

# SEABIRD REPORT 1969



The Seabird Group

10/-

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## INTRODUCTION

It is almost five years since a number of enthusiasts proposed the formation of a new group to promote more vigorously and to co-ordinate co-operative research into seabirds. The three major ornithological societies, the British Ornithologists Union, the British Trust for Ornithology and the Royal Society for the Protection of Birds, agreed to sponsor their efforts, and the inaugural meeting of the new Seabird Group was held on 8th January 1966. There were some who regretted the formation of yet another ornithological body—have their fears been justified?

As one who had some initial doubts, I believe that a clear answer can now be given. In its relatively short existence the Seabird Group has achieved much of scientific and conservation value which would almost certainly have been left undone had it not come into being. First and foremost, has been Operation Seafarer, an ambitious attempt to locate, and where possible count, all the nesting seabirds around the coasts of the British Isles. After two years of preliminary investigations, the main count took place in 1969 and over 95% cover was achieved in spite of formidable difficulties. This result owes much to the enthusiasm and energy of its full-time organiser, David Saunders, whose appointment was made possible by a grant from the World Wildlife Fund, the Royal Society for the Protection of Birds and the Royal Society for the Prevention of Cruelty to Animals. It is hoped to complete the survey this year and publish the full report in 1971. It will provide a solid basis for assessing future changes in our seabird numbers. Some, like the gulls and fulmars, have increased, but the auks seem to be increasingly threatened by pollution, and others like the Little Tern, by disturbance.

Inevitably the Seabird Group has found itself more and more involved in conservation questions. It has been recognised by the Natural Environment Research Council and the Nature Conservancy as having a vital role in assessing seabird numbers and in measuring the effects of disasters, whether caused by oil or other pollutants. It has worked closely with the Royal Society for the Protection of Birds on the Beached Birds Survey, with its countrywide network of observers who report on seabird casualties. This provides not only a means of monitoring the continuing effects of oil pollution, but also enables early warning to be given of major disasters, whether caused by oil spills or where, as in the great catastrophe in the Irish Sea last autumn, other chemical pollutants may be involved. It sponsored the Little Tern enquiry, and the report by R.K. Norman and D.R. Saunders showed that in 1967 the population in Great Britain and Ireland was down to not more than 1600 pairs, with human disturbance as the major factor in the decrease. As a result special conservation measures have been taken by the R.S.P.B. and the County Naturalist Trusts. The Group, through its Secretary, Dr. W.R.P. Bourne, has also been able to give to the Roskill enquiry into the siting of the third London airport, expert evidence on the dangers presented by birds, especially gulls, to aircraft.

This does not mean that scientific enquiry has been forgotten—indeed the Group's function is to provide the scientific facts without which no effective conservation measures are possible. Sea-watching, one of the Group's earliest and most exciting activities, has continued throughout, ably guided by Garth Pettitt, and many of the results have been reported in the Bulletin. They have provided new facts and new problems requiring solutions. Inevitably, if we are to understand the behaviour and ecology of many species of seabirds, we must extend our enquiries beyond the breeding colonies and the coastal waters to the wider seas, where many species spend much of their lives.

Here, our knowledge is pitifully limited, and the Executive Committee decided that any expansion of activities must lie in this direction. They saw the need to determine the seasonal pattern of distribution and abundance of different populations and age groups of birds at sea; to describe their feeding habits and food and to

relate these observations to other relevant oceanographic and biological research in the same areas. The waters of the British Isles offer unrivalled opportunity for such co-ordinated investigations. In association with the Seabird Group, Dr. G.M. Dunnet of Aberdeen University (the Group's first Chairman, and a member of its Executive Committee) applied to the Natural Environment Research Council for support for this work. A grant of £9,500 over two years beginning on August 1st 1970, has now been awarded for a feasibility study. The work will be carried out from Aberdeen, in close association with the Marine Laboratory there. The Senior Investigator will be Dr. W.R.P. Bourne, who becomes Director of Research, as well as Secretary, of the Seabird Group, and there is provision for a research assistant for Dr. Bourne. Though Dr. Dunnet is responsible to N.E.R.C. for the grant, an Advisory Committee will be set up for the project, consisting of Mr. B.B. Parrish, Deputy Director of the Marine Laboratory, Aberdeen, and on behalf of the Seabird Group, Mr. Ivor Rees of the Marine Science Laboratory, Bangor, and myself.

So now, after five years it is no longer a question of whether the Seabird Group can, or should, survive. It has grown, and developed, to an extent that even its most enthusiastic pioneers can hardly have foreseen. It has proved its value for science and conservation and the task now is to build further on the foundations they so securely laid. One sign of the Group's maturity is the replacement of the Bulletin by this first Annual Report, which it is hoped will give a wider circulation and a greater permanence to the researches of the Group and its members. I hope too that it will help to provide more extensive support for the exciting tasks which lie ahead.

Stanley Cramp

## THE BIRDKILL IN THE IRISH SEA

Dr. W.R.P. Boume

In late September 1969, Oscar Merne wrote reporting the discovery of a number of dead auks, mainly Guillemots with a few Razorbills, around Wexford Harbour in south-east Ireland. Over the next couple of weeks Ivor Rees reported similar mortality from North Wales, then John Slinn from the Isle of Man, while Frank Hamilton, for the Royal Society for the Protection of Birds, was also receiving independent reports of occurrences in Northern Ireland, so that when in early October Graham Stewart wrote describing a very large wreck of the same species in Ayr following westerly gales at the end of September in the Firth of Clyde it seemed clear that a major ornithological disaster of a most unusual type was in progress. After anxious consultation it was agreed that the Royal Society for the Protection of Birds would, on 15th October, issue a press statement appealing for more information. There was an immediate response by television and the newspapers, and persistent public speculation as to the cause of the disaster was continually stimulated by news of further arrivals of increasingly decayed bodies on the eastern shores of the Irish Sea, of exaggerated rumours which appear to have been spread by a practical joker in Cornwall and reports of what may have been no more than normal mortality of young seals, until the disaster reached its natural termination with the arrival of the last raft of bodies reported by Norman Hammond from Cumberland in mid-November.

Confronted with this situation and growing public disquiet, the Natural Environment Research Council rose to the occasion and convened a meeting of a wide variety of specialists on 24th October to discuss the situation and initiate investigations, which were reviewed at a further meeting on 11th November. In the subsequent press releases it was reported that the main species concerned in the disaster was the Guillemot, and the first deaths were reported in Northern Ireland in early September, while the peak mortality occurred during the climax of the autumn moult in the last ten days of the month. Many dead birds came ashore all round the northern Irish Sea and the largest number in the Firth of Clyde with severe gales at the end of the month, while some mortality was reported by Tom Pearson as far north as Fort William. The birds were all weak and underweight, virtually all of them were renewing their flight feathers and a minority were oiled, although this was not sufficient to account for the whole disaster. Many of the larger arrivals also coincided with the onset of strong winds, but some mortality occurred before, and some birds came ashore on coasts which were not affected by them, so these did not provide a full explanation of the disaster either.

It was provisionally concluded that in over fifty birds subjected to detailed study there was no evidence of viral or bacterial infection, but that 36 sent for chemical analysis contained varying amounts of heavy metals, not considered sufficient to account for the mortality, average levels of organochlorine pesticides, but proportionately high levels of Polychlorinated Biphenyls (PCB's, widely used in the chemical industry) compared to other wild birds, although the significance of this last finding was not clear. Nothing abnormal could be detected in the sea. It was concluded that after fuller study an official report would be prepared on the incident, for which the Seabird Group agreed to collate the data relating to field observations. This is in the last stages of drafting and seems likely to be a model of its kind, although it may not add much more than detail to the account given above. A number of reports are also being prepared on local aspects of the disaster; we are pleased to be able to reproduce those on southern Ireland and north Wales and a survey establishing a base line for the latter area, while others are in preparation for the rest of Ireland and Scotland, so that the whole story, if not the cause of the disaster, should eventually be exceptionally well documented.

