

# British Birds

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## The great immigration of early September 1965

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A VAST FALL of North European migrants occurred on the east-facing coast of East Anglia on 3rd September 1965. Arrivals on a less spectacular scale also took place along most of the east coast of Britain north to Shetland about this time, and large movements were seen at Vlieland in Holland and at Heligoland. The object of this paper is to bring together the records of these falls, and to relate them to the weather-pattern of the period.

'Rushes' of the common summer visitors to north-west Europe in the first week of September have been a recurrent and prominent feature of autumn migration on our North Sea coast during the past decade. The main species involved in them are the Wheatear, Whinchat, Redstart, Garden Warbler, Willow Warbler and Pied Flycatcher,\* all ones which migrate SSW from Scandinavia to Iberia on the first stage of their autumn passage. The widespread falls of 1956 and 1958 were described and discussed by Williamson (1959), and those of 1963 were more briefly reviewed by the present writer (1964). Smaller and more local falls of similar composition have occurred in this week in many other post-war years, though it is curious that there have been four large series since 1956 while the previous ten years, when several of our east coast observatories were already operating, saw no arrivals in comparable strength so early in the autumn. There are occasional references to 'rushes' at the beginning of September in the works of such earlier students of the east coast passage as the Misses E. V. Baxter and L. J. Rintoul, W. Eagle Clarke, B. B. Rivière, and C. B. Ticehurst, but this period does not achieve the same pre-eminence in

\*Scientific names of species involved in this immigration and mentioned in the text are given in an appendix on pages 375-376; references to other species in the discussion are followed by the scientific name in the usual way.

their writings as it would in similar works today. Although such falls depend largely on the chance occurrence of easterly winds in the North Sea, and probably never involve more than a fraction of the total populations, it is interesting to speculate that there may have been some slight change in the annual cycle of these common species, or some long-term climatic change, which has contributed to their more abundant appearance on our east coast at the beginning of September in the past ten years.

The fall of 3rd September 1965 in Suffolk was by far the heaviest of its kind ever recorded in Britain. Axell and Pearson (1966), in a very detailed account of events in the county, have estimated that more than half a million birds descended along the 24 miles of coast between Sizewell and Hopton on this day. I have been unable to find any record of a fall of migrants in this country in such concentration, though taking the east coast as a whole there may have been visible falls involving comparable numbers over a much wider area.

In east Norfolk the fall of 3rd September has probably never been matched, though densities there were evidently much lower than in Suffolk; while in north Norfolk the arrival was the largest of its kind experienced by R. A. Richardson in the past twenty years and has few, if any, rivals in the earlier records. Further north the numbers were often 'good', but by no means unprecedented.

Many species apart from the familiar summer visitors were of course concerned in these great movements; Axell and Pearson list 78 species they consider to have been involved in Suffolk alone, and a few others could be added from other areas. The total includes many northern waders, some raptors and waterfowl, and a number of rarities (though, if one discounts Wrynecks and Bluethroats, these were remarkably few). The number of Wrynecks recorded is one of the most extraordinary features of the period; even the most conservative reckoning gives a score of 280 seen, and it is likely that there were many hundreds in East Anglia alone. The Bluethroat totals, allowing for the bird's very skulking habits, cannot have been much lower. The western-populations of both species are thought to migrate SSW in autumn (unlike those of most other east-coast rarities), so that the number of records might be expected to increase roughly in proportion to the numbers of commoner species taking part in the same type of movement, but this can hardly be the whole explanation of the fantastic quantities on this occasion.

#### THE GENERAL SITUATION

During the last ten days of August the weather had been unsettled, with much cloud and rain, over most of Scandinavia. It is unlikely that in these conditions there had been much early emigration, and

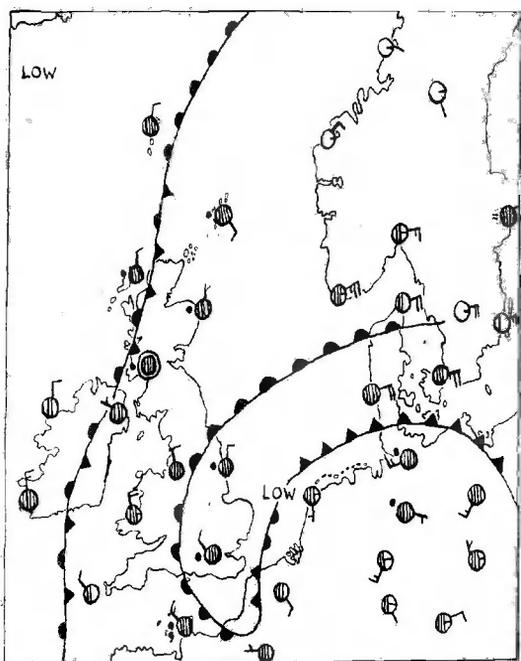
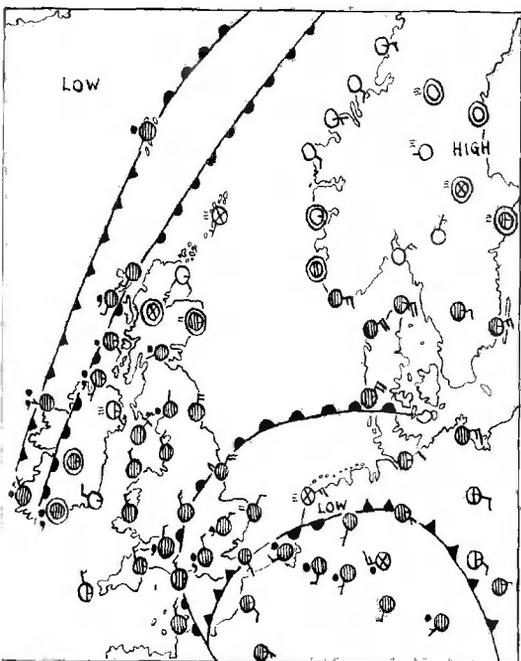


FIG. 1. Weather map for 06.00 hours GMT on 3rd September 1965      FIG. 2. Weather map for 12.00 hours

GMT on 3rd September 1965 At 06.00 a large arrival was taking place at Vlieland in the Netherlands, ahead of the northward-moving rainbelt; and some birds were arriving at Spurn (Yorkshire) and elsewhere on the east coast of England. At 12.00 considerable falls of migrants were occurring in the northerly airstream from Norfolk north to Yorkshire, and the mass arrival in Suffolk was to follow during the next two hours as the front (accompanied by a shift of wind direction to the south-east) reached the coast

certainly, in the absence of easterly winds in the North Sea area, there had been no east coast arrivals of Scandinavian birds in Britain since a series of small falls about 15th August. Conditions became more appropriate to emigration from about the 31st, and by 1st September an anticyclone was established over central Scandinavia, bringing mainly light winds and clear skies. This high, which shifted slowly north-east during the first days of September, was probably ultimately responsible for releasing a mass emigration which resulted in spectacular falls far to the south.

During these few days pressure was low to the south of Scandinavia; a mainly east to north-east airstream covered most of the North Sea basin, and there were large areas of overcast with rain, which would contribute to the disorientation of migrants.

