left, when we were still in the Gulf of St. Lawrence, we noticed a bird on the upper deck which I identified as a Myrtle Warbler (*Dendroica coronata*): it remained on board and we last saw it on 30th May as we were passing the coast of North Ireland and approaching Scotland (land in sight). We watched it each day because we realized that it was unusual for a small bird to remain with a ship and we wished to see how long it would stay. It seemed to adjust itself to the confined limits of the ship and to accept human beings fairly readily: often we were within six feet of it as it hopped about the after deck. If anyone approached too close, however, it would fly to a lifeboat or to one of the masts. The crossing was not a rough one—there were no gales and little heavy rain—but the bird was always near the stern. Several people scattered crumbs for it, but although it was

often hopping about among them we did not see it take any. It appeared to be searching crannies and corners, behind benches and tackle on the deck, though I could not say whether there was any insect food there and it may just have been seeking shelter. Whatever the way it managed to survive, it certainly appeared very lively and strong on the wing. The bird was dull blue above and almost white beneath, striped with broken black marks and with pale yellow at the sides; the throat was white, and there was a yellow patch on the head and another on the rump.

JOHN M. R. MARGESON

Starlings affected by smog.—Fog persisted nearly all day at Sleaford, Lincolnshire, on 9th February 1959, but at dusk it became a dense blanket with its base more or less level with the top of the church spire. There was almost a complete lack of breeze. Next morning (10th February) the main thoroughfares in the northern half of the town were littered with dead Starlings (*Sturnus vulgaris*) over a distance of half a mile. The information was passed on to me after the roadmen had been at work for some time, but from their estimates and an examination of the unswept parts a total of 250 to 300 dead Starlings seemed reasonable. All appeared to have been injured by impact in some way. It was learned later that on the night of the fog a large roost formed in the village of Leasingham, 2 miles north of Sleaford, for the one night only, although flight lines passing in a northerly direction had been noted for a fortnight previously.

A random selection of seven Starlings, and also a House Sparrow (*Passer domesticus*) found dead in the area, were sent the same day to Dr. A. R. Jennings, at the Department of Animal Pathology, Cambridge. His report stated that deaths were largely due to asphyxia resulting from severe smog.

It is suggested that flocks of Starlings entered the Sleaford area on their usual south-to-north flight line, were gradually overcome by smog concentrated under the thick fog blanket and descended to the roads in the northern half of the town. Here, being unable to fly, they were probably killed by heavy traffic. No birds were found in gardens or on traffic-free roads and only one or two odd ones were reported in other parts of the town.

W. M. PEET

Reed Buntings alighting on water.—On 12th March 1959, my wife and I were walking along the north shore of Hengistbury Head, Hampshire, when a male and female Reed Bunting (*Emberiza schoeniclus*) flew out very fast and close together (presumably in a courtship chase) about 40 to 50 yards from the shore and alighted simultaneously on the water of Christchurch Harbour which was quite calm at the time. They were on the water for not more than two seconds and then returned separately to the shore, landing some 30 yards apart.

EDWIN COHEN

LETTERS

BLACKBIRDS FEEDING ON MARINE WORMS

SIRS,—I can confirm the note by Mr. Roger Harkness (*antea*, p. 97) on Blackbirds (*Turdus merula*) feeding on marine worms, strangely enough from the same part of Hampshire—at Hill Head, which is only about two miles from Lee-on-Solent. On 10th June 1953, I watched a hen Blackbird pulling out and swallowing marine worms from the mud on the beach. Then on 9th June 1955, I saw a cock Blackbird eating marine worms about two inches long, which he pulled out from the mud on the river bank at Hill Head harbour. On 6th April 1957, a cock Blackbird on the beach was hunting and eating pale brown marine worms about one inch long, and what was probably the same bird was doing likewise on the next day. Lastly, on 3rd June 1957, I watched a hen Blackbird feeding on marine worms pulled out of the harbour mud.

C. SUFFERN

[Since writing the above, Dr. Suffern has reported that on 19th June 1959 he watched two adult male Blackbirds and one juvenile together extracting and eating marine worms from the muddy shore of Hill Head harbour at low tide, and that in the following month he repeatedly saw Blackbirds doing this—possibly, he suggests, because of the hard state of the adjacent dry ground through the drought. He has also drawn our attention to a statement by Miss H. M. Quick in the 26th Annual Report of the Cornwall Bird-Watching & Preservation Society (1956):—“Blackbirds are one of the commonest of our shore-birds (on St. Agnes, Isles of Scilly); there are always some in the line of cast-up seaweed Thrushes are usually less numerous, but there is often one among the low rocks beating out a periwinkle just as it does a garden snail. Occasionally as many as a dozen at once may be seen on the low tide sand, digging for lugworms instead of garden worms.” Dr. Suffern adds that on 23rd May 1959 he watched an adult Song Thrush (*T. philomelos*), on the muddy beach of Hill Head harbour, pull out *and reject* at least three lugworms in quick succession.—EDS.]

THE KITES OF SIXTEENTH-CENTURY LONDON

SIRS,—From time to time the question arises whether the kites which swarmed in London in the fifteenth and sixteenth centuries were Red Kites (*Milvus milvus*) or Black Kites (*M. migrans*). Their urban habitat and scavenging habits, of which there is abundant contemporary documentation, are nowadays characteristic of the Black Kite, but Turner (1544), who clearly distinguished between the two species, stated that he had only seen the Red Kite in the British Isles. Turner's statement is usually considered conclusive evidence for identifying the London birds as *M. milvus*, but this has recently been questioned by Ferguson-Lees (1957), who raises evidence which appears to point the other way. This is the quotation by Fitter (1945) of a statement by the contemporary Flemish naturalist Charles L'écluse

(= Clusius), who visited England in 1571 and thought that there were as many kites in London as in Cairo. Ferguson-Lees points out that the kites of Cairo are Black Kites, with the implication that if those in London had been Red Kites L  cluse should have noticed the difference.

Lest Ferguson-Lees's article be thought to cast serious doubt on Turner's identification, it seems desirable to examine L  cluse's original statement. Fitter does not mention the source of his information, but it is evidently derived from the footnote to page 108 of "*Petri Bellonii Cenomani ab ipso conspectorum Observationes*", contained in L  cluse's "Ten books of *Exotica*" (Clusius, 1605). This, however, is not an original work, but merely a translation of a book published fifty years earlier by the great French naturalist Pierre Belon (1555a). Belon is known to have visited England (Ray, 1678), but he himself made no comment on the London kites, and the footnote was in fact added by the translator. Indeed, the wording of this passage—"Vix majorem in Cairo milviorum frequentiam conspici existimo, quam Londini Trenobantum in Britannia"—makes it clear that L  cluse was merely commenting on Belon's description of the kites in Cairo, and that no direct comparison had been made.

However, the same passage also contains a clear statement that the London kites were permanent residents—" *quinullo non anni tempore frequentissimi istic app  rent*"—while the Black Kite was then (as now) only a summer visitor to France, and was considerably less common there than the Red Kite (Belon, 1555b). Thus we see that L  cluse's statement actually provides additional *support* for the identification of the London kites as *M. milvus*. Their occupation of an urban habitat in the absence of *M. migrans* is an interesting example of ecological replacement, and is matched to the present day by the situation in other areas where *migrans* is lacking, such as the Cape Verde Islands (Bourne, 1955). I. C. T. NISBET

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In order that this number, long delayed by the printing dispute, may be published as quickly as possible, the "Recent reports and news" covering the months of May and June is being held over to the August issue.

PURCHASED

8 FEB 1969

NOTICE TO CONTRIBUTORS

British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlvii, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

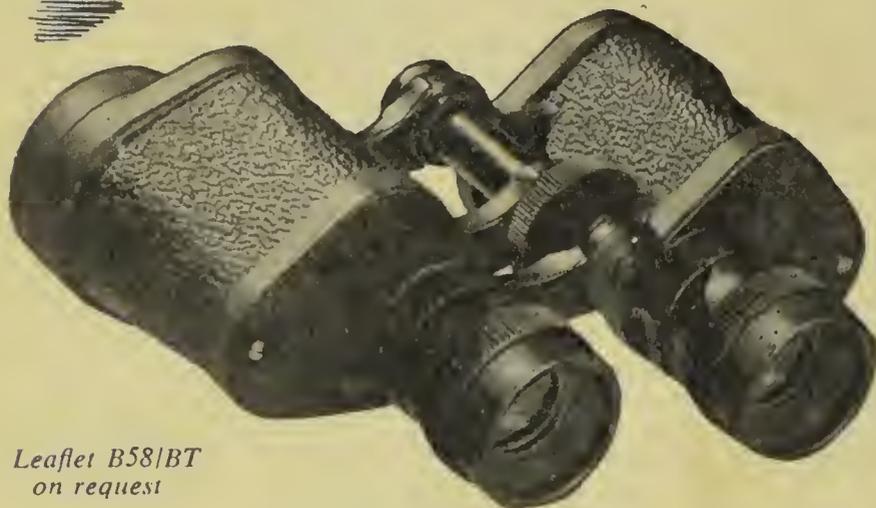
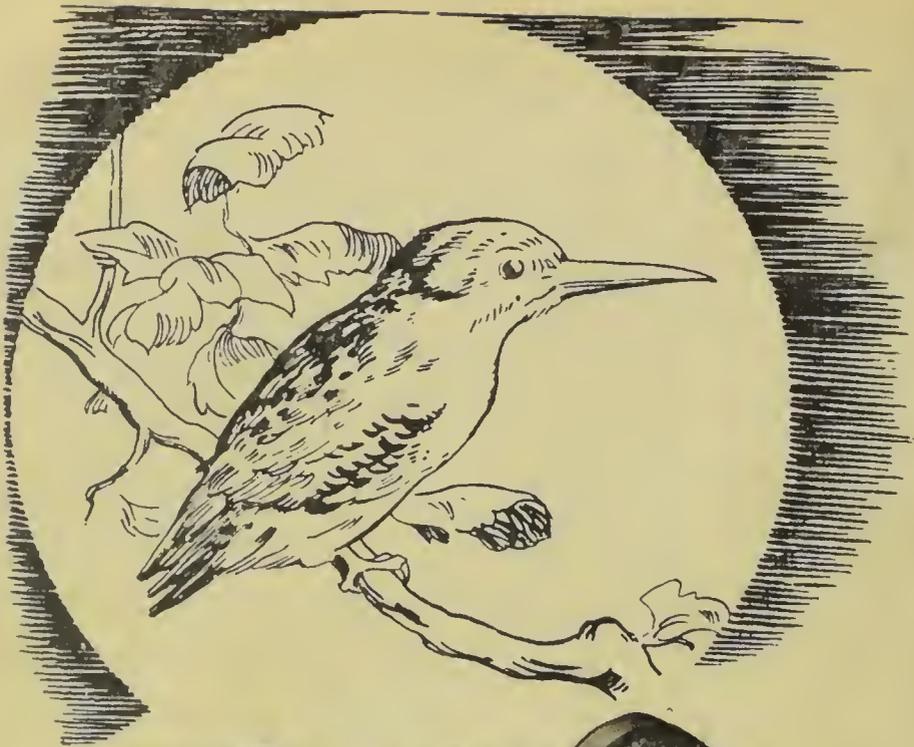
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Various other conventions concerning references, including their use in the text, should be noted by consulting previous examples.

4. Tables should be numbered with Roman numerals, and the title typed above in the style used in this issue. The title and any headings within the Table should not be underlined, because this sometimes makes it difficult for the Editor to indicate the type to be used. It is most important that the lay-out of each Table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that Tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All Tables should be self-explanatory.

5. Figures should be numbered with Arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in Indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4" width the original should be 8" wide); sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of Indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman. The publishers regret that, owing to rising costs, it will in future be only in exceptional cases that they can undertake to have lettering inserted.



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BRITISH BIRDS

EDITORIAL

Records of Rare Birds

DURING the past year or more there has been a growing realization that a large number of birds formerly thought to be rarities are reaching the British Isles regularly, and even in some numbers. In some cases a change of habit or expansion of breeding distribution may be responsible, but in all probability many of these species have been overlooked in the past and their discovery now is due to the larger numbers of bird-watchers, the considerable advances in field-identification and the enormous increase in bird observatories and trapping.

The position has been reached where the flood of records of unusual species reaching *British Birds* has swamped the system for dealing with them, as two examples may show: it was as recently as 1953 that we were still publishing full details of any Woodchat Shrike, but it is now clear that this bird is an annual visitor and over a score were reported in 1958; similarly, there were some 14 records of Melodious Warbler last autumn, yet twenty years ago *The Handbook* was able to include an all-time total of only 3 occurrences of this species.

Obviously we cannot now provide space for the publication of full details of all the rarer birds, and the county reports in general have less room available than we have. On the other hand, the publication of details enables the reader—now, or 50 years hence—to make some assessment of the record for himself; it has on occasion led to the rejection of a record which should not have been accepted; it often brings to light useful field-characters; and it encourages the taking of field-descriptions. We are therefore proposing still to publish descriptions of birds falling into the following limited categories:

- (1) all species (and some well defined races) which have occurred in Great Britain and Ireland not more than 10 times;
- (2) all species which have not occurred at all during the previous 25 years.

There remain a large number of lesser rarities. Many are reported to us direct or through the courtesy of the county report editors and, although most of these records are subsequently published in the regional reports, we feel we owe our readers a more considered opinion than is possible in "Recent reports and news", which feature is, in any case, not intended to have any great value as a permanent record. It was at this point that it was realised how interesting and helpful it would be to bring together, year by year, all records of rarities, both lesser and greater, collected from as many sources as possible. Accordingly we propose to institute an annual rare birds report, drawn up on the brief lines of a county report and published in this magazine. The first will cover the year 1958 and these annual reports will be additional and complementary to the "Recent reports and news".

The decision on what constitutes a rarity is necessarily somewhat arbitrary, but as a guide we print below the list of species selected at this stage. Even with this limited list there are some 400 observations to be considered for the year 1958.

White-billed Diver	Snow Goose
Black-browed Albatross	Red-breasted Goose
Wilson's Petrel	Egyptian Vulture
Madeiran Petrel	Griffon Vulture
Frigate Petrel	Golden Eagle (outside Scotland)
Little Shearwater	Spotted Eagle
Audubon's Shearwater	Goshawk (except southern half of
Cory's Shearwater	England)
Bulwer's Petrel	Kite (outside Wales)
Kermadec Petrel	Black Kite
Collared Petrel	White-tailed Eagle
Capped Petrel	Pallid Harrier
Magnificent Frigate-bird	Gyr Falcon
Purple Heron	Red-footed Falcon
Little Egret	Lesser Kestrel
Great White Heron	Crane
Squacco Heron	Sora Rail
Cattle Egret	Baillon's Crake
Night Heron	Little Crake
Little Bittern	American Purple Gallinule
American Bittern	Great Bustard
White Stork	Little Bustard
Black Stork	Houbara Bustard
Glossy Ibis	Sociable Plover
Flamingo	Kentish Plover (except coast from
Black Duck	Wash to Isle of Wight)
Blue-winged Teal	Killdeer
American Wigeon	Caspian Plover
Red-crested Pochard (except	Asiatic/American Golden Plover
London)	Dowitcher
Ring-necked Duck	Great Snipe
Ferruginous Duck	Upland Plover
Buffelhead	Eskimo Curlew
Surf Scoter	Solitary Sandpiper
Harlequin	Spotted Sandpiper
Steller's Eider	Greater Yellowlegs
King Eider	Lesser Yellowlegs
Hooded Merganser	Marsh Sandpiper
Ruddy Shelduck	Terek Sandpiper
Lesser White-fronted Goose	Least Sandpiper

Baird's Sandpiper	Red-flanked Bluetail
White-rumped Sandpiper	Thrush Nightingale
Pectoral Sandpiper	Lanceolated Warbler
Sharp-tailed Sandpiper	Savi's Warbler
Semipalmated Sandpiper	Pallas's Grasshopper Warbler
Buff-breasted Sandpiper	Moustached Warbler
Broad-billed Sandpiper	Thick-billed Warbler
Black-winged Stilt	Great Reed Warbler
Stilt Sandpiper	Marsh Warbler (outside England)
Wilson's Phalarope	Blyth's Reed Warbler
Pratincole	Paddyfield Warbler
Cream-coloured Courser	Aquatic Warbler
Ivory Gull	Melodious Warbler
Great Black-headed Gull	Icterine Warbler
Mediterranean Black-headed Gull	Olivaceous Warbler
Bonaparte's Gull	Booted Warbler
Ross's Gull	Orphean Warbler
White-winged Black Tern	Sardinian Warbler
Whiskered Tern	Subalpine Warbler
Gull-billed Tern	Dartford Warbler (outside England)
Caspian Tern	Rufous Warbler
Sooty Tern	Greenish Warbler
Bridled Tern	Bonelli's Warbler
Royal Tern	Arctic Warbler
Brünnich's Guillemot	Yellow-browed Warbler
Pallas's Sandgrouse	Pallas's Warbler
Eastern Turtle Dove	Dusky Warbler
Great Spotted Cuckoo	Radde's Bush Warbler
Yellow-billed Cuckoo	Firecrest (outside England and Wales)
Black-billed Cuckoo	Brown Flycatcher
Scops Owl	Collared Flycatcher
Eagle Owl	Alpine Accentor
Snowy Owl	Richard's Pipit
Hawk Owl	Tawny Pipit
Tengmalm's Owl	Pechora Pipit
American Nighthawk	Red-throated Pipit
Red-necked Nightjar	Yellow-headed Wagtail
Egyptian Nightjar	Lesser Grey Shrike
Alpine Swift	Woodchat Shrike
Needle-tailed Swift	Isabelline Shrike
Bee-eater	Red-eyed Vireo
Blue-cheeked Bee-eater	Black-and-White Warbler
Roller	Myrtle Warbler
White-winged Lark	Northern Waterthrush
Short-toed Lark	Yellowthroat
Lesser Short-toed Lark	Rose-coloured Starling
Crested Lark	Summer Tanager
Red-rumped Swallow	Baltimore Oriole
Nutcracker	Rose-breasted Grosbeak
Crested Tit (outside Scotland)	Arctic Redpoll
Bearded Tit (outside East Anglia)	Citril Finch
Wallcreeper	Serin
Dusky Thrush	Scarlet Grosbeak (outside Fair Isle)
Black-throated Thrush	Pine Grosbeak
Siberian Thrush	Two-barred Crossbill
American Robin	White-throated Sparrow
White's Thrush	Song Sparrow
Rock Thrush	Pine Bunting
Olive-backed Thrush	Black-headed Bunting
Grey-cheeked Thrush	Red-headed Bunting
Desert Wheatear	Yellow-breasted Bunting
Black-eared Wheatear	Rustic Bunting
Pied Wheatear	Little Bunting
Isabelline Wheatear	
Black Wheatear	

For the sake of completeness this list includes several species which are at the moment under consideration for addition to the B.O.U. List, but it is probably unnecessary to add that any bird new to the British Isles is automatically included. The above list, in any case, should not be regarded as finalized and it will inevitably have birds added to it and taken off it in the course of time, but it is published now as a guide to the many recorders and observers who we hope will be kind enough to co-operate with us in making the national rare birds report as complete as possible.

As already indicated, the report will largely be confined to the bare details of dates, places and observers, and it is unlikely that full descriptive accounts of any but the extreme rarities will appear in print anywhere except in those county and regional publications which are still able to provide the necessary space. To compensate as far as possible for the loss of safeguards which this entails, it was regarded as essential to establish a large committee with wide experience in as many aspects as possible of the problems and pitfalls of field-identification, to be responsible for checking all the descriptions and other evidence for all the records included in the annual list. We are therefore very grateful indeed to H. G. Alexander*, D. D. Harber, A. Hazelwood, H. P. Medhurst, M. F. M. Meiklejohn, G. A. Pyman, R. F. Rutledge and Kenneth Williamson who have agreed, together with P. A. D. Hollom and I. J. Ferguson-Lees, to form our Rarities Committee. In particular we are indebted to G. A. Pyman who has given up all his commitments with the Essex Bird-Watching and Preservation Society, save the senior editorship of the Essex Bird Report, in order to become the Honorary Secretary of the committee and compiler of its annual report. It is hoped that this committee of 10 members will carry enough weight in all departments from field identification to taxonomy to command general respect and confidence.

Work is already well under way on the rather heavy accumulation of records awaiting consideration, and we should like here to express our appreciation of the prompt and generous help we are receiving from the editors and recorders of county and other regional publications. Over 200 records have already been circulated, and the remainder will be as soon as full details are received. The committee hope in turn to be able to arrive at decisions reasonably quickly and, where they favour acceptance of a record, they will normally invite the comments of the recording organization in the county concerned before finally accepting.

In conclusion, we ask that all records, with the supporting descriptions and other evidence, should continue to be sent to the editorial address in Bedford and not direct to Mr. Pyman.

*Chairman of the British Records Committee of the B.O.U.

THE SPREAD OF THE EIDER IN GREAT BRITAIN

By J. H. TAVERNER

THE PURPOSE OF THIS PAPER is to trace the spread in the winter range of the Eider (*Somateria mollissima*) in the southern half of Great Britain since the Second World War, and also to describe the increasing number of birds which are recorded in summer along the same parts of the coast even though they are far removed from the breeding areas. At the same time, apparently connected increases at certain breeding grounds are outlined, particularly those at the Farne Islands and in Holland. Finally, possible causes and consequences of the spread are discussed.

The material has been drawn largely from county bird books and reports, from the editors of some of these reports or, for areas where no such publications exist, from individual local observers. A request for unpublished records was printed in *British Birds* (*antea*, vol. li, p. 447). The data should therefore include practically all known Eider records for the period under review. However, two factors may cause some bias. Firstly, the last few years have seen a very great increase in the numbers of watchers, particularly in counties such as Dorset, Hampshire and Lincoln, so that a straight comparison between, say, 1946 and 1958 may sometimes be misleading. Secondly, certain parts of the coasts of Ireland and Wales are still comparatively poorly covered. These points are mentioned in the text wherever it is felt they may have altered the pattern.

DISTRIBUTION UP TO 1945

Breeding numbers and range.

Scotland was the headquarters. On the islands off the western coast Eiders bred abundantly in places and were generally well distributed. They also nested commonly in Orkney and abundantly in Shetland. On the mainland they were not found in any numbers in south-west Scotland, but they bred commonly from Kintyre to Cape Wrath and also in some numbers along the north coast of Sutherland. Apart from recent records from Caithness, no Eiders were found breeding from that part of the coast round to and including Banff, but the species was a common resident from Aberdeen to Forth and was plentiful on the East Lothian coast, the northern corner of Berwickshire and on some of the adjacent islands. There was no breeding reported from the extreme south-east. A very detailed account of the Scottish breeding range is given by Baxter and Rintoul (1953).

The only colony in England at that time was in Northumberland, on the Farne Islands. Numbers were very small, however, for during the war the eggs had been taken, the sitting birds shot and some family parties used as targets for troops practising with

machine guns. Thus in 1945 only a score were present (Watt, 1951).

In Ireland, Eiders were resident on the northern coast, mainly on islands off Co. Donegal, but also on the mainland of that county, on the mainland and islands of Co. Antrim and on one group of islands off Co. Down (Kennedy *et al.*, 1954).

This distribution was the result of a remarkable spread that began around a hundred years ago. Eiders had been breeding on the Farne Islands for several hundred years, but at the opening of the nineteenth century the only known mainland colony was on the East Lothian coast. Otherwise the birds were confined as breeders to the islands off the west coast of Scotland. Then began the tremendous expansion which carried on through the first half of this century until the birds had colonized the area outlined. The present spread is thus by no means unprecedented and is possibly a continuation of the original movement. Apparently when the birds were colonizing the mainland of Scotland new nesting areas were often heralded by arrival offshore in preceding winters. Again, this original spread has been fully documented by Baxter and Rintoul (*op. cit.*).

There is one other breeding area that is probably of great importance to this paper and that is the one on the islands off the Dutch coast. Eiders were first recorded as nesting on the island of Vlieland in 1906, the number of "observed" breeding females rising to 16 in 1928, 25-30 in 1931, 134 in 1934 and *ca.* 200 in 1935, but van Oordt (1954) points out that the true numbers must have been higher. By 1936 some 300 breeding females were estimated and by 1940 the number had risen still more. In spite of the heavy toll taken by the Germans during the occupation, this level was maintained until the war ended, but during this time the birds had established two new colonies at Texel and on the Boschplaat.

The Handbook (Vol. III, p. 338) refers to Brittany as a breeding area, and this part of the French coast is also included in the map in the *Field Guide* (1954). However, no nesting has been proved there since an isolated case in 1925. Eiders have been seen since then, but some in the springs of 1954 and 1955 behaved like non-breeding birds (R. D. Etchécopar, *in litt.*; see also Bannerman and Lodge, 1958).

Winter range.

The winter range of the Eider at that time is not absolutely clear. Most authorities say that the birds were largely sedentary and the few ringing returns support this view. In winter Eiders were thus found on nearly all the breeding coasts, but to the south they were uncommon visitors to most areas. (More information appears later in this paper when a summary of the spread is given under individual county headings.) In some places the species kept so much to its breeding grounds that it

was uncommon in winter even on adjacent coasts. Thus in east Sutherland, which lies between two breeding areas, the birds were very scarce in winter. *The Handbook* summarizes the situation by saying: "In winter scarce visitor south of breeding range but occurs irregularly in small numbers all coasts Oct. (exceptionally Sept.) to March, exceptionally April and May and even between June and Aug."

However, a certain amount of movement was evident. It was known, for example, that some Eiders from more northern latitudes came south in winter and such passage was reported at Fair Isle. Similarly, there was a dispersal from some of the Scottish breeding islands while at others there were reports of winter arrivals in large numbers. H. W. Robinson recorded an almost complete absence of immature drakes during the winter months in Orkney and suggested that they could have moved south (see Baxter and Rintoul, 1953).

Before the war Eiders were apparently only uncommon or rare visitors to English and Welsh coastal counties except Northumberland, Sussex, Glamorgan and possibly Anglesey (records for the last are too few for certainty). Off the Sussex coast adults and immatures were of annual occurrence, mainly out in the Channel but also in estuaries and harbours, never being plentiful although "large flocks" were sometimes detected (Walpole-Bond, 1938). Walpole-Bond seemed to consider that the majority of these birds were "from north-west Palaearctic regions" and expressed surprise that the county bird books of both Kent and Hampshire included the Eider only as an irregular visitor. At least as far as Hampshire is concerned, this surprise was probably justified since the coastline there was poorly covered in those days.

As to Glamorgan, or the Glamorgan/Carmarthen border, small numbers have wintered in the area of the Burry estuary for at least ninety years and even before the war were seen in summer as well, although a similar situation was not reported from any other part of Wales.

The past winter status of the Eider, particularly on the south coast, must remain obscure, but the species was probably commoner in some areas than was suspected.

THE POST-WAR SPREAD

Breeding numbers.

There has not been a great increase in the actual breeding range since 1945, though some new localities have been colonized. In Scotland, the Clyde has had more nesting reports and, as mentioned above, it is only recently that the species has spread to Caithness. In England, Eiders now breed on new parts of the Northumberland mainland and have colonized the west coast for the first time—at Walney Island, Lancashire. There they were first reported in 1949 (a single nest) and except for 1951, they have bred every year since. There has apparently been very

little new colonization in Ireland (although Major R. F. Rutledge tells me that parts of the coast are so poorly covered that the birds may have been overlooked), but the Dutch Eiders have extended their breeding range to the islands around the original locality.

Although there is then only small evidence of an actual spread in the breeding range, there has been a spectacular rise in the numbers in certain established colonies and it is fortunate that detailed figures are available for two important and outstanding areas—the Farnes off the Northumberland coast and the Dutch islands of Texel, Terschelling and Vlieland (see Table I). If the increases in these two fringe parts of the Eider's range continue, a point of saturation will presumably be reached and it seems reasonable to expect a dispersal to new colonies.

TABLE I—NUMBERS OF PAIRS OF EIDERS (*Somateria mollissima*) BREEDING ON THE FARNE ISLANDS, NORTHUMBERLAND, AND ON VARIOUS DUTCH ISLANDS

Total counts are not available for all years. In connection with the Dutch figures it is worth noting that as many as 5,000-6,000 non-breeding birds have also been seen in the area during recent summers.

Year	Farnes			
1946	120-132			
1949	370-385			
1951	ca. 445			
1952	532			
1953	ca. 643			
1957	1,200+			

Year	Texel	Terschelling	Vlieland	Others
1946	10-15	50	500-600	—
1948	ca. 80	50	500-1,000	2
1953	50	240	2,300	3
1955	ca. 60	450	2,000-3,000	ca. 100
1958	No count	No count	6,000	No count

Eiders are birds which respond quickly to protection and in both of the above areas they have been well protected since the war. The numbers on the Farnes Islands in the past have shown a close relationship to the degree of interference. Furthermore, the Walney colony has only been successful because of the efforts of the lighthouse keepers in warding off predators in the early days.

Winter flocks and non-breeding birds in summer.

The following is a county-by-county summary of the winter and summer status of the Eider off the coasts of England, including a section for Wales, areas being taken in geographical order down the east coast, along the south and up the west. Names of authorities in brackets, apart from references to published works, indicate information given in personal correspondence. Throughout this section the term "1949/50" refers to the period from

1st July 1949 to 30th June 1950 inclusive and similar terms refer to the same dates in other years.

NORTHUMBERLAND/DURHAM.—Being a breeding area, the Northumberland coast had wintering Eiders in some numbers before the spread started (thus in a census during 25th-28th March 1949 a total of 623 were counted along the whole coast), but in Co. Durham they were much less regular. By 1953, however, the species was more abundant than ever in Northumberland and reports were more frequent from Co. Durham as far south as the Tees. 1955 saw numbers steadily increasing and by this time Durham records were still more frequent.

YORKSHIRE.—Previously of very occasional occurrence off the coast (R. Chislett). A few were reported in 1949/50, three in 1950/51 and four in 1951/52. There was a marked increase in 1953/54 when over 30 birds (including 16 together) were seen and, following this, the 1955 Ornithological Report said: "Too many records of both sexes to enumerate". There was a large influx in November 1957, and in 1958 Eider were at Flamborough in all months with a maximum of 74 on 1st March.

LINCOLN.—Formerly a very scarce and irregular winter-visitor (R. K. Cornwallis). In 1952/53, however, the species was more numerous and greater numbers have been seen in subsequent years, with "unusual numbers" in the Wash in 1955/56 and 1957/58. (Greatly intensified watching in recent years, especially on the Wash, could mean that birds were missed in years before 1952/53.)

NORFOLK.—Before about 1948 an occasional winter visitor in small numbers (M. J. Seago). Since then, there has been an increase on the north Norfolk coast and in the Wash with the maximum at any one place reaching 18 in 1952/53, 40 in 1953/54 and 200 in 1955/56; in 1954/55, although numbers were small, the birds were more widespread. On 4th December 1955 there were 200 together at Hunstanton, the previous maximum for the Wash being 6; there were 150 at the same place on 22nd January 1956 and in the first part of April of the same year. Eiders now appear regularly, monthly maxima for the Brancaster area in 1958 being 90, 80, 120, 120, 100, 100, 80, 125, 50, 120, 180 and 160. As the winter totals increase, so summer records become more frequent and 200 were reported off Wells, 12 miles out to sea, in May/July 1958.

SUFFOLK.—Formerly very rare (F. K. Cobb). The first sign of change was in 1953/54 when there was a flock of 12 at Walberswick for nearly four months. By 1956 Eiders were not uncommon in winter and were also recorded in moderate numbers during summer. 29 at Lowestoft, 20-25 at Shingle Street and 22 at Dunwich are the maximum counts.

ESSEX.—Up to 1950 a very rare vagrant (G. A. Pyman). Four birds in 1950 were followed by increasingly regular occurrences and larger numbers. In 1952/53 the maximum at any one place was 15, in 1953/54 the figure was 23, and in 1954/55 there were 52 at Bradwell in January. In late 1957 there was a considerable influx and 100+ were reported from the Naze in the following April. There were also two inland records at this time. By 1957 Eiders were present on and off throughout the summer in most years.

KENT.—Up to the mid-1940's a very rare visitor (Harrison, 1953). An increase was noticed in the late 1940's and one on 19th July 1946 was the earliest record for a place so far south. By 1954 the *Kent Bird Report* was recording numerous observations from January to December. Eiders were seen on the north, south and east coast but mainly on the north where there were several parties of up to 24. Subsequent years have been similar with winter parties up to over 20 and summer numbers regular but low.

SUSSEX.—As already briefly mentioned, the position here was so different from that reported from other southern counties that it must be reviewed in more detail. Even before the recent spread began, the Eider had long been a regular visitor to the Sussex part of the English Channel. Adults and

immatures were considered to be of annual occurrence between autumn and spring, mainly on the open sea but also in estuaries and harbours. They were never plentiful but large parties had been detected. They occurred as early as 4th October and as late as 8th April, but most did not arrive until early November and had left by early March (Walpole-Bond, 1938). The *Sussex Bird Report* for 1949 stated that there were "more records than usual", and from then onwards observations have become progressively more frequent. In 1950/51 the county had its first September record. 1955/56 saw "larger numbers than usual" with up to 40 at one locality and in 1956 came the first Sussex records for June, July and August. The 1958 *Sussex Bird Report* said, "More recorded than ever before"—with *ca.* 70 at one place, which was a larger flock than any previously known for this county. Most left the county by the end of April 1958, but at Langney Point the numbers increased through June to 22 and then fell away in August. Mid-October saw the start of the main arrival again and off Selsey Bill on 5th April 1959 there was a flock of 85, the largest number for Sussex to date (A. B. Sheldon).

HAMPSHIRE.—Until the spread a very uncommon winter visitor. The first signs of change were in 1953/54 when two birds were seen. The following year one female wintered and up to 12 were present in another place in 1955/56. Small numbers were recorded in 1956/57 from more places than before. Then in 1957/58 there was a marked increase, Eiders being reported from ten localities, in some of which they stayed all winter: the maximum was 35. One was seen in the summer of 1958.

DORSET.—Previously a rare vagrant (Blathwayt, 1943). The spread was first noticed in 1949/50 when up to three were seen on several occasions at the mouth of Poole Harbour. One was there the following year and eight in 1951/52. Since then Eiders have been seen at this locality in small numbers each year, with 30+ in 1955/56, and they have also been recorded in the Weymouth area, staying progressively longer each spring.

DEVON.—Before 1946 an uncommon winter visitor (F. R. Smith) and none had been seen in the previous five years. In 1946/47, however, one was observed off the north coast and one off the south; and the next year Eiders were reported from three localities, including six birds off the Taw estuary. 1948/49 saw none, but in 1949/50 as many as 13 were seen off the Exe. 1950/51 had small counts, 1951/52 none and then in 1952/53 there was a marked increase with 16 off the Exe and 18 in Start Bay. The Exe numbers increased to 45 in 1953/54 and since then the species has been regular with counts of up to 35, mainly off the Exe, Taw, Torbay and Start Bay. On 16th November 1958, 150 were seen flying west off Sidmouth. The spread has been accompanied by summering on a small scale.

CORNWALL.—Previously a very irregular visitor (Ryves, 1948). One in March 1948, another in May 1949 and then none for the next three winters. Two were seen in 1952/53 and at least six the following winter. None was reported in 1954/55, but in 1955/56 Eiders occurred in five localities, though there were no more than three at any one. Similar small numbers have been recorded in subsequent years.

SOMERSET.—Previously a rare visitor. There had been no outstanding increase by the end of 1958, but Eider records have become more frequent in the 1950's (G. H. E. Young).

WALES.—Previously almost unrecorded except from the Burry estuary, Glamorgan, where flocks of 15-20 were seen not only in winter but all the year round, and Anglesey, though there were not many records from the latter. Between Merioneth and Pembroke, however, there are few observers and this may have been the reason. The first sign of increase was in 1954/55 when Eiders were reported as more frequent than usual from the Dec. 1957/58 seems to have been the main period of increase, but it does not appear to have continued in 1958/59 and it was not general for Wales. Thus, the only Welsh counties that can boast Eiders as regular visitors at the moment are Glamorgan (mostly Burry estuary), Carmarthen (Gwendraeth estuary only,

which adjoins Burry), Merioneth (maximum 10, at Harlech), Anglesey (up to 23) and Flint (Dee Estuary). In the Burry estuary in 1957 and 1958 the highest numbers were in summer, as is shown by the following monthly maxima for the latter year: 12, 21, 22, 22, 43, 45, 20, 43, 54, 22, 22, 22. Eiders are still apparently very scarce on the remainder of the Welsh coast (M. P. Harris).

CHESHIRE.—1939 saw the first Eiders recorded for many years. Several at Hilbre in December 1941 were the only ones noted in the 1940's, however, and there were but four records for 1951/55. Then in 1957/58 there were unusual numbers at Hilbre from 21st September to 22nd June, the maximum being 17 on 11th and 13th April (A. W. Boyd).

LANCASHIRE.—Up to 1949, in which year breeding was first proved on Walney Island, it was a very rare vagrant with only three records (Oakes, 1953). Since then winter records have increased out of all proportion to the numbers nesting with a particularly marked rise in 1958/59—until on 16th March 1959 "Eiders are about in hundreds" in the Walney area (Miss E. Wheeler *per* K. G. Spencer). At the same time an increasing number of non-breeding adults and immatures linger into the summer, in addition to the nesting pairs: 33 on 15th June 1956, 39 adults and 14 immatures on 28th June 1957, 21 adults and 14 immatures on 14th July 1957.

CUMBERLAND.—Odd birds recorded on a very few occasions (Canon G. A. K. Hervey), with some small increase in frequency since the Lancashire colony became established.

Arrival dates.

As might be expected, the increasing frequency of winter records in each area has resulted in progressively earlier dates of arrival. This tendency is very difficult to trace in such counties as Norfolk and Kent, as first arrivals are confused by the summering birds which became not infrequent a few years after the winter spread began. In some south coast counties, however, where Eiders do not as yet summer regularly, figures show this trend clearly. For example, the recorded arrival dates at the mouth of Poole Harbour, Dorset, from 1950/51 to 1957/58 were as shown in Table II (though it must be remembered that watching has very much increased in this county during this period).

TABLE II—DATES OF ARRIVALS OF WINTERING EIDERS (*Somateria mollissima*) AT POOLE HARBOUR, DORSET, 1950/51-1957/58

1950/51	1951/52	1952/53	1953/54	1954/55	1955/56	1956/57	1957/58
16 Jan.	25 Dec.	7 Dec.	2 Dec.	Dec.	20 Nov.	12 Oct.	11 Nov.

However, at Portland Bill, also in Dorset, the first birds were seen on 23rd September in 1954 and on 9th/10th September in 1958. This tendency for odd birds to occur some time before the main arrival has been noticed at St. Catherine's Point on the Isle of Wight, which like Portland projects into the Channel a little, and it seems possible that these early records are either of ones moving along the Channel or of ones that do not at first come close inshore.

Further east along the south coast the arrival dates are a little earlier. In Sussex, for example, the first date in 1953-54 was 27th November (apart from two September birds), in 1954/55 it

was 1st November and in 1955/56 19th November (apart from some summer records). Later years have continued to produce earlier dates than those given in Table I for Dorset, but the increase of summering birds off the Sussex coast now confuses the picture there. Nearer to the breeding grounds, in Norfolk and Kent, Eiders were being recorded in all months by 1954, and the position in Essex was very similar. However, numbers in these counties tend to increase in November and December, so that it seems clear that the period of arrival in both East Anglia and on the south coast is from mid-October to mid-November onwards.

Summering.

The increasing number of summer records in the southern half of Britain has already been mentioned and the position was briefly outlined in the county-by-county summary above. Nevertheless, it is convenient to be able to examine these records on their own and so the position from Yorkshire and Wales southwards is briefly summarized below.

YORKSHIRE.—The *Y.N.U. Ornithological Report* for 1958 states that the species was noted "at Flamborough in every month of the year" and there were other summer records from other parts of the coast.

NORFOLK.—Reported in summer from 1953 onwards.

SUFFOLK.—Recorded in modest numbers in summer for the first time in 1956.

ESSEX.—Present on and off through the summer in most years now.

KENT.—Recorded in all months in 1954 and seen in each succeeding summer.

SUSSEX.—1956 saw the first June, July and August records and there have been more in subsequent summers, over 20 in 1958.

HAMPSHIRE.—One summer record 1958.

DORSET.—No summer records during this period.

DEVON.—Summering on a small scale from 1953 onwards.

CORNWALL.—One summered 1957.

WALES.—Summering long regular at Burry, Glamorgan, as mentioned. Elsewhere recorded from three localities in summer in four post-war years. Picture could be very incomplete.

Thus, as might be expected, those counties which first experienced the widening winter range have generally been those in which summering first occurred. In this connection it is interesting to note that, apart from the eastern and south-eastern counties, Devon was one of the earliest to have summer records and it will be remembered that Devon was also very early with the winter spread.

By 1958, then, summering in small or moderate numbers occurred in all counties from the north-eastern breeding grounds round to and including Sussex, but summer records were very unusual in Hampshire and unknown in Dorset. Further west, summering on a small scale was regular in Devon and in one or two localities in Wales, but there is only one such record for Cornwall.

Age and sex.

The data are not complete enough at the moment to show the exact proportions of adult drakes, adult females and immatures.

It would appear, however, that adult males are the least common in all non-breeding areas of England and they become less frequent as one proceeds westwards along the south coast. Generally speaking, however, there is a tendency for the proportion of adult drakes to rise as the spread gathers pace. The exact ratio of immature birds to adult females is rather vague because many reports refer to "females or immatures" or simply even "brown birds". However, some observers have distinguished fairly fully between the various plumages and, although it would be unwise to make a categorical statement, it does appear that the immatures are mainly responsible for the spread but that adult females are recorded far more often than adult males. Much more information is needed on the question of sex and age, and it is particularly important that changes in the proportion be noted as the spread continues.

In more detail, Co. Durham and Yorkshire report birds of both sexes frequently, but the proportion in Yorkshire identified as adult drakes has been small. Further south, in Lincoln and Norfolk, adult drakes form a very small proportion of the whole; in Norfolk up to one third of large parties have been males, but most of these have been immature. In Suffolk immatures and females form the bulk of the records and in Essex adult drakes are definitely uncommon: there is very little doubt that the vast majority of those in the latter county are immatures, although a few adult females have been identified (G. A. Pyman, *in litt.*); the 100+ at the Naze in early 1958 did not include a single adult drake.

In Kent adult drakes become more frequent. Thus in 1956 "In parties over five, the number of adult males seldom exceeded one third of the total" (*Kent Bird Report*, 1956). This, however, appears to be a recent increase because in 1954 the *Kent Bird Report* stated that parties over 10 seldom included more than one or two drakes—except in April and May 1954 when a third of the highest totals were old males.

Sussex reports few adult drakes and in 1958 most of the summering birds were immatures (though a record pack of 85 off Selsey Bill early in 1959 included 8 males). In Hampshire, out of a total of about 70 birds in the last few years, only three have been mature drakes. In Dorset, on the other hand, 10% of all recent records have been adult males (but most of these have occurred in the last two or three years).

Further west, in Devon, in the eleven years up to 1957/58, only two adult males were seen out of about 200 individuals, but of the party of 150 in 1958 a third were drakes in full plumage. Otherwise, the majority of Devon's birds have been immatures, around two-fifths being young males.

There are no details available from Wales of adult females and very few records of adult males, though in 1958 over a third of the Burry estuary flocks were full drakes. In that same area

there is usually a large proportion of immature males—a third or a half of some flocks in recent years.

DISCUSSION

Summary.

If we summarize the above data, the following picture emerges. About a hundred years ago Eiders began a great extension of their British breeding range, which at that time was confined to the Western Isles of Scotland apart from the Farne Islands and a colony on the East Lothian coast, until many parts of the coast of Scotland had been colonized by the 1930's (see pp. 245-6 and *The Handbook*, vol. III, p. 337). Even then, however, the birds were no more than scarce winter visitors away from the breeding-grounds except off the coasts of Sussex and Glamorgan (Burry estuary): in both these localities they had long been noted fairly regularly in winter and in the Burry estuary a few had usually summered since at least the late nineteenth century. But in the 1930's breeding numbers were still increasing, especially in colonies on the southern fringe of the range, and this trend has accelerated enormously in the post-war years. Since 1945 a slight extension in the breeding range has been accompanied by a quite remarkable spread in the winter range until almost all English coastal counties now have Eiders as regular winter visitors. Summering has also become regular in all counties from Yorkshire to Sussex (save Lincoln) and also in Devon.

Norfolk, Kent and Sussex all noted a winter increase about 1948/49, Yorkshire a small one in 1949/50 and Essex in 1950/51. About this same time the first sporadic occurrences were recorded in Dorset and even a little earlier in Devon. Yet it was not until 1952/53 and 1953/54, by which time the spread in the south-east was well advanced, that Lincolnshire and Yorkshire reported any *marked* change (although in the former county the then scanty coverage could have been partly responsible). It was in 1953/54, too, that Hampshire had more Eiders for the first time. Meanwhile, there was no evidence of an increase off the coasts of Wales until a small influx in 1954/55 and much bigger numbers in 1957/58 (though scanty coverage should again be borne in mind). Years such as 1955/56 and 1957/58 resulted in very marked changes in many areas, but the spread has been uneven and 1954/55, for example, brought only small increases or even decreases: in that winter Sussex recorded only three birds.

The origin of the wintering birds in southern England.

The curious pattern that emerges from the last paragraph, showing that the south-eastern quarter of England was the first area to experience the effects of the main spread, raises several questions. Above all, where have the birds come from? The possibility of an origin far removed from the British Isles needs further investigation, but for various reasons (some of which will become apparent

in what follows) this is thought to be unlikely and will not receive further consideration in this paper. Three sources therefore remain: western Scotland (with north Ireland), south-eastern Scotland and the Farne Islands, and Holland. The west coast, however, can certainly be ruled out. There is no evidence of an increase in the breeding numbers there on a scale large enough to account for the spread and, in any case, everything points to the east rather than to the west: the east experienced the spread first and still has much larger numbers; the extension to Walney Island and Lancashire did not begin until the southward movement was in full swing in eastern and south-eastern counties; the progression of arrival dates along the south coast, and the spread of the summering habit, are both from east to west.

Even the reports of passage, which are unfortunately few, suggest the east as the source. In Sussex Eiders have been seen moving west in late summer and autumn, and east in spring. At St. Catherine's Point, Isle of Wight, 15 flew east and only one west in spring 1958. At Portland, Dorset, two passed east in March 1957 and four flew in the same direction the following May. Correspondingly, the 150 seen in Devon in November 1958 flew westwards. This all points to birds moving to and from breeding grounds in the east, though the increase at Walney, the very large numbers seen off Lancashire in 1958/59 and the inexplicably isolated summering ground in South Wales do suggest that there is some influence growing in the west. That this influence is likely to become more important is shown by the fact that 1957/58 and 1958/59 have seen the greatest changes in numbers wintering on that side of Britain.

The south-east of Scotland (with the Farnes) and Holland thus seem to be more likely dispersal points. The numbers on the Farne Islands over this period have probably been insufficient to allow this colony to be the main source of the spread since that area and the Northumberland coast hold large numbers of Eider themselves in winter. Indeed, Dr. E. L. Arnold writes, "I think the majority of Eiders on our coast do not move very far and there are large numbers of wintering birds offshore which almost certainly form part of the Farne breeding stock". Further, if the Farnes were the main source, it would be difficult to account for the fact that Yorkshire experienced no marked increase until after the spread had established itself in counties further south. The proximity of such a rapidly increasing colony to the areas experiencing the winter spread is surely more than mere coincidence, however, and the Farnes have probably been a minor point of dispersal, perhaps affecting all the east coast counties of England to some extent.

The bulk of the evidence seems to point at Holland as the major source of the spread which, let it be remembered, first affected the parts of England closest to that country. In 1958, there were upwards of 18,000 Eiders on the Dutch coast in summer

(Hoogerheide, 1958; M. F. Mörzer Bruijns, *in litt.*) which represented a considerable increase on the immediate post-war years. Still more important, however, is the fact that these birds gradually leave the breeding grounds and the waters near the coast when nesting operations are completed. Thus, the maximum numbers seen per month on Terschelling during 1951/53 and at Vlieland during 1953/56 are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Terschelling	0	0	10	450	820	300	110	60	15	0	6	10
Vlieland	225	300	2,000	4,500	4,000	3,000	2,500	1,000	300	600	600	500

In May on Vlieland only breeding birds are counted.

M. F. Mörzer Bruijns writes: "Most Eiders in our opinion leave the Waddensee coast and perhaps even the Waddensee itself in August/September. Up to 1950 only very few birds were seen in autumn and winter on our coasts. After 1950 more and more observations of birds during winter were made. Great numbers, however, have always been an exception". The exact position in Holland in winter is not yet known. Although some do winter on the North Sea coast of Holland and smaller numbers on the northern coasts of Belgium and France, the general opinion in Holland seems to be that most of the breeding population go away, and begin to return in February. However, there is one school of thought which believes that the birds winter in the Waddensee (Verwey, 1956; Hoogerheide, 1958) even though there have apparently been no records for that area during visits in December and January. If the majority opinion is correct in thinking that most of the birds leave the country in winter, then this could well be the source of the British birds, particularly if one bears in mind the order in which different parts of England first experienced the spread and that adult drakes, the birds least inclined to wander far in winter, are seen more often in Kent than in counties further north.

However, only extensive ringing returns, or better still colour marking, will bring the final answer. It must suffice here to summarize by saying that the evidence suggests that Holland is the main source affecting our East Anglian and southern counties, and that the Farne Islands are probably another dispersal point which began a little later to influence counties down to East Anglia or thereabouts. Lastly, the western colonies seem to be having some influence so that perhaps the winter range will spread down the coast of Wales if breeding numbers continue to increase. The possibility of the winter spread being a prelude to breeding, as was originally the case in Scotland, is an exciting one that becomes more likely as the existing colonies approach a point of saturation.

The reasons for the spread.

The most vital question is, why has the spread taken place?

Before this can finally be answered the source must be definitely established, but one factor that can already be said to be of prime importance is protection. Both the Farne Islands and the main colony in Holland have been vigorously protected since the war and this must have been fundamental to the increase. Local opinion in Northumberland, indeed, believes that protection is the sole cause (Dr. E. L. Arnold, *in litt.*). However, the Farne Eiders have had some fair degree of natural protection for centuries owing to their connection with St. Cuthbert (Watt, 1951), which resulted in the local fishermen leaving them unmolested, and yet this did not produce a spread like the one that is happening today. Furthermore, protection could not possibly have been the cause of the original spread from the Western Isles.

Food has been suggested as a factor. Thus in the Clyde area, the increase in Eiders has been linked with the increase in mussels. But food can be of only local importance in this way since mussels and other crustaceans on which Eider feed have always been plentiful in parts of the country where the birds have hitherto been rare. On the other hand, food could be involved to the extent that the increased breeding might result in the supply being insufficient to support the total population in the nesting area.

It seems unlikely that the general amelioration of the climate could be involved in the spread of a northern species like the Eider, but weather conditions almost certainly influence the numbers and localities of Eiders seen inshore. 1957 illustrates this point well. In November of that year there was a large influx of these birds on the Yorkshire coast about the 9th and in Norfolk around the second week, the maximum count in Kent occurred during the 9th-20th and Lincoln also reported unusual numbers. On 7th November a high pressure system had moved from the vicinity of Rockall to the north of Scotland. This led to continuous north-east winds up to and including the 11th; these reached 25 knots on the 8th and 30 knots on the 9th-10th over the North Sea. The wind then turned easterly until the 16th. At this time there were unusual numbers of skuas (*Stercorarius* spp.) and auks (*Uria*, *Alca*) off the Yorkshire coast, and the arrival of Eiders in Hampshire coincided with westerly weather-movements and an unusual appearance of Long-tailed Ducks (*Clangula hyemalis*).

Thus this analysis is intended as a preliminary report which it is hoped will stimulate further work, including observations of movements and counts of sex and age proportions in flocks.

ACKNOWLEDGEMENTS

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WATCHING MIGRATION BY RADAR

By DAVID LACK

(Edward Grey Institute, Oxford)

HISTORY

SO FAR AS I know, the first time that radar echoes were definitely identified as coming from birds was in the spring of 1940, when an experimental equipment on a wavelength of 50 cm. at Christchurch, Hampshire, detected gulls (*Larus* spp.) (Shire, 1958). Unidentified echoes, some of them doubtless from large birds, were reported on 150 cm. equipment round the British coasts during the ensuing year, but the next identified records appear to be those of R. G. Finnis, who between 11th August and 11th November 1941 regularly plotted a migration of Herons (*Ardea cinerea*) by radar over Tobruk (Stanford, 1954). In September 1941, echoes from sea-birds for the first time became a serious operational nuisance, on the newly developed 10 cm. equipment (Lack and Varley, 1945, who also refer to other early records). During the war years, only large birds were usually detected,

though a big roost of Starlings (*Sturnus vulgaris*), repeatedly disturbed by VI bombs passing over it, caused a scare that the enemy had invented a new form of radar jamming. The only other migration plotted in this period was of raptors in the Suez area in October 1945 (Goodwin, 1947).

Thereafter the ornithological problem was allowed to languish for more than a decade, though in the latter part of this time, both in Britain and U.S.A., radar equipments much stronger in power than those used during the war were regularly plotting bird-migration, unknown both to the operators and to the investigating scientists who ascribed the echoes in question to unidentified meteorological phenomena ("angels"). I am, however, indebted to Dr. Stuart Smith for an overlooked record, in this period, of a hard-weather south-westward movement of Lapwings (*Vanellus vanellus*) detected by the airport radar on Jersey, Channel Islands, and confirmed visually on 26th January 1952 (Graham, 1953). Three years later Lapwings were tracked by radar at Zürich Airport (Hoffmann, 1956), and the next year Sutter (1957ab) not only showed convincingly that "angels" recorded on radar at Zürich Airport were echoes from migratory Passerine birds, but by thorough and imaginative techniques explored the possibilities of this new tool in the study of migration: his speeded-up films of a radar display with migration in progress provided a sensation at the International Ornithological Congress at Helsinki in 1958. Harper (1957, 1958), working independently in England, also established that "angels" were echoes from migratory birds, while for some further references see Lack (1958) and Tedd and Lack (1958). From 1955 onward, the Royal Radar Establishment, and later the Research Branch of R.A.F. Fighter Command, collected regular records of "angels" on their new high-powered equipment, at first by operators' reports and later by repeated photographs, and this material they generously put at my disposal for analysis, while also allowing me to watch at their stations.

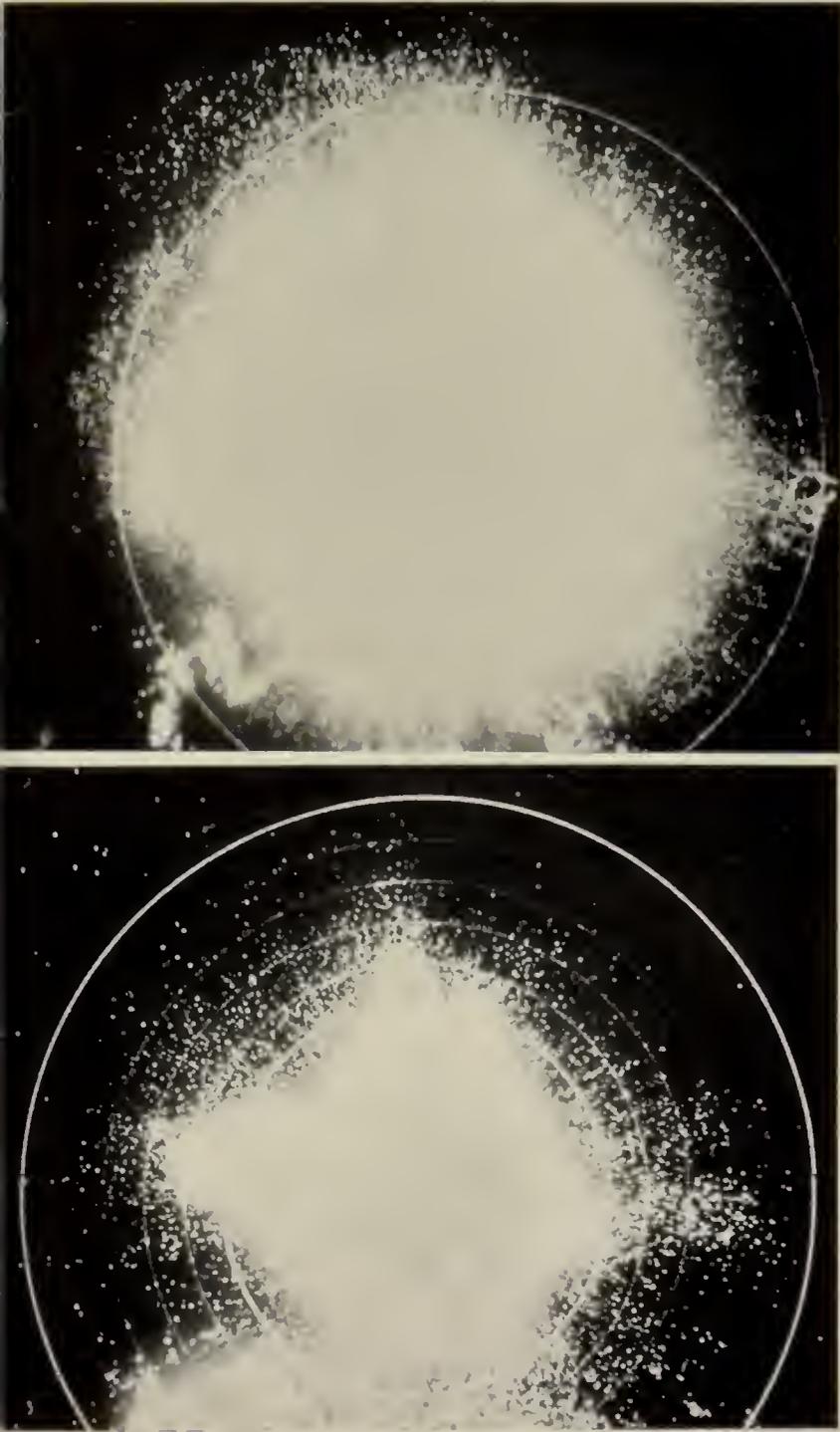
THE ILLUSTRATIONS

Good photographs of "angel" displays have been published for radar equipments of lower power by Sutter (1957 ab) and Harper (1958), and some for high-power R.A.F. equipment by Tedd and Lack (1958), one of which is reproduced here, as plate 48a, by kind permission of the Air Ministry and the Royal Society (in whose *Proceedings* it appeared). The other photographs shown here were supplied by the Royal Radar Establishment through Mr. H. K. Sutcliffe, to whom I am extremely grateful, and, of these, plates 45b and 46b have previously appeared in *The Ibis* and are reproduced by the editor's permission. All these pictures are Crown Copyright. They demonstrate better than a lengthy description in words what bird migration looks like on a radar display, and though movement is absent, bird-echoes do not move at a visible rate on the scale used, so at any one moment the human observer does not see more than what is shown here.

On the plan-position display, all radar echoes appear as bright points of light against a dark ground. Each is in its correct geographical position with respect to other echoes, and the range from the station is indicated by concentric rings. Not all the photographs have been reproduced here on the same scale, but the scale is readily seen because the bright rings in all the photographs on plates 45, 46 and 47 are 50 miles apart, while the fainter rings on plates 45a, 46b, 47 and 48b are 10 miles apart; plate 48a, without range-rings, has a scale at the bottom. All the plates have been arranged with north at the top.

Plate 45a shows an eastward emigration of moderate size from East Anglia in March at 0400 hours, i.e. near the end of the night movement. The large bright echoes on the left of the picture are mainly from land, while those from migrating birds are smaller points, in a dense mass near the station, and extending from it fairly densely to 50 miles and in more scattered form to 80 miles. Plate 45b, a picture of the same movement taken at 22.00 hours, which is near to the peak time for nocturnal departures seaward in spring, shows an extremely heavy eastward emigration, with bird-echoes extending in the north-east to 130 miles from the station. Plate 46a, again of the same display, was taken at 06.00 hours next morning, when the nocturnal emigration had nearly ceased and the morning emigration was under way. The latter movement was of moderate size, with echoes to about 70 miles in the north-east. Note particularly the sharp boundary running from north-east to south-west in the bottom right-hand part of the display, with many bird-echoes to the east of it but hardly any to the west of it. This line is that of the coast, and the effect, as I interpret it, is due to many migrants flying over the land so low as to be out of radar range, and then rising higher, into radar range, on putting out to sea. This effect was often seen on spring mornings, and a drawing from another photograph in Lack (1959, Pt. 2) shows both the Suffolk coast and the Wash outlined in this way. The effect was never seen at night, when eastward-moving echoes were usually as dense over the land as out to sea. This presumably means that migrants leaving at night immediately rise high while over the land.

Plate 46b, taken at 21.00 hours in mid-November, shows to the east of the station a typical immigration of moderate extent. The birds involved in this movement presumably took off after dusk from northern Holland, travelling just south of west. There were, as usual, few echoes to the north of the station because, owing to the Heligoland Bight, there is no land immediately north of Holland from which birds could come. This is the characteristic pattern for westward movements in autumn, by day and night, except that there are not infrequently more echoes to the south of the band shown in plate 46b. The picture is very different for the south-westward immigrations in autumn, which are usually densest to the north-east of the station, but I have no



Royal Radar Establishment
 DENSE NIGHT EMIGRATION IN MARCH

MIGRATION ON RADAR: (a) MODERATE NIGHT EMIGRATION IN MARCH, and (b) DENSE NIGHT EMIGRATION IN MARCH. The bright rings are 50 miles and the faint rings to miles apart; every photograph has north at the top. The large echoes on the left are mainly from land; the bird-echoes are the small points of light which form a dense mass near the station and are more scattered further out. Both pictures are of the same eastward emigration, (b) at the peak and (a) six hours later near the end of the night (see page 260).

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Royal Radar Establishment

MIGRATION ON RADAR: (a) MODERATE MORNING EMIGRATION IN MARCH, and
(b) MODERATE WESTWARD IMMIGRATION ON A NOVEMBER NIGHT

The rings in (a) are 50 miles and the faint rings in (b) 10 miles apart. In (a) the sharp boundary on the bottom right, with many bird-echoes to the east but few to the west, is the coast-line which shows up because diurnal migrants rise high, into radar range, before putting out to sea (see page 260). In (b) is a typical westward autumn pattern, with few echoes to the north because there is no land immediately north of Holland from which the birds can come (see page 260).

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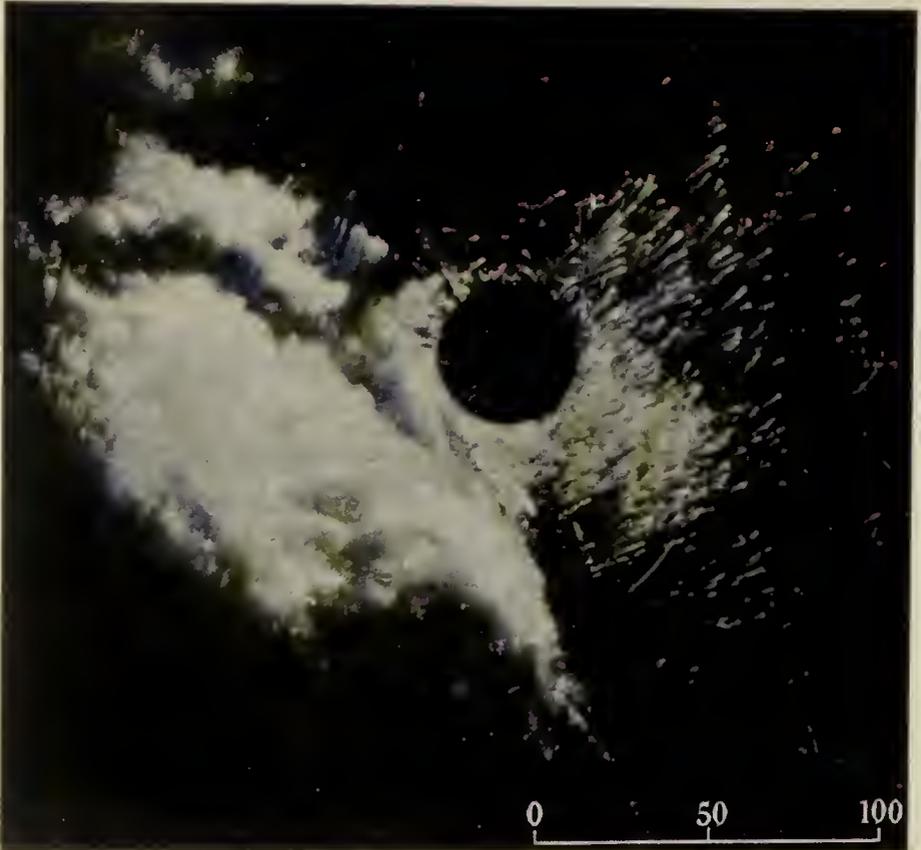
Royal Radar Establishment

MIGRATION ON RADAR: (a) EASTWARD EMIGRATION NORTH OF COLD FRONT, and
(b) WNW ARRIVAL INSIDE 45 MILES AND SPARSE NE MOVEMENT ELSEWHERE

The faint rings are 10 miles apart. In (a) the dense echoes given by rain show the position of the cold front. In (b)—taken at 09.45 hours—the centre is blacked out, the opaque smears are from rain and the rest from birds; this was a short time-exposure, so that the bird-echoes appear as direction-giving lines, not dots (see page 261); the W.N.W. movement inside 45 miles was probably drift arrival and the N.E. beyond was the remains of a morning emigration which had been much denser.

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Royal Radar Establishment

MIGRATION ON RADAR: (a) NE DEPARTURES AND A BELT OF RAIN, and
 (b) ENLARGEMENT OF BIRD-ECHOES GOING WEST, TO SHOW AFTER-GLOW TAILS

In (a), a $\frac{1}{2}$ -hour time-exposure of spring emigration at another station, the bird-echoes appear as lines moving north-east; the rain-belt on the left was travelling 10° east of north. Directions can also be noted immediately from the after-glow tails—as shown in (b), a greatly enlarged picture (rings 10 miles apart) of a June movement, presumably of Lapwings (*Vanellus vanellus*): these tails result because the glow from each echo takes time to die away (see page 261).

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photographs of these. Plate 46b also shows a moderate number of bird-echoes over the land.

Rain also gives radar echoes, and plate 47a taken at 17.30 hours on 30th March 1958, of the same display as plates 45 and 46a, shows many birds moving E.N.E. to the north of a cold front. Plate 47b, again of the same display but enlarged, was taken at 09.45 hours next day. The centre of the station is blacked out, the opaque bright smears are from rain, and the remaining echoes are from birds. This was a time-exposure, so that each bird-echo appears not as a dot, as in previous pictures, but as a line, this representing successive positions of the same echo and thus showing the track of the bird, though not the direction in which it moved along it. Most of the echoes over the land between west and south of the station were moving N.E., and most of those out to sea between north and east of the station beyond a range of 45 miles were moving E.N.E.; these were the remains of a typical morning emigration. But out to sea inside 45 miles from the station was a dense group of echoes moving about W.N.W. The comparatively short range at which they ceased to be detected suggests that the birds concerned were flying lower than those on the eastward emigration (but they could not have been really close to the waves, or they would have been out of radar range). I earlier postulated (Lack, 1959) that this north-westward movement was part of the big drifted arrival of Continental night-migrants into eastern Britain in the period concerned (Ferguson-Lees, 1958), but observations in late March 1959 showed that north-westward arrivals also occur at this season with westerly winds when drift from the Continent can be excluded, finches (*Carduelis* spp.) and Meadow Pipits (*Anthus pratensis*) probably being involved. Hence my early conclusion that this was an instance of down-wind drift must unfortunately be regarded as unproven, though it may well have been correct.

Plate 48a, taken at a different radar station, was a $\frac{1}{2}$ -hour time-exposure, and shows bird-echoes moving north-east out to sea, also a large belt of rain which was travelling 10 degrees east of north; hence the birds were not moving directly away from the rain. While directions can be obtained photographically by a time exposure, and on an actual display by tracking individual echoes, they are most quickly obtained on the present type of radar equipment in another way. The glow from each echo persists for some time, so that previous positions of the same echo are normally visible as a "tail" to the main echo in the direction from which it has come. After-glow tails are not easily photographed, but can be seen in the enlarged portion of a radar display in plate 48b. The birds are arriving west in June and are presumably Lapwings (*Vanellus vanellus*).

MAIN ORNITHOLOGICAL FINDINGS

The following are some of the main ornithological findings so

far, most of which are being published in detail in *The Ibis* (Lack, 1959), while others have not yet been written up.

(1) Radar confirms that the migration visible by day may be not merely incomplete but also unrepresentative of what is passing overhead. For instance, depending mainly on the wind, sometimes much and sometimes nothing was visible of the big eastward emigrations from Norfolk on April mornings in 1958. Further, the direction of migrants flying within visual range is sometimes different from that of birds migrating high up. It follows that great caution is needed in interpreting results from visible migration.

(2) Radar similarly confirms that the grounded night-migrants seen next morning represent a variable fraction of those which came through the area during the night. A particularly good instance of this occurred in September 1958, when on four different occasions I observed by radar fairly large south-westward arrivals from the North Sea into Norfolk during the night and morning. On the first of these movements there was a big "fall" of Continental night-migrants, many individuals and species alighting in the bushes at Blakeney Point, on the second a moderate number and variety were seen there, on the third extremely few were seen, and on the last none—though Redwings (*Turdus musicus*) and Fieldfares (*T. pilaris*) were heard at night.

(3) The density of bird-echoes on a radar display provides an objective measure of the volume of migration. This measure is on an arbitrary scale which cannot, so far as I can see, be related to the true number of birds in the air. For one thing, echoes from single birds and small flocks cannot be distinguished, nor can those from different species. There is also a gap in the radar coverage since birds flying just above the waves are not detected; and at the same time echoes from other objects, such as rain, may obscure those from birds. Otherwise, however, the radar record is complete, and this allows one to establish (a) the main patterns of migration through the year, and (b) variations in the volume of migration due to the weather and other factors. With respect to (a), it is important to have simultaneous visual observations, and my radar findings in Norfolk have been fully discussed with R. A. Richardson of Cley Bird Observatory, to whom I am most grateful.

(4) The three biggest migratory movements of the year in the southern part of the North Sea are demonstrated, by combining the results from more than one radar station, in Figs. 1, 2 and 3, prepared from photographs by Research Branch, Fighter Command, and reproduced by their permission, as well as that of the Royal Society in whose proceedings they have previously appeared. Fig. 1 shows a typical eastward emigration across the North Sea on a spring night. Note, however, that in the Pas de Calais the main movement over the land was north-east. Fig. 2, on an October morning, shows a big south-westward immigration,

but also a movement W.S.W. My own later inspection of the photographs on which this was based revealed clearly that two different movements were involved, one with a mean direction near to S.S.W., which presumably left Norway around dusk, and the other with a mean direction near to W.S.W., which presumably left northern Holland around dawn. Note that some of the birds on the S.S.W. movement passed through the Straits of Dover and evidently did not make their landfall until they reached France.

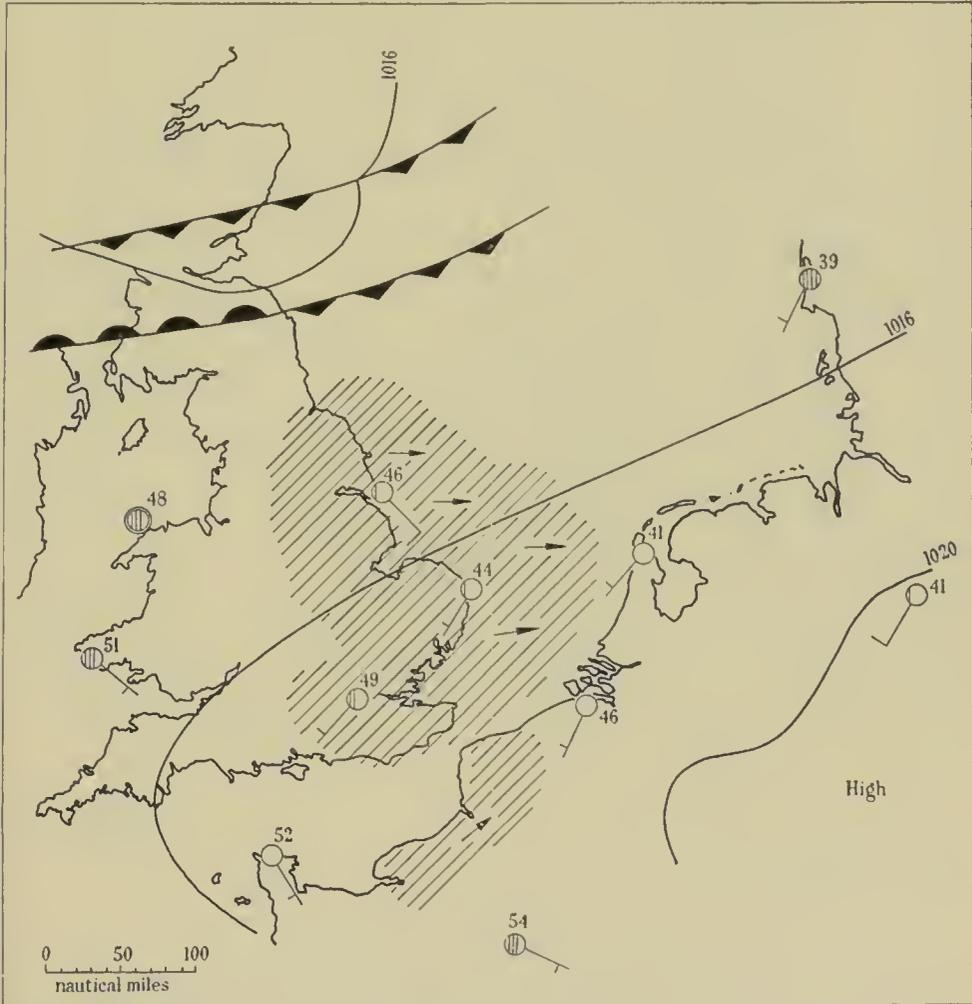


FIG. 1.—A TYPICAL EASTWARD EMIGRATION IN SPRING, AT 20.00 HOURS ON 3RD MARCH 1957

For discussion see page 262.

This often happens on movements of this type and, on the assumption that the birds concerned came from Norway, means that they had a sea-crossing of about 600 miles. Fig. 3, on a morning in mid-December, shows a westward immigration to Norfolk and a south-westward movement along and off the Belgian coast and the Pas de Calais. It occurred during cold

weather on the Continent, so might be termed a "hard-weather" movement, though a similar pattern is often observed in late October and early November.

In addition to these three main movements, radar plotted movements off Norfolk north-westward in spring and south-east-

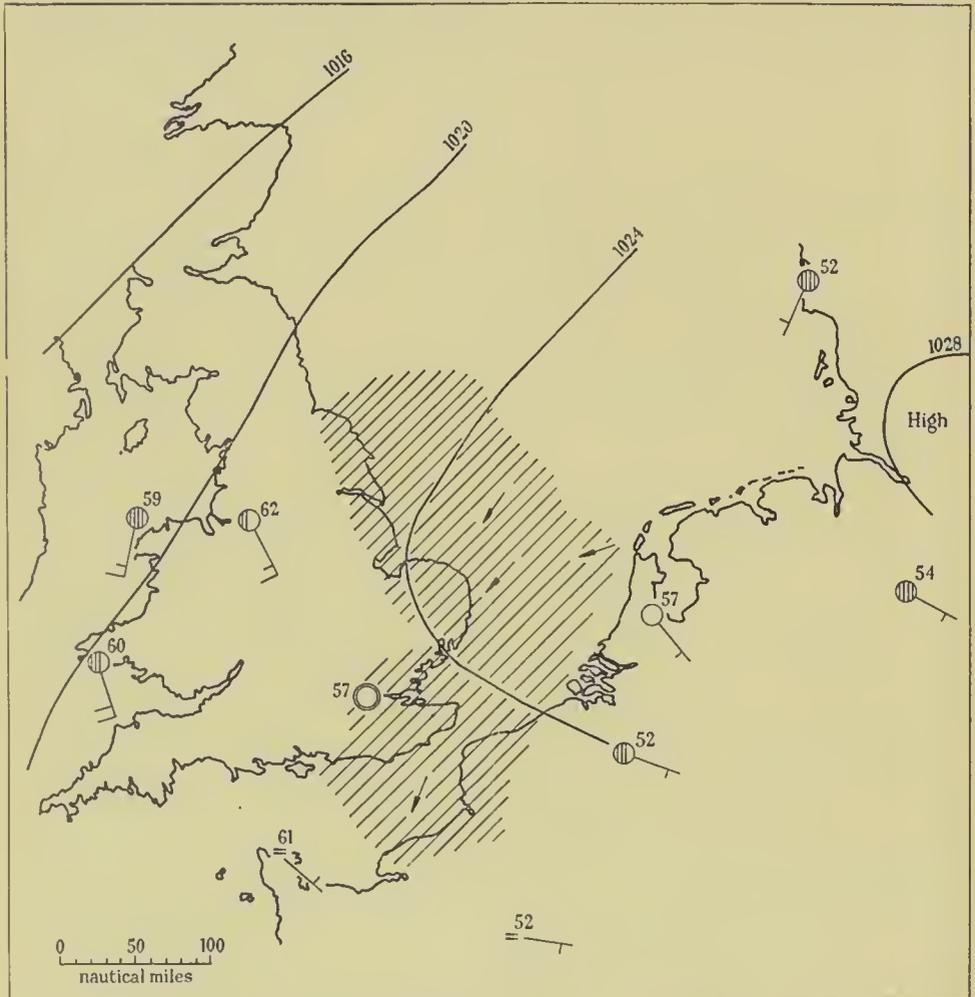


FIG. 2—A TYPICAL SOUTH-WESTWARD IMMIGRATION IN AUTUMN, AT 10.00 HOURS ON 15TH OCTOBER 1957

Two separate movements are involved here, S.S.W. and W.S.W., presumably of birds which left Scandinavia at dusk and Holland at dawn respectively (see page 263).

ward in autumn, presumably of British summer residents, but they are smaller than those of the British winter residents shown in Figs. 1-3.

(5) The amount of spring emigration from East Anglia in March and April 1956-58 was large with clear skies, light winds and warm weather, and small with rain, clouds, high wind and

cold, while it was unaffected by pressure-pattern and wind-direction as such.

(6) Nocturnal emigration usually reached its peak out to sea between 21.00 and 22.00 hours, while the morning emigration



FIG. 3—TYPICAL WESTWARD AND SOUTH-WEST MOVEMENTS IN COLD WEATHER, AT 14.30 HOURS ON 12TH DECEMBER 1955
For discussion see page 263.

was usually densest about an hour after sunrise. In spring, emigration was usually much heavier by night than by day, but in autumn westward immigration was about equally dense by night and day.

(7) All night movements and nearly all day movements were on a broad front, and radar provides no support for the view that night-migrants follow coast-lines, though big coasting movements were sometimes tracked by day in autumn.

(8) An analysis of the directions of emigration over the sea in relation to the wind showed that, in clear and fairly clear weather by both day and night, the track could best be interpreted

as the resultant between a heading maintained by the bird and lateral displacement by the wind. In spring, for instance, the track was almost always north of east with a southerly wind and south of east with a northerly wind. This is the commonest type of "drift", indeed it is invariable in fine weather, but it is not the type usually responsible for big drifted "falls" at bird observatories, which seem to be associated with overcast weather.

(9) On 17th April 1958, a big evening emigration rather north of east later met widespread drizzle at sea, and thereafter no steady tracks were obtained, the birds clearly being disoriented. Under such conditions they would gradually drift down-wind (but as the wind was light and individual echoes could not be tracked for long, a down-wind drift would not have been detectable by radar). Since the birds might well be tired if they flew in this way all night, this type of drift could be responsible for big "falls" at observatories, though there is as yet no direct evidence of this.

(10) I have been personally present at a radar station during two big drift-arrivals of night-migrants into Norfolk, which is not, of course, enough to justify any generalization. As already mentioned, during the drift-arrival at the end of March 1958 many bird-echoes, presumably but by no means certainly from this movement, travelled north-west, i.e. down-wind. But the passage appeared to differ from Williamson's picture of down-wind drift in not being very close to the waves. Further, though for much of the time there was a cold front or fog at sea, it seems almost certain that the sky was clear enough to see sun or stars during part of the time when this movement occurred.

On the second movement, in the first week of September 1958, there were clear skies and south-easterly winds. The bird-echoes that I presume to have been from the drift-movement moved south-west, so the track of the birds was presumably a resultant between their normal southerly heading and the wind. The puzzling feature about this movement is not the direction taken, which was that to be expected with a laterally displaced movement, but the fact that so many of the migrants alighted on arrival, suggesting that they had come a long way. I should add that, throughout the period concerned, there were simultaneous westward arrivals corresponding to dawn and dusk departures from northern Holland, but these birds travelled high and fast, and I infer that they were waders and not the Passerines of the drifted movement.

(11) Following both big drift-arrivals, movements were tracked by radar in early April heading south-eastward and in September eastward, which must, I think, have been redetermined movements of the same birds correcting for their previous drift.

I would in conclusion stress that experience and judgement are needed in observing and interpreting radar data, just as they are

needed for all other forms of bird-watching, and I would not want the reader to think that, because a new and highly technical tool of research is being used, the conclusions based on it are infallible. Difficulties in observation arise particularly when two movements take place simultaneously, and difficulties in interpretation in relating the radar record to the ornithological situation.

SUMMARY

After a brief history of bird-detection by radar, photographs of bird-echoes under different conditions are described, and the main ornithological findings so far are reviewed.

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NOTES

Display flight of Bitterns.—On 18th May 1959, at midday, I saw three Bitterns (*Botaurus stellaris*) rise from a reed-bed near Walberswick, Suffolk, and mount in a fresh N.E. breeze to a height which I estimated to be 600 or 700 feet. Not much wing-flapping was needed. For about 10 minutes they remained circling, repeatedly performing two actions which I have not seen described in any work of reference. One was for a bird to fly immediately above another and appear to attempt to rest on its back: this was so marked that one of my companions asked if Bitterns mated in the air. The other was for one bird to fly up behind another

and then, stretching its neck, either to peck or stab (it was too high to see whether the bill was open) at its tail; in so doing, it lost way each time and fell considerably behind.

Both these actions were performed four or five times, after which all three birds planed down and landed in the reed-bed, two close together and the third probably a hundred yards away.

G. B. G. BENSON

Flightless condition of Common Scoter.—On 3rd November 1957, while walking over the sands at Humphrey Head, Grange-over-Sands, Lancashire, my son and I picked up one male and two female Common Scoters (*Melanitta nigra*), all of which were practically flightless with primaries partially sheathed. They bore no trace of oil and were in good condition: they were caught only after we had cut them off from the water and driven them inland. Three other observers have told me of Common Scoters in a similar state. Mr. J. A. G. Barnes has seen birds in this condition, at the same time of year, on the Kent estuary. Mr. Robert Spencer found and ringed an immature female, with primaries in complete moult, on the Blackwater in Essex on 3rd November 1951: there was no trace of oil and it was apparently in perfect health, but it was recovered dead 2 miles away four days later. Finally, Mr. H. Shorrock recorded completely flightless Common Scoters on six occasions during 1952-57 on the Lancashire coast, 10 birds being involved altogether: one of these was an adult male (30th October) and the rest were females between 1st and 19th November, except for one on 26th March.

R. W. ROBSON

Early roding of Woodcock.—On 30th March 1957, near Milford, Surrey, while searching for the nest of a Woodcock (*Scolobax rusticola*), A. Smith and I were very surprised to find the broken shells of eggs already hatched. The female must thus have begun to incubate not later than the beginning of the second week of March and, in fact, the evidence led us to the conclusion that she must have started to lay in the closing days of February.

In early 1958, as the weather in the first few weeks of the year seemed to be following the same favourable pattern as in 1957, we decided to visit this same area each week-end from 1st/2nd February to ascertain when the roding began. There was no activity that week-end or during the 8th/9th, but by 15th February we found that roding had started. That same evening we moved to another section of woods about a mile away, where A.S. had noted roding the previous summer, and here also we found that a Woodcock had already begun this display flight.

L. J. RAYNSFORD

[It will be remembered that, following the unusually mild winter and early spring of 1957, a number of species laid their eggs somewhat earlier than normal in that year—see “Early breeding in 1957”, by M. J. Goodacre and David Lack (*antea*, pp. 73-83). The above record was included in that analysis.—Eds.]

Adult male Cuckoo being fed by Dunnock.—On 18th June 1959, at about 7 p.m., I saw a Cuckoo (*Cuculus canorus*) perched on a fence post at Reydon, near Southwold, Suffolk. It was an adult male with clearly defined grey throat and no buff below. It was repeatedly uttering a thin drawn-out note, and the bright red inside to its mouth showed very clearly. As I watched, a Dunnock (*Prunella modularis*) landed on the post and fed it. A few seconds later this was repeated, either by the same or another Dunnock. At this point I unfortunately alarmed the Cuckoo as I sat down, and it flew swiftly away.

G. B. G. BENSON

Swallows following man to catch insects disturbed from ground.—I was interested in Mr. H. G. Alexander's observations on the Swallow (*Hirundo rustica*) which persistently followed him. I think that the habit may be not uncommon, as I have often seen similar behaviour (sometimes involving cattle and machines also), but unfortunately I have never made such pertinent observations and experiments as he did. I saw this behaviour in very marked degree in Libya in April and May 1942, during or after dust-storms which had "grounded" flying insects. The many migrating Swallows then appeared weak for lack of food and desperate to obtain it. At such times they would fly close to and even flutter around one's feet as one walked, and attempt—usually without success—to seize disturbed Painted Lady butterflies (*Vanessa cardui*) before these dropped again to cover. In good weather these butterflies were ignored. The Swallows would also eagerly try to seize cicadas (Cicadidae) thrown into the air, but they were unable to hold these large insects in their short bills. Spotted Flycatchers (*Muscicapa striata*) caught, held and carried off cicadas thrown to them without much difficulty.

A weak and starving young Swallow picked up in an army camp in Egypt in 1942 showed how quickly individuals of this species can learn to "put two and two together" in such matters. After only two flies had been swatted and then given to it, it flew at once to the third man it saw swat a fly (in a large tent with several men inside it) and begged to him before he had even had time to lift the swatter from his victim. Until satisfied, the Swallow continued to fly at once to whichever person it saw strike with the swatter.

DEREK GOODWIN

Woodchat Shrike killing mouse.—On 9th October 1958, an immature Woodchat Shrike (*Lanius senator*) which R. J. F. Child and I had under observation in a large garden at Portslade, Sussex, was seen to fly down to a vegetable patch and there kill a fair-sized mouse with two swift stabs of its bill. It then carried the rodent in its bill, by the head, to some trees near-by; there we saw it pecking fiercely at the corpse. In *The Handbook* (Vol. I, p. 286) mice are not listed among the recorded prey of *L. s. senator*, although (p. 289) they are included for the Corsican race (*L. s. badius*).

B. A. E. MARR

Great Spotted Woodpeckers killing nestling tits.—With reference to the recent note by Messrs. R. A. O. Hickling and I. J. Ferguson-Lees on predation by Great Spotted Woodpeckers (*Dendrocopos major*) on nestlings in nest-boxes (*antea*, pp. 126-129), it may be of interest if I report some observations made at Possingworth Park, Sussex, in the spring of 1959. The park consists of some 200 acres of mixed woodland and scrub, with an additional 60 acres of grazing. In part of the wooded area 122 nest-boxes were erected in the winter, the distances between them varying from 50 to 250 feet. These were speedily occupied by 56 pairs of Blue Tits (*Parus caeruleus*), 25 pairs of Great Tits (*P. major*), 2 pairs of Coal Tits (*P. ater*), 1 pair of Marsh Tits (*P. palustris*) and 3 pairs of Nuthatches (*Sitta europaea*). The area contained about 4 pairs of Great Spotted Woodpeckers.

The first sign of typical woodpecker damage to the nest-boxes was noted in early March. On 17th April a Great Spotted Woodpecker was seen enlarging the entrance hole of a box containing the eggs of a Blue Tit. In the territories of two pairs of Great Spotted Woodpeckers at either end of the park the attacks on nest-boxes soon multiplied and in some later instances the damage was extensive. This increase coincided with the hatching of the tits' eggs and it continued until the young were on the point of flying.

On 27th May the remains of a newly-hatched Blue Tit were found on the roof of a damaged nest-box which still contained eight out of the original ten nestlings. On 31st May a box which had held twelve young Blue Tits aged twelve days was found badly damaged, with the remains of the nest on the ground. Two adjacent boxes were similarly attacked: one contained only two of the original ten nestlings and part of the nest had been pulled out; the other box, which had contained twelve young Blue Tits aged 10-11 days, was empty and the nest was on the ground.

The total number of boxes attacked in the two areas during the breeding season was 13, of which 6 had had the entrance holes enlarged sufficiently to enable the woodpeckers to insert either their heads or their whole bodies. In all instances but one the boxes contained Blue Tits; in the remaining case a brood of young Great Tits survived in spite of the entrance-hole of their box being greatly enlarged, possibly because of the greater ability of the larger species to harass the intruder. Elsewhere in the park the boxes were undamaged and it was assumed that the other pairs of Great Spotted Woodpeckers had not yet learned the habit. When they do so, as seems inevitable, the losses may become severe.

During the month of July, i.e. after all the young tits had flown, the entrance holes of several additional nest boxes were attacked by Great Spotted Woodpeckers. It would be interesting to know whether the attacks represent a deliberate search for nestlings as food, or whether the mere sight of a hole in a nest-box has an irresistible attraction for the woodpeckers. I have previously

observed only one other instance in which young birds have been killed by Great Spotted Woodpeckers. This was in 1958 when a brood of young Great Tits was lost and the nest pulled out of a box in my garden at Woldingham, Surrey. GUY MOUNTFORT

[We should like to take this further opportunity of drawing attention to the British Trust for Ornithology's Great Spotted Woodpecker Enquiry, organized by Mrs. P. V. Upton, Park Lodge, Margaretting, Ingatestone, Essex (see *Bird Study*, vol. 6, pp. 28-29). Apart from investigating the question of attacks on nest-boxes, the Enquiry is concerned with the present status of this species in the British Isles and with its apparently increasing practice of visiting bird-tables. We hope that the publication of the above note will encourage anyone who may have any relevant observations, past or present, to get in touch with Mrs. Upton. —EDS.]

RECENT REPORTS AND NEWS

By KENNETH WILLIAMSON and I. J. FERGUSON-LEES

The items here are largely unchecked reports, and must not be regarded as authenticated records. They are selected, on the present writers' judgment alone, from sources generally found to be reliable. Observers' names are usually omitted for reasons of space and in case a report is subsequently rejected, and none of the items will be mentioned in our annual Index. Readers are asked to submit anything of interest as quickly as possible.

This summary covers the months of May and June and follows the one published in our June number (*antea*, pp. 203-204). It is hoped to deal with the months of July and August in our next issue.

UNUSUAL BIRDS IN EARLY MAY

A few geese stayed into May in the south. A Barnacle (*Branta leucopsis*) remained at Lundy (N. Devon) from 26th April to 5th May, and there were 5 of the same species at Hanningfield Reservoir (Essex) during 2nd-3rd May; a week later, on the 9th, a party of 4 appeared at Pitsford Reservoir (Northamptonshire) and 3 of these were still there on the 11th. A Whitefront (*Anser albifrons*) was at Sheppey (Kent) on 2nd May and a solitary Pink-foot (*A. brachyrhynchus*) at Gosforth Park, Newcastle-upon-Tyne, next day. Kent also produced a Brent Goose (*B. bernicla*) on the 13th, near Sittingbourne.

Other latish winter-visitors about this time included a Great Grey Shrike (*Lanius excubitor*) at Cley (Norfolk) on 1st May, joined by another on the 3rd; 3 Lapland Buntings (*Calcarius lapponicus*) at Fair Isle on the 1st; an immature Iceland Gull (*Larus glaucooides*) at Farlington (Hampshire) on the 3rd; an adult Glaucous Gull (*L. hyperboreus*) at Teesmouth (Co. Durham) on the 12th; and 4 Little Auks (*Plautus alle*) flying east past St. Catherine's Lighthouse (Isle of Wight) on the 17th. In Fife, where Little Gulls (*L. minutus*) winter in some numbers (*antea*,

vol. xlvii, pp. 170-172), as many as 42 of these birds were seen in the last week of April and some remained until at least 7th May. Little Gulls were also seen at Walberswick (Suffolk) on the 1st and at Portland (Dorset) on the 3rd and 5th; at Portland, too, an adult lived in the colony of Kittiwakes (*Rissa tridactyla*) from mid-May until 25th June.