Meanwhile, arrangements were made to repeat that part of our national census of breeding seabirds, 'Operation Seafarer', relating to the area affected, during the spring of 1970. It was a cold, late spring, and the birds returned to the colonies late. In those studied most closely, in Anglesey, none had returned in the usual way by the beginning of February, and only half the usual number by the end of the month. Later it was noticed that Guillemots were visiting some colonies much more erratically than usual, and that many were failing to breed. By the time half the colonies had been examined at the end of June many were still severely reduced, the Guillemots by about half and the Razorbills by a third overall in the Irish Sea and south-west approaches, and both by about a fifth in south-west Scotland. These figures are highly provisional since many birds, perhaps young ones which escaped the disaster, appear to be coming in late in the season, and repeated counts are sometimes indicating that the gaps have been filled. Fortunately, despite further large mortality possibly due to oil pollution in north-east Britain early in 1970, the northern and eastern breeding colonies appear to be holding their own.

The full impact and significance of the disaster is not yet clear and it would be premature to draw too many conclusions before all the figures for this year's breeding censuses are available and the appearance of the official report. Meanwhile an absolute minimum of 15,000 auks are known to have come ashore dead around the Irish Sea and south-west Scotland in the autumn of 1969, and it seems likely from the deficit in the breeding population in 1970 that the full toll was many times this number. Whether the disaster was due to poisoning by some agent such as PCB's, or some undetected natural cause (and we should be able to detect one which causes so much damage), it seems unlikely that the birds will be able to recover their numbers easily in the face of the continual toll from oil pollution. The whole situation gives grave cause for disquiet; it is to be hoped that the mortality had a natural cause and will not be repeated; if it is, this must suggest that something very serious indeed is wrong with the sea.

## GUILLEMOT KILL IN NORTH WALES--AUTUMN 1969

E.I.S. Rees

During the last week of September and the first three weeks of October 1969 unusually large numbers of dead and disabled guillemots *Uria aalge* came ashore on the south-west facing coasts of North Wales between Barmouth and Carmel Head. Abnormal numbers of dead birds were also found at other localities around the Irish Sea and the whole incident is the subject of a report by the Natural Environment Research Council (N.E.R.C. in preparation). This paper is based upon reports made by very large numbers of people in the North Wales area through the R.S.P.B. beached bird survey, the Nature Conservancy and in response to the great publicity surrounding the incident.

### TIMING

In North Wales the first report was of an obviously sick bird drifting up the Menai Strait past Port Dinorwic on 20th September. Fresh corpses started to be found on the west coast of Anglesey on the following day and later in the same week when a minor oiling incident affected Trearddur Bay it was surprising to find as many clean birds ashore as oiled ones. The peak of the incident seems to have been reached during the following week (29th Sept.-5th Oct.) but freshly dead birds continued to be found in higher than normal numbers until early November. The main arrivals coincided with periods of fresh south-westerly winds but some came ashore even with offshore winds.

### NUMBERS DYING

During the course of the incident counts were made of the numbers of dead birds on most of the accessible beaches in the area. However as it lasted for more than seven weeks and as there are considerable stretches of relatively inaccessible coast an indirect method has to be used to estimate the total number which came ashore.

In places the dead birds accumulated on the shore at densities of up to 120/mile but it is thought that such high figures are a result of the configuration of the coast. Floating material tends to accumulate at the head of bays open to the wind but the catchment frontage of these bays is likely to be much greater than the actual length of the beach. Most of the beaches on the west coast of Anglesey have this sort of configuration so the figures for arrivals on these beaches were calculated as numbers arriving per mile of estimated catchment frontage to south-west or west winds. This empirical approach was found to even out most of the differences in the numbers found per mile on neighbouring stretches of coast. The coast of North Wales between Barmouth and Carmel Head presents a frontage of about 45 miles to the residual wind direction for the period of the main arrivals.

Several of the beaches were counted at least once a week during this period and as rough estimates were also made of the time the birds had been dead, from their state of decomposition, it was possible to derive approximate figures (Table 1) for the numbers coming ashore per mile of coast each week and another extrapolated figure for the numbers believed to have died each week. Many of the corpses were starting to decay before they came ashore so that the peak of the mortality may have been about a week before the peak of the stranding.

There were also a few reports of dead or disabled birds along the north facing coast of Wales between Carmel Head and the Dee and south round Pembrokeshire to Gower. However no concentrations of bodies were found that, but for the publicity, would have received any notice at all. There were scattered reports all along the coast of Cardigan Bay south from Barmouth to Pembrokeshire, but much of this coastline lies parallel to the wind direction and the shores are not much frequented outside the holiday season. The west facing beaches of St.Brides Bay were checked several times but remarkably few birds were found. In Carmarthen Bay however, the southerly winds in mid October seem to have brought birds to several beaches at a rate of about



5/mile. It is estimated that about 100 birds came ashore in South Wales and a further 60 on the north facing coast between Carmel Head and the Dee, bringing the total for Wales to about 2,150.

## CONDITION OF BIRDS

### (a) Live birds.

Live birds were seen swimming close in to the rocks and in enclosed waters. Many of them were obviously weak and allowed themselves to be swept along by the tide. They appeared to be tame and allowed boats to approach very close before diving. The weakest ones swam with their necks withdrawn and their feathers looked ruffled. A number of weak live birds were found ashore. In general they were far weaker than oiled auks that are found in similar situations and made no effort to evade being picked up. Several people made attempts to revive ailing birds and all reports indicate that the birds died within a couple of hours of being found ashore. A proportion of the freshly dead birds were found above the high tide mark presumably having clambered out of the water before dying. Live apparently ailing birds continued to be found throughout the period of the incident but the greatest numbers were seen during the first two weeks.

### (b) Dead birds.

During the first week of the incident all the corpses seemed to be fresh but by the end of the second week many corpses were coming ashore that had started to decay. For example, amongst 60 corpses examined on the west coast of Anglesey on 5th October only about 5% had been dead less than about 5 days, 70% had been dead about 5-10 days and the remaining 25% had been dead about 2-3 weeks. Some of this last group were waterlogged and from their position on the shore were thought to have sunk and been brought ashore by the bottom currents. During the later phases of the incident and during the winter, auk bones were often found amongst the loose weed on the lower parts of several shores.

### (c) Moulting

Almost all the birds found during the early weeks of the incident had recently moulted their primary feathers. Only a centimetre or two of the new feathers was visible. The sides of their heads had reached a mottled stage and there was a bare area underneath the base of the wing where the coverts had been moulted. Fly maggots were first entering the corpses through this bare area. During the later phases of the incident there was much more variation in their state of moult. Some were only just starting to moult and their feathers were so worn that they appeared a very pale chocolate colour. At the same time other birds were found with the moult seeming to be almost complete with well developed primaries and pure white sides to the head.

### (d) Emaciation

It was immediately obvious that the birds were much lighter to handle than were the several hundred birds that I handled during the "Hamilton Trader" oil pollution incident in May 1969. The sternum was prominent and the pectoral muscles were reduced.

## DRIFT AND ORIGIN OF BIRDS

The great majority of the birds were found on south-west facing beaches after periods of fresh south-westerly winds. It was found by experiment that dead birds can be drifted a considerable distance by the wind and that the rate of drift is about 2.2% of the wind speed (Jones et al., in press). The residual wind drift in St. George's Channel based on records from four meteorological stations for this period, has been calculated by Mr. G. Stewart (Table 2). Comparable though marginally lower figures are obtained if only the records from Valley on the west coast of Anglesey are used. These figures indicate that dead or disabled birds could have been blown right across St. George's Channel in less than a week. The normal residual flow in St. George's

Channel is to the north at only about 1 km. per day (Bowden 1955) but Ramster (personal communication) suggests that the wind would have induced a slightly greater temporary residual current. This would have caused a slight displacement to the north from the direct wind drift direction.

The oiled birds that were used in the experiment remained drifting for about a week but it is likely that a proportion of them sank as one marked corpse was brought up in a trawl. It is not clear whether unoiled moulting birds are more likely to sink, but an appreciable number of obviously waterlogged corpses was found in circumstances that suggested that they had sunk and been brought ashore in the bottom currents: localised bottom currents tend to bring bottom drifters ashore in Caernarvon and Cardigan bays at about 2 km. per day (Harvey 1968). Birds which reached the confines of these two bays before sinking could have been brought ashore before they disintegrated but any that sank out in St.George's Channel are most unlikely to have come onto the beaches.