On 31st August a shallow depression (Low 'M' of the Daily Weather Report) was near north Denmark, drifting south and filling. By the evening of 1st September, this low was absorbed into the circulation of a more vigorous depression (Low 'N') which had appeared over north Italy and had commenced to move north-west across France. Low 'N' had reached northern France by the night of the 2nd/3rd, where the centre filled as a secondary (Low 'O') developed on the cold front over the Low Countries (fig. 1). The original warm front, which is shown straddling the southern North Sea basin, appears no longer to have been giving much rain except in south-east England, and the main rain-belt on the early morning of the 3rd extended across south-east England and the Low Countries to north-west Germany. Low 'O' moved NNW over the North Sea past East Anglia during the 3rd, bringing heavy rain to most coastal areas of eastern England during the day, accompanied by a shift of wind from the north to the south-east as the front passed in Suffolk and east Norfolk. The main falls of migrants in these areas occurred with the arrival of the heaviest rainfall shortly after noon (fig. 2). Winds soon veered through south-west to north-west on the south side of the Low, and by early on the 4th, when it was off the Northumberland coast, all coastal areas to the south were in a north-west airflow. Arrivals on the 4th were virtually confined to Scotland and the extreme north-east of England. By evening on the 4th the Scandinavian high had retreated far to the north-east and there was some rain in southern Scandinavia, which would perhaps have discouraged further emigration; and indeed it is doubtful if there were any fresh arrivals in Britain on the 5th. The rain had largely cleared again by the 5th in south-west Scandinavia and this was presumably the source of a large migration brought down at Heligoland with the passing of a cold front in the early hours of the 6th. There followed a more persistent deterioration in the weather over northern Europe, during which further large emigrations would be unlikely to occur.

## THE ARRIVALS

*Wednesday 1st September*

A very small number of presumably Scandinavian night-migrants appeared at the coastal stations from the Wash northwards on this day. *Fair Isle* (Shetland) received a few Whinchats and Willow Warblers and a Garden Warbler, and the *Isle of May* (Fife) some Willow Warblers; odd Redstarts appeared at *Holy Island* (Northumberland) and at *Spurn* (Yorkshire), with six Pied Flycatchers at the latter station, two at *Gibraltar Point* (Lincolnshire) and one and a Garden Warbler at *Holme* (north Norfolk). There are no reports of arrivals elsewhere in East Anglia nor in Kent. These migrants would probably have flown from western Norway, where there were easterly winds on 31st August, and have travelled in a north-east to northerly airstream north and west of Low 'M' (off Denmark).

*Thursday 2nd September*

On the second day of arrivals there were considerable movements at Fair Isle and from Spurn to the Blakeney-Cley area (north Norfolk), but very few at the intervening stations. A few birds appeared on the Suffolk coast and better numbers at Sandwich Bay in Kent. Overnight there had been light easterly winds in southern Scandinavia and a stronger north-east to NNE flow over the greater part of the North Sea, becoming northerly in the extreme south. Eastern Scotland (except the far north) and north-east England had fine weather (which may have minimised any arrivals there), but there was extensive cloud and some rain-showers from Yorkshire southwards.

At *Fair Isle* the newcomers were mainly Willow Warblers (30), Garden Warblers and Pied Flycatchers (both about 20), with a few other birds including three Barred Warblers. The *Isle of May* reported only odd Pied Flycatchers and a Red-backed Shrike, and apparently there were virtually no increases in Northumberland, though two Barred Warblers were recorded on *Holy Island*. At *Hartlepool* (Co. Durham) there were few arrivals also, but *Spurn* had a varied fall, with over 30 more Whinchats, about 15 Wheatears and Garden Warblers, a few Redstarts, and representatives of a dozen other species. Odd chats appeared in the census area at *Tetney* (north Lincolnshire), and at *Gibraltar Point* a minor fall included about ten Garden Warblers and Pied Flycatchers. Numbers at *Holme* were similar, but more Wheatears and an Icterine Warbler were also seen.

This was a good day at *Blakeney Point*, with 40 Wheatears, 30 Garden Warblers, 20 Redstarts, and small numbers of many other species. Six Wrynecks were present. The only reports of arrivals on the Suffolk coast on the 2nd came from *Benacre*, where A. G. Hurrell trapped a Bluethroat and several other migrants; and from *Walbers-*

wick, where several Pied Flycatchers, Tree Pipits, and Siskins appeared. Further south, a fall of some 40 Pied Flycatchers, 20 Redstarts, and 20 Garden Warblers at *Sandwich Bay* (Kent) had an obviously 'Continental' flavour; this fall was reflected at *Dungeness*.

Dr. C. D. T. Minton reported that at *Vlieland*, off the Dutch coast, a good arrival of small migrants occurred on the 2nd; the majority were present in the afternoon with a clearing sky and calm conditions, which gave way to light easterlies late in the day. The species involved were Redstart, Garden Warbler, Pied and Spotted Flycatchers, Whinchat and Wheatear in similar density to that of a 'moderate to good fall' on the east coast of England. No arrivals were reported from *Heligoland* on the 2nd.

It is evident that a substantial movement had occurred over much of the North Sea area on the 2nd, presumably as the result of departures from Scandinavia on the previous evening. Many birds must have been deflected to the west in the east wind belt in the northern part of the area, though from the weather maps (which include no observations made over the sea) it appears unlikely that there was anything approaching full overcast over the relevant part of the North Sea. The next wave was to run into more formidable difficulties.

#### *Friday 3rd September*

On the evening of the 2nd the weather in Scandinavia continued ideal for migrant departures, with little cloud and calm conditions over a wide area, and light easterlies in the south and west. The weather over the North Sea was steadily deteriorating from the south, however, and by dawn there was extensive cloud as far north as central Scotland and the Skagerak, with local fog patches in several places. It rained heavily in south-east England overnight and, although there were some breaks in the early morning on the Suffolk coast, the rain soon resumed there and became torrential in the late morning, continuing until evening. The rain seems to have reached north Norfolk by mid-morning, while at Spurn it began to drizzle at 11.15 GMT and to rain heavily at 11.45, with only brief lulls later in the day. On the Northumberland coast there was early drizzle, and heavy rain from soon after midday, and eastern Scotland was affected during the afternoon. Fair Isle remained dry until evening. At *Vlieland* it had started to drizzle at 08.00 and rained heavily from 11.00. Migrants crossing the North Sea would therefore have encountered an extensive barrier of adverse weather to the south. Although some east coast falls began in dry overcast and NNE winds before the rain set in, there seems to be general agreement that from Suffolk north to Yorkshire the main arrival coincided with the heaviest rain, which suggests that a great concentration of dis-

oriented birds had accumulated near the front. If the weather map is to be relied upon, the front impinged upon the east coast at a very acute angle, which would account for the nearly simultaneous peak falls along much of the coast. Unfortunately I have no details of arrival times at the stations north of Spurn.