Among rarer birds, Spurn (Yorkshire) reported a Mediterranean Gull (*L. melanocephalus*) on 2nd May, and 7 Gull-billed Terns (*Gelochelidon nilotica*) were identified at Poole Harbour (Dorset) on the 3rd. There was a Dotterel (*Charadrius morinellus*) at Cley on the latter day, and a female Little Bustard (*Otis tetrax*) was found on Salisbury Plain, near Everleigh (Wiltshire), on the 5th. A Spoonbill (*Platalea leucorodia*) visited Minsmere (Suffolk) on the 6th, and from the 6th to the 17th 1-2 Collared Doves (*Streptopelia decaocto*) remained on Bardsey (Caernarvonshire): this is the most northerly observation of this species on the west side of Britain so far. The most interesting Passerines of this period were a Moustached Warbler (*Luscinia melanopogon*) at Lundy on the 2nd; a Woodchat Shrike (*Lanius senator*) at East Chaldon (Dorset) on the 3rd; a Rustic Bunting (*Emberiza rustica*) trapped at the Isle of May (Firth of Forth) on the 6th; and two Red-throated Pipits (*Anthus cervinus*) at Lundy on the 7th, one being trapped the following day. An inland Bluethroat (*Luscinia svecica*) was seen at East Malling (Kent) on the 4th; earlier there had been one at St. Catherine's (Isle of Wight) and a probable at Portland on 25th April. There was also a Water Pipit (*Anthus s. spinoletta*) in summer plumage at Island Barn Reservoir (Surrey) on 3rd May; Blue-headed Wagtails (*Motacilla f. flava*) at Spurn on the 2nd, at Fair Isle on the 5th and at Cley on the 6th; and a Grey-headed Wagtail (*M. f. thunbergi*) and a Greenland Redpoll (*Carduelis flammea rostrata*) at Fair Isle on the 6th.

BLACK TERNS—THE FIRST INVASION

May was notable for two big invasions of Black Terns (*Chlidonias niger*), one at the beginning of the second week and the other in the fourth; and it was also of interest for the variety of eastern and south-eastern rarities which occurred, particularly in East Anglia, during the same two periods.

The first of these spectacular influxes began on the 9th—a Saturday, it is true, but as not a single bird has been reported to us for the previous day the sudden onset of the movement appears to be genuine enough. The figures for most places were small on that day, with Essex showing the biggest number: there there were 26 at Abberton Reservoir and independent observers recorded 12 and 28 at Hanningfield Reservoir, which suggests a build-up during the day. A few reached Yorkshire (3 in the Aire valley, 2 at Halifax, 1 at Doncaster), but the area of England involved on this day was evidently small and Northamptonshire (18 at Pitsford) and Leicestershire (9 at Eye

Brook) were the most westerly counties from which Black Terns were reported.

On the next day, however—the 10th—an increase and general spread were apparent. Single birds in Radnor and Glamorgan, three in Shropshire and 11 in Somerset (Chew Valley Reservoir, 6.55 p.m.) indicated an extension westwards. To the north, there were more reports from Yorkshire and a single bird was noted at Teesmouth, on the border of Co. Durham. In Leicestershire numbers at Eye Brook rose to 30-40 and in Northamptonshire at Pitsford to 58—the latter accompanied by 24 Common or Arctic Terns (*Sterna* sp.), an unusual number for an inland reservoir. Other midland counties like Nottingham (15 at Attenborough) and Bedford (5 at Stanford) had a share in the movement on this day and, in the south, the first ones were noted in Kent and Sussex while at Portland (Dorset) 27 were seen moving eastwards past the Bill. Black Terns, some 80 in all, were also moving eastwards at Cley (Norfolk).

Next day, Monday the 11th, saw a general movement back towards the east coast, though numbers were still good over a wide area. Yorkshire, for example, had observations of 9, 12 and 18: 11 of the 18, in the Aire valley near Leeds, were seen heading off very high to the east. There were no reports from the west of England or Wales, however, and the Pitsford total was down to 20. Swithland Reservoir (Leicestershire) had 10, but otherwise only ones and twos were reported from the Midlands. A dozen were seen at Staines and King George VI Reservoirs (Middlesex), apparently travelling east, and at Wisbech sewage-farm (Norfolk/Lincolnshire border) small parties were passing north-east towards the Wash most of the day. 10 at Cley and 17 at Rockland Broad (Norfolk) were otherwise the biggest numbers reported from East Anglia that day.

By the 12th the invasion was virtually over, the only reports to reach us being 12 at Tring (Hertfordshire), 8 at Rockland Broad and one at Eye Brook Reservoir.

The main thrust of the terns, judging by their distribution on the 9th, was across the southern sector of the North Sea, and it seems fairly clear that they came in on the light easterly winds, like the rarities which appeared at this time.

RARER BIRDS IN MID-MAY

At this period, with a high over the Baltic and an easterly air-stream across central Europe, the wind was generally light easterly along the North Sea coasts; southwards, in France, conditions varied from calm to light southerly and cloud-amounts were small. Thus the weather was excellent for migration, but there was no big Passerine movement on our east coast and, next to the Black Terns, events were dominated by rarities of eastern and south-eastern origin. The first day of the Black Tern invasion saw the arrival at Cley (Norfolk) of a Spoonbill, a Purple Heron (*Ardea*

purpurea) and a male Red-footed Falcon (*Falco vespertinus*); and on the 10th there followed a Crane (*Megalaranis grus*) and an Avocet (*Recurvirostra avosetta*)—while an Osprey (*Pandion haliaëtus*) was seen not far away, at Snettisham.

A Black Stork (*Ciconia nigra*) came in from the sea at Cullernose Point (Northumberland) on the 10th. A Bee-eater (*Merops apiaster*) at Wimborne (Dorset), a Kentish Plover (*Charadrius alexandrinus*) at Cley and 22 Pomarine Skuas (*Stercorarius pomarinus*) passing Dungeness (Kent) were the most noteworthy birds of the 11th, and on the 12th two Gull-billed Terns were watched flying over ploughed fields between Weybourne and Sheringham (Norfolk).

Blue-headed Wagtails were identified on the 9th at Sheppey (Kent), Abberton (Essex) and Gladhouse Reservoir (Midlothian); but much more remarkable was the occurrence on the 10th of single male wagtails with the characters of Ashy-headed (*M. f. cinereocapilla*) at Perry Oaks sewage-farm (Middlesex) and aboard S.S. *Mahseer* when she was passing the Cross Sands Light Vessel off the Norfolk coast; the former was seen at Perry Oaks on a number of occasions to 12th June. A glance at the weather-map shows that Fair Isle had a south-east "drift-migrant" wind, and interesting arrivals there included a Wryneck (*Jynx torquilla*) on the 9th; a Bluethroat and an Ortolan (*Emberiza hortulana*) on the 10th; and a Wryneck, two Bluethroats, two Ortolans and Yellow (*M. f. flavissima*) and Grey-headed Wagtails on the 11th. On this last day there was also a Wryneck on the Isle of May, and this little group of these birds is of interest in being a full fortnight later than the entry of presumed English Wrynecks into Kent—19th, 21st and 27th April and 1st May at Sandwich Bay, and 2nd May at Dungeness.

Another glance at the same weather-map shows that the Irish Sea stations also had a "drift-migrant" wind—south-south-east from Finistère and north-west France ahead of the cold front of a low nearing Ireland—and this seems to have carried some interesting birds to that region. In addition to several Hoopoes (*Upupa epops*) at various points (we are preparing a separate analysis of this season's Hoopoes and would be glad of all records), an Alpine Swift (*Apus melba*) reached Lundy on the 9th and Golden Orioles (*Oriolus oriolus*) appeared there and at Plymouth (Devon) on the 10th. A Nightingale (*Luscinia megarhynchos*) at Great Saltee (off Co. Wexford) on the 11th, Blue-headed Wagtails at Skokholm (off Pembrokeshire) on the 12th and 14th, and a male Woodchat Shrike at St. Agnes (Isles of Scilly) on the 13th were other interesting Passerines.

As Britain lay under the beneficent influence of an intense anti-cyclone from 12th May, with calms and light breezes everywhere, it is possible that a number of the vagrants which continued to be seen were "left over" from the earlier drifts. On the other hand, it is perhaps equally likely that many were new arrivals because

from the 14th to the 18th, without any appreciable change in the winds (and even allowing for the fact that a week-end is included), the reports of such vagrants increased. There was also increased evidence of wader passage at this time: there had been an unusually large number of reports (for the spring) of Wood Sandpipers (*Tringa glareola*) and Spotted Redshanks (*T. erythropus*), for example, at intervals since the second week of April, but these seemed to reach a peak during the 12th-15th when several Wood Sandpipers were reported from Kent to Northumberland; a Temminck's Stint (*Calidris temminckii*) at Wisbech sewage farm (Norfolk/Lincolnshire) on the 13th and two on Walland Marsh (Kent) on the 15th should also be mentioned.

Reverting to the rarer birds, a female Black-winged Stilt (*Himantopus himantopus*) stayed at Lodmoor near Weymouth (Dorset) from the 14th to the 16th. On the 15th a Great Reed Warbler (*Acrocephalus arundinaceus*) appeared at near-by Portland, another Woodchat reached St. Agnes, a female Bluethroat was seen on St. Kilda and, in Norfolk, there was a Spoonbill at Hickling Broad and a male Red-footed Falcon at Blakeney Point. This last bird may have been the same as was seen at Cley on the 9th, but on the next day, the 16th, a first-summer male was identified at Burton Bradstoke (Dorset) and no fewer than five Red-footed Falcons, 2 males and 3 females, were found in the New Forest (Hampshire). The Burton Bradstoke bird was seen again on the 17th and up to 3 of the New Forest ones remained for the next three weeks. Also on the 16th, there was a White-winged Black Tern (*Chlidonias leucopterus*) at Sidlesham Ferry (Sussex); a Spoonbill at Teesmouth (which stayed till the 24th); an Osprey at Wilstone Reservoir, Tring (till the 22nd); a Red-headed Bunting (*Emberiza bruniceps*) at Skokholm (till the 21st); and a Red-throated Pipit at Fair Isle. Moreover, there was a further trickle of Black Terns on this day, with odd reports in the Midlands and Home Counties and a single bird as far west as Great Saltee (Co. Wexford).

The catalogue continued the next day, the 17th, but with the emphasis back on East Anglia. A Red-throated Pipit at Scott Head Island (Norfolk) brought the May total for this species to four birds (see Lundy and Fair Isle above). There was a Broad-billed Sandpiper (*Limicola falcinellus*) at Wisbech sewage farm, an Osprey at Hickling Broad (Norfolk), a Spoonbill and a probable Icterine Warbler (*Hippolais icterina*) at Easton Broad (Suffolk) and a Goshawk (*Accipiter gentilis*) at Walberswick (Suffolk). A Golden Eagle (*Aquila chrysaetos*) called at St. Kilda. On the 18th Dungeness had a male Red-headed Bunting (and either this or another was seen there on the 22nd). A few Black Terns were reported on the 17th and 18th, chiefly in east coast counties up as far as Teesmouth but also including counties as far inland as Surrey and Nottingham, and there was another peak of Wood Sandpipers on the latter day with observations in Kent, Surrey, East Anglia and as far north as Newcastle-upon-Tyne.

The 19th was apparently a poor day—though the few Black Tern records included 5 at St. Ives (Cornwall) and 2 at Crosemere (Shropshire)—but at least it served to “clear the decks” for better things to come.

FIELDFARES AND FULMARS

Before any discussion of the events of the fourth week, two other matters seem worthy of comment. The first was a crop of late Fieldfares (*Turdus pilaris*) in and after this period. Perhaps the most notable was one at Beddington (Surrey), first seen on 17th May, which stayed throughout June and July. There was also one at Copeland (Co. Down) during the 12th-16th, one on the Calf of Man on the 15th and 2-3 there on the 17th, one at Gibraltar Point (Lincolnshire) on the 20th, one at Holy Island (Northumberland) on the 22nd and, finally, 2 at Spurn (Yorkshire) on the 31st.

The other was the occurrence of a steady *migration* of Fulmars (*Fulmarus glacialis*) past the Isle of May (Firth of Forth) on the 20th, a total of 237 being counted in numbers up to 7 at a time. There was also a report from the Shipwash Light Vessel (off the Suffolk coast) of large numbers in parties up to 5 on the same day, and the coincidence of two curious inland records soon afterwards may perhaps have been connected: on 22nd May single Fulmars were found near Huddersfield (Yorkshire) and near Stourport-on-Severn (Gloucestershire), the former subsequently dying and the latter being sent to Bristol Zoo.

BLACK TERNS—THE SECOND INVASION

On 20th May there began a further period of light easterly winds on the North Sea coasts and perfect weather for migration all over middle Europe. The next few days were completely dominated by Black Terns, a far bigger movement than the first one.

On the 20th there were over a dozen Black Terns as far west as Porthkidney Beach (Cornwall) and up to half that number at places in Leicestershire, Bedfordshire, Norfolk and Surrey. On the 21st there were at least 14 at Tring (Hertfordshire), 15 at Swithland (Leicestershire), 20 at Cley (Norfolk) and 13 flying west between the Hayle estuary and St. Ives (Cornwall), apart from smaller numbers in East Anglia, Surrey, Huntingdon, Nottingham and Gloucester. Then came the three-day peak, with Black Terns widespread and numerous.

During the next three days Black Terns were reported from 23 of the 32 English counties that lie between Lancashire and Yorkshire in the north and Somerset and Sussex in the south. Outside this area no records were received from Scotland, Northumberland or Cumberland, and only one each from Co. Durham (17 at Teesmouth on 22nd) and Westmorland (6 at Sunbiggin Tarn on 22nd); only one record from Wales (4 at Llyn Hilyn, Radnor, on 23rd); and complete negatives from Devon and Cornwall (though it

should be remembered that parties had been seen in the latter county on the previous two days). Doubtless we have not received all the available observations, but we believe we have a sufficiently large percentage to make the following daily totals useful as a guide to the size and duration of the movement:

Wednesday 20th	50	Sunday 24th	440
Thursday 21st	80	Monday 25th	150
Friday 22nd	660	Tuesday 26th	60
Saturday 23rd	1,050	Wednesday 27th	10

The maximum numbers were thus again at a week-end, but the fact that the Friday had the second highest total seems significant and observations from regularly watched areas support the impression that the Friday-Saturday was the genuine peak.

On the 22nd totals of 30 or over were reported from Kent (80 off Dungeness), Essex (70 at Abberton), Norfolk (50 at Cley, 65 at Rockland Broad), Leicester (40 at Eye Brook, 33 at Swithland), Nottingham (40-43 at Attenborough), Cheshire (28-30 at Redesmere) and Gloucester (31 at Witcombe). Thus there were most in the east and south-east but also a fair number in the west, and this pattern was repeated on the next day with greater numbers in the west: on the 23rd the biggest flocks were in Somerset (106 at Chew), Gloucester (70 at Frampton-on-Severn), Warwick (60+ at Shustoke), Lancashire (57 at Pennington Flash), Lincolnshire/Norfolk (180 at Wisbech sewage farm), Cambridge ("hundreds" at Wicken Fen) and Norfolk (50+ at Rockland, 50 at Cley), while other counties with parties of around 20 included Huntingdon, Essex, Nottingham and Yorkshire. On the 24th few were reported from the west and north-west and most parties everywhere were much smaller; thus only Norfolk (120+ at Rockland, 20 at Cley), Hertford (60+ at Tring) and Gloucester (20-25 at Coombe Canal, near Cheltenham) could muster gatherings of over 20, though Surrey (19 at Island Barn Reservoir) and Bedfordshire (15 at Houghton Regis, 13 at Arlesey) were not far behind.

The directions of flight were given in a number of cases: in every instance except one (a single bird flying north in Somerset) arrivals on each day were from the west or south-west and departures were to the east (this applies to records as far north as Westmorland, as far south as Somerset and as far east as Lincoln, Leicester and Norfolk). Black Terns are to some extent night migrants, and in many places numbers were static during the day or dusk departures were seen. However, the Chew total on the 23rd was a gradual build-up from 22 at 10.20 hours and 68 at 12.30 to 87 at 13.20 and 106 at 14.35.

By the 25th the invasion had clearly contracted and the only reports came from East Anglia, Bedfordshire, Berkshire and Nottingham, apart from over 100 in the Lea Valley near the Hertford/Essex border, passing from King George V Reservoir towards Rye Meads. On the 26th the only reports were from

Hertford (50 at Tring), Buckingham, Huntingdon and Norfolk, and on the 27th from Hertford (only 6 at Tring), Buckingham and Lincoln. The invasion ended with 2 at Cley (Norfolk) and 2 at Attenborough (Nottingham) on the 29th.

OTHER INTERESTING BIRDS IN LATE MAY

The east wind lasted from the 20th to the 23rd and was followed, as in the earlier period, by a strong anticyclonic development. The only worth-while drift of the month, a small one, took place during these few days, but in the still and calm period that followed it would appear the rarer extra-limital species continued to arrive.

St. Kilda recorded its first Quail (*Coturnix coturnix*) on the 20th, and a pair of Blue-headed Wagtails appeared on Marazion Marsh (Cornwall): the latter subsequently nested, as did a pair unsuccessfully on the Exe marshes (Devon). There was a further arrival of Bluethroats at Fair Isle, and on the 21st a *Phylloscopus* with a single wing-bar was seen at Cley: this was thought to be a Greenish Warbler (*Ph. trochiloides*) and is of interest in view of the Red-breasted Flycatchers (*Muscicapa parva*), birds of very similar distribution, reported during the next two days (see below). Also on the 21st a Little Gull visited Great Saltee (Co. Wexford), followed there by a Quail, Nightingale and Short-toed Lark (*Calaudrella cinerea*) on the 22nd. A Kentish Plover was at Wisbech sewage-farm (Lincoln/Norfolk) on both these days.

Bluethroats at the Isle of May and Dungeness on the 22nd coincided with the peak of this species (5+) at Fair Isle, where 2 Wrynecks were also seen. There was an influx of Spotted Flycatchers (*M. striata*) and a few Pied (*M. hypoleuca*) on the east coast on 22nd May (as well as a big movement in the Irish Sea—see *Bird Migration*, no. 2) and 2 Red-breasted Flycatchers were found among the commoner species at Holy Island (Northumberland). Red-breasted Flycatchers are rare in spring, but on the same day one was handled on the Shipwash Light Vessel (off Suffolk)—as well as one Pied and one Spotted—and on the 23rd another was found at Spurn (Yorkshire), together with a Bluethroat. Fair Isle still had 5 Bluethroats, mainly new birds.

The 23rd saw the appearance of a Roller (*Coracias garrulus*) at Oxshott (Surrey)—which stayed until the 29th—and a Golden Oriole was heard at St. Margaret's (Kent). This week-end, however, as indeed the previous three days, was mainly notable for an unusually strong wader movement (in addition to the Black Terns). Apart from an increase in Spotted Redshanks, Greenshanks (*Tringa nebularia*) and Ruffs (*Philomachus pugnax*), and another peak in Wood Sandpipers, there were several records of Curlew Sandpipers (*Calidris testacea*), including one as far west as Skokholm (Pembrokeshire) on the 21st and as many as 4 at Wisbech sewage-farm on the 23rd. There were also Temminck's Stints at Wisbech and at Harty (Kent) on the 23rd and 24th respectively. At Cley on the 23rd the limelight was stolen by 5

Avocets and there was another at Foulness (Essex) (which stayed to the 24th), whilst a Spoonbill visited Breydon Water (Suffolk).

Fair Isle had an Icterine Warbler on the 24th—and 4 Blue-throats, again mostly new: one of these was recovered 4 days later (28th May) at Ostend, Belgium. Also on the 24th a White-spotted Bluethroat (*L. s. cyanecula*) appeared at Bluebell Hill (Kent), 2 Blue-headed Wagtails at Spurn, and a Hoopoe at Monmouth: there were many fewer reports of Hoopoes after the first half of May than there had been earlier, but several birds seemed to settle down and breeding was later proved in Kent. On 25th May a Scops Owl (*Otus scops*) was identified on Bardsey (Caernarvonshire) and a Woodchat, the fourth for the month, was seen at Craster (Northumberland). There were also Bluethroats at Dungeness and inland in Wiltshire (at Idmiston, near Salisbury) and an Osprey was seen flying to the south-east at North Cotes (Lincolnshire). On this day, too, the occurrence at Aberlady Bay (East Lothian) of a Wood Sandpiper and a Little Stint (*Calidris minutus*), both unusual in Scotland in spring, typified the wader movement: Little Stints became more in evidence during the next three weeks until on 16th June as many as 8 were seen in the West Riding of Yorkshire.

MAY OUT AND JUNE IN

The last few days of May and the first of June provided a curtain-call of practically all the east and south-east vagrants which had dominated the spring season. Counts of 13 and 15 Black Terns were made at Cley on the 30th and 31st, and single White-winged Black Terns appeared again at Sidlesham Ferry (Sussex) on the 30th and at Grantham (Lincolnshire) on 3rd June. Ospreys were seen at Saxilby (Lincolnshire) and Eye Brook Reservoir (Leicestershire) on the 28th, and at Eastwell Park (Kent) the next day. A single Avocet at Eye Brook on 27th May stayed until the 29th, on which day there was also one at Christchurch Harbour (Hampshire), 5 at the Midrips (Sussex) and up to 6 at Wisbech sewage-farm. Lundy had a Dotterel on the 27th, Fair Isle a *thunbergi* wagtail on the 28th, and Spurn a Bluethroat and a female Ortolan on the 30th. A female Red-footed Falcon at Dungeness on the 28th was probably the same bird as that seen at Lydd-on-Sea (Kent) on the 31st, and what was thought to be a male of this species was watched at Havergate (Suffolk) on 1st June: unfortunately it was seen only in flight in a poor light but, if confirmed, it would have brought the number of Red-footed Falcons reported in under four weeks to a round 10.

A Spoonbill at Minsmere (Suffolk) on 30th May was joined by 3 others next day, and on 1st June there were also 4 at Havergate. At Havergate, too, on the latter day were 2 Temminck's Stints. An Alpine Swift was identified at Hollywell Ponds, near Earsdon (Northumberland), on 31st May, and in the first ten days of June there was a Short-toed Lark at Southwold (Suffolk) on the 3rd,

a Bee-eater at Aymestrey (Herefordshire) on the 5th, a male Woodchat at Foulness (Essex) on the 6th and 7th, a Golden Oriole at Walberswick (Suffolk) on the 7th, and a White-winged Black Tern at Portland on the 7th and 8th. The last brought the spring total of White-winged Black Terns to 5 and thus did the curtain finally fall on four weeks completely dominated by south-eastern species.

THE LAST THREE WEEKS OF JUNE

June provided a scattering of unusual birds, but no significant movements and the rarities were mostly of a different character from those of the previous weeks. Fair Isle continued an interesting run with single Marsh Warblers (*Acrocephalus palustris*) trapped on 12th, 13th and 30th June, and an Alpine Accentor (*Prunella collaris*) on 27th and 28th June. There was also a sub-adult Glaucous Gull there on 11th June and a Red-necked Phalarope, only the third record for the island, on the 18th. Other Red-necked Phalaropes were reported from Sutherland and Lincoln about the same time, and a fortnight earlier from Caithness. A drake King Eider (*Somateria spectabilis*) was seen at St. Ninian's Isle (Shetland) on 24th June; and a party visiting the Flannan Isles (Outer Hebrides) found 2 Quail on the 23rd, a male Red-headed Bunting next day and 4 Crossbills (*Loxia curvirostra*) on the 27th (see below).

Other June records included a Collared Dove at Trethewey, Porthurno (Cornwall), on the 10th; a Crested Lark (*Galerida cristata*) on Bodmin Moor (Cornwall) on the 14th; a Gull-billed Tern at Covehithe Broad (Suffolk) on the 19th; a Whiskered Tern (*Chlidonias hybrida*) at Chew Valley Reservoir (Somerset) from the 22nd to the 25th; 6 Spoonbills at Cley on the 27th; and a male Blue-headed Wagtail at Grangemouth (Stirlingshire) on 22nd June and 4th July. There was an adult Mediterranean Gull at Hove (Sussex) on 30th June and two as yet unconfirmed reports of Sabine's Gulls (*Xema sabini*) in Suffolk and Cardiganshire: the first between Covehithe and Easton Broads on the 19th and 24th, and the second at New Quay "during the week 13th-20th".

CROSSBILLS

The Crossbills on the Flannan Isles were the first intimation we received that there might be a new irruption, though it was not until mid-July that any significant reports came from Fair Isle and the east coast. Since then, however, and particularly since early August, many observations have come in of Crossbills on the move: Fair Isle had up to 50 in late July and sizeable flocks have been seen in various parts of Scotland and England, with a few reports from the Irish Sea and Ireland. We hope to include a preliminary summary in one of our next issues.

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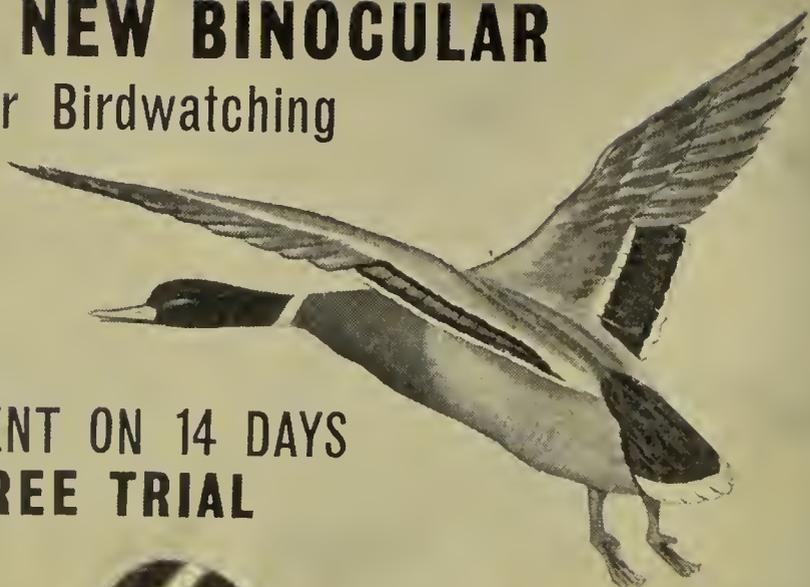
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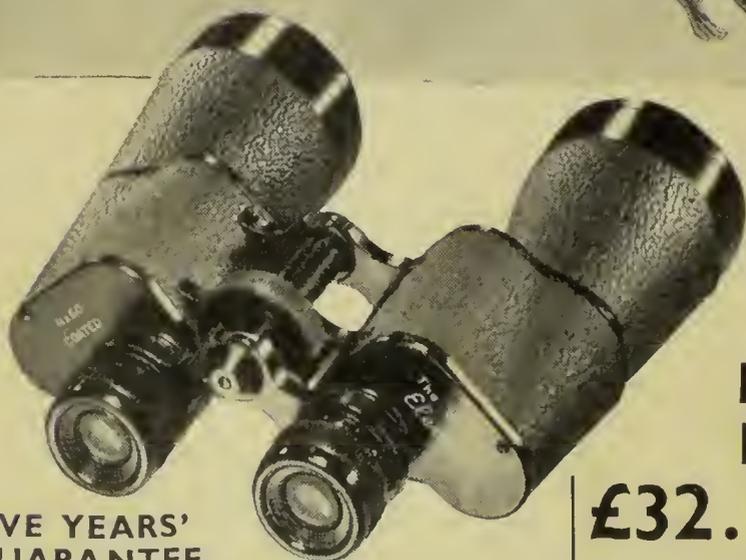
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SEPTEMBER 1959

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BRITISH BIRDS

VARIATION IN A POPULATION OF YELLOW WAGTAILS

By B. S. MILNE

INTRODUCTION

DURING 1957 and 1958 several greyish-headed yellow wagtails, which appeared to be identical in appearance with Sykes's Wagtail (*Motacilla flava beema*) of western Siberia, bred at Beddington sewage farm, Hackbridge, Surrey. Since the discovery by Arnold (1935) of a small breeding colony of similar birds near Eastbourne, Sussex, there have been numerous records of passage and breeding along the south-east coast of England. Other breeding colonies have been reported in the Rother Valley in Sussex (Ticehurst, 1936; White, 1936; Walpole-Bond, 1938) and on a marshland area in south-west Kent (Gregory and Hale, 1942). The Kent colony was particularly interesting as the five breeding males showed a gradation in head colour between *beema* and the Blue-headed Wagtail (*M. f. flava*).

In recent years there has been considerable controversy over this not infrequent occurrence of birds resembling *beema* in south-east England. Most British writers (Harrison, 1945; Tucker, 1949; Smith, 1950) have supported the view expressed by Stresemann (1926) that the various races of yellow wagtails produce mutants closely resembling birds found in distant breeding populations, a phenomenon well known throughout the group. Williamson (1955) exposed many inconsistencies in the "genetical instability" theory and suggested that migrational drift and hybridization might well account for much of the vagrancy found within the group. Recent observations on the Continent and outside Europe (Mayaud, 1952; Meinertzhagen, 1954; Schwarz, 1956; Sammalisto, 1958) have shown that, where the various greyish-headed forms meet, considerable areas of hybridization

occur, these zones having greatly increased the degree of variation found in the local population.

Mayr (1956), in a general review of the situation, drew attention to the complete absence of field-work where the greyish-headed and yellow-headed populations meet and suggested possible lines of study, expressing the opinion that "the field ornithologist will have the last word".

This paper gives details of the field and colour-ringing observations made at the Beddington colony between 1957 and 1959 inclusive.

THE BEDDINGTON COLONY

Beddington sewage farm covers an area of approximately a square mile and consists mainly of grass meadows which are periodically grazed by cattle and flooded with sewage effluent. The Yellow Wagtail (*M. f. flavissima*) is a common passage migrant and breeding bird on the farm. Since 1947 small numbers of *flava* and "flava-type" variants have regularly been recorded accompanying the larger movements of *flavissima*, whilst occasionally birds referable to other races are seen. A breeding colony of *flavissima* is known to have existed there since the beginning of the century (Homes *et al.*, 1957), but details of the numbers involved are extremely vague. Breeding censuses between 1950 and 1955 revealed a fairly stable population of 18-22 pairs, but in 1956, 1957 and 1958 there was a marked increase in the number of breeding pairs. In some years *flava* and "flava-type" variants have remained throughout the breeding season and breeding was suspected, though not proved, in 1950, 1951 and 1952. In 1955 a "flava-type" male bred successfully with a hen *flavissima*.

Degree of Variation at the Colony.

Any field observer who watches the spring migration of the yellow wagtail group at Beddington cannot fail to be impressed by the bewildering variety of colour forms that appear every year. Observations show that there is a complete lack of these variants until the third week of April when typical *flava* arrive, and as a result most field observers have tended to lump the variants together under the non-committal title of "flava-type" variants. It seems desirable in this present study to try to sort through the mass of records that have accumulated over the past ten years, for it is obvious that the birds resembling *beema* are only a small part of a very much larger problem.

Sushkin (1925) suggested it was desirable on taxonomic grounds to separate the yellow-headed races from the greyish-headed races. More recently Grant and Mackworth-Praed (1952) and Williamson (*op. cit.*) have worked along these lines. As our own field observations show agreement with this approach, it is proposed to analyse the records in the two separate groups.

YELLOW-HEADED GROUP

The yellow-heads can be divided into two types:—

- (1) Typical *flavissima*.
- (2) Birds showing a more intense coloration of the crown and resembling the Kirghiz Steppes Yellow Wagtail (*M. f. lutea*).

flavissima—typical birds showing yellow forehead and greenish-brown crown and mantle.

"*lutea*"—six birds present in 1958 showed a marked gradation in head colour, the extent of yellow varying from covering most of the crown to covering the whole crown and nape. These birds did not show the "orange glow" mentioned by Wallace (1955) as being a field characteristic of *lutea*, nor was the mantle brighter than *flavissima*. Williamson, after a critical analysis of the British Museum collection, stated that "many of the more intensely coloured forms of *flavissima* are quite indistinguishable from *lutea*".

GREYISH-HEADED GROUP

The greyish-heads can be divided into four types:—

- (1) Dark-headed birds—typical examples of the Grey-headed Wagtail (*M. f. thunbergi*).
- (2) Blue-headed birds—either typical *flava* or "*flava*-type" variants, many of which show a gradation between *flava* and *beema*.
- (3) Pale blue-headed birds—some closely resemble *beema*, whilst others are not attributable to any of the recognized races.
- (4) White-headed birds—some of which resemble the White-headed Wagtail (*M. f. leucocephala*).

thunbergi—a typical bird of this northern race was recorded on 8th September 1956: dark blue-grey crown and nape, faint suggestion of white eye-stripe behind eye, blackish lores and ear-coverts, white chin.

flava—typical birds with blue-grey crown and nape, complete white eye-stripe, greyish ear-coverts, white chin.

"*flava*-type"—birds falling under this heading are exceptionally variable with seldom two alike, though many undoubtedly fall into the normal range of variation found in *flava*.

type I—the majority of these show a gradation in head colour from blue-grey (as in *flava*) to pale blue-grey (as in *beema*). There is also a gradation in the length of the white eye-stripe, but this bears no simple relationship to the gradation in head colour.

type II—occasional birds show changes in the direction of the northern *thunbergi*, with darkish crowns and ear-coverts and poorly developed eye-stripes.

type III—several birds did not fit into the general pattern of variation described above and extreme examples showed a blue-grey crown as in *flava*, but had a complete yellow eye-stripe and a yellow chin. Some of these birds resembled the form "*Budytes perconfusus*" (see pages 290-291).

"*beema*"—pale blue-grey crown and nape, incomplete white eye-stripe running from above and behind eye, pale grey ear-coverts, pure white chin and throat. Typical *beema* has a complete white eye-stripe, often broader before the eye than in most *flava*.

"*beema*-type"—pale pearl-grey crown nape and ear-coverts, poorly developed pale yellow or white eye-stripe, frequently absent altogether. Pale yellow under-parts, with the yellow being frequently confined to the under tail-coverts only. Sexes are difficult to distinguish in the field. Occasional birds show a tendency towards *flava*, with a more intense blue coloration of the crown.

"*leucocephala*"—a bird with a pure snow-white head was recorded on 15th May 1958. This was considered to be a white-headed *flava* and not an example of the eastern *leucocephala* as the upper-parts were too dark for the latter race.

Meinertzhagen (1956) mentions similar white-headed birds collected by himself and van Someren in Egypt and Kenya, which he considered to be aberrant *flava* and not examples of *leucocephala* or *beema*.

Clearly both the yellow-headed and greyish-headed groups are subject to an abnormal degree of variation with certain individuals being impossible to attribute to any of the recognized races. An examination of the county bird reports for south-east England reveals that the position at Beddington is by no means unique, rather that it is a picture which is true for the whole of this part of the country.

The Colony in 1957.

(a) Spring Migration. Immigration started early, the first male *flavissima* arriving on 27th March, whilst a male *flava* on 8th April was the earliest ever to be recorded at Beddington. During the next two weeks only a few male *flavissima* and the single *flava* were recorded. The main passage began during the third week of April and accompanying a "rush" of *flavissima* on the 21st were three *flava*, two males and a female. By the following day most of these birds had moved on and the next noticeable movement occurred on the 30th. From then until 20th May there were numerous records of *flava*, "*flava*-type" variants and "*beema*". The first "*beema*" was seen on 26th April and subsequently there were many records of single birds, the first "*beema* × *flavissima*" pair being noted on 19th May.

(b) Breeding. In 1957 *ca.* 30 pairs of yellow wagtails were estimated to be breeding on the farm. Eight of the male birds appeared to be almost identical with *beema*, showing the typical pale blue crown and ear-coverts, a fairly conspicuous white eye-stripe running from above and behind the eye and a striking white chin and throat. With one exception all these males were breeding with females which closely resembled *flavissima*, though some observers thought that the eye-stripes of some of them were rather too whitish and well-defined for this race; the only one of these females to be trapped was undoubtedly a hen *flavissima*. The other male was paired with a female almost identical in appearance with the hen of the Norfolk pair portrayed in Smith (fig. 2, plate 6). Subsequently either this bird or an identical female was seen consorting with a male *flavissima*. A "*flava*-type" variant male was breeding with a hen which appeared to be a *flavissima*.

Yellow Wagtails breed over a large area of the farm in a wide variety of sites, but show a marked preference for the water-meadows and the cross-bars of the sludge lagoons. Crop fields, areas of waste ground and the rank vegetation bordering the farm paths are used to a lesser extent for breeding. The results of an enquiry into the bird population (Milne, 1956) showed that the field rotation system of grazing and flooding the grass meadows has disastrous results on the field-breeding population, Yellow Wagtails being one of the species most affected. Three "*beema*

× *flavissima*" pairs are known to have lost their nests owing to the rotation system. Of the remaining four pairs, one bred successfully in a hundred-acre wheat field, and as far as is known the other three bred successfully on partially flooded water-meadows.

(e) Ringing. During the year 78 Yellow Wagtails were trapped and marked with British Trust for Ornithology and colour rings. A simple colour-ringing scheme was used with orange as the key colour; all interesting catches were ringed with individual colour combinations.

Perhaps the chief interest of the "*beema*" males lay in the fact that three of them were noted to be ringed. One of these was eventually trapped and proved to have been ringed at Beddington as a juvenile Yellow Wagtail in 1956. Subsequently this bird was recovered in Portugal. The full ringing details are as follows:

Ringed at Beddington as juvenile Yellow Wagtail on 21st July 1956

Retrapped at Beddington as adult male "*beema*" on 6th July 1957

Recovered near Ovar (Beira Litoral), Portugal, on 15th September 1958

It seems not unreasonable to assume that the other two birds had also been ringed as juveniles at Beddington. Both at least were similarly ringed on the right leg.

Other wagtails trapped included one of the unringed "*beema*", a male *flava* on spring migration, and the "*flava*-type" variant male recorded as breeding.

The Colony in 1958.

(a) Spring Migration. For the second consecutive year immigration began early and the first *flavissima* male arrived on 28th March. During the first two weeks of April numbers steadily built-up until the peak passage started on the 18th, when several "*flava*-type" variant males were seen. The first male "*beema*" arrived on the 26th and two days later five were present. During the first three weeks of May there were the usual records of "*flava*-type" variants, whilst the only *flava* to be recorded on spring passage, a hen, was seen on the 17th. A variant showing white on the crown and nape was seen on the 12th, and on the 15th a pure white-headed bird was recorded.

(b) Breeding. In 1958 ca. 35 pairs of Yellow Wagtails were estimated to be breeding on the farm. For the second consecutive year eight of the males resembled *beema* and were identical with the birds present in 1957. Some of these males were paired with unusually marked females. These females had muddy-brown upper-parts and a complete lack of yellow on the breast; the detailed field description resembled none of the recognized races.

At least five other males appeared to belong to the form considered by some workers to be an interspecific hybrid, "*Budytes merconfusus*" (see pages 290-291). Two of these males were also

paired with muddy-brown females. No “*flava*-type” variants remained to breed, but a male bird resembling the male of the Norfolk pair (*op. cit.*) bred with a hen *flavissima*.

Some of the breeding *flavissima* were noted to be exceptionally yellow on the crown and appeared to be close to *lutea*, whilst three others had almost complete yellow heads and napes. The most remarkable pair present was that in which the male showed a complete yellow head, whilst the female had a faint blue-grey “wash” on the crown but was otherwise similar to a hen *flavissima*.

Breeding success in 1958 was exceptionally low owing to the very heavy rainfall in June (a total of 4.2 inches was recorded in London during the month). A trail of flooded nests and floating eggs left ample evidence of the seriousness of heavy rain at the height of the breeding season.

(e) Ringing. During 1958 work was concentrated on interpreting the results of the previous year’s colour-ringing, rather than on attempting to ring large numbers of new Yellow Wagtails. Green was substituted for orange as the key colour in 1958. Once again three of the eight “*beema*” carried rings. One had a B.T.O. ring only on the right leg and was almost certainly one of the 1957 breeding birds. Orange colour rings on the other two birds indicated they had been ringed as juvenile Yellow Wagtails in 1957.

Numerous colour-ringed *flavissima* returned to breed and these included one of the birds close to *lutea* and one of the completely yellow-headed birds. The “*lutea*” was trapped and in the hand confirmed our field observation that the yellow extended over the greater part of the crown. This bird had been ringed in 1957 as a nestling of normal *flavissima* parents.

The most interesting wagtails ringed during the year were a pair in which the male was of the form “*perconfusus*” whilst the female appeared to be a normal *flavissima*. The male had a pale blue crown “washed” with greenish-yellow, a faint suggestion of greyish in the ear-coverts and a yellow eye-stripe and throat. Colour-ringing indicated that another male “*perconfusus*” had been ringed as a juvenile Yellow Wagtail in 1957.

Recoveries of Beddington-ringed wagtails during the period 15th-19th September 1958 gave an excellent demonstration of the autumn migration route down the Atlantic west coast of Europe. As already mentioned, on the 15th a male “*beema*” was recovered near Ovar, Portugal. On the 17th an adult male *flavissima* was trapped and released at Ushant, Finistère, France, and on the 19th a bird ringed as a juvenile in 1957 was recovered near Fanzeres, Oporto, Portugal.

The Colony in 1959.

(a) Spring Migration. Immigration began on 4th April with the arrival of a single male *flavissima*. On the following day eight

males, including a bird ringed as a juvenile in 1957, were present. The main passage of *flavissima* started on the 17th when a bird resembling *lutea* was also seen. On the 18th a "flava-type" male and the first hen *flavissima* were seen, and on the following day the first male "beema" arrived. Although this "beema" was recorded again on 1st and 2nd May, it was not seen subsequently. Birds resembling *lutea* were seen on several dates in late April and early May, but they did not stay to breed.

(b) Breeding. In 1959 only *ca.* 18 pairs of Yellow Wagtails were estimated to be breeding on the farm. This marked drop was probably in part due to the very low success of the previous season. During May two or three unusually marked birds were recorded, but there was no evidence that any of them stayed to breed; these all showed a pale greenish-blue "wash" on the crown and were considered to belong to the form "*perconfusus*". With the exception of a single hen closely resembling the muddy-brown females recorded in 1958, all the breeding birds were remarkably normal in appearance.

(e) Ringing. During 1959 red was substituted for green as the key colour. Several colour-ringed *flavissima* returned to breed, and these included about six birds ringed in 1957. It seems probable, however, that rather more 1957 birds were in fact present as a pair trapped on 30th May had between them lost a total of three colour-rings put on in 1957. Another limitation of colour-ringing is the marked degree of fading that occurs after a period of two years, some being quite unrecognizable even in the hand.

ARE THE YELLOW-HEADED AND GREYISH-HEADED GROUPS SPECIFICALLY DISTINCT?

With the foregoing to serve as a guide to the events at the Beddington colony, we can now attempt to make a more detailed analysis of the observations and try to answer some of the biological problems posed by the Yellow Wagtail complex. As has already been stated, several workers have separated the two colour groups on taxonomic evidence, but this alone is insufficient grounds for regarding them as two distinct species—the yellow-headed *Motacilla lutea* and the greyish-headed *Motacilla flava*. Williamson (*op. cit.*) showed that the available field evidence supported this claim to specific distinction, but unfortunately there appears to have been an almost complete lack of field study of this problem. Mayr (*op. cit.*), writing on this subject, posed a number of questions to the field worker and it is proposed to take each of these in turn in an attempt to answer them in the light of the observations at Beddington.

"Are they out of step physiologically?"

The arrival dates for all three years suggest that there is a marked difference between those of the two colour groups; the

following averages are based on the records available for the last ten years:

YELLOW-HEADED GROUP	
<i>flavissima</i>	April 3rd
" <i>lutea</i> "	April 12th
GREYISH-HEADED GROUP	
<i>flava</i>	April 19th
" <i>flava-type</i> "	April 21st
" <i>beema</i> "	April 21st

(The date for "*lutea*" is based on two years only, and for "*beema*" on the average for five years.)

Clearly the yellow-heads arrive well in advance of the greyish-heads, and colour-ringing observations in 1958 showed that male *flavissima* have taken up territory and in many cases obtained a mate before the males of the greyish-headed group arrive. This was particularly well demonstrated in one of the years under study. The first male "*beema*" arrived on 26th April and two days later five were present. Less than a week later all the *flavissima* pairs were carrying nesting material and several already had their first eggs. Support for our observations that the yellow-heads move earlier is provided by Boyd (1919) who, whilst watching migration in France at Brie-on-Somme, recorded that on 21st April *flavissima* were moving with *flava* in the ratio of ten to one.

With the later arrival of the greyish-headed birds it is not unreasonable to expect that the whole of their breeding cycle will be correspondingly later. Smith (p. 44) gives a breeding table for *flavissima* in Cheshire and, using this as a guide, the following time-table of events was drawn up for the Beddington colony:

	<i>flavissima</i>	<i>flava-beema</i> variants
(1) Arrival of males ...	April 3rd	April 20th
(2) Arrival of females ...	April 18th	May 3rd
(3) Pair formation complete	April 25th-30th	May 15th-22nd
(4) Nests and first eggs ...	May 3rd-11th	Late May/early June

The significance of this table will be discussed under the next heading for obviously it can have considerable bearing on the question of whether or not reproductive isolation exists.

"Does reproductive isolation exist?"

The question whether or not reproductive isolation exists has caused considerable controversy. Observers on the Continent (Mayaud, 1949; Gladkov, 1954) state that reproductive isolation is achieved where the yellow-headed and greyish-headed groups overlap. Smith (*op. cit.*) took the reverse view and considered the Russian statement to be "rather improbable", whilst Mayr (*op. cit.*) drew attention to the fact that there are enough published records to show that reproductive isolation is not complete and wonders "whether it exists at all".

With the later migration of the greyish-headed group into south-eastern England the stage is set for a state of reproductive

isolation, for, as has been shown, many hen *flavissima* are mated a day or two before the arrival of the greyish-headed males. On the other hand, it must be remembered that the greyish-headed group are on the extreme edge of their breeding range, and Tucker (*op. cit.*) pointed out that in some years of *flava* immigration one or other sex predominates, Williamson (*op. cit.*) stating that this is governed by the operation of North Sea drift. In these conditions it is not unreasonable to expect a number of mixed pairs to occur, for there is a considerable overlap in the arrival of the greyish-headed males and the later hen *flavissima*. It is precisely due to these circumstances that the majority of mixed pairs consist of a greyish-headed male and a yellow-headed female. The chances of the reverse happening are exceedingly remote as the period between the arrival of the yellow-headed males and the greyish-headed females is frequently as much as five weeks, during which time the males will have found a yellow-headed mate.

If our observations hold true for the French channel coast then there is an explanation why no mixed pairs occur at the small remaining isolated breeding colonies of *flavissima*. If male *flavissima* take up territory upon arrival then they have the whole of the passage of hen *flavissima* from which to choose a mate, before the hens of the greyish-headed group have started arriving. Under these conditions a state of reproductive isolation is liable to exist.

Some observers have drawn attention to the fact that the greyish-headed birds attempt to form "closed" colonies despite the close proximity of breeding *flavissima*. Gregory and Hale (*op. cit.*) noted this at the colony in Kent, and in Norfolk Rivière (1941) recorded variants breeding together on an area populated by *flavissima*. At Beddington there was no attempt by the "beema" to form a closed colony, pairs of both colour forms breeding on the same meadows.

"Do *flava* arrive as solid flocks and colonize areas?"

Our observations are in complete agreement with those of Smith that the females of both colour forms arrive 10-14 days after their respective males. Obviously as a result there can be no question of *flava* immigrants arriving as a solid flock, colonizing a breeding area as a flock and then pairing with individuals within the flock. There are, however, a few records where the possibility of birds arriving as a solid flock cannot be ruled out. Perhaps the most striking example was the breeding of two pairs of Ashy-headed Wagtails (*M. f. cinereocapilla*) in Ireland (Ennis and Dick, 1959). The arrival of the birds as a solid flock must surely be the explanation of this remarkable breeding record in the Belfast Docks area, for it seems quite unreasonable to assume that two hen *cinereocapilla* should arrive in the same area a fortnight after two males, when there are only two previous British records.

“How many mixed pairs occur in the area of overlap?”

This is probably the most difficult question to answer for it relies on the field observer accurately identifying the hen birds. At best this is a difficult task, and frequently quite impossible.

Assuming our field identifications to be correct, then several mixed pairs occur in our area of overlap. However, it must be remembered that the Beddington colony raises other problems. Firstly the greyish-headed forms are on the extreme edge of their breeding range, and, as has been shown, other factors may well contribute to the number of mixed pairs that occur. Secondly, during the three years under study not a single hen “*beema*” was recorded, which must immediately throw suspicion on the field observations unless some other fact can be found to explain the phenomenon (see below).

“Are there any ecological differences?”

The peculiar distribution of the yellow-headed birds, *flavissima* in Britain, *lutea* in the Kirghiz Steppes and the Kurile Yellow Wagtail (*M. f. taiwana*) in eastern Siberia, has prompted some workers to look for a common ecological factor between these apparently closely related races. However, on the face of it, these widely separated breeding grounds have little in common, nor are there any obvious ecological preferences between the two colour forms, though Wallace (*op. cit.*) recorded that in Kenya on migration the yellow-headed forms appeared to show a preference for drier ground, whilst the greyish-headed birds occurred in damper localities.

The sewage farm at Beddington presents a marsh area with occasional crop fields and it is not surprising that all pairs showed a marked preference for breeding in the damper localities. Only a single “*beema* × *flavissima*” pair were recorded breeding in the wheat field in both 1957 and 1958. Smith (p. 58) mentions that on the Continent various writers have shown that individual colonies may show a marked preference for certain highly specialized localities. On this evidence it would obviously be unwise to try to draw any conclusions concerning ecological preferences from observations on a single colony.

THE NATURE OF THE INTERSPECIFIC HYBRID

If, as in fact the available biological and taxonomic evidence suggests, the two colour forms should be regarded as distinct species, then with the not infrequent records of mixed pairs breeding in southern England it should be possible to find a colour form which is in fact the interspecific hybrid. Grant and Mackworth-Praed (*op. cit.*) raised to species level, on the evidence of five adult males, the form “*Budytes perconfusus*”. Birds of this form have a yellow or yellowish-white eye-stripe, some yellow on the grey-brown ear-coverts and the blue-grey crown “washed”

with yellowish-green. Williamson, and A. L. Butler who collected two of the birds, considered that this "new species" was in fact an interspecific hybrid, the wide distribution of the known specimens adding considerable support to this suggestion. If their beliefs are correct, and the birds we recorded breeding with the male "*beema*" in 1957 were in fact hen *flavissima*, then it was reasonable to assume that birds of the hybrid form would be present on the farm in 1958. With this aim in view a two-day breeding census was carried out in late May but despite much careful observation no birds suggestive of the hybrid form were found. However, a repeat census five weeks later revealed the presence of at least five males of the hybrid form, colour-ringing indicating that some of these had been passed over in the earlier census as slightly pale *flavissima* males. It was thought that these birds were probably overlooked in May due to the yellowish-green "wash" obscuring the pale blue-grey of the crown. This was subsequently confirmed when one of these birds was trapped and the crown feathers were found to be well worn and showed a mixture of yellowish-green and blue-grey feathers. The hen accompanying this bird appeared in the hand to be a typical *flavissima*. In view of the difficulty of identifying the males of this hybrid form in the field early in the season, it is problematical whether in fact the hens can be distinguished from *flavissima*, and apparently nobody has described the hen of this form. Moreover, the fact that the morphological difference in male *perconfusus* only develops through abrasion rules out the possibility that the *perconfusus* head-pattern could have any selective value, since at mating time it is to all outward appearances a *flavissima*.

Although the bird handled at Beddington closely resembled those obtained by Butler, it is obvious that this hybrid form originating from two known variables must itself be exceptionally variable. The available field evidence at Beddington suggests that while many closely fit into the general pattern described by Grant and Mackworth-Praed, others may show definite tendencies towards one or other of their respective parents. This was particularly well demonstrated by a bird seen on 2nd May 1959. This bird closely resembled a male *beema* but had the crown and ear-coverts "washed" with greenish-blue, and a complete yellowish-white eye-stripe. In view of this wide range of variation it seems probable that several of the birds attributed to "*flava*-type III" in fact represent further examples of the interspecific hybrid.

DISCUSSION

The field observations at Beddington raise a number of practical questions which have considerable bearing on whether or not the greyish-headed yellow wagtails appearing in southern England should be regarded as genuine *beema*. Birds resembling *beema* have been recorded at Beddington in 1953, 1955, 1957, 1958 and

1959, and ringing indicates that, whatever the cause to which the colony owes its origin, there is no doubt that these birds are now arising from the breeding population. The recovery in Portugal suggests that these birds are migrating with *flavissima* down the Atlantic west coast of Europe, presumably to wintering grounds in West Africa. The suggestion put forward by some observers that the Beddington colony is receiving an annual influx of "drifted" *beema* is entirely without foundation as the annual return of birds ringed as juveniles the previous summer clearly indicates. Whilst there can be little doubt that a small number of migrants affected either by drift or migrational drag reach our shores, there is as yet no evidence of the massive drift and resultant gene-flow that would be required to bring about the enormous degree of variation found in southern England.

If, in fact, the "*beema*" colony at Beddington owes its origin to drifted birds, then it is not unreasonable to assume that both males and females will be thrown up by the colony in roughly equal proportions. Yet such is not the case, and during the three years under study not a single hen *beema* was recorded. There can be no question of these birds being overlooked in the field, for Witherby *et al.* (1940) say that hen *beema* "cannot be distinguished from that of *flava*"—a bird which we have never experienced any difficulty in identifying in the field during the spring and early summer—and the complete absence of hen *flava* during the breeding season rules out the possibility of there being any confusion between the two forms. With this apparent complete absence of hen *beema* we must look for another answer to this puzzling problem. Our observations have, of course, been based on the assumption that the hens of the greyish-headed males would in fact look like hen *beema*, but if the males are not genuine *beema* then there is no reason why the hens should resemble *beema*. The available field evidence suggests that the unidentified muddy-brown females may well be the hens of this colour form. These birds showed muddy-brown upper-parts and whitish under-parts with some yellow on the under tail-coverts. Without exception they were all paired with "*beema*" or "*perconfusus*", so it seems not unreasonable to assume that they are connected with the greyish-headed males.

Our observations show quite conclusively that it is the problem of identification of the hens of the yellow wagtail group that is the biggest stumbling block to the field observer, for whilst most of the males fall readily into one or other category, many of the females cannot be attributed to any recognized race and it is anybody's guess to what form they rightly belong. We do not know what the hen of the interspecific hybrid looks like and there appears to be no way of finding an answer until such time as an intensive colour-ringing scheme can be carried out at a mixed breeding colony. The nature of the breeding area at Beddington makes this an unsuitable colony for intensive study.

During recent years much work has been done on the zones of hybridization that occur where the greyish-headed races overlap with each other. These zones have greatly increased the degree of variation in the local population and Sammalisto (*op. cit.*), working on the Fennoscandian population, found that where *flava* and *thunbergi* met he was able to identify on the basis of head colour "variants practically inseparable from nine of the thirteen commonly recognized races of the greyheads". This mass of recent evidence suggests that hybridization alone might well account for much of the apparent genetical instability found in the yellow wagtail group. Our own observations show agreement with this new approach and suggest that the variation found in southern England is in part due to hybridization between the two colour forms. Although some writers have hinted that interbreeding between the two colour forms occurs rather more frequently than the records suggest, there is as yet no evidence that it occurs on a scale large enough to prejudice their claims to specific distinction.

Rather than draw any hard and fast conclusions from the observations at a single colony the various findings at Beddington are best given as a series of inferences:—

- (1) That the new field evidence presented suggests support for the postulate that the yellow-heads (*lutea*) and the greyish-heads (*flava* etc.) are specifically distinct.
- (2) That there is evidence to suggest that the basis of "genetical instability" rests on this interspecific hybridization, of which "*perconfusus*" is clearly one product.
- (3) That, in view of this, the postulate that *M. f. beema* is in anyway regular as a spring drift-migrant to Britain must be discarded. Such is the incidence of variations in the local populations that it would be impossible to detect natural vagrancy of *beema* even if it occurred.

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SUMMARY

1. Details are given of the field-work and colour-ringing

observations made on a breeding colony of variant yellow wag-tails at Beddington sewage farm, Surrey, in 1957, 1958 and 1959.

2. An analysis of the observations shows support for the suggestion, previously based only on museum taxonomy, that the greyish-headed races should be regarded as a distinct species from the yellow-headed races.

3. Observations at the colony show support for the suggestion that "*Budytes perconfusus*" is in fact an inter-specific hybrid.

4. The limitations of the value of field observations are discussed in the light of the difficulty in identifying the hen birds, particularly of the hybrid form.

5. The enormous degree of variation found in the yellow wag-tail group in south-east England is thought to be due to inter-specific hybridization, rather than the result of gene-flow from "drifted" migrants.

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TEST OF AN AUTOMATIC NEST-RECORDER

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VARIOUS DEVICES have been described by various authors for the purpose of registering visiting frequencies by birds to their nests (see Kendeigh, 1952; Gibb, 1956).

An ordinary nest-recorder is most effectively used for those species in which one sex alone is responsible for incubation or feeding young but is less useful when both share the part, not only because it cannot distinguish which sex makes the visit but because, as arrivals and departures by both sexes are not made in regular sequence, confusing figures are often registered, from which even the total number of visits is hard to read.

The apparatus described here was designed for the purpose of

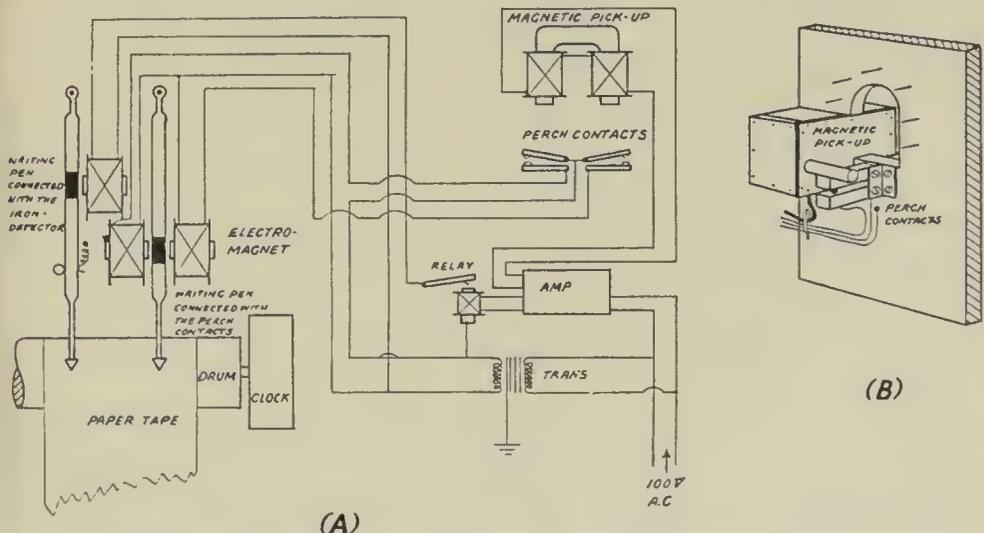


FIG. 1—DIAGRAMS OF THE APPARATUS USED FOR SEPARATELY RECORDING THE VISITS OF THE MALE AND FEMALE GREAT TITS (*Parus major*) TO THEIR NEST, FUJI, JAPAN, JULY 1958

(A) shows the circuit system and (B) a front view of the nest-box equipped with the magnetic pick-up and the perch contacts (see page 296).

recording the visiting activities of male and female separately. A test was carried out at a nest-box occupied by a pair of Great Tits (*Parus major*) at the University Forest in Fuji, Japan, in the summer of 1958.

DESCRIPTION OF THE APPARATUS

The apparatus consists of three main parts, a recording unit, an iron-detector and a double set of perch contacts (Fig. 1). The double perch contact system is, in principle, the same as that adopted by Kendeigh (1952) in his itograph. Two perches are attached to the entrance hole of a nest-box, one outside and the other inside, each with a pair of silver contacts. Each pair of contacts is connected to one of two electromagnets placed in parallel with each other at the recording unit; and a writing pen is set between the magnets. When a bird enters the box the outer perch is pressed down first, with the result that the electric circuit is closed and one of the electromagnets pulls the pen towards it. Next moment the bird gets into the box and presses the inner perch down, so that the other magnet pulls the pen. When the bird leaves the nest the pen moves in the reverse order. Since there is no spring on the pen, it swings freely in each direction and, when once pulled by one of the magnets, remains in that position even after the circuit is opened as the bird leaves the perch. Therefore when a bird visits the nest and leaves it after brooding or feeding the young, a rectangular sidestep in the otherwise straight line drawn by the pen will be registered on the paper tape (see Fig. 2). The length of the gap thus caused in the line indicates the duration of the visit.

The differentiation of one sex from the other can be made by ensuring that some additional mark is registered on the tape when a particular individual arrives at and leaves the nest. The iron-detector system plays this role. The principle here is that when a small piece of iron passes near the magnetic pick-up of the iron-detector, the density of the magnetic flux changes and an electric current thus induced is amplified to operate a relay switch connected to another single electromagnet with a writing pen. This writing pen, unlike the one in the double perch contact system, is balanced by a spring, and after being pulled by the magnet it returns to its original position as soon as the circuit is opened.

An iron-detector made by Sanwa Electric Co. for the purpose of detecting a needle in clothes or a nail in timbers was used in slightly modified form. The pick-up is attached to the nest-box just by the entrance hole, so that a bird bearing iron rings (parmaroy was used in this test) on both its legs cannot enter the box without making the pick-up sensitive to at least one of the rings. (It should be noted that the effective range of the pick-up is so small that the bird with the iron rings must pass as near as possible to the pick-up.)



FIG. 2—SPECIMEN OF THE ACTIVITY RECORD PRODUCED BY THE VISITS OF THE GREAT TITS (*Parus major*) TO THEIR NEST, FUJI, JAPAN, 17TH JULY 1958

This shows the paper tape produced on one day when the oldest nestling was 16 days old. Each gap on the left-hand side of each two-hour section represents one visit to the nest and the size of the gap shows the duration. When the visit was by the ringed female, the iron-detector caused the corresponding marks on the right-hand side of the tape (see page 296). On this day there were 46 visits by the male and 47 by the female.

The recording unit is of a multiple type (see Kendeigh, 1952), consisting of a clockwork-operated drum (which unwinds the paper tape) and five sets of pens and magnets. Three small rubber wheels are brought into contact with the surface of the drum to provide enough pressure and friction to unwind the tape. The clock is adjusted, by removing its pendulum, to move the tape at a speed of 5 mm. per minute which proved to be the optimum for registering the Great Tit's nesting activities.

The recording unit and the amplifiers of the iron-detectors are set in a small hut built in the study area, from which electric cables lead to five nest-boxes placed around at a distance of less than 100 metres; this distance may be the maximum for this type of iron-detector to be effectively operated. 100v. A.C. was used for the operation of the iron-detectors and 10v. A.C. for the operation of the electro-magnets with pen attachments.

RESULTS

The results described here were obtained for the last five days of the fledging period at a nest-box occupied by a pair of Great Tits with seven nestlings. Although the data are incomplete, they are sufficient to show how the nest-recorder works.

The nest-box occupied by this pair of birds was replaced by the one equipped with the recording apparatus on the morning of 14th July when the oldest nestling was 13 days old. The nest and the nestlings were moved to the new nest-box and, at the same time, the female was caught and ringed. Both adults showed hesitation in entering this new nest-box, but they had got used to it by the evening and from the next morning their behaviour became normal again. The female did not show any sign of being affected by the parmaroy rings and the magnetic pick-up.

TABLE I—NUMBER OF FEEDING VISITS PER HOUR MADE BY THE MALE AND FEMALE GREAT TITS (*Parus major*), FUJI, JAPAN, 1958

Age of oldest nestling in days	Male					Female				
	14.5	15.5	16.5	17.5	18.5	14.5	15.5	16.5	17.5	18.5
Hour beginning*										
04.00	0	1	0	0	0	0	1	0	0	0
05.00	0	0	1	0	1	3	3	4	2	4
06.00	3	1	11	7	6	9	1	4	6	3
07.00	10	8	6	2	2	5	7	6	4	6
08.00	7	5	1	6	1	5	6	4	4	1
09.00	1	6	0	2	3	4	3	2	3	0
10.00	7	5	5	2	—	3	1	4	5	—
11.00	6	4	2	2	—	6	3	5	4	—
12.00	4	2	8	4	—	5	3	4	4	—
13.00	5	9	4	9	—	3	5	1	2	—
14.00	1	6	5	3	—	5	6	4	3	—
15.00	5	4	2	2	—	3	6	2	2	—
16.00	7	4	0	3	—	5	1	3	3	—
17.00	1	10	1	5	—	2	6	3	3	—
18.00	5	0	0	2	—	3	0	1	1	—
Totals	62	65	46	49	13	61	52	47	46	14

*Japanese Standard Time (meridian 135°E.) is used throughout this paper.

The visiting frequencies are shown in Table I. The number of nest-visits per day decreased towards the end of the fledging period in the cases of both male and female, and they were a little more frequent in the male than in the female. There is no apparent correlation between the two birds in the numbers of visits per hour except in the morning peaks which occurred between 06.00

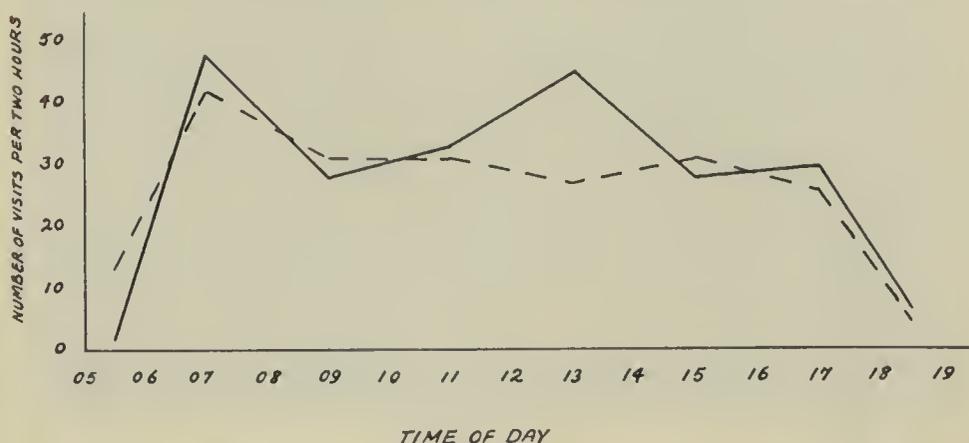


FIG. 3—FOUR-DAY TOTALS OF NEST-VISITS BY THE PAIR OF GREAT TITS (*Parus major*) IN EACH TWO-HOUR PERIOD, FUJI, JAPAN, 15TH-18TH JULY 1958

At each two-hourly point the sum of the visits recorded during the preceding and following hours over four days has been plotted (the figures are given in Table I). The male (continuous line) showed two peaks of feeding, in the early morning and the early afternoon, but the female (broken line) only the former one.

and 08.00 hours every day coincidentally in both sexes. When these daily records are combined (those on the last day, 19th July, not included), there appear two distinct peaks in the visiting frequency of the male; the one in the morning around 07.00 and the other in the afternoon around 13.00 (Fig. 3). In the female, however, only the morning peak is distinct.

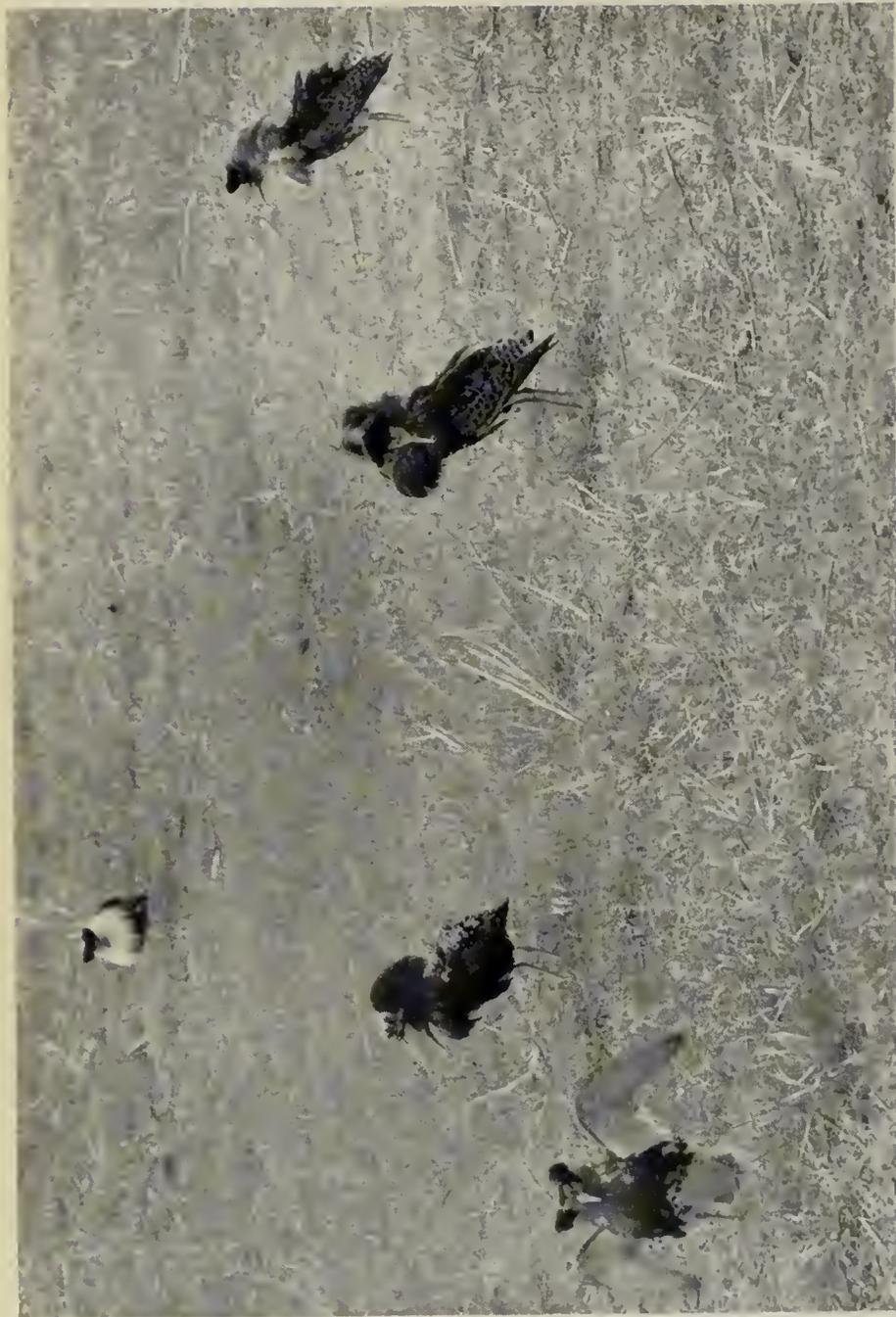
TABLE II—AVERAGE LENGTHS OF NEST-VISITS BY THE MALE AND FEMALE GREAT TITS (*Parus major*) ON EACH OF FIVE DAYS, FUJI, JAPAN, 1958

(a) Averages of all times (in seconds).

Age of oldest nestling in days	14.5	15.5	16.5	17.5	18.5
Male	18.0	25.3	14.2	14.4	12.9
Female	53.6	65.3	30.3	25.6	24.5

(b) Averages of short periods only (long visits of over 1 minute excluded).

Age of oldest nestling in days	14.5	15.5	16.5	17.5	18.5
Male	16.1	14.5	14.2	14.4	12.9
Female	23.0	41.2	19.2	20.3	19.3



C. C. Doncaster

"RESIDENT" RUFFS (*Philomachus pugnax*) ANTICIPATING ARRIVAL OF "VISITORS": NORTH JUTLAND, MAY 1958
 Note the alert and upright posture, with ruffs and head-tufts raised and bills pointed down, which is adopted at the approach of a newcomer. The wing-flap usually heralds a new arrival, the suddenly exposed white undersides acting as a flash-signal which in life is very conspicuous (see page 303). A lek may involve anything from 2-3 to 20-30 or more males, some of which are "residents" whose regular stands become worn and bare patches a foot or two in diameter.



C. C. Doncaster

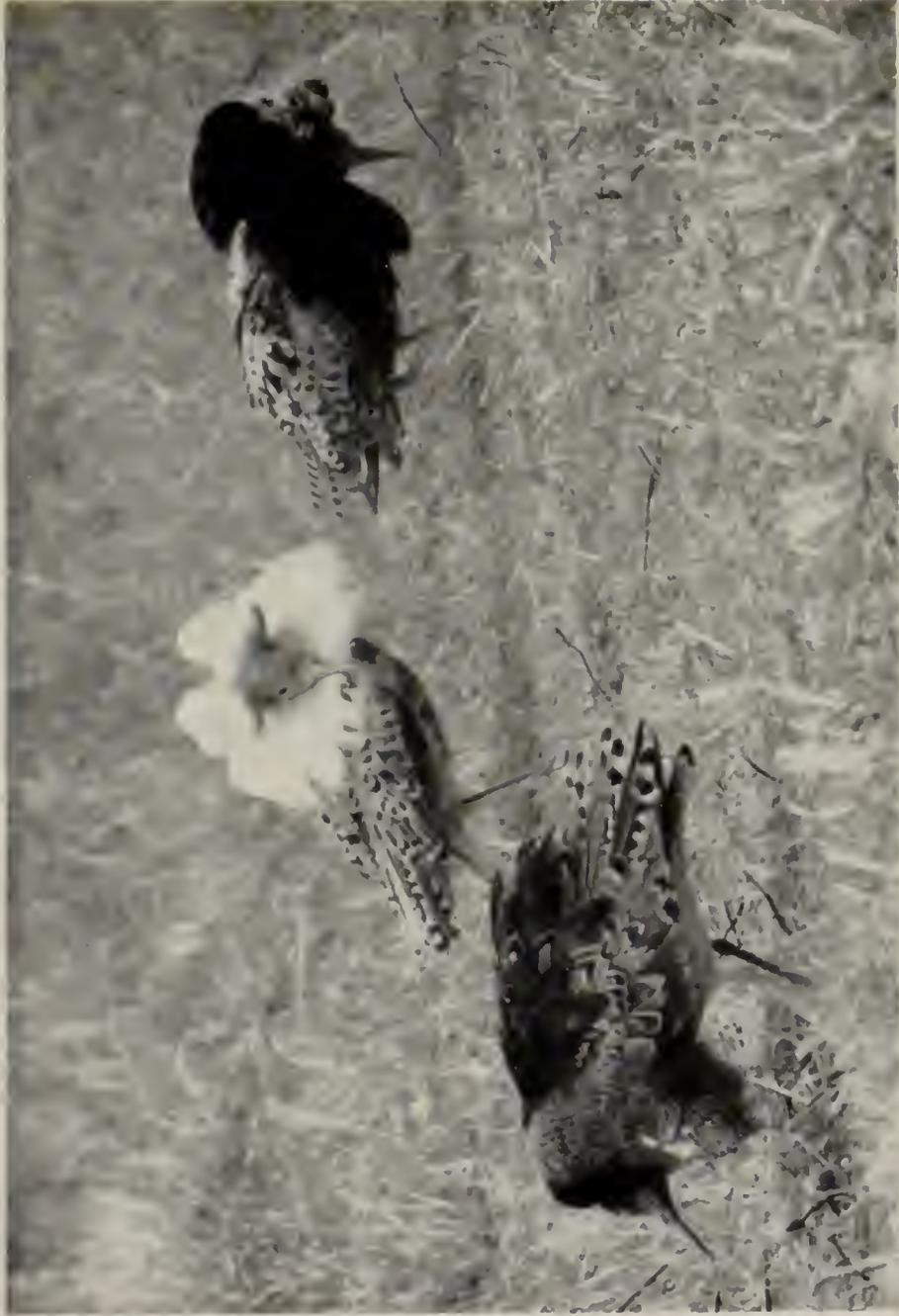
"RESIDENT" RUFFS (*Philomachus pugnax*) AFTER DEPARTURE OF "VISITORS": NORTH JUTLAND, MAY 1958. These three have their ruffs in very different positions from those in plates 50, 53 and 54, and it is suggested that the raising, relaxing and sleeking of ruffs and ear-tufts would repay further study (see page 304); the sleeked appearance of the two right-hand birds is too similar to be coincidental. Still photographs like these do not convey the feverish activity of the lek: a frantic scuttling, with or without real or mock fighting, interspersed with sudden "freezing".





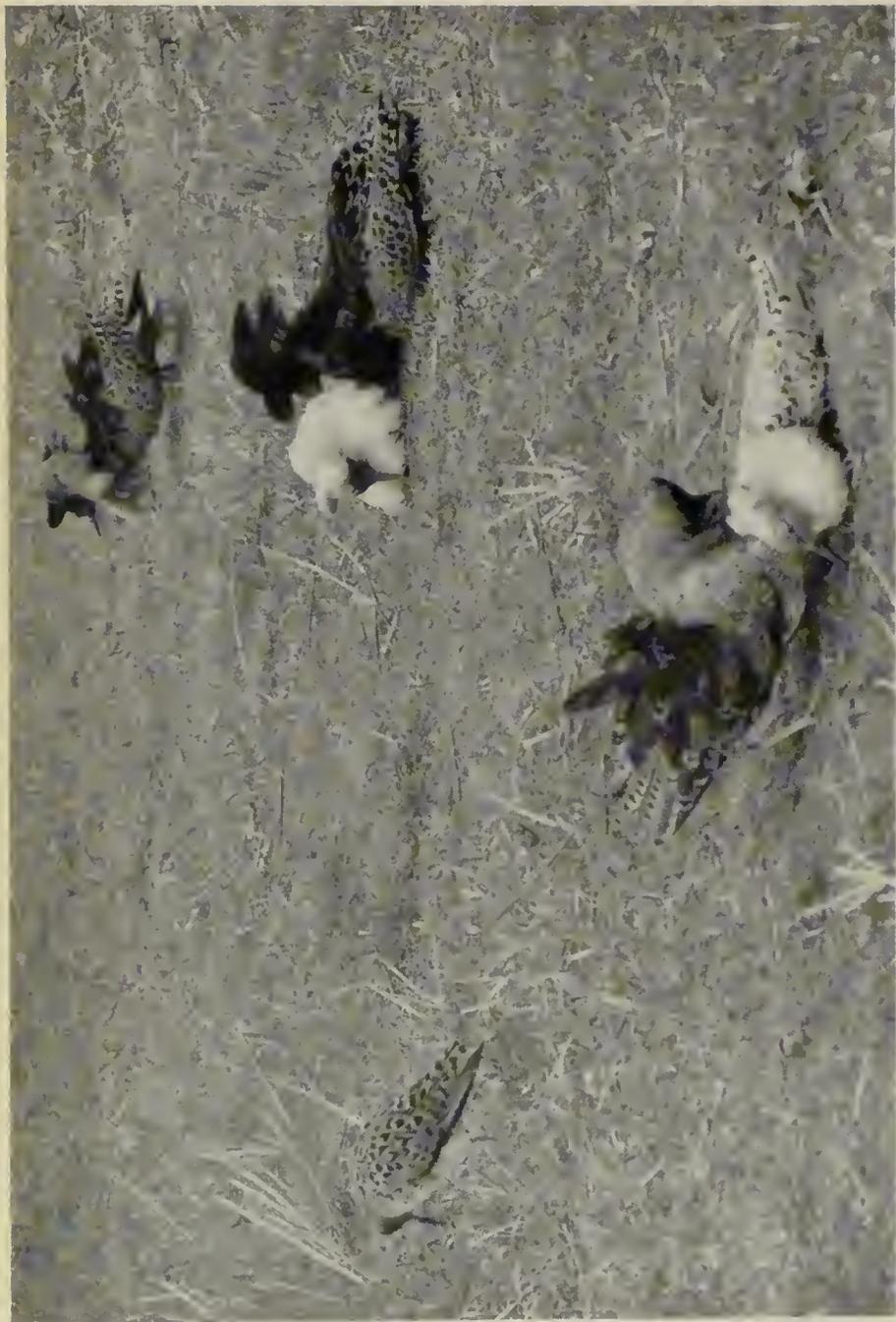
C. C. Doncaster

"RESIDENT" AND "VISITOR" RUFFS (*Philomachus pugnax*) TOGETHER: NORTH JUTLAND, MAY 1958
 The three males on the right and the two dark birds on the left are "residents", the remaining five Ruffs and two Reeves being "visitors". Note the crouching and passive display in front of Reeves—which seem disinterested and often preen (see page 305). White-ruffed males, as this picture shows, hold a special position of tolerance on the lek when other visitors are quickly chased off, yet they do not seem particularly successful (see page 303).



C. C. Doncaster

"RESIDENT" AND "VISITOR" REDPOLLS (*Philonachus paganus*) TOGETHER: NORTH JUTLAND, MAY 1958
 The white-ruffed male is a "visitor". The bird in the foreground is in the attitude of "beak-stabbing" that is frequently adopted on the arrival of visitors. The posture of the white bird, which seems to be facing away from the one on the right and to have its tufts raised more than those of either of the dominant "residents", may be significant (see page 304). This close-up gives a good impression of the wide range of colours and patterns of the ruffs (see plate 55).



C. C. Doncaster

RUFFS (*Philomachus pugnax*) CROUCHING PASSIVELY IN "PAIRS": NORTH JUTLAND, MAY 1958
 After a fight, or a period of skirmishing and scuttling about, the males often sink down and "freeze", commonly in "pairs" as here. In each of these couples the partly raised bird is dominant and a "resident". Compare the position of the far bird's ruff and tufts with plate 51. Note again the seemingly unconcerned attitude of the Reeve on the left: until she is willing to mate and approaches a particular male, she stands or walks quietly in the lek (see page 305).

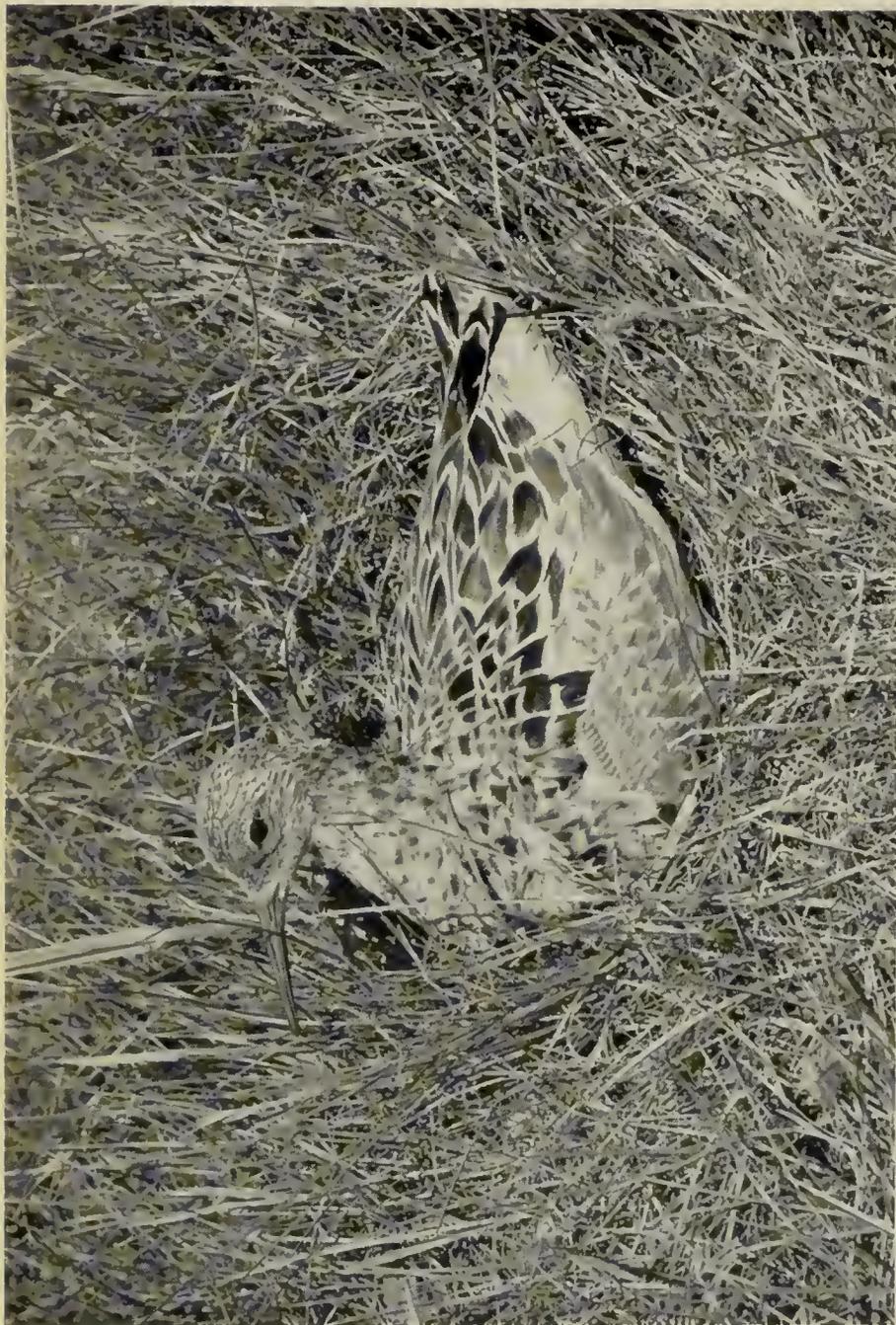




C. C. Doncaster

RUFF (*Philomachus pugnax*) WITH EAR-TUFTS ERECT BUT NECK RUFF LOWERED
NORTH JUTLAND, MAY 1958

This posture, with wings held out as well, is again different from any other in these pictures (see page 304). Note the bare area on the forehead and round the eyes: this is covered with tubercles and is usually yellow, orange or brown. The ruffs and tufts may be sandy or chestnut with or without bars and spots of black or brown; or they may be purplish with buff, white or reddish markings; or white with or without faint buff freckles.



J. B. and S. Bottomley

REEVE (*Philomachus pugnax*) ABOUT TO LEAVE NEST; WEST JUTLAND, JUNE 1958

This shows well the contrasting scaly pattern on the mantle and back, produced by the sandy-grey edges to the purplish-black feathers of summer; also the short bill and the rather small and "old-looking" head. The nest—a grass-lined hollow often completely hidden from above—is usually between 25 and 400 metres from the lek (see page 306). The four (occasionally three) blotched eggs are laid in May or June, and incubated for three weeks by the Reeve on her own.

TABLE III—TIMES OF FIRST AND LAST NEST-VISITS BY THE MALE AND FEMALE GREAT TITS (*Parus major*) ON EACH OF FIVE DAYS, FUJI, JAPAN, 1958

Times are given in minutes before (-) or after (+) sunrise and sunset.

Age of oldest nestling in days		14.5	15.5	16.5	17.5	18.5
First visit	Male	+110	+10	+79	+78	+25
	Female	+30	+14	+46	+34	+35
Last visit	Male	-17	-61	-72	-55	
	Female	-26	-69	-49	-50	

In Table III are shown the times of the first and last feeding visits by both sexes on each of the five days. Both in the male and in the female the feeding visits began after sunrise and ended before sunset. In the male the times of both first and last visits varied greatly from day to day, but in the female there were rather smaller daily variations. In general these figures were not so different from those obtained in England by Hinde (1952) and Betts (1955) for the same part of the fledging period.

TABLE IV—HOURS AT WHICH EACH OF THE NESTLING GREAT TITS (*Parus major*) LEFT THE NEST ON 19TH JULY 1958, FUJI, JAPAN

Young fledging	1st	2nd	3rd	4th	5th	6th	7th
Time of leaving	07.30	07.51	07.58	08.12	08.25	09.00	09.06

All the young left the nest on the morning of 19th July when the oldest was 18.5 days old. The hours of flying were easy to read from unusual marks registered on the paper tape and are shown in Table IV. It took 1 hour and 36 minutes for all seven young to leave the nest at an average interval of 16 minutes.

ACKNOWLEDGEMENTS

My thanks are particularly due to Professor Masatoshi Nitto who made this study possible and to Professor Yuzo Kitazawa of Tokyo Metropolitan University who read the MS. I would also like to express my gratitude to Mr. Hajime Taniguchi, without whose help this apparatus could not have been constructed, and I am much indebted to the Sanwa Electric Co. for making the modified iron-detector.

SUMMARY

1. An automatic nest-recorder was designed for the purpose of recording the visiting activities of male and female birds separately. A test was made at a nest-box occupied by a pair of Great Tits (*Parus major*) in Fuji, Japan.

2. The data obtained for the last five days of the fledging period were analysed to illustrate the uses of the apparatus in recording visiting frequencies, daily rhythms, the durations of

periods at the nest, the times of the first and last visits each day, and the hours when the young left.

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PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

C. RUFF

Photographs by C. C. DONCASTER and J. B. and S. BOTTOMLEY
(Plates 49-56)

Text by N. TINBERGEN

IN OUR AVIFAUNA the Ruff (*Philomachus pugnax*) is the most extreme example of a "lek" bird; a species which, like the Black-cock (*Lyrurus tetrix*) and many other gallinaceous birds, birds of paradise (Paradiseidae), Gould's Manakin (*Manacus manacus*) and others, has specialized in male communal displays, extreme sexual dimorphism, promiscuity without a pair-bond, and loss of all nest-building, incubation and parental behaviour by the males. Mr. Doncaster's beautiful photographs of Ruffs at the lek stimulated me to re-read Edmund Selous's famous "day-to-day diary" (1906-07), the more recent papers of Portielje (1931), Andersen (1951 and earlier), Lindemann (1951) and Bancke and Meeseburg (1952), and to look through the few notes I myself made some 25 years ago. It then became clear to me that, while these papers agree on most points and allow a rough sketch of what usually happens on the leks, a great deal still remains to be cleared up about the "tourneys"—about the exact forms of the displays, their motivation, their functions, and their evolutionary derivation.

The males begin to gather on their leks, hills or arenas during April, when their plumage is not yet fully developed; the displays reach their peak in May. Early morning is the best time for watching; there is a lull in late morning, but in the afternoon and evening the leks are populated again.

Even at the height of activity on the lek, periods of quiet alternate with bouts of wing-flapping, frantic running and mutual "charging", sudden "freezing" and, if Reeves are present, an occasional copulation. Now and then the whole flock will fly off and, after a short round flight, alight on the lek once more to resume their mad charging and running. All observers agree

that the birds seem to be very excited and, even when motionless, in a state of great tension. The displays are often shown in the absence of females, but there is no doubt that they become more vigorous when females arrive. Actual fights are relatively rare (as in most birds) but have been observed regularly. Since the displays during fights are so very similar to those shown in response to the arrival of a female, opinions differ as to which (if any) are hostile and which are "courtship". With our present knowledge of the close connections between hostility and courtship in many species, this similarity between displays in the absence and in the presence of females is not astonishing. It seems very probable (though without more detailed analyses I can say no more) that much of the posturing is predominantly hostile and that many of the courtship actions have at least been derived from threat displays, and are even now motivated by a mixture of aggression, fear and sexual attraction.

Plate 50 shows the males in a state of alertness evoked by the approach of another bird: they stand in an upright posture, ruffs and head-tufts raised, bills pointing down. One of them flaps his wings: this is a very common response to flying birds—in fact, it almost unfailingly signifies the arrival of a newcomer. As a rule it is much more striking than in this photograph which, according to Mr. Doncaster, has not fully caught the effect, for the white undersides of the wings are in reality clearly visible from afar; they are undoubtedly flash-signals which make the birds even more conspicuous than they are already.

By following recognizable males from day to day (Selous) and by colour-ringing (Andersen) it has been established beyond doubt that the small bare patches on the lek, 2-3 feet across, are individual territories of "resident" males. Some of these territories are regularly occupied by particular owners; some "change hands" now and then (often after violent fighting); and there are always a number of hangers-on, some (perhaps) visitors from other leks who may have a territory there, others underdeveloped birds whose lack of perseverance in fighting has prevented them from staking out an undisputed claim. Intwoven with this territorial system there is a hierarchy or peck-order; some males (often particularly fine specimens) seem to be unchallenged masters of their territories; others have to fight more. Selous found that the undisputed top-males copulated far more than even the victors in the prolonged fights. According to Blancke and Meesenburg, white-ruffed males with a generally pale plumage are in a special position: they are tolerated more often on the lek than other "visitors" (who are often chased off by the nearest males jointly); yet they do not seem to be very successful.