Information on the normal distribution of guillemots at sea at this time of the year is rather sparse, but there are reports of concentrations in the tidal overfall areas in the middle of St.George's Channel (Norris 1965). It seems likely that they also concentrate along the banks off the east coast of Ireland between Dublin and Wexford. The timing of the peak of the arrival of bodies in Anglesey, 10 days or so after the onset of westerly winds which followed a period of easterlies, suggests that disabled birds were accumulating off the Irish coast during the period 12th to 20th of September. The fresh westerly winds then seem to have blown them back across St.George's Channel, by which time many of them had died.

#### NORMAL MORTALITY RATE

The numbers of bird corpses on two Merioneth beaches have been counted at least twice a month for the last three years. Jones (in press) analysing these counts in relation to the wind recorded at Bardsey lighthouse has shown that most corpses were found after fresh SW-WSW winds. His data also shows that the mean rate of finding of the corpses was 3.1 per km. and of these 26% were guillemots. Thus the normal number of guillemot corpses on this west facing shore would be about one per mile including oiled birds which accounted for more than half the total. When allowance was made for the erratic incidence of oiled birds it was clear that much higher numbers of clean guillemot corpses were found during the month of October than during any other month. This higher incidence of guillemot corpses was found in 1966, 1967, and 1968 though not as spectacularly as in 1969. The mean number found in October, not including the 1969 autumn figures was about eight times greater than any of the other months. Jones therefore suggests that the autumn 1969 mortality may have been an unusually severe manifestation of a phenomenon that has been occurring at least since 1966.

#### INTERPRETATION

##### (a) Weather

There is a clear correlation between the arrival of dead and dying birds on the Welsh coast and the residual wind over the preceding 3-4 days. Wind speeds in St.George's Channel were at no time abnormal nor were the gales exceptionally prolonged, so that there is not the slightest evidence to suggest that the wind was a primary cause of the incident, although it undoubtedly had a secondary effect.

##### (b) Pollution

Although a small proportion of the birds were oiled the great majority were not. The distribution of the kill suggests that if pollution was implicated it was of the widespread accumulative kind rather than an immediate localised incident. The extensive investigations for suspected toxic chemicals (Polychlorinated biphenyls (P.C.B.) and heavy metals) are referred to in the N.E.R.C. report (in preparation).

### (c) Food during moult

Guillemots go through an abrupt moult during which they are flightless. As they 'fly' underwater when fishing the loss of primary feathers probably restricts the depth to which they can dive and restricts the range of prey they can catch easily, to smaller and less agile fish. The added metabolic demands of the moult probably mean that they need good feeding conditions if they are not to mobilise a large part of their fat reserves. The overall abundance of fish of the right size or merely their availability in traditional moulting areas could have been critical.

Although the great majority of the birds were emaciated there is no direct evidence to suggest whether the emaciation was a primary or a secondary factor in their distress. However, Pearson (1968) speculates that the dispersal of many British sea birds and the departure of surface feeding species such as the terns indicates reduced availability of food as prey fish, particularly sand eels *Ammodytidae*, move into deeper water. He also suggests that food availability outside the breeding season may be of greater importance in influencing population size than while the chicks are being fed.

The size of food taken by guillemots away from the colonies is assumed to be much the same as during the breeding season, when sand eels *Ammodytes sp.* and white bait (O-group sprats, *Clupea sprattus* and herring *C. harengus*) are the main prey (Pearson 1968 and personal observations). Pearson found that the mean weight of fish brought to the Farne Islands by guillemots was 8 grams. For sand eels this corresponds to fish in the 100–125 mm length class and for whitebait about 70–80 mm. Tuck and Squires (1955) studying the Brunnich's guillemot *Uria lomvia* show that this slightly larger species usually took fish of much the same size range. Apart from sand eels, which probably become less available in the autumn, O-group winter/spring spawned herring (length 60–90 mm.) should normally be the most abundant fish of the right size available as prey in the Irish Sea. Tuck (1960) records that a single species of fish *Mallotus villosus* made up over 90% of the food of guillemots wintering on the Newfoundland banks.

It is too early to have any clear indication whether or not there was anything unusual about the 1969 year class of herring but Saville (1965) has related the dispersal and survival of Clyde spring spawned herring to the winds in the first few weeks after they hatch. A particular feature of the spring of 1969 was an unusually prolonged period of north easterly winds. Even if accumulative pollutants are implicated a natural trigger of this type is required to explain the sudden yet widespread nature of the incident.

Table 1

Week ending	N/mile frontage	Arrival	Deaths
21 September	<1	10	160
28 September	5	225	820
5 October	17	765	220
12 October	6	270	170
19 October	1	45	170
26 October	8	360	180
2 November	2	90	130
9 November	3	135	90
16 November	2	90	50
23 November	<1	-	-

Estimates of numbers of guillemots coming ashore along the west facing coasts of North Wales by weeks and approximate numbers of these which are believed to have died each week. See text for explanation of how these figures were derived.

Table 2

	Direction	Period	Distance	Rate
31 August–7 September	020 <sup>o</sup>	8 days	33.6 nm	4.2 nm/day
8 September–12 September	230 <sup>o</sup>	5 days	26.5	5.3 nm/day
13 September–19 September	070 <sup>o</sup>	7 days	33.6	4.8 nm/day
20 September–26 September	250 <sup>o</sup>	7 days	63.0	9.0 nm/day
27 September–1 October	300 <sup>o</sup>	5 days	37.0	7.4 nm/day
2 October–8 October	220 <sup>o</sup>	7 days	59.5	8.5 nm/day
9 October–13 October	160 <sup>o</sup>	5 days	26.5	5.3 nm/day
14 October–17 October	200 <sup>o</sup>	4 days	38.0	9.5 nm/day
18 October–22 October	150 <sup>o</sup>	5 days	16.0	3.2 nm/day
23 October–27 October	240 <sup>o</sup>	5 days	42.0	8.4 nm/day

Wind drift in St. George's Channel based on an analysis of winds recorded at Aberporth, Valley, Dublin and Roches Point adapted from calculations by G. Stewart. A figure of 2.2% of the wind speed has been used to estimate the rate of drift of the bird corpses.

#### REFERENCES

- Bowden, K.F., 1955, Physical Oceanography of the Irish Sea. Fishery Investigations, London, Series II, Vol. XVIII (8) 67pp.
- Harvey, J., 1968. The movements of sea-bed and sea-surface drifters in the Irish Sea, 1965–1967. *Sarsia*, 34: 227–242.
- Jones, P.H., in press. Tideline bird corpses on two Merioneth beaches. Seabird Report. 1969.
- Jones, P.H., G. Howells, E.I.S. Rees and J. Wilson, in press. Effect of "Hamilton Trader" oil on birds in the Irish sea in May 1969. *British Birds*.
- Natural Environment Research Council, in preparation. The Seabird Wreck of 1969. H.M.S.O.
- Norris, A.Y., Birdwatching by submarine. The Irish Sea in June. *Seabird Bulletin*, 1: 32–34.
- Pearson, T.H., 1968. The feeding biology of seabird species breeding on the Farne Islands, Northumberland. *J. Anim. Ecol.* 37: 521–552.
- Saville, A., 1965. Factors controlling dispersal of the pelagic stages of fish and their influence on survival. *Int. Comm. N.W. Atlantic Fisheries*, Special Publication 6, pp. 325–348.
- Tuck, L.M., 1960. The Murres—their distribution, populations and biology. A study of the genus *Uria*. Canadian Wildlife series number 1. Published by the Department of Northern Affairs and National Resources, Ottawa.
- Tuck, L.M., and H.J. Squires, 1955. Food and feeding habits of Brunnichs Murre *Uria lomvia lomvia* on Akpatok Island. *J. Fish. Res. Bd., Canada*, 12: 781–792.

## THE AUK KILL IN COUNTY WEXFORD, SEPTEMBER 1969

Oscar Merne

Following a report, from a member of the public, of large numbers of dead seabirds on the beach at Rosslare Strand, H. Mathews, President of the Wexford Ornithologists' Club, made a search along 2½ miles of the beach on 21st September 1969. He found a total of 64 dead auks; 48 Guillemots and 16 Razorbills. Only one bird had traces of oil. Mathews also noticed 'quite a number' of auks in the water close inshore. These were behaving in a rather unusual manner, swimming along with their heads and necks stretched out along the surface of the water. The condition of the dead birds ranged from badly decomposed to reasonably fresh. Mathews contacted the writer immediately after these findings.