At *Fair Isle* the main additions on the 3rd were 100 Common Gulls and 50 Garden Warblers, whilst Wheatears increased considerably. About 15 Redstarts, Whinchats and Tree Pipits came in, with a selection of other migrants including a Wryneck, a Bluethroat and two more Barred Warblers. At the *Isle of May* Garden Warblers (200) were by far the commonest birds, with Pied Flycatchers (50), Redstarts (40), Whinchats (30) and Willow Warblers (20) also prominent; among other records were four Wrynecks and three Barred Warblers. *Holy Island* received about 50 small migrants, and there were fewer at *Bamburgh* and *Hauxley*, and in the *Blyth* area. The *Hartlepool* observatory fared better (considering the small area covered) with over 100 newcomers, mainly Wheatears and Willow Warblers. The *Teesmouth* area produced a few reports of the common species and an Icterine Warbler was seen.

At *Spurn* the falls began with a 'fairly good' arrival of Redstarts, Pied Flycatchers and Garden Warblers between 07.00 and 08.00 hours, and a main fall of Wheatears about 10.00-10.30 in the period before the rain began. A much larger fall, mainly of Redstarts, Pied Flycatchers and Garden Warblers, but also involving many other species, took place in heavy rain some time between 12.00 and 16.00. Estimates late in the day showed that at least 300 Redstarts and over 100 Wheatears, Garden Warblers and Pied Flycatchers had arrived. Other records involved a variety of waders, 50 Whinchats, 40 Siskins, 30 Tree Pipits, a Barred Warbler, a Red-breasted Flycatcher, four Red-backed Shrikes, and many others.

At *Tetney*, on a morning count, only some 15 night-migrants were found, and at *Gibraltar Point* the scores were surprisingly low though a fair cross-section of species was represented; perhaps both places suffered from a 'drift-shadow' effect in nearly northerly winds.

On the opposite corner of the Wash, at *Holme*, a 'big influx' occurred from 08.30, with a peak at about 12.30-13.00, in driving rain from the north-east. By then there were 'uncountable numbers' of birds in the outlying dunes and bushes. A count in the small fir-plantation at the peak period gave 100 Redstarts and 50 Garden Warblers, with small numbers of the other common species, two Wrynecks, a Bluethroat, and an Icterine and two Barred Warblers; there were also over 40 Wheatears in the vicinity.

At *Blakeney/Cley* the day started overcast with poor visibility; steady rain came on during the morning and continued for the rest of the day, which made observations extremely difficult. During the after-

noon it was estimated that at least 200 Redstarts and as many Garden Warblers, also numerous Wheatears, had arrived on the Point, together with small numbers of Whinchats, Pied Flycatchers, Tree Pipits, Siskins, at least seven Wrynecks and six Bluethroats, an Aquatic Warbler, a second Barred Warbler, and various other birds. Migrants were still arriving at dusk, but overnight the wind became south-west and it is unlikely that there were further arrivals on the 4th. The counts for this day will therefore give a better idea of the numbers involved. R. A. Richardson, who collected records from a number of other observers, stated that along seven miles of coastline from Salt-house to Blakeney Point there were at least 500 Redstarts, nearly as many Wheatears and Garden Warblers, and more Whinchats and Lesser Whitethroats than had been appreciated on the 3rd, but still only very small numbers of Pied and Spotted Flycatchers and Willow Warblers. The most astonishing feature was the number of Wrynecks (at least 27 seen) and Bluethroats (at least 12). Five Barred Warblers, two Ring Ouzels, several Robins and three Red-backed Shrikes were present, and among non-passerines several Spotted Redshanks and Black Terns, as well as at least six Dotterels. Although Pied Flycatchers were scarce at the coastal sites in Norfolk, it should be mentioned that two people reported them very prominent a few miles inland during the 4th-5th, so perhaps they moved quickly into more suitable habitats.

M. J. Seago kindly forwarded other coastal and inland records that he received, and said that very large numbers of the common migrants were present 'in every coastal parish from Holme to Gorleston'. At *Holkham* pines (between Holme and Cley) some 70 Redstarts and 30-40 Pied Flycatchers were present on the afternoon of the 3rd, and up to four Wrynecks were seen there. East of the Cley area, there were several reports of Wrynecks at *Sheringham*. In the *Cromer* district, 'incredible numbers' of Redstarts arrived on the 3rd, and after dark many were flying around the street-lights and attempting to enter buildings. There was also a 'heavy influx' of Wheatears there, with many Whinchats and 'large numbers' of Spotted Flycatchers. Several Wrynecks, a Bluethroat, and ten Siskins were also reported. Other coastal Wryneck records came from *Mundesley*, *Waxham*, *Hickling* (up to four seen), *Scratby* and *Yarmouth*, and many Redstarts and Spotted Flycatchers were still present at *Ostend* (near Happisburgh) on the 5th.

G. R. South was making regular observations on the *Winterton* nature-reserve, an area including nearly three miles of coast, about eight miles NNW of Yarmouth, from the 3rd. His largest estimates, made early on the 4th and thought to be 'very conservative', gave 1,000-1,500 Redstarts, 500-700 Pied Flycatchers, several hundred Wheatears and Willow Warblers, many Garden Warblers, at least 150 Spotted Flycatchers, and smaller numbers of Whinchats, Whitethroats

and Lesser Whitethroats. Other species present included Cuckoo, Grasshopper Warbler, Barred Warbler, Tree Pipit and Siskin, also several Wrynecks (maximum five on the 7th) and a Red-backed Shrike on the 6th. Here also there was no further fall after the 3rd.

No details are available for *Yarmouth*, although it is known that many migrants appeared in the town. Close by, at *Gorleston*, there were 'vast numbers' of Wheatears, Redstarts and Spotted Flycatchers, 'very large numbers' of Whinchats and 'large numbers' of Tree Pipits, but very few Garden Warblers and Whitethroats; Wryneck and Siskin were also recorded.

For the Suffolk records I am indebted to H. E. Axell and D. J. Pearson, who have collated the observations of many bird-watchers in the county, and who have given me copies of the original data and of their very detailed account prepared for a local journal (Axell and Pearson 1966). From this it is apparent that very few birds had arrived overnight on the 2nd-3rd, and that the main influx came all along the north Suffolk coast with very heavy rain and a sudden shift of wind from north to south-east in the early afternoon.

At *Lowestoft*, at 13.15 GMT, a huge cloud of small birds was seen to appear over the town, moving towards the south, with individual birds dropping out continuously; the town itself was soon alive with birds hopping about in every garden and open space, on walls and television aerials, in all the streets (where many were killed by traffic), on the sea-wall and even among the groynes on the beaches. Two people in different parts of the town had the extraordinary experience of Redstarts descending from the mass of migrants overhead and alighting on their shoulders. Apart from the vast numbers of small birds, many waders landed on the sea-front, and a number of ducks and sea-birds (including Little Gulls) were seen along the shore. Local ringers were able to make large catches on the following days, including 17 Wrynecks in one small area. Several Ring Ouzels, a Wood Warbler and a Red-breasted Flycatcher were found subsequently.

What was perhaps the same great mass of migrants was also seen flying along the coast at several points up to three miles south of Lowestoft at about the same time. On the morning of the 4th a survey was made of this three-mile stretch from Lowestoft to Pakefield, and it was estimated that no less than 30,000 birds were seen. Redstarts were much the most numerous, followed by Wheatears, Pied Flycatchers and Whinchats (thousands of each), Spotted Flycatchers and Whitethroats (many hundreds), and Willow and Garden Warblers (several hundreds). There were also a good many Lesser White-throats, over 50 Tree Pipits, well over 30 Wrynecks, at least seven Bluethroats, a Barred Warbler and a Red-breasted Flycatcher.