The photographs do not give an instance of a posture which has been observed by various authors (Selous, Lindemann): an upright stance with the bill pointing up. Selous explicitly says that this

posture is taken up by males which are not very certain of themselves—either visitors or birds that are likely to give way easily. Selous further writes (p. 291) that when an attacked bird adopted this posture the attacker often “ceased its assault, and sank quietly down beside it”.

Thus it seems that the Ruff, like several waders and gulls, has an aggressive and an anxiety upright posture; their derivation might well be the same as in the other Laro-Limicolae. Further, Selous’s remarks quoted above strongly suggest that the anxiety upright has an attack-inhibiting or appeasing effect.

Fighting birds peck at each other and jump up into the air, “kicking one another, hitting out with their wings, and seizing one another with their bills”. (Selous, p. 421). Very often they face each other in a bent posture, ruffs and head-tufts raised, and making downward stabbing movements (male on left in plate 53), or they run wildly about making many sideways turns; this turning away from, or parallel to, other birds has been shown in gulls and other species to be connected with a fear component.

After a fight, or a period of skirmishing and running about, the males often sink down and “freeze”, commonly in “pairs”, as shown perfectly in plate 54: Mr. Doncaster writes that the two darker males of the pairs shown, which are holding their heads higher than the two others, were the residents (the others seem to be “whites” in Bancke and Meesenburg’s sense, already mentioned). All this looks rather similar to what is known of gulls and various other waders: the upright and the crouching postures seem to occur when the birds are at the same time aggressive and inhibited by fear; and the more aggressive a bird is, the more he tends to hold his head high while pointing the bill down; further, freezing in such a conflict state is a common phenomenon in many Laro-Limicolae.

Some of the photographs seem to show birds in the act of facing away from others (the centre bird on plate 53 and the two white-ruffed birds on plate 54); since we know that this posture is common in anxious birds, not only among gulls but also in the Lapwing (*Vanellus vanellus*) (von Frisch, in press), I would not be surprised if future observations show that this is a regular feature of the Ruff’s repertoire too.

The raising, relaxing and sleeking of ruff and head-tufts also seems to deserve further study. Plate 55 shows a male with the ruff flattened but the head-tufts raised; at the same time the wings are held out. The males on plate 51 (taken just after some visitor birds had left) have their ruffs in an entirely different position from, for example, the solitary far bird on plate 54; also, it may not be accidental that the visiting Ruff on plate 53, which seems to be facing away from the bird on the right, has his head-tufts much more raised than the other two birds who are residents and as such certainly dominant.

All these postures seem to be part and parcel of the hostile

pattern. When a Reeve arrives she sets off an outburst of skirmishing, and Selous repeatedly says that the males' general behaviour is the same then as when females are absent. After this, the males crouch on their territories as described. Portielje (pp. 161-162) emphasizes an aspect of the crouching which Selous seems to have overlooked, or has glossed over in his published account, possibly because it looks like rather "perverse" sexual behaviour: "a spasmodic quivering of the plumage and jerking of the wings and particularly of the spread, strongly downward pressed tail", which is "extremely similar to effective copulation". Unfortunately it is not clear whether this occurs merely in the presence of the females or also during the fighting bouts. Portielje draws from this fact the conclusion (which I think is unjustified) that all displays of the Ruff are merely concerned with pairing and so sexually motivated; the obvious connections of several postures with pure fighting contradict this. It is true, however, that the males have a very strong sexual urge; even homosexual matings have been reported by several observers and were noted by Mr. Doncaster while he was taking these photographs.

Females stand or walk quietly amidst all this commotion "with seeming unconcern" and often preening. The situation is well illustrated by plates 52 and 54. What happens next has been described in great detail by Selous. A female who is willing to mate walks up to a particular male, and in so doing often bypasses one or more other males. It is quite obvious that she selects a mate and that males just have to wait until she does so. Males do occasionally approach or follow a female and may even fly off after one, but it is doubtful whether any copulations result from this. Usually the female now pecks gently in the male's ruff and may even preen him for a while. Even then the male does not stand up from his crouched position. However, eventually the female adopts a crouching position herself, indicating her readiness to mate, and most observers agree that this sets the stimulus for the male to mount. During coition the neighbours do not interfere, but after copulation a male often charges one or more neighbours.

Selous's observations—though on a relatively small seal for purposes of statistical treatment, in spite of his remarkable perseverance—nevertheless show quite convincingly that on his lck some males were singled out by the females more often than others. Particularly are the records of his "brown" male and his "blue" male impressive: on some days females literally "queued up" for them, ignoring several others. His observations also make it quite clear that the matings are promiscuous; there is no pair bond except perhaps in the sense that certain Reeves show an attachment to certain males, but even so they approach such males exclusively for the purpose of coition.

The most likely interpretation of Selous's observations seems to me that, as in other birds, fighting and threat serve to stake out territories; that a dominant male who has established a claim

which, through conditioning, is recognized by the other males is in the best position to mate when the females come; that the males' courtship contains numerous hostile display components which intimidate other males but attract females; and that females show a marked preference for the dominant, well-established males. It is probably more than a coincidence that Selous' two most successful males struck the human observer as particularly handsome birds. The advantage of successfully establishing a territory seems to be the prevention of interference with mating.

The spacing-out of broods (undoubtedly an important function in this vulnerable species) must be done exclusively by the females. Andersen showed that the nests are rarely very near the lek (his nearest was 20 metres from it) and seldom more than 400 metres away; within this area they are scattered. Whether this depends merely on a tendency of the females to lay well away from the lek, or whether in addition they avoid each other, is not known; nor is there any record in the literature of females fighting over nest sites.

It is interesting to see how on the one hand the Ruff is a typical wader, and how on the other it has specialized as an arena bird and developed certain traits (extreme sexual dimorphism, social courtship, males mere "sperm carriers" with a mating territory and possessing unusual sexual vigour, females choosing) which are very similar to the characteristics of other arena birds (Lack, 1939).

It is to be hoped that Mr. Doncaster's splendid pictures will stimulate further research into the behaviour of this unique species.

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OBITUARIES

GUSTAV KRAMER (1910-1959)

The death of Gustav Kramer on 19th April 1959, in a climbing accident in Calabria, Italy, where he was collecting Rock Doves for his homing experiments, meant not only the loss of a very good

personal friend to many of us but also a serious blow to ornithology and to international science. To many ornithologists he was mainly known through his pioneer studies in bird navigation—which were both original and penetrating—but he did equally outstanding work in several other fields. His doctor's thesis, on the function of the lateral line organs of the South African Clawed Frog, attracted wide attention and he later published important investigations into the behaviour of birds and lizards, and into the metabolism, comparative morphology, taxonomy and evolution of the latter. He was also an authority on problems of allometric growth. Before the war he held positions in the marine biological stations of Rovigno d'Istria and of Naples, and many zoologists all over the world are deeply indebted to him for his generous help and encouragement.

Yet he will always be remembered first and foremost for his brilliant work on the orientation of birds. It was Kramer who, immediately after the war, initiated new methods and who discovered the sun navigation of migrating Starlings. Characteristically (for he always felt challenged by difficulties which seemed unsurmountable to most of us) he switched to the question of homing, an even tougher problem than that of "mere" direction-finding. Nor did he neglect the question of the internal clock so closely linked to celestial navigation. His approach to this complex of interrelated problems was the opposite of narrow, and yet extremely cautious and critical. He had the courage and honesty to stress the unsolved aspects at every stage. It is not surprising that his efforts stimulated many such gifted younger workers as Ursula von Saint Paul, Klaus Hoffmann, Franz Sauer and others, who have all made important contributions. In the English written literature Kramer's priority in this field has not always been made as clear as it ought to have been, but Kramer himself, free of all social ambition, was far too modest ever to try to rectify this.

Kramer was, through his honesty, modesty and generosity, an exceptionally likeable man. His integrity and courage commanded respect. Because of this, he was one of those rare men who are generally accepted leaders without ever trying to be one. He was rather over-conscientious and was continually worrying about the value of his work to humanity, even to such an extent that he felt guilty for accepting a salary. The agonies he suffered during the Nazi period and the war, when it was his task to act as interpreter between brutal S.S. men and simple Italian country folk to whom he felt strongly attracted, are known only to a few friends.

Kramer was an amazing all-round biologist and naturalist. At the biennial international conferences on animal behaviour he was, through his wide knowledge and understanding of zoological problems and his outstanding linguistic abilities, the man we

all turned to when scientific or semantic misunderstandings threatened to stagnate the discussions. Quietly, clearly and briefly he would steer us back into the right course. No wonder that he became a central figure in the German ornithological world, the man who was destined to be the successor to Stresemann as a leader and stimulator of scientific ornithology there.

The famous Max-Planck Gesellschaft, whose officers have the gift of recognizing talent (and control the funds to attract Germany's best research workers), had just started to build him a fine new institute when there came the news of his untimely death at the age of 49. It is sad to think of the work he could and would have done, had not one treacherous stone given way. However, he has left his mark on the minds and souls of many, and among those are several whose work will complete what he had to leave unfinished.

N. TINBERGEN

JAMES PARSONS BURKITT (1870-1959)

J. P. Burkitt, who died at his home near Ballinamallard, Co. Fermanagh, in March 1959, after a short illness, was known in ornithological circles mainly for his original study of the Robin. This resulted in a series of notable papers in *British Birds* during 1924-26*, but otherwise he published little apart from a few contributions to the *Irish Naturalist*, chiefly on song. Yet in the centenary number of *The Ibis* Dr. David Lack chose him as one of the seven British pioneers in ornithological research. There Lack recalls how Burkitt "placed different patterns of metal bands on the legs of his garden Robins—not coloured rings because he was colour-blind—and thus initiated a technical revolution in the field study of the individual bird. By its means he discovered new facts about territorial behaviour and song, including female song; he was one of the first to observe threat display in a bird and to interpret it correctly; and the first to use ringing returns to estimate average age".

Burkitt owned that he took no interest in birds until he was 37. However, from that age throughout his long life he was a diligent observer, not only of Robins, but of all our native birds. The Garden Warblers around Lough Erne were a favourite with him, and it was there under his guidance that I became familiar with that species.

My first remembrance of Burkitt was when he met me at Enniskillen railway-station. I asked if he would care for some lunch before we set off in search of birds. His eagerness was typical when he thanked me and said, "Too much waste of time—I have brought sandwiches for us both in my pocket". He was

*See vol. xvii, pp. 294-303; vol. xviii, pp. 97-103, 250-257; vol. xix, pp. 120-124; vol. xx, pp. 91-101.

then 76, but almost at once he showed his amazing stamina and activity: our first obstacle was an eight-barred gate, but he was over it before I had had time to offer the helping hand that I realized afterwards would have been politely refused.

Constantly throughout that week with him I learned things of value, not least the kindness of his home, his delightful personality and character. He was a deeply religious man, extremely humble and of great intellect. He had a brilliant academic career and was County Surveyor of Fermanagh for 40 years; for a similar period he was a member of the Synod of the Church of Ireland. An outstanding mathematician and engineer, he brought to his study of birds a mind as sharp as a needle and he was ruthlessly thorough.

Beyond doubt he was a good ornithologist, but an even greater Christian.

R. F. RUTLEDGE

JOHN HUGH OWEN (1877-1959)

J. H. Owen, M.A., who died at Oswestry General Hospital on 2nd August 1959, at the age of 82, made substantial contributions to ornithology, particularly by his studies of the Sparrowhawk and Red-backed Shrike. Born at Kinton, Nesscliffe, Shropshire, he was educated at Oswestry Grammar School and Jesus College, Oxford, and after filling other teaching appointments became an assistant master at Felsted School in 1907. His subjects were mathematics and science, while he also acted as games-master and later became a house-master. He was an accomplished all-round sportsman—an Association footballer, cricketer and oarsman in his younger days, and later a first-class shot. But throughout his life his main hobby was natural history, and particularly the study of birds, though his interests were catholic and embraced mammals, insects and plants as well. Through the Felsted School Scientific Society he initiated many of the boys into the delights of bird-watching, and inspired them with something of his own devotion to the study of nature. He was an excellent bird-photographer: his papers on the Sparrowhawk and other species were admirably illustrated by his own photographs, and his remarkable collection of lantern-slides was used to good effect in the lectures which he sometimes delivered to natural history societies.

In 1937, anticipating his retirement from Felsted, Owen gave his collection of British birds' eggs to the Essex Field Club Museum at Stratford (see *Essex Naturalist*, vol. xxv, pp. 273-277). This contained over 6,100 eggs of 105 species. More than three-quarters of them had been obtained in Essex and a feature of the collection was 122 Cuckoos' eggs, representing seventeen species of fosterers.

On leaving Felsted in 1939, Owen, who had remained un-

married, retired to his native border country, where he had spent most of the vacations during his residence in Essex. He went to live at Llanymynech, a village through which the boundary between England (Shropshire) and Wales (Montgomeryshire) actually runs. Here he settled down to pursue his natural history and sporting interests in a countryside which afforded ample scope for both. He took an active part in the work of local natural history societies on both sides of the border, leading excursions, giving lectures and contributing observations to their publications. In recognition of his services to natural history and to the club, the Caradoc and Severn Valley Field Club elected him an honorary member in 1947.

Owen remained remarkably active until within two or three years of his death, and his powers of observation—and particularly of nest-finding—showed little diminution. In 1950, for example, at the age of 73, he recorded 307 nests of two species only—108 Spotted Flycatchers' and 199 Robins'—on which he presented a paper to the Caradoc and Severn Valley Field Club in February 1951. Just over a year later, in a letter to the writer of this memoir, dated 25th March 1952, although he complained of failing sight and activity, he recorded having found seventeen Robins' nests, as well as nests of Moorhen, Blackbird, Song Thrush, Long-tailed Tit, Lapwing, Tawny Owl, Dipper, Mallard, Kingfisher, Rook and Raven. As an observer, indeed, Owen was outstanding. His patience and his meticulous attention to detail are exemplified in his breeding studies of several species, while his facility in finding nests seemed uncanny to the uninitiated, though it was actually due, of course, to his quick eye, long experience and understanding of the minutiae of habitat and behaviour. I remember an incident that illustrates the point. Owen was leading a party of twenty or thirty naturalists in Indian file along a narrow path when he suddenly stopped, turned, and said, "You have all passed a Robin on its nest without seeing it". He pointed to a spot in the hedgebank, and there was the nest with the bird sitting.

A first-rate observer rather than a scientific ornithologist in the full sense of the term, Owen was essentially a field-worker. He relied little upon books, and, indeed was apt to express some impatience with the statements of authors which he found at variance with his own experience. For this reason his papers and lectures were always based solely upon his own observations, which was at once a strength and a weakness; a strength because the facts he described were authenticated by his own knowledge and experience, a weakness because they sometimes lacked completeness and comparative material. There can be no doubt, however, about the substantial value of the work he did and of the recorded observations he has left behind him.

Most of Owen's published work appeared in the pages of

British Birds, beginning in 1911 with a note on the food of young Barn Owls (1). During the next forty years there are few volumes that do not contain notes and papers from his pen. Most notable of his contributions was the series of papers on the Sparrowhawk, of which the first appeared in 1915 and the last in 1936 (2). Collectively these form an exemplary species monograph based entirely upon personal observation. Another species on which he did outstanding work was the Red-backed Shrike, on which he published several papers between 1917 and 1951 (3). Throughout his life, too, he took a particular interest in the Cuckoo and was often in communication with that greatest of Cuckoo-students, the late Edgar Chance. Owen contributed many notes on Cuckoos to the pages of *British Birds*, and between 1913 and 1921 supplied annual notes on fosterers, and other aspects, in the Felsted district. Other species on which he wrote papers—largely concerned with nesting habits—were Swallow (4), Great Spotted Woodpecker (5), Long-tailed Tit (6), Whitethroat (7) and Chaffinch (8).

Owen's papers and diaries were bequeathed to the Shropshire branch of the British Empire Naturalists' Association, and are therefore in safe keeping. He was a Vice-President of the Shropshire Ornithological Society from its inception in 1955.

For certain biographical particulars I am indebted to Owen's niece, Mrs. J. F. Franklin.

L. C. LLOYD

SELECTED LIST OF J. H. OWEN'S PUBLICATIONS MENTIONED IN THE TEXT

- (1) *British Birds*, vol. v, pp. 112-113.
- (2) *British Birds*, vol. viii, pp. 193-195; vol. x, pp. 2-10, 26-37, 50-59, 74-86, 106-115; vol. xii, pp. 61-65, 74-82; vol. xiii, pp. 114-124; vol. xv, pp. 74-77, 256-263; vol. xx, pp. 114-120; vol. xxv, pp. 151-155, 238-243; vol. xxvi, pp. 34-40; vol. xxx, pp. 22-26.
- (3) *British Birds*, vol. x, pp. 173-180; vol. xv, pp. 109-110; vol. xxiii, pp. 95-96; vol. xli, pp. 200-203; vol. xlv, pp. 166-170. *Transactions of the Caradoc and Severn Valley Field Club*, vol. xii, p. 59.
- (4) *British Birds*, vol. xi, pp. 226-227.
- (5) *British Birds*, vol. xix, pp. 125-128.
- (6) *British Birds*, vol. xxxviii, pp. 271-273.
- (7) *Trans. Caradoc and Severn Valley Field Club*, vol. xii, p. 127.
- (8) *Trans. Caradoc and Severn Valley Field Club*, vol. xiv (in press).

NOTES

Breeding of Leach's Petrel on the Flannan Isles.—Leach's Petrels (*Oceanodroma leucorhoa*) have been known to breed on the Flannan Isles, some 20 miles west of Lewis in the Outer Hebrides, since 1904 (W. Eagle Clarke, *Annals Scot. Nat. Hist.*, 1905, pp. 8-19 and 80-86). However, apart from the discovery of colonies on Eilean Tighe in 1955 (R. Atkinson and B. Roberts, *Scot. Nat.*, vol. 67, pp. 109-110), the only proved nesting has been on Eilean Mòr (R. Atkinson and J. A. Ainslie, *Brit. Birds*, vol. xxxiv, pp. 50-55); Eilean Mòr and Eilean Tighe are the two

largest islands of the group. It is therefore interesting to record that, during a visit to the Flannan Isles in June 1959, breeding was also proved on Soray, Sgeir Toman, Roareim* and Eilean a' Ghobha by the finding of one or more adult Leach's Petrels in burrows, each incubating an egg. No Leach's Petrels were found on Sgeir Righinn or the only three stacs that have a suitable cover of soil and vegetation—Lamh a' Sgeir Mhor, Lamh a' Sgeir Bheag and the unnamed stac between Roareim and Eilean a' Ghobha. It was not possible to be on the islands at night, other than Eilean Mòr, and we could not estimate the size of the colonies.

A full account of the general ornithology of the Flannan Isles is in preparation. T. B. BAGENAL

*When this note was in proof, there appeared in *Scottish Birds* (vol. 1, pp. 110-117) a paper on "Birds of the Flannan Isles" by Michael Robson and Peter Wills. This gives the results of a short visit paid there in the summer of 1957, in the course of which breeding of Leach's Petrels was proved on Roareim. Credit for the first discovery of these birds on that particular island therefore belongs to Messrs. Robson and Wills.

"Head-lagging" by a Buff-breasted Sandpiper.—A Buff-breasted Sandpiper (*Tryngites subruficollis*) remained at the Midrips, Sussex, from 17th September to 2nd October 1955 (see *Sussex Bird Report*, 1955, p. 13). While watching it on 24th September 1955, I saw it perform what seemed a most remarkable feat. It was very tame, but when approached too closely it would stop feeding and stretch its head and neck upwards—a characteristic action of this species which has been commented on by many observers. Then, however, it would move its body and lower neck forward while keeping its head where it was; having completed a step, it would bring its head back to the normal position. There was absolutely no forward movement of the head until the body had stopped, as could be seen by "fixing" the head in relation to some object in the background. I also observed this action when watching another Buff-breasted Sandpiper on Ushant, France, on 24th September 1957, although here it was less exaggerated.

J. F. NAYLOR

[This would seem to be another example of head-stabilization, akin to the case of the Stone Curlew (*Burhinus oedicnemus*) settling on its eggs (*antea*, p. 20).—EDS.]

Great Black-backed Gull attacking migrant Starling.—Mr. George Gamble's note on "Great Black-backed Gull attacking migrant Blackbird" (*antea*, p. 164) encourages us to record a similar occurrence at Cley, Norfolk, on 3rd November 1957, when a Great Black-backed Gull (*Larus marinus*) attacked a migrant Starling (*Sturnus vulgaris*). Hordes of Starlings were arriving from the north, flying at about 20 feet above the sea into a strong S.W. wind. Some, which were too tired to keep up with the

main flocks, were flying alone just over the sea and collapsing on to the beach just above the tide line. One of these tired Starlings, when only some 200 yards from the safety of the shore, was pursued and chased by a Great Black-backed Gull and forced down on to the sea. It flew off again, and was then chased by two of these gulls, one of which caught it in the air with its beak and then settled on the sea where waves interrupted our view.

On the same day gulls showed interest in other tired Starlings, and a Great Skua (*Catharacta skua*) twice chased migrants so that they were forced to take evasive action.

P. R. COLSTON, B. NEWPORT and M. J. CARTER

Gulls attacking migrant thrushes.—Whilst on convoy duties off the east coast of Britain during the 1939-45 war, I found the habit of gulls attacking migrant thrushes (*antea*, vol. lii, p. 164) to be a not uncommon form of predation. Thrushes, mostly Blackbirds (*Turdus merula*) and Redwings (*T. musicus*), mainly migrated in a concentrated movement, many thousands passing at one time. When flying into strong headwinds, the birds would be forced down to wave-top level. Progress under these conditions was difficult and slow. Frequently, exhausted birds settled on the water and were unable to take flight again.

When the ship crossed the path of such a movement, the gulls following astern quickly availed themselves of the easily obtained food. Any floating bird was seized and others in flight would be swooped on and knocked into the water. As each bird was seized and the attacking gull sought to make off with it, the usual fights and squabbles took place, the unfortunate victim being repeatedly dropped and picked up again, until a gull was able to cram it down its throat. Herring Gulls (*Larus argentatus*), the main assailants, had little difficulty in swallowing whole both Blackbirds and Redwings. Common Gulls (*L. canus*) and even Black-headed Gulls (*L. ridibundus*) were also seen carrying and dropping thrushes, but I never confirmed that they were able to eat them, as invariably they were left well astern, still squabbling over their victims.

J. N. HOBBS

[Some comparable observations have also recently been published by D. A. Rushforth in *The Naturalist* for July-September 1959 (No. 870, pp. 91-92). These refer mainly to attacks on Starlings (*Sturnus vulgaris*) by Common and Great Black-backed Gulls which, in two cases at least, made no attempt to eat their victims once they were dead.—EDS.]

Communal bathing by Black Terns in deep water.—At Chew Valley Reservoir, Somerset, on 23rd May 1959—a hot and sultry day—we witnessed the gradual gathering of at least 106 Black Terns (*Chlidonias niger*) (see *antea*, p. 277). Many of these occasionally left the main party and in groups of 30 or more bathed

communally in one of the deepest parts of the reservoir. Flying at heights of 20 feet or less, they would swoop down to the water and there in compact "rafts", with vigorous movements of feet and wings, they splashed not only themselves but also their companions. Some of the terns momentarily turned on their sides or wholly on their backs during these displays which lasted anything up to two or three minutes. When we left the reservoir, in the early afternoon, all the Black Terns were flight-feeding in the normal manner. C. G. BENNETT and BERNARD KING

Kestrel catching a fish.—The Handbook makes no mention of fish in the diet of the Kestrel (*Falco tinnunculus*). On 9th November 1957, at the Brent Reservoir, Middlesex, I noticed a Kestrel flying low over the water. Suddenly it swooped down and caught a small fish in its beak, in the manner of a Black Tern (*Chlidonias niger*). I have seen a kestrel attempt to catch a fish in this way on one other occasion, but it was unsuccessful. L. A. BATTEN

[Mr. Derek Goodwin comments: "The seizing in the bill seems an interesting point; captive Little Owls (*Athene noctua*) pick up small insects in the bill, and mice and large insects in the feet".—EDS.]

Great Tit stung to death by bees.—On 24th July 1959 I found a young fledged Great Tit (*Parus major*) lying dead by the side of one of my bee-hives, near St. Breward, Cornwall. It had apparently died from the stings of bees (*Apis mellifera*) and there were five of these still in position—two on the forehead, one a little above the left eye, one below the left eye and one on the carpal joint of the right wing. All the stings had gone through the feathers and had penetrated the skin.

This spring and summer an adult Great Tit has been seen, on numerous occasions, to fly down in front of the hives and pick up dead bees from the ground. On no occasion has it been seen to attack living bees. The dead ones taken have all been workers, but generally there are no drones lying about dead. It is possible that the young Great Tit had learned from the adults to pick up bees but had not confined itself to dead ones. W. E. ALMOND

Apparent triple nesting by Blue Tit.—My brother, Mr. E. R. Mountfort, has a nest-box in his small suburban garden in Bristol. This is cleaned out each winter and so was emptied at the end of 1957. At the end of 1958 it was found to contain three nests of Blue Tit (*Parus caeruleus*), one on top of another. The top nest had contained a brood of young which had been successfully reared. Beneath was a second nest with seven eggs and at the bottom was a third, also completely lined, with four eggs. No more than one pair of Blue Tits had been observed in the garden at any one time during the breeding season. There was no indication of interference with either of the first two nests and the eggs were undamaged. GUY MOUNTFORT

Redwings breeding in Ross-shire.—On 22nd June 1959 I heard the 3-5 descending flute-like notes of a Redwing (*Turdus musicus*) in a garden in Ross-shire, and had a good view of the bird; on being disturbed, it flew off with a harsh cackle. On 23rd June, about 300 yards from this spot, I again heard a Redwing singing and watched two adults feeding at least 4 fully fledged young perched in a birch tree. What I presumed to be the nest, now empty, was in another birch near-by: it was about 6 feet from the ground and was made of moss, birch twigs and wool, the cup lined with a brittle earthy material. On 26th June a Redwing's nest containing four young 3-5 days old was found in the top of a beech hedge, about 12 feet from the ground, at the site where the original bird had been seen singing on the 22nd. This nest was made of moss and birch twigs, together with some wool; two adults were watched feeding the young. On 27th June another Redwing was heard singing (but not seen) in a third site half a mile away from the second, in a thick spruce wood.

The identification of all the birds and their songs was confirmed by D. Pollack who is familiar with Redwings in Norway. At the particular request of the owner of the property, the locality has not been divulged in the hope of an undisturbed return next year.

E. G. HOLT

[Previous instances of Redwings nesting in the British Isles have usually involved single pairs. Here we have breeding proved in the cases of two pairs with some evidence that a third pair was present.—EDS.]

Snail-eating by Blackbirds.—On three occasions recently, at Frocester, Gloucestershire, I have watched a male Blackbird (*Turdus merula*) extract snails from their shells. As in the interesting paper on "Snail-eating behaviour by Thrushes and Blackbirds" (*antea*, vol. xlvii, p. 46) Mr. Desmond Morris stated that in his experience Blackbirds were always unsuccessful in their efforts, it may be of value to describe the methods used.

On 7th June 1959, for example, the Blackbird found a Common Snail (*Helix aspersa*) on the flower border. It did not beat it on a stone nor, so far as could be seen, hold it by the rim of the shell as a Song Thrush (*T. philomelos*) does. Instead, taking the body of the mollusc between its mandibles, the Blackbird eventually extracted it by shaking, wiping and jabbing movements. Time and again the bird lost its grip and the snail dropped or was thrown several inches, and many times it pecked into the mouth of the shell, but this may have been when trying to get a firm grip on the body. The wiping action was from side to side, the bird sweeping the shell slowly and firmly over the ground, and the shaking was a very vigorous movement, also from side to side. It was during shaking that the shell fell off and landed on the bird's neck.

The whole operation took $3\frac{1}{2}$ minutes; this compares with the $2-2\frac{1}{4}$ minutes taken by a Song Thrush that was timed with three

snails of identical size. The shell aperture measured 18×15 mm. in diameter at the widest points and was intact except for a small sliver off the rim. Perhaps the long-continued dry weather at the time of brood-rearing caused the Blackbird to be more persistent in its efforts to obtain the food.

SYBIL M. BUTLIN

[Snail-eating by Blackbirds has often been recorded in the literature, even as far back as George Montagu (1802) and William MacGillivray (1839). The former wrote in his *Ornithological Dictionary* that "shelled snails . . . are most dexterously broken against a stone in order to get at the animal" and MacGillivray in his *A History of British Birds* said that in the winter months "its food consists principally of snails, especially *Helix aspersa* and *H. nemoralis*, the shells of which it breaks by raising them in its bill, and dashing them against a stone or other hard surface . . . occasionally breaks them open by pecking against the spire, in which the shell is much thinner". Miss Butlin's careful observations seem to have something to add to our knowledge, however.—EDS.]

A second Gray-cheeked Thrush at Fair Isle.—A first-winter Gray-cheeked Thrush (*Hylocichla minima*) was caught by Peter Hope Jones in the Vaadal trap on Fair Isle at noon on 29th October 1958. This is the second British record of this small American thrush; the first, on 5th October 1953, also on Fair Isle, was described in detail by Kenneth Williamson (*antea*, vol. xvii, pp. 266-267; and *Bull. F.I.B.O.*, vol. 2, pp. 3-8).

The 1958 bird was identified with the aid of Roger Tory Peterson's *A Field Guide to the Birds*, Williamson's notes, and Allan D. Cruickshank's photographs (*antea*, vol. xvii, plates 45-46). Its determination as *H. minima* rather than the very similar Olive-backed Thrush (*H. ustulata*) was based on the lack of a well-defined buff eye-rim—there were only small whitish patches before and behind the eye—and the grey, not buffish, lores and ear-coverts. It would be tedious to reproduce the full plumage-description which resembles that of the 1953 bird in every respect, including the presence of a pale buff suffusion on the upper breast—a feature said by Peterson *et al.* in *A Field Guide to the Birds of Great Britain and Europe* (1954) to be absent in this species. The bird's age was deduced from the presence of whitish tips on the greater coverts, most marked on the inner ones.

The main measurements taken were: wing (maximum) 99, bill from skull 16.5, tarsus 31, and tail 66 mm. The weight was 27.8 gm. and, since this is 3 gm. heavier than Williamson's bird was and nearer to the normal weights he gave for autumn migrants in North America, it seems likely that our specimen was not newly arrived when caught. October 1958 brought a great deal of strong westerly wind and there were several extensive gales earlier in the month, which could have been responsible for this arrival.

PETER DAVIS

Bonelli's Warbler in Cornwall.—On 14th September 1958, I visited Marazion Marsh, Cornwall. At about midday my attention was attracted by a warbler which perched in full view for at least two minutes on a bramble bush not more than seven feet high. It appeared to be about the shape and size of a Chiffchaff (*Phylloscopus collybita*), but it differed from that species in having a white eye-stripe and a conspicuous yellow-green lower back and rump, the latter being easily the bird's most striking character. It was quite unlike any warbler known to me and I was convinced it was a species that I had not seen before. Later I consulted the *Field Guide*, as well as the third volume of *The Birds of the British Isles* by David A. Bannerman and the paper by H. G. Alexander on "Field-notes on some Asian leaf-warblers" (*antea*, vol. xlviii, pp. 293-299 and 349-356), and from these it was evident that the bird could be none other than a Bonelli's Warbler (*Ph. bonelli*). The following are the plumage details I noted:

Crown, nape and hind neck pale greyish-brown; mantle and upper back deeper greyish-brown; lower back and rump conspicuous yellowish-green, this colour being suffused into the brown of the upper back. Tail brownish but thought to have paler edging to the outer feathers. Wings greyish-brown but paler margins to some secondaries. Noticeable whitish eye-stripe; face even lighter than crown and head and with some very whitish grey-brown smudgings. Under-parts 'warm' whitish throughout. Bill dull brown; leg-colour not noted.

Later in the month I visited the British Museum (Natural History) and through the kindness of Messrs. R. W. Sims and G. S. Cows I was able to examine skins of Bonelli's Warbler. The bird I had seen in Cornwall closely resembled specimens obtained in late summer.

This appears to be the first record of Bonelli's Warbler for Cornwall and the fourth for the British Isles. BERNARD KING

Pallas's Warbler in Kent.—A Pallas's Warbler (*Phylloscopus proregulus*) was located at Sandwich Bay Ringing Station, Kent, at 9.30 a.m. on 23rd November 1958. It was present for most of the day, but it could not be found on the 24th. The 23rd was windless and cloudy with some mist, following a day of N.E. wind at force 4. Other species present and not seen previously included a few Golderests (*Regulus regulus*) and Blue Tits (*Parus caeruleus*).

When first seen, the bird was feeding in sea buckthorn and seemed to prefer this low cover, returning to it if driven out. Later, however, it was found in a rose-bed surrounded by tall conifers. It allowed close approach at times, but was somewhat difficult to follow with binoculars for it was extremely active—far more so than Yellow-browed Warblers (*Ph. inornatus*) I have seen on other occasions. The following detailed description was noted:

Crown and nape darkish green with broad central stripe of yellow (extending from base of bill to nape) and broad superciliaries of the same colour;

blackish line through eye; ear-coverts greyish, tinged yellow. Mantle and back paler and brighter green than head. Rump conspicuous yellow-green. Tail-feathers dark brown with pale edges. Primaries and secondaries dark brown edged with yellow; median and greater coverts broadly tipped with yellow, so that two wing-bars were formed, the median one not so conspicuous as the greater; scapulars greenish with dark centres. Under-parts greyish-white, the sides of the face and under tail-coverts being tinged with yellow. Legs, bill and eye dark.

The general impression was of something like a Firecrest (*R. ignicapillus*) with a pale rump. The bird was also seen by Messrs. G. Dunkling and J. Websper. This appears to be the fourth British record, almost exactly a year after the one trapped in Norfolk on 17th November 1957 (*antea*, vol. li, p. 197 and plate 36). We attempted to catch the bird in a mist net, but had the misfortune to see it pass through the mesh. DENNIS F. HARLE

[The above three records are the first ones of species recorded in Britain less than ten times to be published under the scheme announced in the August number (*antea*, pp. 241-244). All have been accepted by the new Rarities Committee.—EDS.]

RECENT REPORTS AND NEWS

By I. J. FERGUSON-LEES and KENNETH WILLIAMSON

The items here are largely unchecked reports, and must not be regarded as authenticated records. They are selected, on the present writers' judgment alone, from sources generally found to be reliable. Observers' names are usually omitted for reasons of space and in case a report is subsequently rejected, and none of the items will be mentioned in our annual Index. Readers are asked to submit anything of interest as quickly as possible.

This summary is confined to July and August, and deals almost exclusively with a selection of the rarer species. In the next issue it is hoped to outline the general movements and only a few essential features are mentioned now as background. An early and unusually large passage of northern waders reached a climax towards the end of August with the vanguard of an exceptional influx of Curlew Sandpipers (*Calidris testacea*). Wood Sandpipers (*Tringa glareola*) and Spotted Redshanks (*T. erythropus*) were also prominent. The Passerines presented a contrast. There were local falls of flycatchers (*Muscicapa* spp.), Redstarts (*Phoenicurus phoenicurus*) and various warblers on the east coast on 11th August, on several days between the 17th and the 25th, and again on the 31st; on the 25th as many as 30 Nightingales (*Luscinia megarhynchos*) were estimated at the Naze (Essex); and Tree Pipits (*Anthus trivialis*) were widely reported as unusually numerous in southern England between the 7th and the 23rd. Nevertheless, in general small Passerines were conspicuously absent on passage, presumably because the prolonged spell of calm and clear weather provided perfect migration conditions which enabled birds to continue without stopping.

THE RARER WARBLERS IN JULY AND AUGUST

Against the background of these small numbers of the common Passerines, the proportion of extra-limital vagrants was surprisingly high—a situation which continued through September. The Aquatic Warbler (*Acrocephalus paludicola*) was perhaps the most striking species. In 1938 *The Handbook* was able to list only 31 British records plus "several other seen". Yet in

August and September of this year nearly 20 were identified. The first was trapped at Dungeness (Kent) on 2nd August. A week later, on the 9th, single birds appeared at Stanpit Marches near Christchurch (Hampshire) and at Portland (Dorset); the Stanpit bird was seen until the 12th (and later, in September, no less than three were to be ringed there). Then, nearer the end of August, there were two at Portland on the 23rd (one staying till the 24th), one between Brasted and Westerham (Kent) on the 23rd and 24th, one at St. Agnes (Isles of Scilly) on the 27th and another trapped there on the 29th; and also on the 29th one at Ham Island, Old Windsor (Berkshire).

Icterine Warblers (*Hippolais icterina*) were again a feature of August. At Fair Isle there were one or two most days during the 12th-20th, and 4 were trapped. There was one at Gibraltar Point (Lincolnshire) on the 22nd, one at Cape Clear (Co. Cork) on the 26th and one north of Spurn (Yorkshire) on the 31st, and three separate birds were identified at Portland (Dorset) on the 21st, 23rd and 25th. Among several unidentified *Hippolais* one at Holme (Norfolk) on the 21st was very probably this species. Rather fewer Melodious Warblers (*H. polyglotta*) than in 1958 were reported, but one was trapped at Dungeness (Kent) on 2nd and 3rd August, one at Skokholm (Pembrokeshire) on the 18th, one at Portland during the 27th-29th and one at Cape Clear on the 31st. A Booted Warbler (*H. caligata*) which was ringed at Fair Isle on 29th August and remained until the 31st was only the second recorded in Britain.

Other uncommon warblers included a Great Reed Warbler (*A. arundinaceus*) at Dungeness on 3rd August and a Bonelli's Warbler (*Phylloscopus bonelli*) at Bardsey (Caernarvonshire) from the 19th until 5th September (there are only four previous records of the latter, but later in September there was to be a second one at Bardsey). Barred Warblers (*Sylvia nisoria*), which were to be another great feature of September, began to appear in mid-August. The first ones were at Fair Isle where they were seen every day from 19th onwards (with 6 on the 21st and 5 on the 30th) and at Foula (Shetland) where single ones were noted on the 20th, 21st, 22nd, 27th and 31st. Later the species appeared at Rendall (Orkney) on the 30th and 31st, near Spurn (Yorkshire) on the 31st, at Cley (Norfolk) on the 28th and, more remarkable, at Dungeness on the 29th and at Shoreham (Sussex) on the 31st: this species seldom appears on the south coast and the Sussex record was, in fact, only the second for that county.

OTHER UNUSUAL PASSERINES

Another herald of things to come was the Red-breasted Flycatcher (*Muscicapa parva*) at Foulness (Essex) on the 30th: this was the only report in August, but it was to be followed in September and October by the greatest number ever recorded in one year. The irruption of Crossbills (*Loxia curvirostra*) (*antea*, p. 280) continued into August and on the 21st two Two-barred Crossbills (*L. leucoptera*) were recorded, an immature on Foula (Shetland) and a freshly dead adult male at Newtonmore (Inverness); unusual numbers of Two-barred Crossbills have apparently been seen this autumn in Norway, Sweden and Denmark. Another colourful vagrant was an adult Rose-coloured Starling (*Sturnus roseus*) at Street (Somerset) on 26th July. A Red-rumped Swallow (*Hirundo daurica*) at Murston (Kent) on 28th August was only the ninth or tenth to be identified in Britain.

Buntings play quite a part in the picture. There was a male Red-headed Bunting (*Emberiza bruniceps*), which may or may not have been wild, at Bardsey in the last week of July and an influx of Little Buntings (*E. pusilla*) at Cape Clear (Co. Cork) at the end of August (one on the 29th, 4-5 on the 30th, 2 on the 31st). The first Ortolan Buntings (*E. hortulana*) of the autumn were also seen in the west in late August—at Skokholm (Pembrokeshire) on the 27th, at Marloes (Pembrokeshire) on the 29th, at Cape Clear on the 30th and at St. Agnes on the 31st.

Another southern species which is now regarded as a regular vagrant, especially in the west, is the Woodchat Shrike (*Lanius senator*) and single ones, mostly birds of the year, appeared at Dungeness on 13th August, at St. Agnes

on the 20th, 26th and 27th (different birds) and at Great Saltee (Co. Wexford) on the 30th, the last staying till 9th September.

Among the colourful near-Passerines, we should mention single Bee-eaters (*Merops apiaster*) at Havergate (Suffolk) on 3rd July and at the mouth of the Halladale River (Sutherland) on 14th August; a Roller (*Coracias garrulus*) at Northmavine (Shetland) on 20th and 21st July; an Alpine Swift (*Apus melba*) at Clyro (Herefordshire) on 14th August; and a Great Spotted Cuckoo (*Clamator glandarius*) from then to the 30th. After the unusually good spring passage, a pair of Hoopoes (*Upupa epops*) reared three young in Kent, but the species was then apparently rather scarce in July and August and we have received only a handful of reports from Kent, Sussex, Hertfordshire and Scilly.

TERNS AND GULLS, WADERS AND OTHER WATER-BIRDS

After the total of 5 in the spring (*antea*, p. 280), White-winged Black Terns (*Chlidonias leucopterus*) were identified in August at Radipole Lake (Dorset) during the 19th-23rd, at Farlington Marshes (Hampshire) on the 20th and at Murston (Kent) on the 28th and 29th (two different birds). All were birds of the year except that on the 28th. What may well have been another young White-winged Black Tern was seen at Chichester (Sussex) on the 18th. Caspian Terns (*Hydroprogne caspia*) appeared at Abberton Reservoir (Essex) on 2nd August and at Windermere (Westmorland) on the 15th, while one seen at Hickling Broad (Norfolk) in September and early October was apparently present from June. Adult Mediterranean Gulls (*Larus melanocephalus*) appeared at the Naze (Essex) on 6th August and at Hartlepool (Co. Durham) on the 9th—each for the fourth successive autumn. Other Mediterranean Gulls were seen in Sussex: an adult at Portobello, Brighton, on 12th July, adults at Selsey Bill on 18th July and 29th August, and an immature at the latter place on 9th August.

Few American birds were seen in July and August and all were waders. The first Pectoral Sandpiper (*Calidris melanotos*) was reported from Farlington Marshes (Hampshire) on 26th and 27th July—an unusual date. There was then one in Co. Kerry on 12th August, followed on the 30th by a sudden flush of three American species—a third Pectoral at Hanningfield Reservoir (Essex) (stayed till 5th September), a Lesser Yellowlegs (*Tringa flavipes*) on the Torridge estuary above Instow (Devon) and a Wilson's Phalarope (*Phalaropus tricolor*) on the Flintshire side of the Dee estuary (stayed till 4th September). (The last was only the fourth British record, but was soon to be followed by another in Northamptonshire in mid-September.) Other less common waders included a Pratincole (*Glareola pratincola*) at Ecton sewage-farm (Northamptonshire) on 23rd August, Kentish Plovers (*Charadrius alexandrinus*) in Hampshire (2 on 15th July) and Kent (29th August), a scattering of Temminck's Stints (*Calidris temminckii*) in Kent, Essex and Staffordshire—about 7 in all reported—and Red-necked Phalaropes (*Ph. lobatus*) in Norfolk, Suffolk and Essex, as well as an early Grey Phalarope (*Ph. fulicarius*) at Holbeach (Lincolnshire) on 19th August. We must also mention the remarkable trip of 47 Dotterel (*Ch. morinellus*) at Terrington Marsh (Norfolk/Lincoln border) on 20th August.

A Crane (*Megalornis grus*) appeared on the Co. Durham side of Teesmouth on 4th August and was still present in September. Another long-legged wading bird which stayed some time was an immature Little Egret (*Egretta garzetta*) which first appeared at Farlington Marshes (Hampshire) on 26th July and then moved to Chichester Harbour (Sussex) where it was seen in various places until about 25th August. Spoonbills (*Platalea leucorodia*) were noted in Norfolk, Suffolk, Kent and Flintshire, the last at Shotton Pools from end-June to mid-August.



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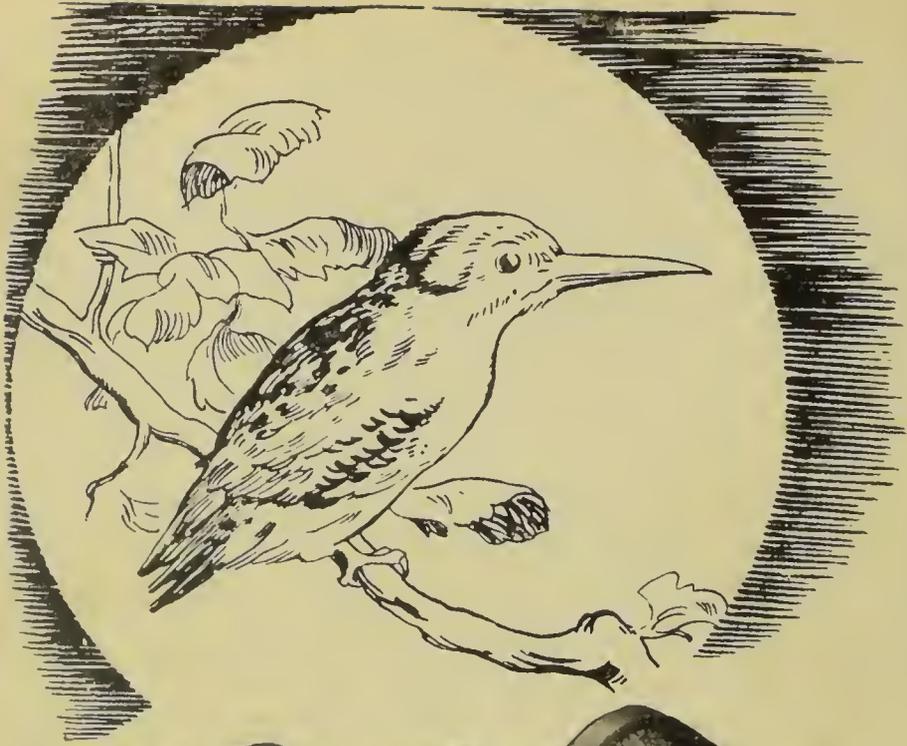
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BRITISH BIRDS

OBSERVATIONS ON THE FULMAR IN SPITSBERGEN

By C. J. PENNYCUICK and D. WEBBE

(Plates 57-62)

INTRODUCTION

THE WRITERS spent the period 23rd July-18th August 1957 observing a colony of Atlantic Fulmars (*Fulmarus glacialis*) on the south-east shore of Tempelfjord, West Spitsbergen, adjacent to the east side of the mouth of Sassendalen.

Although the Fulmar is a well-documented bird, and our period of study was short, we have observations to add to the literature on behaviour at the breeding place, manner of flight, proportions of the colour phases at this particular colony, and the departure of adults at the end of the breeding season.

The breeding area was a vertical cliff about $3\frac{1}{2}$ kilometres long and 150 metres or so high, with a further 100 metres of very steep grass-covered scree below, sloping down to a narrow shingle beach. The cliff consisted of horizontally-bedded crumbly rock, mostly gypsiferous limestone, in which harder and softer bands formed ledges or rows of holes where the Fulmars laid their eggs (plate 57 left).

To estimate the number of breeding pairs in the colony we divided the cliff into 30 sections with roughly equal numbers of birds, and counted the number of chicks on one of them. The result was approximately 10,000 chicks on the whole cliff.

BEHAVIOUR IN THE BREEDING COLONY

Calls.

Fisher (1952) regards all calls made by Fulmars as variants of the cackling display, but we feel this is an over-simplification. Although our birds cackled in many different situations, they also had a small repertoire of distinct calls with sharply defined

associations. The calls which we could distinguish may be classified as follows.

(1) Cackling.

This is the usual note on the cliffs, and there are two forms of it:

(a) Fast cackling — “*cock-cock-cock-cock-cock-aawww-cock-cock-cock- . . .*” The syllables are uttered at a rate of up to 10 per second, and the “-aawww-”, a rasping note, is the inspiration at the end of a stream of syllables.

(b) Slow cackling, aptly referred to as “braying” by Kritzler (1948) — “*AAARK—aawww—AAARK—aawww—AAARK— . . .*” This is a more emphatic form, and the breath is drawn in between each syllable. Some very excitable birds can utter up to 4 syllables per second, but 3 per second is the usual maximum.

When not very excited or provoked the birds usually cackle in discrete outbursts. Typically the outburst starts with a very slow “*cock cock cock*” with the bill hardly open, develops into a crescendo often containing some braying syllables, and then dies away. We often saw a bird begin and end an outburst with its bill under its wing, but in vigorous cackling the bill is opened widely, and the neck and throat are inflated and waved about, often into extreme attitudes (plate 57 right).

When a pair of birds are displaying together, the cackling is normally accompanied by bill fencing and mutual nibbling, which is sometimes instigated by one partner and apparently resented by the other.

One chickless pair, whose displays we observed from a hide, was timed on two occasions, giving respectively 27- and 30-cackle outbursts in half an hour, each outburst lasting usually 10-20 seconds: these were days when the birds were especially lively.

Cackling has no specific meaning (Fisher, 1952). It is used by pairs in mutual display, by established birds towards intruders, by parents when approaching their chicks, and by single birds without apparent provocation. Kritzler (1948) found that, in captivity, Fulmars would cackle when two or more were together, but not when alone.

Small groups of Fulmars may sometimes be seen cackling together on the water near the colony, but we agree with the prevalent view that cackling is essentially an activity of the breeding cliffs, and concerned with generating a social atmosphere conducive to breeding.

(2) Spitting.

This display and the ejection of oil sometimes associated with it is discussed at length by Armstrong (1951). Largely on the basis of Duffey's (1951) observations, he regards it as mainly a defensive reaction of the chick. However, these authors do not emphasise the associated call, a squeaky “*f-chee, f-chee*”,

which in the adult is superimposed on a low growling note. When provoked, a chick can perform the spitting movement and call as fast as 3 times per second.

Quite apart from the deterrence of predators, this display is used by parents and chicks in aggression towards other Fulmars approaching their territory, and produces an immediate effect. Trespassing Fulmars would always retreat promptly from even a small chick spitting, whereas they would often ignore an adult cackling aggressively until it began to spit. Probably as a result of the extreme effectiveness of this display, the Fulmars hardly ever seemed to fight, and even the ejection of oil was unusual.

We saw only one fight. A parent on its chick cackled progressively more intensely at an intruder, which was gradually sidling up to it, and at length seized the other bird's wing in its bill. Both birds flew off locked together, but the parent was back on the ledge within a minute. This was a case of aggression without the spitting display being used.

Fights may be more frequent earlier in the breeding cycle, for Prévost (1953) describes the closely related Antarctic Fulmar (*F. glacialoides*) as fighting in defence of territories when these are being established. The rest of his account of this species' behaviour agrees closely with our observations on the Atlantic Fulmar.

The peaceable behaviour of our birds is in strong contrast to the continual and often vicious fights in, for example, Guillemot (*Uria aalge*) colonies, although these birds have developed the colonial habit further than Fulmars and reduced the territory to the space occupied by the brooding bird.

(3) Feeding the chick.

Our observations on the care of the chick were made mostly during a total of 24 hours' watching from a hide on the cliff face, from which we were able to observe three nests at a range of about 10 feet.

Both parent and chick make special calls in connection with the feeding process, which has been described in detail by Duffey (1951). He, however, apparently missed one important part of the appeasement routine, namely the chick's soliciting call.

Briefly, the routine is as follows. The young chick seems unable to recognize its parents, and spits at anything which moves. The adult therefore alights a short distance from it and approaches gradually, cackling every time the chick spits and thus eventually appeases the latter's aggressive behaviour. The chick then starts its soliciting note, which is a low, very regular and monotonous cawing sound. The syllable rate is about $1\frac{1}{2}$ -3 per second, and the syllable length about $\frac{1}{4}$ second. When the parent hears this it begins to retch, making thin whining sounds like a small puppy, and food is passed to the chick in the manner described by Duffey (plate 58 left).

Duffey does mention a "shrill note, continuously repeated" uttered by chicks older than five weeks during feeding, but does not seem to connect this with soliciting food. Armstrong (1951) remarks on the absence in Duffey's account of a definite releaser for regurgitation.

The cawing note was a very constant feature of our birds' feeding process, and it seems improbable that Duffey would have interpreted it otherwise if he had heard it at all. The most likely explanation is that conditions for listening are probably very much better in inland fjord areas of Spitsbergen than in Orkney where Duffey worked. Days of flat calm are frequent in late summer, and there is then no swell at all; what noise there is from the sea does not echo on account of the scree and beach below the cliff.

The noisiness of cliffs exposed to ocean swells probably accounts for a general tendency, in describing the displays of cliff-nesting birds, to pay little attention to the associated calls, although when they are noted they are often found to be clearly differentiated and to form an important part of the displays. For instance, one of us (Penneyeick, 1956) found a well-developed set of calls in Brünnich's Guillemot (*Uria lomvia*), and two such studies on colonial sea birds which nest in quieter places are those of Sladen (1953) on the Adelie Penguin (*Pygoscelis adeliae*) and Warham (1956) on the Great-winged Petrel (*Pterodroma macroptera*). The calls described by the latter are broadly analogous to those set out in the present paper, although the actual notes uttered are different.

(4) Calls on the wing.

There are two types of call given on the wing:

(a) Alarm or mobbing note. This is a sharp quiet sneeze, rather like the sound of a large focal plane shutter. It is made firstly when a flying bird is surprised—for example, when one gliding steadily along a cliff top is suddenly confronted by a human being and swerves to avoid him. Secondly, one of us (C.J.P.) has heard Fulmars in Scotland repeatedly make this call while they were hovering beside him in an updraught, when he was sitting close to their nests; in this case the call seemed to be a very mild form of mobbing.

(b) Fulmars flying steadily along, generally in flapping flight, sometimes make a repeated call, instances of which are described by Fisher (1952). The syllable rate varies (1-3 per second), but the syllables are not necessarily synchronized with the wing beats. The nature of the syllables is very variable, but in calm conditions the rasping inspiration note can be heard between each one. These calls may be an aerial form of cawing, although they are usually not very loud.

Vestigial nest building.

Movements which may originally have been concerned with nest building are common among adult Fulmars. A bird will repeatedly lean forward and pick up a piece of grass or dirt, or a stone, then slowly drop the object over its shoulder. The objects are not all deposited in one place, and we often saw a Fulmar which had used up all the pebbles within reach move gradually some distance along a ledge doing the same thing further along.

We once saw a strange performance which might be concerned with vestigial nest building. This was the pulling of large tufts of down from the breast of a partly fledged chick by an adult, evidently its parent. The chick spat at the adult which thereupon tried to seize its bill. The chick cawed intermittently and the parent tried again to seize its bill, but the young bird fought it and spat. The parent then pulled out more down but stopped after about two minutes and fed the chick normally.

FLIGHT

Although it spends most of its time at sea, the Fulmar is especially well adapted for hill soaring, that is, making use of the upcurrents formed when the wind blows on to a hillside or cliff face. It is a noticeably better performer in this respect than other cliff-nesting pelagic birds, such as the auks (*Alcidae*) and cormorants (*Phalacrocorax* spp.). These birds have a higher wing loading and therefore glide faster, and need a stronger wind in order to soar. The reason for this difference is probably that the diving birds require smaller wings for use as paddles under water, whereas the Fulmar, being a surface feeder, has been able to evolve its flight mechanism more independently of its aquatic activities.

On account of the Fulmar's fondness for soaring in front of the cliff face, it is relatively easy to observe the details of its gliding flight.

The control movements agree well with Hankin's (1913) account of thermal soaring in kites (*Milvus* spp.) and vultures (*Aegypiidae*), and may probably be regarded as illustrating the general principles of the control of gliding flight in birds. The main points are shown in plates 58-62 and are as follows.

Basic controls.

Control in pitch is effected by fore and aft movements of the wings, moving the centre of lift relative to the centre of gravity, and so producing a pitching moment. Since this involves pivoting the wings about the shoulder or carpal joints, these movements also alter the amount of sweep back or forward of the wings and so affect lateral stability. These movements are accompanied by alterations of dihedral in such a sense as to oppose their effect on lateral stability, and probably sweep and dihedral are reflexly interlocked so as to keep the lateral stability constant.

Sharp vertical movements, such as are necessary when flying in very gusty conditions, can also be produced by rotating both wings together at the shoulder joint, altering their incidence relative to the body. Since the moment of inertia in pitch of the wings is much less than that of the body, this results in a change of angle of attack of the wings, and a sudden drop and acceleration (or climb and deceleration), without much change in the attitude of the body.

Changes of speed which are maintained, as opposed to corrections of changes caused by bumps, are normally initiated by the other method. In normal cruising flight the wings are held with zero sweep and slight anhedral (plate 58 right). To increase speed, the wings are swept back, mainly from the carpal joint, and also bent downwards, while to decrease speed they are swept forward, spread and raised. In this case the incidence of the wings relative to the body is not drastically altered.

The positions described are also maintained for longer periods in other situations. For instance, when the bird is gliding at increased speed the wing is swept back from the carpal joint and the anhedral increased (plate 60 upper), whereas in a sustained turn at normal speed the wings are swept forward and up (plate 59 left). The reduction in wing area with increasing speed would tend to make the angle of attack constant over a wide range of speeds. It is possible that the Fulmar is thus able to fly at its optimum lift/drag ratio irrespective of speed, which would give it great "penetration"—that is, the ability to effect a large increase in speed with a small increase in the angle of descent. This would be an important advantage in the long overland journeys which Fulmars make by soaring in hill lift, and would be even more important in wind gradient soaring as described for albatrosses (*Diomedidae*) by Idrac (1924 ab).

Control of roll is effected by differential twisting of the wings. For fine control movements the twisting is effected by deflecting the primaries alone (plate 60 lower), whereas in coarse movements at low speeds the whole wing is rotated bodily at the shoulder joint (plate 59 right). Recent ciné-films have shown that rates of roll up to 360 degrees per second can be achieved by momentarily retracting one wing to about half the length of the other, but only at the expense of some loss of height. In balanced turns the drag moments of the two wings are presumably equalized by flexing the elbow joint to alter the length of one wing relative to the other (plate 61 upper), there being no control corresponding to the rudder in aircraft which could produce yawing moments.

An intentional sideslip is often induced when a bird is hovering or flying slowly in a strong updraught. If the bird wishes to remain sideways on to the cliff, so as to avoid colliding with it, or to observe an intruder, the relative airflow is then coming steeply upwards and from the seaward side; in other words, the bird must sideslip to seaward, which it does by flexing the seaward wing more

than the other, and raising it more from the carpal joint (plate 62 left).

The tail.

It will be noticed that the tail has not been mentioned in connection with any of the basic control movements; in fact, moulting Fulmars can fly and manoeuvre at normal and high speeds just as well without a tail.

The tail probably serves as a subsidiary minor control in pitch and yaw: it can be twisted through large angles around the longitudinal axis and also rotated up and down, and these movements are made in cruising flight, but not in any consistent relation to direction of turn or other manoeuvres. The movements are probably concerned with minor corrections of bumps. At cruising speeds the tail is normally furled with its edges parallel, and curled slightly concave upwards.

The main function of the tail is at low speeds, when it is spread to provide extra lifting surface, its area being thereby increased by a factor of about three, compared with its cruising configuration (plates 59 left and 60 lower). This is well demonstrated by a Fulmar approaching the cliff to land, which it does by diving down at a high speed, then pulling up and approaching the cliff in a rapidly decelerating climb. In this latter phase the wings are smoothly swung forwards, spread and raised, as described above, and at the same time the tail is spread.

The Fulmar does not use its tail as an airbrake, but relies on its feet for this purpose (plate 60 upper and 62 right). In this it resembles the auks and cormorants, but differs from some more lightly loaded birds such as gulls (*Larus* spp.).

The stall.

A Fulmar will often make repeated approaches to the cliff without landing, climbing up to within a few inches of a ledge in which it is interested, then turning and dropping away again. At the peak of the climb, as it turns, the speed is often very low, and the wings may be seen suddenly to start fluttering, a rapid oscillation about the leading edge, which does not itself vibrate appreciably. At the same time feathers, particularly at the trailing edge, may be seen to be lifted up (plate 61 lower).

This is probably an intentional stall, carried out in a stable configuration with the wings well spread and raised.

The movement is usually seen in an updraught in front of the cliff face, but often the sudden drop as the wings begin to flutter is clearly visible.

The feet.

When fully retracted the feet are folded up forwards under the flank feathers in the space occupied by the manus when the wing is folded, but near the cliffs they are normally carried straight back below the tail, whence they can be lowered quickly into the

airflow when required. When gliding with little updraught near the cliff face, the feet are often lowered slightly below the spread tail, hanging at an angle of 10 degrees or so below the axis of the bird's body (plates 59 and 60 lower). In this position it is possible that the feet may act as split flaps and produce a small increase in the lift developed by the tail.

The more important function of the feet is to act as airbrakes in steep, slow descent, or during hovering in a strong updraught (plate 62 right), which is the same thing aerodynamically. In this type of descent the wings are well raised, with the carpal joints drawn in by flexing the elbows, and the primaries swept upwards and back. The tail is not used as an airbrake, but is furled and raised steeply, so that it is in line with the airflow coming up from below. The feet, however, are extended with the webs fully spread and curved forwards, and back-and-forth movements of them are used to control accurately the angle of descent whilst maintaining the speed constant. In this way the bird can hover steadily in an updraught. This process can be observed more clearly in a ponderous bird like a Shag (*Phalacrocorax aristotelis*): when a Shag is trying to glide at a constant height in a strong updraught the sharp back-and-forth movements of the feet can be very plainly seen.

COLOUR PHASES

We endeavoured to establish the proportions in our colony of the four colour groups described by Fisher (1952). Fisher's (arbitrary) divisions are:

- (1) Double light (LL), in which the head and neck are pure white.
- (2) Light (L), in which there is some pure white on the breast.
- (3) Dark (D), in which there is a dusting of grey or brown (however slight) on the breast.
- (4) Double dark (DD), in which the head, neck and breast are as dark as the wings.

This last category we thought unsatisfactory, as some very dark birds have the wings considerably darker than the head and neck, whereas other much paler ones are of a uniform tint all over.

The distinction between L and D is difficult to dissociate from lighting conditions. Also birds may appear paler when at rest than in flight owing to breast feathers being spread out in the sitting position (although our results showed a reverse tendency).

Counts of birds at rest on the cliff were made from nine observation points, each commanding a view of between 12 and 65 nests and many ledges frequented by adults. Counts of colour phases were made from the same points on 10 different days, although not all the points were covered on each day. Thus the same birds may be assumed to have been counted repeatedly on different days, which should tend to even out variations in our

estimate of a bird's category due to varying lighting conditions.

We made three counts of airborne birds flying in hill lift along the cliff or the neighbouring hillside, and these are listed separately in Table I, in which the percentages of the different forms are given.

TABLE I—PROPORTIONS OF THE DIFFERENT COLOUR PHASES OF FULMARS (*Fulmarus glacialis*), WEST SPITSBERGEN, AUGUST 1957

The divisions used are those proposed by Fisher (1952) (see text). The observations of Burton and Thurston, made in the same season, are included at the foot.

	%LL	%L	%D	%DD	Total
Sitting	0.2	5.0	85.1	9.7	5,352
Flying	0.7	16.2	73.0	10.1	148
B&T (flying)	0.5	6.3		93.2	1,000

We also quote, by permission, the counts made in the same season by P. J. K. Burton and M. H. Thurston (B&T in Table I) of airborne birds at Kapp Linné on the west coast. This is about 80 kilometres west-south-west of our colony and the Fulmars concerned were probably from Grønfjord. Their count of 1,000 birds was divided into 10 groups of 100 each, and the mean percentage of L and LL together was then 6.8%, the standard error between samples being 0.51.

DEPARTURE OF THE ADULTS

Besides the colour phase counts, we made regular counts from the same nine observation points of (a) the total number of adults visible on the cliff, and (b) the number of unattended chicks.

The totals of these counts are represented in Fig. 1, and the actual counts are given in Table II. For various reasons some points were missed out on some days, and the method of estimating the missing values is explained in the Appendix.

TABLE II—TOTAL NUMBERS OF ADULT FULMARS (*Fulmarus glacialis*) ON CLIFF AND PERCENTAGE OF UNATTENDED CHICKS, WEST SPITSBERGEN, AUGUST 1957, TO ILLUSTRATE DEPARTURE OF ADULTS WITHOUT YOUNG

Date	No. of adults on cliff	% chicks unattended
August 4th	926	
5th	846	
6th	789	
7th	684	44.8
8th	824	49.7
10th	662	56.1
11th	677	
12th	648	54.4
14th	457	62.4
15th	440	54.4
16th	393	53.4
17th	170	55.0
18th	259	59.0

It can be seen that throughout the period of the counts the number of adults declined progressively, but there was no very marked corresponding increase in the proportion of unattended chicks. This we take to indicate that the decline in the adults was due mainly to the departure of birds which, through non-breeding or failed breeding, had no chick to tend, while the amount of time spent on the cliff by parents with their chicks had not yet begun to decrease. No chick had been seen to fly by the time we left, but some of them were practically indistinguishable from adults.

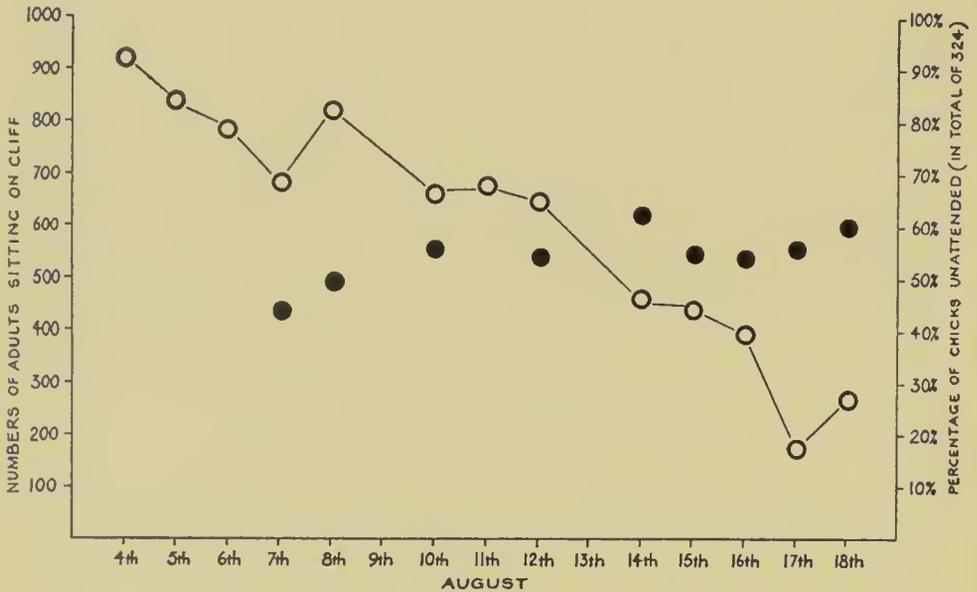


FIG. 1.—DECLINE OF NON-BREEDING POPULATION OF FULMARS (*Fulmarus glacialis*), WEST SPITSBERGEN, AUGUST 1957

The open circles show the total numbers of adults visible on sample sections of the cliff; the black circles indicate the percentages of unattended chicks on the same sections. While the number of adults declined steadily, there was no corresponding increase in the proportion of unattended chicks. This suggests that the birds which left were non-breeders or unsuccessful ones and that, even though some chicks were almost indistinguishable from adults by the end of the period, they were still being regularly tended by their parents.

It can be seen from Fig. 1 that at the beginning of our stay the number of adults which could be seen sitting on the cliff was nearly three times the total number of chicks, whereas by the time we left there were only about half as many.

We had no means of distinguishing birds of pre-breeding age from the others, but we noticed that in some adults the nostril was light blue-grey, whereas in most it was brown. The difference was clear cut, and it would be worth investigating whether it is correlated with, for instance, age.

APPENDIX

The method of filling in the most probable values of missing counts, so that totals for all the counting points could be added,

was as follows. On five out of the 13 days concerned complete coverage of all nine points was made. The counts for these five days were added to give a total for each point, and the average of these totals was calculated. A multiplier was then found for each point which would bring its total to equal the average.

Every value in the Table was now multiplied by the figure appropriate to its counting point, thus eliminating the differences in average number of birds counted from each point. Daily averages could now be calculated and finally these were divided by the multipliers for individual points, so providing estimates of missing values.

TABLE III—NUMBERS OF ADULT FULMARS (*Fulmarus glacialis*) VISIBLE FROM NINE COUNTING POINTS, WEST SPITSBERGEN, AUGUST 1957

Estimated values are given in italics (see above).

Date	1	2	3	4	5	6	7	8	9	Total
August 4th	123	130	211	77	31	79	143	69	63	926
5th	116	113	186	61	32	82	132	65	59	846
6th	96	118	128	105	32	80	115	58	57	789
7th	78	81	151	58	24	68	109	58	57	684
8th	93	114	197	84	30	69	126	57	54	824
10th	76	92	160	44	26	65	102	58	39	662
11th	78	95	150	53	30	68	106	59	38	677
12th	78	85	132	41	35	64	104	54	55	648
14th	58	68	105	28	21	40	74	32	31	457
15th	59	58	103	27	18	46	65	34	30	440
16th	48	54	97	24	22	39	53	32	24	393
17th	19	27	24	11	11	17	39	11	11	170
18th	26	45	60	8	10	36	40	21	13	259

The counts of adults are shown in Table III, with estimated values given in italics. The counts of unattended chicks were similarly treated.

ACKNOWLEDGEMENTS

Our thanks are first of all due to the other members of our party for their part in running the expedition, namely E. Carr-Saunders, R. C. Plowright, M. L. Blake and C. Coulton. We are also very grateful to the Governor of Svalbard and the Store Norske Spitsbergens Kulkompani for their co-operation and for facilities extended to us during our stay in Spitsbergen.

SUMMARY

1. An account is given of the calls associated with various activities in a breeding colony of Fulmars in Spitsbergen.
2. The movements used in the control of gliding flight are described and illustrated with photographs.
3. The proportions of the colour phases proposed by Fisher were found to be approximately as follows: LL ca. $\frac{1}{2}$ %; L 5%; D 85%; DD 10%.
4. From counts of adults visible on the cliff and of unattended chicks, it was deduced that adults without young were leaving

the colony during our stay, but that the time spent by parents with their chicks was not decreasing appreciably.

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THE FOOD OF NESTLING ROOKS NEAR OXFORD

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INTRODUCTION

THIS SHORT PAPER describes an aspect of a study of Rooks (*Corvus frugilegus*) carried out while I was holding a Nature Conservancy Post-Graduate Studentship at the Edward Grey Institute, Oxford, in 1952 and 1953. All four rookeries concerned were within 10 miles of Oxford and were on rather similar farming land. The food obtained refers to the first three weeks of the nestlings' life, a period previously ignored in work on the food of Rooks.

I am grateful to Dr. David Lack, F.R.S., who supervised the work, and D. F. Owen who gave much assistance.

TECHNIQUE

The method was that used by Kluijver (1933) on young Starlings (*Sturnus vulgaris*). A collar is placed around the neck of the nestling, sufficiently tightly to prevent swallowing and loosely enough to allow breathing. The parent is allowed to feed the young and, when the former has left the nest, the food is then removed from the gullet of the nestling and placed in 70% alcohol. This technique allows food to be obtained whole and undigested and, in addition, can be made quantitative; however, it requires practice to apply the collars with the correct degree of tightness. As might be supposed, the very small and very large young are the most difficult to deal with. On several occasions the extent

to which food passed the collar was tested on large young by the placing of two collars around the neck. It was found that, provided the young were not left with food in the throat for more than 20 minutes, very little, if any, slipped past the first collar. Kluijver used aluminium collars but I found plastic-covered wire as efficient; it is important, however, to stretch the plastic insulation beyond the rough end of the wire in order to avoid cutting the nestling. No nestlings died under this technique.

FOOD

Species of animals taken.

Rooks brought various species of earthworms to the nest: most frequent were *Lumbricus terrestris*, *Allolobophora longa* and *A. caliginosa*; in addition, however, *Dendobaena mammalis* occurred occasionally in large numbers and was probably obtained from cow-pats and when dung was spread on the fields. They took few leatherjackets (larvae of crane-flies, Tipulidae) in April, for these were then mostly too small for them to locate. Other food consisted of such animals of grassland as the caterpillars of the moth *Celaena secalis*, ground beetles, weevils and Lycosid spiders.

Differences between rookeries.

The percentages by volume of the main foods of nestlings in 4 rookeries at Oxford are shown in Table I. Earthworms formed the bulk of the food in all rookeries in each year except rookery A in 1953. The percentage by volume of grain brought to the young varied greatly between rookeries.

TABLE I—FOOD BROUGHT TO NESTLING ROOKS (*Corvus frugilegus*) AT FOUR ROOKERIES NEAR OXFORD IN APRIL 1952 AND 1953, EXPRESSED AS PERCENTAGES BY VOLUME

The four rookeries were King's Spinney, Rousham (A); Frilford Heath (B); Appleton (C); and Marcham (D).

Year	Rookery	No. of samples	% Earthworms	% Leather-jackets	% Other animals	% Grain
1952	A	12	73	8	6	13
	B	13	52	14	6	28
	C	24	80	2	17	1
	D	6	68	9	12	11
1953	A	26	32	—	28	40
	C	21	53	—	29	18

Differences between years.

Table I shows that in both rookery A and rookery C the proportion of earthworms was much lower in 1953, which had a cold dry April, than in 1952. The reduction in the proportion of this protein food was not wholly compensated for by a corresponding increase in production of animals other than earthworms. Instead much more grain was given to nestling Rooks in 1953 than in 1952.

Changes in composition of food with age of young.

The proportion of non-protein food (mainly grain but including potato, turnip and a little bread) increased as the young Rooks grew older. The food brought to nestlings in each of three age classes (1-7, 8-15 and 16-22 days) was analysed and in 1952 the percentages by volume of grain, etc., were respectively 1, 6 and 22. In 1953, the corresponding percentages were 16, 11 and 37. This increase in the amount of carbohydrate with increasing age was to be expected since it is the rapidly-developing small young which need much protein food. But in 1953 even very young nestlings were fed with appreciable amounts of grain: as already mentioned, April 1953 was dry and cold, and parent Rooks may have been forced to use grain owing to shortage of animal food. The percentage survival of broods of 5 in 1953 was 55% whereas in 1952 it was 69% (Lockie, 1955).

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THE SEPTEMBER DRIFT-MOVEMENTS OF 1956 AND 1958

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Part 1—General Summary and Weather Conditions

INTRODUCTION

DURING THE FIRST WEEK of September in 1956 and 1958 there were extensive drift-arrivals of migratory birds on the east coast of Britain. These were made up almost entirely of species which are summer-visitors to Europe and widely distributed in Scandinavia and the countries surrounding the Baltic Sea. As might be expected from the coincidence in the time of these falls, the chief participants were much the same in both years. A number of wader and other non-Passerine birds were concerned, but by far the most important numerically were the mainly night-migrating Passerines, among which Wheatear, Whinchat, Redstart, Garden and Willow Warblers and Pied Flycatcher* were dominant. The discussion which follows largely concerns these Passerine species.

In this part of the paper the migration is summarized and its general character is considered in relation to the meteorological environment. Part II is concerned with a more detailed examina-

*Scientific names of all species and races mentioned are given in an Appendix on pages 376-377.

tion of various aspects, especially the occurrence of extra-limital vagrants, and with a theoretical discussion of this material, particularly on the 1958 season.

These drift-movements are worth a detailed analysis because, although much the same species were concerned in the two years, there were some rather striking (and unexpected) differences in composition and differential abundance; and a comparison clearly demonstrates the vitally important effects of meteorological phenomena on bird migration, and throws interesting light (some of it new) on the function of drift in the evolutionary sphere. Migrational drift, which in brief is concerned with the directional influence of wind on migratory movements in circumstances when accurate navigation is not possible, has been discussed in a number of recent papers (particularly Williamson, 1952, 1955).

Perhaps the three most striking differences between the early September falls in the two years were: (a) that certain species which reached "avalanche" strength at Fair Isle in 1956 were more numerous in the south-east than the north-east in 1958; (b) that the movements were almost confined to the east coast in 1956, but were more general and noticeable as far west as the Irish Sea in 1958; and (c) that while certain of the rarer migrants, such as the Wryneck, Bluethroat, Red-backed Shrike and Ortolan Bunting, were well represented in both years, it was only in 1958 that eastern and north-eastern vagrants were concerned, a feature being the remarkable influx of Red-breasted Flycatchers. One aim of this paper is to compare the meteorological developments over the Continent and the North Sea in the two seasons, and enquire what part these developments played in determining these differences.

The full data of the 1956 migration have not previously been presented, except in species lists in the separate annual reports of the bird observatories. The general pattern of the 1958 migration has, however, already received brief mention, with detailed accounts of the birds involved, in *Bird Migration* (vol. 1, no. 1) and the "Recent reports and news" feature of *British Birds*, (vol. li, pp. 361, 405, 432-445). For this reason the 1956 movements are given a fuller treatment in the present paper, those of 1958 being drawn upon mainly for comparison and for the discussion of instructive and important points which emerge. The data are taken mainly from the "Daily Census" record books of the bird observatories, from their annual reports and (in a few cases) their ringing records, and from the two publications cited above.

ACKNOWLEDGEMENTS

My thanks are due to the bird observatories for so readily placing their records for these periods at my disposal, and to many migration students who were "in the field" at these times and have kindly made their observations available.

I am grateful to Sir Landsborough Thomson, R. C. Homes,



FIG. 1.—THE LOCATIONS OF THE MORE IMPORTANT PLACES MENTIONED IN THE TEXT

- | | |
|---|--|
| (1) Foula, Shetland | (16) Cley and Blakeney Point, Norfolk |
| (2) Dunrossness and Sumburgh, Shetland | (17) Walberswick, Suffolk |
| (3) Fair Isle, Shetland | (18) Bradwell, Essex |
| (4) Dornoch, Sutherland | (19) Dungeness, Kent |
| (5) Isle of May, Fife | (20) St. Catherine's Point, Isle of Wight |
| (6) Aberlady, East Lothian | (21) Portland Bill, Dorset |
| (7) Holy Island, Northumberland | (22) Jersey and Guernsey, Channel Islands |
| (8) Monks' House, Northumberland | (23) St. Agnes, Isles of Scilly |
| (9) Farne Islands, Northumberland | (24) Lundy, North Devon |
| (10) Whitley Bay, Northumberland | (25) Skokholm, Pembrokeshire |
| (11) Teesmouth, Co. Durham/Yorkshire | (26) Great Saltee and Tuskar Rock, Co. Wexford |
| (12) Flamborough Head, Yorkshire | (27) Bardsey, Caernarvonshire |
| (13) Spurn Point and Kilnsea, Yorkshire | (28) Copeland Islands, Co. Down |
| (14) Gibraltar Point, Lincolnshire | (29) Tory Island, Co. Donegal |
| (15) Holme, Norfolk | |

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Thanks are also due to the Controller of H.M. Stationery Office for permission to reproduce drawings based on the weather-maps published in the Daily Weather Report of the Meteorological Office (Air Ministry).

MIGRATION AND THE WEATHER IN 1956

During the last week of August 1956, European weather was characterized by low pressure disturbances affecting a very extensive area between the Baltic countries and the British Isles. There was a complicated depression with centres over the Baltic Sea, the north German coast and southern England on the 25th, and this system moved northwards to envelop the whole of Scandinavia next day. The British Isles were then in a trough which brought moderate-to-fresh W.S.W. winds to England and the whole of west and middle Europe. A col developed briefly over south Norway and Denmark on the 27th, but there was much rain in the area, with continuing S.W. wind, and on the 28th another cold front, stemming from a low which developed over Jutland, swept eastwards across the Continent.

A low centre moved into the Skagerrak from the North Sea on the 29th, remaining there throughout the 30th; but with anticyclones building up in mid-Atlantic and over north-eastern Europe the weather showed much promise of improvement. Spreading eastwards, the Atlantic high enveloped Britain on the last day of the month, and a considerable ridge probed far into Europe. A cyclonic disturbance, however, covered Finland and the east Baltic countries, so that winds were westerly except in southern Europe on the south side of the ridge. This ridge extended to southern Scandinavia and most of middle Europe on 1st September, giving easterly winds as the low retreated into northern Russia. During 1st September the two highs joined up to create an extensive anticyclonic ridge penetrating southern Scandinavia, the Baltic region, Poland and western Russia, again establishing an easterly airflow across middle Europe. On the assumption that fine, clear weather is needed as an inducement to begin migration, considerable movement was probably in progress between latitudes 50° and 60° N.

2nd September 1956.

Late on the 1st a somewhat restricted warm front, producing much rain, was associated with a low moving northwards along the Biscay coast of France. The front crossed the English Channel before nightfall and pursued its way through East Anglia, reaching the Humber Estuary at dawn. From Dungeness north to Spurn it was responsible for bringing down a large number

of drift-migrants caught whilst journeying southwards through the Continental maritime region. These seem likely to have had their origin in southern Norway or Denmark where calm air and clear sky had prevailed the previous evening.

Dungeness, Kent. Many birds were already at the lighthouse at 02.30 hours, these including Wheatears and Pied Flycatchers. Assuming they had travelled in a S.W. "standard direction" for some $7\frac{1}{2}$ hours in the N.E. airstream at 20 knots plus their own flight-speed, an origin in Denmark seems likely for the vanguard. When the traps were driven at 06.15 hours it was obvious that there was a great increase in birds from the previous day, and at that time most of these were still in the neighbourhood of the lighthouse. The Garden Warbler was the commonest Passerine,

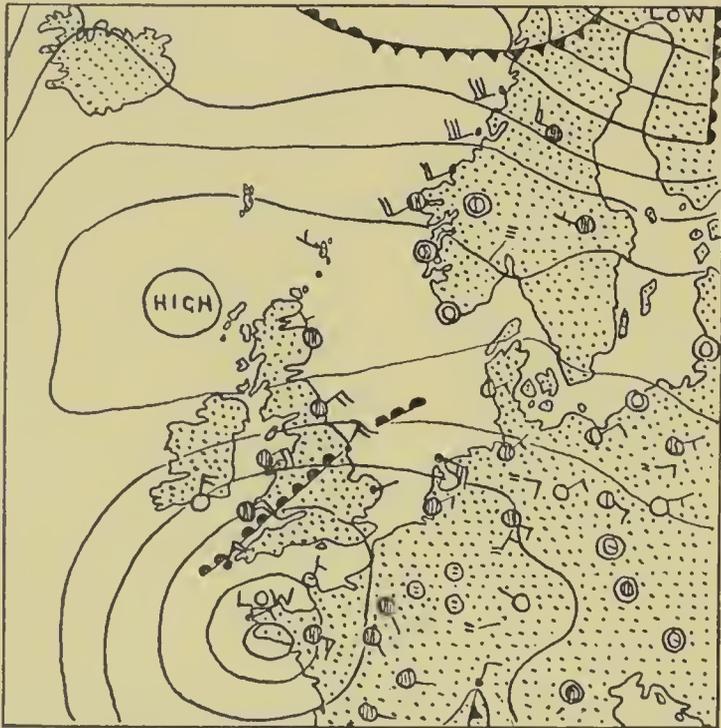


FIG. 2.—POSITION OF THE WARM FRONT AT 06.00 HOURS ON 2ND SEPTEMBER 1956

closely followed by Redstart, Pied Flycatcher, Whitethroat, Wheatear, Whinchat and Willow Warbler in that order. However, although Whitethroats showed a tenfold increase from 1st September it is more than likely that a proportion were of British origin, since 5 of the 30 trapped had been ringed previously at Dungeness. The same probably applies to the Sedge Warblers, since of the three captured one had been ringed before.

Cley, Norfolk. There was rain during the night and early morning on the north Norfolk coast. Redstarts were dominant, Garden Warblers less so—a reversal of the situation at

Dungeness, and this may indicate a different area of origin, perhaps the Skagerrak crossing. An increase in Wheatears was noted, and Pied Flycatchers and Whinchats were common, but Willow Warblers were few and there is no suggestion that either Sedge Warblers or Whitethroats were involved.

Holme, Norfolk. At the north-eastern corner of the Wash the numbers of most species doubled between 14.00 and 18.00 hours, perhaps the result of coasting in the Wash area leading to concentration at this point, although another explanation might be that the birds had passed the front in clear weather to eastward and had been brought to the coast by the veering wind. Pied Flycatchers were dominant, followed by Garden Warblers and Redstarts, but only two Willow Warblers were seen.

Gibraltar Point, Lincolnshire. On the opposite, north or north-west coast of the Wash, Garden Warblers were the commonest birds, followed by Redstarts and Pied Flycatchers, and no Willow Warblers or Whitethroats were present on the 2nd.

Spurn, Yorkshire. The drift appears to have spent itself by the time the Humber was reached: the poverty of the immigration and the totally different numerical relationship of the species involved suggest a different place of origin, perhaps the south-west coast of Norway. Garden Warblers dropped below Whinchats and Redstarts (which were about equally common) and, in fact, were fewer than Willow Warblers. There were more Wheatears, and Pied Flycatchers were scarce.

The differential fall at the various points from the Humber south certainly does not suggest a "broad-front" immigration from the east.

3rd September 1956.

At 18.00 hours on the 2nd the warm front lay across the North Sea between Denmark and the Northumberland coast. By midnight, it stretched from the Forth to the Skagerrak, and a change had occurred in its configuration, a subsidiary front extending southwards parallel to the Northumberland coast, joining a cold front which stretched from the Humber into Belgium and France. These fronts had moved very little by morning. There was a N.E. wind with rain in the Forth, a more northerly breeze with fog off the Northumberland coast, and a S.E. breeze behind the cold front at Spurn. Ahead of the cold front, on the coast of the Low Countries, there was mist at midnight, but the weather was clear and winds were light farther north in Denmark and southern Norway—conditions suitable for emigration from the Scandinavian peninsula.

Monks' House, Northumberland. Events on the Northumberland coast on the morning of 3rd September have been described by Ennion (1957). Overnight there were E. to S.E. squalls rising locally to force 5 or 6, but the wind dropped by dawn. There were Whinchats, Pied Flycatchers and Redstarts "in extra-

ordinary numbers", many Garden Warblers and smaller numbers of Wheatears and *Phylloscopi*.

Farne Islands, Northumberland. A team on the Inner Farne reported mist with heavy rain early on, the mist persisting so that the mainland, only a mile and a quarter away, could not be seen until evening. Immigration went on, apparently, until mid-afternoon and the species involved were Redstarts and Pied Flycatchers, with about half as many Wheatears and Willow Warblers and some Tree Pipits and Garden Warblers.

Isle of May, Fife. It is clear from entries made in the Isle of May "log" that a very big fall of birds took place on the 3rd, after a night of strong E.N.E. wind (locally at force 6) and driving rain, but little field-work was possible under the wretched conditions which marred the day. According to Eggeling (1956)

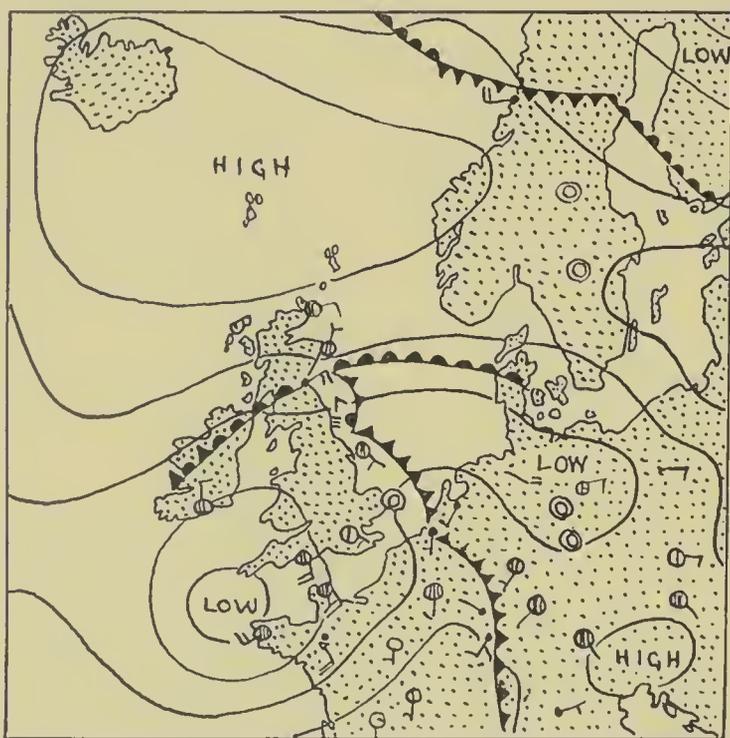


FIG. 3—FRONTAL DEVELOPMENTS AT 06.00 HOURS ON 3RD SEPTEMBER 1956

"it was not possible to obtain a very clear idea of just what birds were involved, though clearly there were many Garden and Willow Warblers, Redstarts, Whinchats and others."

4th September 1956.

The cold front closed up on the warm front during the 3rd and by midnight the occlusion stretched across the North Sea between the Forth and northern Denmark. The weather-maps show a westerly airstream in the Forth area at midnight and 06.00 hours,

though the breeze became E.N.E. at the Isle of May later in the morning. The rain died out before dawn, when the occluded front spanned the North Sea between the Moray Firth and the Skagerrak, with rain and east wind ahead of it. At 10.00 hours on the 4th "about 70 Pied Flycatchers and 300 Redstarts" were still present on Holy Island and in the Monks' House area, and many remained on the Inner Farne.

Isle of May, Fife. With the wind westerly after midnight it is unlikely that any additional drift-migration reached the isle, and in view of the continuing rain it is extremely improbable that any of the previous day's arrivals moved out: doubtless the great majority had made their landfall during the atrocious weather of the preceding day. Wheatears were the most common species (possibly with diurnal arrivals after the wind-change to E.N.E.),

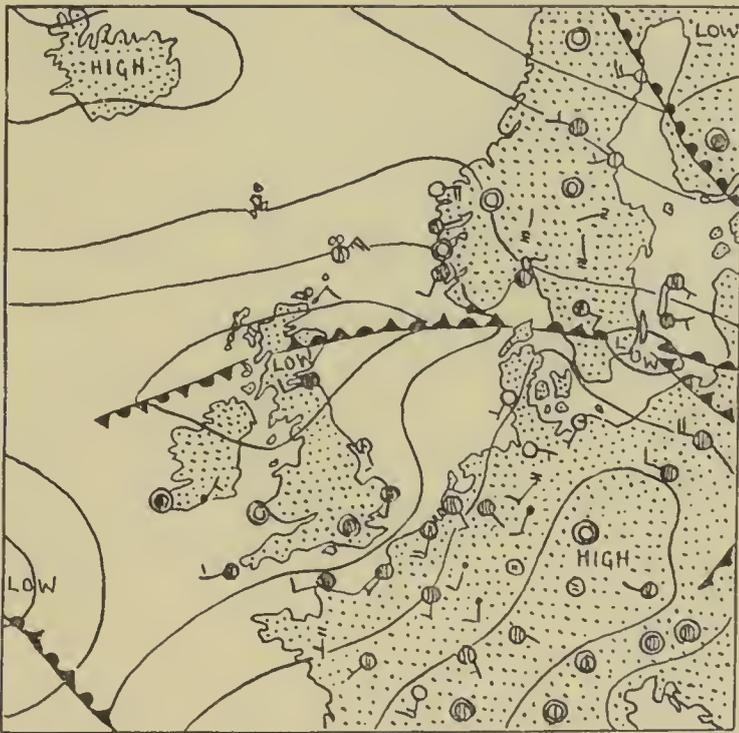


FIG. 4—FRONTAL DEVELOPMENTS AT 06.00 HOURS ON 4TH SEPTEMBER 1956

with Pied Flycatchers a good second and Garden Warblers third. Redstarts and Whinchats each numbered about a score, and there were rather fewer Willow Warblers and Tree Pipits—while the total of Whitethroats, as elsewhere, was negligible. The May, positioned just ahead of the warm front on the night of the 2nd/3rd probably got its complement from farther north.

Fair Isle, Shetland. At about 10.00 hours the front, swinging north-westwards, reached Fair Isle and a heavy downpour ensued. The wind, at first N.E., veered to S.E. as the front went through.