On the 25th September I went to the Carnsore Point area in the extreme south-east of the county and searched 4 miles of beach from Lady's Island Lake to Carne and found 11 Guillemots and 4 Razorbills. Of these, 7 Guillemots and 3 Razorbills were birds of the year, the remainder adults in heavy wing moult. All were fairly fresh and in reasonably good physical condition. There were no auks in the sea offshore.

On the 27th September I covered a further 4½ miles of beach from Raven Point (at the north side of the mouth of Wexford Harbour) to Curracloe, and here found 103 dead auks. 78 of these were Guillemots and 25 Razorbills. 56 of the Guillemots were young birds while 17 of the Razorbills were also young. The remainder of both species were adults in heavy wing moult. Most of the dead auks on this beach were partly or wholly decomposed. A small number of auks were in the sea very close inshore and were behaving in a manner similar to that described above.

Mathews and a few members of the Wexford Ornithologists' Club made searches in other parts of the county, but apart from 10 auks at Rosslare Harbour and 6 to the west of Kilmore Quay no other birds were reported.

Two Guillemots collected in the Carnsore Point area were sent to the Veterinary College in Dublin for post mortem examination, but by the time they arrived they were infested by maggots and could not be examined.

All birds found by Mathews, the writer, and members of the Wexford Ornithologists' Club were examined for rings but none was found. However, prior to the 21st September two dead ringed Razorbills were reported to the British Trust for Ornithology (Mead 1969). These were ringed on Skokholm, Pembrokeshire, in June and July 1969 and were recovered at Curracloe on the 7th September and Kilrane (near Rosslare Harbour) on the 20th September.

### Summary

In Co. Wexford at least 198 dead auks were found beached during the last week in September 1969. 182 were specifically identified and of these 137 (75.3%) were Guillemots and 45 (24.7%) Razorbills. 89 of the Guillemots and 29 of the Razorbills were aged and examined for wing moult. 63 Guillemots (71.9%) were birds of the year, while 20 Razorbills (68.9%) were also young birds. The remainder of both species were adults in heavy wing moult.

Numbers of live auks behaving in an unusual manner were seen in the water close to the two beaches where the greatest numbers of dead birds were found.

### Reference

Mead, C.J. 1969. Report on recoveries of ringed seabirds received by October 21st, 1969. Ringing and Migration Section, British Trust for Ornithology.

## TIDELINE BIRD CORPSES ON TWO MERIONETH BEACHES

P. Hope Jones  
The Nature Conservancy

### INTRODUCTION

Organised regular counts of beached seabirds are a relatively recent development on the British ornithological scene, the main aim being to collect facts about a little-known group of birds, and particularly in connection with oil pollution of the littoral seas. This study in Cardigan Bay, begun in 1965, was put on a regular basis in September 1966 and was then continued until September 1969 to give three years' data. The main aims were to discover (1) which birds turned up as corpses on the tideline at two selected sites—the species involved, their numbers and relative abundance; (2) the factors which led to their arrival on the tidelines; and (3) the extent of oiling of seabirds in the northern part of Cardigan Bay. The work was undertaken on the shorelines of two National Nature Reserves as part of the regular routine observations made on these sites, and the raw data are kept at the Nature Conservancy's Welsh headquarters at Bangor, Caernarvonshire.

### METHOD

Counts were made along the tidelines at two beaches on the north-west coast of Merioneth: Morfa Dyffryn and Morfa Harlech, whose locations are shown in Fig.1. Each of these sites was 3.5 km in length and had a smooth, gently-sloping, sandy shore backed by dunes. Two counts on each beach were made every calendar month; the date was usually determined by pressure of other work, and so long as the counts at each site were at least ten days apart, no special effort was made to keep to a more regular timetable. The most recent tidelines were inspected at a medium walking pace, and any corpses found were examined before being taken off the beach and deposited above the high spring tide line in the Marram Grass (*Ammophila arenaria*) of the backing sand dunes. Features noted for each corpse were species, age and sex where it was possible to determine these, and degree of oiling. Guillemot wings from fresh corpses were removed for further study. The present counts sought to discover the background, normal, situation against which the occasional incidents of high mortality could be more meaningfully seen; to prevent bias resulting from the massive wreck of seabirds in the Irish Sea in the autumn of 1969, the results in this paper are therefore restricted to the three years immediately prior to October 1969.

### RESULTS OF COUNTS

Totals of individual corpses and the patterns of monthly abundance are shown in Tables 1 and 2. The most abundant species was Guillemot *Uria aalge*, comprising over a quarter of the records, followed by Razorbill *Alca torda*, Common Scoter *Melanitta nigra* and Herring Gull *Larus argentatus*. Peak numbers of corpses on the tidelines occurred in spring, with a smaller peak in autumn, this being the pattern imposed by the dominant seabird grouping. The non-seabirds showed a different pattern with peaks in late summer and mid-winter. The number of corpses per kilometre of tideline varied between a minimum of 0.2 in September and a maximum of 1.5 in April, with an average over the three years of 0.7. Even after three years' counting however, these conclusions must be tentative since the overall figures are still relatively small, and the pattern can be upset by a local incident of high mortality or by long spells of strong on-shore winds. Before the analysis of these counts, there was no indication of any significant oil spillage in Cardigan Bay which might have weighted the percentages of the auks, but in fact one hitherto unsuspected incident did come to light for April 1968, so if the April figures are slightly suspect, the true corpse maxima are more likely to fall in May and October.

Corpses of domestic animals—chickens, turkeys, racing pigeons, pigs, and sheep, were occasionally seen though not recorded. Of the marine mammals, six corpses were found of Grey Seal *Halichoerus grypus*, four of Porpoise *Phocoena phocoena*,

and two of Bottle-nosed Dolphin *Tursiops truncatus*, ten of them being in the period August to November.

#### ORIGIN OF THE BEACHED CORPSES

There is no direct evidence to show where the birds died or from where they had drifted as corpses, but British Trust for Ornithology rings were found on five birds as follows:

species:	ringed at:	recovered at:	
Manx Shearwater	Bardsey, Caern.	Dyffryn	6.6.67
<i>Procellaria puffinus</i>	3.7.60 (f.g.)		
	Skomer, Pembs.	Harlech	31.5.69
	17.4.61 (f.g.)		
Shag	Bodorgan, Ang.	Harlech	13.12.66
<i>Phalacrocorax aristotelis</i>	29.6.66 (pull.)		
	Skomer, Pembs.	Dyffryn	1.3.67
	28.7.66 (pull.)		
Herring Gull	Newborough, Ang.	Harlech	15.11.69
<i>Larus argentatus</i>	5.7.65 (pull.)		
Razorbill	Bardsey, Caern.	Dyffryn	23.11.66
<i>Alca torda</i>	21.6.61 (pull.)		

These birds were all ringed on the western coast of Wales, and indicate a relatively local origin for at least some of the corpses throughout the year.

Guillemots can provide a useful clue to the origin of the corpses through a study of the subspecies as indicated by plumage colour. Northern Guillemots *U. a. aalge* have the upperparts sufficiently black to distinguish them from the greyish-brown southern form *U. a. albionis*, though intermediates of varying blackness do occur. The breeding range of the northern form extends, on the western side of the British Isles, from Shetland to south-west Scotland, with a considerable zone of intermediates in this region, Guillemots south of here being of the southern form. Wings were removed from several fresh Guillemot corpses, and these were compared (by W.R.P. Bourne, J.R. Mather, and P.H.J.) with good series of study skins. Thirty-seven determinations were made: three (8%) were good northern type, eight (22%) were intermediate, and 26 (70%) were southern. Birds with northern wings were picked up in February, October, and November, and those with intermediate types in the period from early October to early April; southern type birds occurred throughout the year except in late summer (when Guillemot corpses were very scarce anyway).

In sum then, from samples of the corpses, it seems that southern Guillemots are present in or near Cardigan Bay throughout the year, and that northern and intermediate birds visit the area during the non-breeding season. The geographical origin of other species is at present unknown, though probably there is a considerable complement of local (Welsh) breeding stock involved as well as wintering birds from outside Wales and some migrants on passage through the Irish Sea region.