Further south, at *Benacre Pits*, most of the birds appeared between

13.20 and 13.50 GMT, many thousands arriving along a half-mile front. Pied Flycatchers and Redstarts were the most abundant, but there were huge numbers of Wheatears, hundreds of Whinchats, Garden Warblers and Willow Warblers, smaller numbers of Spotted Flycatchers, Tree Pipits, Whitethroats and Robins, and at least 20 Wrynecks. Between the start of the arrival on the 3rd and early on the 5th (when he ran out of rings) A. G. Hurrell caught some 650 migrants there, of which half were Pied Flycatchers (a much higher proportion than was seen at other places); also included were 14 Wrynecks, two Bluethroats, three Icterine Warblers and an Ortolan Bunting.

At *Covehithe* too the fall was massive and was estimated at a density of 100 birds per acre near the shore on the 3rd, with Redstarts predominant. At *Southwold* the arrival occurred mainly between about 13.00 and 14.30, though some birds continued to come in until about 17.00. Estimates over a restricted area early on the 4th gave over 1,000 Redstarts, several hundred Wheatears, more than a hundred each of Whinchats and Pied and Spotted Flycatchers, and smaller numbers of Robins, the common warblers and Tree Pipits. Other birds included at least ten Wrynecks, two Bluethroats, twelve Black Terns, and many Whimbrels, Greenshanks, Spotted Redshanks, Green, Wood and Common Sandpipers, and Ruffs.

At *Walberswick* there were no detailed observations on the afternoon of the 3rd, though it is known that great numbers of birds arrived then. Early on the 4th D. J. Pearson covered a two-mile stretch of coast south of the village, and in this walk encountered an estimated 15,000 Redstarts, 8,000 Wheatears, 4,000 Pied Flycatchers, 3,000 Garden Warblers, 1,500 Whinchats and as many Tree Pipits, 1,000 Willow Warblers, 500 Whitethroats, and smaller numbers of Spotted Flycatchers and Robins. His other figures for the day include at least 40 Wrynecks, 20 Ring Ouzels, 20 Bluethroats, a Great Reed Warbler (caught), an Icterine Warbler and two Barred Warblers; and among the waders 400 Dunlin, 350 Ruffs, 150 Redshanks, fewer Ringed Plovers, Greenshanks, Common Sandpipers, ten little and three Temminck's Stints, five Green and three Wood Sandpipers, three Curlew Sandpipers and a Kentish Plover.

On the R.S.P.B. reserve at *Minsmere* H. E. Axell and his colleagues were in the field throughout the arrival and the following days. Here the great numbers of birds appeared very suddenly at 12.15, a few minutes after the wind had freshened from the south-east. Small passerines were blown in over the coast to descend everywhere, though most of the woodland species quickly sought shelter among bushes and trees; many even entered the public hides and other man-made structures. At the same time large numbers of terns, waders, and some

ducks came down into the marshland areas. Observations over about 150 acres of the reserve suggested that by evening (when a few migrants were still trickling in) the approximate numbers of the commoner species were as follows: Redstart 7,000, Wheatear 4,000, Garden Warbler 2,000, Pied Flycatcher 1,500, Whinchat 750, and Willow Warbler 500. It was later calculated, from sample counts, that probably 15,000 Redstarts, 10,000 Wheatears and 5,000 Pied Flycatchers, besides thousands of other birds, were present in the reserve area as a whole. Peak numbers of other species on this or the next days were Lapwing 110, Grey Plover 60, Golden Plover 250, Whimbrel 150, Redshank 100, Greenshank 60, Knot 100, Little Stint 20, Temminck's Stint two, Dunlin 700, Curlew Sandpiper 30, Sanderling 20, Ruff 60, Dotterel three, Black Tern and Common Tern each 150, Cuckoo three, Wryneck 25, Ring Ouzel five, Bluethroat 25, Robin 400, Icterine Warbler two, Whitethroat 200, Lesser Whitethroat ten, Spotted Flycatcher 300, Tree Pipit 150, Tawny Pipit one, Red-backed Shrike ten, Siskin 40, Chaffinch 25, and Ortolan three. The wind had shifted to the north-west by the evening of the 3rd, and there was no suggestion of further arrivals during the next few days.

Minsmere seems to have been very near the southern limit of the mass arrival since densities were much lower at *Sizewell*, only a little further south, and at *Aldeburgh* there seems to have been no obvious fall on the 3rd although moderate numbers of Wheatears and a few of the other migrants were present there early on the 4th. The fringe of the movement does seem to have reached *Havergate Island* on the 3rd, with good numbers of the commoner passerines, some Wrynecks and many waders (an American species, Baird's Sandpiper, was there from the 4th), but otherwise the coast south of the bend at Orford Ness was hardly affected. A few Wheatears and little else were seen along the coast at *Shingle Street* and *Bawdsey* early on the 4th, but there was no sign of migration at *Boyton* or at *Felixstowe*, nor does any fall appear to have been seen on the 3rd on the Essex and Kent coasts, except at *Dungeness*, where a number of Whinchats, Redstarts, and Garden Warblers appeared overnight. Some waders, including Little Stints, did however reach the London reservoirs and sewage-farms (notably Perry Oaks) at dusk on the 3rd.

Across the North Sea at *Vlieland* (which is on the same latitude as mid-Lincolnshire and about 140 miles ENE of the nearest part of the English coast at Yarmouth) there were large numbers of migrants everywhere at 06.30, and a continuous increase went on all morning. The wind there was moderate south-east at dawn, increasing later, and there was overcast and poor visibility at the start, drizzle from about 08.00, and heavy rain from 11.00. Dr. C. D. T. Minton reported that there were very many Wheatears, Whinchats, Redstarts, Willow and

Garden Warblers and Pied Flycatchers, also many Spotted Flycatchers, Chiffchaffs (a species scarcely detected in the falls in Britain) and Tree Pipits, and a huge increase of Little Stints and other waders; an Osprey was also seen.

At *Heligoland*, which had been very quiet on the 2nd, a small arrival of the common chats and warblers, with a Wryneck and a Bluethroat, occurred during the early hours of the 3rd, but there was no further increase during the day, apart from a (probably diurnal) movement of Tree Pipits and wagtails. An English observer, C. W. Holt, was present at this time. Apparently *Heligoland*, which is 130 miles ENE of *Vlieland* and roughly on a level with *Flamborough Head* (Yorkshire), escaped the very heavy rain to the west, though there was some precipitation during the night of the 2nd/3rd.

*Saturday 4th September*

By the night of the 3rd/4th only the extreme north-east of England and the Scottish coast remained in the east to north-east airflow and it appears that few if any new arrivals from Scandinavia occurred along the coastline to the south, though naturally there were many higher counts in the more southerly localities, with improved weather and an influx of weekend observers.