When the rain slackened at 11.00 hours it was apparent that a veritable "avalanche" of Redstarts, Whinchats and other small birds was taking place. Redstarts were everywhere, and much more uniformly distributed about the isle than the also abundant Whinchats, which tended to concentrate in the crofting area. There must have been hundreds of the former along the 4-mile reach of the west and north cliffs, with considerable overspill on to the hill and moorland. There were 35 Whinchats in and around one small crop of oats, clinging to the ears and perching along an adjacent wire fence. Willow Warblers were fewer but nevertheless exceedingly common, and next in order were Pied Flycatchers and Garden Warblers. Some little time after the cessation of the rain and the appearance of these birds, Tree Pipits began dropping from the sky by the score, calling continuously, and by mid-afternoon this species was about as numerous as the Whinchat. Small Wheatears, with an average wing-length and weight less than that of the local stock (and considerably less than that of *schjølteri* of north-western origin), were also concerned in the "rush", appearing mostly during the afternoon. Assuming a dusk departure, these birds must have been on the wing for 15-17 hours and, since their migration was clearly diverted by the front, the journey must have been a circuitous one. Wind-flêches at stations in southern Scandinavia show a maximum force of 3 and the average wind-speed would be about 6 knots, so that a ground-speed of about 25 miles per hour is probably a fair estimate of their progress if moving down-wind. This would add up to 350-400 miles and indicate the Skagerrak crossing as the likeliest source. The only other explanation is that this immense horde of small birds was "precipitated" on meeting the front when travelling in a S.W. "standard direction" from western Norway—in which case one must assume that these thousands of normally nocturnal migrants elected to leave the Norwegian coast in daylight.

5th September 1956.

The wind had returned to S.E. all along the east coast from Fair Isle to Dungeness on the night of the 4th/5th, but there was little to show for this change at the bird observatories, except at the extremities of the line. Only in the north and south did this airstream encompass the North Sea crossing from the opposite coasts, the wind round the shores of the Heligoland Bight being southerly to S.W. At Fair Isle there was, in all probability, renewed drift from the Skagerrak and northern Denmark in this S.E. wind (which was part of the circulation of a low centred outside St. George's Channel), as some species, notably Willow Warbler and the two flycatchers, showed an increase on the previous day; the Wheatear was the most important species in the trapping record. At the Isle of May, after good visibility overnight, most of the birds had left. At Dungeness the gain was in

Willow Warblers and Whinchats, probably drifted across the Channel before a warm front which entered the southern North Sea.

6th September 1956.

The warm front advanced northwards during the night, followed by a cold front associated with the same depression, and the changes in status at the various observatories were more White-throats at Dungeness, Whinchats at Cley and Spurn, a new influx of Pied Flycatchers at Spurn, Redstarts and Tree Pipits at the Isle of May, and a few extra Bluethroats at Fair Isle. Additional arrivals at Holy Island were some Willow Warblers and 2 Bluethroats, but no Passerine movement was observed in the Wash. As conditions on the Continental side were very poor for migration, owing to the frontal activity, no large-scale influx was to be expected.

7th September 1956.

Overnight on the 6th/7th there was still easterly wind in the region of the cold front between southern Norway and Shetland, and Bluethroats increased at Fair Isle, coming probably from the west coast of Norway ahead of the front. Cyclonic weather prevailed in southern Norway, the Skagerrak and Denmark and in all likelihood emigration was inhibited. There was thick fog at the Isle of May overnight, clearing in the early hours: most of the birds at the lighthouse were Pied Flycatchers, and one caught at midnight was found to have been ringed on the island four days before. There were still Passerine migrants, Redstarts predominating, on Inner Farne.

8th September 1956.

With the fronts disappearing beyond the north of Scotland and a filling low in the North Sea leaving the British Isles in a col, calms or light westerly breezes with clear skies in the Irish Sea and the south of England made conditions suitable for redetermined passage. In such ideal weather, however, outward movements would pass unnoticed by most bird observatories.

SOUTH COAST MOVEMENTS IN 1956

There were no spectacular movements on the Channel coast during the first week of September 1956, and indeed drift did not develop on any scale until the fronts of a low situated south-west of Ireland on the night of the 8th/9th swept eastwards, penetrating France and the Low Countries.

This resulted in a big influx of *ca.* 250 Turtle Doves at Portland Bill, Dorset, together with a large number of Whinchats, many Pied Flycatchers, and smaller numbers of Redstarts, *Phylloscopi*, Sedge Warblers and Whitethroats. The main "rush" at St. Catherine's Lighthouse, Isle of Wight, was after 05.00 hours (though Turtle Doves were arriving from 02.00 hours) and the dominant Passerines there were Wheatears, Whinchats and

especially Whitethroats, with less of the other warblers and many Pied and fewer Spotted Flycatchers. In Hampshire, a big Wheatear increase was noted at Farlington and Stanpit Marshes, with smaller gains in Whinchats and Redstarts.

This movement affected the east coast as far north as Holme, in Norfolk. Wheatears and Whinchats came in at Dungeness, but the biggest falls there were of Whitethroats and Garden Warblers, with a new influx of Pied Flycatchers. Pied Flycatchers and Redstarts increased at Cley, while at Holme Wheatears were dominant with Whinchats less so and Redstarts, Garden Warblers and Pied Flycatchers also present.

With the low receding southwards to the Iberian Peninsula, and filling slowly, Britain came under the influence of anticyclones lying to east and west, and the night of the 9th/10th was calm with overcast sky along the Channel coast. A local fall of birds in the south-east, mainly Whinchats and Redstarts at Dungeness and the same species plus Pied Flycatchers at Holme, was probably due to drift from the Low Countries, where there was mist and easterly wind. Movements at Portland and St. Catherine's (where passage was in full swing at the light at 01.00 hours) seem certain to have been emigration; all the major immigrants of the preceding day were fewer at Portland, but at St. Catherine's the "rush" was greater, the bulk consisting of Wheatears, Whitethroats, Pied Flycatchers, Redstarts, Sedge Warblers and *Phylloscopi*.

At no time in the first ten days of September 1956 was any significant drift-movement detected in the Irish Sea.

MAIN PASSERINE SPECIES OF SEPTEMBER 1956

WRYNECK (*Jynx torquilla*).—Although this species is not actually a Passerine, it is convenient to treat it as such in migration studies. In fact, in view of its normal scarcity on autumn passage, it must be regarded as an important participant in the 1956 drift-movements. A number of Wrynecks appeared at the bird observatories and other regularly manned sites on the east coast as follows (a dash, as against a complete blank, indicates that none was seen although observers were present, while in others of these tables question marks have been used where precise information has not been forthcoming):

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Dungeness	—	3	—	—	—	—	—	—	3	—
Cley/Blakeney	1	2	—	—	—	—	—	—	—	—
Holme	—	1	2	—	—	—	—	—	—	—
Gibraltar Point	—	—	3	—	—	—	—	—	—	—
Spurn	—	1	3	3	1	1	1	1	1	—
Inner Farne	—	—	2	—	—	—	—	—	—	3
Isle of May	—	—	—	5	3	2	3	1	—	—
Fair Isle	—	—	—	—	1	—	1	—	—	—

In addition, there were 2 at Holy Island, Northumberland, for some days from the 2nd and a number of other scattered reports on other parts of the east coast during this period. These included a total of about 7 further birds in Norfolk and 10 in Suffolk (with 4 at Walberswick on the 2nd)—though, curiously, none in Essex (see Norfolk, Suffolk and Essex *Bird Reports* for 1956). Although the main influx was on the 2nd-3rd, one of those at the

Inner Farne on the 10th came in off the sea at 10.15 hours, and newcomers appear to have reached the Isle of May on the 7th. Similarly, there seems to have been an influx on the Channel coast on the 9th, for, in addition to the new birds at Dungeness, there were 2 at Portland Bill then. Another reached Portland on the 11th and there were single birds there on the 14th, 19th-20th and 23rd. Records in the Irish Sea area were more numerous than usual, the first being at Bardsey on the 7th, while on the 8th there was one off the north-west coast of Ireland, at Inishtrahull, Co. Donegal. Great Saltee had one on the 17th and a dead bird at Tuskar Rock light, also off the Co. Wexford coast, on the 18th had probably arrived a day or two before. Wrynecks were recorded at Lundy on the 11th and 12th, from the 14th to 18th, on the 20th and 21st, and from the 23rd to 26th; while Skokholm had single birds on the 21st and 22nd and the 24th and 25th.

WHEATEAR (*Oenanthe oenanthe*).—This was one of the more important species in the invasion. There were about 30 at Dungeness on the 2nd, and increases at Cley and Spurn (20, after only one on the 1st). Next day there were 20 on the Inner Farne (after 2 on the 2nd), and a big increase at Monks' House, where all those handled proved to be of the typical race. It is probable that the majority of the 70 recorded at the Isle of May on the 4th had arrived the previous day. At Fair Isle on the 4th 8 of the 9 Wheatears trapped after mid-day, and most of the 44 caught next day, were Continental immigrants, paler, lighter in weight and shorter-winged than the local stock; these were followed by a renewed influx with other small Passerines on 7th September, when numbers were also high at the Isle of May (65). There were substantial increases at Holme, Dungeness and along the south coast on the 9th, and the fall assumed "avalanche" proportions at St. Catherine's next day with *ca.* 400.

WHINCHAT (*Saxicola rubetra*).—A common and very widely distributed bird in the drifts all along the east coast, with numbers at Fair Isle on the 4th reaching "avalanche" strength. Although the invasion began on the 2nd in the south, the numbers were highest next day. Dungeness had subsequent increases on the 5th and 10th, Cley and Spurn on the 6th and 10th, and Whinchats were common in the Wells-next-the-Sea and Holme areas of the Wash on the latter day. As there were 8 on the Brownsman (Farne Islands) on the 10th this later influx seems likely to have reached the Northumberland coast. There was a good increase at St. Catherine's and a heavy fall at Portland (over 100) on the 9th, but fewer next day. Records at the Irish Sea observatories were of from one to 4 irregularly (except at Skokholm, where the species was present throughout), with an increase at all stations on the 10th. East coast summary:

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Dungeness	6	20	40	12	40	20	10	15	20	40
Cley/Blakeney	—	10	18	13	10	24	1	seen	2	more
Holme	—	—	2	1	1	—	—	17	3	11
Gibraltar Point	2	4	—	—	—	—	—	6	—	—
Spurn	2	10	20	20	10	25	20	?	?	30
Inner Farne	—	—	12	15	—	—	4	—	—	2
Isle of May	—	—	3	20	20	20	10	3	2	3
Fair Isle	5	1	1	500	300	200	200	200	50	15

REDSTART (*Phoenicurus phoenicurus*).—A common and widely-distributed bird, with the first peaks on the 2nd-3rd and reaching "avalanche" strength at Fair Isle on the 4th. Spurn had a second influx that day, the Isle of May another on the 6th and Cley on the 9th-10th, whilst there seems to have been movement from Dungeness north as far as the May on the 10th (there were 20 then at Wells Point, Norfolk, in addition to birds at Holme). There was a considerable increase, from 15 to 50, at St. Catherine's on the 9th, with about the same number next day, but very few indeed at Portland. Redstarts were practically absent from the Irish Sea (except for 2 at Bardsey on the 2nd)

until odd birds appeared during the 8th-10th. East coast summary:

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Dungeness	—	50	10	10	6	2	2	4	5	20
Cley/Blakeney	2	50	seen	9	4	1	—	—	12	15
Holme	—	1	2	—	—	—	—	—	8	7
Gibraltar Point	—	5	3	3	3	3	2	4	—	4
Spurn	2	11	2	30	?	?	?	?	?	?
Inner Farne	—	—	40	20	—	—	8	—	—	3
Isle of May	—	—	3	20	12	20	10	10	3	12
Fair Isle	—	—	—	1,000	500	350	200	100	30	10

BLACK REDSTART (*Phoenicurus ochruros*).—One at Cley on the 6th and one at the Isle of May on the 13th-14th were the only observatory records in the first half of September, but it is worth adding that there was also one at Dunrossness (Shetland) on the 5th.

NIGHTINGALE (*Luscinia megarhynchos*).—Noted only at south coast stations: one at Dungeness from the 2nd to the 5th and one there on the 10th, one at Portland on the 9th, and one at St. Catherine's on the 10th.

BLUETHROAT (*Cyanosylvia svecica*).—In view of its normal scarcity as an autumn migrant, this species must be regarded as an important element in the drift since it occurred widely along the east coast. Numbers at Fair Isle showed a steady increase from the 4th and there were probably over 20 birds there on the 9th. Apart from those in the summary table below, there was one at Bradwell, Essex, on the 2nd; one or two at Lowestoft, Suffolk, from the 5th to 8th and one at Benacre on the 7th; one at Dunrossness, Shetland, on the 5th; one at Holme on the 9th; one at Gibraltar Point on the 12th; from one to 4 at Cley after the influx of the 10th until the 18th; and another at Lowestoft on the 19th. On the south coast, Portland had one on 2nd September and 3 with the drift of the 9th, while on the latter date there was also one at Farlington Marshes, Hampshire. The Bluethroat is a very scarce vagrant in the Irish Sea, so that records there are of particular interest: there were single birds at Skokholm on the 12th and 14th-15th; one at Great Saltee on the 11th; and single birds at Lundy on the 19th and 21st. East coast summary:

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Dungeness	—	1	1	—	—	—	—	—	—	—
Cley/Blakeney	1	4	3	1	—	1	—	—	1	7
Gibraltar Point	—	1	1	1	—	—	—	—	—	—
Spurn	—	—	1	—	—	—	—	—	—	—
Inner Farne	—	—	1	1	—	—	1	—	—	1
Holy Island	—	—	2	—	—	2	—	—	1	—
Isle of May	—	—	5	3	3	2	2	1	—	—
Fair Isle	—	—	—	1	5	7	12	16	20+	2

GRASSHOPPER WARBLER (*Locustella naevia*).—Migrants during this period included one at Dungeness on the 4th, one at Cley on the 5th, and one at the Isle of May from the 4th to the 6th. There were several at Portland on the 9th.

REED WARBLER (*Acrocephalus scirpaceus*).—Single birds at Dungeness on the 2nd and 9th, and 2 at the Isle of May on the 4th (one remaining till the 7th), provide the only evidence that this species was concerned in the drift, but in some places the position of this species and the Sedge Warbler is obscured by the wanderings of local populations.

SEdge WARBLER (*Acrocephalus schoenobaenus*).—Apart from Dungeness, the east coast observatories recorded very few Sedge Warblers. There were 5 at Dungeness from 2nd to 8th September (7 on the 3rd), but as one of the 3 captured on the 2nd was a locally-ringed bird it is quite possible that the others likewise had no connection with the drift. Elsewhere occurrences were sporadic and concerned single birds only, except at the Isle of May with

2 on the 5th and 7th and 4 on the 8th. None was present at Fair Isle where this is always an exceedingly rare species in autumn. There was some movement of Sedge Warblers at St. Catherine's and Portland on the south coast on the 9th and 10th, but the only notable movements in the Irish Sea were of 15 at Great Sallee on the 4th and 8 at Lundy on the 8th.

AQUATIC WARBLER (*Acrocephalus paludicola*).—One at St. Catherine's on 10th September.

BARRED WARBLER (*Sylvia nisoria*).—Barred Warblers occurred both just before and during the period of the main drift, and were clearly part of it in Northumberland and at Fair Isle. There was one at Cley/Blakeney on 30th August and 2 on the 31st, after which on 1st and 2nd September there were single birds both there and at Holme. The Inner Farne had as many as 3 on the 3rd, and a tired bird trapped near Ripon, Yorkshire, on the next day may have crossed the coast at the same time. One at Fair Isle on the 4th was followed by 3 next day, and there was also one at Dunrossness, Shetland, on the 7th. Meanwhile, for East Anglia, one at Benacre, Suffolk, on the 5th and one at Morston, Norfolk, on the 6th should be mentioned. Single birds were seen at Fenwick and Fenham, Northumberland, on the 8th and one at Holy Island on the 11th, while at Holme again there were 2 on the 9th and one on the 10th. The only Barred Warbler recorded on the south coast was one at Portland on 9th September.

BLACKCAP (*Sylvia atricapilla*).—A scattering of records at bird observatories provided evidence that this species played a small part in the drift: one at Cley on 2nd September; one at Gibraltar Point on the 2nd-3rd and again on the 9th; one on the Inner Farne on the 3rd; 2 females at Fair Isle on the 5th and 7th, and a male on the 8th; one at Dungeness on the 10th.

GARDEN WARBLER (*Sylvia borin*).—This was one of the chief participants, generally distributed but more important in the south-east and in Scotland than along the middle reach of the east coast. As with other species, there were subsequent increases apart from the main influx on 2nd-3rd September, notably at Fair Isle on the 7th and Dungeness on the 9th. On the 9th also there was a movement at St. Catherine's (21 after one on the 8th), and 6 occurred at Portland on the 10th. The Irish Sea observatories had scattered occurrences during the period, the most being 3 at Skokholm on the 10th. East coast summary:

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Dungeness	—	75	10	10	2	1	1	2	30	10
Cley/Blakeney	—	10	5	5	—	—	1	2	4	5
Holme	—	11	2	2	—	—	—	1	6	1
Gibraltar Point	—	10	3	—	—	—	—	2	—	—
Spurn	—	6	4	2	?	?	?	?	?	?
Inner Farne	—	—	6	6	—	—	4	—	—	—
Isle of May	—	—	10	40	20	20	10	8	1	2
Fair Isle	—	—	3	50	30	10	20	20	20	5

WHITETHROAT (*Sylvia communis*).—Nowhere was this an important species during the influx on the east coast, and in some places like Dungeness, and perhaps also Spurn, though a number of Whitethroats were recorded, it is difficult to know to what extent local birds were involved. A significant pointer would seem to be that of the 35 trapped at Dungeness on 2nd September no less than 5 had been ringed there before—one in 1954 and 2 each in the summers of 1955 and 1956. However, the summary table below clearly shows that the species did play a part in the drift, even if to a very minor degree. There was strong evidence of movement at Dungeness, Gibraltar Point and the Isle of May on the 8th (when three were also seen on the sea-wall at Holme) after an obvious influx at the Scottish stations on the 7th; and there were increases during the 8th-9th at Portland (about 50) and during the 9th-10th at St. Catherine's (over 200), at a time when Whitethroats were also moving at the

Isle of May. Whitethroats were regular on passage at the Irish Sea observatories, as is usual at this period, but the 8th was a day of increase at Lundy and between then and the 10th a heavy movement developed at Skokholm. East coast summary:

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Dungeness	5	50	20	15	15	25	20	80	120	90
Cley/Blakeney	1	1	3	7	seen	seen	1	2	1	4
Gibraltar Point	—	—	8	5	3	2	—	20	—	2
Spurn	4	10	12	6	?	?	?	?	?	?
Inner Farne	—	—	2	2	—	—	3	—	—	—
Isle of May	—	—	1	2	—	3	10	30	10	30
Fair Isle	—	—	—	2	3	3	10	10	5	1

LESSER WHITETHROAT (*Sylvia curruca*).—Although clearly concerned, Lesser Whitethroats were scarce. On 2nd September 5 appeared at Dungeness and one at Cley. Then on the 3rd there were 2 at Gibraltar Point and single birds at Spurn and Monks' House. There were 3 at Spurn and Fair Isle on the 4th, and one at Dunrossness (Shetland) next day. The Isle of May had its only record for the period on the 7th, but then on the 8th there were 3 at Gibraltar Point, single birds at Spurn and Fair Isle and also one at Holy Island. Cley and Dungeness each supplied one record on the 9th and the next day there was one at Holme. There were 2 at St. Catherine's on the 9th-10th.

ICTERINE WARBLER (*Hippolais icterina*).—One at Dungeness on 2nd September was the only record during the period, an interesting comparison with 1958.

WILLOW WARBLER (*Phylloscopus trochilus*).—This species was of widespread occurrence, but numbers were small on the 2nd except at Dungeness and Spurn. Willow Warblers were better represented in the fall of the 3rd and large numbers reached Fair Isle next day, the figure increasing still further on the 5th as in the case of the Pied Flycatcher. Subsequently a marked movement occurred at Gibraltar Point on the 8th, this being reflected in the Wash area and as far away as Dungeness and the Isle of May. At Portland there were a few between the 8th and the 10th, and a rush of about 200 took place at St. Catherine's on the latter date. Movement was almost continuous at the Irish Sea bird observatories, the numbers fluctuating from day to day, but the only considerable fall took place at Great Saltee (*ca.* 160) on the 4th. East coast summary:

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Dungeness	5	25	25	20	45	25	10	25	20	?
Cley/Blakeney	—	3	3	1	3	—	—	2	2	4
Holme	—	8	4	—	—	—	—	2	3	1
Gibraltar Point	1	—	1	1	1	1	1	30	—	2
Inner Farne	—	1	20	15	—	—	6	—	—	10
Isle of May	1	1	8	12	5	6	6	10	3	?
Fair Isle	6	1	20	300	500	400	250	200	75	?

WOOD WARBLER (*Phylloscopus sibilatrix*).—Single birds were recorded at Cley on the 2nd and at Gibraltar Point on the 8th.

SPOTTED FLYCATCHER (*Muscicapa striata*).—Although represented in the movements along the east coast, the Spotted Flycatcher was relatively scarce everywhere. It appeared at Dungeness (2), Cley (4) and Gibraltar Point (1) on the 2nd, and singly at Spurn and Inner Farne on the 3rd when an increase to 8 was noted at Dungeness. About 10 reached Fair Isle on the 4th and this number increased to 20 on the 5th, whilst the Isle of May had one or 2 from the same day. Later influxes were on the 7th at Dungeness (4) and on the 10th at Cley (5), Spurn (4) and the Isle of May (3). At Portland, 6 on the 9th increased next day to 10, while the number at St. Catherine's rose from 11

to 17. There was fairly steady passage through the period in the Irish Sea, with notable increases at Bardsey and Great Saltee on the 4th, and at Lundy on the 8th and 12th.

BROWN FLYCATCHER (*Muscicapa latirostris*).—One at Holy Island, Northumberland, on 9th September (see *antea*, vol. li, pp. 125-126).

PIED FLYCATCHER (*Muscicapa hypoleuca*).—Pied Flycatchers played a great part in the invasion along the east coast (and later in the Channel area), being widespread and especially common in the falls of 3rd and 4th September from Northumberland northwards. As with the Willow Warbler, a further substantial increase occurred at Fair Isle on the 5th, but otherwise the only evidence of a "follow-up" seems to have been on the 6th at Spurn and on the 9th at Dungeness and in Norfolk, with 25 at Wells on the 10th. On the south coast, there were 25 at St. Catherine's on the 9th and over 100 there on the 10th, while Portland had 40 on the former date. This is a comparatively scarce migrant in the Irish Sea and there were only sporadic occurrences in that area during the period. However, E. M. Nicholson reported an unusual number in the Isles of Scilly. There were 1-3 daily at Lundy and occasional ones elsewhere, though there was evidence of a bigger movement when 12 were recorded at Great Saltee on the 10th and 8 increased to 15 at Lundy during the 11th-12th. East coast summary:

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Dungeness	4	50	20	5	2	1	—	—	25	10
Cley/Blakeney	1	20	15	2	—	—	—	—	6	3
Holme	—	35	11	1	—	—	—	—	3	14
Gibraltar Point	—	5	7	4	3	4	2	2	—	2
Spurn	—	2	4	2	—	10	?	?	?	12
Inner Farne	—	—	40	15	—	—	—	—	—	3
Isle of May	—	—	—	50	30	30	25	15	5	2
Fair Isle	—	—	—	100	200	50	25	10	5	1

RED-BREASTED FLYCATCHER (*Muscicapa parva*).—Single birds at Cley on 3rd and 9th September were the only ones at an observatory during the period, but one at Pakefield in Suffolk on the 2nd (the first for that county) and one at Fenham in Northumberland on the 8th must also be mentioned, and on the 18th and 26th single ones were recorded at Blakeney.

TAWNY PIPIT (*Anthus campestris*).—Several were recorded in coastal counties from Norfolk to Dorset during September, the following in the period under review: 2 at Camber, Sussex, on 3rd and 5th September and one there on the 6th; one on the Crumbles, Sussex, on the 4th; one at Blakeney Point on the 6th; one at Dungeness and 3 at Portland on the 9th; and one at Hove, Sussex, on the 10th.

TREE PIPIT (*Anthus trivialis*).—A widespread species in the south on the 2nd, more plentiful from Northumberland to the Firth of Forth on the 3rd, and at "avalanche" strength at Fair Isle on the 4th and 5th. There was an increase at the Isle of May on the 6th when the numbers were still high at Fair Isle. On the south coast, there were some at Portland on the 1st (10), the 8th-9th (6), the 10th (12) and 12th (20), while several appeared at St. Catherine's on the 8th. The species is normally a scarce migrant in the Irish Sea and 1-3 were occasionally recorded at the various observatories during the period; the only significant passage was of 17 at Lundy on the 8th. East coast summary:

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Dungeness	—	1	—	—	—	—	—	—	—	—
Cley/Blakeney	—	1	1	—	1	2	—	2	2	1
Gibraltar Point	—	—	—	—	—	—	—	2	—	2
Spurn	—	—	—	—	1	—	1	2	?	?
Inner Farne	—	—	10	2	—	—	—	—	—	—
Isle of May	—	—	—	6	6	12	8	6	1	—
Fair Isle	—	—	—	500	500	200	100	25	25	seen

RED-BACKED SHRIKE (*Lanius cristatus collurio*).—A very scarce species, but there is some evidence that a few were involved in the drift. On 3rd September there were two on Inner Farne and one at Scolt, Norfolk (which stayed until the 9th). On the 4th the Isle of May recorded 3 and Cley one. From the 10th to the 13th one stayed at Spurn. In addition, two were present on Holy Island on 31st August and 3rd September, also on the 6th and from the 8th to the 13th. In the south, there was a migrant at St. Catherine's on the 10th.

WOODCHAT SHRIKE (*Lanius senator*).—A juvenile appeared at Dungeness on the 5th, was trapped on the 7th and was last seen on the 8th. On the 12th there were 2 immatures a mile apart near Shoreham, Sussex.

CROSSBILL (*Loxia curvirostra*).—This "irruption" species, which had been on the move through Britain since June, reappeared in the drift of 3rd-4th September. A big flock reached the Isle of May on the 5th, and Fair Isle had a second influx on the 8th. The only Irish Sea record, however, was of 10 at Lundy on the 6th. During the week from 3rd to 7th September several large flocks were seen on Holy Island, Northumberland, and numbers in the Kyloe-Fenwick woods opposite grew to *ca.* 600 birds. East coast summary:

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Dungeness	—	—	—	—	—	—	—	—	1	—
Cley/Holme	—	—	1	1	—	—	—	—	—	—
Gibraltar Point	—	—	—	—	—	—	—	—	1	—
Spurn	—	—	—	—	—	—	—	—	—	2
Inner Farne/ Monks' House	—	—	2	2	—	6	—	—	—	—
Isle of May	—	—	—	2	35	2	—	—	—	—
Fair Isle	1	1	—	12	1	3	1	10	2	2

RED-HEADED BUNTING (*Emberiza bruniceps*).—In spite of the possibility of escapes from captivity, single males at Lundy from the 4th to the 10th and at Spurn from the 9th to the 11th should be mentioned.

ORTOLAN BUNTING (*Emberiza hortulana*).—Considering its normal scarcity as a passage migrant, this was an important participant in the drift movements—at first best represented in the south-east, but later also in the extreme north. Towards the end of the period, on the 9th, a fresh influx occurred at Cley and on the same day at least 5 were seen at Portland (and there was one at St. Catherine's on the 10th). This bird is normally rare at the Irish Sea stations and the number of appearances there was quite remarkable: at Lundy there were 2 on the 6th and one next day, one on the 11th and 12th and 2 on the 13th and 14th; at Skokholm 2 on the 9th, 4 on the 11th and 3 on the 12th; at Bardsey one on the 8th and 15th; and at Great Saltee one on the 4th and 15th, and 2 on the 16th which remained for several days. East coast summary:

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Dungeness	—	3	—	—	—	—	—	—	—	—
Cley	—	5	7	4	—	—	—	1	5	3
Gibraltar Point/ Spurn	—	—	—	—	—	—	—	—	—	—
Inner Farne	—	—	1	—	—	—	—	—	—	—
Isle of May	—	—	—	1	—	1	1	1	—	—
Fair Isle	—	—	—	1	5	5	2	4	3	—

MIGRATION AND THE WEATHER IN 1958

A depression which had been active over the Scandinavian peninsula and north-eastern Europe filled on 26th August and in its place col conditions developed over the whole area, between an

anticyclone centred on Germany and a polar high developing over northern Norway. The build-up of anticyclonic conditions was rapid, the polar high uniting with the other to cover the whole of middle Europe from northern Russia to Sicily and Greece on the 28th. This high expanded eastwards and on the 30th-31st was centred on Novaya Zembya and the Arctic Ocean between Cape Cheliuskin and Murmansk, so that between latitudes 50° and 70°N. there was a light to moderate easterly airflow across Europe from western Asia.

31st August 1958.

On the last day of August the high was well entrenched over Scandinavia and the North Sea, with the wind S.E. at forces 2-4 between the Skagerrak and northern Britain. Light easterly airs or calms were reported by most of the Continental weather stations, and there was considerable cloud in the south of Scandinavia and on the Danish and Dutch coasts. With a front extending from N.N.E. to S.S.W. across St. George's Channel the wind in the approaches to the Irish Sea was light S.S.E. and there was some rain.

The first migrants at Cley were Willow Warblers, with a few Tree Pipits and a single Barred Warbler, Blackcap, Whitethroat, Spotted Flycatcher and Red-backed Shrike. As the wind was light easterly throughout the night this was probably a drift influx from Holland and southern Denmark. In the Isles of Scilly the overnight wind was southerly at force 2, veering west by dawn, and there was rain from the front mentioned above. From its composition, the influx of migrants at St. Agnes seems likely to have come by drift from north-west France rather than as a southwards movement from the Irish Sea, where visibility was poor owing to the influence of the front. The most important migrants were Willow and Sedge Warblers, Wheatears, White-throats, Pied and Spotted Flycatchers, some Turtle Doves, 2 Reed Warblers, a Wood Warbler and a male Black-headed Bunting.

1st September 1958.

During the night visibility was excellent over much of Europe, including the whole of Germany; but there was mist with force 3 E.S.E. wind on the south-west coast of Norway and heavy overcast on the Dutch and Belgian coasts—and although the sky conditions improved there towards dawn, they deteriorated around the Skagerrak. These conditions of atmospheric stability by night in the maritime regions marked the beginning of the drift movements along the east coast generally. Calm and fairly clear weather existed over England, and it is probable that emigration from the British Isles was also going on.

At Fair Isle the first arrivals, few in number, were mainly Willow Warblers (20), Garden Warblers (10) and a few each of Pied and Spotted Flycatchers. Red-backed Shrikes (2), Tree

Pipits (2), a Lesser Whitethroat and a Barred Warbler were other migrants, and with overcast and rain in western Norway it seems likely that these birds came from no farther north than the Skagerrak. As evidence of movement within the country, "Northern" Wheatears were on passage at Monks' House; but a big "rush" of Whinchats and Pied Flycatchers began at 11.00 hours, and with this drift influx were Bluethroats (2), Blackcaps (2), a Wryneck, a Wood Warbler, a Red-backed Shrike and a Red-breasted Flycatcher. There was Wheatear passage, again probably internal, at Cley, but Garden Warblers (10) and a few Whinchats were most likely derived by drift from the Low Countries. A Whitethroat peak at Bradwell, Essex, was probably due to local movement. A Wheatear increase was noted at Dungeness and a Hoopoe appeared there, whilst an Icterine Warbler was recorded at Portland.

Spotted Flycatchers increased to 20 and Pied Flycatchers to 6 at St. Agnes; with calms in St. George's Channel and the West Country this was probably emigration, especially as it was followed diurnally by Hirundine and *flava* wagtail passage. There was a Woodchat Shrike at Lundy. Warblers—*Phylloscopi*, Sedge and Whitethroat—were dominant at Great Saltee, with Grasshopper Warblers and Spotted Flycatchers less so, a picture suggestive of emigration. However, a Marsh Warbler (the first Irish record) and 3 Red-throated Pipits were also recorded. Skokholm had a Spotted Flycatcher peak, and Whitethroat and Spotted Flycatcher were the most numerous birds at Bardsey.

2nd September 1958.

Visibility was excellent throughout the night over north-western Europe, the only areas with mist being the southern tip of Norway and the Channel coast of Belgium and north-eastern France. Elsewhere the air showed instability on the Continental side, but was stable along the east coast of Britain where it was in contact with the moister air on the periphery of an Atlantic low. Nearer the heart of this depression, in the Irish Sea basin, there were force 2-5 easterly or south-easterly winds and considerable cloud associated with a warm front which moved northwards through St. George's Channel. Conditions were therefore unsuitable for emigration from that region, and the birds that arrived overnight probably came ahead of the front on the southerly airstream from north-western France.

There was much migration at Fair Isle, probably out of the high pressure area in western Germany as well as from the Skagerrak region. Common Gulls (500) and various waders were mainly concerned, but among Passerines there were big increases in Willow Warblers (40), Whinchats (25) and Pied Flycatchers (10). Others affected were Tree Pipits (6), Redstarts and Garden Warblers, and making a first appearance were Wryneck, Bluethroat, Whitethroat and Red-breasted Flycatcher. Unfortunately

the Isle of May was not manned, but the lighthouse keepers reported a heavy fall of Redstarts, warblers, flycatchers and 2 or 3 Wrynecks between the 2nd and 5th.

At Monks' House Redstarts and Whitethroats were common, and Wrynecks (2) and Bluethroats (3) appeared. Pied and Spotted Flycatchers and Willow Warblers were present and Nightingale and Red-backed Shrike were trapped. At Gibraltar Point there were small numbers of Wheatears, Redstarts, Pied and Spotted Flycatchers, Willow Warblers, Tree Pipits and Whitethroats, with a single Wryneck. A "rush" of Willow Warblers (100) took place at Cley, together with Pied Flycatchers (50), Tree Pipits (25) and Redstarts (10), in addition to good increases in Wheatears, Whinchats and Garden Warblers. A Wryneck, a Lesser Whitethroat and 3 each of Grasshopper Warbler, Spotted Flycatcher and Ortolan Bunting appeared.

There was a Water Pipit at Portland Bill. At St. Agnes Passerines included a few Willow Warblers, Pied Flycatchers, Whinchats, 2 each of Garden and Wood Warblers, and a Hoopoe. It would seem likely that this was a drift-movement ahead of the warm front. At Great Saltee there was a general decrease on the previous day's numbers.

3rd September 1958.

By night the cold front of this low, which had occluded hardly at all, overhauled the warm front, so that generally southerly winds remained in the Channel region, and a heavy overcast combined with southerly winds affected the Irish Sea—so that again such movements as occurred in the area seem more likely to have been due to drift from north-western France than to emigration. By contrast, the night sky over the North Sea and its adjacent coasts was remarkably clear, the light S.E. airstream continuing. West Norway had clear sky and a light to moderate N.E. wind south of latitude 63°N., but mist beyond.

Fair Isle reported big increases in Whinchats (40), Tree Pipits (12) and Tree Sparrows (7), while Pied Flycatchers (12) and both species of whitethroat increased slightly. Additional Wrynecks and Bluethroats appeared, and, for the first time, there were Fieldfares, Blackcaps, Ortolan Buntings and Great Spotted Woodpeckers (2). A decrease in waders and some Passerines (e.g. Willow and Garden Warblers) suggested some outward movement.

At Monks' House this was the peak day for most species, though Redstart and Whitethroat were perhaps fewer than on the 2nd. The dominant birds were Garden Warblers, Willow Warblers, Redstarts, Pied and Spotted Flycatchers and White-throats and there were a single Icterine Warbler, Red-breasted Flycatcher and Ortolan Bunting. Two Reed Warblers, a Bluethroat and a Red-backed Shrike were also trapped. At Hartley, Northumberland, there were many Pied and Spotted Flycatchers, Redstarts and Whinchats, and a Red-breasted Flycatcher.

Spurn had large numbers of Wheatears, Redstarts, Willow Warblers and Pied Flycatchers, and a heavier passage of Garden Warblers than usual. A Barred Warbler and Red-breasted Flycatcher were trapped, and Wryneck, Bluethroat, Icterine Warblers and Red-backed Shrike were seen or trapped on the following days.

Gibraltar Point had Redstarts, Willow Warblers and Pied Flycatchers in large numbers, and fewer Garden Warblers, Spotted Flycatchers and whitethroats (both species). Two Wrynecks and a Greenish Warbler were trapped. There was an Icterine Warbler at Holme on the opposite corner of the Wash, and at Cley Willow Warblers (200), Redstarts (100) and Garden Warblers (70) were dominant, Spotted Flycatchers (25) and White-throats (10) less so. The numbers of Whinchats, Pied Flycatchers and Tree Pipits remained steady, but there were increases in Wheatears, Wrynecks (3), Lesser Whitethroats (3) and Ortolan Buntings (6). The first Icterines (3) and Reed Warblers (2), as well as Sedge and Wood Warblers and Blackcap appeared. At Walberswick Pied Flycatchers and Whinchats were present in large numbers, with many Tree Pipits, but there were no Redstarts.

Apparently drifted ahead of the fronts from across the Channel to Portland Bill were Dotterels (2), Hoopoes (2), immature Red-backed Shrike, Marsh and Melodious Warblers, and Pied Flycatchers (7). At St. Agnes there were increases in Willow Warblers (60), Pied Flycatchers (23), Whinchats (20), Wheatears and Spotted Flycatchers, and another Hoopoe appeared. At Great Saltee an increase in Turtle Doves, the reappearance of Whinchats (4) and Woodchat Shrike, and arrival of an Aquatic Warbler and Ortolan Bunting, were the main features—strongly suggestive of drift from north-western France, as at St. Agnes.

4th September 1958.

The now occluded front of the Atlantic low spanned the country from Kent to Northern Ireland at dawn, leaving calm air with moderate cloud behind it, and S.E. wind at forces 1-2 in the North Sea. Once again, the night sky was remarkably clear over an extensive region of north-western Europe, including the Scandinavian peninsula. The only mist and drizzle was in the extreme west of Norway between latitudes 59° and 66°N. almost at the centre of the high: inland, the weather was calm and clear, with not the slightest danger of westwards drift, and, as the influx at Fair Isle had a similar composition to that at the east-coast bird observatories, we may assume that it came from the south-east. A ridge of the high protruded into south-west England, so that the wind was light S.E. (with a clear sky) in Finistère and more southerly (with overcast sky) in the Isles of Scilly.

At Fair Isle there were more Redstarts and Spotted Flycatchers, Bluethroats (5) and Lesser Whitethroats (5), but the dominant

Passerines were Willow (60) and Garden Warblers (20). Wrynecks increased to 4, Fieldfares to 2. Wood Sandpipers, Song Thrush and Icterine Warbler also appeared.

Fewer Redstarts, Willow Warblers, Garden Warblers and Pied Flycatchers were trapped at Monks' House, but captures included 2 Red-backed Shrikes, a Bluethroat and another Red-breasted Flycatcher. Observations indicated a Bluethroat arrival all along the east coast, with 2 at Aberlady Bay, East Lothian, and 3 at Teesmouth, Co. Durham, whilst at Spurn the first Bluethroat, Icterine Warbler and Wood Warbler were recorded. Redstarts were dominant at Gibraltar Point, and other migrants increased.

Icterine Warblers (2) and an adult male Bluethroat were present at Holme. At Cley, Redstarts increased (150) and Wheatears numbered about the same, a considerable movement. There was a decline in the number of Whinchats, but Garden Warbler, White-throat, Willow Warbler, Pied Flycatcher and Tree Pipit were steady. Spotted Flycatchers increased to 50 and Wrynecks to 8. The first Bluethroats (2), Black Redstarts (2) and Red-backed Shrikes (2) appeared.

An increase took place at Dungeness in Tree Pipits (20), and there was also a Wryneck. St. Agnes had an increase in Wheatears and both flycatchers, with several Turtle Doves, Tree Pipits, Redstarts, Swifts and a Corncrake; but at Great Saltee a general fall in the numbers of Passerines was noted.

5th September 1958.

With the disappearance of the frontal zone in the eastern part of the English Channel the region of excellent visibility extended farther to the west in France, and the only cloud was associated with a stationery occlusion which embraced Finistère, Cornwall and southern Ireland. The wind continued S.E. at forces 1-2 in the North Sea, but was more easterly on the Continent. There was again poor visibility, with light westerly airs, on the coast of western Norway.

Fair Isle arrivals included Turtle Doves (3), additional Whinchats (40), Pied Flycatchers (7), Red-breasted Flycatchers (5), Ortolan Buntings (3) and Tree Sparrows (11), with one Reed Warbler. Most of those indicate a drift from the south-east. Both Garden and Willow Warblers decreased.

There were more Redstarts and Willow Warblers at Monks' House, with Bluethroats (2) and Lesser Whitethroats (2), whilst at Spurn Bluethroats increased (3) and a second Icterine Warbler was trapped. At Gibraltar Point, Pied Flycatchers increased and they and Redstarts were the dominant birds; there were also 2 Wrynecks and a Bluethroat. There was a decrease in all the main migrants at Cley, but more Bluethroats (6) and a Barred Warbler were seen. Wheatears and both flycatchers reached peak numbers at St. Agnes. At Great Saltee there were increases in *Phylloscopi* and Spotted Flycatchers (20), with decreases in

Sedge Warbler and Whitethroat; Melodious Warblers (2) and a Tree Pipit appeared. Bardsey had a few Spotted Flycatchers (6), Garden Warblers (3) and Sedge Warblers (4), but *Phylloscopi* were dominant; there was a Melodious Warbler here, too.

6th September 1958.

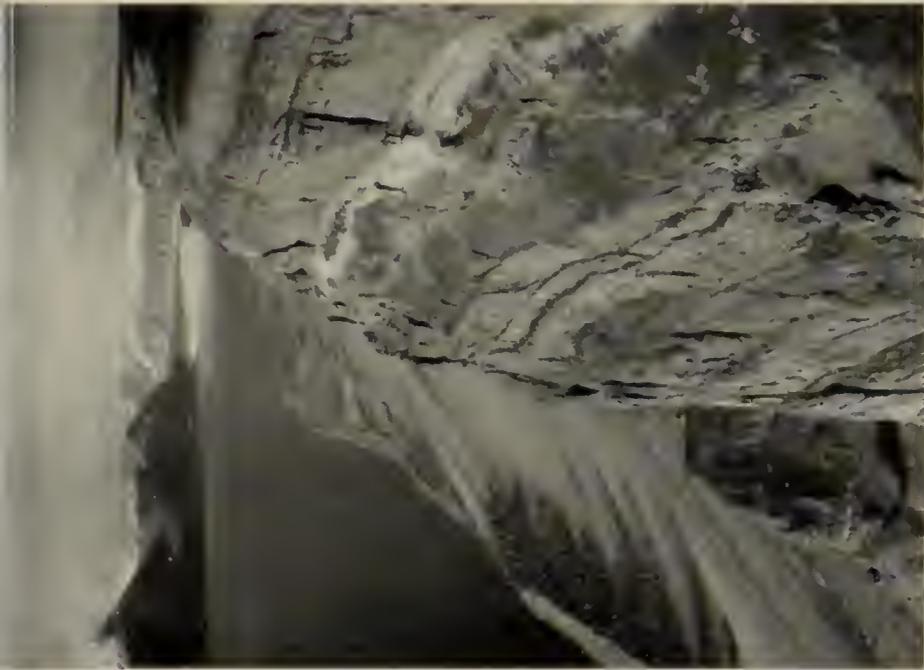
With the Atlantic low filling to the west of Ireland the anti-cyclonic weather became even more widespread, embracing the whole of Britain. Clear night skies were maintained on the Continent and a generally S.E. breeze in the North Sea. There was some fog and drizzle in northern Scotland and south-eastern England at night, and along the Scottish and Northumberland coasts in the early morning. A light S.E. breeze blew in St. George's Channel.

Fair Isle reported additional Wrynecks and Bluethroats, an Aquatic Warbler and a Great Spotted Woodpecker, but otherwise a general decrease in Passerine species, so that the new birds may have been on redetermined passage. This was the first day that the Isle of May was manned. The dominant birds there were Redstarts (50), Willow Warblers (50), Garden Warblers (20) and Pied Flycatchers (20); and other species present were Bluethroat, Sedge Warbler, Blaekcap, Lesser Whitethroat, Red-backed Shrike, and Ortolan and Lapland Buntings. Redstarts, Willow Warblers and Pied Flycatchers were fewer at Monks' House, but 2 Red-breasted Flycatchers appeared and a Reed Warbler was trapped. There were more Bluethroats (4) at Spurn—and one or two elsewhere in Yorkshire—and another Icterine Warbler was trapped. A general decrease was noted at Gibraltar Point, but new arrivals included 2 Red-backed Shrikes. The main migrants remained steady at Cley—except for Pied Flycatchers, Tree Pipits and especially Wheatears, all with substantial decreases. There was an additional Wryneck, and an Icterine was trapped at Titchwell near-by.

Portland Bill had a peak of Whinchats (21) and a Wryneck, and Great Saltee an increase in Spotted Flycatchers (20) and *Phylloscopi*, with the first appearance of Pied Flycatchers (5), a few more Turtle Doves, Whinchats, Whitethroats, Sedge and Grasshopper Warblers, and also Woodchat Shrikes (3) and Red-throated Pipits (3). A Hoopoe and the first Chiffchaff were noted at Skokholm and at Bardsey there was a peak of Pied Flycatchers (20) and a second Melodious Warbler.

7th September 1958.

The filling low moved eastwards to cover Ireland and the Irish Sea, so that the North Sea airstream veered S. to S.W. at force 2, though continuing S.E. and stronger in the Skagerrak, with overcast sky. The night skies continued clear on the Continent. Garden Warblers were reduced to one at Fair Isle and neither Redstart nor Whitethroat remained, while the less important



C. J. Pennycook

FULMAR (*Fulmarus glacialis*) NEST-CLIFF, AND CACKLING-DISPLAY: SPITSBERGEN, JULY/AUGUST 1957
 (a) The breeding cliff was about 150 metres high, above another 100 metres of steep grass-covered scree sloping down to a narrow shingly beach; the rock was crumbly limestone and the pale bands contained gypsum (see page 324). (b) In the cackling-display the wide-open bill and inflated neck are waved about in extreme attitudes; this may be done by the pair together (accompanied by bill-fencing), or towards intruders or chicks, or by birds on their own (see page 322).





C. J. Pennycook

FULMAR (*Fulmarus glacialis*) FEEDING CHICK, AND FLIGHT: SPITSBERGEN, JULY/AUGUST 1957

(a) Its aggressive spitting appeased by the cackling of the adult, the chick utters a low and monotonously regular cawing; the parent then begins to retch and food is passed when the chick puts its bill crosswise on top of the adult's tongue, as here, and rapidly vibrates its lower mandible (see page 323). (b) In the cruising configuration, the wings are held with a zero sweep and slight anhedral which increases towards the tips, and the tail is not spread (see page 227).



C. J. Pennycook

FULMAR (*Fulmarus glacialis*) FLIGHT: SPITSBERGEN, JULY/AUGUST 1957

(a) At low speeds the wings are spread forwards to their maximal area, and raised; the tail is spread and the feet are generally lowered with the result that at small angles, as here, they may act as split flaps beneath the tail (see page 328). (b) Coarse all-ron is applied by the rotation of the whole wing at the shoulder joint (see page 326); this bird is banking steeply at a low speed to turn away from the cliff after a close approach.



C. J. Pennycuik

FULMAR (*Fulmarus glacialis*) FLIGHT: SPITSBERGEN, JULY/AUGUST 1957
(a) The wings are reduced in area and swept back from the carpal joint as the bird glides at increased speed in a steep descent, the angle of which is controlled by use of the feet (not tail) as airbrakes (see page 328). (b) In a gentle turn at low speed, the tail is spread and the feet are drooped (plate 59), while fine control is achieved with the application of slight outside aileron by deflecting the primaries of one wing (here the left) more than the other (see page 326).



C. J. Pennycuik

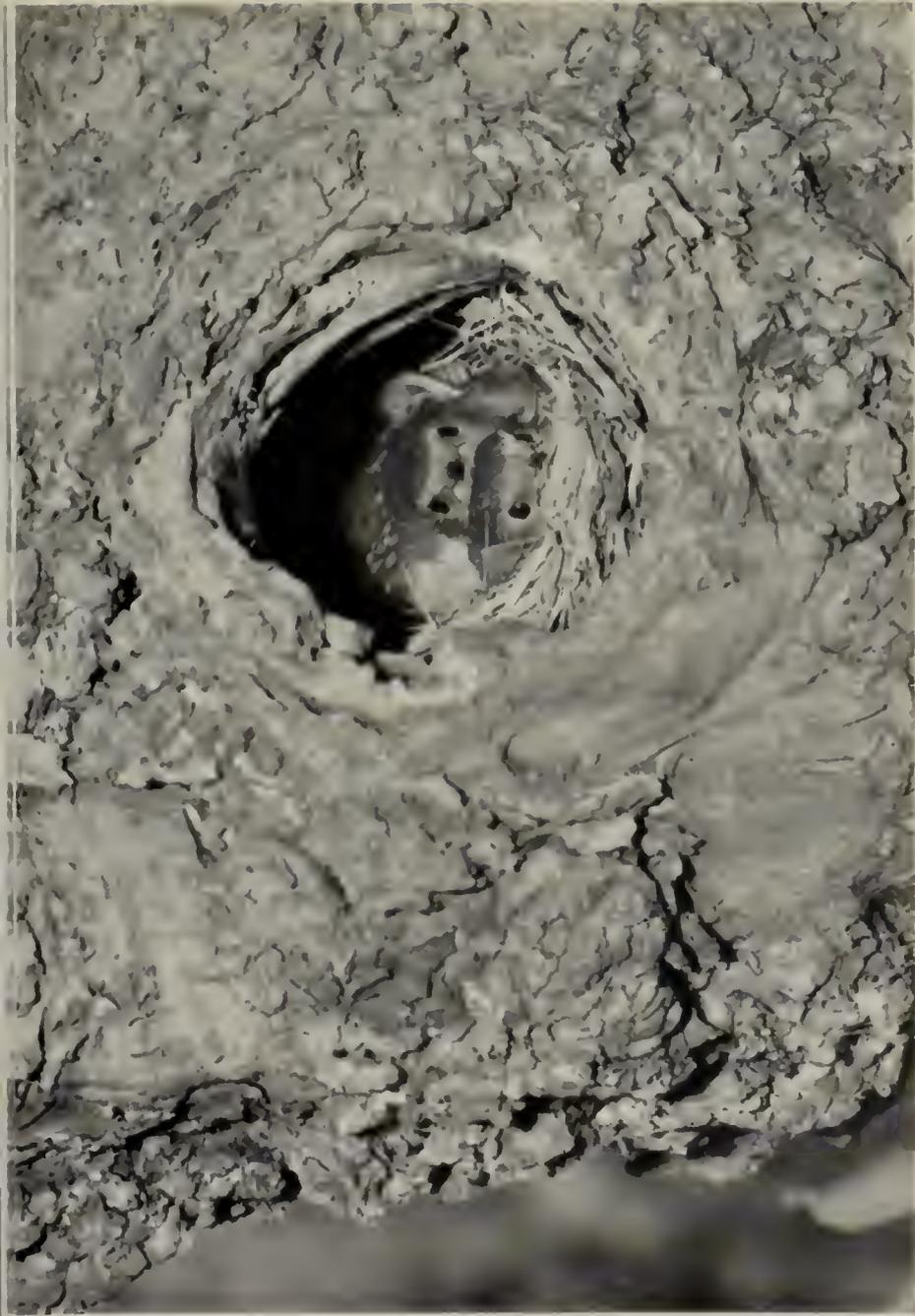
FULMAR (*Fulmarus glacialis*) FLIGHT: SPITSBERGEN, JULY/AUGUST 1957
 (a) Yawing moments are produced by altering differentially the lengths of the wings, there being no counterpart to the rudder of an aircraft (see page 326); here the right wing is shortened in relation to the other by the flexing of the elbow joint. (b) Feathers are lifted up at the trailing edge of the wing as the bird stalls, probably intentionally, at the peak of its climb to the cliff-face before turning away again without landing (see page 327).



FULMAR (*Fulmarus glacialis*) FLIGHT: SPITSBERGEN, JULY/AUGUST 1957

(a) This bird is moving slowly forward in a controlled sideslip, in order to stay sideways on to the cliff in a strong upcurrent from its left: to achieve this the outward wing is flexed more and raised more from the carpal joint (see page 326). In wind-hovering (b) the bird is stationary in a strong updraught, wings raised and swept back to give excessive lateral stability with nose-down trim, tail cocked up in line with airflow; feet control angle of descent and hence fore-and-aft position (see page 328).

C. J. Pennycook



F. Wörger

Two Robins (*Erithacus rubecula*) SITTING ON THE SAME NEST: SUSSEX, MAY-JUNE 1959
 The nest was in a large hole in an apple tree, about four feet from the ground. Eggs appeared at the rate of two a day until there were 11 or 12. Thereafter the two females sat together—without any sign of animosity—one in front and one to the side and behind, as here. Both birds could partly cover the eggs, but none hatched and the nest was deserted after nearly four weeks (see page 300). This is a flash photograph and the birds did not appear so open to view in daylight.



W. S. Nevin

NEST OF ROOK (*Corvus frugilegus*) ON GROUND: KENT, APRIL/MAY 1959
Built right on the ground in a field and surrounded by rushes (*Juncus communis*), this nest was constructed of grass, reed, wool and a few feathers. There were no sticks, so the whole structure resembled a bulky edition of a normal lining on its own. It was about 12 inches in diameter, with a rather deep cup. In all, three eggs were laid in the third week of April, but these disappeared one by one (see page 388).

species were also fewer. Numbers similarly decreased at the Isle of May, where the arrival of Spotted Flycatchers (6) and Tree Pipits (2) may have been redetermined passage, since there was a strong diurnal movement of Meadow Pipits. A general reduction in all species, except Tree Pipits (4), also took place at Monks' House and Cley; while at Dungeness there was Tree Pipit movement (15), and a Wryneck and Red-backed Shrike occurred. A small influx of Whitethroats at St. Agnes coincided with a Lesser Whitethroat and a Hoopoe. Great Saltee showed an increase in Whinchats, but other migrants were fewer. At Bardsey, *Phylloscopi* (30) were dominant, there were a few Spotted Flycatchers and Tree Pipits, and a third Melodious Warbler was trapped.

Part 2—The Occurrence of Extra-limital Vagrants

When one examines the meteorological environment of these early autumn drift-movements, it is noteworthy that each coincided with the onset and growth of anticyclonic weather in northern and central Europe. In 1956 the high pressure system invaded Europe from the Atlantic, and did not penetrate beyond western Russia: in 1958 the anticyclonic build-up was of polar origin and much more extensive, the high reaching considerably farther east. It is suggested that the larger representation of the rare eastern species in 1958 was due to this greater expansion of the high pressure system, so that an easterly instead of northerly airstream prevailed in eastern Europe.

A markedly different situation existed in the North Sea basin in the two years. The heavy falls of 1956 were associated with rain and bad visibility brought about by cyclonic frontal activity in the maritime region. The immigration was not on a "broad front", but took place as a series of influxes into different areas on successive days, corresponding to the local activity of the frontal developments. An association between the falls of birds and the zones of precipitation and bad visibility is clearly demonstrated in the bird observatories' records discussed in Part 1. The 1958 movements, on the other hand, did take place as a "broad front" invasion along the whole eastern seaboard in anticyclonic conditions—an extension of the vast European high pressure system—the peak coinciding all along this reach of coastline from Norfolk to Fair Isle, as can be seen from Table I, taking the Wryneck as an example.

The only common factor in the North Sea weather in the two years was the wind-direction—easterly in the southern sector, more south-easterly farther north, especially between the Skagerrak and Fair Isle. The winds were generally light, but their strength was more changeable in 1956 than in 1958, as would be expected with severe frontal disturbances.

It has been shown experimentally by Sauer (1957) that nocturnal

TABLE I—WRYNECKS (*Jynx torquilla*) AT COASTAL LOCALITIES IN EARLY SEPTEMBER 1958

September 1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th
SHETLAND:															
Foula			1	1											
Sumburgh		1													
Fair Isle		1	2	4	1	2	1	1		1					
SUTHERLAND:															
Dornoch			1												
FORTH:															
Isle of May						2	1	1	2	2	1				
Aberlady			1												
NORTHUMBERLAND:															
Holy Isle						4									
Monks' House	1	2	3					1							
Whitley Bay				1	1										
CO. DURHAM:															
Teemouth			2		1	1									
YORKSHIRE:															
Flanborough					3										
Spurn Coast	1	3	6	8	8	5			1						
LINCOLN:															
North Cotes						1									
Gibraltar Point			3	3	2										
NORFOLK:															
Holme			2	1				1							
Cley-Blakeney	1	3	8	3	5	4			3		1	1			
Cromer						2				1					
SUFFOLK:															
Walberswick				3	2			1					1		
ESSEX:															
Naze and N.E.					3	1	1	1	1	2	1	1	1	1	1
Abberton										1	1	1	1	1	
Foulness							3			1		1			
KENT:															
Isle of Sheppey				1											
Sandwich Bay					1					2					
Dungeness				1			1								
HAMPSHIRE:															
Cosham												1			
DORSET:															
Portland Bill						1		1							1
SCILLY ISLES:															
St. Agnes													1	1	
GLAMORGAN:															
Gower Peninsula												1			
PEMBROKE:															
Skokholm														1	
CO. WEXFORD:															
Great Saltee														1	1
CO. DONEGAL:															
Tory Island										1					
TOTALS	1	6	21	29	25	27	17	6	8	11	4	7	5	3	1

migrants respond to changes in the star-pattern, and probably therefore use a form of astro-navigation in determining and following their normal migration routes; but that cloudy conditions which tend to obscure the night sky, thus rendering the star-pattern invisible, cause a breakdown in the birds' ability to orient their flight. Such conditions are often associated with frontal weather, and include mist or fog (especially prevalent in coastal areas), rain and drizzle, and a heavily overcast sky. All these conditions were provided by the North Sea weather of early September 1956. In this respect the east-coast movements, though on a larger scale than usual, were typical of many studied by the bird observatories in past years; and, indeed, overcast skies with or without precipitation on the Continental side of the North Sea, have come to be regarded as a pre-requisite of drift invasions of this type.

The most striking feature of the 1958 immigration, however, is that it took place during a period when the sky over a vast area of the Continent and North Sea basin was remarkably clear night after night. There was some atmospheric stability locally in eastern Germany and the Baltic countries, and at some coastal localities in Holland and south-west Norway, at the outset, causing mist and fog; but apparently perfect migration weather prevailed over the whole of Europe, by day and night, at the height of the invasion along the British east coast. It is extremely difficult to understand, on the evidence presented by the *Daily Weather Report*, why such an enormous number of migratory birds, including several eastern species, should have sustained mass displacement so far to the west of their normal routes in weather well-nigh perfect for orientation, with an airstream seldom stronger than force 2 and sky conditions giving ample opportunity to correct for deflection by observation of the sun or stars.*

The possibility exists that bright moonlight may equally impair night navigation, since the stars may then be less conspicuous; but if such is the case, the risk would probably apply only to the few

*While this paper has been in proof, reports of the autumn migration of 1959 have been coming in. A preliminary examination indicates a situation very similar to that of early September 1958, not only in the anticyclonic activity over the Continent, but also in the absence of significant "falls" of the commoner night-migrants coupled with an unusually high incidence of the rarer eastern vagrants. Some 70 or more Barred Warblers have been recorded in the north and along the east coast, with scattered occurrences on the Channel coast and in the Irish Sea; there have been a number of Bluethroats and Icterine Warblers (but fewer Woodchat Shrikes and Melodious Warblers), and Red-breasted Flycatchers, with over 60 reports, have far surpassed their remarkable record of 1958. The main differences between the two seasons are that the fine, clear anticyclonic weather persisted over a much longer period in 1959, and the occurrences of the extra-limital species were more widely dispersed throughout the autumn; also, this extended period of easterly weather brought birds from even farther afield (e.g. Yellow-browed Warblers, of which very few penetrated to western Europe in 1958).

nights around full moon. One might suppose, furthermore, that when birds are not able to orient themselves satisfactorily for this reason, they would experience no difficulty in alighting, and migration would be inhibited until the danger-period had passed. Full moon was on 29th August, when the high had developed strongly, and in all probability considerable migration had got under way in northern and eastern Europe; but the most pronounced drifts along the British east coast did not take place until a week later, 3rd-6th September, by which time the moon was approaching its third quarter.

THE RED-BREASTED FLYCATCHERS

One of the most striking differences between the movements we are considering was the paucity of east European vagrants in 1956 and their comparative abundance in 1958. In this section an attempt is made to analyse the occurrences of one of the species concerned, namely the Red-breasted Flycatcher, but it must be remembered that this was not the only east European bird with a normal south-east "standard direction" of autumn migration to reach the British Isles, and the conditions were much the same for the others. It is probable that many of the Bluethroats and Icterine Warblers which were involved in the drift in unusual numbers, were from the same area rather than from the Scandinavian Peninsula. Among other vagrants might be mentioned a Greenish Warbler at Gibraltar Point on 3rd September and an Arctic Warbler at the Sands of Forvie in Aberdeenshire on the 2nd (*Scottish Birds*, vol. 1, p. 42).

The Handbook of British Birds (Vol. I, p. 313) describes the Red-breasted Flycatcher as an irregular passage-migrant, chiefly in September and October, with about 50 recorded in England, over 30 in Scotland, and 5 at the Irish Lights. Since the second world war the bird observatories have added a number of records, but only a few each year, and we have not had to revise our view that this is a very rare bird.

In the September movements of 1956 the only observatory reporting this species was Cley, where examples appeared on 3rd and 9th September, and later the same month (actually at Blakeney Point) on the 18th and 26th. The only others were single birds in Suffolk on the 2nd and in Northumberland on the 8th (see page 349), and then in October at Portland on the 1st-2nd and at Blakeney Point on the 8th. During much the same period in 1958 there were nearly thirty reliable reports from the observatories and individual migration watchers, mostly of trapped birds. They came in two phases in September, followed by a scatter of records in late October. The first phase was confined to the east coast, but the second and more widespread influx in mid-month favoured the southern and south-western observatories as well as those situated on the North Sea:

TABLE II—RED-BREASTED FLYCATCHERS (*Muscicapa parva*) IN AUTUMN 1958

September	
1st	Monks' House, Northumberland.
2nd	Fair Isle (tr., remained till 4th).
3rd	Monks' House (tr.); near Hartley, Northumberland; Spurn, Yorkshire (tr.).
4th	Monks' House.
5th	Fair Isle (5, 2 tr.); Holy Island, Northumberland.
7th	Burnham Overy, Norfolk.
9th	Fair Isle (tr.).
11th	Isle of May, Forth (tr.); Ivybridge, S. Devon.
12th	Portland Bill (tr.).
13th	Flamborough, Yorkshire (2); Spurn (tr.); Blakeney, Norfolk.
14th	Jersey, C.I.
16th	St. Agnes, Scilly Isles (tr. 17th).
17th	Fair Isle (2, one tr.); Allhallows, Kent; Great Saltee, Co. Wexford (tr.).
18th	Jersey; Great Saltee (tr., remained till 23rd).
26th	Isle of May (tr.).
October	
18th	St. Agnes (tr.).
19th	Portland Bill (tr.).
22nd	Spurn (tr.).
31st	St. Agnes (tr.).
November	
9th	Fair Isle (tr., tenth bird of autumn).

(tr. = trapped)

East coast conditions during the earlier phase of the immigration have been outlined in the general summary in Part I and, although some drift was taking place into the Irish Sea at that time, this species was not represented there. As in the case of the Wryneck, however, some birds had been carried farther west with the main mass of migrants by mid-month, as indicated by the south coast occurrences on the 11th and 12th, and the Irish Sea occurrences on the 17th and 18th (Table II). The meteorological situation governing this type of drift-movement is fully discussed in the next section. A few reports from inland localities (there were two from Surrey in mid-month, and one from Stretford, Manchester, on 21st October) are not included in the above list—which is confined to coastal appearances—and these would bring the minimum number reliably reported to 38 birds, or nearly half as many as the *Handbook* records for British ornithology prior to 1938! The incidence of the Red-breasted Flycatcher in autumn 1958, therefore, compares very favourably with that of other east-coast rarities such as the Wryneck, Blue-throat, Icterine Warbler, Red-backed Shrike and Ortolan Bunting.

The breeding range of the Red-breasted Flycatcher lies to the east and south of the Baltic Sea, as shown in the shaded portion of Fig. 5. Such an unprecedented influx presupposes the westwards displacement of a very large number of birds, since the

normal route taken by the species is south-east to wintering grounds in India. From the last days of August the northern part of the breeding range was on the southern flank of the developing polar high, and exposed to light north-east or east-

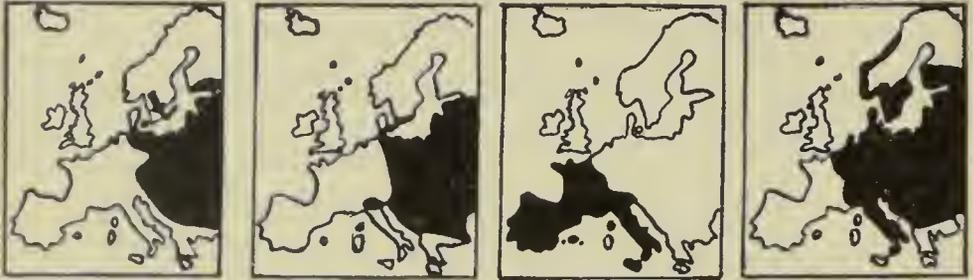


FIG. 5—EUROPEAN DISTRIBUTION OF (LEFT TO RIGHT) RED-BREASTED FLYCATCHER (*Muscicapa parva*), BARRED WARBLER (*Sylvia nisoria*), MELODIOUS WARBLER (*Hippolais polyglotta*) AND ICTERINE WARBLER (*H. icterina*)
(With acknowledgements to Peterson, Mountfort and Hollom, 1954)

north-east airs, seldom more than force 1, but occasionally force 2 (i.e. 5 knots). As pointed out in the general summary, the night skies were exceptionally clear over western Europe during the first week of September, but the weather-maps indicate early morning mist over a wide region of eastern Germany, Poland, etc., on 30th August and 1st September, and more locally on 31st August and 2nd-3rd September. This appears to be the only feature of the environment likely to have caused the disorientation of these birds, so far as our present knowledge of the factors inhibiting orientation goes; and by itself it does not seem a sufficient explanation of this remarkable phenomenon.

Had these birds not been disoriented, they would nevertheless have been subject to a lateral drift, as shown by radar work (Lack, 1959), by the east-north-east cross-wind along their presumed south-eastwards route; but in view of its extremely slight strength over the whole area throughout the period, this lateral displacement would have been very small, so that the expected track would not have deviated by more than a few degrees from the normal. It does not seem in the least likely that the birds which reached the North Sea countries and crossed to the British Isles could have been disoriented through this cause except during the initial stages of their journey, for the skies in western Europe were such that accurate reorientation and re-determined passage should have been possible. As the airstream in western Europe generally was between east and east-south-east at about 5 knots, birds on redetermined passage could have made good headway with even less risk of wind-displacement than before, since their new direction would have been more or less into the wind. Instead, however, many of these birds entered Britain, first along the east coast, then later in the south and south-west, after sustaining a deflection of 120 degrees or more from the "standard direction" of the species.

These disoriented birds, arriving with many thousands of other drift-migrants, would thus appear to have moved on a down-wind track—not only across the North Sea (and later from France into the Irish Sea), but also over some 500-700 miles of the Continent. If we suppose that, on becoming disoriented, they merely flew haphazardly all night in the manner postulated by Yapp (1956) and more recently by Lack (1959), and so moved passively with the wind, then their average ground-speed westwards would have been close to that of the wind. Therefore, unless considerable numbers had already reached western Europe when the development of the polar high began (in which case the absence of Red-breasted Flycatchers from the late August drift-movements is difficult to explain), these birds would have taken at least ten days or a fortnight to travel across Europe to the North Sea coast, and two or three days more to traverse the sea to places such as Monks' House and Fair Isle. Since the first one appeared at the beginning of the movement, and probably many passed the east coast between the 3rd and 5th, the probability that the down-wind movement was an active one, with the bird's own flight-speed added to that of the wind, is inescapable.

The mass immigration of Pied Flycatchers and Whinchats at Monks' House on 1st September (with which was the first Red-breasted Flycatcher) arrived at approximately 11.00 hours. Thus the birds may have had a maximum of 16 hours' flying, mostly but not necessarily all over the North Sea. On a down-wind track, Monks' House was about 400 miles from the opposite coast. If this movement came as a disoriented drift* of the type postulated by Yapp and Lack, and we generously estimate the force of the wind bearing it at 10 knots, then we have to assume that this movement left the Continent not one night, but at least two nights, before. If however, we allow for the chats, warblers and flycatchers a flight-speed of 20 knots and add to this a wind-speed of 5 knots, we have a ground-speed of 25 knots, which, if maintained for 16 hours, would span the North Sea comfortably in one night. This seems an eminently reasonable postulate even if the flight-speed of the birds is under-estimated, since it is most unlikely that the mass of migrants was concentrated near the coast at dusk, and many may not have started moving immediately after dusk. On this reckoning the Red-breasted Flycatchers might have taken three nights to reach Britain (the distances covered overland would be shorter, since the birds would not be under the compulsion to continue flying as when crossing the sea), and this is in good agreement with an east-coast peak from 3rd to 5th September.

ICTERINE AND MELODIOUS WARBLERS

These two closely related warblers have a standard direction of autumn migration entirely away from the British Isles, the

*For a definition of this and other terms, see Lack and Williamson (1959).

Icterine (the eastern member of the pair) moving south-east, and the Melodious (the western member) due south. A decade ago they were regarded as rare vagrants—the Melodious extremely rare, *The Handbook* (vol. II, p. 65) admitting only three for England, one for Scotland and two for Ireland. Since then the bird observatories have added many records and have shown that both species are to be expected annually in autumn; and it would seem that, owing to the difficulty of field identification, many were previously overlooked by the comparatively few bird-watchers then engaged in migration studies. Their respective breeding ranges overlap over a comparatively narrow belt running from north-west to south-east through central Europe, including Italy and Sicily. Apart from its presence in Italy, south Sweden and the coastal fringe of Norway, the distribution of the Icterine closely accords with that of the Red-breasted Flycatcher (Fig. 5). The Melodious Warbler breeds over the greater part of France and the Iberian Peninsula.

Their occurrence in the British Isles throws a most interesting "drift-shadow"* which clearly demonstrates the influence of the anticyclonic airstreams in late summer and autumn. This "drift-shadow" is very clear-cut, as can be seen from the August and September occurrences in 1958 (Tables III and IV). With but two exceptions, the score or so of Icterine Warblers were confined to the east coast between Fair Isle and Norfolk, whilst a similar number of Melodious Warblers were confined to the south coast and the Irish Sea basin. It will be seen how closely the September records correspond with those of the Red-breasted Flycatcher: as the general pattern is so similar, we can regard the movements of the Icterine Warbler as being sufficiently covered in the discussion pertaining to the other species in the preceding and following sections.

TABLE III—ICTERINE WARBLERS (*Hippolais icterina*) IN AUTUMN 1958

August	
19th	Gibraltar Point, Lincolnshire (5, 2 tr.); Isle of May, Forth (tr.).
23rd	Fair Isle (till 25th).
28th	Isle of May (tr.).
September	
1st	Spurn, Yorkshire; Portland Bill, Dorset (tr., first record).
3rd	Monks' House, Northumberland (tr.); Holme, Norfolk (2, one tr.); Blakeney, Norfolk (3 or 4).
4th	Fair Isle (tr.); Cley, Norfolk (tr.); Blakeney (tr.).
5th	Spurn (tr.); Morston-Skiffkey, Norfolk (2).
6th	Spurn (tr.); Titchwell, Norfolk (tr.).
11th	Blakeney (tr.).
13th	Kilnsea, Yorkshire.
14th	Spurn (tr.); Bradwell, Essex (probable); Copland Is., Co. Down (tr., stayed till 28th).

*I acknowledge this very expressive term to T. C. Smout and Clive Minton, who have used it in a different connection, namely to illustrate the differing distribution of migrants in the Wash area with north-east and south-east winds.

MIGRATION IN THE IRISH SEA

The Melodious Warbler (in common with the Woodchat Shrike which has a not dissimilar breeding distribution) is now recognised every autumn at Portland Bill and one or more of the Irish Sea bird observatories, but in 1958 many more appeared than in a normal year.

TABLE IV—MELODIOUS WARBLERS (*Hippolais polyglotta*) IN AUTUMN 1958

August	
3rd	Portland Bill, Dorset (probable).
15th	Skokholm, Pembrokeshire (tr.).
17th	Portland Bill (tr.); Eastbourne, Sussex (tr.).
28th	Portland Bill (tr.).
29th	Bardsey, Caernarvonshire (probable).
September	
3rd	Portland Bill (tr.).
5th	Great Saltee, Co. Wexford (tr.); Bardsey (tr.).
6th	Bardsey (tr.).
7th	Bardsey (tr.).
8th	Bardsey (2 unringed birds seen).
9th	Great Saltee (tr.); Skokholm (tr.).
10th	Lundy, N. Devon (tr.); Great Saltee (2).
14th	Guernsey, C.I.
16th	St. Agnes, Scilly Isles (tr.); Great Saltee and Bardsey (ringed birds still present).

Woodchat Shrikes were of less frequent occurrence, juveniles being caught at Skokholm on 3rd and 29th August, at Lundy on 1st September, at Great Saltee on 3rd and 6th September (when three were present), at St. Agnes on 14th September, and at Portland Bill on the same date and again from 7th-23rd October. Among other southern elements also affected may be mentioned the Hoopoe, examples of which were seen at Skokholm, St. Agnes and Lundy between 6th and 8th September, as well as at other times.

These Irish Sea appearances represent a deflection of little short of 180 degrees from the standard direction of autumn migration, so cannot be explained by a theory of lateral displacement. In 1958, as in other years, they were associated with anticyclonic weather over France and south-east or southerly winds blowing from western France and sea-area Biscay into St. George's Channel. These winds, as on 15th, 17th-18th, 28th-29th August and 3rd September 1958, may be nothing more than light airs at forces 1-2; and, although fine clear skies may cover most of France, the south-east airflow in the extreme west is often associated (as on all the above dates) with overcast skies or mist and drizzle in the maritime region, due to the influence of fronts advancing towards the land from Atlantic low pressure disturbances.

A veritable invasion of these southern elements of our bird fauna took place in the Irish Sea basin between 5th and 10th September. At the outset there was fine clear weather with light

casterly airs over France except in a restricted frontal zone in the extreme west (extending to south-west England), where the wind-direction was south-east. During the night of the 5th/6th, with the low responsible for this front filling west of Ireland, the airflow in the West Country, Finistère and St. George's Channel was south-east to south at forces 2-3. Subsequently the low moved over Britain, bringing a west-south-west airstream to the Channel coast, but maintaining a southerly breeze at force 3 in the Irish Sea, this veering south-west at force 4 on the night of the 7th/8th. The low passed westward to the North Sea, filling rapidly, and leaving the Irish Sea with light variable airs and very little cloud, conditions improving still further on the 10th with the approach of a high from the Atlantic.

The main birds concerned in the movements were Pied and Spotted Flycatchers, Wheatears and Whinchats, Turtle Doves, Tree Pipits, and several species of warblers. Great Saltee is selected as the station most exposed to this south-east airstream and least likely to be involved in coasting movements of English breeding birds. At Great Saltee Spotted Flycatchers reached a peak on the 6th, when the first Pied Flycatchers and several Whinchats appeared, together with Tree and Red-throated Pipits as well as the southern rarities already mentioned. Bardsey had a Pied Flycatcher peak and a number of Tree Pipits next day when (except for Whinchats) the numbers were already declining at the Co. Wexford station. With the weather becoming clear on the 9th, giving conditions suitable for emigration and the redetermined passage of drift-migrants, numbers again increased at Great Saltee, as shown in Table V.

In ideal weather such as the 9th-10th provided, movements through and around the Irish Sea basin are undoubtedly complex. We might expect to find four different main types proceeding, as follows:

- (a) Onward passage of birds which earlier reached the north and west of Britain from Greenland, Iceland and the Faeroe Islands.
- (b) Emigration of British breeding species.
- (c) Local or regional movements from Scotland/England/Wales to Ireland, or vice versa.
- (d) Redetermined passage or continued wandering of earlier drift-migrants into the area.

With this classification as a guide, we may analyse the main movements observed at Great Saltee on the 9th-10th as follows:

- (a) Increase in Wheatears; diurnal passage of White Wagtails and Meadow Pipits.
- (b) Diurnal Hirundine movements; increases in Whitethroats and Sedge Warblers, since the figures suggest that these were not much concerned in the earlier drift.
- (c) Fluctuations in Blackbirds, Robins, Starlings, etc.

- (d) Increase in flycatchers, especially Pied, and probably also Whinchats and some warbler species; reappearance of Tree Pipits, Garden Warblers and the characteristic southern rarities.

It may be asked why a part, if not the whole, of the Pied Flycatcher and Tree Pipit migration should not be put in category (b), since the two species are well distributed breeding birds in England and Wales; but Browne and Ruttledge (1957) have clearly demonstrated that these birds, long regarded as rarities in Ireland, are associated at Saltee with anticyclones over Britain, giving east to south-east winds in the Irish Sea, and also with conditions favourable for redetermined passage following such weather. I diverge from their view only in so far as I regard a large part of the Pied Flycatcher and Tree Pipit migration in this area as originating not by lateral drift from Britain, but by down-wind directed drift from north-west France (and it is this latter interpretation that I would put upon the movement of 23rd September 1954 illustrated in their paper, *op. cit.* fig. 2).

There is a difference of opinion as to how much reliance should be placed on rare vagrants as "markers" indicating the source of the drift-movements in which they take part. Their importance in this respect was advocated when the hypothesis of down-wind directed drift was first put forward by the present author (Williamson, 1952, p. 14), and their significance may be re-examined in the present context. In a later section, objection is made to the view (unsupported as it is by scientific evidence) that such vagrants have either lost, or were born without, the inherited navigational faculty of migrant birds; on the contrary, such birds are probably well endowed with the hereditary ability to navigate, but are temporarily disoriented for one of two reasons—either because their power of orientation has not yet developed, or because down-wind flying during the course of an over-sea drift has strong survival value. During a large-scale drift such as flowed northwards into the Irish Sea on 5th and 6th September 1958 it can be safely assumed that many more Melodious Warblers, Woodchat Shrikes and Hoopoes reached the West Country, Wales and Ireland than were seen at the few widely-scattered bird observatories—just as, indeed, with increased migration-watching, it is now fully realised that the east-coast rarities have a more uniform spread than the well-dispersed bird observatory records previously indicated. If these were only temporarily disoriented for either of the reasons given above, we should expect that some of them would appear or reappear at the Irish Sea observatories with improving weather, continuing their wandering or on redetermined passage south. Melodious Warblers were in fact recorded on all six days during 5th-10th September, the bulk of the records coming from Bardsey in the earlier drift-phase (5th-8th) and from the more southerly islands of Lundy, Skokholm and Great Saltee on the 9th-10th (see Table IV).

The evidence provided by the early September migration in the south Irish Sea supports the view that the Melodious Warblers and other southern rarities seen with south-easterly and southerly weather (and in improving weather subsequently) arrive by down-wind directed drift from the north-west coast of France as temporarily disoriented birds; and that such vagrants serve as excellent "markers" indicating the source of the drift of a number of more familiar species, chief among which are Pied Flycatcher, Tree Pipit, Redstart, Wryneck and Red-backed Shrike.

TABLE V—PASSERINE MOVEMENTS AT GREAT SALTEE, CO. WEXFORD, IN EARLY SEPTEMBER 1958

September	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	Category*
Swallow	5	2	5	50	100	100	50	10	400	1000	600	b
House Martin	1					2	2			8	6	b
Sand Martin	1				4	5	10	2	50	100	100	b
Song Thrush	1								1	2	1	c
Ring Ouzel										1	2	b
Blackbird	70	50	40	30	40	50	60	40	40	50	50	c
Wheatear	30	10	30	50	50	50	40	15	50	50	70	a(b)
Whinchat	1		4	1	1	4	10		4	3	1	d(b)
Redstart									1			d
Nightingale								1	1			d
Robin	12	10	10	8	8	8	8	8	10	10	10	c
Grasshopper Warbler	8	1	3	2	2	3	2		2	1		b
Marsh Warbler	1											d
Sedge Warbler	30	10	30	20	12	15	8	5	15	15	15	d(b)
Aquatic Warbler			1									d
Melodious Warbler					2				1	2	2	d
Blackcap		1	1									?
Garden Warbler	2	1	2	1	2	1			1		1	d(b)
Whitethroat	20	10	20	15	10	15	8	6	25	20	20	b(d)
Lesser Whitethroat									1		1	d
Willow Warbler	6		2		5	5		2	1	6	1	
Chiffchaff		1				1			2	4	1	
<i>Phylloscopus</i> sp.	20	10	10	10	20	25	8	6	20	30	15	d(b)
Goldcrest											1	c
Spotted Flycatcher	4	3	2	1	4	20	8	5	6	6	5	d(b)
Pied Flycatcher						5	3	3	6	4	2	d
Meadow Pipit	150	30	60	60	120	80	80	60	500	250	150	a(b)
Tree Pipit					1	2			3		1	d
Red-throated Pipit	3					3	3					d
White Wagtail†	35	12	14	19	24	18	23	13	102	72	102	a
Grey Wagtail									2	1		c
Yellow Wagtail		1							1	2	3	d
Woodchat Shrike			1	1		3						d
Red-backed Shrike									1	1	1	d
Starling	50	25	20	10	5	2			8	2		c
Scarlet Grosbeak	1	1	1	1								d
Ortolan Bunting			1	1	1	1					1	d

*For explanation of categories see page 366.

†Includes one or two *M. a. yarrellii* (b)

WEIGHT-LOSS ON MIGRATION

I have drawn attention to the weight-loss sustained by migrant birds, particularly when drifted over the sea, and to the associated

phenomenon of an "off-passage" recuperative period (Williamson, 1950, pp. 15-16 and 21-22; 1951, pp. 6-7; 1952, pp. 8-10; 1958, pp. 212-216). Lack (1959, p. 390) has attacked the concept of down-wind directed drift partly on the view that such weight-loss is more comparable with what one would expect if the birds were completely disoriented and their flight haphazard, so that their mean rate of progress is that of the wind-stream. Such birds would be airborne for a much longer period than those which flew down-wind, adding wind-speed to their own flight-speed.

I consider Lack's objection unsound because it assumes that the bird loses weight only when flying over the sea: in other words, he accepts the loss from normal weight as recorded at (say) Fair Isle as representing the actual loss since the bird's departure from the Continental coast. This is fallacious, since the birds in question are not likely to have begun their migration at the coast; they may well have had their origin several hundred miles inland, and have migrated two or more nights before drifting out to sea. I suggest that the pattern of weight-loss on migration is as follows.

It is now well-known, especially from American work (Odum and his associates: see references in Lack, 1959, p. 384) that autumn migrants build up a store of fats before departure; but this is an expendable reserve of energy and we should not expect the bird to maintain its initial high weight during a prolonged spell of migratory activity. The migratory routine of long night-flights alternating with day-time feeding activities must obviously make more severe demands on the bird's metabolism than ordinary routine in which the weight lost during roosting can be restored next day. The adaptive value of a high weight at the outset is that it enables the bird to continue migrating in suitable weather by providing an essential reserve, but during this rigorous programme of day-time feeding followed by long nocturnal flights the bird will use up these reserves more rapidly than it can replace them. I suggest that, provided the external stimulus of eol or anticyclonic weather is present, the urge to migrate will persist despite a gradually declining weight until a critical threshold is reached, below which the urge is inhibited by the need for recuperation. A period of "off-passage" activity in a suitable environment follows during which the bird builds up its energy-store to something like the original high level before continuing migration. This threshold doubtless varies individually, and it could be passed during the course of a single night's flight if a bird which had already migrated some distance were suddenly exposed to a long oversea drift. In such cases, moreover, the "off-passage" period might be of considerable duration.

DRIFT AND POST-JUVENILE DISPERSAL

As already mentioned, it has been suggested that the eastern vagrants which turn up almost annually at such places as Heligo-

land and Fair Isle are individuals which never possessed, or have absolutely lost, the inherited navigational faculty of migratory birds. This is merely an easy way of side-stepping a dilemma, and does nothing to explain or clarify the problem; but unfortunately the view has gained a number of advocates among critics of down-wind directed drift. If this is the true explanation of such vagrancy, then it is difficult to understand why many more Red-breasted Flycatchers should have been without this vital faculty in 1958 than in any previous year; and it is curious that, while the same was apparently true of several warbler species, including Icterine and Melodious, fewer Yellow-browed Warblers were disinherited than in almost any season since the bird observatories began their work. These inconsistencies in the year-to-year pattern of vagrancy do not lend much colour to the simple but entirely unsupported solution we are asked to believe, and some more reasonable explanation should be sought.

We have seen that the September drift of 1958 was remarkable for the fact that two usually very rare east European species, both of which migrate south-eastwards away from the British Isles, appeared on our coasts at that time in unprecedented numbers, despite the light strength of the prevailing anticyclonic winds and the clear night skies; whilst accompanying these Red-breasted Flycatchers and Icterine Warblers were less markedly eastern elements, such as Barred Warblers and Red-backed Shrikes, which also have a south-eastwards migration route. For the purpose of the following discussion, let us concentrate on the most distant (and for that reason, generally the scarcest) of these migrants, remembering that what applies to this species may well apply also, at least in part, to the others.

If we accept the findings of Sauer (1957) that nocturnal migrants use the star-pattern as an aid to navigation in the true direction of their winter home, then the vastness of this east-coast immigration under conditions of remarkable atmospheric clarity, which should have afforded recurrent opportunities for reorientation, is quite inexplicable on any of the migration theories which have so far been proposed. The assumption that great numbers of these south-east migrants were unable to reorient, despite the favourable weather, is inescapable; not only must many have travelled 600 miles or more across Europe to reach the British east coast, but a proportion went even farther and drifted in mid-September from north-west France into the Irish Sea. This seems to have been, in fact, a relentless westerly drift in very nearly the opposite direction to the one these birds might have been expected to take.

Perdeck (1958) has described experiments carried out in recent years by Vogeltrekstation Texel, using ringed migrant Starlings. The birds were caught in large numbers in Holland when migrating from eastern Europe to England in a west to west-south-west standard direction that is now well-established as normal for these populations (both from field observations in Holland and an

accumulation of ringing recoveries). These captured birds were ringed and removed south to release-points in Switzerland: subsequent recoveries of adult birds were made in England or at places between the release-point and England, showing a north-west movement and true goal-orientation; but young birds of the year moved between west and south-west, along a parallel route to the normal migration, to give recoveries in a "new" wintering area in southern France and Spain. Thus, the young birds showed a one-directional orientation only. Moreover, a few of these young Starlings returned to this new winter area in subsequent years (i.e. when adult) having, in the interim, returned to their native quarters to breed.

Perdeek's results reveal a dichotomy in the orientation mechanism of the Starling, depending upon the age and experience of the birds. Whether or not this applies to other Passerine species remains to be shown (there is some evidence that it exists in the Chaffinch and possibly the Sparrowhawk—*idem*, pp. 28-29); but it may well be that in migratory Passerines generally the young of the year are less adept navigators than their parents, having one-directional but not true-goal orientation. In such case, young of the year would be more likely to be displaced far from the homeland by drift, as they would be powerless to reorient towards the true winter home in the intervals between successive flights. Nevertheless, they ought still to be able to orient along a parallel route to the traditional one for the species, so that the occurrence of large numbers far to the west during a period of very light winds and excellent visibility is still not satisfactorily explained.

With Perdeek's results in mind, however, we are perhaps justified in seeking the key to the situation in this demonstrably weaker navigational ability of the young. It has long seemed to me that the westward drifts of eastern birds during the autumn migration comprise very largely the young of the year, and I suggest that these drifts begin *before* true migration—in other words, during the short period of post-juvenile dispersal which we find in many species after completion of the first-winter moult. It is perhaps likely that such movements away from the birth-place are stimulated, or at least encouraged, by those conditions of col and anticyclonic weather which provide the most favourable environment for the inception of migratory movements in the population as a whole. Drift of early migrating adults might take place at the same time, but the adult section of the population will be much less seriously affected because of its more efficient orientation mechanism; and because, in many populations, the majority of adults will still be in the later stages of the annual post-nuptial moult on the breeding-ground, and unready for migration.

Personal experience with the Barred Warbler first suggested to me that the regular late summer and early autumn vagrancy

in the British Isles might be connected with post-juvenile dispersal rather than with true migration, since I know of no reliable record of an adult bird being seen or trapped at that period. I have seen Barred Warblers in the Faeroe Islands (three first-winter birds on 7th September 1942), at Fair Isle (on many dates, but always first-winter birds) and St. Kilda (first-winter birds on 13th and 28th August 1957), and the species sometimes passes through the northern isles in such numbers as to have led some writers to suspect that a west-coast migration route exists. Meinertzhagen (1941) records no fewer than 14 at Lunna Ness in Shetland on 26th August 1940; there are at least ten records of its appearance in the Faeroes, and a first-winter bird in the British Museum (Natural History) collection was shot as far north as Jan Mayen (see *Ibis*, vol. 94, p. 315). Yet, in common with the Icterine Warbler and the Red-breasted Flycatcher, this bird has a south-eastwards migration route.

Data of age and sex are not always recorded by ringers, though clearly it is important that these points should be noted wherever safe criteria are available. Certainly the majority of the Red-breasted Flycatchers trapped in September 1958 were young of the year, and so were all the Barred Warblers; the same may be true of the Icterine Warblers, but ageing is more difficult in this species and is seldom attempted by recorders. With the kind assistance of those in charge I have been able to draw up a list (Table VI) of all recent occurrences of these three species at four east-coast bird observatories, and it will be seen that first-winter birds are overwhelmingly involved.

An interesting and perhaps significant feature of the Red-breasted Flycatcher invasion of 1958 was its very early date, birds appearing from the beginning of the month, whereas in other years the species has not usually arrived until the third week of September or later (this fact is obscured in Table VI by the preponderance of early records for 1958). As an explanation for this, I suggest that the marked anticyclonic development just described happened to coincide with the main period of post-juvenile dispersal of this species in eastern Europe, and that the dispersal was drift-aided by the light winds so that the bulk of it took place to westward of the home range.

It has often been observed, in weather of this kind, that although comparatively few individuals of the commoner species are to be found at the island and coastal bird observatories, extra-limital vagrants are unusually well represented. I suggest the reason for this lies in a difference in the physiological states of the birds concerned; for while the true migrants feel a sense of urgency to continue their journey under the stimulus of such weather, and pass beyond the coastal watch-points, the extra-limitals are wanderers pioneering new ground, and tend to alight at the first opportunity after a sea-crossing.

TABLE VI—THE OCCURRENCE OF THREE EXTRA-LIMITAL SPECIES—ICTERINE WARBLER (*Hippolais icterina*), BARRED WARBLER (*Sylvia nisoria*) AND RED-BREASTED FLYCATCHER (*Muscicapa parva*) AT FOUR EAST-COAST OBSERVATORIES DURING THE TEN YEARS 1949-1958

	Early Aug.	Late Aug.	Early Sept.	Late Sept.	Early Oct.	Late Oct.	Early Nov.	Totals	Age		
									Ad.	1st.W.	
ICTERINE WARBLER											
Fair Isle	1	2	4	1				8	1	6	
Isle of May	2	4	10					16	2	4	
Monks' House			1					1	—	—	
Gibraltar Point	1	2	1					4	—	1	
Totals	4	8	16	1				29	3	11	
BARRED WARBLER											
Fair Isle	2	12	15	4	1			34	—	34	
Isle of May	1	5	4	3	4			17	—	9	
Monks' House		3	3	3	1			10	—	10	
Gibraltar Point		3	2	2	1			8	—	7	
Totals	3	23	24	12	7			69	—	60	
RED-BREASTED FLYCATCHER											
Fair Isle			4	4	3		2	13	1	12	
Isle of May			4	3	4			11	1	6	
Monks' House			3					3	—	3	
Gibraltar Point			2	1				3	—	3	
Totals			13	8	7		2	30	2	24	

The British Museum (Natural History) collection contains 4 Icterine Warblers, 10 Barred Warblers and 5 Red-breasted Flycatchers taken in the British Isles: all are first winter samples. The *Norfolk Bird Report* records a minimum of 36 autumn Barred Warblers in six years 1953-58 on the N. Norfolk coast: all of them were immature.

I further suggest that this eruptive dispersal of the young birds is an ephemeral phase, to be reckoned perhaps in days rather than in weeks, and of strong adaptive value, necessary to the well-being of the species as a whole. Clearly it would be dysgenic if the young birds' ability to orient in the direction of the true winter home were already developed in this period, since in such case all the young would disperse in one direction only—namely, towards the winter range. It is obvious that if post-juvenile dispersal is to have any adaptive significance some factor must operate against such a contingency, so that the young can spread outwards from the home range in all directions, more or less at random. It is not unlikely that this inhibiting factor is a delayed development of the navigational instinct.