#### INCIDENCE OF OILED BIRDS

Each corpse was examined for traces of oil on the plumage, any pollution being graded as slight, moderate, or heavy. In the non-seabird group, the only species to show any traces of oil was Red-throated Diver, with plumage on both corpses being slightly soiled. The incidence of oiling amongst the seabirds was much higher, and is summarised in Table 3. Of those species where more than five individuals were recorded, three show up badly in this context: 61% of the Common Scoter corpses were oiled to some degree, 69% of the Razorbills, and 54% of the Guillemots. In

most cases, the birds had probably been in contact with the oil whilst they were alive (though there is no direct evidence to show that this is what killed them), but in some cases there is just a possibility that the oil had been picked up by drifting corpses.

#### EFFECTS OF CURRENTS, TIDES, AND WINDS

Until now, discussion has been based on lumped totals of corpses found on the two beaches. There is, however, a distinct difference between the two sites in the number of corpses found on each:

	seabirds	non-seabirds	total corpses	%
Morfa Harlech	161	44	205	60
Morfa Dyffryn	99	38	137	40
		totals	342	100

The difference lies mainly in the higher number of seabirds found on the shore at Morfa Harlech. The reason for this difference is unknown at the present time, but it is probably an effect of the geographical position of the two beaches: corpses coming into Cardigan Bay with prevailing south-westerly winds may tend to "pile up" in the north-east corner, and a complicated pattern of tide, current, and river movements close inshore in this area could well influence the number of bodies deposited on the Morfa Harlech shore. Harvey (1968) showed that seabed drifters released in Cardigan Bay tended to move northwards into the north-east corner of the Bay and onto the south Caernarvonshire coast, whereas movements of surface drifters were determined mainly by the wind direction. If any of the seabird corpses sank before coming ashore, they would therefore be carried northwards by currents, and the more northerly beach of the two, Morfa Harlech, would be likely to receive the most corpses. Harvey also concluded, from  $\chi^2$  tests on numbers of drifters found, that the height of the tide at any given time in the lunar month did not affect the likelihood of arrival onshore of either seabed or seasurface drifters, and this would presumably apply also to bird corpses.

The main factor connected with the occurrence of corpses was the direction of the wind in the days previous to the tideline count, and an analysis was carried out to find the relationship between wind direction and corpse arrival. Using six-hourly figures for wind speed and direction at Bardsey (30 miles west of Morfa Dyffryn) a wind vector analysis was made for the ten days prior to each count over the three years, and the numbers of corpses were then compared with the resultant direction (Fig.2) and speed of the wind in this arbitrary period. For seabirds, the direction producing most corpses is between  $230^\circ$  and  $240^\circ$  (between SW and WSW); this is very similar to the direction subtended by the arc from the two beaches giving a clear fetch out into the Irish Sea ( $223^\circ$ – $243^\circ$ ). For other birds, the situation is less clear cut, but most of the corpses turned up when the resultant wind was between  $200^\circ$  and  $320^\circ$  (approximately SSW to NW). The residual speed of the wind can also be important in determining the number of corpses found on the tideline. High numbers of corpses, almost 40% of the total, arrived with winds blowing from the sector between  $200^\circ$  and  $280^\circ$ ; at a low value of residual speed from directions within these limits, the number of corpses coming in averaged 0.86 per km of tideline, but above this the number increased to 1.21 per km, though dropping to 0.92 per km at the very highest residual speeds. This last, lower, figure may be due to a reduction in the percentage of corpses found as a result of their being hidden amongst the vast amounts of seaweed which usually came ashore under these conditions.

In an experiment in the north Irish Sea, Jones, Howells, Rees & Wilson (in press) calculated that auk corpses in the open sea are drifted at 2.2% of the wind speed; a back projection of corpse drift based on the ten day period of strongest winds in this study would originate some 144 miles south-west of the Merioneth coast. The potential collection zone for surface-floating corpses therefore extends well out into St. George's Channel between southern Ireland and Cornwall, though of course the birds could come from any distance along the line between there and the Merioneth coast.



## THE MONITORING VALUE OF THE COUNTS

Numerous variables affect the numbers of corpses found on the beaches, e.g. the patterns of species movements offshore and the relative numbers involved—that is, the total numbers of birds at risk at any given time; the annual incidence of onshore and offshore winds; as well as the many factors already mentioned. In the light of the present data, one can conclude that the highest “normal” numbers with onshore winds are 11 per count (3.1 corpses per km of tideline) and that high single counts of 26 and 12 corpses were indicative of a special incident: the original data for Morfa Harlech on 1st and 17th April 1968 show that of the 38 seabird corpses found, 35 were oiled, the figure in this case presumably relating to a local oiling incident which was not on a large enough scale to attract the attention of ornithologists or the general public.

In the autumn of 1969, large numbers of dead Guillemots were reported from several Irish Sea coasts. Between 29th September and 9th November six counts were made on the Morfa Harlech shore, producing 53 Guillemots (only two of which were oiled) and seven corpses of other species: on two of these counts 17 and 13 Guillemots were found (average of 4.3 corpses per km) so here was an indication of abnormal mortality where oil was not involved. Fig. 3, the aggregated numbers of Guillemot corpses for each month of the year, shows two major peaks: the April one is due almost entirely to the local oiling incident of April 1968, but the October peak comprises three years' counts of apparently natural deaths, and it may be that the major Guillemot catastrophe in the autumn of 1969 could be a more than usually severe manifestation of an annual phenomenon. The data collected over the three years can therefore probably provide a useful working baseline to show up incidents of mortality within the “corpse catchment area” which could comprise—for these two beaches—the southern Irish Sea and much of St. George's Channel.

## SUMMARY

Counts of tideline bird corpses were undertaken twice a month for the three years 1966 to 1969 at two sandy beaches, each 3.5 km in length, in west Merioneth. 342 corpses were counted, comprising 32 species; Guillemots *Uria aalge* made up 28% of this total, Razorbills *Alca torda* 17%, and Common Scoters *Melanitta nigra* and Herring Gulls *Larus argentatus* 8% each. Most birds turned up in spring, with an average of 1.5 corpses per km of beach in April, and least in September, with 0.2 corpses per km; overall, the average was 0.7 per km.

Guillemots with plumage characters of northern and intermediate forms comprised about one-third of the total for this species, and occurred only between autumn and spring; birds of the southern form were found throughout the year.

Eight species showed evidence of oiling; 69% of the Razorbills were oiled, 61% of the Common Scoters, and 54% of the Guillemots.

Highest numbers of corpses arrived with residual winds blowing strongly from between SW and WSW; some of the corpses could have travelled over 100 miles. The data can provide a baseline for the monitoring of seabird mortality within the “corpse catchment area” of the two beaches.

## ACKNOWLEDGEMENTS

I am grateful to my wife for carrying on the counts during three months in the summer of 1968 when I was abroad, and to Mr. E.I.S. Rees for his helpful comments on early drafts of this paper; also to the Trinity House Lighthouse Service for permission to use their wind data collected on Bardsey, and to Mr. N.F. Matthews for making it readily available.

## REFERENCES

- HARVEY, J. (1968)  
“The movements of sea-bed and sea-surface drifters in the Irish Sea 1965–1967”  
Sarsia 34: 227–242.  
JONES, P.HOPE, HOWELLS, G., REES, E.I.S., & WILSON, J. (in press)  
“Effect of *Hamilton Trader* oil on birds in the Irish Sea in May 1969”.

Table 1  
Numbers of tideline corpses found during 144 counts  
on two beaches in Merioneth, October 1966 to September 1969.

(a) seabirds*	number	% of grand total (where exceeding 1%)
Manx Shearwater <i>Procellaria puffinus</i>	21	6.1
Fulmar <i>Fulmarus glacialis</i>	8	2.3
Gannet <i>Sula bassana</i>	19	5.5
Common Scoter <i>Melanitta nigra</i>	28	8.2
Kittiwake <i>Rissa tridactyla</i>	24	7.0
Razorbill <i>Alca torda</i>	58	17.0
Guillemot <i>Uria aalge</i>	95	27.7
Numbers of other species comprising, individually, less than 1% of the grand total: Leach's Petrel <i>Oceanodroma leucorhoa</i> 1; Great Skua <i>Stercorarius skua</i> 2; Puffin <i>Fratercula arctica</i> 3; Little Auk <i>Plautus alle</i> 1. Total 260.		
*an arbitrary group comprising those species which spend most of their time on or over the sea more than one mile offshore.		