Reports from *Magnus Sinclair* in *Unst* (Shetland) showed that odd Pied Flycatchers, Wheatears and Redstarts were present at *Haroldswick* on this day, but there was no large arrival there. This was certainly the peak day at *Fair Isle*, however, with Whinchats (110) increasing sharply and several other species showing their largest numbers of the period. Around 50-60 Redstarts, Willow Warblers and Pied Flycatchers were now present, and a score of 23 Whitethroats was the highest autumn total for this species since at least 1948. Other passerines included two Bluethroats, four Red-backed Shrikes and three Ortolans. Eight Wrynecks were seen, as well as the observatory's first Little Ringed Plover, and several wader species increased.

Reports from *North Ronaldsay* (Orkney) also suggested a considerable movement coinciding with the one at *Fair Isle*, but no detailed figures are available; Wryneck and Barred Warbler were among the migrants there. At the *Isle of May* there were no very substantial arrivals on the 4th, the greatest increase being only about 25 in the case of the Wheatear, and Garden Warblers were much reduced to about 75; a Bluethroat and a Red-breasted Flycatcher were among other migrants seen.

There were much larger numbers on the Northumberland coast, where the combined totals for the commoner species at four well-watched localities increased from insignificant numbers on the 3rd to some 420 Wheatears, 180 Whinchats, 140 Redstarts, 100 Garden

Warblers and 150 Pied Flycatchers on the 4th. At *Holy Island* there were also some 30 Willow Warblers, three Wrynecks, and two Red-backed Shrikes; at *Bamburgh* an influx of Sedge Warblers (18) occurred, also two Wrynecks, two Barred Warblers, a Greenish Warbler and various other birds; and at *Hauxley* the records included a Bluethroat, three Barred Warblers, five Red-backed Shrikes and an Ortolan Bunting.

The *Hartlepool* station had considerably more birds than on the 3rd, with Redstarts (30), Garden Warblers (33) and Pied Flycatchers (18) about twice as numerous, and a few more Wheatears (40), also an Osprey, a Red-backed Shrike and two Bluethroats. The *Teesmouth* figures (referring mainly to the South Gare) also reached a maximum, with some 20 Wheatears, 20 Pied Flycatchers, two Wrynecks and a Red-backed Shrike, also a Honey Buzzard, a Dotterel, and a party of 70 Whimbrels, the largest ever recorded in the area. There is, however, no strict comparison with the previous day.

At *Spurn*, in the opinion of the warden, B. R. Spence, most increases were probably artificial ones, due to better coverage on the 4th. Some of the common species had already decreased from late on the 3rd, but Whinchats (100) had probably been underestimated earlier, and there were now seven Wrynecks, two Icterines and three Barred Warblers, to mention only a few of the 'increases' over the 3rd.

The *Tetney* count showed little change, but at *Donna Nook* (opposite Spurn), which had not been visited on the 3rd, there were many birds which had presumably arrived on the previous day. They included at least 45 Whinchats, 30 Wheatears, 25 Redstarts, a Barred Warbler, a Red-backed Shrike and other species. The same qualification applies at *Huttoft Bank* (Lincolnshire) where ten Redstarts, a Bluethroat and an Icterine were found. At *Gibraltar Point* there were few changes to record, though an Osprey, two Wrynecks and a Wood Warbler appeared, and eight Green Sandpipers passed.

At *Holme* it seems that few birds remained early on the 4th, whilst another sizeable increase occurred during the afternoon, mainly of Whinchats, Wheatears, Redstarts and Garden Warblers. Seventeen Wrynecks were found in the vicinity, and a Red-backed Shrike. This influx can only have been an onward movement from the earlier falls. Neither at *Blakeney-Cley* nor in Suffolk was there any real evidence of further arrivals on the 4th, apart from at *Benacre* where A. G. Hurrell is convinced that more Willow Warblers had come in overnight. These could well have been British birds halting at the coast. Ospreys were seen at *Minsmere* (two) and at *Havergate*.

There were no further arrivals at *Heligoland*, apart from an Osprey and a few Siskins.

*Sunday 5th September*

It is extremely doubtful if there were further arrivals fresh from Scandinavia on this day, even in the far north, though both *Fair Isle* and *Isle of May* produced more Tree Pipits, and the former station also had a few more Fieldfares and Redwings, an Aquatic Warbler and three Bluethroats. Changes at most other places can be ascribed to onward movements; there were, for instance, more Garden Warblers at Holy Island, more Barred Warblers at several points, and more widespread records of Wrynecks and other species. An Aquatic Warbler appeared at Holme. Whitethroat numbers at Walberswick showed a marked increase, almost certainly due to a fall of British emigrants, for there were very heavy individuals among them, and it is likely that some other British birds (e.g. Sedge Warblers) were involved. A few more Whitethroats appeared at Spurn on this day, and more leaf-warblers at Holme.

*Monday 6th September*

Britain was now cut off from further immigration, but the vast fall on *Heligoland* in the early hours of the 6th should be mentioned, since it was essentially part of the same series of falls. C. W. Holt's description of the scene is reminiscent of the accounts from observers in Suffolk, for the small island was literally inundated with birds of the same species. The day's ringing total—1,047—was a record one for the long history of the bird observatory. Redstarts (364) headed the ringing list, followed by Pied Flycatcher (337), Garden Warblers (181), Whitethroats (47) and Willow Warblers (24); the others included five Ortolans, four Icterine Warblers, four Wrynecks, two Bluethroats and a Barred Warbler. More of all these, and many other species, were seen outside the trapping-garden. The total could have been much increased had more ringers been present. One interesting point is that, whereas the great majority of the Redstarts and other species in Britain were in their first winter, a high proportion of those taken at *Heligoland* were adult; over half, in the case of male Redstarts. It is possible that the adults had tended to depart a little later, but perhaps more likely that young birds are more prone to displacement during migration. The *Heligoland* fall was not a 'drifted' one, but occurred in light south-west winds with overnight rain.

## DEPARTURE AND ONWARD PASSAGE

Although a few of the migrants from the big fall were present up to three weeks later in Suffolk, the majority here and elsewhere moved on very quickly. At *Fair Isle* some left on the night of the 4th/5th and most of the remainder on the 6th/7th or 7th/8th. More than half of the Garden Warblers which arrived at the *Isle of May* on the 3rd had gone

next day, and most of the remainder departed on the 4th/5th or 5th/6th. At Spurn two-thirds of the Redstarts seen on the 3rd were no longer present next morning, and most other birds remained no more than one whole day. Similarly, most of the birds appearing at Holme on the 3rd moved away very quickly and few were left next morning. At Cley and Blakeney numbers were still high on the 5th, but most had gone by the 6th.

Most of these places offer little suitable habitat for the woodland species and the exodus would be dictated by the scarcity of suitable food, but at least it shows that few of the birds involved were so depleted as to be incapable of rapid onward movement. In Suffolk many of the migrants were reported to be very tired on arrival, and a good many were washed up dead along the tideline after the 'rush'. It may be, however, that wetting by the torrential rain was a more important factor than depletion of fat-reserves, since the very limited data available on the weights of freshly-arrived birds (mainly from Walberswick on the 4th) suggests that few were at unusually low weights. The range for 30 Redstarts there on the 4th was 12.0 to 15.8 grams, average 14.2; for 17 Garden Warblers 16.5 to 22.0, average 18.7; for 16 Pied Flycatchers 11.2 to 14.4, average 13.0; and for seven Willow Warblers 7.9 to 11.5, average 9.3. These are by no means critical weights for these species, though some individuals, such as a Wheatear at 17.0 grams and a Redstart at 10.5 grams at Minsmere early on the 4th, were very light.