Conversely, it would be equally dysgenic if the faculty for directional orientation were too long delayed in its implementation, since in that event the dispersal would be without any potential value for the race, these pioneers of range-expansion perishing long before their autumn exploration could bear fruit. We must therefore assume, I think, that the faculty for a one-directional orientation is latent in all young birds, but does not mature until

a short period of random dispersal has been fulfilled. A dichotomy in the orientation mechanism of adults and young, of the type found by Perdeck, seems clearly to be of great benefit to migratory species: if the young inherited a true-goal orientation, they would eventually reach the true winter home, with less likelihood of consolidating the territorial gains of the autumn pioneering on the spring return; whereas a one-directional orientation seems well designed to enable them to open up a new winter as well as summer range, with new migration routes between, thus dispersing the species more widely and evenly over all suitable terrain.

What looks well in theory may not always work out well in practice, and we would do well to examine more closely the benefit gained from post-juvenile dispersal among the summer visitors to the northern Palaearctic, when a long winter season in a far country must necessarily intervene before the autumn pioneering can be put to good account. If we suppose that, following the brief exploratory phase, a faculty for directional orientation matures, then the survivors (no matter how far they may have been drifted from their home) will pursue a migration parallel to the normal one for the species, and, like Perdeck's Starlings, open up anew wintering area. If they winter successfully, they will return approximately (allowing for the vagaries of drift) along this same track in the spring to colonize new summer areas beyond the periphery of the established breeding range. Thus, always provided that the range of tolerance of the species is compatible with the ecological conditions in the "new" winter and summer areas, and that the annual wastage of the pioneers is therefore small, some range-expansion should result. It is conceivable, however, that a number of species are held to their present summer boundaries, not by inability to survive the hazards of migrational drift and still less by ecological conditions in potential new breeding areas, but by the heavy annual wastage of young pioneers in new winter-quarters totally unsuited to the species' requirements. It may be that this winter mortality of displaced birds, in migratory species, is the most powerful of those "density dependent mortality factors" (see Lack, 1954), which combine to maintain animal populations at a stable level.

It might be thought that if this hypothesis is close to reality in portraying the pattern of range-expansion in migratory Passerines, we should expect to have seen an apparent westwards "push" in the summer area of the Red-breasted Flycatcher in 1959. This may have happened, but on the other hand there are good reasons why it may not have. The normal winter range of the Red-breasted Flycatcher is peninsular India—and for a long way westwards of India, between the same latitudes, there is a vast expanse of mainly desert country in Arabia and Africa which is totally unsuited to the survival of this (and many other) species. So the winter wastage of these autumn pioneers may be very severe. It is indeed possible that this vast desert region acts as

a check to further westwards colonization by several east European species, and the fact that the limit of breeding distribution in a number of cases runs south-eastwards from Denmark or northern Germany to Italy or Greece may reflect this situation. It is perhaps also significant that in Europe practically all the notable range-expansion in recent years has been from east to west, or south-east to north-west—i.e. in the general direction of drift-aided dispersal occasioned by the airflow of Continental highs.

It would be a mistake to argue, if the pattern outlined above bears some relation to the facts, that in view of the conditions prevailing to the westward of the Indian sub-continent, the phenomenon is without adaptive significance; for, wasteful though such drift-aided dispersal may seem at the present day, this may not always have been the case, and may not be so in the distant future. Evolution is a continuing process, and over a few thousand years regional physiography may undergo vital changes, small or considerable, due to new methods of land utilization, different climatic trends and other factors, bringing new areas for winter and summer habitation within the species' range of tolerance. The important thing is that the species, by virtue of its high productivity and the design of the orientation mechanism in the young, is always in a strong position to turn such changes to its own advantage as and when conditions change for the better.

SUMMARY

1. East-coast drift-movements in early September 1956 and 1958 are described and compared. In 1956 there were falls of nocturnal migrants on three successive days at points from Dungeness (Kent) northwards to Fair Isle (Shetland), coinciding with the northward movement of frontal disturbances through the North Sea basin. In 1958 the influx was a "broad-front" movement along the full length of the coast in clear anticyclonic weather.

2. In 1958 (but not 1956) an unusual number of east European vagrants, whose "standard direction" of autumn migration is to the south-east, appeared first along the east coast, and at a later stage on the Channel coast and in the Irish Sea. Red-breasted Flycatchers and Icterine Warblers were prominent. Evidence is given to show that these arrivals resulted from down-wind directed drift in the anticyclonic airstream.

3. Also in 1958 an unusual number of southern vagrants, chiefly Melodious Warblers and Woodchat Shrikes, occurred on the Channel coast and in the Irish Sea. These records are discussed in relation to the current meteorological conditions, and their value in interpreting the nature of migratory movements in the Irish Sea is shown.

4. Finally, the unusual strength of this invasion of eastern and southern rarities in early September 1958 is considered in the

light of current theories of migrational drift. It is shown that such vagrants are predominantly young of the year. The suggestion is offered that the orientation mechanism is similar to that shown by Perdeck (1958) for the Starling, but that it does not mature until after a brief phase of random post-juvenile dispersal. In a season so markedly anticyclonic as 1958, the light easterly winds produced a drift-aided dispersal far to the west of the normal range.

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APPENDIX—SCIENTIFIC NAMES OF SPECIES MENTIONED IN THE TEXT

Sparrowhawk (<i>Accipiter nisus</i>)	Song Thrush (<i>T. philomelos</i>)
Corncrake (<i>Crex crex</i>)	Ring Ouzel (<i>T. torquatus</i>)
Dotterel (<i>Charadrius morinellus</i>)	Blackbird (<i>T. merula</i>)
Wood Sandpiper (<i>Tringa glareola</i>)	Wheatear (<i>Oenanthe oenanthe</i>)
Common Gull (<i>Larus canus</i>)	Whinchat (<i>Saxicola rubetra</i>)
Turtle Dove (<i>Streptopelia turtur</i>)	Redstart (<i>Phoenicurus phoenicurus</i>)
Swift (<i>Apus apus</i>)	Black Redstart (<i>Ph. ochruros</i>)
Bee-eater (<i>Merops apiaster</i>)	Nightingale (<i>Luscinia megarhynchos</i>)
Hoopoe (<i>Upupa epops</i>)	Bluethroat (<i>Cyanosylvia svecica</i>)
Great Spotted Woodpecker	Robin (<i>Erithacus rubecula</i>)
(<i>Dendrocopos major</i>)	Grasshopper Warbler (<i>Locustella naevia</i>)
Wryneck (<i>Jynx torquilla</i>)	Reed Warbler (<i>Acrocephalus scirpaceus</i>)
Swallow (<i>Hirundo rustica</i>)	Marsh Warbler (<i>A. palustris</i>)
House Martin (<i>Delichon urbica</i>)	Sedge Warbler (<i>A. schoenobaenus</i>)
Sand Martin (<i>Riparia riparia</i>)	
Fieldfare (<i>Turdus pilaris</i>)	

Aquatic Warbler (<i>A. paludicola</i>)	Meadow Pipit (<i>Anthus pratensis</i>)
Melodious Warbler (<i>Hippolais polyglotta</i>)	Tawny Pipit (<i>A. campestris</i>)
Icterine Warbler (<i>H. icterina</i>)	Tree Pipit (<i>A. trivialis</i>)
Blackcap (<i>Sylvia atricapilla</i>)	Red-throated Pipit (<i>A. cervinus</i>)
Barred Warbler (<i>S. nisoria</i>)	White Wagtail (<i>Motacilla a. alba</i>)
Garden Warbler (<i>S. borin</i>)	Pied Wagtail (<i>M. a. yarrellii</i>)
Whitethroat (<i>S. communis</i>)	Grey Wagtail (<i>M. cinerea</i>)
Lesser Whitethroat (<i>S. curruca</i>)	Yellow Wagtail (<i>M. flava</i>)
Willow Warbler (<i>Phylloscopus trochilus</i>)	Woodchat Shrike (<i>Lanius senator</i>)
Greenish Warbler (<i>Ph. trochiloides</i>)	Red-backed Shrike (<i>L. cristatus collurio</i>)
Chiffchaff (<i>Ph. collybita</i>)	Starling (<i>Sturnus vulgaris</i>)
Wood Warbler (<i>Ph. sibilatrix</i>)	Scarlet Grosbeak (<i>Carpodacus erythrinus</i>)
Arctic Warbler (<i>Ph. borealis</i>)	Crossbill (<i>Loxia curvirostra</i>)
Yellow-browed Warbler (<i>Ph. inornatus</i>)	Chaffinch (<i>Fringilla coelebs</i>)
Goldcrest (<i>Regulus regulus</i>)	Black-headed Bunting (<i>Emberiza melanocephala</i>)
Spotted Flycatcher (<i>Muscicapa striata</i>)	Red-headed Bunting (<i>E. bruniceps</i>)
Brown Flycatcher (<i>M. latirostris</i>)	Ortolan Bunting (<i>E. hortulana</i>)
Pied Flycatcher (<i>M. hypoleuca</i>)	Lapland Bunting (<i>Calcarius lapponicus</i>)
Red-breasted Flycatcher (<i>M. parva</i>)	Tree Sparrow (<i>Passer montanus</i>)

FULMARS IN THE NORTH ATLANTIC IN THE SUMMERS OF 1956 AND 1958

By WILLIAM H. and MARY DRURY

IN 1956 WE MADE two crossings of the North Atlantic on the small Royal Netherlands ship "Groote Beer", from Montreal to Southampton in June, and back in September. We kept records of all the birds we saw, but the following notes, compiled from half-hourly watches, are confined to the distribution and colour-phases of the Fulmar (*Fulmarus glacialis*). Table I on pages 378-379 covers the eastward trip, while Table II on pages 380-381 deals with the westward voyage. In late June and early July 1958 R. Stackpole crossed from Liverpool to St. John's, Newfoundland, and at our request kept comparable notes which have been included at the end of this paper as Table III.

TABLE I—NOTES ON FULMARS (*Fulmarus glacialis*) IN NORTH ATLANTIC, MONTREAL TO SOUTHAMPTON, JUNE 1956
 L = Light phase LL = Light with light tail D = Dark phase DD = All dark

Date	Place	Noon Position	Weather	Hour	Number	Phase
June 3rd	N of E end of Gaspé Peninsula Most of the birds were grey-tailed, but no accurate count was made; all were resting on the water and a few flew heavily.	47° 30' N, 62° 30' W	Visibility good; wind none; sea flat	19.00	200	6 D
June 4th	Newfoundland Bank and at midnight south of Cape Race Fifteen counts, for a period of 10 minutes each, were made throughout the day. There were usually 15-20 birds per 10 minute period. The light-phased birds were chiefly L, and very few had a white tail (LL). The birds were frightened off the water at our bow, rose and flew a few yards, then settled.	47° N, 57° W	Thick fog; visibility 200-300 yards	Morning and afternoon	10-30 per 10 minute period	1 in 20 D No DD
June 5th	Outer Bank As soon as we turned north off Cape Race in the fog in the afternoon, dark-phased birds nearly disappeared.	46° N, 46° 30' W	Fog until 17.00, visibility 200-300 yards	2 hours in morning	5 per 10 minute period	1 in 15 D 1 in 20 LL
June 6th	Northwest Midway One in 20 were LL; the rest were equally pale-mantled to dark-mantled, with grey tail (both of these included in L). Our impression, borne out by the above figures and in a specific comment then, was that there were definitely more dark-mantled white-tailed birds from late June 4th until mid-afternoon June 6th, than before or after.	48° 30' N, 38° W	20-30 knot winds, W to SW; visibility 10 miles	08.00-08.15 09.30-09.45 10.30-11.30 14.20-15.00 16.00-17.00 19.30	3 5 20 5 23 150 in wake	1 D 1 D All grey-tailed

Date	Place	Noon Position	Weather	Hour	Number	Phase
June 7th	Southern Outer Bailey	51° N, 28° W	25-knot wind; visibility good	08.30-09.30 15.00-18.00 at garbage dumping, about 19.30	40 30 45 in wake	8 LL 1 LL 1 LL
June 8th	Roekall Seas Temperature rose all morning, and by noon we were in the deep blue of the Gulf Stream; wind dropped to 10-15 knots at noon.	51° N, 18° W	Wind 20 knots; visibility good	08.00-10.00 12.00 13.00-13.30 14.00 19.30	30 12 following None 21 following 5 following	All L All L All L All L
June 9th	South of Ireland These notes indicate that most of the birds were on the Outer Bank, or the Newfoundland Bank. From Midway toward the east very few birds were seen that were not actually following the ship. It is nearly impossible to tell, but it seemed that all birds that were travelling came around to follow in our wake, but they may have been following before and gone on a foray, then returned. The increase in birds each evening indicates there was a good number of birds travelling, which followed the ship closely in the evening, waiting for garbage dumping. On the eastward trip travelling Fulmars had no trouble catching and circling the ship.		Overcast; 10-knot west wind	08.00	1	1 L

TABLE II—NOTES ON FULMARS (*Fulmarus glacialis*) IN NORTH ATLANTIC, SOUTHAMPTON TO MONTREAL, SEPTEMBER 1956
 L = Light phase LL = Light with light tail D = Dark phase DD = All dark

Date	Place	Noon Position	Weather	Hour	Number	Phase
Sept. 24th	Rockall Seas	52°N, 17°30'W	Wind 10 knots	10.30	1	1 LL
	Four other watches produced no Fulmars.					
Sept. 25th	Outer Bailey	53°N, 29°W	Wind WSW, force 6	09.00-09.15	1	1 LL
	Passed the SS Homeric			13.00-14.00	4	1 L, 3 LL
	Repeated short observations indicated there were usually no or 1 to 2 Fulmars visible.			15.00 15.00-15.30	11 following 2	1 L, 2 LL 2 L
Sept. 26th	Reykjanes Tongue	53°N, 37°31'W	Wind WNW, force 8	09.00-09.30 12.00-13.00 16.30 17.00	5 4-7 50 following 6 following	2 L, 3 LL All L 2 LL, 30+ L All L
	The group at 16.30 were the first large number of Fulmars seen.					

Date	Time	Noon Position	Weather	Hour	Number	Phase
Sept. 27th	Cape Farewell Seas	52° 30' N, 48° W	Wind NNW, force 7	06.45-07.15	40	15 L, 1 LL
	During the morning the wind increased to 25-30 knots, and the Fulmars swept higher, to a height of 50 feet, similar to the flight of albatrosses.			08.00-08.30	30 total, 17 following	3 LL, 7 L, 1 D
	Of these birds, 1/3 were moulting the fourth primary from tip. There is a comment in my field notes on the tremendous increase in grey-tailed birds as compared with those seen near England.			10.45-11.15	80-85 total, 4 following	39 L, 7 LL, 5 D, 32 unidentified light phase
				12.05-12.30	20	12 L, 2 D 1 DD
				14.00-14.45	10-20 per 15 minute period	24 L, 5 D
				17.00-17.30	24-36 following	1 LL, 23 L, 2 D
			In stronger wind these birds stayed on the water, and were not travelling after 15.00. Visibility was poor after 12.00 noon, due to white horses.			
			With the ship travelling into the wind 3-4 points on the starboard bow, Fulmars could be seen coming in from forward, but those coming from aft only appeared in changes in the birds following. Birds swung across wind to the ship from down wind, and passed to leeward, then worked up in the wake a few minutes. Then they turned off across wind. Birds appeared 90% from the port bow, dead ahead or starboard bow during the two days in which we saw a number of Fulmars, September 26th-27th. In the westward trip also there can be no doubt of the concentration of birds in the Cape Farewell Seas.			

The 1956 trip from Montreal to Southampton passed south of Newfoundland, but the return voyage was through the Straits of Belle Isle. We met fog for two days near Newfoundland on the east-bound passage, but the rest of that journey was fair, with 10-12 knot westerly winds. The westerly trip had no fog, one day of rough weather and force 7 winds (Beaufort) in the Reykjanes Tongue and eastern Cape Farewell seas. We met no fishing vessels except in continental waters.

These notes on the Fulmar are intended to follow James Fisher's discussion of the feeding distribution of the colour phases of this species in the North Atlantic (*The Fulmar*, 1952, pp. 266-288). Nothing emerges which would not have been anticipated. The Fulmars were in the cold waters on the western side of the Atlantic, and the occurrence of the plumage types approximately followed the location of main breeding concentrations of those colour-phases as outlined by Fisher.

Fisher divided the colour-phases of the Fulmar into four groups—LL, L, D and DD. The first two of these are the light phases with head, neck and under-parts almost or completely white. D birds are smoky grey all over the body and belly, with flight-feathers darker. DD birds are all dark chocolate brown or grey, as dark as their flight-feathers.

At sea we had real trouble distinguishing colour-phase LL from L, perhaps because we did not see a good sample of British birds. Fisher separates them on the white versus grey crown and nape. We could not see these at sea, and have used instead a system based on divisions that we made on the spot and compared later with Fisher's classification and that of Bernard O'Reilly which he quotes (p. 28). Most of the birds we saw had grey mantles and pale grey tails; about 40% had darker grey mantles with grey tails, and a small percentage had white tails with either pale or dark grey mantles. Using Fisher's classification, and O'Reilly's which foreshadowed it by over a century (*Greenland, the adjacent seas, and the north-west passage . . .*, London, 1818), we have, in assigning our field notes, called birds with a white tail LL and those with a grey tail L. There were no individuals whose phase assignment was a problem between L and D or between D and DD.

In all three of the tables, each day is treated separately with general location given, both according to E. M. Nicholson's classification of the ocean areas of the North Atlantic (*Proc. Xth Int. Orn Congr.*, 1950, pp. 600-602) and according to the noon position as posted for the ship's passengers.

TABLE III—NOTES ON FULMARS (*Fulmarus glacialis*) IN NORTH ATLANTIC, LIVERPOOL TO ST. JOHN'S, JUNE/JULY 1958, BASED ON OBSERVATIONS BY R. STACKPOLE

L = Light phase

D = Dark phase

Date	Place	Noon Position	Hour	Number	Phase
June 28th	British Seas	Liverpool Docks	16.20-17.40	1	L
			19.40-21.00	1	L
June 29th	Rockall Seas	55°34'N, 11°49'W	06.30-07.30	20-25	L
			09.15-10.15	20+	
			11.00-12.30	25+	
			13.45-16.15	40	
			19.30-20.30	10+	
June 30th	Outer Bailey	55°05'N, 22°42'W	09.00-09.15	12	L
			11.00-12.15	12	
			14.15-15.45	15-20	
			17.00-18.00	8-10	
July 1st	Reykjanes Tongue	53°49'N, 31°55'W	08.50-09.50	1	L
			11.45-12.30	4	
			14.15-15.30	15+	
			17.30-18.00	10-15	
			20.00-20.30	1	
July 2nd	Cape Farewell Seas	51°34'N, 41°20'W	09.30-11.30	30+	L
			12.00-12.30	15+	
			16.45-18.00	15+	
			20.00-20.45	5+	
July 3rd	Outer Bank	49°21'N, 48°10'W	09.15-11.15	2+	L(1D)
			13.50-14.55	2	
			15.55-16.45	10+	
July 4th	08.30 into St. John's, Newfoundland		06.30-08.30	5+	L

NOTES

Feeding behaviour of Gannets and Great Black-backed Gull with Mackerel shoals.—During the months of July, August and September, Mackerel (*Scomber scomber*) habitually enter the Village Bay of Hirta, St. Kilda, in the late afternoon and evening. These shoals are often pursued by Grey Seals (*Halichoerus gryphus*) and the fishes crowd together near the surface of the sea, actually breaking the water over an extensive area. Gannets (*Sula bassana*), from the huge adjacent colony on Boreray, Stac an Armin and Stac Lee, are usually diving for fish in the bay at

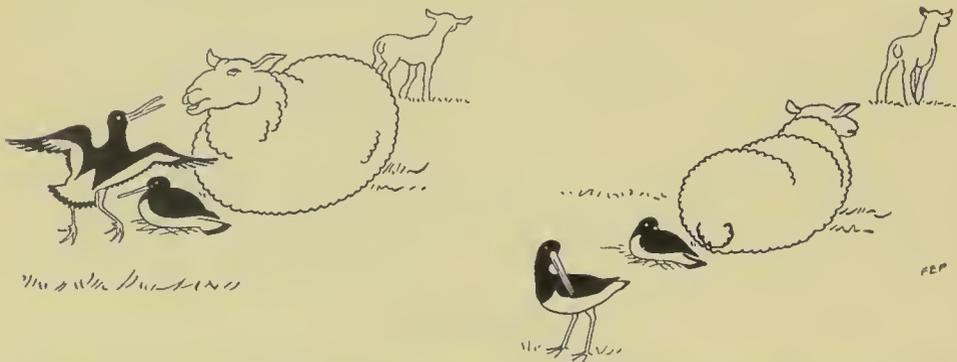
this time, but they persistently ignore these Seal-driven shoals, although sometimes flying over them slowly. In fact, during a year spent on Hirta, from September 1958 to August 1959, Gannets were seen diving into the Mackerel shoals on only three occasions. The first time was in September 1958. A Gannet twice circled overhead and then dived quite deeply into the edge of the shoal. From a cliff 100 feet above I was able to watch Seal, Gannet and Mackerel clearly. One of two Seals chasing the fish turned aside and swam towards the Gannet, though it did not reach it before the latter resurfaced. During the same month, however, a Gannet was seen to emerge from the water in a state of slight distress and a Seal appeared on the same spot as it started to fly off. The third occasion was in August 1959, but then the dive into the pursued shoal was uneventful.

The only other occasion on which a bird was seen making use of this apparently ready supply of food was on 3rd August 1959, when an adult Great Black-backed Gull (*Larus marinus*), after much preliminary circling, landed in the shoal and picked up a fish which I estimated to be between 12 and 14 inches long. Holding its head high, with the wriggling fish transversely in its beak, it swam with open wings 20 yards to the rocks—where it pierced the Mackerel behind the gills and swallowed it.

DAVID BODDINGTON

Reactions of nesting Oystercatchers to intruding sheep.—

In June 1954, in a rushy pasture beside the shores of Loch Inchard, Sutherland, a ewe was grazing. Her lamb ventured too near to the eggs of a pair of Oystercatchers (*Haematopus*



These sketches illustrate the behaviour of the birds when the ewe (a) was facing the nest and (b) had her back to it.

ostralegus) close by. The cock bird reacted violently and the lamb retreated. Next the ewe seated herself with her nose immediately over the nest. The hen bird hastily covered the eggs while the cock flapped his wings and pecked repeatedly at the ewe's nose. The ewe slowly became aware of the bird's vexation; she rose and turned herself round, and resettled with her

tail towards the nest, thus resuming her chewing of the cud. The cock Oystercatcher, although still apprehensive, became much calmer when faced by the rear end of the sheep, although the animal was just as close to the nest. The hen Oystercatcher remained imperturbable throughout.

M. and F. PENROSE

Wilson's Phalarope in Bedfordshire.—On 10th May 1958 my wife and I visited a gravel-pit at Stanford, near Shefford, Bedfordshire. One end of this pit had been cleared of gravel and the clay base that remained held shallow pockets of rain water which formed good feeding areas for waders. By the largest of these pools, which measured approximately 100 yards by 20 yards, we noted three waders. Two of these were Redshanks (*Tringa totanus*), but the third was quite strange to us. As we tried to approach closer, the Redshanks took alarm and flew off, and the other wader went with them. Fortunately it returned after about 15 minutes, without the Redshanks, and we were able to take detailed notes on it. We had no reference books with us, but we hoped to identify it readily as its head and neck plumage were outstanding. That evening, however, we could find nothing to agree with it in either *The Handbook* or the *Field Guide*. Further observations were made on 11th and 12th May, on the latter occasion with F. C. Gribble and R. Whyman, Jr., and the bird was seen again on the 13th by F.C.G. and I. J. Ferguson-Lees who identified it as a female Wilson's Phalarope (*Phalaropus tricolor*) in almost complete summer plumage. Later that day it was watched by several other people, including H. P. Medhurst and M. P. Roseveare, but it was not seen after about 5.30 p.m. in spite of repeated searches that evening and during the next few days. I took the following details:

Size between Redshank and Little Ringed Plover (*Charadrius dubius*), both of which were present: nearer to Redshank, but more slender. Bill blackish, straight, very slender and slightly longer than head. Legs long and slender, blackish, with much of tibia exposed. Grey-blue stripe from bill to eye, with a narrow white stripe above. Forehead and crown grey-blue. Prominent white band from back of crown down nape and hind neck to mantle. Blackish band (a little wider than eye) running backwards from eye in line with bill and then curving downwards, widening and shading into dark chestnut colour at sides of breast. White patch below eye. Throat and breast lightly tinged chestnut. Belly and undertail white. Back and folded wings brownish, with some chestnut flecks visible on the back at close range. Rump white, tail duskier than rump but not seen properly in flight and completely hidden by the folded wings on the ground. Flight rapid and direct, with quick wing-beats; the pointed wings appeared more delicate than those of the Redshanks, with a smaller spread. No wing-bar. When the bird settled, the undersides of the wings were seen to be dull greyish.

Although it was not as shy as the Redshanks, the closest view I had was at a range of about 12 yards and that only after waiting half an hour in an exposed position near its favourite feeding area. It was very active, walking with rapid steps, jerking its head to and fro, and picking under the water as it tripped along. When

suspicious it would stand still for a few seconds with its slender neck stretched and looking very long. No spinning action was ever seen, but it often waded in the water up to its belly and once I saw it swim vigorously with neck very erect and head jerking. Other observers also watched it swim on different occasions. It made no call. All other birds were tolerant of it and it showed no aggression towards them.

This is the second authenticated occurrence of Wilson's Phalarope in Europe, the first having been in Fife in 1954 (*antea*, vol. xlviii, pp. 15-17).
H. COLE

Wilson's Phalarope in Anglesey.—At 11.30 a.m. on 15th June 1958, at Malltraeth, Anglesey, I found a wader which I thought at first was a Red-necked Phalarope (*Phalaropus lobatus*) in almost complete summer plumage. As time went on, however, several features puzzled me, especially its greyish-white nape, uniform grey-brown wings without any streaking or bars, and white rump and tail. In addition, it fed by wading instead of swimming. I was watching the bird at distances down to 30 yards in a good light and began taking notes from which the following description has been compiled:

Size larger than Dunlin (*Calidris alpina*) and Ringed Plover (*Charadrius hiaticula*), but much smaller than Redshank (*Tringa totanus*); these were the only waders near-by for a direct comparison, but the size was estimated to be about that of a Common Sandpiper (*T. hypoleucos*). Horizontal stance of longish body, and attenuated neck especially when bird on the alert, noted particularly. Bill long, black and needle-like, thickening at the base. Head small in comparison with body and neck. Crown grey bordered on each side by a short and narrow white superciliary. A black stripe ran through the eye and broadened down the side of the neck into a dark chestnut patch on each side of the upper breast which was rosy-pink. Nape greyish-white merging into greyish-brown back and very conspicuous. In flight the upper-wings were uniform pale greyish-brown with no streaking or light bars; rump pure white and tail white streaked with grey, very much like Wood Sandpiper (*T. glareola*) but with fainter marks. Under-parts (including undersides of wings) white. Legs appeared olive-brown and projected beyond the tail in flight.

Throughout this and a later period of watching—a total of about three hours—the bird was constantly on the move, wading through the shallows and feeding greedily and hurriedly by picking insects off the surface of the water. Not once was it seen to swim, but its general behaviour was typical of a phalarope picking rapidly in all directions around itself.

At 1.45 p.m. I tried, without success, to contact Mr. D. P. Morgan and by the time he was able to come it was well on in the evening and distance and light were not good for detail. Early the next morning, 16th June, I compared my notes with those published in *British Birds* in 1955 on the Wilson's Phalarope (*Ph. tricolor*) (*antea*, vol. xlviii, pp. 15-17 and 30-32, and plate 2) and was convinced that this was what I had been watching the

previous day. I immediately telephoned Mr. Morgan and told him of my conclusions. Fortunately he and Mr. C. F. Tunnicliffe were able to locate the bird again, and their observations—supported by Mr. Tunnicliffe's sketches—left no doubt that it was indeed a female Wilson's Phalarope in summer plumage.

This appears to be the third record for Britain and the first for Wales.

JOHN P. WILKINSON

Common Tern nesting on vegetation above water.—On 1st August 1959 I watched a young Common Tern (*Sterna hirundo*) being fed by an adult on the island in Abberton Reservoir, Essex, and the next day, landing there, I found that it was at least six days old. Incubation must therefore have started on 5th July at the latest (taking *The Handbook's* minimum of 22 days), but then the surface of the island had been 15½ inches under water. There is no possibility that the nest was on the mainland and that the youngster swam over, so the eggs must have been laid either in the floating weed over the island or on the very old remains of a nest of Great Crested Grebe (*Podiceps cristatus*) or Coot (*Fulica atra*) in the horizontal stubs of a dead willow bush. This bare platform came out of the water on 30th June or 1st July, but the surface of the island not until 20th July.

C. B. WAINWRIGHT

Skylark carrying dead half-feathered fledgling.—I was looking through binoculars at Nook Beach, Rye Harbour, Sussex, on 21st July 1958, when a bird flew across my field of vision carrying a fluffy mass in its bill. This it dropped from a height of about 4 feet. I lowered my field-glasses and watched the bird which alighted on the ground some 30 yards from where it had dropped the object: it was a Skylark (*Alauda arvensis*). I then went to the place where the object had fallen and found a beheaded fledgling Skylark which was still warm. The corpse was not so very young as the feathers on the back and the wing were quite well developed.

C. J. LEWIS

[Passerines usually remove dead young from their nests during the first two or three days after hatching, but after that any which die are normally left to become trampled into the bottom of the nest.—EDS.]

Carrion Crow attacking young Magpies in nest.—On 27th May 1957, at Frocester, Gloucestershire, a battle took place between two Magpies (*Pica pica*) and a Carrion Crow (*Corvus corone*) which was trying to reach the young in their nest. I did not see the struggle begin, but it lasted, without pause, for 21 minutes while I watched.

The commotion was first heard at 06.19 G.M.T. The nest was in the thick upper canopy of a Scots pine, 35-40 feet above the ground. The Crow repeatedly got to the dense part near the nest with the frenzied Magpies flying at it. The robber would

then fall several feet, perch again and, with wings partly spread, jab viciously at them. The cries of the young Magpies were heard for the first time at 06.36, but again the Crow was beaten off, only to return immediately to the attack. At 06.40 a fledgling fell to the ground, followed by the Crow and both Magpies, and it was obviously killed there. At 06.51, just after the Crow had gone, a second youngster fell to the ground, trying unsuccessfully to cling to the branches, and was ignored by the old birds.

One corpse was found, pecked and bleeding about the head, but uneaten; the second had disappeared in thick nettles. The survivors left the nest on the following day. SYBIL M. BUTLIN

Rook nesting on the ground.—Through the kindness and interest of Mr. Percy Weaver of Lydd, Kent, I was able to examine a very unusual Rook's (*Corvus frugilegus*) nest on his land on 23rd April 1959. At the time I was accompanied by Messrs. D. M. Broom, M. J. Harding, D. Shepherd and S. D. G. Stephens.

The nest was built on the ground and surrounded by a small clump of rushes (*Juncus communis*), near the corner of a lambing field that was in use throughout the time that it contained eggs. The nest, approximately 12 inches in diameter and with a rather deep cup, was built basically of dried grass, reed from the lambing wattles and wool. The entire structure was rather reminiscent of the normal lining to a Rook's nest—i.e. lacking sticks—but much thicker and bulkier. There appeared to be an attempt at an additional lining of wool over the basic construction. Small pieces of moss were attached to the wool and the lining also contained a Rook's feather, a few chicken's feathers and a little bit of brown paper.

When the nest was examined, the full clutch of three eggs was present, the third having been laid about 19th April. Two of the eggs were typical, but the third was smaller and paler, with less markings and a more blue-grey ground colour. The three eggs measured: 40.5 × 29.6 mm., 42.3 × 28.5 mm. and 39.9 × 28.3 mm.

The bird could readily be watched incubating and the presumed mate was continually to be seen in the vicinity of the nest. Mr. Weaver informed me that late in the evening, after the large numbers of Rooks feeding in the field had returned to the rookery to roost (about a mile away), two Rooks remained in the field, one incubating, the other standing near-by.

When I was next able to visit the site on 16th May, the nest was empty and I was informed by Mr. Weaver that the eggs had disappeared one at a time, the last going on 9th May. Mr. W. S. Nevin visited the site and obtained the accompanying photograph (plate 64) when the nest contained only two eggs. R. E. SCOTT

Feeding behaviour of Choughs.—During the past five years I have made regular observations on the feeding behaviour of three

captive Choughs (*Pyrrhocorax pyrrhocorax*) which I keep at Ipswich, Suffolk, and it is especially interesting to note what these birds do with surplus food after their appetites are sated.

When they are fed with fly pupae, they apparently swallow more than they want, because some of the pupae—still whole—are invariably regurgitated afterwards and inserted into cracks between the bricks which form a surround on the aviary floor (these bricks are simply laid end to end on the ground and have become half buried in the loose earth). About 2-4 pupae are inserted into a crack, on top of which the bird then places 3-6 small stones. Often, after depositing anything up to half a dozen lots, a Chough will inspect the caches and take out the contents, sometimes replacing them, sometimes swallowing them and at other times reburying them elsewhere.

On one occasion one of the Choughs was seen to place three pupae in a small hole at the base of an upright post, then lightly cover them with soil and finally put three or four stones carefully on top: these it rearranged several times, furtively inspecting the site as it did so. This done, the bird left the cache and indulged in such irrelevant activity as flying round the aviary and bickering with its fellows before finally going to rest in the sleeping-quarters. After a period of about five minutes it flew down to the ground and without any hesitation picked up a stone, went straight to its cache and placed it on top. It was just leaving again when one of the other two Choughs—a bird which was dominant over it—approached, removed the stones and ate some of the pupae. The first bird stood by in a mildly challenging posture, but appeared afraid to attack. When the dominant Chough withdrew, the first bird removed the pupae that were left and reburied them in a fresh place.

During periods of observation of some 15-30 minutes after feeding, all three Choughs are sometimes seen burying and digging up pupae. Almost invariably they either unearth food or, after making a small hole, bury some—so that all the digging activity appears to be purposeful, without any sign of the random searching that a bird indulges in when it is hungry. All the dozens of pupae that I have seen buried are actually swallowed and regurgitated, sometimes only after great difficulty, and are never merely carried in the beak. The little stones used for covering the hiding places range in size from $\frac{1}{4}$ in. to $\frac{3}{4}$ in. in diameter. Unlike my Ravens (*Corvus corax*) which have a few large holes (see *antea*, pp. 129-131), the Choughs appear to use any little crevice or rapidly make a small hole by digging: as a result of this activity and of their normal random searching for beetles and grubs the entire floor of the aviary is pitted and uneven.

By contrast, when the food consists of meal-worms the surplus is usually carried in the tip of the beak to the place where it is to be buried. Further, the Choughs never bury the soft food given as a staple diet: they snatch up odd beakfuls as they dig through

the mass and any food thus scattered is simply wasted. Earth-worms are never eaten by my Choughs (*cf. The Handbook*)—even if they are small ones—although they are not infrequently unearthed by the birds when they dig for beetles. BRIAN C. TURNER

Two Robins laying in one nest.—On 17th May 1959, at Balcombe, Sussex, I was shown a nest on which two Robins (*Erithacus rubecula*) were then sitting. This was in a large hole in an apple tree, about four feet from the ground, in a much used part of a private garden. The lady of the house told me that the two Robins had then been sitting for a day or two at least and that during the period of laying, eggs had appeared at the rate of two a day. The final number of eggs was 11 or 12.

I visited the nest on several occasions up to 4th June. On each visit both Robins were sitting and their usual positions were one in front and one to the side and behind (see plate 63); on one occasion, however, one bird was sitting on top of the other. The nest cup was not measured, but appeared much larger than normal and both birds could at least partly cover the eggs: probably they had stretched the rim in settling on the eggs together.

I was away for a time after 4th June and when again able to visit the nest was told that the two Robins had continued to sit, though with diminishing intensity, until about 10th June. The nest was then deserted. I was informed that the eggs were removed and some were purposely broken: apparently at least three had well-developed embryos and others were thought to be infertile (though it seems possible that those at the bottom of the nest might not have had a chance to develop).

On only one visit did I see a third Robin near the nest. There appeared to be no animosity between the two Robins sitting, either when off the nest or returning to it. G. DES FORGES

Abnormal song of Chiffchaff.—A Chiffchaff (*Phylloscopus collybita*) near Radipole Lake, Weymouth, Dorset, in April 1959 consistently produced an abnormal song. The bird was found on 2nd April by Miss H. Betchley and D. W. Betchley, and later seen by Miss H. Brotherton, Miss M. D. Crosby, Dr. J. S. Ash, K. D. Smith and the writer; it was last recorded on the 19th. Everyone agreed that in all respects except song the bird was a typical Chiffchaff.

The song was written “chi-chi-chi-chi-chi-churru-churru churru-chi-chi-chi-chi-chi”, and when sung in full lasted about five seconds, though it was frequently cut short. The first and last phrases were written as “chip” by M.D.C. and “chiff” by K.D.S., but were quite unlike the normal song and clearer and more decisive. The middle phrase was slower and lower pitched, written as “tirra” by M.D.C. and “wich-it” by K.D.S., and was almost thrush-like in its richness. Between each group of phrases a faint squeak was audible. The whole was astoundingly different from

the normal song, which was not once produced, though when J.S.A. imitated normal Chiffchaff song the bird became very excited, fluttering up towards him, calling "tui" continuously.

R. S. DOVE

REVIEW

FUNDAMENTALS OF ORNITHOLOGY. By JOSSELYN VAN TYNE and ANDREW BERGER. (*John Wiley & Sons*, New York, and *Chapman & Hall*, London, 1959). xi + 624 pages; many text illustrations. 94s.

THE DISTINGUISHED senior author unfortunately did not live to see the completion of this useful work of reference. It is a well produced and suitably illustrated volume, of which about two-thirds constitute a text-book on the structure and life of birds in general, and about one-third a review of the characteristics of all the families represented in the world today. There are also a short section on ornithological sources, a convenient glossary of terms, and an index.

The general part consists of twelve chapters, each of which is a summary of a large subject. The first three are mainly structural, covering palaeontology, anatomy and plumage (including moult). Three others deal with physiology and action—senses and behaviour, voice and sound production, and flight. The chapters on distribution and migration are written mainly from a North American angle. Three others are concerned entirely with behaviour—food and feeding habits, breeding behaviour, and social relations. Finally there is one on taxonomy and nomenclature. The presentation is clear, and as adequate as the limitations of space permit.

The part devoted to separate families provides a compact systematic survey of the birds of the world. The authors have, however, imposed on themselves the handicap of a uniform plan which allots one page to each family; this involves sometimes giving the same space to a single species as elsewhere to a group including hundreds of diverse forms, and the treatment of the larger families is thus inevitably in the most general terms. The authors also appear to have followed certain views of their own on taxonomy; thus, the inclusion of the *Carduelinae* (in addition to the *Passerinae*) in the *Ploceidae* is unusual and unexplained, while the position assigned to the estrildid weavers can be inferred only from another part of the book. The information about each family is conveniently arranged under the heads of physical characteristics, range, habits, food and breeding, with references to the literature on technical diagnosis, classification and general points.

A.L.T.

LETTERS

ST. KILDA WRENS ON STAC AN ARMIN

SIRS,—Following the publication of the recent letters by the Rev. E. A. Armstrong and Mr. Kenneth Williamson on the St. Kilda Wren (*Troglodytes t. hirtensis*) (*antea*, pp. 136-138), we feel that the following information is both timely and interesting. On 13th May 1959, at midday, we climbed Stac an Armin (627 feet) to the summit. During the ascent we heard at least three Wrens in full song and saw Wrens on more than six occasions. The birds were seemingly as numerous per unit area as on Dun and Carn Mor, and much more so than in the village area of Hirta. They were concentrated in the locality of the old bothy and the cleits on the east-facing slope about one-third of the way up, but they seemed to range in all directions from this part. There was an abundance of insects on the wing, the numbers doubtless encouraged by the great quantity of semi-digested fish which lay strewn about the colonies of Gannets (*Sula bassana*) and Puffins (*Fratercula arctica*).

The vegetation of the stac is generally sparse and often confined to lichen and algal growth but the least precipitous parts have a luxuriant sward of red fescue (*Festuca rubra*) and scentless mayweed (*Matricaria maritima*). With food and rock sites for nests in obvious abundance, Stac an Armin is a very favourable habitat for the St. Kilda Wren.

J. MORTON BOYD, DAVID BODDINGTON and DEREK A. RATCLIFFE

SIRS,—It may be worth recording that on the afternoon of 7th July 1959, I heard a Wren (*Troglodytes t. hirtensis*) singing on the north-east face of Stac an Armin, St. Kilda. Dr. J. Morton Boyd tells me that this is some distance from the sites at which, two months earlier, he and others heard and saw several birds. I was put ashore by a motor-boat of H.M.S. Adamant (Captain John Adams, M.V.O., R.N.) and spent half an hour on the rock.

JEFFERY BOSWALL

THE BIRDS OF STAFFORDSHIRE

SIRS,—The Research Committee of the West Midland Bird Club has decided to bring up to date T. Smith's *The Birds of Staffordshire*, which was published in parts from 1930 to 1938 in the *Transactions* of the North Staffordshire Field Club. The prime objective will be to report on the status and distribution of species recorded in the county since 1938.

Could we therefore appeal to your readers to let us have any unpublished information on Staffordshire birds since 1938? A questionnaire has been prepared and copies may be obtained from A. R. M. Blake, 102 Russell Bank Road, Four Oaks, Sutton Coldfield, Warwickshire, to whom all information and all enquiries should be sent.

J. LORD, *Editor*, and A. R. M. BLAKE, *Hon. Sec.*,
West Midland Bird Club

NOTICE TO CONTRIBUTORS

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Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and lay-out are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing Systematic Lists, Reference Lists, Tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlvi, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in Tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the lay-out of the Table concerned. It is particularly requested that authors should pay attention to Reference Lists, which otherwise cause much unnecessary work. These should take the following form:

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Various other conventions concerning references, including their use in the text, should be noted by consulting previous examples.

4. Tables should be numbered with Roman numerals, and the title typed above in the style used in this issue. The title and any headings within the Table should not be underlined, because this sometimes makes it difficult for the Editor to indicate the type to be used. It is most important that the lay-out of each Table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that Tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All Tables should be self-explanatory.

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Cover design by E. A. Tomsett, the Buzzard being based on a photograph by C. Pearson Douglas

14 DEC 1959

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VOL. LII

No. 12



DECEMBER

1959

BRITISH BIRDS

BEWICK'S SWANS IN THE BRITISH ISLES IN THE WINTERS OF 1954-55 AND 1955-56

By I. C. T. NISBET

AMONG THE MOST STRIKING results of the periods of severe frost in the winters of 1954-55 and 1955-56 were the unprecedented numbers of Bewick's Swans (*Cygnus columbianus bewickii*) which occurred in Great Britain. The influx in early 1956 was particularly spectacular, and the birds were seen in greater or lesser numbers at over 200 different places in England alone, the total numbers certainly running into thousands. This paper is primarily a summary of the records available for the 1955-56 winter in England and Wales, in relation to the movements elsewhere in Europe. However, the influx of 1954-55 provides an interesting comparison with that in the following year, and a brief account is also given of this as observed in England and Wales.

Records from Britain have been drawn mainly from the county and local bird reports for the years concerned. In 1956, thanks to the Express Information Service of the International Wildfowl Research Bureau, a considerable mass of data was also collected by Mr. G. Atkinson-Willes through the medium of the National Wildfowl Counts organisation. Other records from Britain have been supplied directly by a number of ornithologists (listed in the Appendix on p. 416), and information from other areas is derived from sources quoted later in the paper.

The records are much too numerous to list in detail, but all counts of large numbers and other important records are quoted directly in the text. Copies of the full list of records have been deposited at the Wildfowl Trust and at the Edward Grey Institute, Oxford.

PAST STATUS OF THE SPECIES IN GREAT BRITAIN

Although the unprecedented influxes of Bewick's Swans to Great Britain in 1954-55 and 1955-56 can be related to unusually severe

weather in their Continental wintering-areas, the species had been increasing as a winter visitor in England for some years previously. This had been most spectacular on the Ouse Washes in Cambridgeshire and Norfolk, where a regular wintering population has built up since the winter of 1950-51 (Nisbet, 1955). Table I, which gives the maximum numbers recorded in this area in each winter since that of 1944-45, shows that a rapid increase took place between 1950 and 1956. Perusal of local reports and county avifaunas shows that the increase has been equally striking in other areas—notably Essex, Somerset and the Midlands—although there are no established wintering flocks comparable to that on the Ouse Washes.

TABLE I—LARGEST NUMBERS OF BEWICK'S SWANS (*Cygnus columbianus bewickii*) ON THE OUSE WASHES (CAMBRIDGESHIRE) AND ADJACENT WATERS IN EACH WINTER SINCE 1944-45 (MAINLY DERIVED FROM NISBET, 1955)

1944-45	1	1949-50	5	1954-55	254
1945-46	Nil	1950-51	30	1955-56	705
1946-47	33	1951-52	7	1956-57	270
1947-48	2	1952-53	120	1957-58	250
1948-49	5	1953-54	41	1958-59	343

Detailed records have not been collected for winters subsequent to that of 1955-56, but there has been little sign that the increase has continued since then. On the Ouse Washes, for example, the population seems to have become stable at around the 1954-55 figure (Table I), and in other areas the numbers generally seem to have been smaller than in that year. Thus the two major influxes in 1955 and 1956 do not seem to have led to the establishment of any new wintering areas in England, although we may anticipate that future cold spells will again produce large numbers.

IDENTIFICATION

Many observers still do not realise that Bewick's Swan is now much more common than the Whooper Swan (*C. cygnus*) in southern England, and there have been many cases of misidentification in recent years. Since it is unlikely that many Whooper Swans are misidentified as Bewick's, it is necessary to consider whether the recorded numbers of the latter are thus seriously underestimated.

The problem is complicated by the fact that there was undoubtedly an abnormal influx of Whooper Swans into southern England in early 1956, and probably in 1955 as well. However, none of the well-authenticated records of Whoopers south of the normal range (which extends south to North Wales, Yorkshire and Norfolk) involved herds larger than 25 or 30. Significantly, all the records of larger herds of "Whoopers" in southern England in these winters coincided with the main periods of passage of the Bewick's, even flight directions being the same in some cases: such coincidences would be remarkable in view of the wide differences between the wintering areas and migration routes of the two species (Hilprecht,

1956). The writer suspects that many, if not all, of these records refer to Bewick's Swans, a suspicion which is supported by a few proved cases of misidentification.

On this assumption some 5% to 10% of the Bewick's Swans which visited England in 1956 were misidentified, and this would have a serious effect on the estimates of the total numbers if these birds were omitted. For this reason all records of large herds of "Whooper Swans" and "unidentified wild swans" will be mentioned in the text, with suitable qualification, but allowance will be made for the possibility of error when these birds are included in the tables.

For those still unfamiliar with the species it may be remarked that size is *not* always a reliable guide to the identification of wild swans, particularly in flight. When the bill pattern of adults cannot be distinguished clearly, the best identifying features of Bewick's are its relatively short, thick neck, and its small head with short, shallow bill. These points were well illustrated in the photographs published in this journal in 1951 (*antea*, vol. xlv, plates 59-60). The voice of Bewick's is also distinctive, higher-pitched and softer, less bugle-like than that of the Whooper, but the calls of both species vary, and identification by voice alone is not recommended to the inexperienced observer. Good recent accounts of the field-characters of this species have been published by Hilprecht (1956) and Robyns de Schneidauer (1958).

RECORDS IN ENGLAND AND WALES IN THE 1954-55 WINTER

Records before 6th February

In the winter of 1954-55 only three Bewick's Swans were seen before 11th December—single birds in Suffolk on 8th November and 5th December, and in Lincolnshire on 21st November. Twenty-nine were seen in Cambridgeshire during 17th-19th December, 5 in Northumberland on the 20th and 9 in Nottinghamshire on the 23rd-24th, and there were a number of other scattered records in late December and the first week of January.

The main influx started on 9th January (when 20 flew west at Cley, Norfolk) and continued until early February. There were no new records between the 10th and 13th, but on the 14th the first large numbers were seen on the Ouse Washes in Cambridgeshire, and a count there a few days later gave a total of 105-110 birds. Thenceforwards new arrivals were reported somewhere in the country on almost every day until the end of the month. At Cley 45 flew west on the 14th, 16 flew west on the 15th, 50 flew south-east on the 20th and 57 flew west on the 23rd; these birds probably formed at least part of the herd of over 100 birds seen on the 24th in Blakeney harbour, a few miles to the west. Fifty were seen flying south in N. Lincolnshire on the 25th. In North Kent there were three separate parties of 4, 15 and 23 birds on the 15th-16th, and the birds in the latter party may perhaps have been the same as the 23 seen at Abberton reservoir in Essex (30 miles to the north)

from the 17th to the 23rd, and those seen in other parts of Essex from the 23rd onwards. At the same period there were several records in Sussex, including 9 at Pett Level on the 14th and 16 on the Glynde during the 26th-28th, and on Walland Marsh in S. Kent, where there were 35 on the 30th. Farther to the west, 18 arrived in Somerset on the 30th, and 84 were seen in Anglesey from about the 25th onwards. There were also many records of single birds and small parties.

No new arrivals were reported on the east coast during the first week of February, but the numbers on the Ouse Washes, still only 100-120 on 2nd February, had increased to 254 by the 6th.

Most of the birds seen during this period remained for only a few days, or were seen only in flight; thus some may have been seen two or three times, and it is very difficult to estimate the total number involved. However, well over 200 were seen passing through Norfolk and Lincolnshire between 14th and 25th January, and these were almost certainly different from the birds on the Ouse Washes, where the numbers were more or less stationary during this period. It is very probable that the birds seen in Kent and Sussex were also different, so that even if those in the midlands and the west had all been seen earlier in the east, the total number must have been well over 500 individuals.

Records during February

The birds on the Ouse Washes remained there until the usual departure date in late March, but most of the other birds soon passed on: the chief exceptions are 20 to 30 birds in Essex, 24 or more in Somerset, up to 12 in Suffolk, and probably 23 in Lincolnshire. The total number which spent the whole winter in England and Wales cannot have exceeded 400, and was certainly less than the number seen in January.

There is evidence, however, of a second influx into the country about 20th February, at the height of a second period of severe weather, which again raised the number in the country to a total which for a few days approached 500. New arrivals in this period included 46 in Suffolk between the 12th and 15th, about 25 in Norfolk from the 20th onwards, 35 at Durleigh reservoir, Somerset, on the 20th, 14 in Sussex on the 19th, and there were several other records of smaller parties.

Departure and return passage

Most of the wintering birds left during March, with a few stragglers remaining into April. However, between 6th March and 5th April there were 28 records of new arrivals, involving a total of 268 birds. Unlike the birds seen earlier in the winter, most of these herds were seen on only one day, and only one stayed for more than five days. These records probably represent return passage, which was very marked at the same period in 1956 (see pp. 401-403), and has often

been noted in previous springs in Cheshire (Anon., 1957) and other counties. Typical examples are the herd of 50 seen in flight in Cheshire on 19th March, 18 in Buckinghamshire during 10th-15th March, 23 in Nottinghamshire on the 20th, two herds of 25 and 8 in Somerset on the 13th, 27 in Sussex on the 29th, and 18 in Yorkshire on the 27th.

There are several records of late stragglers after the middle of April: 4 in Leicestershire from 25th to 28th April, 1 in Yorkshire on 30th April, 1 in Lincolnshire from 23rd April to 15th May, 1 in Warwickshire from 17th April until 22nd May, and 1 in Somerset on 12th May. One bird spent the whole summer on Tealham Moor, Somerset, and was last seen at the end of July.

RECORDS IN ENGLAND AND WALES IN THE 1955-56 WINTER

The influx of 1956 differed from that of the previous year, not only in being more spectacular, but also in taking place in a single wave, coinciding with a long period of exceptionally severe frost. The influx attracted a good deal of attention, and the detailed observations made at the time permit a fairly complete reconstruction of the birds' movements.

Records before 27th January

The early part of the winter was unusually mild on the Continent, and there were only 15 records of Bewick's Swans in England and Wales before 27th January, these involving a total of 64 individuals. Only four sizeable herds were seen: 8 at Durleigh reservoir, Somerset, on 25th November 1955, and 10 there during 2nd-4th January 1956; 14 at Crindon Lough, Northumberland, from mid-December onwards; and 12 at Horsey Mere, Norfolk, on 4th January.

27th January to 12th February

The first two Bewick's Swans reached the Ouse Washes on 27th January, only two days after they had been flooded, and there were already 32 there on the 29th. Twelve arrived in Glamorgan at about the same time. The main movement, however, began with the onset of the severe weather on 31st January-1st February, and continued steadily thereafter, with large flocks arriving daily. Table II, which enumerates the flocks seen migrating, shows that the movement was mainly from east to west. Other large flocks seen at this period include the following: 21 at Tring, Hertfordshire, on 1st-2nd February; three or four herds of 15 to 27 in Somerset from the 2nd and 9th onwards; herds of 26 and 12 in Sussex on the 5th, and many subsequent records in the same county; 30 in N. Kent on the 5th; two herds of 14 and several smaller parties in Yorkshire from the 5th onwards; up to 50 at Blakeney, Norfolk, on and after the 7th; 40, perhaps up to 100, at Abberton reservoir, Essex, with arrivals on the 8th, 9th, 10th and 11th; and herds of 39 and 48 on the Leicestershire reservoirs on the 9th and 10th. Large numbers (at least 150) had also reached the Ouse Washes by the 6th.

TABLE 11—HERDS OF BEWICK'S SWANS (*Cygnus columbianus bewickii*) SEEN MIGRATING IN ENGLAND AND WALES DURING FEBRUARY 1956

Date	County	Locality	Number	Direction	Comments
3rd	Norfolk	Cley	10	W	
7th	Norfolk	Cley	53	W	
	Essex	Abberton reservoir	52	W	
8th	Lincoln	Holbeach St. Mark's	4	W	circled
9th	Essex	Abberton reservoir	28	W	arrived
	Norfolk	Cley	4	W	
	York	Gouthwaite reservoir	17	ENE	arrived
10th	Norfolk	Snettisham	2	S	coasting
	Essex	Abberton reservoir	6	W	arrived
11th	Essex	East Tilbury	11	WSW	coasting
	Hampshire	Langstone harbour	14	W	arrived
12th	Warwick	Alvecote Pools	61	W	some alighted
15th	Essex	Abberton reservoir	12	W	
16th	Essex	Abberton reservoir	40	W	
17th	Norfolk	Cley	23	W	departed
18th	Stafford	Rugeley	26	W	
	Stafford	Belvide	large flock	W	
	Bedford	Luton	58	NW	
	Essex	Girling reservoir	49	N	
	Hampshire	Langstone harbour	20	W	
	Norfolk	Cley	19	W	
19th	Bedford	Luton	15	N	
	Norfolk	Corton lightship	2**	SSW	
	Pembroke	Skokholm	47*	W	
	Stafford	Cannock reservoir	4	NW	departed
20th	Kent	Botany Bay	12*	WNW	
21st	Hampshire	Langstone harbour	14	W	
	Norfolk	Newarp lightship	4**	WNW	
	York	Gouthwaite reservoir	31	WSW	departed
22nd	Essex	Manningtree	30**	NW	
24th	Gloucester	Clifton	12	W	
	Norfolk	Holt	29	SE	
25th	Hampshire	Langstone harbour	28	W	departed

*originally reported as Whooper Swans (*C. cygnus*)

**reported as "unidentified wild swans"

At the height of the movement of Bewick's Swans, about 175 Whooper Swans were also reported in Norfolk and Suffolk, and the writer suspects that many were misidentified.

The records seem to indicate that the largest numbers arrived between 5th and 9th February, but this conclusion should be accepted with caution, since the period 1st-5th February was extremely cold and may well have discouraged observation.

12th February

12th February was a fine Sunday which coincided with a scheduled National Wildfowl Count, and observation of wildfowl was unusually thorough throughout the country. Bewick's Swans were seen at 36 different places in England and Wales, including fifteen high counts listed in Table III. The remaining counts included 81

additional birds, and the presence of about 63 more can be reasonably inferred at places from which precise counts are not available for this day. In addition, 86 unidentified "wild swans" were seen on the same day, mainly in Bedfordshire and Northamptonshire, where the occurrence of large herds of Whoopers is very unlikely.

TABLE III—COUNTS OF BEWICK'S SWANS (*Cygnus columbianus bewickii*) IN ENGLAND AND WALES ON 12TH FEBRUARY 1956

County	Locality	Number
Cambridge, etc.	Ouse Washes	376
Warwick	Alvecote Pools	61
Leicester/Rutland	Eye Brook reservoir	55
Essex	Abberton reservoir	52
Norfolk	Blakeney harbour	50
Northampton	Pitsford reservoir	36
York	Gouthwaite reservoir	31
Somerset	Blagdon reservoir	27
York	Bottomboat	26
Somerset	Durleigh reservoir	20
Gloucester	New Grounds	17
Wiltshire	Coate Water, Swindon	17
Somerset	Southlake Moor	15
Hampshire	Langstone harbour	14
Essex	Hanningfield reservoir	12
	Other places (see text)	230
TOTAL		1,039

Adding these figures, it appears that the total number of Bewick's Swans in England and Wales on 12th February was probably rather over 1,000, and could not possibly have been less than 950.

13th to 25th February

With further intensification of the cold weather the westward movement was resumed, especially from 18th February onwards, and many more large herds arrived in this period. In addition to those noted in Table II, noteworthy new records were: a maximum of 94 at Eye Brook reservoir, Leicestershire, on the 19th; an increase to 89 at Abberton reservoir on the 24th; 64 at Pitsford reservoir, Northamptonshire, on the 18th; 38 on the Essex coast on the 21st; 35 on the Orwell, Suffolk, on the 18th-19th; up to 26 at Rockland Broad, Norfolk, from the 18th onwards; 23 in Titchfield Haven, Hampshire, on the 25th; 17 at Fletton, Huntingdonshire, on the 18th; 17 on the River Medway, Kent, on the 19th; and 15 at Hornsea Mere, Yorkshire, on the 19th. There were also two questionable records of "Whooper" Swans at the same period, 45 in Norfolk and 40 in Suffolk.

However, the total numbers present in the country did not increase much, for as the large fresh waters on which they had settled gradually froze over, most of these birds, and others which had arrived in earlier weeks, departed and continued westwards (see

Table II). The Ouse Washes, where there had previously been almost 400 Bewick's Swans, were almost completely frozen by 18th February, and it is probable that most of the birds left, for only 10 were seen in a virtually complete count on the 22nd. However, the records quoted above from other parts of the country cannot possibly account for the Ouse Washes birds, and most of them cannot have gone far—perhaps only 30 miles, to the coast of the Wash, where several hundred wild swans were seen at this period. In any case they were back on the Ouse Washes by the 25th, in greatly increased numbers.

26th February

Thanks to a hastily organized enquiry by the Wildfowl Trust, almost all the major haunts of the species were again visited on 26th February, the last day of the frost, and the day on which the largest numbers appear to have been present in the country. The larger counts are given in Table IV.

TABLE IV—COUNTS OF BEWICK'S SWANS (*Cygnus columbianus bewickii*) IN ENGLAND AND WALES ON 26TH FEBRUARY 1956

County	Locality	Number
Cambridge, etc.	Ouse Washes, etc.	705
Essex	Abberton reservoir	95
Norfolk	Blakeney harbour	54
Somerset	Chew Valley reservoir	53
Norfolk	St. Olaves	50
Norfolk	Rockland Broad	41
Somerset	Blagdon reservoir	34
Anglesey	Llyn Coron	33
York	Bottomboat	26
Hertford	Cheshunt gravel-pits	25
Northampton	Pitsford reservoir	24
Anglesey	Malltraeth	18
York	Hornsea Mere	15
	Other places (see text)	440
TOTAL		1,613

In addition, 114 birds were seen at 19 other places in England and Wales, and there is reason to suppose that about 200 more were present at various places (notably in Yorkshire, Suffolk and Sussex) from which precise counts are not available. Besides these, there was also a large herd on the Fleet at Abbotsbury, Dorset, which was thought to have contained perhaps 200 birds in all: these were originally reported as Whoopers, but were later shown to have been Bewick's (Miss M. D. Crosby, *in litt.*). Allowing a conservative figure of 100-150 for this herd (which was never carefully counted), we reach an estimate of approximately 1,600 birds for the number present in England and Wales on 26th February; it is unlikely that the total could have been below 1,500 or could have exceeded 1,700.

An estimate of the total number of Bewick's Swans which were seen in Britain in February 1956 is made very difficult by the species' habit of constantly moving about in small flocks. In several areas (e.g. Sussex, Essex, Norfolk, Cambridgeshire, Leicestershire, Yorkshire and Somerset) the birds were found to be flying freely up to 10 miles from one water to another, causing considerable danger of duplication in records. It is also quite possible that some of the migrant flocks seen on the east coast of England were later seen in the west. On the other hand, a detailed analysis of the records of the *large* herds, in relation to the east-to-west movement revealed by Table II, has failed to show even a single instance where this seems to have been true.

Even if a liberal allowance is made for such duplication of records, it appears that at least 1,000 Bewick's Swans must have passed through England and Wales before the count was made on 26th February, in addition to some 300 to 400 others which were reported as Whooper Swans or which were not definitely identified. The total number of different individuals involved in the February influx thus appears to have been roughly 3,000, with a possible maximum of 3,500 and an absolute minimum of 2,500. In view of the fact that only about 4,400 Bewick's Swans left the Continent during this period (see below), this figure is an indication of the thoroughness with which birds are observed in Great Britain. At least it seems clear that virtually all of the birds must have passed through the country on their way west to Ireland.

Departure

With the thaw on 26th February the westward movement stopped abruptly, and the numbers present in the country began to dwindle almost at once. On the Ouse Washes, for example, the numbers remained at 650-700 for about a week, but by 6th March almost all the flood water had drained away, and the count had dropped to 550 by the 8th. Many more were seen flying off to the east and north-east on the 10th and 11th, and by the 13th the numbers were down to about 400, at which level they remained constant until the 23rd. All left overnight on the 23rd/24th—exactly the same date as the departure in earlier years (Nisbet, 1955).

Departures from other areas followed a similar pattern. Most of the coastal flocks left immediately after the thaw, and many of the smaller herds inland dwindled and disappeared during the first half of March. However, some large flocks which were well settled—notably those at the Somerset and Essex reservoirs, at St. Olaves in Norfolk and at Bottomboat in Yorkshire—remained together for three or four weeks after the thaw, and left between 18th and 25th March.

Return passage

Overlapping the period of departure, and extending until well

into April, there was a very large eastward movement, evidently the return passage of the birds which had reached Ireland during the frost. As at the same period in 1955, the birds passed mainly in flocks of 10 to 50, and those which stopped to rest and feed usually did so only for a matter of hours, very few staying for more than two days. Fig. 1 shows the places where herds of more than 4 birds were seen during this movement (omitting those seen on or before 26th February), and the total numbers seen week by week are summarized in Table V.

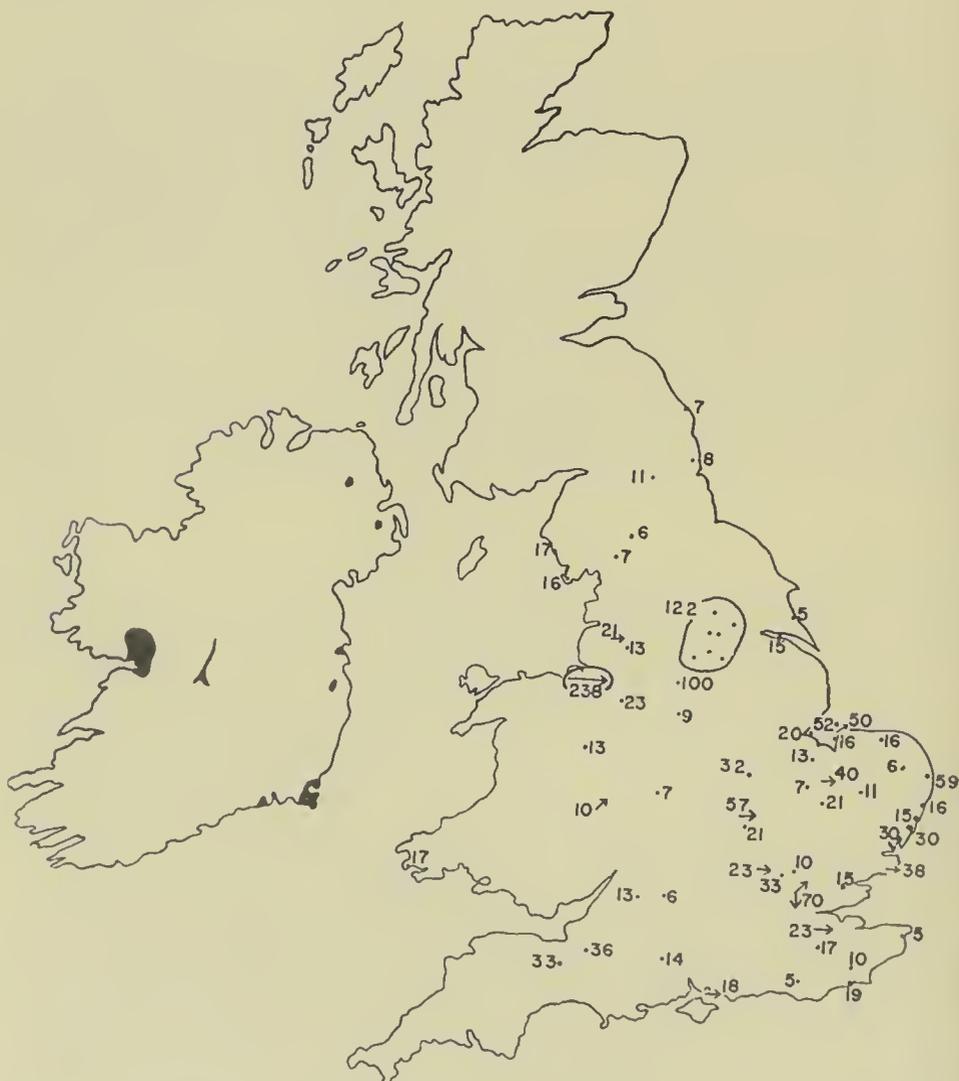


FIG. 1.—EASTWARD MOVEMENT OF BEWICK'S SWANS (*Cygnus columbianus bewickii*) THROUGH ENGLAND AND WALES IN MARCH AND APRIL 1956

Each place where more than four birds were seen is marked with the total number recorded and the direction of flight (if observed). Areas in Ireland where the species was seen in numbers in February are marked in black.

TABLE V—TOTAL NUMBERS OF BEWICK'S SWANS (*Cygnus columbianus bewickii*) SEEN FLYING EAST, OR NEWLY ARRIVED AT WATERS IN ENGLAND AND WALES, IN MARCH AND APRIL 1956

The geographical distribution of these records is shown in Fig. 1.

Dates	No. of flocks	No. of birds
26 Feb.-4 March	8	105
5-11 March	20	288
12-18 March	24	404
19-25 March	17	161
26 March-1 April	33	539
2-8 April	20	143
9-15 April	8	83
16-22 April	7	25
23-29 April	1	1
30 April-6 May	4	7
TOTALS	142	1,756

The total number of birds seen in this return migration was about 1,750, including some 170 which were not seen well enough for definite specific identification. This figure, of course, contains an unknown number of duplications, and may also include some of the birds which were leaving wintering areas in England. However, most of the latter left between 19th and 25th March, when relatively little eastward movement was seen (Table V), while the remaining birds passed through so quickly that duplication of records of *large* flocks seems rather improbable. The writer believes that about as many birds were seen on their way east through the country in March and April as had been seen passing west in February.

Only stragglers remained in the country after the third week in April, and only four birds were seen after 4th May. One remained at Hickling Broad, Norfolk, from 6th to 21st May, and two single birds (one reported as "unwell") were seen in Yorkshire as late as the 29th. A single bird spent the whole summer in Anglesey.

Summary

In the winter of 1955-56 only 64 Bewick's Swans were seen in England and Wales before 27th January. Between 31st January and 26th February (with peaks probably in the periods 5th-9th and 18th-20th February) large numbers arrived from the east, some passing directly westwards, the remainder staying at suitable fresh waters so long as they remained unfrozen. It is estimated that 1,000 (± 40) were present in the country on 12th February, and 1,610 (± 90) on 26th February. The total number of birds seen in England and Wales during February was probably between 2,500 and 3,500.

The birds present at the end of February departed during March, the largest numbers leaving between the 18th and 25th. There was also a large eastward passage through the country in March and April (peak: 16th March to 1st April), involving some 1,500 (± 250) birds.

MISCELLANEOUS NOTES ON THE BIRDS IN BRITAIN IN 1956

Movements

Despite the very wide scattering of single birds and small parties (records were received from over 200 different places in England alone), most of the birds travelled in medium-sized flocks containing some 12 to 50 birds; even the enormous numbers on the Ouse Washes appeared to arrive and depart in flocks no larger than 60. Indeed, almost every observer who watched large flocks saw them break into independent groups which fed or migrated separately, and on many favoured waters the numbers changed almost daily.

The larger flocks seen migrating (e.g. those listed in Table II) were usually in V-formation at moderate heights, often 200 to 400 feet from the ground. However, there are two records of birds seen much higher than this: a herd of 17 which arrived at Gouthwaite reservoir, Yorkshire, on 9th February was seen to descend at a steep angle from at least 1,500 feet (A. F. G. Walker), and another of 50 flying north-east at Hunstanton, Norfolk, on 17th March was so high that it could scarcely be seen with the naked eye against the bright sky (A. J. Holcombe). There is only one, uncertain, record of birds heard passing after dark, but some undoubtedly travel at night: many were seen leaving the Ouse Washes at sunset on 11th March (C. D. T. Minton; *cf.* Armitage, 1940; Hilprecht, 1956).

Habitat and feeding

As usual, most of the birds were seen on fresh waters inland, showing a preference for flooded grassland and the grassy edges of lakes and reservoirs. A certain number of birds also stopped briefly in coastal estuaries, and others resorted to the coast at the height of the frost, but these visits to salt water usually lasted at most a few days. An exceptional case was that of a herd of up to 54 birds which remained in Blakeney harbour, Norfolk, from 2nd to 26th February, fighting up and down with the tide (G. H. Hunt).

The birds were reported as feeding on both submerged and exposed vegetation, and in the former case several observers noted them "paddling" with their feet before feeding—probably to clear the mud from the roots of their food plants (Brouwer and Tinbergen, 1939). The birds on the Ouse Washes were unperturbed when the flood water receded in early March, leaving only a network of small ditches, and they remained there for several weeks afterwards, grazing like geese on the marshy grassland. At the height of the frost, when food was otherwise scarce, these same birds were seen climbing a 20-foot high flood bank to feed on exposed grass at the top.

Age composition and mortality

Comparatively few observers noted the proportion of young birds, especially in the larger herds, but an amalgamation of the

reports received gives an average of 26% young (137 out of 525). The birds on the Ouse Washes have been excluded from these totals, but a count there on 12th February gave 28% young (105 out of 376). These figures are in good agreement, but are much smaller than the counts of 35% and 44% young on the Ouse Washes in previous winters (Nisbet, 1955). However, a count in the Netherlands (Oostelijke Flevoland), on 30th October 1955, gave a figure of 34% young in a flock of 1,063 birds (M. F. Mörzer Bruijns, *in litt.*).

Remarkably few birds are known to have died in Great Britain during the winter. One was shot and two others injured in Kent, and two or three were shot in Glamorgan, but apart from these the only mortality reported concerned two birds on the Ouse Washes, two on the Norfolk coast, one in Kent, one in Northamptonshire and one in Yorkshire. Recalling that over 1,000 birds were present in the country for fully two months, it would seem that the average mortality rate—including that due to shooting—barely exceeded $\frac{1}{2}$ % per month. The same figure is given by Over and Mörzer Bruijns (1957) for the mortality of all geese and swans in the Netherlands during the February frost. Although these figures should not be taken too literally, mortality at this rate obviously cannot account even for the normal annual population turnover, reflected in the high counts of young birds. It seems evident that hard winter weather, even if exceptionally severe like that of 1956, does not act to limit the population of the species.

OTHER RECORDS IN EUROPE IN THE 1955-56 WINTER

In order to trace the source and destination of the large numbers of Bewick's Swans which passed through England and Wales in February 1956, records have been collected from the other European wintering areas of the species. The following account is concerned primarily with events between the beginning of November and the end of February: the return flight in March and April is less well documented. Most of the important localities mentioned in the text are marked on Figs. 1 or 2.

Germany

Bewick's Swan is primarily a passage-migrant in north Germany (Niethammer, 1938; Thielcke, MS.), and its only major wintering ground in that country is in the marshes of Emsland, in the Leda-Jümme area of Ostfriesland: here the numbers in recent years have varied between about 300 and about 1,000 (Thielcke, MS.; R. Drost, *in litt.*). About 300 were seen there on 26th January 1956, when the weather was still relatively mild, but all had left by 12th February, when the flood water was completely frozen. A few birds were seen by the Rhine river near Wesel, Nordrhein-Westfalen, during the February frost, as well as at a few other places along the Rhine (Drost, *in litt.*). Farther east, at least two were seen at Hiddensee on the Baltic on 19th December 1955 and again on 9th

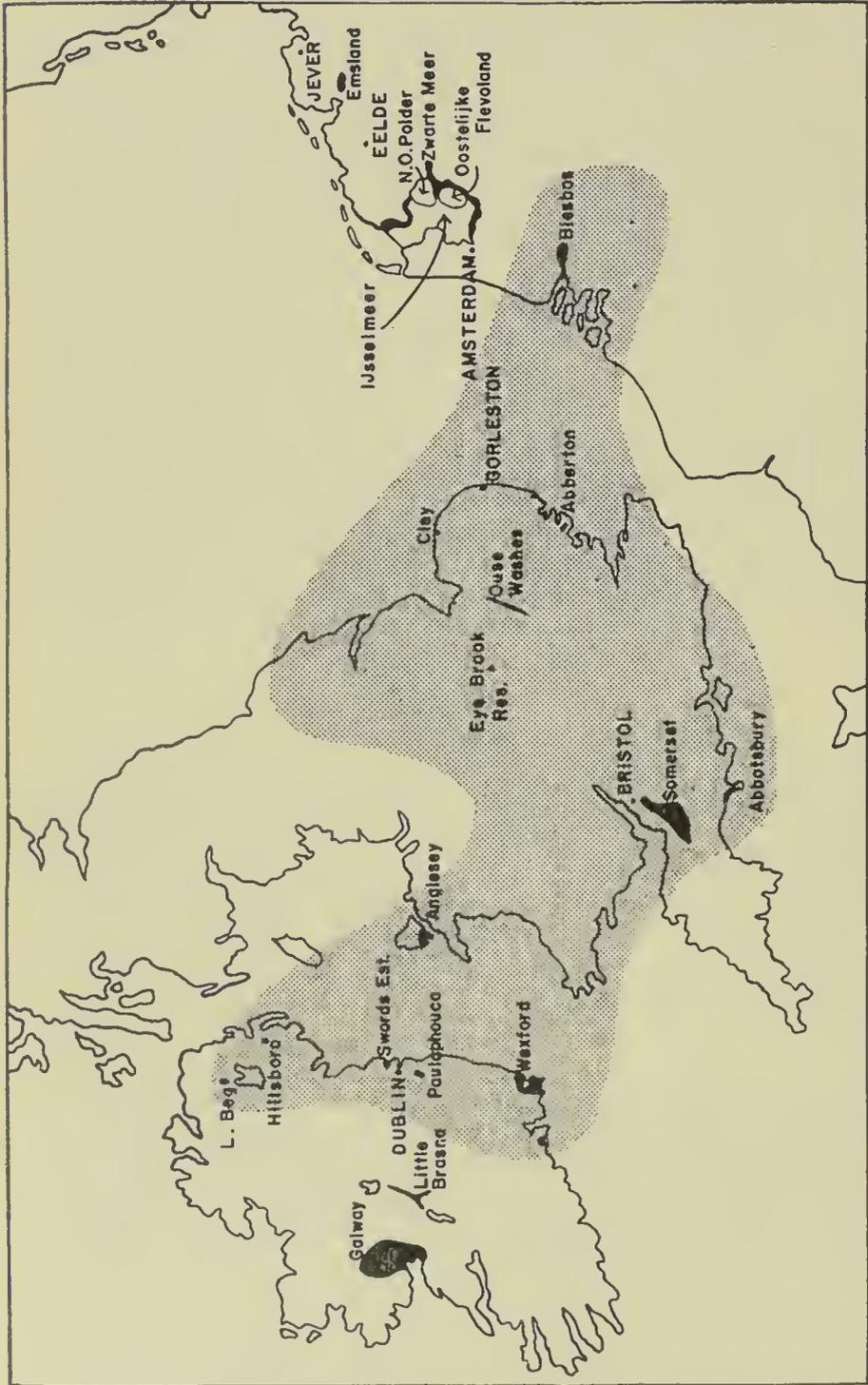


FIG. 2.—PRINCIPAL LOCALITIES MENTIONED IN THE TEXT

The main haunts of Bewick's Swans (*Cygnus columbianus bewickii*) during the 1955-56 winter are marked in black, and the area where unusual numbers were seen in February 1956 is shaded. Capital letters denote the six weather stations from which records have been used in Fig. 3.

January 1956 (Küchler, 1958). During the return passage in March unusual numbers were also seen far inland along the Ems, e.g. near Meppen (Brinkmann, 1956).

Netherlands

The main haunt of the species in the Netherlands is the south-east part of the IJsselmeer (the former Zuider Zee) in the provinces of Overijssel and Gelderland, including the polder known as the Oostelijke Flevoland, under water in 1956 but now reclaimed. Here, soon after the autumn arrival, no fewer than 5,850 Bewick's Swans were counted between Harderwijk and Kampen on 14th November 1955, plus an additional 300 to 400 on the nearby Zwarte Meer reserve (ten Kate, 1956). Prof. G. J. Van Oordt, who made this count, informs me (*in litt.*) that there were certainly other birds present in areas which he did not visit, and this is confirmed by an independent count of 7,000 on 17th November between Nulde and Elburg, an area only partly overlapping that counted on the 14th (ten Kate, 1957). By then the numbers at the Zwarte Meer were probably at their peak: 750 were counted on the 15th and 775 on the 22nd. These numbers are by far the largest ever seen in the country, previous high counts on the IJsselmeer having been of the order of 2,000 to 3,000 (Brouwer and Tinbergen, 1939; Le Bret and Van der Heide, 1942; Eykman *et al.*, 1936-49; ten Kate, 1952; etc.).

No other large numbers were reported anywhere else in the country at this period, but other favoured haunts which were not visited may well have held large numbers (Van Oordt, *in litt.* and in Bannerman, 1957). 650 were seen on the south coast of the IJsselmeer (near Huizen, Zuid Holland) on 22nd November, but by then the big concentration had already broken up: only 3,000 were seen between Nulde and Elburg on 20th November, with 625 on the Oostelijke Flevoland next day. The latter concentration increased to 1,741 by the 27th, and remained there until the end of January, when it numbered about 2,300. (These and other Dutch data were supplied by C. G. B. ten Kate and M. F. Mörzer Bruijns, *in litt.*).

With the onset of the frost at the end of January, these localities froze up rapidly, and most of the smaller herds left during the first ten days of February. However, on the 13th no fewer than 4,000 were seen in a small unfrozen area in the IJsselmeer near Kampen (ten Kate, 1957); this flock had decreased to 400 by the 22nd, and only a single moribund bird was left next day. Many of the birds had merely moved to the Nord-Oost Polder near-by; here about 1,600 remained until the end of the frost, while at the same period 700 birds were present in the Biesbos and Hollands Diep, a freshwater tidal area south of Rotterdam.

In addition to these large herds, many small ones were seen in various parts of the country during the frost, e.g. 32 near Terneuzen in the Scheldt estuary on 11th-12th February (H. Van der Vloet *in litt.*); 40 in the Brielse Bat on the 12th; 63 in the Haven van

Breskens, Zeeland, on the 21st; 30 in a hole in the ice near Kampen on the 23rd; 50 at Harculo, Overijssel, on the 13th; 43 in the neighbourhood of 's-Hertogenbosch, Nordbrabant, on the 29th; etc. Over and Mörzer Bruijns (1957), who thought that virtually all the major wildfowl concentrations in the Netherlands had been counted during February, estimated that the total number of Bewick's Swans seen was about 3,560. However (as shown by the observations in England) many birds continued to leave the Netherlands and migrate westwards until the very end of the frost-period, and the data available to the author suggest that only about 2,500 were left on 26th February. On the other hand, there were still at least 4,500 present on 12th and 13th February.

Like other wildfowl throughout the Netherlands, the Bewick's Swans were artificially fed during the severe weather: police, soldiers and even helicopters were used in some parts of the country to feed the beleaguered birds. But for this feeding, it is quite possible that still more birds would have left and reached the British Isles.

Ireland

Ireland is the only other country which could boast appreciable numbers of Bewick's Swans in February 1956, and was clearly the destination of the birds seen flying west through England. Observation there was unfortunately less complete than in England or the Netherlands, but nevertheless many were seen: although the numbers at the main haunts were not abnormally large, the birds were unusually widespread, at least in the eastern part of the country, and the total seen was probably larger than had been recorded for some years (*cf.* Kennedy, Ruttledge and Scroope, 1954). Much of the information quoted here has been published in the *Irish Bird Report* for 1956; other data have been supplied by R. F. Ruttledge, G. R. Humphreys and others.

Only three Bewick's Swans were seen in Ireland before the end of January, although several favoured haunts were visited: this was very unusual, since normally many arrive in October and November and peak numbers are normally reached in January. However, large numbers were seen at the following places in February and March:

Hillsborough, Co. Down: 41 on 6th March.

Lough Beg, Co. Londonderry: 96 on 25th February, 117 on 18th March.

Swords Estuary, Co. Dublin: 26 arrived on 25th February, 48 on 25th March.

Poulaphuca reservoir, Co. Wicklow: 24 on 12th February, 88 on 11th March.

North Slob, Co. Wexford: 38 on 5th February, 26 on 18th February, 13 on 4th March.

Kilmore Quay, Co. Wexford: *ca.* 275 on 4th March, 30 on 20th March.

Ballinlough, Co. Waterford: 10 on 12th and 19th February, 34 on 28th February, 36 on 4th March.

Little Brosna, Co. Offaly: *ca.* 100 before 16th February.

Rahasane, Co. Galway: 194 on 7th February.

Cloonkeen, Co. Galway: 15 on 4th February, 37 on 11th March.

Turloughcar, Co. Galway: 50-100 on 25th February, 97 on 10th March,
56 on 16th March.

Rossturlough, Co. Galway: 20 on 10th March.

Grehan's, Co. Mayo: 16 on 11th March.

Parties of 11 or less were seen at eight other places.

Other countries

No significant numbers occurred during the winter in any other European country. In Denmark, for example, the species is only casual in winter (Löppenthin, 1946), and none is known to have wintered in 1955-56 (E. Thomsen, *in litt.*).

In Belgium the small influxes noted in previous winters (Lippens, 1954) were not repeated in 1956 (Verschuren, 1957), and only two records of single birds have been traced: at Balen-Wezel on 25th February (Waelbers, 1958) and at Ekeren, near Antwerp, on 17th March (Van der Vloet, *in litt.*).

There are five records for Scotland: 5 at Rattray Head, Aberdeenshire, on 28th December and 1st March (Garden, 1956); one at Hamilton, Lanarkshire, on 30th December (Meiklejohn and Palmar, 1956); one in Clackmannanshire on 2nd January, two near Edinburgh in February, and one found dead on the Isle of May on 15th April (*Edinburgh Bird Bulletin*, vol. 6, pp. 36 and 51, 1956).

There are only two records in France, in Loire-Inférieure and Finistère (N. Mayaud, *in litt.*), but Whooper Swans and Mute Swans (*C. olor*) were numerous in February in the Seine and Loire and on other parts of the coast (Etchécopar and Roux, 1957) and a few other Bewick's may have been overlooked. The Loire record is of an injured bird at Paimboeuf in February: it was ringed and released ten days later, and was shot in December 1956 in Co. Cork, Eire (Mayaud, 1957; Leach, 1958).

Finally, six were seen near Neeracherried, Zürich, Switzerland, on 7th April (Anon., 1958): like the two seen near Göttingen, Niedersachsen, Germany, on 15th April (Köpke, 1956), these were far south of the normal range of the species, and may perhaps have been returning from a frost resort in France.

Total size of the European population

Since the numbers of Bewick's Swans in England and the Netherlands on both 12th and 26th February are known fairly accurately, and since no appreciable numbers were then present in any other European country except Ireland, it would be possible to determine the total European population of the species if the numbers in Ireland on those days could be estimated. Although very few Irish haunts of the species were actually visited on the 12th or 26th, these estimates can be made in the following way.

Recalling that the second phase of the westward movement through England did not start in earnest until after 16th February (Table II), we can reasonably use counts up to that date to estimate

the Irish population on the 12th. Moreover, the return passage was only just under way by 11th March (Table V), so that counts up to that date can be used to estimate the Irish population on 26th February. With these assumptions, about 400 birds are known to have been present in Ireland on the 12th, and about 1,050 on the 26th. Bearing in mind that the numbers on the larger waters always tend to increase in March (R. F. Ruttledge, *in litt.*, quoted by Nisbet, 1955)—probably due to the tendency for small scattered parties to amalgamate into flocks before departure—we can estimate the net increase on the waters concerned as some 550-600 birds.

Now some 2,000 birds left the Netherlands between these two dates, while the numbers in England and Wales increased by about 600 in the same period, so that about 1,400 birds must have reached Ireland. We conclude that rather under half the birds that reached Ireland were actually seen, and hence estimate that the total number of birds there on 12th February was about 1,000. Adding the 1,000 birds in England and Wales and the 4,500 in the Netherlands, we obtain an estimate of approximately 6,500 for the entire European population.

This calculation is obviously decidedly rough, but in fact 5,800 of the birds were actually counted, so that even large errors in the estimation of the number missed would not greatly alter the final figure. The most serious source of error is the likelihood that some birds were overlooked in England or the Netherlands after the large flocks had dispersed, and for this reason the estimate is almost certain to be somewhat low. However, coverage of suitable waters was so complete, both in the Netherlands (Over and Mörzer Bruijns, 1957) and in England, that it is improbable that any large flocks were missed. Even when the possibility of errors in counting and identification is considered, it seems very unlikely that the actual population in February 1956 could have exceeded 7,500.

Fortunately, a completely independent estimate of the population is available for the same winter. As noted above, counts of 6,200 ($\pm 10\%$) and 7,750 were made in parts of the IJsselmeer on 14th and 17th November 1955, at a time when there were probably also a few hundreds in the Emsland, but no significant numbers elsewhere in Europe. Neither of these counts was complete, even within the small part of the IJsselmeer they covered, but the February counts show that very few birds can have been missed. Despite the contrary opinion of the observers (see Bannerman, 1957), the writer believes that they were fortunate enough to see almost the entire European population of the species—as was suggested by the way in which the large concentration rapidly broke up in late November, without the appearance of unusual numbers in other areas. At any rate these figures (after allowing for counting errors) set an absolute minimum of about 6,500 for the population in November, to be compared with the maximum of 7,500 indicated by the February records. Thus the best available estimate of the European population in the 1955/56 winter is 7,000 \pm 500.

Based on this estimate, and allowing 100 for the mortality during the three-month period, Table VI is a reconstruction of the numbers present at the main haunts on three dates in the winter. The westward displacement of the population during February is very clearly shown.

TABLE VI—ESTIMATED NUMBERS OF BEWICK'S SWANS IN THE MAJOR EUROPEAN HAUNTS ON THREE DATES IN THE 1955-56 WINTER

The places where the largest numbers were seen are marked on Fig. 2.

Date	Germany (Emsland)	Netherlands (IJssel- meer)	Netherlands (Biesbos)	England & Wales (Others)	Ireland	Total
14 Nov. 1955	300	6,800	—	—	—	7,100
12 Feb. 1956	—	4,400	—	500	1,100	7,000
26 Feb. 1956	—	1,600	700	300	1,700	7,000

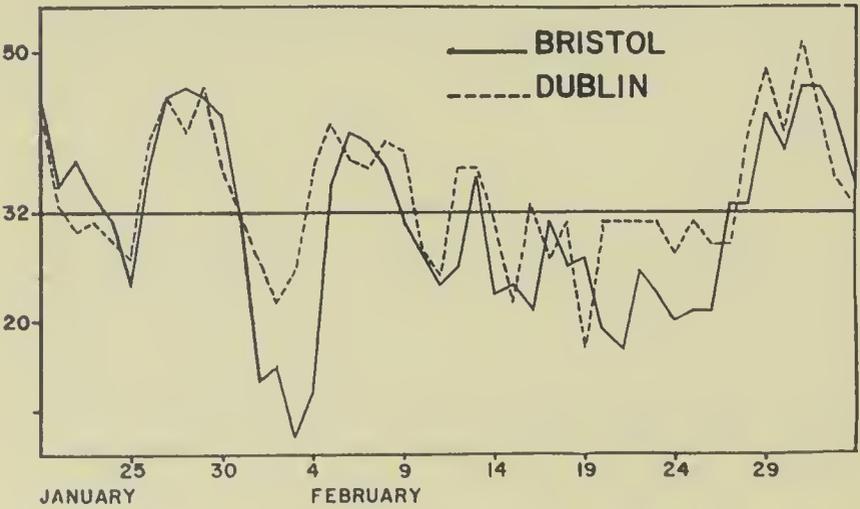
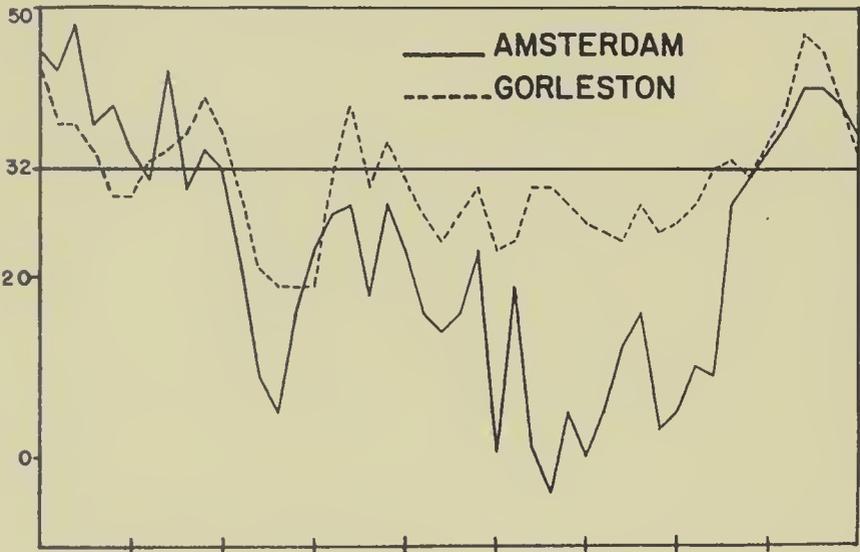
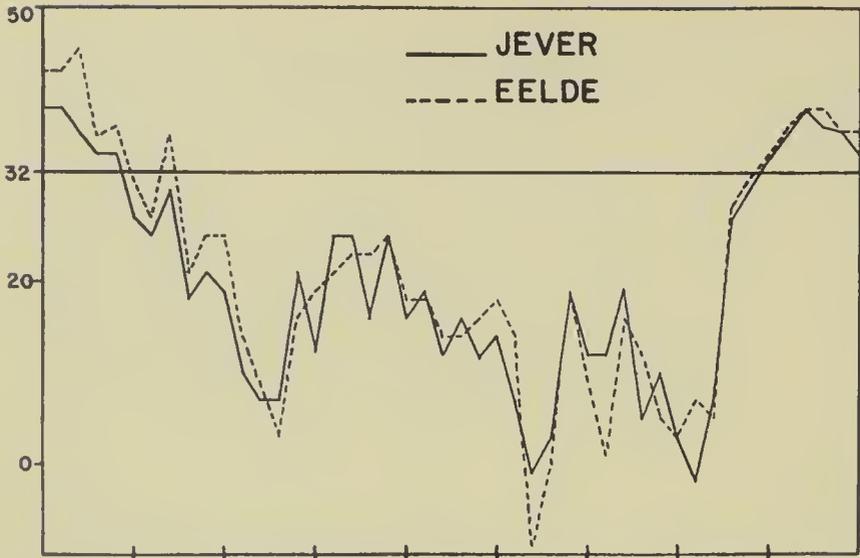
The figure of 7,000 for the total population may seem extremely small, especially in comparison with the numbers on the North American* wintering grounds of the species, which vary from 20,000 to 45,000 on the Pacific coast and from 35,000 to 80,000 on the Atlantic coast (Stewart and Manning, 1958). Even so, there is some evidence that the population in Europe was exceptionally large in 1955-56. In the first place, unusual numbers were reported from all the major haunts of the species except north Germany and parts of Ireland. Secondly, counts on the IJsselmeer in November and December in previous years had never suggested a total there exceeding 2,500 to 3,200 (*cf.* Brouwer and Tinbergen, 1939). The species is never abundant in Ireland in these months (Ruttledge, in Nisbet, 1955), and it is inconceivable that 2,000 to 3,000 birds could have been present in recent autumns without attracting the attention that a similar number did in February 1956. The high counts of young birds in recent winters may perhaps reflect a series of successful breeding seasons, in spite of the predation which occurs on the breeding grounds (Dementiev and Gladkov, 1952). Future counts of the proportion of young birds in the wintering flocks would help to show if the population is indeed stable,† even if the exceptional opportunities for a complete census which arose in 1955-56 do not recur.