(b) other species	number	% of grand total (where exceeding 1%)
Cormorant <i>Phalacrocorax carbo</i>	6	1.8
Shag <i>Phalacrocorax aristotelis</i>	10	2.9
Wigeon <i>Anas penelope</i>	4	1.2
Herring Gull <i>Larus argentatus</i>	28	8.2
Black-headed Gull <i>Larus ridibundus</i>	6	1.8
Carrion Crow <i>Corvus corone</i>	4	1.2
Starling <i>Sturnus vulgaris</i>	4	1.2
Numbers of other species comprising, individually, less than 1% of the grand total: Red-throated Diver <i>Gavia stellata</i> 2; Shelduck <i>Tadorna tadorna</i> 1; Lapwing <i>Vanellus vanellus</i> 2; Oystercatcher <i>Haematopus ostralegus</i> 2; Ringed Plover <i>Charadrius hiaticula</i> 1; Great Black-backed Gull <i>Larus marinus</i> 3; Lesser Black-backed Gull <i>Larus fuscus</i> 1; Common Gull <i>Larus canus</i> 2; Little Gull <i>Larus minutus</i> 1; Arctic Tern <i>Sterna macrura</i> 1; Stock Dove <i>Columba oenas</i> 1; Jackdaw <i>Corvus monedula</i> 1; Chough <i>Coracia pyrrhocorax</i> 1; Redwing <i>Turdus musicus</i> 1. Total 82.		

Table 2  
Monthly numbers of tideline corpses found on  
144 counts on two beaches in Merioneth,  
October 1966 to September 1969.

	J	F	M	A	M	J	J	A	S	O	N	D	totals
SEABIRDS	20	17	25	53	33	14	6	7	6	33	29	17	260
other species	12	3	6	9	8	4	11	9	2	5	3	10	82
totals	32	20	31	62	41	18	17	16	8	38	32	27	342
no. of corpses per km.													
	0.76	0.74		0.98		0.40	0.19		0.76				
		0.47	1.47		0.43		0.38		0.91	0.64			

Table 3  
Incidence of oiling of seabird corpses found on  
two Merioneth beaches, October 1966 to September 1969.

species	oiled			not oiled	total
	heavy	moderate	slight		
Manx Shearwater	-	-	-	21	21
<i>Procellaria puffinus</i>	-	-	-		
Leach's Petrel	-	-	-	1	1
<i>Oceanodroma leucorhoa</i>	-	-	-		
Fulmar	-	-	-	8	8
<i>Fulmarus glacialis</i>	-	-	-		
Gannet	-	-	2	17	19
<i>Sula bassana</i>	-	-			
Common Scoter	1	6	10	11	28
<i>Melanitta nigra</i>	-	-	-		
Great Skua	-	-	1	1	2
<i>Stercorarius skua</i>	-	-			
Kittiwake	-	3	1	20	24
<i>Rissa tridactyla</i>	-				
Razorbill	10	14	16	18	58
<i>Alca torda</i>	-	-	-		
Guillemot	22	14	15	44	95
<i>Uria aalge</i>	-	-	-		
Puffin	1	-	-	2	3
<i>Fratercula arctica</i>	-	-	-		
Little Auk	-	-	-	1	1
<i>Plautus alle</i>	-	-	-		

Table 4  
Comparison of numbers of corpses with residual wind direction.

resultant wind direction	no. of counts in each category	no. of corpses	average number of corpses per count
0-45° (N-NE)	10	5	0.5
46-90° (NE-E)	13	9	0.7
91-135° (E-SE)	15	19	1.2
136-180° (SE-S)	16	25	1.6
181-225° (S-SW)	21	40	1.9
226-270° (SW-W)	34	152	4.5
271-315° (W-NW)	23	58	2.5
316-360° (NW-N)	12	34	2.8

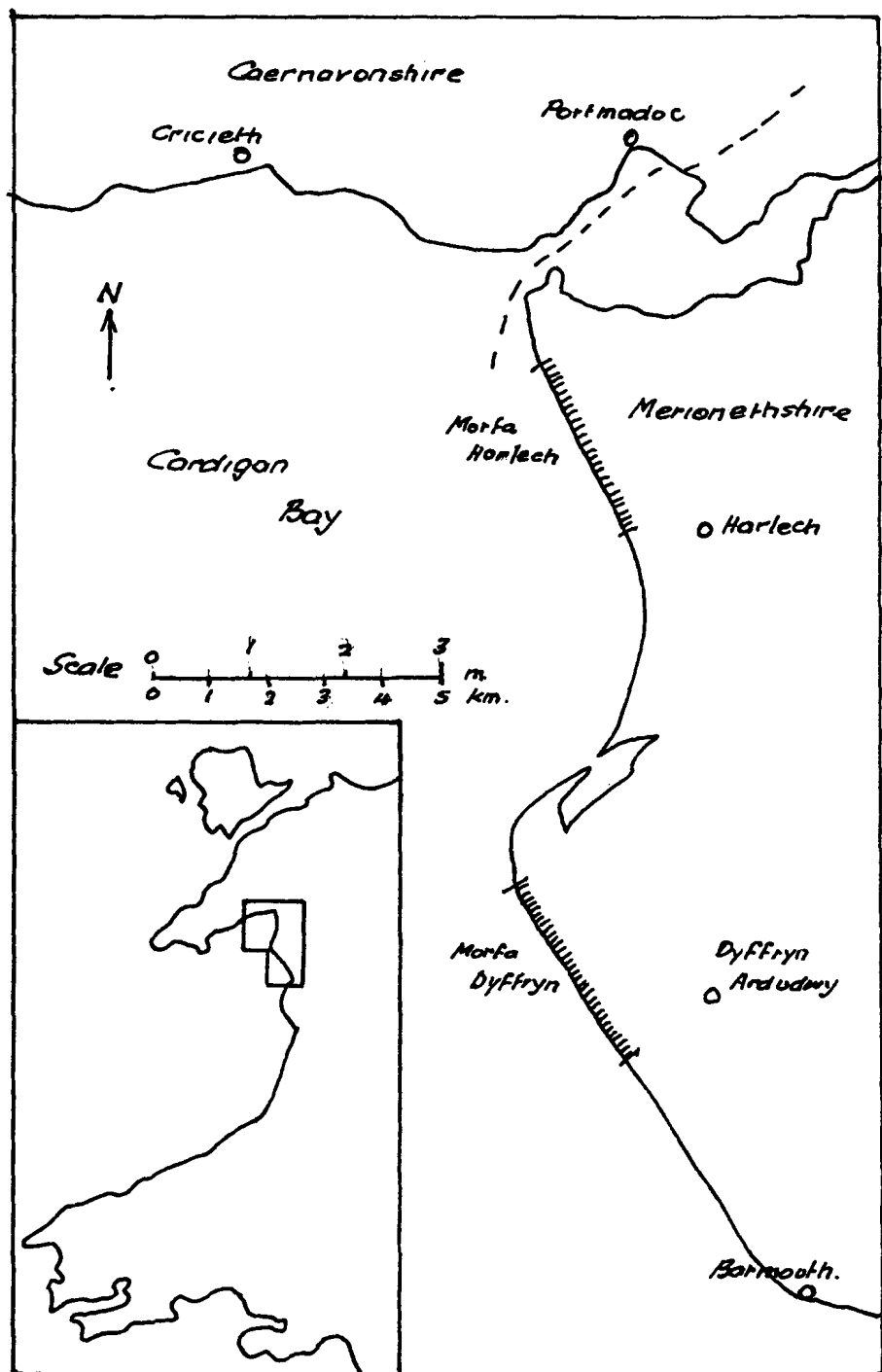


Fig.1

Location of the two beaches on which corpse counts were undertaken in 1966-69.