Fortunately, there are rich and varied habitats close to the Suffolk coast, and most species would have little difficulty in restoring their reserves. Many birds moved inland from the first arrivals, and from the 4th they were remarkably numerous up to five miles inland, though nowhere does the fall seem to have been at all obvious more than about ten miles from the coast. Many of the Garden Warblers apparently departed from Suffolk on the clear night of the 4th/5th, but the main departure of most other species took place on the following night, and after this there were further decreases almost daily until only very small numbers remained at mid-month.

In Norfolk the only real reflection of the rush well inland was the occurrence of a few Wrynecks; there were single ones at Thorpe (Norwich), Horstead, Brundall and Old Buckenham on various dates between 6th and 13th. In Suffolk there was some southward shifting along the coast and inland, to areas not affected by the invasion on 3rd, and the common species were encountered in some numbers at many places near the coastline in the southern half of the county between the 4th and the 7th. Fuller details of this southward spread have been given by Axell and Pearson (1966).

In Essex there was evidence of onward movement as early as the

4th, when a Wryneck, two Pied Flycatchers and a Redstart were seen at Bradwell, and an Osprey was there next day. At the Naze some 50 Whinchats were present on the 4th, with a few Wheatears, Redstarts and Pied Flycatchers. A Bluethroat was caught near Hornchurch on the 4th. Apart from these records we have no report of any obvious arrivals after the great fall; there are negative reports from Abberton and Foulness.

A few of the commoner species involved in the falls were seen in the London Parks from about the 6th/7th, but with the possible exception of odd Pied Flycatchers it is not certain that they were linked with the east coast falls; they could equally well have been of British origin. The same applies to some of the movements observed at the southern observatories at this period, though here there are definite links in the arrival of some of the rarer birds.

At Sandwich Bay there were several records of Little Stints, Curlew Sandpipers and Black Terns between the 4th and the 6th, and large numbers of the commoner waders (including 25 Whimbrels) on the 5th. A Wryneck occurred on the 6th, and on the 7th an obvious arrival included some 30 Pied Flycatchers, a Bluethroat, three Siskins, a Tree Pipit and an Osprey. At Dungeness the probable reflections of the great fall included two Wrynecks, a Red-breasted Flycatcher and a Siskin on the 4th, and two Bluethroats, a probable Icterine Warbler and several Pied Flycatchers and Tree Pipits on the 6th. There were Wrynecks each day to the 13th, including three on the 9th, and two more Bluethroats on the 11th.

Beachy Head (Sussex) reported a Barred Warbler on the 4th, two Wrynecks and an Icterine Warbler on the 5th, and a Bluethroat and two Siskins on the 6th, when there were also 20 Tree Pipits. A few Pied Flycatchers were seen on the 4th and 5th, and an Osprey on the 8th, and there were several other Wryneck records from the 7th.

Ospreys were recorded in nearly twenty places in England outside the immediate area of the great fall in the weeks following the arrivals, including individuals as far west as Walney Island (Lancashire) during the 4th-7th and at the Calf of Man from the 6th. Wrynecks were also reported fairly widely, but some may not have had any direct connection with the large influx. They included ones at Walney on the 4th, St. Agnes on many dates from the 3rd, Portland on the 3rd and during the 5th-9th, and St. Catherine's Point (Isle of Wight) on the 4th and 5th, as well as at Bardsey and Skomer later in the month. Very small numbers of Pied Flycatchers seen at Walney on the 5th and at Bardsey, Skokholm and Cape Clear on the 7th might have had some connection.

Evidently the great mass of birds departed without first moving very far from where they had landed, and very few were obliged to descend again within Britain. The observatory at Cap Gris Nez in northern

France was not manned at this period, and the station at Ouessant off Brittany had no large falls in the period immediately following the departures, though a Wryneck occurred there on the 5th and a small arrival of Pied Flycatchers on the 7th (as in south-west Britain). There was, however, a direct link between the east coast falls and Ouessant, since a Garden Warbler ringed at Redcar (Yorkshire) on 3rd September was recovered there on the 15th. It was not part of an obvious arrival of this species, however: only very small numbers were present at Ouessant at this time.

#### RINGING RECOVERIES

Apart from the Garden Warbler already mentioned, 13 birds ringed during the great fall were recovered at some distance from the places of ringing. Two of these showed onward movement within Suffolk: a Redstart and a Pied Flycatcher ringed at Walberswick on 4th September were recovered respectively at Bawdsey (22 miles south-west) on the 7th and at Kesgrave (25 miles south-west) on the 11th. Another Pied Flycatcher had moved on very quickly: it was ringed at Benacre on the 4th and found on a ship off the coast of south Suffolk or Essex early on the 5th (the vessel was bound from Rostock in East Germany to Southend-on-Sea).

Three Redstarts ringed in Suffolk during 4th-6th September were recovered abroad later in the autumn: at Logrono (north-east Spain) on 20th September, in Zaragoza province (north-east Spain) about 1st October, and in the Algarve (south Portugal) on 25th October. (Another which may have been a 'left-over' from the fall, ringed at Walberswick on 15th September, was recovered at Cordoba in southern Spain about 10th November.) Two more Suffolk Redstarts were reported in 1966: one from Burgos (north Spain) in April, and the other from Opland (central Norway) in July. The latter is the first bird from an 'early September rush' to be recovered in its home area.

Two Pied Flycatchers caught at Benacre on 3rd September were recovered at Cap Ferret (south-west France) on 15th September and in the Beira Alta province of Portugal on 18th October; another from Lowestoft on 4th September was found at Ciboure (south-west France) on the 26th; and one ringed at Bamburgh (Northumberland) on 5th September was in Beira Litoral (Portugal) on 20th October.

Finally, there is an intriguing recovery of a Spotted Flycatcher ringed at Minsmere on 3rd September and recovered at Tivoli near Rome on the 25th. This is only the second recovery of a British-ringed Spotted Flycatcher in Italy, the first having been one caught at Fair Isle in late August 1960 and found in northern Italy the following October. According to an analysis of ringing recoveries by Creutz (1941), the Swedish population tends to move east of south in autumn

so that these birds were probably from this area. It may be noted that the species has not previously been very prominent among the autumn arrivals on our east coast.

## DISCUSSION

There are still several problems connected with 'drift-movements' in the North Sea area which remain unsolved, and which are not likely to be solved merely by the collection and examination of records of arrivals along our coast. It may not be entirely unprofitable, however, to discuss briefly some of the difficulties of interpretation posed by the 1965 falls.