CAUSES AND SIGNIFICANCE OF THE 1956 INFLUX

As has already been noted several times, the westward movement in February 1956 took place in a period of exceptionally severe frost

*The North American form is the Whistling Swan (*Cygnus c. columbianus*). The two birds were formerly regarded as separate species, but are now considered to be conspecific (see *Ibis*, vol. 98, p. 159).—EDS.

†The population on the Ouse Washes in February 1959 contained only 9% young birds (T. C. Smout, *in litt.*).



JANUARY

FEBRUARY

in an otherwise mild winter. In order to examine this correlation in more detail, the daily minimum temperatures for the period 20th January to 5th March have been plotted on Fig. 3 for six stations in the wintering range of the species: Jever, Germany; Eelde and Amsterdam, Holland; Gorleston and Bristol, England; and Dublin, Eire (see Fig. 2).

It will be seen that the main period of immigration into England, 31st January-26th February, coincided exactly with the period of unbroken night frost on the Continent, and that the immigration stopped as soon as the temperature rose sharply on 26th-27th February. Further, the peak periods of immigration (5th-9th and 18th-24th February) each followed several days after the onset of the most severe periods of frost, the first actually taking place in comparatively mild weather. This suggests that the crucial factor which drove the birds westwards was the freezing of the large fresh waters (which takes several days' continuous frost) rather than low temperature in itself. However, this conclusion should be accepted with caution, for arrivals before 5th February may have been overlooked. Perhaps more significantly, the first birds began to arrive in Britain on 27th January, *before* any hard frost set in in the Netherlands: this may indicate that these birds flew directly to England from Germany.

There can thus be no doubt that the immediate cause of the westward movement to Britain in February 1956 was the severe frost in Holland and Germany—weather which in some areas was described as the worst of the century. However, this cannot explain the unique nature of the influx. Bewick's Swans have been frozen out of the Netherlands many times before, yet they have never previously visited England in such numbers. Indeed, before the influx of 1938-39 (Witherby, 1939) the species was almost unknown on inland waters in England.

As the writer has previously pointed out (Nisbet, 1955), Bewick's Swans flew over England on migration for many years before they began to stop there. It seems possible that the opening of many large reservoirs for drinking water in England in recent years has made this country appear more attractive than it did 25 years ago to a species which requires shallow fresh waters. Be this as it may, the increase in England has closely followed other changes in the wintering range of the species, and it is quite likely that these changes are still going on. It may be recalled that Bewick's Swans occurred on the Ouse Washes as hard weather visitors for 12 years before a regular wintering population was established (Nisbet, 1955), and it will be interesting to see if the recent occurrences elsewhere in

FIG. 3.—DAILY MINIMUM TEMPERATURES (IN DEGREES FAHRENHEIT) AT SIX WEATHER STATIONS DURING JANUARY, FEBRUARY AND MARCH 1956

The positions of the stations are marked on Fig. 2. The readings given are the minima at 9 a.m. at the British stations and at 6 a.m. at the Continental ones (except at Amsterdam and Eelde during January, when 3 a.m.).

(Reproduced by permission of the Director-General of the Meteorological Office)

England will be followed in the same way by the adoption of other permanent wintering areas.

Vleugel (1947) has pointed out that birds driven from their preferred wintering grounds by frost ("weather migrants") usually return soon after the cold weather relaxes. This behaviour is well illustrated by the events on the Ouse Washes in 1956, where some 300 birds left within a fortnight of the thaw, while the remainder (probably the established wintering population) stayed until the normal departure date. If the local population can legitimately be distinguished in this way, it would appear that places such as the Essex and Somerset reservoirs, where large numbers of Bewick's Swans also remained during most of March 1956, are the localities where new wintering populations are most likely to become established.

At least it is clear that only future events will reveal the true significance of the influx in 1956: it may remain as unique as the weather which induced it, or it may prove to be part of a new phase in the eventful history of this unpredictable species.

SUMMARY

1. The Bewick's Swan (*Cygnus columbianus bewickii*) has greatly increased as a winter visitor to England in recent years. This increase culminated in large invasions in the winters of 1954-55 and 1955-56.

2. The 1954-55 influx took place in two waves, one from 14th January to 6th February, the other on or about 20th February. During each wave some 500 birds were seen in England and Wales, and about 400 remained there for most of February and March. Some 250 more were seen on return passage in March and early April.

3. The 1955-56 influx took place between 29th January and 26th February, in which period large numbers were seen flying west through the country. 1,000 (± 40) birds were seen in England and Wales on 12th February, and 1,610 (± 90) on the 26th; some 3,000 (± 500) different individuals were seen during the month. Most birds departed during March, and about 1,500 more were seen flying east during March and early April.

4. It is thought that 5% to 10% of the Bewick's Swans that reached Great Britain were misidentified as Whooper Swans (*C. cygnus*), and allowance has been made for this in calculating the totals.

5. Notes are given on migratory behaviour, habitat, feeding, and age composition. Mortality was extremely low.

6. A summary is given of records from other European haunts of this species between November 1955 and February 1956. The total European population was 7,000 (± 500) in February 1956, and was probably unusually large. About 4,400 birds left Germany and the Netherlands during that month and flew west to the British Isles.

7. The westward movement in February 1956 coincided exactly with a long period of exceptionally severe frost in an otherwise mild winter.

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APPENDIX: CONTRIBUTORS

I am greatly indebted to Mr. G. Atkinson-Willes, who passed on to me his voluminous correspondence, and to Miss P. Barclay-Smith, who obtained for me much of the foreign information: but for these two, many of the records used here would never have been collected. I. J. Ferguson-Lees collected most of the 1954-55 records and kindly offered his assistance with those for 1955-56. Foreign data in great detail were supplied by R. Drost, J. A. Eygenraam, M. F. Mörzer Bruijns, N. Mayaud, G. J. Van Oordt, C. G. B. ten Kate, H. Van der Vloet and E. Thomsen. T. C. Smout helped me with the weather data (Fig. 3), which were supplied by the Director-General of the Meteorological Office and are reproduced with his permission. J. Baird assisted me with the preparation of the figures. Not least, I am greatly indebted to the following, who contributed anywhere from one record to elaborate regional summaries:

R. H. Allen, R. P. Bagnall-Oakeley, R. M. Band, Mrs. E. G. Barnes, A. R. M. Blake, Miss P. M. Bond, A. W. Boyd, Dr. B. Campbell, P. J. Chadwick, D. R. Coda, E. Cohen, W. M. Condry, Miss M. D. Crosby, J. Cudworth, H. Dawson, A. Dobbs, R. Donnally, R. Driver, K. V. Edwards, R. Felton, J. C. Follett, Miss E. A. Garden, M. Goodman, C. Gosling, F. C. Gribble, E. Hardy, Dr. J. G. Harrison, R. H. Harrison, M. Haworth, R. Henderson, R. A. O. Hickling, R. C. Homes, G. R. Humphreys, G. H. Hunt, W. Kelly, B. King, Mrs. G. W. Lawson, W. K. Marshall, C. D. T. Minton, D. P. Morgan, Miss E. M. Palmer, M. Pearson, F. Penn, D. E. Pomeroy, G. H. Rees, J. Reynolds, R. A. Richardson, G. B. Rimes, E. M. Rutter, Major R. F. Rutledge, B. L. Sage, Col. H. M. Salmon, M. J. Seago, T. C. Smout, C. F. Tebbutt, G. W. Temperley, A. J. B. Thompson, P. Thompson, Maj.-Gen. C. B. Wainwright, A. F. G. Walker, D. I. M. Wallace.

I have also used records contributed by a few other observers without having been able to ascertain their names: their anonymity in no way diminishes the value of their assistance.



Eric Hosking

ARNOLD WHITWORTH BOYD (1885-1959)

A full obituary appears on pages 417-419. This very characteristic photograph was taken at Hilbre Island, Cheshire, in October 1956.



ROSS'S GULL (*Rhodostethia rosea*): VLIELAND, HOLLAND, JUNE/JULY 1958
J. Kist
 This bird, only the twelfth recorded in Europe, stayed on Vlieland in the Friesian Islands for nearly six weeks from 6th June 1958, but was then found dead (see pages 422-424). It was an adult female, but in poor condition and lacking the rosy tinge over head, under-parts and tail normally seen in full plumage. Nevertheless, the black necklace of summer dress was clearly defined and shows well in those places.



J. Kist

ROSS'S GULL (*Rhodostethia rosea*): VRIJLAND, HOLLAND, JUNE/JULY 1958

Note the necklace, tiny black bill and large dark eye; the legs are red or orange-red. This species is markedly smaller than a Black-headed Gull (*Larus ridibundus*), with long wings which extend beyond the tail when folded. The tail is wedge-ended, but this individual's rectrices were very worn (see plate 69). The flight-feathers seem dark here, but were in fact uniform grey except for black on the outer web of the second primary (see page 422).



J. Kist

Ross's GULL (*Rhodostethia rosea*): VLIELAND, HOLLAND, JUNE/JULY 1958

Four days before these photographs were taken, the bird was caught and ringed. It never foraged in deep water, but always chose a muddy part at the edge of a pool. There it fed on insects, amphipods, small water-snails and green algae (see page 422). It was twice seen swimming, which is of interest in view of the contrary statement in *The Handbook*. It was very intolerant of other birds near it.



Ross's GULL (*Rhodostethia rosea*): Vlieland, Holland, June/July 1958
J. Kist

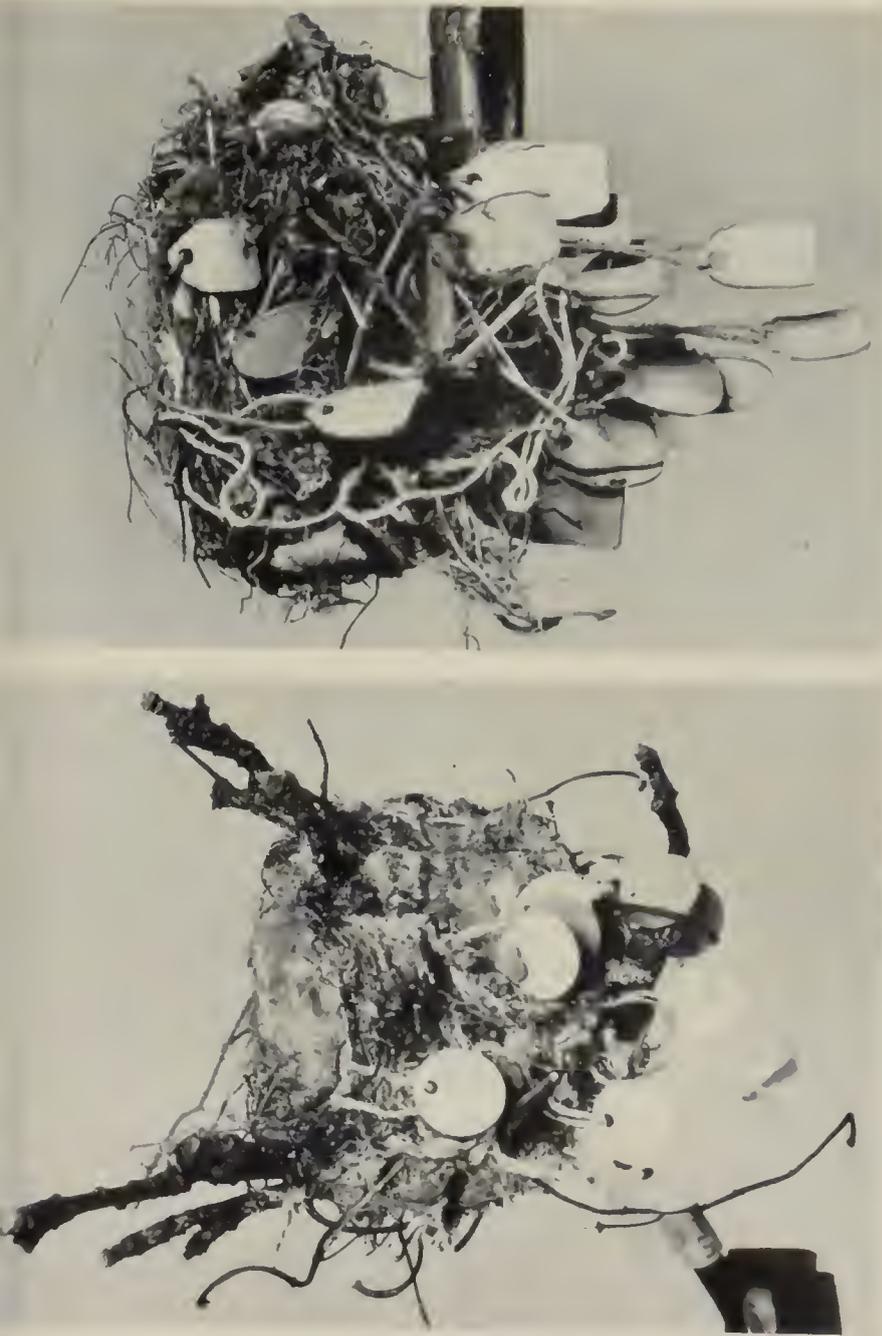
In this flight photograph delicate bill and dumpy shape are noticeable features, and the black neck-ring is conspicuous. The flight is tern-like and the wings appear long and pointed with a broad white hind border that is just discernible here. As a breeding species this is confined to the mouths and lower valleys of the north-flowing rivers of N.E. Siberia, and in winter it moves northwards into the Arctic Ocean (see page 423).



Angela Davis

MALE SONG SPARROW (*Melospiza melodia*): FAIR ISLE, APRIL/MAY 1959

This North American bunting, recorded in Europe for the first time, was reminiscent of a thick-billed Dunnock (*Prunella modularis*) in size, coloration and skulking habits. The chestnut crown has a greyish central streak and is bordered by paler grey superciliaries, brown eye-stripes and grey and blackish moustachials. The slightly rounded tail is grey-brown. Heavy streakings on the whitish under-parts join on the breast as a dark smudge (see pages 419-421).



East Malling Research Station

NESTS OF GOLDFINCHES (*Carduelis carduelis*): EAST MALLING, KENT, MAY/JUNE 1950
 Incorporated in both these nests are a number of "jewellers' tags" — the small tie-on labels used in marking horticultural experiments. Note that the strings are unbroken, showing that the birds presumably untied them by pulling the loops and allowing the tags to slip through (the fruit spurs to which they were fixed were considered too thick for the birds to break and there was in any case no evidence of such damage — see page 434).



N. J. Antoine

BLUE TIT (*Parus caeruleus*) FEEDING YOUNG TREECREEPERS (*Certhia familiaris*): STAPLEFORD, NOTTINGHAMSHIRE, MAY 1958

In the upper photograph the Blue Tit is actually feeding one of the nestlings, and in the lower it and the adult Treecreeper are approaching the hole at the same time. This male Blue Tit regularly fed the young Treecreepers and probably did so for most of their time in the nest. The tit's nest was only two feet away (facing the opposite direction), but he was not seen to feed his own young (see page 432).

OBITUARY

ARNOLD WHITWORTH BOYD (1885-1959)

IN A NOTE in the third volume of *British Birds*, the late T. A. Coward mentioned some ducks seen at Marbury Mere in Cheshire on 10th April 1910 by one A. W. Boyd, and during the space of nearly 50 years which has passed since then only three volumes—two in the First World War and one in the Second—have appeared without some contribution from him. On 1st March 1944 he became an Assistant Editor and he continued to share the editorial load until his death, in his home county of Cheshire, on 16th October 1959. These simple facts begin to show how much he meant to this journal and how keenly he will be missed.

Born in 1885, the younger son of James and Mary Boyd of Altrincham, he was educated at Rugby and Oxford. In early life he was a fine Rucker player, turning out for Sale and for Cheshire on many occasions. He also did much climbing and he once survived a fall of 1,800 feet (into snow) on the Obergabelhorn. Early in the First World War he left for overseas service in Egypt with the 7th Lancashire Fusiliers and quickly rose to the rank of Captain. In 1915 he won the Military Cross in Gallipoli for gallantry in covering the evacuation from Suvla. He was twice wounded and one legacy of the war was the loss of an eye. In spite of this, he managed to rejoin the army and became a Major in the Second World War.

Even before 1914 he had shown by his records of Willow Tits in the field that he was an exceptionally gifted and thorough observer. He had early extended his attention from natural habitats to sewage farms, the attraction of which to migrants he was among the first to recognise. From 1918 onwards his contributions in the form of notes became more frequent, not only from Cheshire and Lancashire, but also from Cornwall where in September 1920 he secured a most indifferent but interesting snapshot of a flock of Glossy Ibises at Marazion (*antea*, vol. xiv, p. 137). One of his chief bird-watching companions between the wars was Kenneth Fisher, Head Master of Oundle, who was his brother-in-law and the father of James Fisher. Earlier he had been out much with T. A. Coward and Charles Oldham, both among the best field observers of their time.

In the 'twenties he became a keen ringer, in some years achieving the second highest total in Britain. Already a third of a century ago he was obtaining significant results from systematic trapping; in this he was one of the pioneers and some of his most notable work was on Tree Sparrows and Swallows which he studied around his small farm, Frandley, in the Cheshire parish of Antrobus. He also recognised early on the great possibilities of regular observations at reservoirs, giving much attention to those in Staffordshire and seeking to fill in the hitherto fragmentary picture of inland movements and distributions of waders and waterfowl. He was remarkably well-informed, not only from his first-hand knowledge,

but also from his close contacts with neighbouring observers of all sorts and ages and with ornithologists in other parts of the country.

Like his friend T. A. Coward he was so deeply rooted in his Cheshire region that he contributed a special character and flavour to British ornithology. Cheshire country, Cheshire ways, Cheshire dialect and Cheshire humour were for him something to be enjoyed with gusto; and he would never fail to raise his hat to any passing Magpie, explaining that this was an old Cheshire custom. Yet despite this he was always ready to appreciate other places and other people. Indeed, his intuitive responsiveness to others was a significant handicap to him as a book reviewer and an assessor of sight records, when his kindness sometimes got the better of his critical judgement. Yet he spoke his mind with forthrightness, although never brusquely or without tact, and he was a vigilant opponent of verbosity, jargon or sheer dullness in ornithological literature. His own beautifully small script and pithy sentences, with plenty of down-to-earth humour, were always a pleasure to read. He was a most interesting and agreeable companion, indoors or out, and had a great capacity for making friends. Full of character himself he was a connoisseur of character in others.

His occupation as a Manchester yarn agent seemed badly matched with his love of the outdoors and of country scenes and ways, and above all with his skill and enthusiasm in natural history, especially ornithology. His interests were, however, unusually wide, and he was remarkably well-read with a keen critical sense and a flair for good straightforward English without any nonsense about it. Characteristically, *The Wrong Box* was among his favourite books. His wife Violet, who died before him, was a talented writer of both prose and verse, and he himself contributed regular nature notes to "A Country Diary" in *The Manchester Guardian*. A decade ago these notes of many years were collected together as *The Country Diary of a Cheshire Man*. This delightful book gave pleasure to many, but his most ambitious work was *A Country Parish*, published in the "New Naturalist" series in 1951. In this book he wove together an astonishing collection of facts about the Cheshire village of Great Budworth and its neighbourhood, showing how the birds, mammals, insects and plants were influenced by the human history and the effects of man on the land. Hardly any other ornithologist of his time, or indeed any other naturalist, could have written so broad and many-sided a book on . . . a country parish.

Arnold Boyd was called to office in many fields in the world of ornithology. From 1938 to 1943 he served on the Committee of the British Ornithologists' Union, and from 1953 to 1955 was one of the Union's Vice-Presidents. The British Trust for Ornithology greatly interested Boyd from its very beginning in 1933 and he served on its Council for a number of years, becoming Chairman in 1949-50. Nor was he content to sit back in an advisory capacity and let others do the work. In 1934 and 1935 he piloted one of the B.T.O.'s first national enquiries, that into the brood-size and density

of the Swallow (*antea*, vol. xxix, pp. 3-21; and vol. xxx, pp. 98-116), and he was an active member of the Bird-Ringing Committee for a number of years right up to his death. Nearer home, he compiled the "Reports on Birds" for the Lancashire and Cheshire Fauna Committee from 1914 to 1949. But, in spite of his many commitments, he never lost his enjoyment of familiar birds in familiar places and, above all, he was always ready to help and advise the young; indeed, this was one of his greatest pleasures and many a now expert ornithologist owes much to his wise guidance.

He was ahead of his time, too, in being a keen conservationist. He never had any illusion that, if there were to go on being interesting creatures to watch in pleasant places, someone would have to work hard to protect them and their habitats. He was an active member of the Society for the Promotion of Nature Reserves, for whom he looked after Marbury Mere and other Cheshire sites. He was also an energetic Fellow of the Royal Society for the Protection of Birds and was long a member of its Council: he played a leading part in the work of the Home Office Advisory Committee which framed the basis for the Protection of Birds Act 1954. Not content with such indirect measures, he was sworn in as a Special Constable and took his share in bringing to book offenders against the bird protection laws. He managed to do all these things with a twinkle in his remaining eye, as if they were not a duty but good fun. His zest and humour, as well as his common sense and wisdom are not readily replaceable, and for those who knew him life has lost some of its tang.

E.M.N., I.J.F.-L. and P.A.D.H.

SONG SPARROW AT FAIR ISLE: A BIRD NEW TO EUROPE

By PETER DAVIS and ROY H. DENNIS

ON THE EVENING of 27th April 1959, R.H.D. found an unfamiliar small bird—"like a cross between a Hedge Sparrow and a bunting"—skulking in a tangle of rusty barbed-wire near the derelict radar-station on Ward Hill, Fair Isle. He came down to the Observatory to report this find, and it was still present when we returned to the hill an hour later. It proved difficult to get an adequate view of the stranger, since it was very shy and kept closely to the cover, but we saw it well enough to know that it was one of the North American "sparrows" (Emberizidae). The size, generally drab coloration and skulking habit were reminiscent of a Dunnock (*Prunella modularis*), but the bill and head-pattern suggested a bunting. At 10-15 yards, in indifferent light, we made out a chestnut crown with a greyish central streak, grey superciliary, a brown stripe through the eye, and pale grey and black moustachials. The under-parts were seen

to be whitish, with heavy dark streaking on the flanks and on the breast, coalescing into a conspicuous dark smudge in the centre. The upper-parts were mottled grey-brown, the wings sandier brown, the tail apparently uniform mouse-brown. The bird hopped when moving slowly, but broke into a rapid run when disturbed outside the cover; when flushed, it flew rapidly into cover, but sometimes emerged near the top to watch us.

Within half an hour it was caught in a single-panel mist-net and was then identified in the laboratory as a Song Sparrow (*Melospiza melodia*), with the aid of Peterson (1947) and Forbush and May (1939); being distinguished from Lincoln's Sparrow (*M. lincolni*) by the broad, not fine, streaking below, and the lack of a buff band across the breast. The following description was made:

Head: crown chestnut with narrow grey central streak; superciliary pale grey; eye-stripe (obvious only behind eye) chestnut; ear-coverts and lores greyish brown; moustachial pale grey, bounded above with a narrow chestnut stripe and below with a narrow brown-black one. *Upper-parts*: all feathers blackish-centred with a varying amount of chestnut outside the black, and with more or less pale grey edgings. *Wing*: Coverts similar to upper-parts, but more foxy in general colour due to smaller black centres and paler red-brown webs; tips of median and greater coverts whitish, forming two rather indistinct wing-bars; flight-feathers dark brown with sandy-brown edgings; axillaries and under wing-coverts washed greyish-brown. *Tail*: grey-brown, rather warmer towards the base; slightly rounded in shape. *Under-parts*: white basically; feathers of breast and flanks (not chin or belly) with blackish centres bordered by slight chestnut streaks; the black breast-spot so obvious in the field was not very apparent in the hand; under tail-coverts washed buffish, with grey-brown centres. *Soft parts*: eye dark brown; legs brownish-pink; bill dark grey on upper mandible, pale grey on lower.

The measurements taken (apart from wing-formula) were: wing (maximum) 65.5 mm.; bill (from skull) 14; tarsus 24; and tail 69. The tips of the primaries were rather abraded, the tail less so. The weight was 24.5 gm. at 19.45 G.M.T.; this had fallen to 22.9 at 06.30 on the following day, when the bird was photographed by Angela Davis (see plate 70), and released at the Observatory, bearing ring K81690.

Kenneth Williamson kindly despatched to us a copy of Mrs. Nice's celebrated study of this species (Nice, 1937), which includes a long series of weights and measurements. In a sample of 137 males and 123 females Mrs. Nice found only four females with wings as long as 65-66 mm., and only twelve males with wings shorter than 65 mm. In the same sample no female had a tail more than 66 mm. long, whereas males ranged up to 72 mm. It would therefore have been fairly certain that the Fair Isle bird was a male, had not this already been shown in a more striking way; for early on 1st May the Song Sparrow was heard singing from a low wall outside the hostel kitchen, and on most early mornings until 7th May (also on two occasions in the evening) this performance was repeated. The song—a sweet note repeated three times and followed by a short jingle—was tape-recorded by David Bradley on the 7th, and one sequence is now in

the B.B.C. Record Library (DBS 14826). No other note or call was heard at any time.

The Song Sparrow lived near the Observatory until 8th May, apart from a brief half-mile excursion to the Gully trap early on the 6th, whence it was quickly retrieved (weight 24.0 at 06.30). On 9th and 10th May it was by the stream at Vatstrass, a few hundred yards away, and after that it was not seen again. During its stay the bird was usually shy and often difficult to locate; when found, it would elevate the crown feathers, and then vanish in a singularly accomplished manner. The usual refuge was a cliff in South Haven, where it was occasionally seen feeding in the short turf at the cliff-edge. On 7th May, however, when the island's human population was swollen to about five times its normal size by the arrival of the National Trust for Scotland's "Islands Cruise" and also an excursion-steamer from Shetland, the Song Sparrow unaccountably lost its shyness and showed itself throughout the day to scores of visitors, including such well-known names as those of Irene Waterston, Kenneth Williamson, W. J. Eggeling, Seton Gordon and Jeffrey Boswall, with our "resident" bird-watchers, William Crawford, David Bradley, Barrie Juniper and Terry Brown acting as guides and controlling the crowds!

To several American bird-watchers on the cruise, this attention was a source of restrained amusement, for in eastern North America the species is numerous and widespread. On the east coast the breeding area extends as far north as the Gulf of St. Lawrence and Newfoundland, and the bird occurs sparsely in southern Labrador (Harper, 1958). The northern population is migratory, but the spring return appears to be very early (by March in New England, according to Forbush and May), and it is unlikely that the Fair Isle bird was freshly arrived on 27th April. This is supported by the high weight of the specimen; Mrs. Nice gives the mean weight of 63 males in April as 22.4 gm. (19.6-25.8).

Kenneth Williamson and I. J. Ferguson-Lees investigated the possibility of escape from captivity in Europe, but were informed by leading aviculturalists that the species is not imported as a cage-bird, and is not known to be kept alive on this side of the Atlantic. There appears to be no previous record of *M. melodia* in Europe, though the closely allied *M. lincolnii* has been found once, in Germany.

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PHOTOGRAPHIC STUDIES OF SOME LESS FAMILIAR BIRDS

CI. ROSS'S GULL

Photographs and text by J. KIST

(Plates 66-69)

ROSS'S GULL (*Rhodostethia rosea*) is indeed, as Fisher and Lockley (1954) put it, "one of the most mysterious birds of the world". It is also still true that very few ornithologists have seen it alive and so we were extraordinarily fortunate when the discovery of an adult in Holland in the summer of 1958 enabled us to obtain what must be some of the first close-up photographs ever taken of this species.

This Dutch bird was discovered by A. L. Spaans on 6th June 1958 in a small muddy polder on the Friesian isle of Vlieland (see Spaans, 1959). His identification was confirmed by Dr. H. N. Kluijver on 23rd June, and on the 25th Spaans managed to capture the bird with an old fishing net. He put a ring on its leg (which can be seen in these plates) and set it free again. Jan P. Strijbos filmed and photographed it on 27th June, and I myself took over a hundred photographs in colour and black-and-white on the 29th. The bird was last seen alive on 10th July and was found dead seven kilometres away five days later. It proved to be an adult female and the skin is now preserved in the Rijksmuseum of Natural History at Leiden.

It could easily be identified by its small size (markedly smaller than a Black-headed Gull, *Larus ridibundus*), delicate black neck-ring, very small black bill, reddish legs and feet, light pearly grey upper and under wings (without black, except on the outer web of the 2nd primary) and large dark eyes. Several of these features, particularly the neck-ring, bill and large eyes, and the black on the outer primary, can be well seen in these plates. The bird lacked the rosy tinge on the white parts which is a normal character of an adult at this time of year, and which gives the species its other name of Rosy Gull. This may have been due to the fact that it had not yet attained full sexual maturity, as the post-mortem showed, or it may have been a result of its generally poor condition. The tail-feathers were very worn, so that the wedge-shape was difficult to observe. The flight was tern-like and the wings appeared long and pointed with a broad white hind-border (plate 69 shows the bird in the air, but at an angle which brings out only the last of these features). When flushed it uttered a single subdued "kew".

Having been able to watch the bird closely on several days, Spaans (1959) recorded a number of interesting observations. Foraging never took place in deeper water, but always in a muddy part at the edge of a pool. The bird was seen to take insects from the surface of the water, and on dissection its stomach was found to contain some remains of small flying insects, several fragments of

amphipods (probably *Gammarus*), pieces of small snails (*Hydrobia ulvae*), some strands of green algae (*Enteromorpha*), and such lesser items as a wisp of *Sphagnum*, as well as 21 tapeworms, some nematodes and 2 trematodes. The bird usually rested in a squatting attitude and was very intolerant of other species—for example, several times chasing away a Redshank (*Tringa totanus*) that came close. Twice it was seen swimming (cf. *The Handbook*), and this is perhaps of interest in connection with the remarks of Bateson (1959) on the aversion to water of another Arctic species, the Ivory Gull (*Pagophila eburnea*).

There are only a handful of records of Ross's Gull in Europe, owing to the "abnormal" preference that seemingly tiny bird has for wintering in the Arctic. Spaans lists the following as the only 12 known European occurrences: England (1846 or 1847), Heligoland (1858), Sardinia (1906), France (1913), Faeroes (1863, 1922 and summer 1927), Shetland (1936), Norway (1909 and 1949), Germany (1953) and Holland (1958). The Shetland record, which does not appear in *The Handbook*, was described by Kay (1942).

This species was first discovered in June 1823 by James Clark Ross, a member of W. E. Parry's second expedition, at Alagnak on the east side of Melville Peninsula in the Canadian Arctic. The fascinating history of efforts during the next 80 years to unravel the mysteries surrounding this beautiful gull in the Polar Basin have been described in detail by Fisher and Lockley (*op. cit.*, pp. 234-237). S. A. Buturlin, in 1905, was the first naturalist to discover its breeding place in the delta of the Kolyma River in eastern Siberia. He showed (Buturlin, 1906) that it nested in marshy areas of alder scrub in the lower valleys of the Indegirka, Alazeya and Kolyma rivers, not on the tundra. According to Dementiev (Dementiev and Gladkov, 1951; quoted by Harber, 1955), little information has been added since Buturlin's day though the species may nest at the mouth of the Yana and on the lower Khroma, and may extend about 100 miles east of the mouth of the Kolyma. There is also a single breeding record from western Greenland, which according to Salomonsen (1950) has been the subject of unjustified disbelief. There two adults and two eggs were collected on a small islet in Disko Bay on 15th June, 1885. Neither Salomonsen nor Snyder (1957) excludes the possibility that Ross's Gull may breed in the Canadian Arctic.

The exact winter range of the species is still unknown, but it has been established from the observations made in the Polar Basin outside the breeding-season that Ross's Gull does not migrate southwards, but apparently moves north, north-east or north-west into the Arctic Ocean. It is usually thought of as wintering on the pack ice, but Dementiev states that it apparently winters in those parts of the Arctic Ocean that are free from ice. Point Barrow in Alaska has long been known as a concentration point where big flocks of Ross's Gulls may be observed in September and October. Fisher and Lockley summarized observations there over the last

eighty years. A few are occasionally seen in the spring, but "thousands" may appear in the autumn, always on a north-west wind and always flying east.

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POLLEN CONTAMINATION OF BIRDS

By J. S. ASH

DURING THE SPRINGS of 1957 and 1959 an unidentified substance was found adhering to the bills of four migrant species trapped at Portland Bird Observatory, Dorset. This has now proved to be an accumulation of *Citrus* pollen, and the following birds have been recorded carrying it:

28.4.57	Adult ♂	Whitethroat (<i>Sylvia communis</i>)
30.4.57	Full-grown	Whitethroat
1.5.57	Full-grown ♀	Blackcap (<i>S. atricapilla</i>)
1.5.57	Full-grown ♀	Blackcap
4.5.57	Full-grown ♀	Blackcap
5.5.57	Full-grown ♀	Whitethroat
5.5.57	Full-grown	Northern Willow Warbler (<i>Phylloscopus trochilus acredula</i>)
28.4.59	Full-grown	Whitethroat
1.5.59	Full-grown ♂	Blackcap
2.5.59	1st-summer ♂	Whitethroat
16.5.59	Full-grown	Chiffchaff (<i>Ph. collybita</i>)

Unfortunately this list is not complete, for ringers have not always recorded the presence of the substance, and there are a few entries in the observatory records merely mentioning that several contaminated birds were trapped. The proportion of spring migrants carrying the pollen is probably not more than 1-2%.

This contamination takes the form of variously shaped nodular protuberances, usually of a hard rubbery consistency, varying in colour externally from yellow through orange and various shades of brown to almost black. Inside it is hard and cheese-like and yellowish-green in colour. Most often the nodules are attached to the base of the upper mandible, usually spreading on to the feathers of the forehead: on one bird the substance had surrounded the bases

of both mandibles, and on another extended on to the crown. The natural colour of *Citrus* pollen is yellow. The various shades to brown are due to contamination by dirt, some of which resembled insect frass.

It was not until 1959 that it occurred to me that these nodules might consist of a compacted mass of pollen grains, collected unwittingly by the birds during a search for insects in some flowering plant, possibly a tropical species. All the birds trapped were newly arrived migrants, so they could not possibly have acquired pollen on Portland, where there are no likely flowers at that time of the year. Three samples were sent to the Royal Botanic Gardens at Kew, where analyses produced the following results:

WHITETHROAT (28.4.59).—Almost entirely pollen of a *Citrus*, probably the orange (*C. aurantium*).

BLACKCAP (1.5.59) and WHITETHROAT (2.5.59).—Both consist largely of pollen of *Citrus*. Variation in size of pollen grains suggests that more than one species of *Citrus* is present. The Blackcap material was almost pure pollen: that from the Whitethroat had, in addition, some small traces of other material, possibly insect frass.

It was pointed out to me that this pollen is rendered sticky and adherent by the presence of a yellow oily material, which is probably a product of the breakdown of the tapetal cells of the anthers. It is thus capable of adhering readily to the bodies of insects or other visitors to the flowers. These interesting records have a double significance. First, as an indication of how the many nectar-feeding species of birds probably evolved from forms questing for insects in nectariferous flowers, and, secondly, demonstrating the possible economic importance of these migrants as pollinating agents in citrus-growing areas. In this latter respect it should be remembered that the greater part of the vast West European populations of summer-visitors must pass through N.W. Africa and the Iberian Peninsula, where citrus crops are grown. It is perhaps unnecessary to add that these migrants are much persecuted by man in these countries.

It would be of interest if visiting or resident ornithologists were able to obtain direct evidence of the visits of these birds to *Citrus* flowers.

British Birds once published a request (*antea*, vol. xlix, p. 192) for further records of an unidentified substance which had been found on the bills of Chiffchaffs and a Willow Warbler in Jersey. A sample of the Portland material was sent to W. D. Hooke, the instigator of the above request, and he stated (*in litt.*, 10th May 1957) that it was unlike the substance found on Jersey birds. An analysis of the Jersey material had failed to demonstrate its origin, but it does seem likely that soiling of this nature may be caused in some way other than by contact with pollen. Dr. R. Melville of Kew informs me that, apart from pollen, there are few substances that are likely to adhere to the heads of insectivorous birds. Gum resins and oleo-resins are possibilities. Insects are caught on pine

oleo-resins, so that it would be possible for migrants passing through the pine forests of the Landes, for instance, to pick up some if they fed on captured insects. Pure resin can be identified by chemical tests.

It is hoped that anyone else who traps birds with any unidentified substance attached to its head, will send samples direct to the Director of the Royal Botanic Gardens, Kew, Richmond, Surrey, stating species involved, position on bird, date and locality.

ACKNOWLEDGEMENTS

I am extremely grateful to Dr. G. Taylor, Director of the Royal Botanic Gardens, and particularly to Dr. R. Melville, who was responsible for the pollen analysis; also to those visitors to Portland Bird observatory who have collected and labelled samples for me.

NOTES

Birds drinking the sap of a birch tree.—On 13th April 1958 I was watching a Marsh Tit (*Parus palustris*) feeding at the edge of a deciduous wood at Minsmere in Suffolk when I noticed it return several times to the same place on a tree. At first I thought it was taking insects, but then I realized that the bird was drinking the sap oozing out of a broken twig. Three times the bird flew off to feed elsewhere in the wood and then came back again to drink at the same spot. The tree, a young silver birch (*Betula pendula*) about twenty feet high, was still leafless as the weather for the previous few weeks had been unusually cold. There was nothing therefore to absorb the sap which was clearly rising already, and when I broke off a small twig the liquid dripped from the break quite rapidly. I retired to watch and was surprised to see first two Long-tailed Tits (*Aegithalos caudatus*) and then two Blue Tits (*P. caeruleus*) come to the same place and drink the sap in the same way. Seizing this photographic opportunity, I set up a ciné-camera within about fifteen feet of the tree and in the next hour, between 5 and 6 p.m. G.M.T., I obtained shots of Blue, Marsh and Long-tailed Tits all coming again and again to the same "bait". Finally, a Nuthatch (*Sitta europaea*) landed in the top branches of the tree and ran down the bark to the patch of moisture. It is some indication of the attraction which this drinking-place had for the birds that I was able to film them without any form of hide at a range of fifteen feet and that this was the closest I approached to any Nuthatch during a whole season's film-work on birds.

The following day I erected a hide at the spot, but owing to the direction of the light this was of use only in the late evening. During several spells of watching over the next week the same species as before were seen enjoying a drink on several occasions. On 14th April there was a movement of Goldcrests (*Regulus regulus*) through

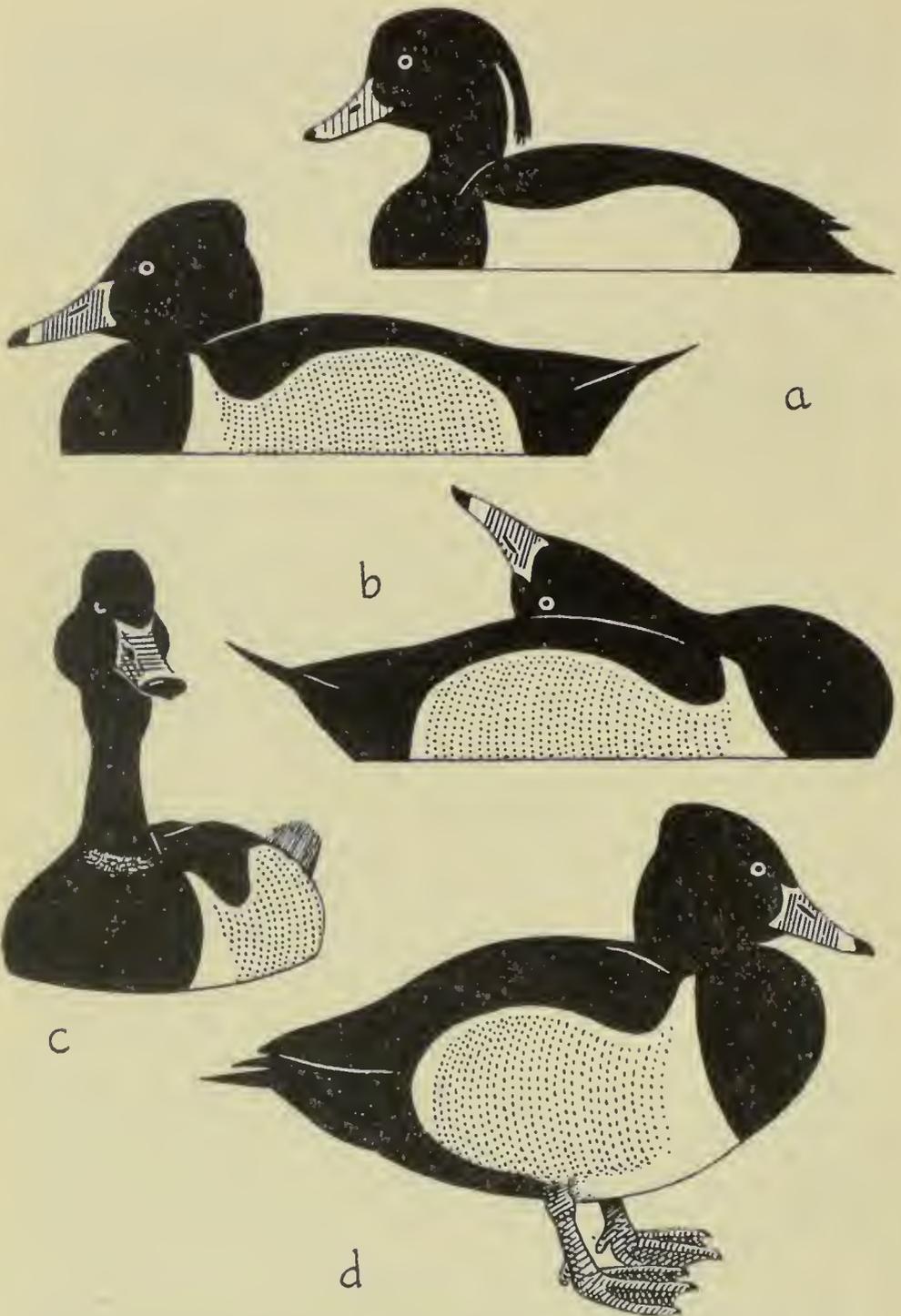
the area and several were watched on the lower branches of the tree taking the sap running down some of the smaller twigs near the bole. A Wren (*Troglodytes troglodytes*) also appeared in the lower branches as though attracted by the activity of the other birds, but it was not actually observed drinking. By the 20th it was noted that the leaves were beginning to appear and the flow of sap was less, with the result that fewer birds were coming to drink. However, on 22nd the Marsh Tits were still visiting the tree regularly and a Coal Tit (*P. ater*) was also seen drinking.

This was the only tree at which this habit was observed, though we were watching a wide area of similar woodland at the time. It may be significant that the tree was standing at the edge of a wood beside a road and the shiny patches of moisture on the light-coloured bole were fairly conspicuous. But it seemed clear that most of the birds were learning the habit from those which had already discovered it, as the activity seemed to come in bursts. Most of the tits appeared to be feeding in pairs. It should be added that there was no other obvious source of water in the immediate vicinity and, though there was an extensive marsh with open pools and ditches only about 150 yards away, this was separated from the woods by an open space which birds like tits might be reluctant to cross. However, the frequency of the visits of some individuals, and their persistence, seemed to show that they were really attracted by the sap more than just as a means of quenching their thirst, and so the birds may well have been gaining some satisfaction from the sugar content.

It has been suggested to me that part of the attraction may have been insects feeding on the sap. However, although flies were seen sitting on the bark on many occasions, I never saw any of the birds take any. Examination of the ciné-film confirms this and clearly shows the birds reaching up from below and sipping at the dripping sap, or laying their bills along the bark sideways to drink.

C. K. MYLNE

Ring-necked Duck in Berkshire.—At Burghfield gravel pits to the west of Reading, Berkshire, on the morning of 19th April 1959, one of us (J.T.R.S.) noted an unusual duck in a flock of 15-20 Tufted Duck (*Aythya fuligula*) and identified it as an adult male Ring-necked Duck (*A. collaris*). R.A.F.G. was informed by telephone and then collected by car, and we returned together to the pit where the party of duck, including the Ring-necked, was still present. About 10 minutes later, however, sailing boats disturbed the birds which made off to the west, towards Theale New gravel pit, about two miles distant. We immediately left for this pit and the whole flock was there when we arrived. For the next 50 minutes J.T.R.S. took full field notes while R.A.F.G. made sketches. At lunch time a number of people were informed, and during the afternoon and evening the bird was watched at Theale by H. M. Dobinson, P. A. D.



MALE RING-NECKED DUCK (*Aythya collaris*): BERKSHIRE, APRIL 1959
 (a) Comparison with drake Tufted Duck (*A. fuligula*) (upper). (b) Display used to Tufted Duck females: head thrown back with very rapid jerk, bill at an acute angle. (c) Attitude when alert, the only time when the brown neck-ring was definitely seen. (d) On land, showing the extent of grey, white and black on the flanks and belly.

(Diagrammatic drawings by Robert Gillmor)

Hollom, K. E. L. Simmons and Dr. E. V. Watson, as well as ourselves.

The following description is compiled from field-notes obtained during the day:

Stockier than Tufted Duck and slightly larger. Upper-parts black (though this less extensive than in Tufted Duck) with a greenish gloss. Breast, neck and head black, the last with a marked purplish gloss. Brown ring round neck (very difficult to discern, except in ideal conditions at less than 40 yards when neck stretched up at the alert). Belly dusky and not the pure white of male Tufted Duck. Under tail-coverts black, this extending further down to the belly than in any Tufted Duck. Flanks a warm silver-grey, the fore portion white extending up in front of the wing in the form of a crescent; grey sharply divided from anterior white portion and apparently paler along the top (though this could have been an optical illusion), with a white hind border, widest at the base; grey flanks tapered off at the back more than the white flanks of a Tufted Duck, which end squarely. The less extensive black back, and consequently larger "panel" of the flanks, made the bird appear to be sitting higher in the water than a Tufted Duck. Head "peaked"—the highest point at the back—with puffed-out cheeks. Head appeared to be almost "two-domed"—especially from directly in front or behind. No tuft. Line of bill and forehead straighter than Tufted Duck, and back of head almost flat. Eye yellowish-orange (or even red, in some lights) and always distinctly redder than accompanying Tufted Duck. Bill noticeably longer than Tufted Duck, mainly a cold steel-grey with a thin white line round the nostril and two rings round the bill—one in front (the broader of the two) and one at the base (broadest at the top); tip of bill (all that in front of the first white ring) black. Extensive grey wing-stripe. "Pied" bill very obvious, even in flight.

Neck frequently stretched up in attentive attitude and occasionally "nodded" like a Moorhen (*Gallinula chloropus*) when extended in this manner. Tail held "cocked" nearly all the time, in a manner reminiscent of a Common Scoter (*Melanitta nigra*). Display to a female Tufted Duck by flicking the head straight back on to the back was likened to the display of a Barrow's Goldeneye (*Bucephala islandica*) by R.A.F.G. (see accompanying sketches). In flight, especially, the bird seemed stockier than accompanying Tufted Duck and the wing-span was, perhaps, slightly greater. In front view appeared particularly thick-set compared with Tufted Duck. Always more alert than Tufted Duck, giving the impression of being wilder, though it was led by the flock it accompanied.

The duck stayed in the vicinity until at least 27th April. From the 20th to the 23rd it was at Burghfield, flying to Theale New on the afternoon of the latter day, but returning to Burghfield by the 24th. It was seen at Theale New again on the 25th, but on the 26th and 27th it had moved to Cranemoor Lake, Englefield Park, about two miles to the north-west of Theale New gravel pit. It was last seen (at Englefield) by David Bradley at 6 p.m. on 27th April.

In the nine days that it stayed in the Reading area we both had many opportunities to study it under ideal conditions and R.A.F.G. made numerous field-sketches which formed the basis for those reproduced here. During this time, the bird was seen by well over a hundred observers, including Dr. Clive Balch, I. J. Ferguson-Lees, D. D. Harber, Bernard King, H. P. Medhurst, Dr. J. F. Monk, J. L. F. Parslow, C. W. G. Paulson-Ellis, Kenneth Williamson and D. R. Wilson.

From our experience of this one bird, we would list the following points as the most important field-characters (in order of importance) when compared with male Tufted Duck:

- (1) Grey flanks with white patch at front extending up in front of wing.
- (2) Dark grey bill with two white rings (very striking).
- (3) Head shape.
- (4) In flight, broad grey wing-stripe.
- (5) Grey flanks tapering off at posterior end and not ending squarely like the white flanks of a male Tufted Duck.

The "cocked" tail and yellowish-orange eye were found to be useful pointers (especially the former, which enabled the bird to be picked out from amongst Tufted Duck at distances when other characters could not be seen), but these may only have been individual characteristics.

In the text accompanying the first British record of this species—in Gloucestershire from 12th to 14th March 1955 (*antea*, vol. xlvi, pp. 377-378)—Peter Scott wrote that "the 'panel' of the flanks comes to a white peak at the forward end and shades to a soft vermiculated grey at the after end" and this is borne out by his painting (published as plate I in vol. xlix). In our bird, however, the white and the grey were quite distinct and their borders quite sharp. At the same time, the grey of the bill was darker than in Scott's painting, so that the white rings were more distinct.

The possibility of the Reading bird being an escape seems to be very remote. Peter Scott (*in litt.* to I. J. Ferguson-Lees, April 1959) wrote, "In my opinion there is very little doubt that this is a wild bird".

An adult male Ring-necked Duck was present at Wassenaar, a suburb of the Hague, Holland, from 15th to 23rd March 1959. The possibility that the Reading bird was the same individual cannot, of course, be entirely ruled out, but the Dutch bird had a "thin white (or light) margin to the tail" (Dr. W. H. Bierman, *in litt.* to I. J. Ferguson-Lees, April 1959) which was entirely lacking in the adult male at Reading.

The Reading bird is thus the third European and the second British record of this North American duck.

J. T. R. SHARROCK and ROBERT GILLMOR

Green Sandpiper breeding in Inverness-shire.—On 29th May 1959 my wife and I were finding our way out of a particularly trying stretch of boggy moorland in Inverness-shire, when we saw a Green Sandpiper (*Tringa ochropus*) take flight a short distance away from us. The bird flew only a few yards before settling on a stump, from which it began to call in an agitated manner. We were at once intrigued by this behaviour and watched for several minutes. It showed no inclination to move away and continued to call incessantly.

The area concerned was of wet moor with many small pools—some of black and peaty ooze—interspersed with clumps of tall heather and cotton grass, and a few widely scattered Scots pines. The particular spot favoured by the Green Sandpiper was around a group of twenty or so very stunted Scots pines. None of these exceeded fifteen feet in height and many of them were gnarled and twisted.

We were unable to stay longer on that day but returned on the next, 30th May, to investigate the site more closely. On reaching the spot where the bird had first been seen we were disappointed by its failure to appear and it was not until we walked among the group of trees that we found it again. It suddenly took flight from a muddy pool almost at my feet and immediately began to utter alarm notes whilst flying in a jerky undulating way from perch to perch in a rough circle around us.

We assumed that it had a mate sitting somewhere near-by and accordingly we embarked on a systematic search of every tree in the group. This proved fruitless although the adult bird rarely ceased circling us. It was as we stopped to reconsider the situation that we heard a thin cheeping quite close at hand. We took this to be made by young Meadow Pipits (*Anthus pratensis*) as we had seen adults of this species carrying food, but on tracking down the calls we found a wader chick running a little unsteadily along the edge of a pool. As we stooped to look at the chick more closely the adult Green Sandpiper ceased calling. The young bird was white on the under-parts shading to grey on the flanks and a rich buff irregularly blotched with black on the crown and upper-parts. The legs were a greyish-blue and the bill of medium length. A black streak extending back from the eye but not reaching the nape was particularly noticeable. We guessed it to be three or four days old. After photographing the chick we watched from a distance and were pleased to see the adult Green Sandpiper drop down amongst the trees within a few minutes.

The alarm note of the adult was a high and musical ringing note often repeated quickly to produce a continuous lilting phrase. Although it showed no sign of aggression the bird frequently passed close enough for us to see the black underwing and white rump and upper-tail without the use of field-glasses.

Although only the one chick was found we both had the impression that there was a second cheeping near-by. Only the one adult bird was seen. We could not return to the site again ourselves, but George Waterston and P. J. Conder visited the area on 3rd June and were unable to find any trace of the bird on that day.

This would appear to be the first occasion on which a Green Sandpiper has been proved to breed in Scotland. F. R. CLAFTON

[Mr. Clifton kindly sent us two colour transparencies and one monochrome print of the young bird, and these and the description were compared by Messrs. Alfred Hazelwood and Eric Gorton with

specimens at the Bolton Museum, Lancashire, and in the Dresser Collection at Manchester. A. H. reported: "Feeling it necessary to eliminate everything else we have gone over all the possible wader chicks and can find nothing with which the photographs agree nearly so well as with Green Sandpiper where the resemblance is practically absolute. I may add that we have discounted colour as unreliable and gone entirely upon pattern. In the circumstances I think that there need be no hesitation about accepting the breeding record."

It is of interest to add that Wood Sandpipers (*T. ochropus*) were also found breeding in Scotland in 1959. Prof. M. F. M. Meiklejohn tells us that flying young with down still on their heads, accompanied by scolding parents, were seen in Sutherland on 23rd June and ensuing dates by Messrs. I. Downhill and G. Hallas. The young were also seen later by Dr. Ian D. Pennie. Full details will be appearing in *Scottish Birds*.—EDS.]

Blue Tit feeding young Treecreepers.—On 4th May 1958 my wife and I found the nest of a pair of Treecreepers (*Certhia familiaris*) about 3 feet above the ground in a dead limb of an elder at Stapleford, Nottinghamshire. This contained six eggs which hatched on 13th May. A Blue Tit (*Parus caeruleus*) was seen near the site and its nest proved to be in another limb of the same tree, approximately 2 feet away and about 2½ feet above the ground; the entrance faced the opposite direction from the Treecreeper's.

On 15th May we went to photograph the Treecreepers feeding their young and as we approached the tree were surprised to see a Blue Tit, with a small green caterpillar in its beak, perch at the entrance to the Treecreeper's hole. Three times the Blue Tit went to the nest and on the second and third occasions actually disappeared into the hole, but each time it emerged with the caterpillar still in its beak. During photography that day, no more was seen of the Blue Tit at the Treecreeper's nest. The hide was left in position, however, and on 25th May we returned to take more photographs. During this session the cock Blue Tit was seen to take food in to the young Treecreepers and emerge without it. It was also noted that the hen Blue Tit was feeding her own young quite regularly in the adjacent nest, with no assistance from her mate.

We kept a close watch on 26th and 27th May and again the cock Blue Tit was feeding the young Treecreepers, now even more frequently than their parents were. He was also seen removing faeces from the nest during many of his visits. It was interesting to note that, while the parent Treecreepers fed the nestlings on things like moths and craneflies, the Blue Tit brought exclusively small green caterpillars.

We felt sure that the nestlings would be leaving on the next day, the 28th, and so we watched from 7 a.m. to 6 p.m. with one short break. At 4 p.m. the young Treecreepers started to come out and

the Blue Tit was seen to feed each one in turn away from the nest, until four had gone by 5 p.m. At this stage the parent Treecreepers appeared to desert the remaining two young and no visits were paid for quite a period. The Blue Tit, however, then began feeding these last two very quickly and vigorously. Afterwards, he entered the nest and gave it a thorough clean, throwing debris out at the front and chattering away volubly all the time. At 6 p.m. the nestlings were lying asleep and the Blue Tit had gone off to feed. Throughout the day the hen Blue Tit had continued alone to feed her young.

On the following day the two remaining Treecreepers had flown. The young Blue Tits left their nest some time between 8th and 12th June. Two of the photographs we took are reproduced on plate 72: one shows the Blue Tit actually feeding one of the young Treecreepers, and the other the Blue Tit and one of the parent Treecreepers approaching the nest at the same time.

N. J. ANTOINE

Greenfinches building in old nests of other species.—On three occasions now, in 1957, 1958 and 1959, I have come across cases of Greenfinches (*Chloris chloris*) adapting old or deserted nests of other species for their own use. On 31st May 1957 I found the nest of a Song Thrush (*Turdus philomelos*) at Ulnes Walton, near Leyland, Lancashire. It was about 5 feet from the ground in a large laurel bush and, on going to look at it, I was surprised to see a female Greenfinch, which had been almost hidden by the nest, fly off. The Greenfinch had built its own nest, perfect in every detail, inside the mud lining of the other. There were three eggs, and the three young fledged successfully.

The second case was more peculiar. On 8th April 1958 the nest of a Dunnock (*Prunella modularis*) was found half finished in a thick holly hedge in our garden at Leyland. On 11th April it was complete, but the birds then deserted because a load of manure was tipped right by the hedge. On 8th June a pair of Greenfinches began to show an interest in the area and to my amazement, on going to look for their nest on the 14th, I flushed the female from the Dunnock's nest. This was still in good condition and contained one Greenfinch's egg which was unfortunately then deserted.

The third instance concerned the nest of a Blackbird (*T. merula*). On 15th March 1959 a Blackbird started to build in a trackside holly hedge about a mile from our house, but deserted it when it was only half finished, owing to bad weather. On 19th April, however, a female Greenfinch flew out of the hedge and it was found that she had used the partly finished nest as a base and sides for her own. Because of the absence of any mud lining she had been able to shape it to her own satisfaction, afterwards adding a few roots and the normal lining of hair and feathers. When it was found, the nest was still incomplete, but the eventual structure was smaller

than a Blackbird's and yet larger than a normal Greenfinch's by a good inch; the cup, however, was of the normal size, measuring about $2\frac{1}{2}$ inches across. The bird laid four eggs, all of which hatched and fledged successfully.

The three nests were thus quite different. The 1957 bird had used the old nest as a convenient platform for her own which was complete in itself. The 1959 bird merely added a lining to an existing structure. The 1958 one, on the other hand, did no more than remove a holly leaf from the Dunnock's nest before laying her egg in it just as it was: it is possible that her own nest had been destroyed and that she had had to find somewhere to lay quickly.

J. LAWTON

[Notes on single cases of Greenfinches adapting the nests of Bullfinch (*Pyrrhula pyrrhula*) and Chaffinch (*Fringilla coelebs*) were published in *British Birds* in 1943 and 1946 (vol. xxxvii, p. 134; and vol. xxxix, p. 276). In each instance the Greenfinches had simply added a fresh lining of feathers to the original structure. It is also of interest to add that many writers on birds in captivity recommend the use of old *Turdus* nests as sites for Greenfinches in aviaries.—EDS.]

Goldfinches undoing tie-on labels and using them as nest-material.—Goldfinches (*Carduelis carduelis*) frequently breed in the apple orchards of East Malling Research Station, Kent. Recently a colleague drew my attention to a curious nest found there on 6th May 1959. A considerable number of small tie-on labels had been incorporated into its structure (plate 71 left). These labels, known as "jewellers' tags", are used for marking parts of fruit trees in horticultural experiments (their removal in this instance, while adding to the hazards of field trials, fortunately caused only slight inconvenience to the experimenter).

It is common knowledge that many species occasionally utilize a variety of artificial materials in the construction of their nests, but this was particularly interesting because it appeared that the labels must have been actually untied from the fruit spurs to which they had been attached: the strings, which had been woven into the nest, were unbroken. In order to untie a label, it would be necessary for the bird to pull a loop in the string and allow the tag to slip through. However, the only other possibility is that the spurs were nipped off and the strings slipped over the broken ends, but this seems unlikely because the spurs are considered to be too thick for a Goldfinch to break and in any case there was no evidence of such damage on the trees.

Further enquiry revealed that two more similarly decorated nests had been discovered in 1959; one of these, found in the first week of June, was photographed (plate 71 right). I was also shown a photograph taken in 1953 and another report mentioned a nest

that had been found in the 1930s. The habit thus appears to have been practised occasionally by more than one bird over quite a number of years: it is interesting because it suggests problems in manipulative behaviour comparable to those of titmice (*Parus* spp.) opening milk-bottles.

R. C. MUIR

RECENT REPORTS AND NEWS

By I. J. FERGUSON-LEES and KENNETH WILLIAMSON

The items here are largely unchecked reports, and must not be regarded as authenticated records. They are selected, on the present writers' judgment alone, from sources generally found to be reliable. Observers' names are usually omitted for reasons of space and in case a report is subsequently rejected, and none of the items will be mentioned in our annual Index. Readers are asked to submit anything of interest as quickly as possible.

This summary covers the months of September and October, and deals mainly with the rarer species. It includes reports of the commoner birds only where these are of special interest or form a pattern. Many valuable observations have had to be omitted, but some of these will be made use of in other ways and we should like once more to express our gratitude to the several hundred contributors who have made this outline possible. So much of general interest happened in these two months that we have had to divide this summary into two. Here we are concerned solely with non-Passerines; the Passerines will be dealt with in the January number. Finally, the very nature of the period—an abundance of unusual records, coupled with several isolated but striking influxes of commoner species, against a background of an almost total absence of big movements of the normal migrants—has made it convenient to arrange this summary by taking the families individually in order.

For a general picture of the autumn migration as seen at the observatories and other regularly watched stations the reader is referred to *Bird Migration*, No. 3, which will be published at the end of December.

SHEARWATERS AND PETRELS

One of the most remarkable features of the autumn was the tremendous passage of Sooty Shearwaters (*Procellaria grisea*) on the east coast. The first evidence of this was in late August when at Spurn (Yorkshire) one was seen on the 27th, 3 on the 28th, 6 on the 29th and 2 on the 30th; at the same time at Hartlepool (Co. Durham) 22 were watched moving north and 10 south on 28th August and 2 were there on the 31st. There were a few other isolated observations from elsewhere and then the records began to increase in September. It would be tedious to list them all here and the general pattern can be outlined by summarising the observations at the two regularly manned observatories at Spurn and on the Isle of May (Fife). It should be added that the passage of Manx Shearwaters (*P. puffinus*) was described as especially heavy on this part of the east coast at the time (the majority moving northwards). At Spurn there were single Sooty Shearwaters on 3rd and 6th September, a dozen on the 13th-14th, 20 on the 15th and 43 next day (2 of these actually being in the Humber), 26 on the 17th, 19 on the 23rd and only a few afterwards. From 20th September Sooty and Manx Shearwaters approached the mouth of the Forth in immense numbers, and at the Isle of May 20 Sooty and 100 Manx were seen on that day, after which there were 40 of each on the 22nd and a remarkable 500 of each in three large rafts on the 25th. There were a few observations of Sooty Shearwaters on the east coast into October, but the last one to be reported was in the south at Portland Bill (Dorset) on 2nd November. Balearic Shearwaters (*P. p. mauretanicus*) were seen along

the south coast from the Isles of Scilly and Cornwall east to Dorset, but the numbers were generally smaller than in 1958, though the observatory at Portland kept up its reputation for this bird with a peak of 131 moving west on 11th October.

Fulmars (*Fulmarus glacialis*) are rarely recorded far inland and so the appearance of a moribund bird at Tring reservoirs on 20th September is of interest, particularly as this was the first record of this species for Hertfordshire. One or two Leach's Petrels (*Oceanodroma leucorhoa*) and Storm Petrels (*Hydrobates pelagicus*) appeared inland in late October and early November when a number of Little Auks (*Plautus alle*) were also reported, but these will be dealt with in the summary for November. Portland, Hengistbury Head (Hampshire) and St. Catherine's Point (Isle of Wight) all reported unusual numbers of Gannets (*Sula bassana*) on 17th October.

HERONS AND CRAKES

A juvenile Purple Heron (*Ardea purpurea*) seen at Cattawade Marshes by the River Stour (Essex/Suffolk border) on 2nd October was observed at Flatford Mill next day. The Crane (*Megalornis grus*) first seen at Cowpen Marsh (Co. Durham) on 4th August remained throughout the next two months (*antea*, page 320). Two Flamingos (*Phoenicopterus ruber*) delighted visitors to the Frodsham Marsh area of the Mersey (Cheshire) at intervals between 6th September and 18th October, but these were doubtless the ones which escaped from Belle Vue Zoo, Manchester, on 16th August. There were three reports of Glossy Ibises (*Plegadis falcinellus*) in September: an adult at Burton Marsh (Cheshire) from the 16th until 6th October was the first, and then there were two (perhaps one individual) very close together in time and place, at the Devonshire localities of Tamar Lake on 25th September and Braunton Marsh on the 27th.

A Spotted Crake (*Porzana porzana*) which was recognised at Farlington Marshes (Hampshire) on 28th August remained until 19th September, and between 14th and 20th September one, perhaps two, Little Crakes (*P. pusilla*) were also there. A total of 6 other Spotted Crakes were reported between the beginning of September and early November. There was one at Cambridge sewage farm on 9th September and another in the watercress beds at Leatherhead (Surrey) on 4th October. One first heard at Cape Clear Island (Co. Cork) on 9th October was firmly identified on the 12th, and on the 15th one was picked up dead at Gorad in Anglesey (N. Wales). St. Agnes (Isles of Scilly) had one on 20th October, and another was observed at Pett Level Pools (Sussex) on 4th November.

DUCKS AND GEESE

The autumn waterfowl migration brought a reminder of the fantastic influx of Garganey (*Anas querquedula*) which took place in the spring (*antea*, pp. 174-175) and which resulted in unusual breeding records as far west as Devon and as far north as Cheshire. Departure was well under way in mid-August, but the early part of September gave evidence of more than usual at reservoirs from Middlesex to Staffordshire. It would be misleading to list the records as we clearly do not have them all, but the London reservoirs can serve as an example. In 1957 there was only one record (of 4 birds) for the whole autumn in the London area, but in September this year the total at Brent Reservoir (Middlesex) had risen to 5 on the 1st, fell to 3 on the 3rd and then steadied at 6 between the 6th and the 16th, while there were 4 at Queen Mary Reservoir (Middlesex) on the 5th and single birds at other localities. Two migrants at St. Agnes (Isles of Scilly) on 7th September might also be mentioned.

Among rarer ducks, a drake Red-crested Pochard (*Netta rufina*) was at Nazeing (Essex) for most of September and there was a pair at Ravensthorpe Reservoir (Northamptonshire) from 3rd October to at least 25th (a female on the 31st). Two at Abberton Reservoir (Essex) on 5th October had increased to 5 by the 25th—a picture reminiscent of several recent years, except 1958, at that place (*antea*, pp. 42-56). A drake Surf Scoter (*Melanitta perspicillata*) was recorded at Traigh Nisabost on the Isle of Harris (Outer Hebrides) on 4th September. On 25th September people at Hilbre Island in the Dee Estuary

(Cheshire) sustained a shock when a flock of 5 Ruddy Ducks (*Oxyura jamaicensis*) appeared on the sea. Were these the same birds which were first seen at Belvide Reservoir (Staffordshire) in early September and reappeared at Gailey in the same county, 3 males and 2 females, on the 27th? Whatever the answer, it is likely that they and the several other single Ruddy Ducks reported during the period had originally escaped from captivity (see *antea*, vol. li, pp. 239-241).

Some reports suggest an early arrival of Smews (*Mergus albellus*) and Goldeneye (*Bucephala clangula*) in mid-October, but the observations are too scattered to form a clear picture.

Bewick's Swans (*Cygnus columbianus bewickii*) do not usually enter the scene much before the turn of the year, but four reports suggest something of an influx at the very end of October. On the 31st there was a young bird at Ham Island, Old Windsor (Berkshire), and on the next day there were five on the Dee Estuary and a remarkable herd of 46 at Eye Brook Reservoir (Leicestershire). Reports from Eye Brook vary the figure from 45 to 47, but it seems there were at least 29 adults and 17 immatures. Finally, there was one near Hilbre Island (Cheshire) on 4th November.

Other early arrivals included several interesting reports of Barnacle Geese (*Branta leucopsis*): among these were one at the Isle of May on 2nd October, a party of eight at Dale (Pembrokeshire) on the 11th, and single birds at Brent Reservoir (Middlesex) on the 22nd, Fair Isle on the 26th and Hule Moss (Berwickshire) on the 31st. The peak of Barnacle immigration into this country is perhaps represented by the skeins of 11, 23 and 13 which passed over North Rona between the 24th and the 26th. A party of 7 Greenland Whitefronts (*Anser albifrons flavirostris*) came in off the sea from the south-west at Cape Clear Island (Co. Cork) on the 28th, probably finishing a long cyclonic journey; exactly a month earlier a young bird had been caught and ringed at Fair Isle.

DIURNAL BIRDS OF PREY AND OWLS

There was only one autumn report of a Red-footed Falcon (*Falco vespertinus*), in striking contrast to the spring (*antea*, p. 275), and that was "scraped off the road" between Aele and Great Yarmouth (Norfolk) on 27th September. Other interesting falcons included the first Hobby (*F. subbuteo*) at Skokholm (Pembrokeshire) on 16th September (the species is seldom recorded in Wales) and a Gyr Falcon (*F. rusticolus*) which was watched at close quarters at Hilbre in the Dee Estuary on 31st October. Among several reports of Hairy Buzzards (*Pernis apivorus*) we might mention one at Langamull (Isle of Mull) on 13th September. There was a Rough-legged Buzzard (*Buteo lagopus*) at Fair Isle on 13th and 14th October. Wandering Marsh Harriers (*Circus aeruginosus*) appeared at a number of places: an immature male was at Farlington Marshes (Hampshire) on 15th September, and one flew north past Gibraltar Point (Lincolnshire) next day; juveniles were seen at Porlock Marsh (Somerset) during 10th-16th and near Cannington (Somerset) on the 21st; then there was one at St. Agnes on 7th October, and an exhausted bird which reached Hilbre on the 8th stayed till the 11th.

As usual at this season, a number of Ospreys (*Pandion haliaëtus*) were seen on passage through the southern and south-western counties, especially at the beginning and again in the middle of September. Sightings at several Hampshire localities—Calshot, Keyhaven, Farlington and especially Titchfield Haven—on various dates in September quite probably refer to one bird. One was seen at Darwell Reservoir, near Battle (Sussex), on several days during 2nd-13th September, and there was one at Tresco Great Pool (Isles of Scilly) on the 4th and 6th. One remained at Stodmarsh (Kent) from the 12th to the 25th, a young bird visited Whiteknights Park Lake (Berkshire) on the 13th, and there was a report from the Camel estuary (Cornwall) next day. Two were found perching on a haystack near Dauntsey (Wiltshire) early on 4th October, and when disturbed flew off towards the Avon valley. Other October Ospreys were seen on the Exe (Devon) on the 10th, and at Fareham and Botley (both Hampshire) on the 17th and 26th.

A Hawk Owl (*Surnia ulula*) was well seen in Lancashire, near the Bleasdale Fells, on 13th September.

CURLEW SANDPIPERS

It will be remembered that the autumn of 1958 was one of the poorest in recent years for Curlew Sandpipers (*Calidris testacea*) (*antea*, vol. li, p. 367, 443), but this year there was almost an avalanche of them. The movement really began in the last days of August and by the beginning of September the species was well distributed, with flocks of 30-40 in Co. Durham, 21 in Kent, and 10-15 in various places in Middlesex, Hampshire, Somerset and Cornwall. Then by the end of the first week of September the totals had multiplied out of all proportion. There were at least 200 at Holbeach (Lincolnshire) on the 5th-6th when no fewer than 31 were ringed! And at Shotton Pools (Flintshire) and the neighbouring flats there were an estimated 100-200 as early as the 3rd—a very remarkable total for the west side of Britain where the species is always much scarcer. On the 6th other high figures included over 70 by the Exe estuary (Devon), 50 at Yantlet (Kent), 30 at Swanscombe (Kent), 105 at Murston (Kent), 45 at Hanningfield Reservoir (Essex), 20 at Cley (Norfolk) and 50 at Wisbech sewage farm (Norfolk/Lincoln).

The 6th was a Sunday and so may not have represented the true peak which was certainly earlier at, for example, Spurn (Yorkshire) (14 on the 3rd) and Nottingham (18 on the 4th). On the other hand, the maximum numbers were equally certainly later at a number of other places—11 on the 7th at Sandwich Bay (Kent), 8 on the 8th at Blithfield Reservoir (Staffordshire) and 34 on the 12th at Farlington Marshes (Hampshire). At the last locality there was a steady build-up from 3 on the 3rd, through 18 on the 5th, 20 on the 6th, 23 on the 7th and 31 on the 9th. By mid-month the numbers were much reduced—though North Hayling (Hampshire) had 34 on the 16th—and by 20th September even Holbeach could muster only 10. October records, except for 20 at Burton Marsh (Cheshire) on the 2nd and 30 at Funton (Kent) on the 18th, refer mainly to single or a few scattered birds.

GREY PHALAROPES

Just as the Curlew Sandpiper was the wader of September, so was the Grey Phalarope (*Phalaropus fulicarius*) the wader of October. After one August observation (*antea*, p. 320) the first Grey Phalaropes were single birds at St. Agnes (Isles of Scilly) and Skokholm (Pembrokeshire) on 7th September and at Great Saltee (Co. Wexford) on the 9th. In mid-month several small parties of unidentified phalaropes were seen from O.W.S. *Weather Observer* at Station "Juliett" (400 miles west of Co. Kerry), mostly associating with Wilson's Petrels (*Oceanites oceanicus*)—15 in one lot on the 18th, and occasional birds afterwards. Another Grey reached Skokholm on the 24th, and 6 at St. Ives (Cornwall) on the 26th were followed by 3 at Tory Island (Co. Donegal) on the 29th. No more were reported for a full week, and then there were 7 at Tory Island and 2 of uncertain species on the Penzance-Scillies crossing on 6th October.

It was about this time that the real increase began. At St. Agnes 28 or more were recorded on the 9th and at St. Ives 20 on the 11th. Single Grey Phalaropes started to appear inland—at King's Langley (Hertfordshire) and Ascot Heath (Berkshire) on the 11th, at Queen Mary Reservoir (Middlesex) from the 14th to the 18th, and at King George VI Reservoir (Middlesex) and Guildford sewage-farm (Surrey) on the 18th, when a Red-necked Phalarope (*Ph. lobatus*) also appeared at Rye Meads (Hertfordshire). Evidence of an influx in the English Channel was provided on the 17th (a Saturday) by 7 at Portland Bill (Dorset), 2 off St. Catherine's Point (Isle of Wight) and one off Selsey Bill (Sussex), and on the 18th by 6 off Hengistbury Head (Hampshire). There were more inland birds at Barn Elms (Surrey) and Durlough Reservoir (Somerset) for a few days from the 22nd and the 23rd respectively, 2 at Hengistbury Head on the 24th and 2 in the Lower Cuckmere (Sussex) on the 24th and 25th. Grey Phalaropes reappeared at St. Ives on the 22nd (6), 25th (9) and 28th (about 30), after which a few passed at Portland until the end of the month.

But all these numbers were completely eclipsed by the fantastic invasion at St. Agnes on 23rd October, when at least 350 phalaropes "carpeted the bay", the great majority certainly Greys although 4 Red-necked were identified. Close inshore on the 23rd, they had moved farther out next day and only about 100 were seen. By the 25th a mere 6 remained.

AMERICAN AND OTHER WADERS

With the anticyclonic weather keeping the Atlantic storm-track at a respectful distance this has not been a very good autumn for American waders. The two Wilson's Phalaropes (*Phalaropus tricolor*)—only the fourth and fifth British records—have already received brief mention (*antea*, p. 320). The earlier one remained on the Flintshire side of the Dee until 4th September; the second appeared at Pitsford Reservoir (Northamptonshire) on the 8th and was last seen on the 12th, but judging from leg colour and other points it was certainly a different individual. Only 4 Pectoral Sandpipers (*Calidris melanotos*) were reported in September, which with the 3 in July and August (*antea*, p. 320) make an autumn total of 7. The September ones were at Talybont Reservoir (Breconshire) during 13th-26th, at Fairburn Ings (Yorkshire) during 17th-27th, at Murston (Kent) on the 24th and 25th and at Great Saltee (Co. Wexford) from the 24th to the 26th, the last being caught and ringed. The second and third Lesser Yellowlegs (*Tringa flavipes*) of the autumn were at Collieston (Aberdeenshire) on 22nd September and at Seahouses Harbour (Northumberland) on the 30th. Dowitchers are now divided into separate species, the Long-billed (*Limnodromus scolopaceus*) and the Short-billed (*L. griseus*), and it is very difficult to distinguish the two in the field. The four Dowitchers reported this autumn are therefore treated here as *Limnodromus* sp. The first stayed at Killingworth, near Newcastle, for at least a month from 29th September; the second was identified at Frodsham Marsh (Cheshire) on 18th October; and the last two were at the beginning of November—at Aberlady Bay (East Lothian) on the 1st and at Thorney Island (Sussex) from the 2nd to the 12th. The Thorney bird, which like the Newcastle one was watched by dozens of people, was joined on 9th November by a White-rumped Sandpiper (*Calidris fuscicollis*) which was still present on the 14th. Another White-rumped Sandpiper was reported from near Seaseale (Cumberland) on 3rd October.

Of the rest of the waders, the most unusual species was a Cream-coloured Courser (*Cursorius cursor*) which stayed at Dawlish Warren (Devon) from 11th to 14th October. Several reports of Great Snipe (*Capella media*) included two birds which stayed for a number of days: one haunted Girling Reservoir and Ponders End sewage-farm (Middlesex) during 12th-17th September and another was at Cambridge sewage-farm during 12th-22nd October. Between these dates single Great Snipe were reported from Leighton Moss (Lancashire) and Rye Harbour (Sussex) on 20th and 26th September respectively. Other less common waders included a Kentish Plover (*Charadrius alexandrinus*) at Titchfield Haven (Hampshire) on 4th September and one at Christchurch Harbour (Hampshire) on the 11th and 12th, odd Dotterel (*Ch. morinellus*) in Kent, Norfolk and Yorkshire in early September, and among various Avocets (*Recurvirostra avosetta*) one at Steart Island (Somerset) on several days in September and October. The only Temminck's Stints (*Calidris temminckii*) reported after those in August (*antea*, p. 320) were at Allhallows (Kent) on 1st September and Christchurch Harbour (Hampshire) on 18th October. There were two interesting inland records of Purple Sandpipers (*C. maritima*), at Tring (Hertfordshire) on 25th October and at Queen Mary Reservoir (Middlesex) on 1st November, the latter only the fourth record for the London area.

Other features of the wader passage included good numbers of Little Stints (*C. minuta*) in September, particularly in the first week and the last ten days; a heavy passage of Greenshanks (*Tringa nebularia*) with a late peak at end September and beginning October; plenty of Spotted Redshanks (*T. erythropus*); and a rapid decline in Wood Sandpipers (*T. glareola*) after August

which is the main passage period for this species (*antea*, p. 319), though there were late birds at St. Agnes on 5th October and at Abberton Reservoir (Essex) on the 6th and 28th.

GULLS AND TERNS

Sabine's Gulls (*Xema sabini*) were noted in September at Portland (Dorset) on the 4th, at Gibraltar Point (Lincolnshire) on the 6th, at Portland and at Swale (Kent) on the 12th, at St. Ives (Cornwall) on the 22nd, and at Tring (Hertfordshire) on the 26th; in October at Langney Point (Sussex) and at Harlyn Bay near Padstow (Cornwall) on the 10th, at sea 5 miles south of St. Catherine's Point (Isle of Wight) on the 17th, and at St. Ives on the 28th; and at Selsey Bill (Sussex) on 2nd November. Only three of these eleven were adults. Two Ivory Gulls (*Pagophila eburnea*) were reported in October, at Guardbridge (Fife) on the 4th and at Langney Point (Sussex) on the 27th. Hilbre's Glaucous Gull (*Larus hyperboreus*) returned to the island in early September in practically full adult plumage, after barely four months' absence from the district, and an early bird appeared at Cley (Norfolk) on 29th August. The last Arctic gulls worthy of mention are an immature Iceland Gull (*L. glaucoides*) at Moelfre (Anglesey) on 2nd September, and another Iceland Gull at Hunstanton and Snettisham (Norfolk) on 31st October and 1st November; the Sussex bird (*antea*, p. 68) was still present at Shoreham in November after remaining throughout the summer.

Little Gulls (*L. minutus*), as is usual during the autumn, were widely reported from east coast counties and to a lesser extent from the south and west, but there seemed to be peaks in the first week of September and more particularly in late October. At Cley (Norfolk) there were 7 on 13th September and up to half a dozen on several October days, with 8 on the 26th. On 27th and 28th October as many as 16 were reported from Hartlepool (Co. Durham), and on the 29th no less than 35, all going north. The only reports from inland counties concerned 3 at Queen Mary Reservoir (Middlesex) on 6th September and an immature at Guildford sewage-farm (Surrey) on the 26th.

Mediterranean Gulls (*L. melanocephalus*), not so many years ago regarded as extremely rare birds, were reported from a number of places. Apart from the Essex and Co. Durham ones (*antea*, p. 320), the September and October observations were all on the south coast in Sussex, Hampshire and Dorset. In Sussex there was an adult at Telscombe Cliffs on 5th-6th September and again on 4th October when there was also an adult at Hove; an immature was seen at Manhood End, Chichester Harbour, on 27th September and one flying east at Selsey Bill on 12th October was the fourth noted there since July. In Hampshire there was one at Farlington Marshes on 9th September, an immature in Langstone Harbour on 20th September and an adult at Farlington on 24th October. In Dorset first-winter birds were identified at Portland on 12th September (flying west) and on the 19th and 25th (flying east).

A Caspian Tern (*Hydroprogne caspia*) which was seen on several days in September and up to 2nd October in the area of Hickling and Heigham (Norfolk) has already been mentioned (*antea*, p. 320). On 30th September one appeared at dawn at Tory Island (Co. Donegal). Only a single Gull-billed Tern (*Gelochelidon nilotica*) is reliably reported, at Christchurch Harbour (Hampshire) on 2nd September. White-winged Black Terns (*Chlidonias leucopterus*) in September (*cf. antea*, p. 320) included first-winter birds at Russells Lake and Langstone Channel (Hampshire) on the 14th, the day after one which had spent some days at Hanningfield Reservoir (Essex) was last seen.

Black Terns (*Ch. niger*) were seen from Kent north to Co. Durham and Westmorland and west to Somerset and Cornwall, but there was no suggestion of any invasion even in August when there was a fair coastal passage in the south-east (*cf. antea*, pp. 272-273, 276-278). Very few records in September and October were of more than 3 or 4 together and most were of single birds. Perhaps the most interesting observations, since the species is of irregular occurrence in Ireland, were 3 in Wexford Harbour on 9th October and one at Kilmore Quay (also Co. Wexford) next day.

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2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in 1953 (vol. xlvi, pp. 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Sub-specific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1955" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form:

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PURCHASED
BRITISH BIRDS

REPORT ON BIRD RINGING FOR 1958*

By ROBERT SPENCER

(*Ringing Officer of the British Trust for Ornithology*)

IN 1958 THE RINGING SCHEME reached two milestones: for the first time 200,000 birds were ringed in a year, and the grand total since 1909 passed the two million mark. It is a measure of the rate of growth of the scheme that the second million has been added in only seven years—from 1952 to 1958. Unfortunately, the increase in nestling ringing shown in 1957 was not maintained, but this may have been due to the normal vicissitudes of the breeding season: Blue and Great Tits, for example, showed a marked drop from the peak figures of the previous year, while many fewer chicks of Common, Roseate and Sandwich Terns were ringed.

In contrast, there was a further big increase in the number of birds trapped and it is clear that, with their now wider distribution, we are beginning to experience the full benefits of mist nets. The revolution they are bringing about may be seen in many of the individual ringing totals, a typical case being Leach's Petrel, of which no fewer than 553 were caught in 1958 compared with a grand total for all previous years of 241. Similarly, the number of Storm Petrels ringed amounted to more than half the total for the previous forty-eight years, while 80% more Hirundines were trapped than in 1957. In smaller ways, too, the nets are making their contribution: the first Bluethroat to be recovered was caught by a ringer operating mist nets. The ringing of the scarcer passage migrants has for too long been limited—by opportunity, not design—to the bird observatories. Now, the wider dispersal of ringers made possible by mist nets must obviously lead to a more accurate assessment of the frequency and distribution of many of the scarcer visitors to our islands.

A further five birds were added to the ringing list in 1958, bringing the total number of species ringed in the British Isles to 280. Two of them—the Northern Waterthrush (*Seiurus noveboracensis*) ringed on St. Agnes and the Baltimore Oriole (*Icterus galbula*) trapped on Lundy, both vagrants from America—were new to the British

* This is the twenty-second report issued on behalf of the Bird-Ringing Committee, and is a publication of the British Trust for Ornithology. For the twenty-first report see *British Birds*, vol. li, pp. 449-496.

Isles. Two more were pipits: a Richard's Pipit ringed at Spurn and a Pechora Pipit trapped on Fair Isle. Now the Red-throated alone of the pipit species on the British list has yet to feature in our tables. Finally, an Avocet marked by P. J. Conder brings to 35 the number of species of waders ringed in the British Isles.

Over 6,300 birds were recovered in 1958, or more than twice as many as in the fifteen months ending 31st December 1954. Inevitably, therefore, the list of recoveries published in full is yet more selective than in previous years, but an attempt has been made to keep it representative, and the apparently modest but little-known journeyings of such species as Kingfisher, Long-tailed Tit and Reed Bunting have claimed a place in competition with the more spectacular but well-established migratory flights of ducks, terns and Starlings.

Among the many recoveries published here, some stand out as being of more than usual interest. Seldom can rings have been put to such good use as five which were placed on a brood of Kestrels near Edinburgh, for no fewer than four of them were recovered later in widely separated areas. Once again waders figure prominently in the list, with recoveries of Oystercatcher and Little Ringed Plover in Morocco, Redshank and Dunlin in Iceland, Whimbrel in France, and Snipe in the U.S.S.R. There are also the curious recoveries of an immature Black-headed Gull near Madrid in January, an immature Puffin off Greenland in November and a seven-year-old Puffin at Tangier in April.

One of the most interesting features of recent years has been the recovery of British-ringed Blackbirds in Finland, details of the first two of which appear in this report. Although such recoveries are without precedent it is evident that they are not accidental for a further three records have been received in 1959.

Redstarts and Meadow Pipits ringed in the British Isles have hitherto produced recoveries showing migration in a south-westerly direction through France to Iberia. However, in 1958 an individual of each species was recovered in Italy. An even more easterly course was taken by a British-bred Red-backed Shrike which was reported from the Dodecanese.

The series of recoveries of Blue and Great Tits associated with the large irruption in the autumn of 1957 is perhaps more impressive than that listed in the previous report, and it seems probable that the Tree Sparrow recovered in Germany may also have been connected with this movement. Another irruption is reflected in the recovery of a Waxwing in southern Norway.

FINANCE

The full accounts for 1958 have been published in the Annual Report of the British Trust for Ornithology. The salaries of the staff were met by a grant from the Nature Conservancy. In addition £84 was received from the main funds of the Trust and a grant of £25 from the publishers of *British Birds*. All other expenses were met from income derived from the sale of rings.

THE COMMITTEE

The members of the Bird-Ringing Committee on 31st December 1958 were Sir Landsborough Thomson (*Chairman*), Miss E. P. Leach, J. S. Ash, the late A. W. Boyd, Hugh Boyd, E. J. M. Buxton, P. A. D. Hollom, J. D. Macdonald (representing the Trustees of the British Museum), G. R. Mountfort, C. A. Norris, Major-General C. B. Wainwright and George Waterston; Bruce Campbell, R. K. Cornwallis and E. R. Parrinder (*ex officio*); and Robert Spencer (*Secretary*).

STAFF

Robert Spencer, J. L. F. Parslow, Miss Elsa Moon (to 6th September), Miss C. M. Fell (from 5th October). Miss E. P. Leach, in an honorary capacity, had charge of all reports of rings from foreign schemes.

ACKNOWLEDGEMENTS

Grateful acknowledgement is made to the Trustees for accommodation at the British Museum (Natural History) and for permission to use the address of the museum on rings; to the Nature Conservancy for the financial support which alone makes it possible for the scheme to operate at its present level; and to Messrs. H. F. and G. Witherby Ltd. for their annual grant. At the museum Dr. F. C. Fraser and Mr. J. D. Macdonald have given sympathetic attention to our problems of accommodation and the staff of the Bird Room have helped us readily with many inquiries. Miss E. P. Leach, as in previous years, assisted us with countless problems large and small. Derek Goodwin, A. G. Hurrell, Dr. W. Rydzewski and Mrs. G. Trust once again kindly helped with translations.

PUBLICATIONS

The following analyses of results have been published:

- A. Landsborough Thomson (1958): "The migrations of British hawks (Accipitridae) as shown by ringing results". *Brit. Birds*, li: 85-93.
- A. Landsborough Thomson (1958): "The migrations of British falcons (Falconidae) as shown by ringing results". *Brit. Birds*, li: 179-188.

The following papers make use of the recoveries of the scheme:

- Gordon H. Orians (1958): "A capture-recapture analysis of a shearwater population". *J. Anim. Ecol.*, 27: 71-84.
- Ralph Stokoe (1958): "The spring plumage of the Cormorant". *Brit. Birds*, li: 165-179.

Miscellaneous items incorporating ringing data:

- Ralph Chislett and G. H. Ainsworth (1958): *Birds on the Spurn Peninsula*. Hull and London.
- Wolfgang Makatsch (1958): "Reports from Britain of Black-headed Gulls ringed in the Oberlausitz, East Germany". *Brit. Birds*, li: 74-77.

Table I

NUMBERS OF BIRDS RINGED AND RECOVERED

	Ringed			Recovered	
	<i>Juv.-Ad.</i>	<i>Pullus*</i>	<i>Total</i>	<i>Total</i>	
1958	155,414	45,421	200,835	6,374	
1957	137,060	49,286	186,346	5,497	
1956	104,665	40,069	144,734	4,808	
1955	90,585	35,718	126,303	4,063	
1954 (I.I0.53-3I.I2.54)†	77,809	36,684	114,493	3,043	
1953	63,318	35,199	98,517	Not recorded	
1952	56,867	39,459	96,326		
1951	49,364	36,379	85,743		
1950	42,112	33,994	76,106		
1949	27,496	29,965	57,461		
1948	18,413	20,911	39,324		
Grand Total Ringed 1909-1958					2,014,467
Grand Total Recovered 1909-1958					53,839

Table II

RINGING AND RECOVERY TOTALS TO 31.12.58

	Ringed				Recovered	
	<i>Juv.-Ad.</i>	<i>Pull.</i>	1958 <i>Total</i>	<i>Grand</i> <i>Total</i>	1958	<i>Grand</i> <i>Total</i>
Little Grebe	16	1	17	142	1	7
Leach's Petrel	553	1	554	795	3	4
Storm Petrel	1,717	6	1,723	4,851	1	12
Manx Shearwater	6,446	1,969	8,415	78,755	58	880
Fulmar	162	585	747	4,314	16	55
Gannet	141	681	822	19,577	52	772
Cormorant	2	133	135	4,450	65	1,066
Shag	166	805	971	7,017	119	744
Heron	2	80	82	3,937	40	605
Mallard	2,745	142	2,887	24,219	630	2,901
Teal	1,740	6	1,746	24,712	375	4,067
Garganey	11	—	11	108	4	14
Gadwall	14	—	14	132	5	24
Wigeon	93	—	93	2,009	26	346
Pintail	19	—	19	495	10	93
Shoveler	14	2	16	415	7	86
Tufted Duck	83	—	83	829	8	158
Pochard	20	—	20	178	2	27
Eider	255	4	259	1,287	9	63

* An explanation of the term "pullus" or "pull." appears on page 451.