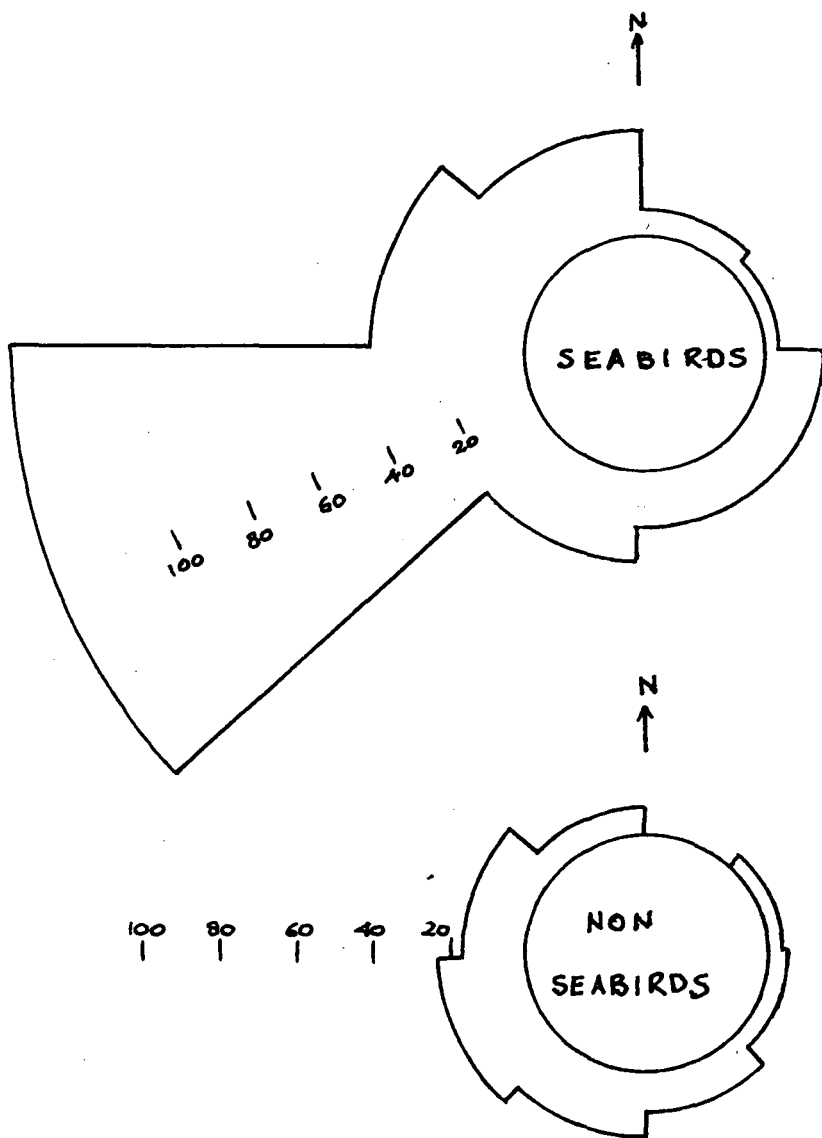
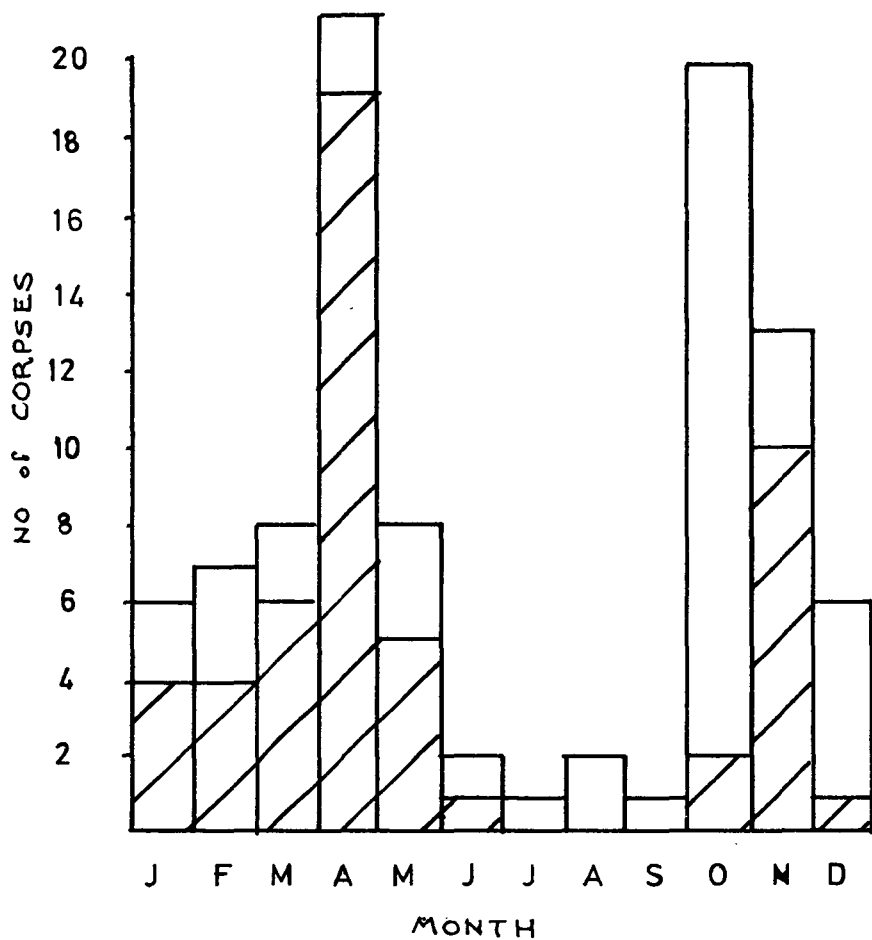


Fig.2  
Comparison of numbers of bird corpses with residual wind direction.



hatched ~ oiled birds ; unhatched ~ unoled.

Fig.3  
Monthly totals of oiled and unoled Guillemot corpses on two  
Merioneth beaches, October 1966 to September 1969.

## 'OPERATION SEAFARER-1969'

David Saunders

Some of the first observers to be active for 'Seafarer' at the start of the season were members of the Purbeck Ornithological Club who were covering the cliffs from Studland Bay to West Lulworth. The first group which had received financial assistance from the Seabird Group to enter the field was the Steep Holm Gull Research Station who carried out an extensive survey of the gull population on Steep Holm during early May.

By the end of the breeding season some one thousand volunteers had assisted with the survey in one part of Great Britain and Ireland or another. It was considered that we had received promises of assistance which would enable from between 95 and 98% of the coastline to be covered during the year. The remaining areas were, as expected, in the north of Scotland and Western Ireland. At the time of writing (early November), the majority of record cards are in, though some are still outstanding from a few areas. Those that have been received confirm the extensive coverage anticipated at the commencement of the 'Seafarer' year. However in a few cases sections of coastline were not covered as adequately as originally hoped due to observers dropping out at the last moment (fortunately there were few instances of this). Inclement weather also prevented quite as much being done as we would have liked in some parts.

Besides the many volunteers who assisted on the ground, or by sailing along difficult coasts and to more remote islands, the Group was indeed most fortunate to receive help from the Armed Forces, to whom we are most indebted. One of the Survey Ships of the Royal Navy, H.M.S.S. Hecla was in the area of Rockall during May and Lt-Cdr. R.A. Wilson reported that no birds were attempting to nest on this the remotest rock stack in the British Isles. Through the good offices of the Royal Naval Bird-watching Society and the R.A.F. Ornithological Society we received assistance from the Royal Navy and Royal Air Force, both Coastal Command and the Central Reconnaissance Establishment. Due to their joint efforts all the main Gannet colonies were photographed at one time or another throughout the summer. Besides this, a number of other seabird colonies were photographed on an experimental basis in order to see whether smaller seabirds could be assessed from the air. In Ireland through the good offices of the Irish Wildbird Conservancy assistance was obtained from the Irish Air Corps. We were doubly fortunate in this instance, for Oscar Merne was able to accompany the flights and these covered virtually the whole of western Ireland from Horn Head, Co. Donegal to the Bull Rock Gannet colony in Co. Cork.

This is not the place to present any great detail about the survey nor indeed is it ready for publication. However one can draw attention to some of the interesting reports that have come in from observers. Probably the most exciting is the discovery of a new Gannet colony on Roareim, a stack in the westerly group of rocks in the Flannan Islands. An expedition under the joint leadership of two Group members—Dick Hansford and Bill Cooper made the discovery during a visit to these islands during early June. This particular expedition was one of the most wide ranging that took part in the 'Seafarer' operation. Using a boat hired in Oban they visited, besides the Flannans, other remote islands in the far west like Gasker, the Monach Islands and those in the Sound of Barra.