It has been shown by radar observations (Lack 1963, etc.) that the western flank of the great SSW movements out of Scandinavia in autumn regularly traverses south-east England, though in favourable weather conditions the passage may be scarcely detectable by bird-watchers on the ground. The large arrivals of passerine migrants in E. England on 3rd September were presumably due to the obstruction and concentration of this passage at the belt of heavy rain. Lateral drift by easterly cross-winds, together with disorientation and passive down-wind drift in the rainbelt, may be invoked to account for the vastness of the falls. It seems highly improbable that Scandinavian migrants regularly cross East Anglia in such density; most of the birds involved would have been deflected west of their 'normal' route.

The waders involved in these movements seem to fall essentially into the same category as the SSW-oriented passerines, though some must evidently have originated further east than these, and some were not halted at the coast but penetrated further in the zone of bad weather (e.g. to the London reservoirs) on the 3rd. A high-flying SW-oriented stream of waders was recognised by the radar workers as a regular feature of early autumn over the North Sea and eastern England. Small numbers of northern waders have been associated with each of the earlier 'September rushes' and, although these birds were exceptionally numerous in Suffolk in 1965, it is not clear that waders were relatively more abundant than might have been expected in such a stupendous fall.

The not insignificant arrivals of passerines in Scotland during the 2nd-4th are more puzzling, since they apparently occurred under clear or partially clear skies and with rather light easterlies in the northern part of the North Sea; and the east wind zone did not extend sufficiently far north in Scandinavia to occasion a simple lateral displacement of over 200 miles at the latitude of Fair Isle in migrants oriented SSW, even had their journey started in northern Scandinavia. The situation in this respect is similar to that in early September 1958 (Williamson 1959), unless the weather maps on both occasions are highly misleading.

Another problem is the simultaneous arrival at stations all along our east coast of common migrants which may be presumed to have the SSW orientation and of other species which certainly do not. The Icterine and Barred Warblers, Lesser Whitethroats and Red-backed Shrikes, which were very widespread, and also the few Red-breasted Flycatchers, the Greenish Warbler and some others, belong to species of which the entire European population migrates to east or south in autumn. Moreover, the 'migratory divide' for a few of the commoner species lies within Scandinavia and (as the Italian Spotted Flycatcher recovery from Minsmere suggests) some elements of the SSE-oriented populations of these species were almost certainly involved. This would be particularly likely with the Wryneck and Bluethroat, in which a relatively small part of the north European populations lies west of the migratory divide.

Williamson (1959) first formulated in detail the hypothesis that these SSE-oriented migrants reach Britain during a post-breeding dispersal, mainly of juveniles, in the period between breeding and true migration. He suggested that this dispersal was at random, not oriented in any preferred direction; but Nisbet (1962) postulated that in the case of the Barred Warbler and the Red-breasted Flycatcher the pre-migratory movements are oriented north-west, in the opposite direction to that of the true autumn migration (and in the same direction as the spring movements). Both agreed that such movements were favoured by anticyclonic (i.e. fine) weather, and by favourable winds in the North Sea area when they were prolonged across it; but Nisbet also found a more marked correlation between the distant movements and high temperatures in the breeding area of the two species with which he was most concerned. Williamson (1963) carried his arguments further by postulating that some of the commoner species may also cross the North Sea during dispersive rather than truly migratory movements. He also suggested that the dispersive element might be more in evidence in 'a year of high fertility' and that 'under favourable weather-conditions both oriented migration and random dispersal will go on side by side'. He visualised the dispersive elements as 'wandering vigorously at random within the anticyclonic system'.

There is now a substantial body of evidence from ringing in Britain and Europe that post-breeding dispersal in 'wrong' directions does occur, mainly among juveniles; and, though much of it awaits detailed examination, or is still insufficient for specific analysis, the indications for several common migratory species are that the dispersal is at random over the relatively short distances involved in most recoveries. This is true of British Swallows (Davis 1965) among others. There is, however, some evidence from the ringing of *Sylvia* warblers, notably Blackcaps *S. atricapilla* and Garden Warblers, that the more distant

movements in 'wrong' directions are directly opposed to the standard direction of migration; these recoveries are discussed in a forthcoming paper on *Sylvia* migration-seasons (Davis in preparation). What is apparently 'reversed migration' has also been documented for the Yellow-breasted Chat *Icteria virens* of North America (references in Nisbet 1962), and Dr. K. B. Rooke (*in litt.*, and in preparation) has pointed out that the European records of Pallas's Warbler *Phylloscopus proregulus* are distributed very close to the Great Circles which also link its north Asian breeding-area and its south-east Asian wintering area, so that here also the autumn dispersal appears to be in a direction directly opposed to that of normal migration.

On the other hand, there are two Garden Warbler recoveries from Swedish ringing which lend credence to the hypothesis of Williamson; both were ringed as juveniles in July and recovered due west in Norway, up to 100 miles away, by the end of August. Such a movement, if prolonged in favourable weather, could have brought them to Fair Isle. This was plainly not reversed migration, since ringing recoveries show that the Garden Warblers from the whole of Europe (with the doubtful exception of the extreme south-east) move west of south in autumn (Mayaud 1961, Davis in preparation). In my opinion, both the 'random dispersal' and the 'reversed migration' hypotheses may be necessary to the eventual unravelling of the mysteries of bird movements in the North Sea area, especially those in the northern part. Evidence that some birds could be moving west and south-west as well as SSW out of Scandinavia would help to explain the 1965 arrivals of the commoner species in the North Isles, which cannot be accounted for by lateral drift of SSW-oriented migration, and which should not have been totally disoriented in clear weather; the birds involved must have moved downwind over the sea. Random dispersal, or pre-migratory movement oriented west or south-west, could also explain the presence of discordant elements (like the SSE-oriented Spotted Flycatcher) further south along the English coast.

It would still be rather surprising that so many Barred Warblers and Red-backed Shrikes, and odd Red-breasted Flycatchers, were involved in these falls. All are rather scarce as breeding birds in Scandinavia, and the weather in Germany was most unsettled at this time. Perhaps there had been an earlier dispersal or 'reversed migration' into Scandinavia (certainly a good many Barred Warblers had reached Britain as usual during August), which was resumed with the establishment of the anticyclone there. Nisbet (1962) was prepared to envisage that some Barred Warblers might resume movement in directions other than north-west or south-east after the pre-migratory flight, and indeed the distribution and timing of the British records shows that this must occur (Davis in preparation).

There would remain the wider problem of why birds disperse in early autumn and, in particular, why they may disperse over such great distances in 'wrong' directions. Short-distance dispersal may be seen to be advantageous (e.g. by relieving population-pressures at the time when they are greatest) and since it mainly concerns juveniles it should be strongest in years of high post-fledging survival. It is much more difficult to envisage that dispersal over long distances, involving long sea-crossings and experience of unfamiliar habitats and climatic conditions, can have any adaptive value. It seems, for example, that the warblers which reach Fair Isle have a low rate of survival, since only one (a Blackcap) of over 3,000 ringed there has so far been recovered at any distance from the island, a proportion far below the national recovery rate for this group of birds. Probably the longer movements are simply an extension of the 'normal' short-distance dispersal, induced by the particular weather situation associated with them by Williamson and Nisbet, and analogous with the well-documented phenomenon of overshooting in fine warm weather in spring. Only a very small part of the population would be concerned in the longer movements, and its fate would have little bearing on the welfare of the species as a whole.