† The ringing year formerly began on 1st October. In 1954 it was decided to make it coincide with the calendar year and there was accordingly a "year" of 15 months.

	<i>Ringed</i>				<i>Recovered</i>	
	<i>Juv.-Ad.</i>	<i>Pull.</i>	<i>1958 Total</i>	<i>Grand Total</i>	<i>1958</i>	<i>Grand Total</i>
Shelduck	4	26	30	694	3	37
Grey Lag Goose ...	—	—	—	463	10	123
White-fronted Goose	152	—	152	558	7	84
Pink-footed Goose ...	1,790	—	1,790	10,709	364	1,681
Canada Goose	49	—	49	1,059	29	83
Mute Swan	336	31	367	648	41	58
Buzzard	1	22	23	927	4	47
Sparrowhawk	13	9	22	1,299	7	198
Marsh Harrier	—	12	12	111	3	12
Hen Harrier	1	46	47	354	6	49
Montagu's Harrier ...	—	8	8	214	3	31
Peregrine	1	2	3	165	1	23
Merlin	9	16	25	587	1	83
Kestrel	49	66	115	2,270	27	275
Red Grouse	—	—	—	1,528	77	174
Water Rail	55	—	55	300	2	10
Corncrake	3	—	3	700	1	12
Moorhen	254	23	277	4,609	19	141
Coot	112	9	121	1,483	23	152
Oystercatcher	29	280	309	5,838	27	285
Lapwing	180	2,183	2,363	67,465	36	1,356
Ringed Plover	74	150	224	3,884	8	56
Little Ringed Plover	2	41	43	200	3	8
Golden Plover	3	11	14	537	—	16
Turnstone	103	—	103	369	—	5
Snipe	368	40	408	3,538	10	152
Jack Snipe	43	—	43	155	1	6
Woodcock	10	7	17	5,648	2	431
Curlew	4	105	109	6,190	12	252
Common Sandpiper ...	225	66	291	3,403	6	24
Redshank	146	142	288	4,949	4	136
Knot	20	—	20	101	—	3
Dunlin	572	11	583	1,955	8	28
Sanderling	18	—	18	104	1	2
Ruff	23	—	23	107	—	2
Stone Curlew	—	4	4	354	—	18
Arctic Skua	21	122	143	797	1	23
Great Skua	—	279	279	1,629	5	40
Great Black-backed Gull	23	247	270	2,227	22	121
Lesser Black-backed Gull	68	1,656	1,724	21,817	71	888
Herring Gull	225	1,247	1,472	24,562	75	920
Common Gull	9	39	48	4,319	2	173
Black-headed Gull ...	223	3,512	3,735	44,275	177	2,084
Kittiwake	553	829	1,382	11,720	36	215
Common Tern	18	855	873	28,193	15	554
Arctic Tern	112	2,067	2,179	14,789	31	198
Roseate Tern	20	73	93	3,083	2	25
Little Tern	4	51	55	1,811	1	22
Sandwich Tern	—	1,330	1,330	31,093	32	520
Razorbill	71	263	334	9,835	14	269
Guillemot	274	344	618	6,782	12	225

NOTE—The "recovery" columns in this table and in Table I omit only retraps—birds caught again locally by the ringer and released. Recaptures by other than the ringer at any distance and local recoveries of dead birds are all included.

	<i>Ringed</i>				<i>Recovered</i>	
	<i>Juv.-Ad.</i>	<i>Pull.</i>	<i>1958 Total</i>	<i>Grand Total</i>	<i>1958</i>	<i>Grand Total</i>
Black Guillemot ...	8	82	90	499	—	5
Puffin ...	581	650	1,231	12,282	10	65
Stock Dove ...	15	58	73	1,930	6	124
Rock Dove ...	—	6	6	110	—	4
Woodpigeon ...	29	245	274	6,722	32	445
Turtle Dove ...	50	27	77	1,452	4	50
Cuckoo ...	53	35	88	1,776	4	45
Barn Owl ...	12	—	12	1,186	10	158
Little Owl ...	23	28	51	1,484	4	119
Tawny Owl ...	17	54	71	2,465	7	167
Long-eared Owl ...	6	3	9	477	—	26
Short-eared Owl ...	1	10	11	354	4	26
Nightjar ...	3	16	19	397	—	8
Swift ...	1,216	100	1,316	7,549	41	138
Kingfisher ...	13	—	13	923	3	39
Green Woodpecker ...	31	4	35	395	1	12
Great Spotted Wood- pecker ...	80	3	83	698	6	31
Wryneck ...	43	—	43	543	—	10
Woodlark ...	4	40	44	373	—	2
Skylark ...	138	41	179	7,876	5	54
Swallow ...	3,022	3,219	6,241	82,741	42	566
House Martin ...	1,283	15	1,298	19,329	7	142
Sand Martin ...	5,261	37	5,298	19,037	20	55
Raven ...	—	53	53	759	5	74
Carrion/Hooded Crow	23	111	134	3,494	16	204
Rook ...	161	175	336	8,968	52	540
Jackdaw ...	166	274	440	9,203	33	481
Magpie ...	37	102	139	2,874	10	120
Jay ...	128	13	141	1,689	12	117
Chough ...	—	6	6	216	—	8
Great Tit ...	4,163	1,305	5,468	44,350	113	719
Blue Tit ...	11,138	1,745	12,883	93,038	325	1,721
Coal Tit ...	352	394	746	5,853	12	79
Marsh Tit ...	229	45	274	1,750	3	20
Willow Tit ...	53	22	75	247	—	—
Long-tailed Tit ...	322	—	322	1,098	5	8
Nuthatch ...	135	22	157	1,943	8	48
Treecreeper ...	99	22	121	1,400	—	3
Wren ...	1,073	12	1,085	10,166	5	48
Dipper ...	73	271	344	3,957	2	47
Mistle Thrush ...	303	230	533	9,253	21	243
Fieldfare ...	58	—	58	837	3	21
Song Thrush ...	3,886	2,155	6,041	108,766	207	2,603
Redwing ...	791	—	791	4,415	7	45
Ring Ouzel ...	6	99	105	1,447	4	23
Blackbird ...	13,910	3,238	17,148	153,474	548	4,961
Wheatear ...	1,089	321	1,410	12,710	9	53
Stonechat ...	174	33	207	2,166	1	14
Whinchat ...	322	126	448	4,994	3	17
Redstart ...	698	398	1,096	10,336	12	34
Black Redstart ...	67	4	71	530	2	13
Nightingale ...	57	37	94	3,381	—	13
Bluethroat ...	24	—	24	122	1	1
Robin ...	4,523	611	5,134	64,292	139	1,504
Grasshopper Warbler	80	8	88	535	—	1
Reed Warbler ...	303	105	408	3,284	4	15
Sedge Warbler ...	1,181	104	1,285	9,154	1	15

	<i>Ringed</i>				<i>Recovered</i>	
	<i>Juv.-Ad.</i>	<i>Pull.</i>	1958 <i>Total</i>	<i>Grand Total</i>	1958	<i>Grand Total</i>
Blackcap	341	45	386	3,070	2	12
Barred Warbler	10	—	10	110	—	—
Garden Warbler	559	15	574	3,984	2	6
Whitethroat	4,315	451	4,766	34,856	22	132
Lesser Whitethroat	274	—	274	2,146	2	8
Willow Warbler	4,408	647	5,055	46,194	19	114
Chiffchaff	1,553	90	1,643	8,623	5	19
Wood Warbler	9	72	81	2,099	—	11
Goldcrest	459	—	459	2,870	1	6
Firecrest	52	—	52	100	—	—
Spotted Flycatcher	528	351	879	9,891	5	65
Pied Flycatcher	751	735	1,486	11,886	9	32
Dunnock	4,166	554	4,720	42,729	87	600
Meadow Pipit	1,820	318	2,138	19,268	27	159
Tree Pipit	91	89	180	3,417	1	5
Rock/Water Pipit	593	171	764	6,274	5	43
Pied/White Wagtail... ..	1,149	418	1,567	16,485	44	279
Grey Wagtail... ..	74	104	178	2,204	—	10
Yellow Wagtail ssp.	727	152	879	7,232	17	62
Red-backed Shrike	39	66	105	1,940	2	10
Starling	21,587	858	22,445	229,861	1,097	8,638
Hawfinch	2	—	2	177	—	2
Greenfinch	8,026	491	8,517	71,866	226	1,108
Goldfinch	334	71	405	2,399	1	18
Siskin	9	—	9	138	—	2
Linnet... ..	2,544	502	3,046	27,746	17	180
Twite	104	—	104	1,808	—	6
Redpoll	168	2	170	1,179	1	13
Bullfinch	552	148	700	4,382	15	72
Crossbill	8	—	8	162	—	2
Chaffinch	5,512	383	5,895	70,688	80	806
Brambling	303	—	303	3,255	3	26
Yellowhammer	885	129	1,014	12,547	10	102
Corn Bunting	107	26	133	647	4	15
Girl Bunting	5	12	17	157	—	—
Reed Bunting	1,466	188	1,654	9,471	14	44
Snow Bunting	440	—	440	1,629	2	5
House Sparrow	11,651	634	12,285	68,820	200	942
Tree Sparrow... ..	1,611	310	1,921	7,783	5	41

SPECIES OF WHICH LESS THAN 100 HAVE BEEN RINGED

(1958 total, grand total, 1958 recoveries and grand total recoveries are given in that order.)

Black-throated Diver	—	2	—	—	Long-tailed Duck	—	2	—	—
Great Northern Diver	—	2	—	—	Velvet Scoter	—	1	—	1
Red-throated Diver	—	6	—	3	Common Scoter	—	10	—	1
Great Crested Grebe	—	23	—	—	Red-breasted				
Red-necked Grebe	—	1	—	—	Merganser	—	11	—	1
Avonian Grebe	1	2	—	—	Goosander	—	1	55	—
Wilson's Petrel	—	1	—	—	Smew	—	—	2	—
Little Bittern	—	1	—	—	Brent Goose	—	—	2	—
Wentworth's Bittern	1	51	—	6	Barnacle Goose	—	—	3	—
Red-crested Pochard	5	15	—	3	Whooper Swan	—	—	3	—
Wentworth's Bittern	—	22	2	4	Golden Eagle	—	8	33	—
Goldeneye	—	5	—	—	Hobby	—	—	50	—

Red-footed Falcon...	—	1	—	—	Desert Wheatear ...	—	2	—	—
Black Grouse ...	—	10	—	—	Black-eared				
Capercaillie ...	—	3	—	—	Wheatear ...	—	1	—	—
Red-legged Partridge	26	46	1	3	Pied Wheatear ...	—	1	—	—
Partridge ...	6	93	1	3	Thrush Nightingale	1	2	—	—
Quail ...	1	4	—	—	Lanceolated Warbler	—	1	—	—
Pheasant ...	—	58	—	4	Pallas's Grasshopper				
Spotted Crake ...	1	6	—	—	Warbler ...	—	1	—	—
Kentish Plover ...	—	1	—	—	Marsh Warbler ...	2	53	—	—
Grey Plover ...	5	12	—	1	Paddyfield Warbler	—	1	—	—
Dotterel ...	2	28	—	—	Aquatic Warbler ...	2	8	—	—
Whimbrel ...	9	93	1	1	Thick-billed Warbler	—	1	—	—
Bar-tailed Godwit ...	7	37	—	—	Melodious Warbler	14	31	—	—
Green Sandpiper ...	14	86	1	2	Icterine Warbler ...	19	57	—	—
Wood Sandpiper ...	2	45	—	—	Olivaceous Warbler	—	2	—	—
Spotted Redshank	1	13	—	1	Orphean Warbler ...	—	1	—	—
Greenshank ...	7	52	—	2	Subalpine Warbler...	3	8	—	—
Purple Sandpiper ...	8	30	—	—	Dartford Warbler ...	5	52	—	—
Little Stint ...	3	73	—	1	Greenish Warbler ...	2	10	—	—
Temminck's Stint ...	—	3	—	—	Bonelli's Warbler ...	—	1	—	—
White-rumped					Arctic Warbler ...	—	1	—	—
Sandpiper ...	—	1	—	—	Yellow-browed				
Pectoral Sandpiper	1	4	—	—	Warbler ...	2	33	—	—
Curlew Sandpiper	—	45	—	—	Pallas's Warbler ...	—	2	—	—
Semi-palmated					Yellowthroat ...	—	1	—	—
Sandpiper ...	—	1	—	—	Northern Waterthrush	1	1	—	—
Buff-breasted					Red-breasted Fly-				
Sandpiper ...	—	1	—	—	catcher ...	16	57	—	—
Avocet ...	1	1	—	—	Richard's Pipit ...	1	1	—	—
Grey Phalarope ...	1	5	—	—	Tawny Pipit ...	—	2	—	—
Red-necked Phalarope	—	21	—	—	Pechora Pipit ...	1	1	—	—
Glaucous Gull ...	—	2	—	1	Yellow-headed				
Little Gull ...	—	1	—	1	Wagtail ...	—	2	—	—
Black Tern ...	—	1	—	—	Waxwing ...	2	29	1	2
Gull-billed Tern ...	—	1	—	1	Great Grey Shrike ...	2	32	—	1
Little Auk ...	1	15	—	2	Lesser Grey Shrike	1	5	—	2
Collared Dove ...	—	2	—	—	Woodchat Shrike ...	9	25	—	—
Scops Owl ...	—	1	—	—	Rose-coloured				
Snowy Owl ...	—	1	—	—	Starling ...	—	1	—	—
Hoopoe ...	2	6	—	—	Baltimore Oriole ...	1	1	—	—
Lesser Spotted					Summer Tanager ...	—	1	—	—
Woodpecker ...	10	67	—	—	Scarlet Grosbeak ...	2	13	—	—
Short-toed Lark ...	1	2	—	—	Pine Grosbeak ...	—	1	—	—
Shore Lark ...	—	1	—	—	Black-headed				
Golden Oriole ...	—	1	—	—	Bunting ...	—	1	—	—
Crested Tit ...	11	46	—	—	Red-headed Bunting	—	4	—	—
Bearded Tit ...	—	49	—	—	Yellow-breasted				
Black-throated					Bunting ...	1	2	—	—
Thrush ...	—	1	—	—	Ortolan Bunting ...	6	20	—	—
American Robin ...	—	1	—	—	Rustic Bunting ...	2	5	—	—
Siberian Thrush ...	—	1	—	—	Little Bunting ...	1	7	—	—
Gray-cheeked Thrush	1	2	—	—	Lapland Bunting ...	3	33	—	—

Table III

NUMBERS AND DISTRIBUTION OF RINGERS (as at 31.12.58)

ENGLAND					SCOTLAND				
County	Category of permit			Total	County	Category of permit			Total
	A	B	C			A	B	C	
Bedfordshire ...	4	—	—	4	Aberdeenshire ...	2	1	1	4
Berkshire ...	10	3	3	16	Angus ...	2	—	—	2
Buckinghamshire ...	7	—	1	8	Ayrshire ...	1	—	—	1
Cambridgeshire ...	5	1	3	9	Berwickshire ...	1	—	—	1
Cheshire ...	12	—	5	17	Bute ...	1	—	—	1
Cornwall ...	2	—	1	3	Dumfries-shire ...	2	—	—	2
Cumberland ...	3	—	1	4	Fife ...	1	—	—	1
Derbyshire ...	7	—	—	7	Inverness-shire ...	4	—	—	4
Devonshire ...	7	—	—	7	Kirkcudbright ...	3	—	—	3
Dorset ...	8	—	—	8	Lanarkshire ...	2	—	—	2
Durham ...	8	3	1	12	Midlothian ...	14	3	—	17
Essex ...	29	1	8	38	Orkney ...	1	—	—	1
Gloucestershire ...	13	1	5	19	Ross-shire ...	1	—	—	1
Hampshire ...	20	1	1	22	Shetland ...	—	2	—	2
Herefordshire ...	1	—	—	1	Stirlingshire ...	2	—	—	2
Hertfordshire ...	9	1	1	11	Sutherland ...	1	—	—	1
Huntingdonshire ...	—	—	1	1	Wigtownshire ...	1	—	—	1
Kent ...	33	2	4	39					
Lancashire ...	17	—	2	19					
Leicestershire ...	6	2	—	8					
Lincolnshire ...	8	1	2	11					
London ...	11	2	4	17					
Middlesex ...	17	—	2	19					
Norfolk ...	3	7	3	13					
Northamptonshire ...	4	2	1	7					
Northumberland ...	5	5	2	12					
Nottinghamshire ...	5	—	1	6					
Oxfordshire ...	10	3	2	15					
Shropshire ...	3	—	—	3					
Somerset ...	3	1	1	5					
Staffordshire ...	10	1	—	11					
Suffolk ...	5	3	—	8					
Surrey ...	41	1	5	47					
Sussex ...	15	1	3	19					
Warwickshire ...	16	2	5	23					
Westmorland ...	4	—	—	4					
Wiltshire ...	4	—	1	5					
Worcestershire ...	4	—	—	4					
Yorkshire ...	49	6	21	76					
Isle of Man ...	3	—	—	3					

WALES				
County	Category of permit			Total
	A	B	C	
Breconshire ...	1	—	1	2
Caernarvonshire ...	2	—	—	2
Denbighshire ...	2	—	—	2
Flintshire ...	1	—	—	1
Glamorganshire ...	4	—	1	5
Monmouthshire ...	1	—	—	1
Pembrokeshire ...	1	2	—	3

IRELAND				
County	Category of permit			Total
	A	B	C	
Antrim ...	7	6	2	15
Down ...	1	—	2	3
Dublin ...	2	—	—	2
Mayo ...	1	—	—	1

KEY TO RINGERS' INITIALS

DGA	D. G. Andrew	JAB	J. A. Benington
JWA	J. W. Allen	JAGB	J. A. G. Barnes
RWA	R. W. Arthur	JASB	J. A. S. Borrett
AEB	A. E. Billett	RB	R. H. Baillie
EB	E. Balfour	RHB	R. H. Brown
FAB	F. A. Bak	RMB	R. M. Band
JB	The late J. Bartholomew	TBB	T. B. Bagenal

TLB	T. L. Bartlett	SBO	Skokholm Bird Observatory
CBC	Cambridge Bird Club	SKBO	St. Kilda Bird Observa- tory
DBC	Dingle Bird Club	AEP	A. E. Platt
DGC	D. G. Cotgrave	CMP	C. M. Perrins
DMC	D. M. Cormack	DP	D. Parr
FRC	F. R. Clifton	HP	H. Pease
GBC	G. B. Corbet	IJP	I. J. Patterson
JBCC	J. B. C. Crompton	IVBP	I. V. Balfour Paul
LAC	L. A. Cowcill	KHP	K. H. Palmer
MJC	M. J. Cowlard	LAP	L. A. Pownall
MOC	Midlothian Orn. Club	MHP	M. H. Pitt
PJC	P. J. Chadwick	RGP	R. G. Pettitt
PWEC	P. W. E. Currie	WDP	W. D. Park
RPC	R. P. Cockbain	WMP	W. M. Peet
WC	Winchester College	KBR	K. B. Rooke
CRD	C. R. Dick	RWR	R. W. Robson
EAGD	E. A. G. Duffey	AS	Ackworth School
GAD	G. A. Dangerfield	AVS	A. V. Smith
HD	H. Dickinson	BS	Bryanston School
HMD	H. M. Dobinson	ESS	E. S. Skinner
KVE	K. V. Edwards	HSS	Halifax Scientific Society
PRE	P. R. Evans	IFS	I. F. Stewart
RE	R. Elmes	JS	J. Stafford
WJE	W. J. Eggeling	LNHS	London Natural History Society
DF	D. Felstead	LPS	Leighton Park School
GTF	G. T. Flock	MSJS	M. S. J. Snoxell
JF	J. Fisher	NS	N. Syer
ROMF	R. O. M. Ford	RS	R. Stokoe
ERG	Epsom Ringing Group	RRS	Romford Ringing Station
GRG	Guildford Ringing Group	SBRs	Sandwich Bay Ringing Station
JCG	J. C. Gittins	WNS	Wharfedale Naturalists' Society
PRG	P. R. Griffiths	WWFS	West Wales Field Society
BPH	B. P. Hutchings	YNS	Great Yarmouth Natural- ists' Society
CH	C. Hodgkinson	ADT	A. D. Townsend
DDH	D. D. Harber	TT	T. Todd
DFH	D. F. Harle	AU	Aberdeen University
DJTH	D. J. T. Hussell	AEV	A. E. Vine
EGH	E. G. Holt	ACW	A. C. Whiteside
HSB	H. S. Hemsley-Hall	DCHW	D. C. H. Worsfold
NH	N. Henson	DRW	D. R. Wilson
RFH	R. F. Hemsley	ELEW	E. L. E. Watkiss
WH	W. Howe	IMW	I. M. Walker
JEK	J. E. King	JW	J. Wagstaff
JMBK	J. M. B. King	JAW	J. A. Wigzell
RAFK	R. A. F. Kemp	NJW	N. J. Westwood
JL	J. Lees	RGW	R. G. Wheeler
JWL	J. W. Lund	A&R	Ash & Ridley
AEM	A. E. Male	C&C	Campbell & Campbell
BAEM	B. A. E. Marr	C&E	Carter & Edwards
CDTM	C. D. T. Minton	D&Q	Dickens & Quin
CKM	C. K. Mylne	D&SC	Misses D & S Crofts
JM	J. MacGeoch	F&H	Felstead & Hutchings
JDM	J. D. Mounsey	F&M	Flegg & Musson
JMM	J. M. McMeeking	HE&W	Hurrell, Ebert & Waite
PPM	P. P. Mackie	HM&M	Hamilton, Macgregor & Mills
CAN	C. A. Norris	J&AP	J. & A. H. Platt
BBO	Bradwell Bird Observatory	K&K	Kay & Kay
CBO	Cley Bird Observatory		
DBO	Dungeness Bird Observa- tory		
MHBO	Monks' House Bird Obser- vatory		
SABO	St. Agnes Bird Observatory		

ND&N Northumberland, Durham
& Newcastle N.H.S.
N&L Nelson & Leedal
P&B Pyman & Barton

P&S Parker & Summers
S&W Sanderson & Walker
Sm&W Smith & Walker
T&H Thearle & Hobbs

NOTE—Ringers' initials are omitted when the ringing was carried out: (i) at one of the following observatories—Bardsey, Cley, Copeland, Dungeness, Fair Isle, Gibraltar Point, Lundy, Isle of May, Portland, Great Saltee, Skokholm and Spurn; (ii) at Abberton Reservoir—where all ringing is carried out by Major-General C. B. Wainwright; (iii) on the Farne Islands, where all ringing is carried out by the Northumberland, Durham & Newcastle N.H.S.; (iv) by the Wildfowl Trust (nearly all ducks and geese).

Selected List of Recoveries Reported during 1958

The following list is highly selective. To indicate the quantity and nature of the material omitted the total number of recoveries is stated in brackets after the scientific name of each species, followed by the minimum movement, in miles, to qualify for inclusion. All foreign recoveries are either given in full or mentioned in the summaries. Species which produced only local recoveries are left out, but the individual totals thus omitted are listed in Table II.

Key to Symbols and Terms

Ring number: Where this is in italics the ring has been returned.

O: Indicates bird breeding, or bred, at place of ringing.

Age: pull. (pullus)—nestling or chick, *not yet flying*;

juv.—young, *able to fly freely*;

1st W.—bird in its first winter;

f.g.—full-grown, age uncertain;

ad.—adult; at least one year old.

Sex: ♂—male; ♀—female.

v: Caught or trapped, and released with ring.

+: Shot or killed by Man.

x: Found dead or dying.

x A: Found long dead.

(): Caught or trapped alive, and not released, or released but with ring removed.

[?]: Manner of recovery unknown.

Date of recovery: Where this is unknown the date of the reporting letter is given in brackets.

Distance: The distance, given in miles, and the directions are approximate.

Arrangement of entry: Ringing details are given on the first or first and second lines, with recovery data on a new line below.

Little Grebe (*Podiceps ruficollis*) (1)

1959 ad. 29.10.56 Abberton: 51°50'N. 0°53'E. (Essex)
x 29.10.58 Aintree (Lancashire) 195m. NW.

Leach's Petrel (*Oceanodroma leucorhoa*) (3: 5 miles)

1955 ad. 6.8.57 Foula: 60°08'N. 2°07'W. (Shetland) DRW
v 6.7.58 North Rona, Outer Hebrides 150m. WSW.

1957 ad. 11.7.58 North Rona: 59°07'N. 5°50'W. Outer Hebrides TBB
x 25.7.58 St. Kilda, Outer Hebrides 135m. SW.

Storm Petrel (*Hydrobates pelagicus*) (1)

1949 f.g. 18.7.58 Fair Isle: 59°32'N. 1°37'W. (Shetland)
v 8.8.58 Mousa (Shetland) 35m. NNE.

Manx Shearwater (*Procellaria puffinus*) (58: 100 miles)

AT55534	O	pull.	19.9.58	Copeland: 54°40'N. 5°32'W. (Down)
	v		25.9.58	Hoylake (Cheshire) 130m. SE.
AT28178		f.g.	1.8.56	Bardsey: 52°46'N. 4°48'W. (Caernarvon)
	×		6.8.58	Allonby (Cumberland) 145m. NNE.
AT50166	O	pull.	16.8.57	Skokholm: 51°42'N. 5°16'W. (Pembroke)
	+		10.7.58	Off Cape Spear: 47°32'N. 52°34'W. Newfoundland
3063556	O	pull.	7.9.58	Skokholm
	×		15.11.58	Caraguatatuba: 23°38'S. 45°32'W. (Sao Paulo) Brazil

The remaining recoveries showing movements of more than 100 miles relate to birds ringed on Skokholm, and are as follows:

	<i>Ringed</i>			<i>Recovered</i>	
AT35615	17.8.55	ad.	(5.4.58)	Gironde, France	
AX4391	27.8.51	ad.	10.4.58	Gironde, France	
AT49812	26.7.57	ad.	17.4.58	Annet, Scilly 135m. SSW.	
AT24735	23.8.54	pull.	17.4.58	Annet	
AT48043	26.3.51	ad.	5.5.58	Finistère, France	
AT56817	7.5.58	ad.	15.6.58	Castlegregory (Kerry) 205m. W.	
AT44368	6.9.56	pull.	24.6.58	Finistère, France	
AT37006	15.8.55	ad.	(19.7.58)	Dalbeattie (Kirkcudbright) 230m. NNE.	
AT42058	16.8.56	ad.	(9.8.58)	Luce Bay (Wigtown) 205m. N.	
AT31089	13.7.55	ad.	3.8.58	Kintyre (Argyll) 260m. N.	
AT48137	29.4.54	ad.	5.8.58	Nr. Holyhead (Anglesey) 110m. NNE.	
AT42007	16.8.56	ad.	15.8.58	At sea 49°30'N. 8°55'W. 220m. SW.	
AT40886	9.7.56	ad.	9.4.58	Annet	
			25.8.58	Annet	
3063220	4.9.58	pull.	18.9.58	Nr. Wolverhampton (Stafford) 140m. ENE.	

Fulmar (*Fulmarus glacialis*) (16: 50 miles)

AT22684	O	pull.	21.8.56	Foula: 60°08'N. 2°07'W. (Shetland) CKM
	+		(14.3.58)	Off Newfoundland : 49°03'N. 50°20'W.
AT61745	O	pull.	8.8.58	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	+	ca.	10.10.58	Fuenterrabia: 43°22'N. 1°48'W. (Guipúzcoa) Spain
3054716	O	pull.	14.8.58	Eynhallow: 59°08'N. 3°08'W. (Orkney) AU
	()		4.9.58	Vaag: 61°29'N. 6°49'W. Suderö, Faeroes
AT13245	O	pull.	25.8.54	Sula Sgeir: 59°06'N. 6°10'W. Outer Hebrides JF
	()		10.4.58	Off Sandö: ca. 61°50'N. 6°54'W. Faeroes
AT13528	O	pull.	26.8.54	Sula Sgeir JF
	+		19.9.58	Trollanes: 62°22'N. 6°46'W. Kallsøy, Faeroes
AT45091	O	pull.	10.7.56	St. Kilda: 57°49'N. 8°34'W. Outer Hebrides Sm&W
	/?/		17.12.58	Off NE. Newfoundland : 51°58'N. 50°52'W.
347768	O	pull.	19.7.54	Kilchiaran: 55°45'N. 6°28'W. (Argyll) CH
	×		(4.5.58)	Kirk Michael, Isle of Man 120m. SE.
AT33724	O	pull.	4.8.57	Isle of May: 56°11'N. 2°33'W. (Fife)
	()		14.6.58	Nr. Sandettié Lightship: 51°13'N. 1°53'E. (France)
AT46338	O	pull.	26.7.57	St. Abbs Head: 55°55'N. 2°08'W. (Berwick) IJP
	()		1.9.58	Rybachli Bank: 69°40'N. 33°30'E. Barents Sea, U.S.S.R.
393686		ad.	30.6.56	Cromer: 52°56'N. 1°18'E. (Norfolk) CBO
	()		end 7.58	Off SW. Norway : ca. 58°00'N. 5°15'E.

Gannet (*Sula bassana*) (52: 150 miles)

5124	O	pull.	9.9.57	Sula Sgeir: 59°06'N. 6°10'W. Outer Hebrides	JM
	()		27.12.58	Mers-el-Kébir: 35°48'N. 0°43'W. Algeria	
5128	O	pull.	9.9.57	Sula Sgeir	JM
	()		20.6.58	Off Courbet-Marine: 36°50'N. 3°35'E. Algeria	
5181	O	pull.	5.9.58	Sula Sgeir	JM
	()		31.10.58	Malin (Donegal) 265m. SSW.	
5201	O	pull.	7.7.57	Bass Rock: 56°04'N. 2°38'W. (East Lothian)	JEK
	()		18.4.58	Cape Verde Islands: ca. 16°00'N. 24°00'W.	
5304	O	pull.	1.7.58	Bass Rock	IVBP
	×		31.12.58	Nr. Bizerta: 37°18'N. 9°52'E. Tunisia	
5417	O	pull.	3.8.57	Ailsa Craig: 55°13'N. 5°07'W. (Ayr)	JAB
	()		20.8.58	At sea, 100 miles SSW. Cape Clear: 49°50'N. 11°00'W.	
5580	O	pull.	3.8.57	Ailsa Craig	JAB
	×		(18.8.58)	Fladen Grounds: ca. 58°25'N. 0°17'E. North Sea	
5952	O	ad.	3.8.57	Ailsa Craig	JAB
	×		(10.3.58)	Bressay (Shetland) 370m. NNE.	
5974	O	pull.	24.6.56	Grassholm: 51°44'N. 5°29'W. (Pembroke)	SBO
	×		4.10.58	Brighton (Sussex) 185m. ESE.	

In addition to those listed above, 27 birds were recovered abroad as follows:

TABLE A—COUNTRY AND MONTH OF RECOVERY OF GANNETS (*Sula bassana*)

Country of recovery	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Ireland (2)	—	—	—	—	—	—	—	1	—	—	(1)	—
Spain (3)	1	—	1	—	—	—	1	—	—	—	—	—
France (2)	—	1	—	—	—	1	—	—	—	—	—	—
England (1)	—	1	—	—	—	—	—	—	—	—	—	—
Portugal (7)	1	2	—	1	1	—	1	—	—	—	—	1
Spain (6)	1	1	1	2	1	—	—	—	—	—	—	—
Portugal (3)	—	—	—	(1)	1	1	—	—	—	—	—	—
Spain (3)	—	—	—	1	1	—	—	—	1	—	—	—

Tables A-G in this Report are subject to error in cases where it has been necessary to assume that the date of recovery was approximately that of the letter reporting it, whereas the bird may have been dead for some time before found or reported. Records of this type are bracketed when they are the only ones for the months concerned, this treatment is not, of course, possible when there are several records for the same month.

Cormorant (*Phalacrocorax carbo*) (65: 100 miles)

587	O	pull.	24.6.57	Nr. Nigg: 57°41'N. 3°59'W. (Ross)	JL
	×		26.1.58	Douglas, Isle of Man 245m. S.	
5878	O	pull.	13.6.57	Farne Islands: 55°37'N. 1°37'W. (Northumberland)	
	×		25.11.58	Barbatre: 46°56'N. 2°10'W. (Vendée) France	
5883	O	pull.	7.7.51	Puffin Island: 53°19'N. 4°01'W. (Anglesey)	T&H
	+		26.1.58	River Fowey (Cornwall) 200m. SSW.	
5943	O	pull.	22.7.53	Puffin Island	T&H
	[?]		0.1.58	Boiro: 42°39'N. 8°53'W. (Coruña) Spain	
5943	O	pull.	21.7.58	St. Margaret's Island: 51°38'N. 4°42'W. (Pembroke)	WWFS
	()		10.11.58	Nr. Vigo: 42°15'N. 8°44'W. (Pontevedra) Spain	
5992	O	pull.	3.7.54	St. Margaret's Island	WWFS
	[?]		22.1.56	Sada: 43°22'N. 8°15'W. (Coruña) Spain	
5993	O	pull.	27.6.58	Lundy: 51°12'N. 4°40'W. (Devon)	
	+		21.9.58	Lanildut: 48°29'N. 4°45'W. (Finistère) France	

Most of the remaining recoveries are of birds ringed in Wigtown at Castle Loch near Mochrum ($54^{\circ}47'N$. $4^{\circ}34'W$.) and in Northumberland on the Farne Islands ($55^{\circ}37'N$. $1^{\circ}37'W$.) and may be summarized as follows:

Ringed at Castle Loch

<i>Miles</i>		<i>Direction of movement</i>							
		N.	NE.	E.	SE.	S.	SW.	W.	NW.
0-75	...	2	—	6	—	1	1	1	1
76-150	...	1	5	—	2	—	—	—	—
151-225	...	—	1	—	—	1	—	—	—
226-300	...	—	—	—	1	—	—	—	—

Ringed on Farne Islands

<i>Miles</i>		<i>Direction of movement</i>							
		N.	NE.	E.	SE.	S.	SW.	W.	NW.
0-75	...	—	—	—	3	3	1	—	11
76-150	...	—	—	—	—	—	—	3	1
151-225	...	—	—	—	4	—	—	—	—
226-300	...	—	—	—	—	—	—	—	—
301-375	...	—	—	—	1	—	—	—	—

Shag (*Phalacrocorax aristotelis*) (119: 100 miles)

Birds ringed on the west coasts of England and Wales showed the regular tendency to move southwards and eastwards during the first year of life, there being French recoveries in Seine-Maritime on (26.2.58) and 12.11.58 and in Côtes-du-Nord on 6.6.58, and a Spanish one in Santander on 5.8.58. A bird from the Farne Islands was recovered in Pas-de-Calais, France, in January.

The following recoveries are given in full because relatively few Shags have been ringed in the north and west and the movements of these populations are less well known:

136190	O	pull.	12.8.57	Foula: $60^{\circ}08'N$. $2^{\circ}07'W$. (Shetland)	D&Q
	×		14.6.58	Portessie (Banff) 175m. SSW.	
518617	O	pull.	21.6.58	Fair Isle: $59^{\circ}32'N$. $1^{\circ}37'W$. (Shetland)	
	+		7.9.58	Nr. Holmengrå Lighthouse: $60^{\circ}51'N$. $4^{\circ}39'E$. (Sogn og Fjordane) Norway	
518614	O	pull.	21.6.58	Fair Isle	
	()		4.9.58	Fladen Grounds: ca. $58^{\circ}25'N$. $0^{\circ}17'E$. North Sea	
509648	O	pull.	3.7.57	Rhum: ca. $57^{\circ}00'N$. $6^{\circ}20'W$. (Inverness)	CH
	[?]		3.7.58	Nr. Portaferry (Down) 185m. SSE.	

During the early part of 1958 many young Shags from east coast colonies were recovered inland (see *Brit. Birds*, vol. li, pp. 84 and 130). The pattern of movements is similar to that which occurred in 1954 (see *Brit. Birds*, vol. xlviii, p. 471) but much more protracted and thus more difficult to relate to one set of weather conditions. For this period all recoveries over 100 miles are listed below (in recovery date order):

	Ringed		Recovered	
rne Is.	pull.	11.6.57	21.12.57	*Hertfordshire 270m. SSE.
rne Is.	pull.	6.7.57	31.12.57	Gloucestershire 300m. SSW.
rne Is.	pull.	29.6.57	(2.1.58)	Essex 285m. SSE.
f May	pull.	3.6.57	25.1.58	*Essex 330m. SSE.
rne Is.	pull.	10.6.57	27.1.58	Norfolk 210m. SSE.
rne Is.	pull.	6.7.57	3.2.58	*Kent 310m. SSE.
f May	pull.	3.6.57	9.2.58	Norfolk 260m. SE.
rne Is.	pull.	6.7.57	13.2.58	*Huntingdonshire 240m. SSE.
rne Is.	pull.	10.6.57	15.2.58	*Cambridgeshire 220m. SSE.
f May	pull.	2.6.57	(18.2.58)	*Lincolnshire 250m. SSE.
f May	pull.	4.6.57	19.2.58	Yorkshire 200m. SE.
rne Is.	pull.	6.7.57	19.2.58	Caithness 200m. NNW.
f May	pull.	26.6.57	21.2.58	Banffshire 100m. NNW.
f May	pull.	3.6.57	22.2.58	Lincolnshire 240m. SE.
f May	pull.	3.6.57	(27.2.58)	Ross-shire 120m. NNW.
ss Rock	pull.	2.7.57	3.3.58	*Cambridgeshire 290m. SSE.
rne Is.	pull.	21.6.57 <i>ca.</i>	9.3.58	Norfolk 210m. SSE.
f May	pull.	26.6.57	15.3.58	Banffshire 100m. N.
rne Is.	pull.	29.6.57	16.3.58	Norfolk 245m. SSE.
f May	pull.	14.7.56	16.3.58	Norfolk 255m. SSE.
ss Rock	pull.	2.7.57	16.3.58	Suffolk 320m. SSE.
rne Is.	pull.	4.8.57	16.3.58	Orkney 240m. NNW.
rne Is.	juv.	4.8.57	(17.3.58)	*Bedfordshire 255m. SSE.
f May	pull.	5.7.57	2.5.58	*Cambridgeshire 280m. SSE.

*Inland locality

Heron (*Ardea cinerea*) (40: 100 miles)

123	O pull.	17.4.52	Nr. Downpatrick: 54°09'N. 5°43'W. (Down)	JAB
	×	30.3.58	Nr. Bowes (York)	150m. E.
820	O pull.	12.5.57	Deeping St. James: 52°40'N. 0°17'W. (Lincoln)	CBC
	+	2.11.58	Tambo I.: 42°24'N. 8°42'W. (Pontevedra)	Spain
909	O pull.	28.4.56	Deeping St. James	DRW
	+	<i>autumn</i> 1958	Nr. Stroud (Gloucester)	100m. SW.
607	O pull.	26.4.58	Denver: 52°35'N. 0°22'E. (Norfolk)	CBC
	+	(16.10.58)	Aveiro: 40°38'N. 8°40'W. (Beira Litoral)	Portugal

Mallard (*Anas platyrhynchos*) (630)

837	f.g. ♂	15.2.56	Ludham: 52°42'N. 1°33'E. (Norfolk)	
	+	0.10.58	Toke: 59°07'N. 9°05'E. (Telemark)	Norway
100	f.g. ♂	28.4.57	Deeping Lake: 52°40'N. 0°17'W. (Lincoln)	
	v	12.8.57	Anna Jacoba Polder: 51°38'N. 4°08'E. (Zeeland)	Netherlands
	+	(11.1.58)	Ollerton: 53°12'N. 1°01'W. (Nottingham)	
255	f.g. ♂	14.5.57	Deeping Lake	
	+	17.8.58	Tjaereborg: 55°28'N. 8°35'E. (Jutland)	Denmark
918	f.g. ♂	14.1.58	Peakirk: 52°38'N. 0°17'W. (Northampton)	
	+	30.11.58	Nr. Brody: 50°15'N. 13°20'E. (Bohemia)	Czechoslovakia
327	f.g. ♀	11.1.57	Peakirk	
	+	1.10.58	Røykenvik: 60°25'N. 10°29'E. (Opland)	Norway
943	f.g. ♂	27.1.58	Peakirk	
	+	3.9.58	Nr. Örje: 59°28'N. 11°40'E. (Ostfold)	Norway

943954	v	f.g. ♀ (with young)	30.1.58 6.6.58	Peakirk Enånger: 61°31'N. 17°00'E. (Gavleborg) Sweden
	+		1.9.58	Nr. Enånger
938458 Leiden	v	juv. ♂	2.9.56 1.8.57	Abberton: 51°50'N. 0°53'E. (Essex) Anna Jacoba Polder: 51°38'N. 4°08'E. (Zeeland)
284065	+		24.1.58	Netherlands Aldeburgh: 52°09'N. 1°36'E. (Suffolk)
940446	+	ad. ♂	2.6.58 (7.8.58)	Abberton Hüntel: 52°48'N. 7°15'E. (Niedersachsen) Germany
938608	× A	f.g. ♀	8.6.57 (17.1.58)	Abberton Nr. Rannoch Station (Perth) 39om. NW.
940060	+	juv.	26.8.57 16.8.58	Abberton Lisheen (Tipperary) 36om. W.
944846	+	1stW. ♂	15.12.57 28.10.58	Slimbridge: 51°44'N. 2°25'W. (Gloucester) Cserkeszöllő: 46°52'N. 20°12'E. (Jasz-Nagy-Kun- Szolnok) Hungary
941981	v	f.g. ♂	2.2.57 13.8.57	Slimbridge Giethoorn: 52°44'N. 6°02'E. (Overijssel) Netherlands
	+		27.12.58	Little Easton: 51°54'N. 0°20'E. (Essex)
AH2926	O	juv.	5.7.55	Damerham: 50°56'N. 1°48'W. (Hampshire) A&R
	+	(hand- reared)	0.9.58	Rannu: 58°14'N. 26°10'E. (Elva) Estonian S.S.R.

In addition to the above, 121 Mallard ringed in the British Isles between August and March were recovered abroad as follows:

TABLE B—COUNTRY AND MONTH OF RECOVERY OF MALLARD (*Anas platyrhynchos*)

Country of recovery	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
France (18)	—	—	—	2	1	3	1	2	—	4	5
Holland (32)†	—	—	—	3	7	5	3	5	7	1	—
Denmark (19)†	—	—	—	—	7	1	1	7	2	—	—
Germany (12) & Poland (1)	1	—	1	—	4	2	1	2	2	—	—
Sweden (19)*	—	—	—	—	9	7	2	—	—	—	—
Finland (11)	—	—	1	—	8	2	—	—	—	—	—
U.S.S.R. and Baltic States (9)	1	1	1	—	4	2	—	—	—	—	—

†Total includes one bird reported recovered in "autumn".

*Total includes one bird reported recovered in "spring".

See footnote to Table A.

Of the 397 Mallard recovered in the British Isles, only 77 show movement of more than 50 miles and only 28 more than 100 miles. Of interest are four Slimbridge birds recovered in Ayrshire (8.10.50–22.9.58), Londonderry (15.12.57–0.10.58), Fife (5.11.55–ca. 1.11.58) and Cumberland (25.9.55–26.12.58); and a Peakirk bird in Berwickshire (24.9.57–27.10.58).

Teal (*Anas crecca*) (375)

358488	O	pull.	24.6.56	Gladhouse Reservoir: 55°46'N. 3°08'W. (Midlothian) DGA
	/?/		(22.1.58)	Nr. Ballymoney (Antrim) 14om. WSW.
Leiden 270052		1stW. ♂	27.12.54	Piaam: 53°02'N. 5°25'E. (Friesland) Netherlands
917868	v		1.10.55	Abberton: 51°50'N. 0°53'E. (Essex)
	+		15.8.58	Nr. Alunda: 60°03'N. 18°05'E. (Uppsala) Sweden

7507	ad. ♀	14.2.55	Abberton
	v	7.9.55	De Koog: 53°06'N. 4°48'E. Texel, Netherlands
	v	29.11.55	De Koog
	+	17.9.56	Vyshni Volochek: 57°34'N. 34°33'E. (Kalinin) U.S.S.R.
7794	juv. ♂	22.9.55	Abberton
	v	16.12.56	Giekerk: 53°15'N. 5°55'E. (Friesland) Netherlands
	+	21.8.58	Persöfjärden: 65°46'N. 22°10'E. (Norrbotten) Sweden
06337	ad. ♂	15.11.55	Abberton
	+	9.3.58	Bentivoglio: 44°37'N. 11°26'E. (Emilia) Italy
21735	ad. ♂	11.12.56	Abberton
iden	v	6.9.57	Naardermeer: 52°18'N. 5°08'E. (Noord-Holland) Netherlands
9100	+	22.8.58	Emajõgi: 58°25'N. 27°09'E. (Tartu) Estonian S.S.R.
224262	ad. ♀	6.10.57	Abberton
	+	13.12.58	Damsay (Orkney) 520m. NNW.

In addition to the above, 175 birds ringed in the British Isles between September and March (two in first week April) were recovered abroad as follows:

TABLE C—COUNTRY AND MONTH OF RECOVERY OF TEAL (*Anas crecca*)

Country of recovery	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Ireland (4)	—	—	—	—	—	—	—	—	—	—	3	1
France (50)	—	—	—	—	2	2	1	1	3	15	12	14
England (13)* and Belgium (7)	—	—	—	1	2	2	2	3	1	3	3	—
Denmark (20)	1	—	—	—	7	9	3	—	—	—	—	—
Germany (14) and Poland (2)	1	1	—	—	5	1	5	—	2	1	—	—
Norway (2) and Sweden (13)	1	—	1	—	8	2	3	—	—	—	—	—
Scotland (25)	1	6	1	3	8	6	—	—	—	—	—	—
U.S.S.R. and Baltic States (25)	—	9	1	—	11	3	1	—	—	—	—	—

*Total includes three undated recoveries. See footnote to Table A.

36 Teal ringed at Abberton and 3 at Slimbridge were recovered in Ireland. Of the remaining 152 recoveries in the British Isles, 3 show a movement of over 300 miles, 9 a movement of 200–299 miles, 27 a movement of 100–199 miles, and 113 a movement of less than 100 miles.

Garganey (*Anas querquedula*) (4)

4531	ad. ♂	21.8.53	Abberton: 51°50'N. 0°53'E. (Essex)
	+	14.9.58	Bozzolo: 45°07'N. 10°29'E. (Lombardy) Italy
7590	ad. ♂	10.6.55	Abberton
	+	4.3.58	Nr. Udine: 46°04'N. 13°14'E. (Venezia) Italy
24170	ad. ♀	9.4.57	Abberton
	+	31.3.58	Lac de Grand-Lieu: 47°06'N. 1°40'W. (Loire-Atlantique) France
24202	ad. ♂	30.7.57	Abberton
	+	31.3.58	Nr. Audenge: 44°42'N. 1°01'W. (Gironde) France

Gadwall (*Anas strepera*) (5: 15 miles)

24187	ad. ♀	24.5.57	Abberton: 51°50'N. 0°53'E. (Essex)
	+	11.10.58	Gressenhall (Norfolk) 60m. N.
24196	O pull.	1.7.57	Abberton
	+	5.1.58	Vauvert: 43°41'N. 4°16'E. (Gard) France

3024197	O	pull.	14.7.57	Abberton	
	+		0.2.58	Vaccarses:	43°32'N. 4°35'E. (Bouches-du-Rhône)
				France	
3041475		ad. ♀	23.5.58	Abberton	
	+		11.11.58	Nr. Le Havre:	49°30'N. 0°06'E. (Seine-Maritime)
				France	

Wigeon (*Anas penelope*) (26)

918868		f.g. ♀	2.4.56	Deeping Lake:	52°40'N. 0°17'W. (Lincoln)
	+		24.11.58	Lough Erne	330m. WNW.
919085		f.g. ♂	5.4.57	Deeping Lake	
	+		3.3.58	Vespolate:	45°21'N. 8°40'E. (Novara) Italy
3021632		1st W. ♂	5.12.56	Abberton:	51°50'N. 0°53'E. (Essex)
	+		19.3.58	Ponte Buggianese:	43°50'N. 10°47'E. (Toscana) Italy
3024049		1st W. ♂	14.1.57	Abberton	
	+		ca. 17.12.57	Holy Island (Northumberland)	285m. NNW.

In addition to the above, Wigeon ringed at Abberton during December-March were recovered as follows. **France:** Vendée, 1.2.58; Loire-Atlantique, 24.1.58. **Netherlands:** Friesland, 6.11.58. **Denmark:** Jutland, 21.9.58; Fyn, 2.9.58; Sjaelland, 29.10.57. **Sweden:** Norrbotten, 21.8.54, 6.6.58; Östergötland, 3.10.58. **U.S.S.R.:** Kaliningrad, 20.10.58; Arkhangel, 18.8.58; Komi, spring 1957, 20.5.58. Eight birds were recovered in England at distances up to 130 miles from the ringing locality.

Pintail (*Anas acuta*) (10: 20 miles)

AD9617	O	pull.	2.7.55	Killyleagh:	54°24'N. 5°39'W. (Down) PPM
	+		0.12.58	Maren:	51°48'N. 5°23'E. (Noord-Brabant) Netherlands
918837		f.g. ♀	21.3.56	Deeping Lake:	52°40'N. 0°17'W. (Lincoln)
	[?]		22.5.58	Leshukonskoe:	64°54'N. 45°42'E. (Arkhangel) U.S.S.R.
3007556		f.g. ♂	30.12.57	Peakirk:	52°38'N. 0°17'W. (Northampton)
	+		20.5.58	Leshukonskoe,	U.S.S.R.
932758		ad. ♂	5.3.53	Abberton:	51°50'N. 0°53'E. (Essex)
	+		11.9.58	Hyllekrog:	54°36'N. 11°30'E. (Lolland) Denmark
932958		ad. ♀	15.11.56	Abberton	
	×	early	12.57	Meissen:	51°10'N. 13°28'E. (Sachsen) Germany
932971		ad. ♂	28.12.56	Abberton	
	[?]		13.10.58	Nordstrand:	ca. 54°30'N. 8°50'E. (Schleswig-Holstein)
				Germany	
938840		f.g. ♀	19.12.55	Slimbridge:	51°44'N. 2°25'W. (Gloucester)
	+		20.8.56	Uniküla:	58°14'N. 26°08'E. (Elva) Estonian S.S.R.
944990		f.g. ♀	22.12.57	Slimbridge	
	+		16.10.58	Vejlerne:	57°05'N. 9°40'E. (Jutland) Denmark

Shoveler (*Spatula clypeata*) (7: 10 miles)

919088		f.g. ♂	22.4.57	Deeping Lake:	52°40'N. 0°17'W. (Lincoln)
	+		3.2.58	Lough Bunny (Clare)	340m. W.
932995		juv.	10.7.57	Abberton:	51°50'N. 0°53'E. (Essex)
	+		8.1.58	Argenta:	44°37'N. 11°50'E. (Emilia) Italy
YE0207	O	pull.	7.8.58	Abberton	
	+		21.12.58	Champdieu:	45°40'N. 4°03'E. (Loire) France

9102	1stW. ♀	18.11.55	Slimbridge: 51°44'N. 2°25'W. (Gloucester)
+		12.9.58	Kronshtadt: 60°00'N. 29°37'E. U.S.S.R.
5373	juv. ♀	12.9.57	Slimbridge
()		16.9.58	Nr. Hedel: 51°46'N. 5°15'E. (Gelderland) Netherlands
Orielton	f.g.	31.12.55	Orielton: 51°40'N. 4°57'W. (Pembroke)
44	+	7.10.58	Mandö: 55°17'N. 8°33'E. (Jutland) Denmark

Scaup (*Aythya marila*) (2)

75406	O f.g. ♂	28.7.54	Cley: 52°58'N. 1°03'E. (Norfolk)
	(hand-reared)		
+		25.5.58	Ust-Tsilma: 65°26'N. 52°11'E. (Komi) U.S.S.R.

Tufted Duck (*Aythya fuligula*) (8: 80 miles)

8927	f.g. ♀	26.12.56	Deeping Lake: 52°40'N. 0°17'W. (Lincoln)
+		21.9.58	Nr. Höckhult: 57°31'N. 16°45'E. (Kalmar) Sweden
02482	f.g. ♀	3.12.56	Walton Reservoirs: 51°17'N. 0°15'W. (Surrey) CMP
+		0.5.58	Ust-Tsilma: 65°26'N. 52°11'E. (Komi) U.S.S.R.

Shelduck (*Tadorna tadorna*) (3: 10 miles)

4155	O pull.	23.7.58	Pagham Harbour: 50°46'N. 0°45'W. (Sussex) BS
	×	15.9.58	Penarth Head (Glamorgan) 110m. WNW.
4158	O pull.	23.7.58	Pagham Harbour BS
()		18.9.58	Fort-Mahon-Plage: 50°20'N. 1°34'E. (Somme) France

Grey Lag Goose (*Anser anser*) (10: 150 miles)

3408	1stW.	14.11.53	(Kinross)
+	ca.	20.9.57	Ashverfi: 63°50'N. 20°36'W. Iceland
3454	1stW.	22.11.53	(Dumfries)
+	ca.	20.9.57	Ashverfi, Iceland

White-fronted Goose (*Anser albifrons*) (7)

9377	ad.	27.2.50	Slimbridge: 51°44'N. 2°25'W. (Gloucester)
+		2.10.58	Virolahti: 60°30'N. 27°42'E. (Kymi) Finland
This is the first recovery of a British-ringed White-fronted Goose in Finland.			
0051	ad.	25.2.51	Slimbridge
+		23.5.58	Mezen: 65°50'N. 44°17'E. (Arkhangel) U.S.S.R.
VT79	ad. ♀	21.2.58	Slimbridge
[/?]		25.5.58	R. Perepusk: 66°42'N. 45°22'E. (Arkhangel) U.S.S.R.
VT100	ad. ♀	21.2.58	Slimbridge
[/?]		20.9.58	Oma: 66°39'N. 47°20'E. (Arkhangel) U.S.S.R.
VT262	1stW. ♂	21.2.58	Slimbridge
×		20.10.58	Oost Flevoland: ca. 52°35'N. 5°35'E. Netherlands
VT264	1stW. ♂	21.2.58	Slimbridge
+		1.12.58	Tetney Fitties (Lincoln) 160m. NE.
VT306	ad. ♂	4.3.58	Slimbridge
+		7.11.58	Nr. Stralsund: 54°18'N. 13°06'E. (Mecklenburg) Germany

Pink-footed Goose (*Anser arvensis brachyrhynchus*) (364)

Five birds were recovered in Iceland between May and October, one off Scoresby Sund in east Greenland in July, and one in Jutland in March. 321 birds were reported from the main wintering grounds in Britain. Ten of them had

been ringed originally in Iceland during 1951-1953 and subsequently re-ringed in Great Britain; three had been first ringed in Great Britain in 1950 and recaptured in Iceland in 1953.

Mute Swan (*Cygnus olor*) (41: 25 miles)

YB1158	juv.	17.9.57	Sleaford: 52°59'N. 0°25'W. (Lincoln) WMP
v		6.8.58	Peterborough (Northampton) 30m. SSE.
YB075	juv.	7.9.56	Abberton: 51°50'N. 0°53'E. (Essex)
v		20.12.58	Wanstead Flats (Essex) 37m. SW.
YB017	ad.	5.9.56	Durleigh: 51°07'N. 3°03'W. (Somerset) WT
v	ca.	17.4.58	Nr. Christchurch (Hampshire) 60m. ESE.

Sparrowhawk (*Accipiter nisus*) (7: 5 miles)

329143	1stW. ♂	23.9.57	Isle of May: 56°11'N. 2°33'W. (Fife)
v		7.5.58	Fair Isle (Shetland) 235m. NNE.

Marsh Harrier (*Circus aeruginosus*) (3: 45 miles)

3011831	O pull.	24.6.58	Hickling Broad: 52°45'N. 1°35'E. (Norfolk) EAGD
×		14.9.58	Holbeach (Lincoln) ca. 60m. W.

Montagu's Harrier (*Circus pygargus*) (3: 30 miles)

3018876	O pull.	9.8.58	Dartmoor (Devon) AVS
+		7.9.58	Nr. Brucheville: 49°22'N. 1°12'W. (Manche) France

Peregrine (*Falco peregrinus*) (1)

409462	O pull.	31.5.53	Lundy: 51°12'N. 4°40'W. (Devon)
×	ca.	17.3.58	Nr. Drogheda (Louth) 190m. NNW.

Merlin (*Falco columbarius*) (1)

3054134	O pull.	29.6.58	(Perth) Sm&W
×		28.11.58	(Lanark) 40m. SE.

Kestrel (*Falco tinnunculus*) (27: 50 miles)

3016925	O pull.	21.6.57	Firth: 59°01'N. 3°09'W. (Orkney) EB
v		6.9.58	Geleen: 50°58'N. 5°45'E. (Limburg) Netherlands
329150	juv.	25.7.58	Isle of May: 56°11'N. 2°33'W. (Fife)
×		7.12.58	Crowland (Lincoln) 260m. SSE.
3019018	O pull.	9.6.58	Colinton: 55°54'N. 3°16'W. (Midlothian) IVBP
+		(23.7.58)	Edenhall (Cumberland) 85m. SSE.
3019019	O pull.	9.6.58	Colinton IVBP
×		11.1.59	Tufton (Pembroke) 285m. SSW.
3019021	O pull.	9.6.58	Colinton IVBP
+		12.11.58	Sidley (Sussex) 380m. SSE.
3019022	O pull.	9.6.58	Colinton IVBP
×		13.12.58	Blackburn (West Lothian) 14m. W.
3030061	O pull.	16.6.57	Lorton: 54°37'N. 3°18'W. (Cumberland) RS
×		28.10.58	Routh (York) 125m. ESE.
3027315	O pull.	29.6.58	Thornage: 52°54'N. 1°05'E. (Norfolk) CBO
×		27.9.58	Nr. Wigan (Lancashire) 160m. WNW.
370898	O pull.	6.7.58	Handley: 50°57'N. 2°00'W. (Dorset) AEB
+		7.12.58	La Reorthe: 46°36'N. 1°03'W. (Vendée) France

3019018, 19, 21 and 22 belonged to the same brood of five. Publication of 3019019 has been advanced to show the recovery in its context.

Red-legged Partridge (*Alectoris rufa*) (1)

2131	f.g.	29.9.56	Spurn Point: 53°35'N. 0°06'E. (York)
+		30.12.58	Thwing (York) 40m. NW.

Water Rail (*Rallus aquaticus*) (2: 20 miles)

222	ad.	4.12.57	Abberton: 51°50'N. 0°53'E. (Essex)
×		24.4.58	Broumov: 50°36'N. 16°20'E. Czechoslovakia

This is the first recovery of a British-ringed Water Rail in Czechoslovakia.

Corncrake (*Crex crex*) (1)

789	f.g.	11.5.58	Fair Isle: 59°32'N. 1°37'W. (Shetland)
×A		(30.7.58)	South Ronaldshay (Orkney) 70m. SW.

Moorhen (*Gallinula chloropus*) (19: 20 miles)

4775	1stW.	6.10.57	High Royd: 53°43'N. 1°51'W. (York) HSS
×		23.5.58	Nidd (York) 24m. NE.
1770	juv.	25.7.57	Nr. Colchester: 51°53'N. 0°55'E. (Essex) MSJS
×	ca.	22.7.58	Chevington (Suffolk) 26m. NW.

Coot (*Fulica atra*) (23: 100 miles)

1096	ad.	15.1.53	Abberton: 51°50'N. 0°53'E. (Essex)
+		15.2.58	Langedijk: 52°41'N. 4°49'E. (Noord-Holland) Netherlands
9538	ad.	20.3.54	Abberton
+		27.10.58	Maarsseveenseplassen: 52°08'N. 5°04'E. (Utrecht) Netherlands
18603	juv.	24.8.56	Abberton
+		1.11.58	Nr. Berck: 50°24'N. 1°36'E. (Pas-de-Calais) France
18636	juv.	30.12.56	Abberton
×		0.1.58	Zwaagwesteinde: 53°16'N. 6°08'E. (Friesland) Netherlands
18644	ad.	2.1.57	Abberton
()		11.10.58	Veenwouden: 53°14'N. 6°00'E. (Friesland) Netherlands
18670	ad.	21.2.57	Abberton
+		12.10.58	Tange Sö: 56°20'N. 9°37'E. (Jutland) Denmark
18706	ad.	24.5.57	Abberton
+		15.12.58	Blithfield Reservoir (Stafford) 130m. NW.
18714	ad.	4.7.57	Abberton
+		15.2.58	Langedijk: 52°41'N. 4°49'E. (Noord-Holland) Netherlands
18728	ad.	29.10.57	Abberton
+		15.1.58	Weston (Stafford) 135m. WNW.
18742	ad.	28.11.57	Abberton
/?/		17.8.58	Nr. Ringköbing: 56°10'N. 8°14'E. (Jutland) Denmark
18753	ad.	19.12.57	Abberton
/?/		23.1.58	Seghill (Northumberland) 240m. NW.
18783	ad.	18.3.58	Abberton
+		0.10.58	Nr. Ringköbing, Denmark

Oystercatcher (*Haematopus ostralegus*) (27: 100 miles)

100	O pull.	6.7.57	Fair Isle: 59°32'N. 1°37'W. (Shetland)
×		8.2.58	Parkgate (Cheshire) 430m. SSE.

385153	O	pull.	1.7.58	Fair Isle
	×		27.11.58	Morecambe (Lancashire) 38om. S.
359383	O	pull.	20.6.53	Durness: 58°33'N. 4°45'W. (Sutherland) EGH
	+		4.12.58	Lahinch (Clare) 42om. SSE.
380049	O	pull.	3.7.57	Durness EGH
	+		5.1.58	Ventry (Kerry) 50om. SSW.
3205355	O	pull.	10.6.57	Strath Nairn: ca. 57°18'N. 4°17'W. (Inverness) ESS
	×	A	4.5.58	Walney (Lancashire) ca. 24om. S.
390817	O	pull.	17.6.58	Aviemore: 57°12'N. 3°50'W. (Inverness) RPC
	/?		30.8.58	Cahirciveen (Kerry) 53om. SW.
3016526	O	pull.	13.6.57	Nr. Moniaive: 55°11'N. 3°55'W. (Dumfries) TT
	×		(8.1.58)	Nr. Swansea (Glamorgan) 24om. S.
327806	O	pull.	23.6.57	Nr. Arnside: 54°12'N. 2°50'W. (Westmorland) JAGB
	+		4.8.58	Dragey: 48°43'N. 1°30'W. (Manche) France
388502	O	pull.	12.6.57	Bardsey: 52°46'N. 4°48'W. (Caernarvon)
	()		0.8.58	Arteijo: 43°19'N. 8°29'W. (Coruña) Spain
3011851	O	pull.	1.7.58	Scolt Head: 52°59'N. 0°45'E. (Norfolk) EAGD
	×	A	26.12.58	Imsouane: 31°00'N. 9°50'W. Morocco

Lapwing (*Vanellus vanellus*) (36)

273611	O	pull.	9.6.57	Milton of Clova: 56°51'N. 3°06'W. (Angus) GBC
	/?		18.7.58	Nr. Sjørring: 56°56'N. 8°31'E. (Jutland) Denmark

In addition to the above, birds ringed in Scotland and northern England were recovered between November and February as follows: Ireland, 2; **France**, 3; **Spain**, 3; and **Portugal**, 1.

Ringed Plover (*Charadrius hiaticula*) (8: 30 miles)

X30035		juv.	26.8.54	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	+		27.5.56	Santander: 43°28'N. 3°48'W. Spain
S78328	O	pull.	18.6.57	Criccieth: 52°56'N. 4°14'W. (Caernarvon) LAP
	/?		10.3.58	Nr. Milford Haven (Pembroke) 9om. SSW.
S56345	O	pull.	23.6.57	Foulness: 51°37'N. 0°57'E. (Essex) F&H
	+		15.8.58	La Barre des Monts: 46°52'N. 2°07'W. (Vendée) France

Little Ringed Plover (*Charadrius dubius*) (3: 10 miles)

S76530	O	pull.	27.5.57	Nr. St. Albans: 51°46'N. 0°20'W. (Hertford) DJTH
	+		18.4.58	Nr. Melilla: 35°17'N. 2°57'W. Spanish Morocco
V78207	O	pull.	4.7.58	Nr. Canterbury: 51°17'N. 1°05'E. (Kent) DFH
	v		23.8.58	Tour du Valat: 43°30'N. 4°40'E. (Bouches-du-Rhône) France

Snipe (*Capella gallinago*) (10: 35 miles)

V10402	O	pull.	15.5.57	Nr. Appleby: 54°36'N. 2°29'W. (Westmorland) RWR
	+		21.1.58	Loch Ryan (Wigtown) 10om. W.
S13407	O	pull.	6.5.56	Nr. Abbeystead: 53°59'N. 2°40'W. (Lancashire) RMB
	+		26.10.58	Portumna (Galway) 23om. WSW.
S33606		ad.	3.10.55	Abberton: 51°50'N. 0°53'E. (Essex)
	/?		28.9.58	Primorsk: 54°46'N. 20°00'E. (Kaliningrad) U.S.S.R.

This is the first recovery of a British-ringed Snipe from the U.S.S.R.

34061	ad. ♀	2.7.57	Abberton
+		ca. 20.2.58	Nr. Winsford (Cheshire) 165m. WNW.
4549	ad.	13.10.57	Abberton
+		13.1.58	La Belle Ile: 47°17'N. 1°54'W. (Loire-Atlantique) France
58574	ad.	3.10.58	Abberton
()		1.11.58	Gatica: 43°22'N. 2°54'W. (Vizcaya) Spain

Jack Snipe (*Lymnocyptes minimus*) (1)

12251	f.g.	7.12.57	Epsom: 51°20'N. 0°16'W. (Surrey) DP
+		3.1.58	St. Augustin: 45°42'N. 1°06'W. (Charente-Maritime) France

Woodcock (*Scolopax rusticola*) (2: 5 miles)

7797	O pull.	24.5.58	Ilkley: 53°56'N. 1°49'W. (York) WNS
+		18.12.58	St. Evarzec: 47°56'N. 4°00'W. (Finistère) France

Curlew (*Numenius arquata*) (12: 70 miles)

11553	O pull.	21.5.56	Langwathby: 54°42'N. 2°39'W. (Cumberland) WH
+		ca. 19.1.58	Nr. Spiddal (Galway) 285m. WSW.
17347	O pull.	22.6.58	Raisbeck: 54°28'N. 2°35'W. (Westmorland) RMB
+		13.12.58	Nr. Lismore (Waterford) 270m. SW.
25950	O pull.	6.8.57	Nr. Harrogate: 53°59'N. 1°33'W. (York) S&W
+		4.10.58	Nr. Kilkeel (Down) 175m. W.
4094	O pull.	31.5.55	Nr. Harrogate S&W
+		8.11.58	R. Exe (Devon) ca. 240m. SSW.
2330	O pull.	11.6.54	Whitewell: 53°56'N. 2°33'W. (Lancashire) RMB
×		ca. 4.3.58	Pwllheli (Caernarvon) 100m. SW.
18549	f.g.	14.9.58	Lundy: 51°12'N. 4°40'W. (Devon)
×		28.10.58	Nr. Brest: 48°23'N. 4°30'W. (Finistère) France

Whimbrel (*Numenius phaeopus*) (1)

10816	ad. ♀	24.4.57	Dungeness: 50°55'N. 0°59'E. (Kent)
+		25.3.58	Grande Brière: ca. 47°24'N. 2°18'W. (Loire-Atlantique) France

Green Sandpiper (*Tringa ochropus*) (1)

3567	ad.	30.9.55	Abberton: 51°50'N. 0°53'E. (Essex)
+		8.12.55	Navalvillar del Pela: 39°05'N. 5°28'W. (Badajoz) Spain

Common Sandpiper (*Tringa hypoleucos*) (6: 20 miles)

0426	f.g.	21.8.58	Nr. Wisbech: 52°44'N. 0°11'E. (Cambridge) CDTM
+		ca. 14.9.58	Nr. Figueira da Foz: 40°09'N. 8°51'W. (Beira Litoral) Portugal
1448	ad.	16.5.56	Abberton: 51°50'N. 0°53'E. (Essex)
v		19.7.58	Nr. Wisbech (Cambridge) 65m. NW.
1577	ad.	13.6.56	Abberton
×		12.5.58	Douglas (Lanark) 320m. NW.
1922	juv.	31.7.56	Abberton
×		31.5.58	Aysgarth (York) 200m. NW.

Redshank (*Tringa totanus*) (4: 10 miles)

S89972	×	f.g.	13.9.57	Fenwick: 55°39'N. 1°54'W. (Northumberland) ND&N
			5.6.58	Laugabær: ca. 64°37'N. 21°33'W. Borgarfjörður, Iceland
V10386	O	pull.	16.5.58	Appleby: 54°36'N. 2°29'W. (Westmorland) RWR
	+		12.10.58	Gayton (Cheshire) 9om. SSW.

S89972 is the first recovery of a British-ringed Redshank in Iceland.

Dunlin (*Calidris alpina*) (8: 10 miles)

S42958		ad.	2.9.56	Nr. Seahouses: 55°35'N. 1°39'W. (Northumberland) MHBO
	+		(25.3.58)	La Teste de Buch: 44°34'N. 1°09'W. (Gironde) France
S42918		ad.	31.8.56	Nr. Seahouses MHBO
	+		15.3.57	Nr. Luçon: 46°28'N. 1°10'W. (Vendée) France
S21072		1stW.	19.8.55	Beadnell: 55°33'N. 1°37'W. (Northumberland) MHBO
	×		10.6.58	Hvitárþakki: ca. 64°09'N. 20°23'W. Arnessysla, Iceland
601009		f.g.	19.8.58	Holme: 52°58'N. 0°33'E. (Norfolk) CDTM
	+		ca. 0.11.58	Nr. Vila do Conde: 41°21'N. 8°45'W. (Douro Litoral) Portugal
R23188		juv.	23.8.58	Nottingham: 52°57'N. 1°08'W. JASB
	+		6.10.58	Noirmoutier: 47°01'N. 2°15'W. (Vendée) France
S1754-		f.g.	21.8.57	Nr. Camber: 50°56'N. 0°50'E. (Sussex) DBO
	+		9.5.58	Bassin d'Arcachon: 44°43'N. 1°10'W. (Gironde) France

S21072 is the first recovery of a British-ringed Dunlin in Iceland.

Great Skua (*Catharacta skua*) (5: 5 miles)

AH9506	O	pull.	8.7.58	Hermaness: 60°50'N. 0°53'W. (Shetland) Sm&W
	×		early 10.58	Nr. Montrelais: 47°24'N. 0°57'W. (Loire-Atlantique) France
AJ10528	O	pull.	9.7.58	Hermaness Sm&W
	()		17.12.58	Setubal: 38°31'N. 8°54'W. (Estremadura) Portugal
409690	O	pull.	24.6.56	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	×		28.7.58	Julianehåb Fjord: ca. 60°45'N. 46°00'W. Greenland

Great Black-backed Gull (*Larus marinus*) (22: 70 miles)

412004	O	pull.	24.6.57	Castlecraig: 57°41'N. 3°59'W. (Ross) JL
	×		end 4.58	Barnton (Midlothian) 120m. SSE.
412019	O	pull.	1.7.57	Castlecraig JL
	/?/		27.4.58	Mull of Kintyre (Argyll) 180m. SW.
412061	O	pull.	11.7.57	Castlecraig JL
	×		22.1.58	Troon (Ayr) 150m. S.

Lesser Black-backed Gull (*Larus fuscus*) (71)

25 birds were recovered in the British Isles, only six showing movements of more than 50 miles. The following are from areas where British-ringed birds are seldom recovered:

AF8779	O	pull.	10.8.53	Farne Islands: 55°37'N. 1°37'W. (Northumberland)
	/?/		3.9.55	Reus: 41°10'N. 1°06'E. (Gerona) Spain
AH7586	O	pull.	18.8.57	Farne Islands
	v		7.12.58	Nr. Algiers: 36°50'N. 3°00'E. Algeria

J2118 O pull. 18.8.57 Farne Islands
 27.12.58 Funchal: 32°40'N. 16°55'W. **Madeira**

This ring number was read through binoculars on the live bird.

J2747 O pull. 26.7.58 Rockcliffe: 54°56'N. 2°59'W. (Cumberland) RHB
 v 10.12.58 Nr. Algiers, **Algeria**

In addition to the above, 38 birds were recovered abroad as follows:

TABLE D—COUNTRY AND MONTH OF RECOVERY OF LESSER BLACK-BACKED GULLS
 (*Larus fuscus*)

Country of recovery	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
France and N. Spain (4)*	—	1	1	—	—	—	—	—	—	—	1	—
Spain and Portugal (30)	3	5	5	6	1	4	3	—	1	1	—	1
N.W. Africa (4)	—	—	—	3	—	1	—	—	—	—	—	—

*Total includes one undated recovery.
 See footnote to Table A.

Herring Gull (*Larus argentatus*) (75: 200 miles)

J1167 O pull. 17.6.57 Castlecraig: 57°41'N. 3°59'W. (Ross) JL
 X 2.2.58 Sale (Cheshire) 300m. SSE.

J4063 O pull. 2.7.57 Nr. Rosemarkie: 57°36'N. 4°07'W. (Ross) JL
 X (5.8.58) Broughshane (Antrim) 200m. SSW.

J3102 O pull. 17.7.57 Nr. Rosemarkie JL
 X 21.2.58 Walthamstow (Essex) 440m. SSE.

H4611 O pull. 10.6.56 Copeland: 54°40'N. 5°32'W. (Down)
 X 7.8.58 1st Kroonspolder: 53°16'N. 4°58'E. (Friesland)
Netherlands

J1101 4th year 13.11.55 Steep Holme: 51°21'N. 3°07'W. (Somerset) DMC
 X A 20.4.58 Nr. Longcroft (Stirling) 320m. N.

F2154 juv. 9.7.58 St. Margaret's Bay: 51°09'N. 1°24'E. (Kent) DFH
 X 10.12.58 Berck-sur-Mer: 50°25'N. 1°34'E. (Pas-de-Calais)
France

Common Gull (*Larus canus*) (2: 10 miles)

J3311 1stW. 26.2.55 Chelmsford: 51°44'N. 0°28'E. (Essex) P&B
 X (15.9.58) Geta: 60°23'N. 19°50'E. (Åland Islands) **Finland**

Black-headed Gull (*Larus ridibundus*) (177)

Do849 O pull. 26.6.57 Ravenglass: 54°21'N. 3°25'W. (Cumberland) ROMF
 + (7.1.58) Vecinos: 40°47'N. 5°52'W. (Salamanca) **Spain**

02602 O pull. 3.7.57 Marston: 52°39'N. 0°41'W. (Lincoln) WMP
 X (26.2.58) Alpiarca: 39°15'N. 8°35'W. (Ribatejo) **Portugal**

9749 O pull. 26.6.58 Nr. Strata Florida: 52°16'N. 3°54'W. (Cardigan) PJC
 + 31.8.58 Oporto: 41°09'N. 8°37'W. (Douro Litoral) **Portugal**

0874 ad. 28.2.52 St. James's Park: 51°30'N. 0°08'W. (London) TLB
 v 17.4.55 Wroclaw: 51°07'N. 17°00'E. **Poland**
 v 4.12.58 St. James's Park

8673 ad. 4.12.52 St. James's Park TLB
 X 13.4.58 Sjölanda: 55°35'N. 13°00'E. (Malmöhus) **Sweden**

017047 O pull. 20.6.56 Stoke: 51°27'N. 0°38'E. (Kent) F&M
 + 25.1.58 Nr. Oporto, **Portugal**

3017177	O	pull.	19.5.57	Stoke F&M
	×		17.1.58	Nr. Madrid: 40°25'N. 3°43'W. Spain
303115-	O	pull.	9.6.57	Stoke F&M
	+		19.1.58	Nr. Oporto, Portugal
3031531	O	pull.	22.6.57	Stoke F&M
	()		10.8.58	Nazaré: 39°36'N. 9°04'W. (Estremadura) Portugal
3044003	O	pull.	14.6.58	Stoke F&M
	()		0.11.58	Llauri: 39°10'N. 0°20'W. (Valencia) Spain
3025330	O	pull.	16.6.57	Nr. Low Halstow: 51°22'N. 0°41'E. (Kent) PRG
	+	early	2.58	Nr. Guisona: 41°47'N. 1°18'E. (Lérida) Spain
368430		1stW.	30.1.54	Sandwich: 51°17'N. 1°20'E. (Kent) DFH
	×		1.7.58	Oslo: 59°56'N. 10°45'E. Norway
3010266		1stW.	18.2.56	Sandwich DFH
	+	early	7.58	Kuddby: 58°32'N. 16°33'E. (Östergötland) Sweden
368450		ad.	21.2.56	Sandwich DFH
	×		20.4.58	Beerse: 51°19'N. 4°51'E. (Antwerp) Belgium
3030198	O	pull.	18.6.58	Rye Harbour: 50°56'N. 0°46'E. (Sussex) DDH
	+		(13.12.58)	Mira: 40°26'N. 8°44'W. (Beira Litoral) Portugal

A total of 39 Black-headed Gulls ringed as pullus were recovered in the British Isles at distances between 50 and 435 miles from their natal colonies.

Kittiwake (*Rissa tridactyla*) (36: 100 miles)

384612		ad.	23.7.54	Farne Islands: 55°37'N. 1°37'W. (Northumberland)
	+		21.3.58	Off Troldhoved: 61°56'N. 7°22'W. Faeroes
3004907	O	pull.	10.8.55	Farne Islands
	×	ca.	15.12.58	Laytown (Meath) 225m. WSW.
3017651	O	pull.	7.7.56	Farne Islands
	+		28.7.58	Nr. Frederikshåb: ca. 62°00'N. 49°30'W. Greenland
3017658	O	pull.	7.7.56	Farne Islands
	+		12.8.58	Nr. Frederikshåb, Greenland
3023478	O	pull.	6.7.57	Farne Islands
	×		28.6.58	Skegness (Lincoln) 190m. SSE.
3023671	O	pull.	6.7.57	Farne Islands
	+		27.8.58	Marrak: 63°24'N. 51°18'W. Godthåb, Greenland
3023673	O	pull.	6.7.57	Farne Islands
	×		3.7.58	Donna Nook (Lincoln) 165m. SSE.
3052034	O	pull.	10.7.58	Farne Islands
	()		15.11.58	Off Ile d'Yeu: 46°40'N. 2°30'W. (Vendée) France
3052717	O	pull.	10.7.58	Farne Islands
	v		(23.10.58)	Nr. Terschelling Lightship: 53°29'N. 5°08'E. Netherlands
3022063	O	pull.	18.7.58	Farne Islands
	()		15.11.58	Off Ile d'Yeu, France
3052361	O	pull.	18.7.58	Farne Islands
	()		17.12.58	At sea: ca. 58°00'N. 5°00'E. Skagerrak (Norway)
3052597	O	pull.	19.7.58	Farne Islands
	()		26.12.58	At sea: ca. 45°30'N. 2°20'W. Bay of Biscay (France)
376771	O	pull.	17.6.55	North Shields: 55°01'N. 1°26'W. (Northumberland) ND&N
	+		17.8.58	Færingehavn: ca. 64°00'N. 51°00'W. Greenland

Common Tern (*Sterna hirundo*) (15: 35 miles)

14015	O	pull.	28.6.57	Ravenglass: 54°21'N. 3°25'W. (Cumberland)	ROMF
	/?/		20.4.58	Aflao: 6°07'N. 1°11'E. Ghana	
6627	O	pull.	18.6.57	Kirkby-on-Bain: 53°08'N. 0°09'W. (Lincoln)	ADT
	()		18.4.58	Nr. Saltpond: 5°13'N. 1°00'W. Ghana	
22720	O	pull.	30.6.58	Scolt Head: 52°59'N. 0°45'E. (Norfolk)	EAGD
	+		(10.11.58)	M'Bour: 14°22'N. 16°54'W. Sénégal	
11450	O	pull.	2.7.57	Scolt Head	EAGD
	()		2.2.58	Yoff: 14°43'N. 17°19'W. Sénégal	
11466	O	pull.	3.7.57	Scolt Head	EAGD
	()		15.6.58	Monrovia: 6°20'N. 10°46'W. Liberia	
112447	O	pull.	21.7.57	Nr. Great Yarmouth: 52°36'N. 1°45'E. (Norfolk)	YNS
	()		15.6.58	Monrovia, Liberia	
112464	O	pull.	18.6.58	Nr. Great Yarmouth	YNS
	×		11.12.58	Dakar: 14°38'N. 17°27'W. Sénégal	
115348	O	pull.	6.7.58	Nr. Great Yarmouth	YNS
	()		(22.11.58)	Joal: 14°09'N. 16°50'W. Sénégal	
116658	O	pull.	11.7.57	Rye Harbour: 50°56'N. 0°46'E. (Sussex)	DDH
	+		27.3.58	M'Bour, Sénégal	
1189442	O	pull.	19.7.58	Rye Harbour	DDH
	()		6.9.58	Honfleur: 49°25'N. 0°14'E. (Calvados) France	
1189444	O	pull.	19.7.58	Rye Harbour	DDH
	+		ca. 0.10.58	Nr. Vila do Conde: 41°21'N. 8°45'W. (Douro Litoral) Portugal	

Arctic Tern (*Sterna macrura*) (31)

142714	O	pull.	9.7.55	Farne Islands: 55°37'N. 1°37'W. (Northumberland)	
	×		ca. 15.5.58	Beaufort (Monmouth) 270m. SSW.	
1193528	O	pull.	16.7.58	Farne Islands	
	×		17.8.58	Lurö: 58°48'N. 13°11'E. (Värmland) Sweden	
118910	O	pull.	13.8.58	Farne Islands	
	()		ca. 12.10.58	Quarteira: 37°04'N. 8°06'W. (Algarve) Portugal	

Roseate Tern (*Sterna dougallii*) (2)

119206	O	pull.	17.7.58	Firth of Forth: ca. 56°05'N. 2°55'W.	MOC
	()		ca. 12.10.58	Quarteira: 37°04'N. 8°06'W. (Algarve) Portugal	
1135032	O	pull.	24.7.58	Firth of Forth	MOC
	/?/		15.9.58	San Esteban: 43°33'N. 6°05'W. (Oviedo) Spain	

Little Tern (*Sterna albifrons*) (1)

1133205	O	pull.	18.7.58	Tentsmuir: 56°27'N. 2°49'W. (Fife)	WJE
	+		ca. 0.10.58	Nr. Vila do Conde: 41°21'N. 8°45'W. (Douro Litoral) Portugal	

Sandwich Tern (*Sterna sandvicensis*) (32)

112417	O	pull.	21.7.55	Fidra: 56°04'N. 2°47'W. (East Lothian)	HM&M
	×		ca. 15.7.58	Charron: 46°19'N. 1°06'W. (Charente-Maritime) France	
113081	O	pull.	14.7.56	Farne Islands: 55°37'N. 1°37'W. (Northumberland)	
	+		22.1.58	Prat de Llobregat: 41°23'N. 2°07'E. (Barcelona) Spain	

276687	O ×	pull. 25.5.58	4.7.55 Nr. The Hague: 52°04'N. 4°14'E. (Zuid-Holland) Netherlands
2007605	O +	pull. 0.9.58	Scolt Head: 52°59'N. 0°45'E. (Norfolk) EAGD Nr. Cartagena: 37°36'N. 0°59'W. (Murcia) Spain

In addition to the above, 23 birds were recovered abroad, as follows:

TABLE E—COUNTRY AND MONTH OF RECOVERY OF SANDWICH TERNS (*Sterna sandvicensis*)

Country of recovery	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Spain and Portugal (3)	1	1	1	—	—	—	—	—	—	—	—
Sénégal (7)	—	2	—	—	1	4	—	—	—	—	—
Ivory Coast and Ghana (6)	—	—	1	—	—	—	1	—	2	—	2
Belgian Congo and Angola (6)	—	—	—	2	1	3	—	—	—	—	—
S. Africa (1)	—	—	—	—	—	—	—	1	—	—	—

See footnote to Table A.

Of the nine birds recovered in the British Isles, only two showed movements of more than 50 miles.

Razorbill (*Alca torda*) (14: 100 miles)

AT28371	O ()	pull. 12.6.58	8.7.56 St. Kilda: 57°49'N. 8°34'W. Outer Hebrides DRW Viderejde: 62°23'N. 6°31'W. Faeroes
AT16619	O ×	pull. (22.5.58)	14.7.53 Skokholm: 51°42'N. 5°16'W. (Pembroke) le Verdon: 45°33'N. 1°04'W. (Gironde) France
AT29418	O × A	pull. 9.2.58	30.6.55 Skokholm Hengistbury Head (Hampshire) 160m. ESE.
AT29526	O ×	pull. 9.1.58	6.7.55 Skokholm Nr. Lacanau Océan: 45°00'N. 1°02'W. (Gironde) France
AT40446	O ×	pull. 4.6.58	1.7.56 Skokholm La Barre de Monts: 46°52'N. 2°07'W. (Vendée) France
AT40393	O ×	pull. 15.11.58	3.7.56 Skokholm Grouville Bay: 49°11'N. 2°02'W. Jersey
AT40513	O +	pull. 14.3.58	4.7.56 Skokholm Ile de Noirmoutier: 46°58'N. 2°14'W. (Vendée) France
AT35921	O ×	pull. (22.1.58)	23.6.56 Lundy: 51°12'N. 4°40'W. (Devon) Golfe de Fos: ca. 43°23'N. 4°55'E. (Bouches-du-Rhône) France
AT36022	×	ad. 2.8.58	2.7.56 Lundy Menai Strait ca. 130m. N.

Guillemot (*Uria aalge*) (12: 100 miles)

AT33712	O +	pull. (17.1.58)	26.6.57 Isle of May: 56°11'N. 2°33'W. (Fife) Off Torbjörn Lighthouse: 58°56'N. 10°41'E. Oslofjord, Norway
AT51894	O +	pull. 22.10.58	1.8.58 Farne Islands: 55°37'N. 1°37'W. (Northumberland) Oslofjord: ca. 59°00'N. 10°40'E. Norway
3055164	O ×	pull. 19.8.58	11.7.58 Skomer: 51°44'N. 5°10'W. (Pembroke) SBO Dawlish Warren (Devon) 110m. SE.

T18723	O	pull.	26.6.55	Lundy: 51°12'N. 4°40'W. (Devon)
	×		23.4.58	Shanklin, Isle of Wight 160m. ESE.
T14836		ad.	4.7.56	Lundy
	()		11.8.58	Ile Houat: 47°24'N. 2°58'W. (Morbihan) France
T61587	O	pull.	4.7.58	Menavaur: 49°58'N. 6°19'W. Scilly HE&W
	()		20.11.58	Nr. Pasajes: 43°20'N. 1°55'W. (Guipúzcoa) Spain

Puffin (*Fratercula arctica*) (10: 100 miles)

T55149	O	pull.	11.7.58	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	×		25.12.58	Seaton Carew (Durham) 340m. S.
T55204	O	pull.	11.7.58	Fair Isle
	+		24.11.58	Sardloq, Julianehåb: ca. 60°00'N. 45°00'W. Greenland
AX9003	O	pull.	22.7.51	Flannan Isles: 58°17'N. 7°36'W. Outer Hebrides DGA
	×		27.4.58	Tangier : 35°47'N. 5°50'W.
T45408	O	ad.	1.6.57	Farne Islands: 55°37'N. 1°37'W. (Northumberland)
	×		(28.2.58)	Camperduin: 52°44'N. 4°38'E. (Noord-Holland) Netherlands
T41465		ad.	22.7.56	Skokholm: 51°42'N. 5°16'W. (Pembroke)
	/?/		(22.1.58)	Ile d'Yeu: 46°42'N. 2°18'W. (Vendée) France

AT55204 is the first recovery of a British-ringed Puffin in Greenland. Note that AT55149, which was ringed on the same day, was apparently wintering in British waters. AX9003 is the most southerly recovery for this species.

Turtle Dove (*Streptopelia turtur*) (4: 5 miles)

85997	O	ad.	4.6.55	Billericay: 51°38'N. 0°25'E. (Essex) D&SC
	+		15.9.58	Elvas: 38°53'N. 7°10'W. (Alentejo) Portugal
86847	O	pull.	27.5.56	Billericay D&SC
	+		13.9.58	Nr. Chamusca: 39°21'N. 8°29'W. (Ribatejo) Portugal
010863		f.g.	7.8.58	Nr. Cranborne: 50°55'N. 1°56'W. (Dorset) RFH
	+		5.9.58	Alcaudete de la Jara: 39°48'N. 4°52'W. (Toledo) Spain

Short-eared Owl (*Asio flammeus*) (4)

08791	O	pull.	2.6.57	Nr. Gisburn: ca. 53°56'N. 2°15'W. (York) D&Q
	×		(8.2.58)	Ramsgate (Kent) 240m. SE.
1F2363	O	pull.	16.5.53	Everingham: 53°53'N. 0°46'W. (York) JWL
	+		0.11.57	Glenamaddy (Galway) 320m. W.
AH6314	O	pull.	16.6.57	Morston: 52°57'N. 0°59'E. (Norfolk) CBO
	×		2.12.57	Nr. Andilly: 46°16'N. 1°02'W. (Charente-Maritime) France
1H6327	O	pull.	16.6.57	Morston CBO
	×		ca. 25.11.57	Nr. Sleaford (Lincoln) 56m. W.

AH6314 is the third foreign recovery for this species, there being previous records from Spain and Malta.

Swift (*Apus apus*) (41: 15 miles)

222434		f.g.	1.8.56	St. Osyth: 51°49'N. 1°05'E. (Essex) RWA
	()		25.5.58	Falkirk (Stirling) 350m. NW.
X53037	O	pull.	22.7.58	Oxford: 51°45'N. 1°16'W. EGI
	()		3.8.58	Puente de Vallecas: 40°24'N. 3°40'W. (Madrid) Spain
242657		ad.	29.7.56	West Ewell: 51°22'N. 0°16'W. (Surrey) C&E
	×		5.8.58	Halstead (Essex) 54m. NE.

<i>E50058</i>	ad.	27.7.57	West Ewell C&E
×		17.8.58	Alegría: 43°07'N. 2°06'W. (Guipúzcoa) Spain
<i>K41058</i>	O juv.	30.7.58	East Malling: 51°18'N. 0°26'E. (Kent) F&M
×		3.8.58	Ouddorp: 51°48'N. 3°56'E. (Zuid-Holland) Netherlands

K53037 and *K41058* provide interesting evidence of the promptness with which young Swifts may quit the breeding area after fledging. The Oxford bird is known to have fledged on the morning of 31st July and thus took not more than four days to reach the vicinity of Madrid. The bird recovered in the Netherlands is considered to have fledged on 29th July and is the first British Swift to have been recovered in that country.

Kingfisher (*Alcedo atthis*) (3: 5 miles)

<i>K45270</i>	ad.	4.9.58	Bradwell: 51°44'N. 0°54'E. (Essex) BBO
v		27.9.58	East Tilbury (Essex) 27m. SW.

Green Woodpecker (*Picus viridis*) (1)

<i>287233</i>	ad. ♀	3.11.57	Beddington: 51°23'N. 0°08'W. (Surrey) LNHS
×		ca. 10.6.58	Sevenoaks (Kent) 16m. ESE.

This is the greatest movement ever recorded for this species by ringing in the British Isles.

Swallow (*Hirundo rustica*) (42: 35 miles)

<i>C26775</i>	O pull.	20.7.56	Nr. Ripley: 54°06'N. 1°34'W. (York) S&W
×		13.4.58	Monétay-sur-Loire: 46°26'N. 3°50'E. (Allier) France
<i>K51310</i>	O pull.	4.7.58	Nr. Cheltenham: 51°54'N. 2°04'W. (Gloucester) NH
v		8.9.58	Sandwich (Kent) 150m. ESE.
<i>K52408</i>	O pull.	15.8.58	Harpenden: 51°49'N. 0°21'W. (Hertford) GAD
()		0.10.58	Viver: 39°55'N. 0°36'W. (Castellón) Spain

Sand Martin (*Riparia riparia*) (20: 30 miles)

<i>K48350</i>	juv.	12.7.58	Nr. Knaresborough: 54°01'N. 1°28'W. (York) JASB
×		8.8.58	North Newbald (York) 37m. ESE.
<i>K48272</i>	juv.	6.7.58	Hoveringham: 53°01'N. 0°58'W. (Nottingham) JASB
v		5.8.58	Nr. Romford (Essex) 110m. SE.
<i>40725</i>	juv.	8.8.58	Nr. Romford: 51°35'N. 0°11'E. (Essex) RRS
+		30.8.58	Luceni: 41°49'N. 1°14'W. (Zaragoza) Spain

This is the first British-ringed Sand Martin to be recovered in Iberia.