An alternative hypothesis, that some birds are deficient in the power to orientate in the standard direction of migration and depart in wrong directions on migration, might meet some of the observations made on our east coast in autumn, but there are now enough recoveries (e.g. of Robins) ringed at east coast observatories and subsequently recovered far to the south-east to show that this hypothesis would not have general application. It is not clear, however, that any bird displaced far to the west of its home area in early autumn can correct for this displacement, or whether a subsequent oriented movement is parallel to the 'normal' route.

Finally, in connection with the great strength of the 1965 arrivals, it should be mentioned that several events in Britain later in the autumn might carry the implication that the breeding-season had been an uncommonly productive one in northern Europe. Further very large arrivals of passage-migrants occurred in late September and early October, the Ring Ouzel in particular being several times more numerous than in any other recorded year. Fieldfares and Goldcrests *Regulus regulus* were particularly abundant, and the former arrived very early in quantity, as did the winter Blackbirds *Turdus merula*. An invasion of Waxwings *Bombycilla garrulus* was the largest on record, and also began very early; while several other irruptive species appeared in considerable numbers.

Enquiries directed to correspondents in Norway and Sweden have not, however, yielded any confirmatory evidence. Dr. K. Curry-

## BRITISH BIRDS

Lindahl informs me that in north Sweden it was a late spring and several species appeared to have had poor breeding-success, some (including the Ring Ouzel) finding their habitat snow-covered long after the normal time; only the Waxwing and a few other birds of coniferous forest seemed to have bred at all successfully. Dr. H. Holgersen tells a very similar story, his wide correspondence in western Norway suggesting that most species fared badly in a very inclement season; a correspondent of his in south Sweden asserted that the summer there was 'just a continuation of the previous winter'. Thus, although there is no more than subjective evidence, it can be inferred that the population of young birds in Scandinavia in late summer was by no means exceptionally high. This serves to emphasise the fortuitous nature of falls of migrants on our east coast in autumn, showing that the weather at the time of the autumn movements is a much more important factor than the actual strength of the bird-populations involved.

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### SUMMARY

A fall of north European summer migrants on the east-facing coast of Suffolk and Norfolk on 3rd September 1965 was by far the largest of its kind ever recorded in Britain. Considerable numbers of migrants also appeared further north along the east coast about the same time, and large arrivals were reported from Vlieland (Netherlands) and Heligoland (Germany). The most abundant of the birds concerned were Wheatears *Oenanthe oenanthe*, Whinchats *Saxicola rubetra*, Redstarts *Phoenicurus phoenicurus*, Garden Warblers *Sylvia borin*, Willow Warblers *Phylloscopus trochilus* and Pied Flycatchers *Ficedula hypoleuca*; but over 70 others were also involved. Wrynecks *Jynx torquilla* and Bluethroats *Luscinia svecica* were exceptionally numerous.

The falls are described in this paper and related to the weather pattern. Ringing recoveries and weights are mentioned. Evidently most of the birds were part of the SSW-oriented stream from Scandinavia to Iberia, disoriented, concentrated and forced down by a belt of overcast and heavy rain.

Some anomalies are discussed. The falls in north Scotland appear not to be explicable on the basis of simple lateral deflection by cross-winds of SSW-oriented migration; the arrivals everywhere included a number of species (such as the Barred

Warbler *Sylvia nisoria* and the Red-backed Shrike *Lanius collurio*) whose autumn migration is known to be oriented about SSE; and some of the commoner species in east England may have included members of SSE-oriented populations (a Suffolk-ringed Spotted Flycatcher *Muscicapa striata* was recovered in Italy). These anomalies would be explicable with the confirmation of the 'random dispersal' theory of Williamson (1959) or of the 'reversed migration' hypothesis of Nisbet (1962), but firm evidence is still lacking.

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## Appendix. Scientific names of species

Honey Buzzard <i>Pernis apivorus</i>	Little Gull <i>Larus minutus</i>
Osprey <i>Pandion haliaetus</i>	Black Tern <i>Chlidonias niger</i>
Lapwing <i>Vanellus vanellus</i>	Common Tern <i>Sterna hirundo</i>
Ringed Plover <i>Charadrius hiaticula</i>	Cuckoo <i>Cuculus canorus</i>
Little Ringed Plover <i>Charadrius dubius</i>	Wtynneck <i>Jynx torquilla</i>
Kentish Plover <i>Charadrius alexandrinus</i>	Fieldfare <i>Turdus pilaris</i>
Grey Plover <i>Pluvialis squatarola</i>	Redwing <i>Turdus iliacus</i>
Golden Plover <i>Pluvialis apricaria</i>	Ring Ouzel <i>Turdus torquatus</i>
Dotterel <i>Eudromias morinellus</i>	Wheatear <i>Oenanthe oenanthe</i>
Whimbrel <i>Numenius phaeopus</i>	Whinchat <i>Saxicola rubetra</i>
Green Sandpiper <i>Tringa ochropus</i>	Redstart <i>Phoenicurus phoenicurus</i>
Wood Sandpiper <i>Tringa glareola</i>	Bluethroat <i>Luscinia svecica</i>
Common Sandpiper <i>Tringa hypoleucos</i>	Robin <i>Eritacus rubecula</i>
Redshank <i>Tringa totanus</i>	Grasshopper Warbler <i>Locustella naevia</i>
Spotted Redshank <i>Tringa erythropus</i>	Great Reed Warbler <i>Acrocephalus arundinaceus</i>
Greenshank <i>Tringa nebularia</i>	Sedge Warbler <i>Acrocephalus schoenobaenus</i>
Knot <i>Calidris canutus</i>	Aquatic Warbler <i>Acrocephalus paludicola</i>
Little Stint <i>Calidris minuta</i>	Icterine Warbler <i>Hippolais icterina</i>
Temminck's Stint <i>Calidris temminckii</i>	Barred Warbler <i>Sylvia nisoria</i>
Dunlin <i>Calidris alpina</i>	Garden Warbler <i>Sylvia borin</i>
Baird's Sandpiper <i>Calidris bairdii</i>	Whitethroat <i>Sylvia communis</i>
Curlew Sandpiper <i>Calidris testacea</i>	Lesser Whitethroat <i>Sylvia curruca</i>
Sanderling <i>Calidris alba</i>	Willow Warbler <i>Phylloscopus trochilus</i>
Ruff <i>Philomachus pugnax</i>	

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Greenish Warbler <i>Phylloscopus trochiloides</i>	Tawny Pipit <i>Anthus campestris</i>
Chiffchaff <i>Phylloscopus collybita</i>	Tree Pipit <i>Anthus trivialis</i>
Wood Warbler <i>Phylloscopus sibilatrix</i>	Red-backed Shrike <i>Lanius collurio</i>
Spotted Flycatcher <i>Muscicapa striata</i>	Siskin <i>Carduelis spinus</i>
Pied Flycatcher <i>Ficedula hypoleuca</i>	Chaffinch <i>Fringilla coelebs</i>
Red-breasted Flycatcher <i>Ficedula parva</i>	Ortolan Bunting <i>Emberiza hortulana</i>