Rook (*Corvus frugilegus*) (52: 20 miles)

<i>3016184</i>	O pull.	22.4.57	Marsham: 52°46'N. 1°16'E. (Norfolk) CBO
×		31.10.58	Rockland (Norfolk) 20m. SW.
<i>3023219</i>	O pull.	30.4.57	Hainault: 51°37'N. 0°07'E. (Essex) P&S
×		15.4.58	Audley End (Essex) 26m. N.

Great Tit (*Parus major*) (113: 20 miles)

<i>C92768</i>	f.g.	19.10.57	Spurn Point: 53°35'N. 0°06'E. (York)
×		4.3.58	Bridlington (York) 35m. NNW.
<i>C72812</i>	ad.	24.1.57	Leicester: 52°38'N. 1°05'W. FAB
×		24.3.58	Bath (Somerset) 100m. SW.

39571	v	1stW.	10.1.58	Colchester: 51°53'N. 0°53'E. (Essex) MSJS
			19.4.58	Tourcoing: 50°44'N. 3°10'E. (Nord) France
70572	v	f.g.	30.11.57	East Tilbury: 51°28'N. 0°26'E. (Essex) HE&W
			12.3.58	Aubers: 50°36'N. 2°50'E. (Nord) France
59463	()	f.g. ♀	19.10.57	Nr. Margate: 51°23'N. 1°27'E. (Kent) DCHW
			4.4.58	Colmesnil: 49°51'N. 1°01'E. (Seine-Maritime) France
39298	×	f.g.	7.4.58	Sandwich Bay: 51°17'N. 1°20'E. (Kent) SBRS
			7.5.58	Sandling (Kent) 36m. W.
25940	×	ad.	28.3.58	Littlestone: 50°59'N. 0°58'E. (Kent) DBO
			26.4.58	Balen-Wezel: 51°10'N. 5°10'E. (Antwerp) Belgium
47668	×	ad.	29.3.58	Littlestone DBO
		ca.	30.3.58	Quend: 50°19'N. 1°39'E. (Somme) France
25132	v	f.g.	3.4.58	Littlestone DBO
			13.4.58	Sandwich Bay (Kent) 26m. NE.
55559	×	f.g.	3.11.57	Eastbourne: 50°46'N. 0°17'E. (Sussex) DDH
			5.3.58	Maidstone (Kent) 35m. NNE.
556613	v	f.g.	26.11.57	Eastbourne J&AP
			27.3.58	Dungeness (Kent) 30m. ENE.

Following the irruption of *Parus* species in the autumn of 1957, Great Tits and Blue Tits were ringed in large numbers. Subsequent recoveries indicated much more movement than in a normal year, with a return to the Continent in the spring of 1958 (see also *Brit. Birds*, vol. li, pp. 477-478, and the paper by Cramp, A. Pettet and J. T. R. Sharrock shortly to be published in this journal, as well as page 490).

Blue Tit (*Parus caeruleus*) (325: 20 miles)

79739	×	1stW.	11.1.58	Middlesbrough: 54°35'N. 1°14'W. (York) IFS
			14.12.58	Nr. Eastbourne (Sussex) 270m. SSE.
79765	v	1stW.	9.2.58	Middlesbrough IFS
			18.5.58	Ripley (York) 39m. SSW.
33170	×	f.g.	23.1.58	Giggleswick: 54°05'N. 2°16'W. (York) JDM
			20.4.58	Kirby-le-Soken (Essex) 210m. SE.
87527	×	f.g.	18.2.58	Ackworth: 53°39'N. 1°19'W. (York) AS
			7.4.58	Bewdley (Worcester) 100m. SSW.
37192	×	f.g.	6.4.58	Spurn Point: 53°35'N. 0°06'E. (York)
			12.4.58	Tourcoing: 50°44'N. 3°10'E. (Nord) France
22731	v	f.g.	1.3.58	Doncaster: 53°32'N. 1°08'W. (York) AEP
			(25.4.58)	Nr. Cheadle (Stafford) 47m. SW.
74041	v	f.g.	15.12.57	Llanrwst: 53°08'N. 3°48'W. (Denbigh) AEM
			18.4.58	Nr. Abergavenny (Monmouth) 95m. SSE.
13544	×	f.g.	15.3.58	Nr. Bleasby: 53°03'N. 0°56'W. (Nottingham) JMM
			(9.12.58)	Much Wenlock (Shropshire) 70m. WSW.
36761	v	f.g.	12.1.58	Oaken: 52°37'N. 2°12'W. (Stafford) PWEC
			1.4.58	Broadway (Worcester) 42m. SSE.
6348	×	f.g.	29.9.57	Ketley: 52°42'N. 2°29'W. (Shropshire) ELEW
			9.4.58	Newnham Bridge (Worcester) 25m. S.
58218	×	f.g.	22.12.57	Nuneaton: 52°32'N. 1°28'W. (Warwick) JW
			13.4.58	Rottingdean (Sussex) 130m. SSE.
096	×	ad.	17.11.57	Clent: 52°24'N. 2°06'W. (Worcester) CAN
			13.4.58	Nr. Abergavenny (Monmouth) 46m. SW.

<i>E53331</i>	×	f.g.	27.10.57 15.4.58	Walberswick: 52°18'N. 1°41'E. (Suffolk) Little Plumstead (Norfolk) 25m. NNW.	DBC
<i>C35928</i>		juv.	18.8.57	Welwyn Garden City: 51°48'N. 0°12'W. (Hertford)	DJTH
	v		31.3.58	Attenborough (Nottingham) 85m. NW.	
<i>C89688</i>	O	pull.	1.6.57	Parkend: 51°46'N. 2°33'W. (Gloucester)	C&C
	×		17.9.58	Limpley Stoke (Wiltshire) 30m. SSE.	
<i>E27871</i>		f.g.	2.3.58	Bradwell: 51°44'N. 0°54'E. (Essex)	BBO
	×		26.4.58	Blaxhall (Suffolk) 35m. NE.	
<i>A19139</i>		f.g.	14.3.55	Nr. High Wycombe: 51°39'N. 0°45'W. (Buckingham)	HSB
	×		25.2.58	Nr. Northampton 38m. N.	
<i>A30973</i>	O	pull.	22.5.57	Reading: 51°27'N. 0°58'W. (Berkshire)	LPS
	×		(27.2.58)	Louth (Lincoln) 135m. NNE.	
<i>C57941</i>		1stW.	1.1.58	Reading K&K	
	v		3.4.58	East Horsley (Surrey) 26m. ESE.	
<i>A39816</i>		f.g.	1.12.57	Nr. Windsor: 51°29'N. 0°36'W. (Berkshire)	IMW
	v		25.12.58	Havering (Essex) 33m. ENE.	
<i>C57423</i>		f.g.	12.10.57	Morden: 51°24'N. 0°12'W. (Surrey)	MJC
	×		(18.4.58)	North Chapel (Sussex) 30m. SW.	
<i>28062</i>		f.g.	7.12.57	Worcester Park: 51°24'N. 0°15'W. (Surrey)	WDP
	×		(8.3.58)	Horsham (Sussex) 21m. S.	
<i>C89301</i>		f.g.	10.1.58	Sandwich Bay: 51°17'N. 1°20'E. (Kent)	SBRS
	/?/	ca.	21.4.58	Nr. Horsham (Sussex) 53m. WSW.	
<i>E26767</i>		f.g.	12.12.57	New Romney: 50°59'N. 0°57'E. (Kent)	DBO
	v		30.3.58	Littlestone (Kent) ca. 2m. E.	
	×		4.5.58	Nr. Blomberg: 51°57'N. 9°05'E. (Nordrhein-Westfalen) Germany	
<i>E46596</i>		1stW.	9.10.57	Dungeness: 50°55'N. 0°59'E. (Kent)	
	×		(14.1.58)	Midhurst (Sussex) 72m. W.	
<i>E46652</i>		1stW.	11.10.57	Dungeness	
	v		20.3.58	"Le Havre" lightship: 49°32'N. 0°09'W. (off Seine-Maritime) France	
<i>K44152</i>		f.g.	1.9.58	Shoreham-by-Sea: 50°51'N. 0°16'W. (Sussex)	JS
	×		19.10.58	Nr. Petersfield (Hampshire) 30m. WNW.	
<i>F16218</i>		1stW.	2.3.58	Dibden Purlieu: 50°51'N. 1°25'W. (Hampshire)	KHP
	×	ca.	21.4.58	Micheldever (Hampshire) 20m. NNE.	
<i>E80252</i>		ad.	16.11.57	Southwick: 50°50'N. 0°14'W. (Sussex)	BAEM
	×	ca.	28.5.58	Polegate (Sussex) 20m. E.	
<i>K12460</i>		ad.	18.4.58	Eastbourne: 50°46'N. 0°17'E. (Sussex)	DDH
	v		26.9.58	Dungeness (Kent) 30m. ENE.	
<i>E14537</i>		f.g.	8.10.57	St. Agnes: 49°53'N. 6°21'W. Scilly	SABO
	×		22.3.58	Nr. Marazion (Cornwall) 44m. ENE.	

Long-tailed Tit (*Aegithalos caudatus*) (5: 5 miles)

<i>C85296</i>		ad.	2.7.57	Winchester: 51°04'N. 1°19'W. (Hampshire)	WC
	×	ca.	24.1.58	Stubington (Hampshire) 16m. SSE.	

This is the most distant recovery so far reported for this species.

Mistle Thrush (*Turdus viscivorus*) (21: 25 miles)

<i>S68736</i>	O	pull.	30.4.57	Kentmere: 54°26'N. 2°51'W. (Westmorland)	JWA
	v		9.2.58	Nr. Apperley Bridge (York) 60m. SE.	

Fieldfare (*Turdus pilaris*) (3)

8873	f.g.	8.5.57	Dungeness: 50°55'N. 0°59'E. (Kent)
+		30.11.58	Septeuil: 48°54'N. 1°40'E. (Seine-et-Oise) France

Song Thrush (*Turdus philomelos*) (207: 100 miles)

7362	juv.	14.6.56	Glen Clova: 56°50'N. 3°06'W. (Angus) GBC
×		13.3.58	Cullen (Tipperary) 370m. SW.
93471	O pull.	22.4.54	Torrance: 55°56'N. 4°13'W. (Stirling) JB
v		23.1.58	Nr. Claremorris (Mayo) 240m. SW.
5856	O pull.	18.5.57	Fenwick: 55°39'N. 1°54'W. (Northumberland) ND&N
×		(25.1.58)	Clonmel (Tipperary) 330m. SW.
3641	ad.	30.3.58	Nr. Seahouses: 55°33'N. 1°37'W. (Northumberland) MHBO
/?		28.6.58	Pennington (Lancashire) 145m. SSW.
7003	f.g.	23.1.58	Belfast: 54°35'N. 5°56'W. GTF
×	ca.	17.6.58	Arden (Dumbarton) 110m. NNE.
0298	f.g.	12.3.55	Ilkley: 53°56'N. 1°49'W. (York) WNS
v		12.2.58	Nr. Belfast 170m. WNW.
040	f.g.	16.9.53	Spurn Point: 53°35'N. 0°06'E. (York)
/?		17.2.55	Cáñete de las Torres: 37°53'N. 4°19'W. (Córdoba) Spain
03027	f.g.	26.2.55	Spurn Point
/?		1.10.55	Montoro: 38°02'N. 4°23'W. (Córdoba) Spain
03028	f.g.	5.3.55	Spurn Point
/?		1.10.55	Montoro, Spain
12060	f.g.	27.2.55	Rathfarnham: 53°18'N. 6°18'W. (Dublin) RGW
v		18.3.58	Keswick (Cumberland) 155m. WNW.
v		29.5.58	Keswick
5000	1stW.	16.10.56	Bardsey: 52°46'N. 4°48'W. (Caernarvon)
×		2.3.58	Nr. Bailleul: 50°44'N. 2°44'E. (Nord) France
7708	f.g.	9.11.55	Lundy: 51°12'N. 4°40'W. (Devon)
×		21.6.58	Pampisford (Cambridge) 220m. ENE.

Note that X93027 and X93028, both ringed at Spurn, but a week apart, were apparently recovered on the same date in the same Spanish town.

Redwing (*Turdus musicus*) (7: 50 miles)

8682	1stW.	7.10.56	Fair Isle: 59°32'N. 1°37'W. (Shetland)
+		6.3.58	Nr. Libourne: 45°01'N. 0°13'W. (Gironde) France
7423	1stW.	17.10.57	Fair Isle
×		24.1.58	Nr. Athlone (West Meath) 490m. SW.
0198	1stW.	1.11.58	Fair Isle
×		13.11.58	Nr. Tomintoul (Banff) 170m. SSW.
5002	f.g.	16.10.56	Bardsey: 52°46'N. 4°48'W. (Caernarvon)
×		25.11.58	Robertstown (Kildare) 90m. WNW.
5987	f.g.	28.10.57	Guildford: 51°14'N. 0°34'W. (Surrey) NJW
+		15.1.58	l'Isle-Jourdain: 43°37'N. 1°05'E. (Gers) France
5821	f.g.	18.4.58	Sandwich Bay: 51°17'N. 1°20'E. (Kent) SBRS
+		14.12.58	Monclar d'Agenais: 44°27'N. 0°33'E. (Lot-et-Garonne) France

Ring Ouzel (*Turdus torquatus*) (4: 5 miles)

X51724	O	pull.	12.5.55	Nr. Keighley: 53°53'N. 1°52'W. (York)	N&L
	×		28.3.58	Chadderton (Lancashire)	27m. SSW.
V41581	O	pull.	22.5.58	Wainstalls: 53°46'N. 1°57'W. (York)	HSS
	+	ca.	2.11.58	Puebla de Valverde: 40°14'N. 0°56'W. (Teruel)	Spain

Blackbird (*Turdus merula*) (548)

38 Blackbirds ringed in Great Britain and recovered on the Continent or in Ireland are summarized in Table F. Three birds ringed in Ireland during October-February were recovered in eastern Britain during March-June. Those published in full include the first recoveries of this species from Finland (see also page 490), a recovery in S.W. France, an interesting example of drift, and all long-distance movement within Great Britain and within Ireland.

TABLE F—COUNTRY AND MONTH OF RECOVERY OF BLACKBIRDS (*Turdus merula*)

Country of recovery	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Norway (10)*	—	—	2	—	—	—	4	1	—	—	1	(1)
Sweden (4)	—	—	—	—	—	—	1	—	—	3	—	—
Denmark (5)	1	1	1	—	1	—	—	1	—	—	—	—
Germany (11)	—	—	—	—	—	2	3	1	2	2	—	1
Holland and Belgium (6)	—	—	—	—	1	—	4	—	—	1	—	—
Ireland (2)	—	—	1	—	—	1	—	—	—	—	—	—

*Total includes one recorded as "autumn 1956".
See footnote to Table A.

X88496	v	1stW. ♀	13.9.55 ca. 12.2.58	Foula: 60°08'N. 2°05'W. (Shetland)	CKM
				North Ronaldshay (Orkney)	55m. SSW.
R49371	()	1stW. ♂	21.11.58 1.12.58	Fair Isle: 59°32'N. 1°37'W. (Shetland)	
				Egersund: 58°37'N. 6°01'E. (Rogaland)	Norway
R49445	×	1stW. ♂	26.11.58 22.12.58	Fair Isle	
				Nr. Fort William (Inverness)	225m. SW.
S16108	×	ad. ♀	29.12.55 (25.2.58)	Anstruther: 56°14'N. 2°42'W. (Fife)	WJE
				Newton Solney (Derby)	235m. SSE.
S76754	×	ad. ♀	25.1.58	High Nibthwaite: 54°18'N. 3°06'W. (Lancashire)	LAC
			Sept./Oct. 1958	Hartola: 61°35'N. 26°02'E. (Mikkeli)	Finland
S24777	v	ad. ♂	19.11.56 18.3.58	Spurn Point: 53°35'N. 0°06'E. (York)	
				Ware (Hertford)	125m. S.
W40029	v	1stW. ♂	31.10.55 15.3.58	Cley: 52°58'N. 1°03'E. (Norfolk)	
				Ponteland (Northumberland)	180m. NW.
S61073	+	ad. ♂	6.11.56 (3.8.58)	Great Saltee: 52°07'N. 6°35'W. (Wexford)	
				Ballinamore (Leitrim)	140m. NNW.
S61045	/?/	ad. ♂	2.11.56 (1.4.58)	Great Saltee	
				Rosscahill (Galway)	135m. NW.
OV210	×	ad. ♀	27.2.58 11.5.58	Sudbourne: 52°07'N. 1°32'E. (Suffolk)	HP
				Pintamo: 65°27'N. 27°25'E. Pudasjärvi (Oulu)	Finland
V45086	v	f.g.	15.10.57 24.7.58	Skokholm: 51°42'N. 5°16'W. (Pembroke)	
				Haresfield (Gloucester)	125m. E.
S77432	×	f.g. ♀	9.10.57 1.3.58	Dungeness: 50°55'N. 0°59'E. (Kent)	
				Pouillon: 43°36'N. 1°00'W. (Landes)	France

Wheatear (*Oenanthe oenanthe*) (9: 5 miles)

1332	juv.	5.8.58	Fair Isle: 59°32'N. 1°37'W. (Shetland)
+		15.9.58	Mimizan-Plage: 44°13'N. 1°18'W. (Landes) France
1818	1stW.	17.9.58	Fair Isle
×		22.10.58	Lesparre: 45°19'N. 0°56'W. (Gironde) France
2638	f.g.	8.9.58	Tory Island: 55°16'N. 8°14'W. (Donegal) RGP
×		15.9.58	Nérigean: 44°52'N. 0°16'W. (Gironde) France
3232	f.g.	9.9.58	Bardsey: 52°46'N. 4°48'W. (Caernarvon)
+		(12.11.58)	Nr. Cognac: 45°42'N. 0°19'W. (Charente) France

Stonechat (*Saxicola torquata*) (1)

8272	f.g. ♀	7.11.57	St. Osyth: 51°49'N. 1°05'E. (Essex) RWA
×	× A	1.2.58	Nr. Chelmsford (Essex) 27m. W.

Whinchat (*Saxicola rubetra*) (3: 20 miles)

2677	O pull.	17.6.57	Nr. Wooler: 55°29'N. 2°05'W. (Northumberland) MHBO
×		3.5.58	St. Pierre-sur-Dives: 49°01'N. 0°02'W. (Calvados) France

Redstart (*Phoenicurus phoenicurus*) (12: 5 miles)

8966	O pull.	18.6.57	Burneside: 54°21'N. 2°46'W. (Westmorland) ACW
×		26.9.58	Lagos: 37°05'N. 8°40'W. (Algarve) Portugal
8420	O pull.	12.6.54	Nr. Grassington: 54°05'N. 2°00'W. (York) N&L
/?		17.4.55	Baracaldo: 43°17'N. 2°59'W. (Vizcaya) Spain
17479	juv.	6.9.58	Spurn Point: 53°35'N. 0°06'E. (York)
+		(29.9.58)	Viana: 42°31'N. 2°22'W. (Navarra) Spain
7011	f.g. ♂	17.9.58	Spurn Point
+		9.10.58	Provaglio d'Iseo: 45°39'N. 10°03'E. (Brescia) Italy
This is the first recovery of a British-ringed Redstart in Italy.			
5858	juv. ♂	11.8.56	Walberswick: 52°18'N. 1°41'E. (Suffolk) DBC
×		6.4.58	Nr. Dol: 48°33'N. 1°45'W. (Ille-et-Vilaine) France

Black Redstart (*Phoenicurus ochruros*) (2)

17169	ad. ♀	5.4.58	Spurn Point: 53°35'N. 0°06'E. (York)
×	(Breeding)	7.5.58	Nr. Boizenburg: 53°22'N. 10°43'E. (Mecklenburg) Germany
9600	ad. ♀	26.3.58	St. Agnes: 49°53'N. 6°21'W. Scilly SABO
v		19.4.58	Dungeness (Kent) 330m. ENE.

Bluethroat (*Cyanosylvia svecica*) (1)

1235	1stW.	7.9.58	Nr. Christchurch: 50°44'N. 1°46'W. (Hampshire) FRC
×		(9.11.58)	Cofita: 42°01'N. 0°16'E. (Huesca) Spain

This is the first recovery of a British-ringed Bluethroat.

Robin (*Erithacus rubecula*) (139: 30 miles)

9129	f.g.	1.4.58	Avoch: 57°34'N. 4°10'W. (Ross) JL
v		26.10.58	Portgordon (Banff) 42m. E.
1908	ad.	10.11.57	West Kirby: 53°22'N. 3°11'W. (Cheshire) DGC
×		2.4.58	Midmar (Aberdeen) 265m. N.

E16879 ad. 30.3.58 Cley: 52°58'N. 1°03'E. (Norfolk)
 () (18.12.58) Winterton-on-Sea (Norfolk) 31m. ESE.

This bird was identified as belonging to the Continental race (*Erithacus r. rubecula*).

F25801 f.g. 27.3.58 Dungeness: 50°55'N. 0°59'E. (Kent)
 × 26.4.58 Nr. Slagen: 59°20'N. 10°27'E. (Vestfold) Norway

F25897 f.g. 28.3.58 Dungeness
 v 30.3.58 Sandwich Bay (Kent) 30m. NE.

Reed Warbler (*Acrocephalus scirpaceus*) (4: 5 miles)

K51305 juv. 28.6.58 Minworth: 52°30'N. 1°50'W. (Warwick) NH
 () 14.9.58 Cantanhede: 40°20'N. 8°36'W. (Beira-Litoral) Portugal

A97043 f.g. 29.8.58 Nr. Swindon: 51°33'N. 1°45'W. (Wiltshire) DF
 × 10.9.58 St. Louis de Montferrand: 44°57'N. 0°31'W. (Gironde) France

E66134 ad. 23.8.58 East Tilbury: 51°27'N. 0°22'E. (Essex) HE&W
 v 31.8.58 Dungeness (Kent) 44m. SE.

Sedge Warbler (*Acrocephalus schoenobaenus*) (1)

E76206 f.g. 8.5.58 Portland Bill: 50°31'N. 2°27'W. (Dorset)
 × 18.5.58 Blackwater Lightship (off Wexford) ca. 210m. NW.

Blackcap (*Sylvia atricapilla*) (2: 5 miles)

C55354 ad. ♂ 12.4.57 Portland Bill: 50°31'N. 2°27'W. (Dorset)
 × 16.6.58 Nr. Totton (Hampshire) 50m. ENE.

Whitethroat (*Sylvia communis*) (22: 10 miles)

K64844 O pull. 9.8.58 Nr. Warrington: 53°24'N. 2°36'W. (Lancashire) RPC
 [?/] (12.11.58) Nr. Vendas Novas: 38°41'N. 8°30'W. (Alto Alentejo) Portugal

E77788 juv. 8.7.58 Gibraltar Point: 53°06'N. 0°21'E. (Lincoln)
 v 13.8.58 Ringwould (Kent) 140m. SSE.

K65108 juv. 7.8.58 Gibraltar Point
 v 4.9.58 Dungeness (Kent) 150m. SSE.

C61178 f.g. 29.4.57 Bardsey: 52°46'N. 4°48'W. (Caernarvon)
 × 31.7.58 Nr. Newtownards (Down) 130m. NNW.

E28873 O pull. 5.6.57 Mundford: 52°31'N. 0°39'E. (Norfolk) CRD
 + ca. 21.9.58 Valpaços: 41°36'N. 7°17'W. (Tras os Montes) Portugal

E24498 juv. 24.7.57 Abberton: 51°50'N. 0°53'E. (Essex)
 + ca. 24.11.58 Nr. Abrantes: 39°28'N. 8°12'W. (Ribatejo) Portugal

35045 f.g. 10.5.58 Skokholm: 51°42'N. 5°16'W. (Pembroke)
 + ca. 18.9.58 Pereiró: 41°11'N. 8°40'W. (Douro Litoral) Portugal

K69709 juv. 21.8.58 Lundy: 51°12'N. 4°40'W. (Devon)
 v 27.8.58 Sandwich Bay (Kent) 255m. E.

E82910 f.g. 5.9.58 Burgess Hill: 50°57'N. 0°08'W. (Sussex) JAW
 + ca. 21.9.58 Boticas: 41°41'N. 7°40'W. (Tras os Montes) Portugal

F25307 ad. ♂ 25.4.58 Dungeness: 50°55'N. 0°59'E. (Kent)
 × (13.7.58) Ipswich (Suffolk) 77m. N.

C91977 f.g. ♀ 5.5.57 Portland Bill: 50°31'N. 2°27'W. (Dorset)
 () 23.9.58 Monforte de Lemos: 42°32'N. 7°30'W. (Lugo) Spain

17047	f.g. ♀	7.5.57	Portland Bill
+		ca. 16.9.58	Monforte de Lemos, Spain
17176	f.g. ♀	9.5.57	Portland Bill
×		20.6.58	Widemouth Bay (Cornwall) gom. W.

Lesser Whitethroat (*Sylvia curruca*) (2)

43043	f.g.	17.5.58	Colchester: 51°53'N. 0°53'E. (Essex) NS
+		6.9.58	Salò del Garda: 45°37'N. 10°31'E. (Brescia) Italy
55225	f.g.	15.9.55	Dungeness: 50°55'N. 0°59'E. (Kent)
×		(7.8.58)	Tadmerton (Oxford) 125m. NW.

Willow Warbler (*Phylloscopus trochilus*) (19: 15 miles)

8158	f.g.	30.4.58	Nr. Seahouses: 55°35'N. 1°39'W. (Northumberland) MHBO
×		20.8.58	Muir of Ord (Ross) 170m. NW.

This bird was identified as belonging to the Northern race (*Phylloscopus t. credula*).

34392	O pull.	11.6.58	Kington: 52°12'N. 3°02'W. (Hereford) RB
×		(3.9.58)	Cantanhede: 40°20'N. 8°36'W. (Beira Litoral) Portugal
54620	f.g.	28.4.57	Great Saltee: 52°07'N. 6°35'W. (Wexford)
+		ca. 20.9.58	Cantanhede, Portugal
5494	f.g. ♂	21.8.58	Skokholm: 51°42'N. 5°16'W. (Pembroke)
v		26.8.58	Llangynin (Carmarthen) 32m. E.
39191	juv.	27.7.58	Rodbourne Cheney: 51°34'N. 1°47'W. (Wiltshire) RE
×		(18.8.58)	Headington (Oxford) 27m. ENE.
62500	ad.	22.4.58	Beddington: 51°23'N. 0°08'W. (Surrey) LNHS
×		25.5.58	Nr. Greenock (Renfrew) 365m. NW.
23512	f.g.	3.8.58	Guildford: 51°14'N. 0°34'W. (Surrey) GRG
+		25.8.58	Villalpando: 41°51'N. 5°25'W. (Zamora) Spain
47828	f.g.	26.8.54	Dungeness: 50°55'N. 0°59'E. (Kent)
+		26.3.58	Nr. Melilla: 35°17'N. 2°57'W. Spanish Morocco
59840	f.g.	13.4.57	Dungeness
×		(24.4.58)	Veniers: 47°02'N. 0°05'E. (Vienne) France

Chiffchaff (*Phylloscopus collybita*) (5)

030	f.g.	9.9.58	Bardsey: 52°46'N. 4°48'W. (Caernarvon)
[?]		(19.10.58)	Casablanca: 35°39'N. 7°35'W. Morocco
31562	f.g.	16.4.56	Great Saltee: 52°07'N. 6°35'W. (Wexford)
×		(19.4.58)	Hove (Sussex) 290m. ESE.
10446	f.g.	4.4.58	Swindon: 51°33'N. 1°47'W. (Wiltshire) DF
+		14.10.58	Puerto de Santa Maria: 36°36'N. 6°14'W. (Cádiz) Spain
9509	f.g.	15.9.56	Sandwich Bay: 51°17'N. 1°20'E. (Kent) SBRS
×		13.3.58	Pau: 43°18'N. 0°22'W. (Basses-Pyrénées) France
5397	f.g.	2.10.55	Dungeness: 50°55'N. 0°59'E. (Kent)
+		23.3.58	Nr. Oporto: 41°11'N. 8°35'W. (Douro Litoral) Portugal

Goldcrest (*Regulus regulus*) (1)

943	f.g. ♂	29.3.58	Dungeness: 50°55'N. 0°59'E. (Kent)
()		(9.4.58)	At sea, 50 km. off Ostende, Belgium

Spotted Flycatcher (*Muscicapa striata*) (5: 5 miles)

<i>E20521</i>	f.g.	9.5.58	Great Saltee: 52°07'N. 6°35'W. (Wexford)
()		0.10.58	Fernan Núñez: 37°40'N. 4°44'W. (Córdoba) Spain
<i>C51267</i>	ad.	22.8.56	Sonning Common: 51°29'N. 0°56'W. (Oxford) HMD
×	(breeding)	6.8.58	Elston (Nottingham) 103m. N.

Pied Flycatcher (*Muscicapa hypoleuca*) (9: 5 miles)

<i>F15411</i>	1stW.	3.9.58	Fenwick: 55°39'N. 1°54'W. (Northumberland) ND&N
+	ca.	1.10.58	Cantanhede: 40°20'N. 8°36'W. (Beira Litoral) Portugal
<i>K46782</i>	O pull.	1.7.58	Capel Curig: 53°06'N. 3°55'W. (Caernarvon) RAFK
×		21.9.58	Nr. Oporto: 41°12'N. 8°34'W. (Douro Litoral) Portugal
<i>B95793</i>	juv.	24.8.55	Gibraltar Point: 53°06'N. 0°21'E. (Lincoln)
+	ca.	8.6.58	Nr. Abrantes: 39°28'N. 8°12'W. (Ribatejo) Portugal
<i>K65477</i>	ad.	4.9.58	Gibraltar Point
×		28.9.58	Nr. Royan: 45°39'N. 1°03'W. (Charente-Maritime) France
<i>C58916</i>	f.g.	22.9.57	Holme: 52°58'N. 0°33'E. (Norfolk) AEV
[?]		(22.10.58)	Nr. Vila Franca das Naves: 40°44'N. 7°16'W. (Beira Alta) Portugal

Meadow Pipit (*Anthus pratensis*) (27: 20 miles)

<i>JB799</i>	juv.	23.8.53	Fair Isle: 59°32'N. 1°37'W. (Shetland)
+		10.1.58	Benalud de Sidonia: 36°20'N. 5°48'W. (Cádiz) Spain
<i>B88396</i>	1stW.	2.9.54	Fair Isle
+		8.10.58	Bidart: 43°26'N. 1°35'W. (Basses-Pyrénées) France
<i>C47721</i>	1stW.	1.9.56	Fair Isle
+		11.11.57	Vicenza: 45°33'N. 11°33'E. (Venezia) Italy
<i>C66815</i>	f.g.	8.9.57	Fair Isle
×		25.2.58	Ondres: 43°34'N. 1°26'W. (Landes) France
<i>B78617</i>	juv.	31.7.54	Nr. Seahouses: 55°35'N. 1°39'W. (Northumberland) MHBO
+		0.12.58	Nr. Cercal: 37°48'N. 8°40'W. (Baixo Alentejo) Portugal
<i>B97354</i>	f.g.	19.8.55	Nr. Seahouses MHBO
[?]		(17.2.56)	Beauvoir-sur-Niort: 46°11'N. 0°28'W. (Deux-Sèvres) France
<i>E60011</i>	O pull.	7.6.58	Burley: 53°55'N. 1°45'W. (York) WNS
+		(22.10.58)	Tondela: 40°31'N. 8°05'W. (Beira Alta) Portugal
<i>C16471</i>	f.g.	17.9.56	Spurn Point: 53°35'N. 0°06'E. (York)
+		29.4.57	Villar del Rey: 39°07'N. 6°50'W. (Badajoz) Spain
<i>C53155</i>	juv.	26.5.57	Nr. Pentre-Voelas: 53°03'N. 3°42'W. (Denbigh) AEM
×		(30.3.58)	Queensbury (York) 90m. ENE.
<i>E21705</i>	juv.	12.8.57	Skokholm: 51°42'N. 5°16'W. (Pembroke)
×		22.1.58	Dale (Pembroke) 5m. E.
<i>E21847</i>	juv.	30.8.57	Skokholm
×		(15.4.58)	Holywell Bay (Cornwall) 90m. S.
<i>K14630</i>	f.g.	13.9.58	Skokholm
+	ca.	5.10.58	Aleguera Mouguerre: 43°28'N. 1°24'W. (Basses-Pyrénées) France
<i>E51745</i>	f.g.	19.9.57	Abberton: 51°50'N. 0°53'E. (Essex)
+	winter	1958	Baracaldo: 43°17'N. 2°59'W. (Vizcaya) Spain

73273	×	f.g.	12.12.57	Abberton
			25.1.58	Ramsgate (Kent) 40m. SE.
62520	+	f.g.	7.10.56	Nr. Romford: 51°53'N. 0°11'E. (Essex) RRS
			26.12.57	Nr. Penha Garcia: 40°03'N. 7°01'W. (Beira Baixa) Portugal

E21705 is the first Meadow Pipit of probable British origin to be recovered in Britain in mid-winter. C47721 is the first British-ringed Meadow Pipit to be recovered in Italy.

Tree Pipit (*Anthus trivialis*) (1)

59932	O	pull.	22.6.58	Nr. Pateley Bridge: 54°06'N. 1°45'W. (York) S&W
	()	ca.	21.9.58	Bustos: 40°30'N. 8°38'W. (Beira Litoral) Portugal

Rock Pipit (*Anthus spinoletta*) (5: 10 miles)

52615	× A	juv.	3.7.56	Fair Isle: 59°32'N. 1°37'W. (Shetland)
			10.3.58	Den Helder: 52°57'N. 4°45'E. (Noord-Holland) Netherlands
10683	v	juv.	28.8.57	St. Kilda: 57°49'N. 8°34'W. Outer Hebrides SKBO
			9.2.58	Benbecula, Outer Hebrides 50m. ESE.

Pied/White Wagtail (*Motacilla alba*) (44: 25 miles)

6225	+	juv.	24.8.57	Fair Isle: 59°32'N. 1°37'W. (Shetland)
			0.10.58	Nr. Boutilimit: 17°40'N. 14°46'W. Mauritania

This bird was identified as *Motacilla a. alba*.

53186	×	pull.	5.6.57	Nr. Aviemore: 57°12'N. 3°50'W. (Inverness) PRE
		ca.	28.2.58	Luton (Bedford) 390m. SSE.
16001	+	pull.	21.6.57	Nr. Ayton: 55°51'N. 2°07'W. (Berwick) IJP
			17.10.58	Eibar: 43°12'N. 2°28'W. (Guipúzcoa) Spain
0733	[?]	juv.	30.7.58	Abberton: 51°50'N. 0°53'E. (Essex)
			15.10.58	Arbonne: 43°25'N. 1°33'W. (Basses-Pyrénées) France

Yellow Wagtail ssp. (*Motacilla flava*) (17: 25 miles)

0851	×	ad. ♂	24.4.56	Rainham: 51°30'N. 0°12'E. (Essex) BPH
			17.4.58	Nr. Centenero: 42°25'N. 0°19'W. (Huesca) Spain
8287	v	juv. ♂	21.7.56	Beddington: 51°23'N. 0°08'W. (Surrey) LNHS
			6.7.57	ibid.
	+	ca.	15.9.58	Nr. Ovar: 40°52'N. 8°38'W. (Beira Litoral) Portugal

This bird showed characteristics of the race *Motacilla f. beema*.

8249	v	juv.	30.6.57	Beddington LNHS
			17.9.58	Ushant: 48°28'N. 5°05'W. (Finistère) France
9119	+	juv.	30.7.57	Beddington LNHS
		ca.	19.9.58	Nr. Fanzeres: 41°10'N. 8°32'W. (Douro Litoral) Portugal

Waxwing (*Bombycilla garrulus*) (1)

2067	[?]	1stW. ♂	9.3.57	Pegswood: 55°11'N. 1°38'W. (Northumberland) ND&N
		ca.	15.12.58	Övre Grorud: 59°57'N. 10°53'E. (Akerhus) Norway

Red-backed Shrike (*Lanius cristatus collurio*) (2: 5 miles)

8904	()	pull.	6.7.58	Guildford: 51°14'N. 0°34'W. (Surrey) ERG
			(25.9.58)	Pylli: 36°51'N. 27°12'E. Kos, Dodecanese

The Red-backed Shrike is a common migrant through the eastern Mediterranean. There is one earlier recovery from Sicily.

Starling (*Sturnus vulgaris*) (1,097)

A total of 149 Starlings were recovered abroad, as shown in Table G.

TABLE G—COUNTRY AND MONTH OF RECOVERY OF STARLINGS (*Sturnus vulgaris*)

Country of recovery	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
France (2)	—	—	—	—	—	—	—	—	1	—	—	1
Belgium (11)	2	—	—	1	—	—	—	4	4	—	—	—
Holland (26)	5	1	8	4	1	1	1	1	—	1	—	3
Denmark (15)	(1)	2	4	3	2	—	1	1	—	—	—	1
Norway (13)*	—	—	4	3	—	1	1	—	—	—	1	2
Sweden (6)	—	1	1	1	1	(1)	1	—	—	—	—	—
Germany (38)†	5	10	4	—	8	5	4	—	1	—	—	—
Poland (14)	4	5	—	1	—	1	—	2	—	—	1	—
Baltic States (11)	—	5	1	—	—	3	1	—	1	—	—	—
Finland (5)	—	—	—	2	—	1	2	—	—	—	—	—
U.S.S.R. (8)	1	1	2	2	—	2	—	—	—	—	—	—

*Total includes a bird recorded as "spring".

†Total includes a bird recorded as "October/November".

See footnote to Table A.

The months of ringing of the birds of presumed Continental origin were: September, 1; October, 13; November, 21; December, 15; January, 40; February, 36; March, 17; and April, 2. The extreme dates were 14th September (Northumberland) and 18th April (Kent).

The list below includes cases of interesting movements by birds of probable British origin and recoveries abroad at unusual dates. The foreign recoveries amongst these have been included in Table G.

W21233	1st W. ♂	16.1.55	Avoch: 57°34'N. 4°10'W. (Ross) JL
×		2.1.58	Bjørkevoll: 68°44'N. 16°32'E. (Troms) Norway
X92649	f.g.	20.11.54	Spurn Point: 53°35'N. 0°06'E. (York)
×		20.1.58	Nr. Ketrzyn: 54°05'N. 21°24'E. (Olsztyn) Poland
S96435	ad.	2.5.57	Breaston: 52°54'N. 1°21'W. (Derby) JBCC
+		16.9.58	Nr. Butzow: 53°54'N. 11°49'E. (Mecklenburg) Germany
S11087	juv.	16.7.55	Abberton: 51°50'N. 0°53'E. (Essex)
× A		19.5.58	Schoorl: 52°42'N. 4°41'E. (Noord-Holland) Netherlands
V36004	juv.	22.6.57	Nr. Romford: 51°35'N. 0°11'E. (Essex) RRS
×		13.2.58	Culdrose (Cornwall) 260m. WSW.
V75423	juv.	14.6.58	Nr. Romford RRS
×		8.8.58	Nr. Meppen: 52°41'N. 7°18'E. (Niedersachsen) Germany
V27539	juv.	21.6.57	Southampton: 50°54'N. 1°24'W. (Hampshire) KVE
v		3.6.58	Sturkö: 56°05'N. 15°42'E. (Blekinge) Sweden

Of the birds recovered within the British Isles, only 17 showed movements of more than 100 miles.

Greenfinch (*Chloris chloris*) (226: 75 miles)

S94316	ad. ♀	12.7.57	Troutbeck: 54°25'N. 2°56'W. (Westmorland) JMBK
×		1.2.58	Nr. Dunbar (East Lothian) 105m. N.
X55014	O pull.	15.6.56	Warton: 53°46'N. 2°53'W. (Lancashire) MHP
×		23.3.58	Blyth Bridge (Peebles) 130m. N.

8593	×	ad. ♀	2.11.57 ca. 27.4.58	Gibraltar Point: 53°06'N. 0°21'E. (Lincoln) Sandal (York) 80m. WNW.
0059	v	f.g. ♀	1.3.58 19.4.58	Caldecote: 52°33'N. 1°29'W. (Warwick) JW Fairburn (York) 85m. N.
3120	×	f.g. ♂	21.3.54 2.4.58	Abberton: 51°50'N. 0°53'E. (Essex) Ulvenhout: 51°33'N. 4°48'E. (Noord-Brabant) Netherlands
4491	()	f.g. ♂	17.10.57 19.1.58	Abberton Guines: 50°51'N. 1°52'E. (Pas-de-Calais) France
8836	×	f.g. ♀	21.2.58 4.7.58	Reynoldston: 51°36'N. 4°11'W. (Glamorgan) HD Charlwood (Surrey) 170m. ESE.
8591	×	ad. ♂	23.11.56 ca. 22.7.58	Dungeness: 50°55'N. 0°59'E. (Kent) Bamber Bridge (Lancashire) 250m. NW.
5780	×	ad. ♂	25.2.58 (24.6.58)	Holwell: 50°55'N. 1°56'W. (Dorset) RFH Nr. Haywards Heath (Sussex) 77m. E.
0448	×	1st W. ♂	13.2.58 ca. 23.4.58	Shoreham-by-Sea: 50°51'N. 0°16'W. (Sussex) JS Colchester (Essex) 85m. NE.

Linnet (*Carduelis cannabina*) (17: 20 miles)

7618	O	pull.	10.6.55 4.1.56	Harrogate: 53°59'N. 1°33'W. (York) S&W Nr. Haro: 42°32'N. 2°52'W. (Logroño) Spain
182	O	pull.	25.5.57 11.11.58	Spurn Point: 53°35'N. 0°06'E. (York) Capbreton: 43°38'N. 1°25'W. (Landes) France
3571	×	ad. ♀	25.4.58 4.6.58	Abberton: 51°50'N. 0°53'E. (Essex) Hadley Wood (Hertford) 44m. WSW.
0526	+	juv.	3.6.57 19.1.58	Dungeness: 50°55'N. 0°59'E. (Kent) Zaragoza: 41°39'N. 0°54'W. Spain
7454	O	pull.	2.5.57 (5.11.58)	Nr. Cranborne: 50°55'N. 1°56'W. (Dorset) KBR Toulon: 43°07'N. 5°55'E. (Var) France

Chaffinch (*Fringilla coelebs*) (80: 20 miles)

883	()	ad. ♂	16.11.57 26.10.58	Spurn Point: 53°35'N. 0°06'E. (York) Renaix: 50°45'N. 3°36'E. (East Flanders) Belgium
0619	×	f.g. ♂	29.3.58 27.4.58	Attenborough: 52°54'N. 1°14'W. (Nottingham) JASB Bräcke: 62°44'N. 15°30'E. (Jämtland) Sweden
781	×	f.g. ♂	13.12.56 (7.5.58)	Sutton Park: 52°34'N. 1°50'W. (Warwick) NH Twyford (Oxford) 40m. SE.
820	×	f.g. ♂	19.1.58 15.8.58	Nr. Nuneaton: 52°32'N. 1°28'W. (Warwick) JW Avesta: 60°09'N. 16°10'E. (Kopparberg) Sweden
218	×	f.g. ♀	20.10.56 ca. 6.1.58	Great Saltee: 52°07'N. 6°35'W. (Wexford) Nr. Newquay (Cornwall) 135m. SE.
424	v	ad. ♀	1.2.58 0.5.58 4.8.58	Chessington: 51°21'N. 0°18'W. (Surrey) DP Steinkjer: 64°00'N. 11°30'E. (Nord-Trøndelag) Norway Ibid.

This bird had already raised one brood and was sitting on a second clutch 4.8.58.

907	×	f.g. ♂	19.1.58 3.6.58	Damerham: 50°57'N. 1°52'W. (Hampshire) A&R Nr. Neukloster: 53°48'N. 11°43'E. (Mecklenburg) Germany
063	×	f.g. ♀	24.2.57 22.4.58	Fordingbridge: 50°56'N. 1°48'W. (Hampshire) A&R Nr. Maschen: 53°25'N. 10°05'E. (Niedersachsen) Germany

E46427	×	f.g. ♀	2.10.57 18.4.58	Dungeness: 50°55'N. 0°59'E. (Kent) Wilhelmshaven: 53°31'N. 8°08'E. (Niedersachsen) Germany
E17987	v	f.g. ♀	14.10.57 9.11.58	Portland Bill: 50°31'N. 2°27'W. (Dorset) Posthuis: 53°16'N. 4°58'E. Vlieland (Friesland) Netherlands

Reed Bunting (*Emberiza schoeniclus*) (14: 5 miles)

E52397	×	ad. ♂	20.2.58 21.4.58	Attenborough: 52°54'N. 1°14'W. (Nottingham) JASB Bury (Lancashire) 63m. NW.
C50399	v	f.g.	17.10.56 25.3.58	Walberswick: 52°18'N. 1°41'E. (Suffolk) DBC Abberton (Essex) 47m. SW.
E26146	×	1stW. ♀	14.9.57 17.2.58	Dungeness: 50°55'N. 0°59'E. (Kent) Nr. Shoreham (Sussex) 53m. W.

There are very few recoveries of British-ringed Reed Buntings showing movements of more than 20 miles.

Snow Bunting (*Plectrophenax nivalis*) (2)

A77726	×	f.g. ♀	5.2.56 25.3.58	Spurn Point: 53°35'N. 0°06'E. (York) Sandwick (Orkney) 400m. NNW.
A77891	×	1stW. ♂	25.2.56 24.4.58	Spurn Point Nr. Steigen: 67°57'N. 15°00'E. (Nordland) Norway

This notable recovery is the first British-ringed Snow Bunting from Scandinavia.

Tree Sparrow (*Passer montanus*) (5: 5 miles)

E16678	×	f.g.	15.12.57 19.11.58	Cley: 52°58'N. 1°03'E. (Norfolk) Nr. Rheine: 52°16'N. 7°26'E. (Westfalen) Germany
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This is the first foreign recovery of a British-ringed Tree Sparrow.

BRITISH RECOVERIES OF BIRDS RINGED ABROAD

Communicated by E. P. LEACH

Selected List of Recoveries Reported

The symbols and terms are the same as those used in the "Report on bird-ringing" (see page 451), with the exception that the term "juv." cannot always be relied upon to signify a young bird that is able to fly freely: owing to lack of unanimity in the various ringing schemes, this term may sometimes mean a nestling or chick.

Abbreviations used for Ringing Stations

B.	Brussels	P.	Paris
C.	Copenhagen	P-V	Polonia Varsovia (Warsaw)
G.	Gothenburg	R.	Radolfzell (ex-Rossitten)
H.	Heligoland	Rk.	Reykjavik
Hki.	Helsinki	Stav.	Stavanger
Hki.R.S.	Helsinki Riista Säätio (Game Research Institute)	St.	Stockholm
L.	Leiden	St. Orn.	Stockholm "Ornis" (Sveriges Ornithologiska Förening)
M.	Moscow	S.J.F.	Svenska Jägare Förbundet
O.	Oslo	T.	Tartu

[Perhaps the most remarkable of the present series of recoveries from abroad is the Reddish Curlew found in Norfolk in its 32nd year. No less interesting in another way, however, is the fourth-year Mute Swan from Lithuania whose recovery in Dumfriesshire in January 1959 adds to the complexities of interpreting recent increases in the population of this species. It is to be hoped that this unexpected occurrence will give an extra stimulus to the efforts at ringing Mute Swans which have already enabled 1958 to surpass the total of all previous years in the British Isles.

A Great Tit ringed in Germany and Blue Tits marked there and in Belgium, all as juveniles during May-July 1957, are interesting as defining points of origin of the remarkable irruption of that autumn. The further development of the influx in autumn and winter, followed by some return movement in the next spring, is indicated among the numerous recoveries in the British-ringed section of this Report (see pages 470-472).

Fifteen Barnacle Geese ringed in 1955 in east Greenland have yielded an interesting pattern of recoveries, a dozen in the Hebrides and the rest in north-west Ireland. Six others ringed at the same time in the same part of Greenland had already been reported wintering in the same two areas (*antea*, vol. li, p. 62). It is interesting that none of these birds has been found on the Solway where two Barnacles were recovered after being ringed in Lutsbergen in the previous year, which is suggestive of a separation of the wintering areas into the two stocks. This matter is being further investigated. Several of the Greenland white-fronted Geese listed had attained a fair age, and two were found wintering in Argyll. An unfortunate Osprey which crossed the Yorkshire coast in an exhausted state a few weeks after fledging in 1958 was revived in vain, and the possibility that it may have been shot is disturbing. A Kestrel from Finland is of some interest, and two Turnstones recovered on the east coast had been ringed two or three years earlier as far north as latitude 60° in east Greenland. A Greenland Kittiwake in South Wales points to a west-to-east, as well as the more familiar east-to-west, transatlantic movement. Once again there is welcome evidence of a mass influx of foreign Great Black-backed Gulls, this time from Russia as well as Iceland and Norway, the immigrants being widely spread over the British Isles.—Eds.]

Manx Shearwater (*Procellaria puffinus*)

2264	v	ad.	30.7.57	Phare du Creac'h: 48°28'N. 5°05'W. Ushant, France
			9.4.58	Annet: 49°54'N. 6°22'W. Scilly Isles

Heron (*Ardea cinerea*)

655	×	O pull.	10.6.56	Sund: 60°17'N. 5°10'E. (Hordaland) Norway
			0.2.57	Moffat: 55°19'N. 3°26'W. (Dumfries)
2022	×	O pull.	12.5.57	Kvarven: 60°25'N. 5°15'E. <i>nr.</i> Bergen, Norway
			2.4.58	Burravoe: 60°30'N. 1°03'W. (Yell) Shetland
1971	×	O pull.	19.5.55	Clairmarais: 50°45'N. 2°15'E. (Pas-de-Calais), France
			(3.4.56)	Chippenham: 51°27'N. 2°07'W. (Wiltshire)
5280	+	O pull.	15.5.57	Lac de Grand Lieu: 47°05'N. 1°40'W. (Loire Atlantique), France
			11.1.58	Hungerford: 51°25'N. 1°31'W. (Berkshire)

Mallard (*Anas platyrhynchos*)

R.S.	O	pull.	21.6.58	Korsholm: 63°10'N. 21°31'E. Finland
10	+		10.12.58	Frogden: 55°33'N. 2°24'W. <i>nr.</i> Kelso (Roxburgh)
		♂	14.8.58	Pori: 61°30'N. 21°45'E. Finland
1959	v		22.12.58	<i>Nr.</i> Peterborough: 52°40'N. 0°17'W. (Northampton)
		juv.	1.8.58	Kokkola: 63°50'N. 23°08'E. Finland
046	+		20.12.58	Chirnside: 55°48'N. 2°12'W. (Berwick)
		♂	13.3.58	Le Sambuc: 43°31'N. 4°42'E. (Bouches-du-Rhône) France
660	+		0.9.58	Eastchurch: 51°24'N. 0°53'E. Isle of Sheppey (Kent)

In addition to those set out in detail above, there are records of Mallard recovered on passage and recovered in the British Isles in autumn and winter.

Eight with Brussels rings were obtained in the counties of Lincoln, Northampton, Norfolk, Suffolk, Essex, and Kent, and thirteen with Leiden rings were recovered in Northumberland, Cumberland, Lincoln, Norfolk, Suffolk, Essex, Kent, Flint, and Cornwall. There is also one record from Co. Cork.

Teal (*Anas crecca*)

<i>M.</i>		10.7.57	Staraya Russa: 58°00'N. 31°21'E. (Novgorod) U.S.S.R.
E111432 +		23.1.58	Brundall: 52°37'N. 1°26'E. (Norfolk)
<i>S.J.F.</i>	ad.♂	17.5.56	Lannavaara: 68°03'N. 21°57'E. (Lappland) Sweden
38591 +		4.1.58	Usk: 51°43'N. 2°54'W. (Monmouth)
<i>S.J.F.</i>	O pull.	14.7.58	Hängasjö: 56°39'N. 13°54'E. (Småland) Sweden
48212 +		22.11.58	Pwllcrochan: 51°42'N. 5°01'W. (Pembroke)
<i>C.</i>	juv.	1.9.57	Amager: 55°40'N. 12°38'E. Denmark
584676 +		13.11.58	Lough Beg: 54°47'N. 6°29'W. Northern Ireland
<i>P.</i>	1st W.♂	20.2.56	Le Sambuc: 43°31'N. 4°42'E. (Bouches-du-Rhône) France
EB2015 +		0.12.58	Pagham: 50°46'N. 0°43'W. (Sussex)
<i>P.</i>	1st W.♂	23.12.57	Le Sambuc, France
EC7565 +		20.12.58	Downham Market: 52°26'N. 0°24'E. (Norfolk)

Just over one hundred Teal ringed at decoys in Belgium and Holland were recovered during the period of this report. These recoveries are distributed over twenty-one counties in England, six counties in Wales, five counties in Scotland and eighteen in Ireland.

Wigeon (*Anas penelope*)

<i>Rk.</i>	O pull.	2.8.57	Fnjóskadalur: 65°46'N. 17°53'W. Iceland
45448 +		5.2.58	Ullapool: 57°54'N. 5°10'W. (Ross)
<i>Rk.</i>	O pull.	26.7.53	Fnjóskadalur, Iceland
44725 +		10.12.58	Mouth of River Ness: 57°28'N. 4°13'W. (Inverness)
<i>Rk.</i>	add.♂	12.8.51	Myvatn: 65°39'N. 16°58'W. Iceland
43216 ×		16.12.58	Hascosay: 60°37'N. 0°59'W. Shetland
<i>L.</i>	♀	13.12.55	Texel: 53°06'N. 4°48'E. Holland
348381 +		30.1.56	Paglesham: 51°36'N. 0°49'E. (Essex)
<i>L.</i>	ad. ♂	30.1.56	Texel, Holland
3848385 +		28.9.58	Dornoch Firth (Sutherland)
<i>L.</i>	juv. ♂	2.11.54	Lekkerkerk: 51°55'N. 4°43'E. Holland
253874 +		10.2.56	Mouth of River Towy: 51°47'N. 4°23'W. (Carmarthen)
<i>L.</i>	ad. ♂	27.10.56	Lekkerkerk, Holland
271049 +		2.12.56	Tramore: 52°10'N. 7°09'W. (Waterford)

Pintail (*Anas acuta*)

<i>L.</i>	ad. ♂	8.10.56	Texel: 53°06'N. 4°48'E. Holland
346348 +		23.11.56	Burton Marshes: 53°16'N. 3°02'W. (Cheshire)

Shoveler (*Spatula clypeata*)

<i>Hki.</i>	O pull.	19.7.58	Luvia: 61°24'N. 21°34'E. Finland
H29654 +		31.10.58	Hickling Broad: 52°45'N. 1°35'E. (Norfolk)

Pochard (*Aythya ferina*)

<i>M.</i>	juv.	28.7.57	Lake Juvintas: 54°28'N. 23°38'E. Lithuania
D276540 +		11.1.58	Loch of Tingwall: 60°10'N. 1°15'W. (Shetland)
<i>P.</i>	O pull.	29.6.58	Cleppé: 45°46'N. 4°13'E. (Loire) France
DC4161 +	ca.	20.12.58	Nr. Colchester: 51°54'N. 0°55'E. (Essex)

Goldeneye (*Bucephala clangula*)

J.F.	ad. ♀	19.6.57	Kattstrufeforsen: 63°20'N. 14°33'E. (Jämtland) Sweden
50426	+	3.1.58	Sleaford: 53°00'N. 0°25'W. (Lincoln)

White-fronted Goose (*Anser albifrons*)

	1st S.	3.7.47	Jakobshavn Dist.: 70°06'N. 52°08'W. Greenland
71647	+	4.11.58	North Slob: 52°20'N. 6°28'W. (Wexford)
	juv.	4.8.49	Jakobshavn Dist., Greenland
74029	+	5.1.57	North Slob (Wexford)
		12.7.49	Jakobshavn Dist., Greenland
74002	×	15.1.57	North Slob (Wexford)
	juv.	4.8.49	Jakobshavn Dist., Greenland
70134	+	19.2.57	Isle of Lismore: 56°30'N. 5°30'W. (Argyll)
	ad.	29.7.55	Jakobshavn Dist., Greenland
73366	+	14.1.58	Isle of Lismore (Argyll)
	juv.	14.7.57	Jakobshavn Dist., Greenland
72834	+	15.10.57	Burrin: 53°09'N. 9°04'W. (Clare)
	juv.	14.7.57	Jakobshavn Dist., Greenland
73063	+	27.10.57	Rochestown: 52°19'N. 7°01'W. (Kilkenny)
	ad. ♀	16.3.56	Bunschoten: 52°14'N. 5°22'E. (Utrecht) Holland
04387	v	21.2.58	Slimbridge: 51°44'N. 2°25'W. (Gloucester)

Pink-footed Goose (*Anser arvensis brachyrhynchus*)

Reports of recoveries of Pink-footed Geese have been fairly numerous, and nearly all were shot on the usual wintering grounds in the British Isles. Most had been ringed on the Central Iceland breeding-grounds in 1953, but a few date from the Wildfowl Trust's earlier expedition in 1951.

Barnacle Goose (*Branta leucopsis*)

The following Barnacle Geese had all been ringed in 1955 in East Greenland, at two neighbouring localities (ca. 71°30'N. 23°20'W.), and recovery details are set out with age and sex at the time of ringing.

	ad. ♀	9.1.57	South Uist, Outer Hebrides
75476			
	ad. ♀	7.1.58	Eochar: 57°23'N. 7°25'W. South Uist
74990			
	ad. ♀	0.2.58	Flodday: 57°29'N. 7°16'W. Benbecula, Outer Hebrides
75496			
	ad. ♀	8.4.57	West coast of Barra, Outer Hebrides
75227			
		11.1.57	Staffin: 57°39'N. 6°13'W. Isle of Skye
75406			
	juv. ca.	27.1.58	Isle of Coll (Argyll)
75351			
	juv.	28.12.56	Gruinart: 55°50'N. 6°20'W. Isle of Islay (Argyll)
75159			
	ad. ♂	25.1.58	North coast of Donegal
75466			
	juv.	8.3.58	Sheephaven Bay: 55°10'N. 7°52'W. (Donegal)
75157			

C.	ad. ♀	23.1.57	Sound of Harris, Outer Hebrides
376577			
C.	ad. ♂	22.1.57	Sound of Harris
376578			
C.	ad. ♀	12.2.57	Drinnishadder: 57°52'N. 6°47'W. Harris
275316			
C.	ad. ♀	12.2.57	Drinnishadder
376567			
C.		3.1.58	Ascrib Is.: 57°35'N. 6°32'W. Isle of Skye
275422			
C.	juv.	2.2.57	Rosse's Point: 54°19'N. 8°34'W. (Sligo)
376580			

Mute Swan (*Cygnus olor*)

M.	juv.	12.8.55	Lake Juvintas: 54°28'N. 23°38'E. Lithuania
A7587	×	12.1.59	Annan: 55°02'N. 3°16'W. (Dumfries)

This unique record has been advanced from 1959 in view of its great interest.

Osprey (*Pandion haliaëtus*)

St. Orn.	O pull.	8.7.58	Strängnäs: 59°21'N. 17°02'E. (Södermanland) Sweden
876122	v	21.8.58	Mouth of Humber
	×	26.8.58	Rise: 53°52'N. 0°14'W. (York)

This Osprey was rescued from the water in an exhausted condition by a member of the crew of a pilot-cutter. He succeeded in feeding and restoring it, and after five days released it in good order. It was capable of flying at least the fifteen miles to Rise on the day it was liberated, and it is feared that it may have been shot.

Kestrel (*Falco tinnunculus*)

Hki.	ad. ♀	14.7.58	Björköby: 65°25'N. 21°10'E. Finland
C70170	+	13.9.58	Wolsley Bridge: 52°47'N. 1°59'W. (Stafford)

There is no other record of a ringed Kestrel from Finland recovered in the British Isles and the only one also showing an eastern European origin is a bird ringed in Silesia, near Breslau, in 1936 and recovered near York the following year.

Coot (*Fulica atra*)

M.	juv.	4.9.56	Lake Juvintas: 54°28'N. 23°38'E. Lithuania
C56487	×	18.1.58	Greenford: 51°32'N. 0°21'W. (Middlesex)

This is the first Coot to be recovered in Great Britain after being ringed so far east, but there are a few parallel cases of British-ringed birds having been recovered in eastern Europe.

Lapwing (*Vanellus vanellus*)

C.	O pull.	3.6.56	Eastern Lolland, Denmark
782976	+	5.1.58	Banagher: 53°11'N. 7°59'W. (Offaly)
L.	O pull.	18.6.56	Ureterp: 53°06'N. 6°10'E. (Friesland) Holland
264009	+	8.2.58	Ballycotton: 51°50'N. 8°01'W. (Cork)
II.	O pull.	11.5.58	Suderwich: 51°38'N. 7°15'E. (Westfalen) Germany
571960	×	24.11.58	Mildenhall: 52°21'N. 0°31'E. (Suffolk)
Stav.	O pull.	28.5.57	Örland: 63°42'N. 9°37'E. (Sör-Tröndelag) Norway
624255	+	31.12.57	West Newcastle: 52°27'N. 9°06'W. (Limerick)

av.	O	pull.	3.6.57	Örland, Norway
44295	×		30.12.57	Beverley: 53°50'N. 0°26'W. (York)
av.	O	pull.	8.5.57	Madla: 58°57'N. 5°40'E. Stavanger, Norway
2719	×		(26.12.57)	Hollym: 53°43'N. 0°04'E. nr. Patrington (York)

Golden Plover (*Charadrius apricarius*)

av.	O	ad. ♀	19.6.57	Fnjóskadalur: 65°46'N. 17°53'W. Iceland
639	+		5.3.58	Buckland Monachorum: 50°29'N. 4°08'W. (Devon)

Turnstone (*Arenaria interpres*)

av.		ad.	8.6.56	Daneborg: 74°20'N. 20°00'W. East Greenland
8015	v		17.8.58	Bradwell-on-Sea: 51°44'N. 0°54'E (Essex)
av.		ad.	2.6.56	Daneborg, East Greenland
8054	×		25.1.59	Sea Palling: 52°47'N. 1°38'E (Norfolk)
av.			30.8.57	Nanortalik: 60°09'N. 45°19'W. South Greenland
2680	+		3.11.57	Inishark: 53°37'N. 10°18'W. (Galway)

Snipe (*Capella gallinago*)

av.	O	pull.	22.6.56	Fnjóskadalur: 65°46'N. 17°53'W. Iceland
746	+		11.1.58	Sneem: 51°51'N. 9°54'W. (Kerry)
av.	O	pull.	28.6.57	Skipalón: 65°47'N. 18°12'W. Iceland
712	+		5.12.58	Ballintra: 54°34'N. 8°08'W. (Donegal)

Woodcock (*Scolopax rusticola*)

av.	O	pull.	19.5.57	Idsal: 58°59'N. 6°00'E. (Rogaland) Norway
4707	+		10.11.57	Fermoy: 52°10'N. 8°20'W. (Cork)

Curlew (*Numenius arquata*)

av.	O	pull.	6.6.56	Pori: 61°30'N. 21°45'E. Finland
8324	+		15.1.58	Stiffkey: 52°57'N. 0°56'E. (Norfolk)
av.	O	pull.	1.6.57	Pori, Finland
0203	+		0.9.57	Teesmouth: ca. 54°36'N. 1°10'W. (York)
av.	O	pull.	17.7.58	Pori, Finland
28579	+		25.9.58	Killingholme: 53°38'N. 0°16'W. (Lincoln)
av.	O	pull.	3.6.57	Karkku: 61°24'N. 22°57'E. Finland
7608	+		23.10.57	Whitton Sands: ca. 53°43'N. 0°40'W. Humber
av.	O	pull.	19.6.57	Kangasala: 61°33'N. 24°15'E. Finland
0586	×	(skeleton)	2.3.58	Millom: 54°15'N. 3°16'W. (Cumberland)
av.	O	pull.	16.6.54	Bjerkreim: 58°37'N. 6°00'E. (Rogaland) Norway
4836	+		5.9.58	Teesmouth (Durham)
av.	O	pull.	4.7.26	Strömsholm: 59°30'N. 16°15'E. (Västmanland) Sweden
266	+		25.1.58	Blakeney: 52°58'N. 1°01'E. (Norfolk)
av.		f.g.	29.8.57	Amager: 55°40'N. 12°38'E. Denmark
2985	v	ca.	7.1.58	Canonbie: 55°04'N. 2°56'W. (Dumfries)

Göteborg DI266 is an extraordinary instance of longevity and there is no reason to doubt that this bird was really in its thirty-second year: most careful investigations were made both by the Bird-Ringing Office and by the Museum authorities at Gothenburg, and the ring itself was fortunately available for examination.

Knot (*Calidris canutus*)

<i>Stav.</i>	f.g.	30.9.56	Revtangen: 58°45'N. 5°30'E. (Rogaland) Norway
Z2422	+	0.12.57	Drogheda: 53°43'N. 6°20'W. (Louth)
<i>St.</i>	juv.	11.8.53	Ottenby: 56°13'N. 16°25'E. Öland, Sweden
YE9359	×	22.2.58	Foulness Island: 51°36'N. 0°55'E. (Essex)

Dunlin (*Calidris alpina*)

<i>Stav.</i>	f.g.	20.8.51	Revtangen: 58°45'N. 5°30'E. (Rogaland) Norway
9382	+	26.1.57	Ruthwell: 54°59'N. 3°20'W. (Dumfries)
<i>Stav.</i>	f.g.	24.9.52	Revtangen, Norway
821276	×	25.12.57	Hessle: 53°44'N. 0°26'W. (York)
<i>Stav.</i>	f.g.	10.9.57	Revtangen, Norway
852216	v	19.9.57	Beadnell: 55°33'N. 1°37'W. (Northumberland)
<i>Stav.</i>	f.g.	29.9.57	Revtangen, Norway
851551	×	13.12.58	Terrington Marshes: 52°48'N. 0°18'E. (Norfolk)
<i>St.</i>	ad.	23.7.58	Åhus: 55°55'N. 14°18'E. (Kristianstad) Sweden
ZBJ7638	×	26.10.58	Cleethorpes: 53°33'N. 0°00' (Lincoln)
<i>St. Orn.</i>	ad.	22.7.54	Ottenby: 56°13'N. 16°25'E. Öland, Sweden
506486	×	13.12.58	Marchwood: 50°53'N. 1°27'W. (Hampshire)
<i>St. Orn.</i>	ad.	28.7.58	Ottenby, Sweden
242715	+	8.11.58	Belfast: 54°35'N. 5°50'W. (Antrim)
<i>St. Orn.</i>	f.g.	25.8.58	Falsterbo: 55°23'N. 12°50'E. (Skåne) Sweden
225876	v	6.12.58	Canvey Island: 51°32'N. 0°35'E. (Essex)
<i>H.</i>	f.g.	18.9.57	Nr. Varel: 53°24'N. 8°15'E. (Oldenburg) Germany
7275061	+	1.1.58	Spalding: 52°47'N. 0°09'W. (Lincoln)

Great Black-backed Gull (*Larus marinus*)

<i>M.</i>	O	pull.	6.7.58	Great Ainov Is.: 69°50'N. 31°35'E. U.S.S.R.
D429233	+		26.12.58	Littleton-on-Severn: 51°37'N. 2°35'W. (Gloucester)
<i>Rk.</i>	O	pull.	17.6.55	Skipalón: 65°47'N. 18°12'W. Iceland
36126	×		22.2.58	Aberlady: 56°01'N. 2°51'W. (East Lothian)
<i>Rk.</i>	O	pull.	26.6.55	Skipalón, Iceland
36145	+		25.1.58	Ennis, 52°51'N. 8°59'W. (Clare)
<i>Rk.</i>	O	pull.	27.6.57	Skipalón, Iceland
21538	×	(wires)	0.1.58	Burton Port: 54°58'N. 8°27'W. (Donegal)
<i>Stav.</i>	O	pull.	22.6.53	Kinn: 61°34'N. 4°45'E. (Sogn & Fjordane) Norway
036225	×		(15.3.57)	Canvey Island: 51°32'N. 0°35'E. (Essex)
<i>Stav.</i>	O	pull.	6.7.55	Kinn, Norway
307614	v	ca.	10.2.57	Gravesend: 51°26'N. 0°22'E. (Kent)
<i>Stav.</i>	O	pull.	6.7.55	Kinn, Norway
308171	×	winter	57/58	Tynemouth: 55°02'N. 1°25'W. (Northumberland)
<i>Stav.</i>	O	pull.	26.6.55	Rott: 58°55'N. 5°30'E. (Rogaland) Norway
415389	×		5.8.57	Skipsea: 53°58'N. 0°12'W. (York)
<i>Stav.</i>	O	pull.	29.6.56	Rott, Norway
410499	()		30.3.57	Off Orford Ness: ca. 52°06'N. 1°38'E. (Suffolk)
<i>Stav.</i>	O	pull.	29.6.56	Rott, Norway
414819	×		21.11.57	Saltburn: 54°35'N. 0°57'W. (York)
<i>Stav.</i>	O	pull.	17.6.57	Rott, Norway
311506	×		16.11.57	Teesmouth: ca. 54°38'N. 1°10'W. (York)
<i>Stav.</i>	O	pull.	27.6.57	Rott, Norway
411903	×		(13.11.57)	Havant: 50°51'N. 0°59'W. (Hampshire)

juv.	O	pull.	27.6.57	Rott, Norway
969	×		4.1.58	Holbeach Marsh: 52°52'N. 0°05'E. (Lincoln)
juv.	O	pull.	30.6.54	Klepp: 58°44'N. 5°33'E. (Rogaland) Norway
4470	×		15.10.57	Newbiggin: 55°11'N. 1°30'W. (Northumberland)
juv.	O	pull.	12.7.58	Klepp, Norway
1159	+		19.12.58	Teesmouth: ca. 54°38'N. 1°10'W. (Durham)

Herring Gull (*Larus argentatus*)

juv.	O	pull.	29.7.56	Bleik: 69°17'N. 16°00'E. Vesterålen, Norway
284	×		5.1.57	Bedlington: 55°08'N. 1°35'W. (Northumberland)
juv.	O	pull.	12.6.57	Hovden: 61°43'N. 4°53'E. (Sogn & Fjordane) Norway
5286	×		(9.1.58)	Grimsby: 53°35'N. 0°04'W. (Lincoln)
juv.	O	pull.	20.8.56	Rottumeroog: 53°33'N. 6°35'E. West Frisian Is., Holland
5780	×		26.4.58	Wootton Marshes: 52°48'N. 0°27'E. (Norfolk)

Common Gull (*Larus canus*)

Twenty-two Common Gulls were recovered during the period covered by this report: three in the western counties, three in Scotland and the remainder in eastern and south-eastern counties. Their countries of origin were Finland, Sweden, Norway, Denmark and the Baltic coast of Germany.

Black-headed Gull (*Larus ridibundus*)

Thirty-three recoveries of Black-headed Gulls come under review for 1958. Of the birds concerned only five penetrated westwards in the British Isles, the rest having been found in eastern and south-eastern counties. The countries in which they were ringed were Finland, the Baltic Republics, south Holland, Germany (Schleswig-Holstein, Baltic coast, Brandenburg and Saxony), Czechoslovakia, Scandinavia and Holland.

Kittiwake (*Rissa tridactyla*)

juv.	O	pull.	22.7.57	Murmansk Coast: ca. 68°49'N. 37°20'E. U.S.S.R.
32714	+		6.4.58	Donna Nook: 53°29'N. 0°10'E. (Lincoln)
juv.	O	pull.	28.6.57	Runde: 62°25'N. 5°38'E. (Sunnmøre) Norway
1575	()		2.12.57	Atlantic Ocean: 50°30'N. 9°30'W.
juv.	O	pull.	28.6.58	Runde, Norway
793	×		(2.1.59)	Aberystwyth: 52°25'N. 4°04'W. (Cardigan)
juv.	1st W.		15.3.58	Cuxhaven: 53°53'N. 8°42'E. Germany
4651	×		9.4.58	Bridlington: 54°06'N. 0°12'W. (York)
juv.	juv.		26.7.55	Jakobshavn District: ca. 70°06'N. 52°08'W. Greenland
641	×		4.3.57	Port Talbot: 51°36'N. 3°47'W. (Glamorgan)

The only foreign-ringed Kittiwakes recovered up to now in the British Isles have been from the Murmansk coast, so that the appearance of the names of three other ringing-stations in the list is noteworthy, and the bird from Greenland is of special interest.

Common Tern (*Sterna hirundo*)

juv.	O	pull.	4.7.58	Sömeri Island: 58°50'N. 23°25'E. Estonia
1370	×		6.9.58	Legsby: 53°22'N. 0°19'W. (Lincoln)

Arctic Tern (*Sterna macrura*)

juv.	O	ad.	13.6.57	Scharlhörn Island: 53°58'N. 8°25'E. Germany
2733	×		1.8.58	Redcar: 54°38'N. 1°04'W. (York)

Sand Martin (*Riparia riparia*)

P.	ad.	17.4.58	Le Sambuc: 43°31'N. 4°42'E. (Bouches-du-Rhône)
JK1154			France
	v	22.6.58	Petworth: 50°59'N. 0°37'W. (Sussex)

This is the first record of a Sand Martin ringed abroad and recovered in the British Isles.

Jackdaw (*Corvus monedula*)

B.	ad.	26.4.58	Le Zoute: 51°20'N. 3°17'E. (West Flanders) Belgium
4E996	+	12.6.58	High Halstow: 51°27'N. 0°34'E. (Kent)

Great Tit (*Parus major*)

H.	O	juv.	31.5.57	Riddagshausen: 52°16'N. 10°31'E. (Brunswick) Germany
8921683				
	v	♀	15.3.58	Sevenoaks: 51°16'N. 0°12'E. (Kent)

Blue Tit (*Parus caeruleus*)

R.	juv.	25.6.57	Hammerstein: 50°28'N. 7°22'E. (Rhineland) Germany
H352016	v	28.4.58	Portland Bill: 50°31'N. 2°27'W. (Dorset)
B.	juv.	28.7.57	Opbrakel: 50°48'N. 3°45'E. (East Flanders) Belgium
17A1076	×	0.2.58	Thirsk: 54°14'N. 1°20'W. (York)

Fieldfare (*Turdus pilaris*)

Stav.	O	pull.	10.6.53	Ål: 60°37'N. 8°33'E. (Hallingdal) Norway
726620	×		2.2.58	Kildangan: 53°07'N. 6°59'W. (Kildare)

Blackbird (*Turdus merula*)

Hki.	O	pull.	23.6.57	Helsinki: 60°09'N. 24°57'E. Finland
A78246	×		9.3.58	Ponteland: 55°03'N. 1°44'W. (Northumberland)
Stav.	ad.		19.2.57	Runde: 62°25'N. 5°38'E. (Sunnmøre) Norway
740143	+		18.11.57	Roscrea: 52°57'N. 7°48'W. (Tipperary)
Stav.	ad. ♀		21.3.52	Line: 58°43'N. 5°38'E. (Rogaland) Norway
716120	×	(hawk)	12.3.57	Alford: 57°14'N. 2°43'W. (Aberdeen)
Stav.	ad. ♂		24.3.57	Line, Norway
752547	v		24.1.58	Kilshanny: 52°59'N. 9°18'W. (Clare)
St.	ad. ♂		20.8.58	Ledskär: 60°30'N. 17°38'E. Bay of Lövsta, Sweden
YR 1007	×		23.12.58	Dudgeon Light-Vessel: 53°13'N. 1°00'E.
G.	ad. ♀		13.4.57	Ytterby: 57°51'N. 11°48'E. (Bohuslän) Sweden
B53778	/?/		(7.2.58)	Ventry: 52°08'N. 10°22'W. (Kerry)
G.	ad. ♂		24.3.57	Stora Mellösa: 59°12'N. 15°31'E. (Örebro) Sweden
B52443	v		0.1.58	Garvagh: 54°59'N. 6°42'W. (Londonderry)
G.	O	pull.	20.5.57	Ballingslöv: 56°12'N. 13°50'E. (Skåne) Sweden
B56494	×		1.1.58	Bryanston: 50°52'N. 2°11'W. (Dorset)
H.	1st W ♂		13.10.58	Heligoland: 54°11'N. 7°55'E. Germany
7309449	v		16.11.58	Cley: 52°58'N. 1°03'E. (Norfolk)
H.	ad. ♀		17.11.58	Heligoland, Germany
7310302	v		20.11.58	Fair Isle: 59°32'N. 1°37'W. Shetland
B.	O	pull.	23.6.57	Wassmunster: 51°07'N. 4°05'E. (East Flanders) Belgium
6D9218	v		25.10.58	Skokholm: 51°42'N. 5°16'W. (Pembroke)

Garden Warbler (*Sylvia borin*)

	f.g.	8.6.58	Heligoland: 54°11'N. 7°55'E. Germany
53598 v		7.9.58	Minsmere: 52°15'N. 1°38'E. (Suffolk)
	f.g.	23.8.57	Heligoland, Germany
112232 v		27.5.59	Isle of May: 56°11'N. 2°33'W. (Fife)

The Garden Warbler recovered at the Isle of May in 1959 is included in this list for 1958 on account of the interest in comparing its dates with those of the Suffolk bird. Compare also the British-ringed bird recovered at Heligoland, referred to in the *Report on bird-ringing for 1955* (*antea*, vol. L, p. 68).

Chiffchaff (*Phylloscopus collybita*)

	juv.	14.8.54	Heligoland: 54°11'N. 7°55'E. Germany
007178 >		4.5.58	Dunoon: 55°57'N. 4°56'W. (Argyll)

This is the first recovery in the British Isles of a Chiffchaff ringed abroad.

Starling (*Sturnus vulgaris*)

	O ad.	23.5.58	Beloviezha Reserve: 52°40'N. 24°10'E. U.S.S.R.
226340 v		23.12.58	Runcorn: 53°20'N. 2°44'W. (Cheshire)
	O pull.	7.6.58	Ristiküla: 58°11'N. 24°47'E. Estonia
114035 >		29.12.58	Isfield: 50°57'N. 0°04'E. (Sussex)
	O pull.	1.6.58	Kandava: 57°08'N. 22°44'E. Latvia
6763 x		5.11.58	Inner Dowsing Light-Vessel: 53°13'N. 0°34'E.
	O pull.	2.6.58	Ogre: 56°49'N. 24°37'E. Latvia
339732 x		31.12.58	Dogger Bank, North Sea: ca. 55°00'N. 2°50'E.
	O pull.	16.6.56	Rakvere: 59°27'N. 26°01'E. Estonia
2260 x		21.9.58	Ballyclare: 54°45'N. 6°00'W. (Antrim)
	O pull.	30.6.57	Oulu: 65°03'N. 25°35'E. Finland
44997 +		23.3.58	Dunfermline: 56°04'N. 3°29'W. (Fife)
	O pull.	30.6.57	Pori: 61°30'N. 21°45'E. Finland
4671 x	(cat)	12.12.57	Watten: 58°29'N. 3°18'W. (Caithness)
	O pull.	4.6.55	Høyland: 58°50'N. 5°45'E. (Rogaland) Norway
5219 x		5.2.58	Hull: 53°45'N. 0°20'W. (York)
	O pull.	28.5.56	Sokndal: 58°20'N. 6°17'E. (Rogaland) Norway
4918 x	(snow)	9.2.58	Norham: 55°43'N. 2°10'W. (Northumberland)
	O pull.	12.5.57	Madla: 58°57'N. 5°40'E. (Rogaland) Norway
5236 x		28.11.57	Limavady: 55°04'N. 6°56'W. (Londonderry)
	O pull.	24.5.57	Sokndal, Norway
2270 +		15.11.57	Scarborough: 54°17'N. 0°24'W. (York)
	O pull.	27.5.57	Sokndal, Norway
2411 v		18.1.58	Greenlaw: 55°42'N. 2°28'W. (Berwick)
	O pull.	10.6.57	Helleland: 58°28'N. 6°15'E. (Rogaland) Norway
2056 +		12.11.57	Stannington: 55°07'N. 1°39'W. (Northumberland)
	O pull.	3.6.55	Resteröd: 58°15'N. 11°54'E. (Bohuslän) Sweden
3124 >		27.3.58	Malpas: 53°03'N. 2°49'W. (Cheshire)
	O pull.	4.6.56	Bohus: 57°52'N. 12°01'E. Sweden
1894 x		31.1.58	Thurlby: 52°44'N. 0°22'W. (Lincoln)
	O pull.	24.5.57	Ryda: 58°17'N. 12°53'E. (Västergötland) Sweden
7908 x		19.10.58	Dudgeon Light-Vessel: 53°13'N. 1°00'E.
	O pull.	13.6.58	Åker: 57°23'N. 14°00'E. (Småland) Sweden
5783 +		26.11.58	Walmsgate: 53°17'N. 0°03'E. (Lincoln)

P-V	O	pull.	16.6.57	Miescisko: 52°45'N. 17°20'E. (Poznan) Poland
F192452	×		31.1.58	Goonbell: 50°17'N. 5°12'W. <i>nr.</i> St. Agnes (Cornwall)
H.	O	pull.	15.5.55	Nordhorn: 52°27'N. 7°05'E. (Hanover) Germany
7225219	v		7.2.58	Hythe: 51°04'N. 1°06'E. (Kent)
H.	O	pull.	22.5.57	Saerbeck: 52°11'N. 7°39'E. (Westfalen) Germany
7285366	×		9.3.58	Loddiswell: 50°20'N. 3°47'W. (Devon)

Numbers of Starlings ringed as full-grown out of the breeding-season, whose countries of origin are uncertain, were recovered extensively in Britain during autumn and winter. Such birds had for the most part been trapped in Germany and Holland.

The records that follow show two further examples of re-orientation on the part of migrants interrupted and displaced *en route*.

L.	ad. ♂	21.10.53	Loosduinen: 52°04'N. 4°15'E. Holland
			transported Geneva: 46°12'N. 6°10'E. Switzerland
K20407	v	16.3.58	Alderford: 52°44'N. 1°09'E. (Norfolk)
L.	ad. ♂	26.10.57	Wassenaar: 52°09'N. 4°22'E. Holland
			transported Basle: 47°34'N. 7°35'E. Switzerland
K42315	×	10.11.58	Easton: 52°51'N. 0°38'W. <i>nr.</i> Grantham (Lincoln)

Greenfinch (*Chloris chloris*)

P.	♀	9.1.56	Carentan: 49°18'N. 1°14'W. (Manche) France
HV2809	×	16.4.58	Selsey: 50°44'N. 0°48'W. (Sussex)

Chaffinch (*Fringilla coelebs*)

Hki.	O	pull.	18.6.57	Eckerö: 60°14'N. 19°30'E. Åland Is., Finland
P6389	×		25.3.58	Minster: 51°20'N. 1°20'E. (Kent)
H.	♀		20.2.56	Wilhelmshaven: 53°32'N. 8°08'E. Germany
8864836	v		24.1.58	Brawdy: 51°53'N. 5°07'W. (Pembroke)
L.	♂		20.10.55	Wassenaar: 52°09'N. 4°22'E. Holland
H54275	v		25.3.58	Colchester: 51°54'N. 0°55'E. (Essex)
L.	juv.		2.10.57	Wassenaar, Holland
H96160	×		27.3.58	Nacton: 52°01'N. 1°14'E. (Suffolk)
L.	♂		20.10.57	Wassenaar, Holland
H97682	v		28.12.58	Much Hadham: 51°51'N. 0°04'E. (Hertford)
L.	♂		4.10.52	Loosduinen: 52°03'N. 4°12'E. Holland
H3845	×	(snow)	0.3.58	Shepherd's Well: 51°11'N. 1°14'E. (Kent)
B.	f.g.		14.10.52	Knokke: 51°20'N. 3°17'E. (West Flanders) Belgium
4A4781	×	(on road)	17.3.58	Black Bourton: 51°45'N. 1°36'W. (Oxford)
B.	♀		7.10.56	Ranst: 51°11'N. 4°34'E. (Antwerp) Belgium
15B1379	×		22.3.58	Chippenham: 51°27'N. 2°07'W. (Wiltshire)
B.	♀		12.10.56	St. Job-in-'t-Goor: 51°14'N. 4°39'E. (Antwerp) Belgium
17A6274	×		8.3.58	Damerham: 50°57'N. 1°52'W. (Hampshire)
B.	♂		15.10.56	Baarle Hertog: 51°26'N. 4°56'E. (Antwerp) Belgium
18B8630	×		19.3.58	Yeovil: 50°57'N. 2°39'W. (Somerset)
B.	♀		6.10.57	Opbrakel: 50°48'N. 3°45'E. (East Flanders) Belgium
19B2998	×		9.3.58	Charlton Horethorne: 51°01'N. 2°29'W. (Somerset)

LIST OF BIRD OBSERVATORIES IN THE BRITISH ISLES

This list is arranged alphabetically and is designed to give (i) the name of the warden or director where there is one; (ii) the address from which particulars may be obtained; and (iii) an indication of accommodation charges and travel routes (charges are, of course, liable to alteration).

ARDREY BIRD AND FIELD OBSERVATORY, Caernarvonshire, N. Wales. *Warden*: R. W. Arthur. *Write to*: W. M. Condry, Felin-y-cwm, Eglwysfach, Machynlleth, Montgomeryshire. *Accommodation*: 4/- per night. *Station*: Pwllheli. *Boat from Aberdaron*: 11/- return.

CLEY BIRD OBSERVATORY, Holt, Norfolk. *Warden*: R. A. Richardson, Hill Top, Cley, Holt, Norfolk, from whom particulars may be obtained (please send stamped reply envelope). *Accommodation*: Cottage or hotel in Cley village. *Station*: Holt (4 miles).

DELMOND BIRD OBSERVATORY, N. Ireland. *Hon. Director*: J. G. Gray. *Write to*: J. Wilde, 23 Kingsland Park, Knock, Belfast. *Accommodation*: 2/- per night. *Bus and Boat from Belfast*: 10/- return.

DENGENESS BIRD OBSERVATORY, Romney Marsh, Kent. *Write to*: H. A. R. Lawkell, 6 Canute Road, Hastings, Sussex. *Accommodation*: 5/- per night. *Station*: Lydd-on-Sea.

EDINBURGH ISLE BIRD OBSERVATORY, by Lerwick, Shetland. *Warden*: Peter Davis. *Write to*: George Waterston, 21 Regent Terrace, Edinburgh 7. *Accommodation and Board*: 15/- to £1 per night. *Station*: Aberdeen; then by steamer to Lerwick (£6 return) or by B.E.A. aeroplane to Sumburgh. *Island boat*: £1 rs. return.

EMBSAY BIRD OBSERVATORY AND FIELD STUDY CENTRE, near Skegness, Lincs. *Bookings*: A. E. Smith, Pyewipes, Willoughby, Alford, Lincs. *Research*: R. K. Cornwallis, Blesby Grange, Legsby, Market Rasen, Lincs. *Accommodation*: 6/- per night. *Station*: Skegness.

EDINBURGH HOUSE BIRD OBSERVATORY AND FIELD STATION, Fife. *General correspondence*: Dr. W. J. Eggeling, Nature Conservancy, 12 Hope Terrace, Edinburgh 9. *Bookings*: J. H. B. Munro, 10 Comiston Place, Edinburgh 10. *Accommodation*: 5/- per night. *Station*: Pittenweem. *Boat*: 15/- return.

EMBSAY BIRD OBSERVATORY, St. Ouen's Nature Reserve, Jersey, C.I. *Write to*: A. le Sneur, 6 York Street Chambers, St. Helier, Jersey, C.I. *Accommodation and Board*: 7/7s. per week (seaside café, "Pro Tem"). *Travel*: by steamer from Weymouth or Southampton (£5 5s. 6d., 2nd class return) or by B.E.A. aeroplane.

EMBSAY FIELD STATION AND OBSERVATORY, via Bideford, Devon. *Warden*: W. B. Workman. *Write to*: Prof. L. A. Harvey, University of Exeter, Devon. *Accommodation*: 5/- per night. *Station*: Bideford. *Boat (m.v. Lundy Gannet)*: £2 5s. return; or Campbell Line steamer from Ilfracombe: £1 5s. return.

EMBSAY HOUSE BIRD OBSERVATORY AND FIELD STATION, Seahouses, Northumberland. *Director*: Dr. E. A. R. Ennion, from whom particulars may be obtained at the address above (please send stamped reply envelope). *Accommodation and Board*: 7/7 or £9 9s. per week, or 30/- per day for less. *Stations*: Chathill (south) or Belford (north).

EMBSAY BIRD OBSERVATORY, Dorset. *Write to*: A. J. Bull, The Gallop, Bryanston, Dorset. *Accommodation*: 5/- per night. *Station*: Weymouth (subject to alteration during 1960).

EMBSAY SALTEE BIRD OBSERVATORY, Co. Wexford, Ireland. *Write to*: Major R. F. Rutledge, Mount Armstrong, Donadea, Co. Kildare, Ireland. *Accommodation*: 10/- per week. *Station*: Bridgetown (boat from Fishguard to Rosslare; train from Rosslare to Bridgetown). *Boat*: £1 return.

EMBSAY BIRD OBSERVATORY, Dale, Haverfordwest, Pembro. *Warden*: K. D. Smith. *Write to*: The Warden, Dale Fort Field Centre, Haverfordwest, Pembro. *Accommodation and Board*: £6 16s. 6d. per week. *Station*: Haverfordwest. *Car and Boat*: £1 return.

EMBSAY BIRD OBSERVATORY, Kilnsea, Yorks. *Write to*: G. H. Ainsworth, 144 Gillshill Road, Hull. *Accommodation*: 3/- per night. *Stations*: Hull (bus to Kilnsea) or Patrington (taxi or bus).

EMBSAY NEW GROUNDS, Slimbridge, Gloucestershire (Headquarters of the Wildfowl Trust). *Hon. Director*: Peter Scott. *Assistant Director (Research)*: Dr. G. V. T. Matthews. *Write to*: Bookings Secretary, at address above.

In addition to the above observatories, two representatives from each of which form the British Bird Observatories Committee, there are several which have not yet applied for formal recognition. These include: Bradwell (Essex), St. Agnes (Isles of Scilly), Cape Clear Island (Cork), Tory Island (Co. Donegal), Sandwich Bay (Kent), the Calf of Man (I.o.M.) and Bressingham (Suffolk). Enquiries concerning these stations may be made through the Ringing Officer, Bird-Ringing Committee, c/o British Museum (Natural History), London, W.C.2.

A BRIEF HISTORY OF BIRD-RINGING IN THE BRITISH ISLES

Although from 1890 there had been several enterprises of limited scope, bird-ringing on a large scale in this country began in 1909 with the independent launching of two schemes—one by H. F. Witherby in connection with *British Birds* (rings marked "Witherby High Holborn London"), and the other by A. Landsborough Thomson in Scotland (rings marked "Aberdeen University"). Of these, the first-mentioned developed into the national scheme of today; the other came to an end during the First World War, its promoter afterwards becoming associated with Witherby's scheme.

In 1937 Witherby transferred the control of his scheme to the British Trust for Ornithology, which appointed a Bird-Ringing Committee to manage it: Miss E. P. Leach, who had latterly assisted Witherby, carried on the work as Honorary Secretary of this Committee. At the same time, the headquarters were moved to the British Museum (Natural History) where the Trustees had agreed to provide accommodation and also to allow the use of the Museum address on rings. *British Birds* continued to support the scheme and to be the chief medium of publication. The Leverhulme Trust made a non-recurrent grant for special projects.

For a long time the scheme was mainly self-supporting, the ringers paying—as they still do—for the rings they used. Its rapid growth after the Second World War, however, eventually made it impossible to maintain the ever-increasing load of headquarters work on a voluntary basis, although some help towards expenses was afforded from the general funds of the Trust. Fortunately, the Nature Conservancy agreed to give financial support, at first on a small scale but from 1954 in an annual amount to cover the salaries of a whole-time Ringing Officer (Robert Spencer) and other staff.

This substantial support and the continuing active co-operation of so many ringers are evidence of the importance attached to the scientific results. A report on progress, with a selected list of recovery records, is published each year in *British Birds*, an extra number of the magazine being entirely devoted to this and related purposes. Analyses of particular sections of the accumulated data are also published from time to time.

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Compiled by MRS. N. D. BLAMIRE

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- (ii) scientific nomenclature under generic names (following the 1952 B.O.U. *Check-list of the Birds of Great Britain and Ireland*, but without strict adherence to original orthography and amended as in *Ibis*, 98: 157-168);
- (iii) authors of all papers, notes and letters; and photographers;
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