Follow-up work during the 1970 season had always been considered necessary in order to achieve a complete coverage of the coastline. In general those areas missed, in particular those on mainland coasts, are sections with few seabirds. Even so, it is hoped that these can be covered during 1970 for it is still important to know the true situation in such places and so provide a really thorough base by which any future changes in our seabird populations may be measured. Some of the island sites not

visited like the Shiants, are however of much greater importance and it is hoped that these can be visited by special expeditions next season. However small the area that an individual covers this is still a valuable contribution to the survey.

Exciting discoveries were by no means confined to birds on islands. Christopher Headlam reported a Sandwich Tern colony of some 1,000 pairs on the mainland 'somewhere in the north of Scotland'. Although a colony had been suspected in the area, the numbers involved were much higher than expected. Three pairs of Roseate Terns were seen at one site in the Orkneys, there are no previous breeding records of this species in that area. Little Terns were also seen in Orkney though did not seem to be nesting. Terns again provided several new records in Ireland, both Sandwich and Little being the species involved.

Auk numbers were down again at the colonies of Skomer and Ramsey in Pembrokeshire. Though a species which may be in the process of colonising the same area—the Black Guillemot—was reported for the second year in succession; a pair breeding 'somewhere in north-east Scotland' provided a new breeding record for that area also. Cormorants, not a species one would have felt to be overlooked, have provided several new or previously unrecorded colonies in the far north. The Shag, also provided an interesting record, in this case a colony of about 400 pairs on an island off Argyll.

A number of records of roof-top nesting gulls have come to light during the survey, some even nesting on the top of a hospital in Carmarthen, a county with otherwise few seabirds. Other artificial nest sites include the road bridge crossing the Tweed at Berwick and the remains of the Tay Bridge. The presence of the well known large colonies of gulls around our coasts was amply confirmed during the survey, but equally important good figures were obtained of the smaller colonies, many of which have not been reported in the past. From all this information it should be possible to obtain a much better picture of the numbers and breeding distribution of these problem species around the coast.

The two species which have received attention in previous surveys, and so already have a base from which changes may be measured—the Fulmar and Kittiwake—have provided some interesting records. With the former species many colonies in the far west and north which had not been visited for twenty years, and in a few cases thirty years, were checked. In the southern section of the country a further expansion of range with several new breeding records has been reported. The Kittiwake with its very easily identifiable nesting sites has figured high in the list of new records of colonies and the expansion of old established ones. New or previously unrecorded colonies have been reported from Shetland south to Devon and some interesting comparisons should be able to be made with the 1959 survey.

It is planned to produce a basic account with maps of seabird distribution at a fairly early stage following the end of the 1970 breeding season. A more detailed analysis of the results will then be undertaken by a number of different workers, who will then produce papers concerning their findings at intervals. In 1970 therefore, it is important that the remaining areas can be covered so that the work is complete, at the same time ensuring that the records are sent in to the Organiser immediately so that the survey can be written up before the expiration of the grant in May 1971.

I would like to take this opportunity of thanking all those who gave so much assistance doing the 'Seafarer' survey, including the many people who, for one reason or another, could not actively participate, but who gave advice on areas of coast they knew well from former years. I would also like to thank the many people who assisted observers by providing accommodation or boat transport free of charge or greatly reduced rates in order that the survey could be carried out. Without their help results in some areas would be that much poorer.



**List of individuals and expeditions receiving financial  
assistance from the expedition fund**

**Scotland**

- |   |  |
|---|--|
| Dick Hansford and Bill Cooper                           | - Flannans, Sound of Barra, Harris and Monachs.                        |
| John Oakshott   | - Hermaness and west Unst.   |
| Peter Stanley and Univ. of London Biological Society    | - Noss, Bressay, Scalloway Islands and part of south Shetland mainland |
| John Pinder and party from Dundee University            | - Muckle Roe and west mainland of Shetland.                            |
| David Wilson  | - North Rona.  |
| Andrew Ramsay and party from Aberdeen University        | - Canna and Sanday.  |
| Roger Powell  | - Eday and Calf of Eday.   |
| David Steventon and expedition from Cambridge Bird Club | - Islay.   |
| Norman Hammond  | - Westray and Papa Westray.  |
| J. McCarthy   | - Mingulay and Berneray.   |
| P. Williams   | - West Yell and Whalsay and holms.                                     |
| J. Fowler and party from Leicester College of Tech.     | - Colonsay.  |
| *P.J. Cowan   | - Mull of Kintyre and islets to south.                                 |
| David Jonas   | - Islands of west coast of Mull.                                       |
| David Swann   | - Rousay and nearby islands.   |
| Gordon Birnie   | - St. Kilda.   |
| Ayr S.O.C. branch                                       | - for boat work off Ayr coast.   |
| Orkney Field Club                                       | - for boat work in Orkneys, in particular for the smaller islands.     |

A total of £435 was spent in grants towards 'Seafarer' in Scotland in 1969.

**Ireland**

- |  |  |
|--|--|
| Andrew Ferguson                                  | - Arranmore and nearby islands.                                    |
| J. McLaughlin                                    | - Inishowen and islands.   |
| R.G. Gibbs                                       | - Islets off south coast of Donegal.                               |
| S.M.D. Alexander                                 | - Islets off Mullet pen., Co. Mayo.                                |
| Robin Woods and party from Swansea University    | - Clare Island, Achill and a number of mainland sites in Co. Mayo. |
| Paul Watson and party from Univ. College, Bangor | - Cliffs of Moher and other sites in Co. Clare.                    |
| Dr. W.R.P. Bourne                                | - Mainland sites in Co. Kerry, in particular the Dingle peninsula. |
| Peter Evans and party                            | - Islands off Co. Kerry.   |
| Redmond Wheeler                                  | - Kenmore River islands, Co. Kerry also islands off Co. Galway.    |
| Tom Green  | - Islands in Cape Clear area.                                      |
| *Cork Ornithologists' Soc.                       | - Cork coast.  |

A total of £210 was spent in grants towards 'Seafarer' in Ireland in 1969.

**England**

£25 was given to the Steep Holm Gull Research Station for census work during 1969.

\*Grants not taken up in 1969.

## SEAWATCHING 1969

R.G. Pettitt

Records from stations watching at sea and from individuals have again been collected from the Atlantic coast, and to an increasing extent the Irish Sea. No collection or organised watching under Seabird Group Auspices has been carried out in the Channel or the North Sea, and the programme of collecting records of birds at sea has been suspended.

An account of the extent of observations in the Irish Sea which it is hoped will stimulate analysis of the considerable amount of data which is being accumulated, has been deferred another year for reasons of space. A paper on the movements observed in North-east Scotland, promised in my report of last year, has again been deferred.

Andrew Ferguson continues to work on the Fulmar, and is starting on the Common Scoter. Michael Hounsborne is working on the Gannet, and Peter Hayward on the Kittiwake. Michael Walters has taken on the Auks. I am working on the Manx Shearwater, and may tackle the Terns. If anyone would care to take on a study of Skua movements, this would be welcome.

Cape Clear has continued to send us all its records, which provide the yardstick against which all others are measured. The records cover watching over the greater part of the year, and are covered very fully in the Cape Clear Observatory Reports. Specially long manning was arranged in order to provide a background for the records collected by other posts in a period of concentration in early April 1969.

In the spring, David Cabot went to Inishkea, Co. Mayo, hoping that besides working on Barnacle Geese, he would be able to watch seabird movements from this site, which had been so productive in 1961. At the same time I went to Blackrock, some six miles further out, to try to discover, as often suspected, whether the mainland sites on the west coast were missing the movement up the coast in the spring, because it was just that little too far out. Unfortunately we were both delayed until mid April by very heavy storms, and were in time to see the very last of the northward movement of Puffins, but little else. Dr. Cabot was unable to watch from Inishkea because of a back injury he sustained there. On the 11th April while we were stranded, Andrew Ferguson recorded at Achill Head, in violent westerly conditions, a movement of Fulmars at about 3,000 an hour north along the cliffs, obviously birds evacuating the southern cliffs because of the wind. In the autumn, Jack Sheldon went again to Slyne Head, from August 27 to September 10. Again he recorded extensive evening movements of Manx Shearwaters N. past the island. Adrian Warwick-Haller observed similar movement from the mainland from August 13. Great Shearwaters were seen in numbers on 8th and 9th (300 an hour N on 8th, up to 600 on 9th). Simultaneous watching from Annagh or Erris Heads by Peter Hayward and Michael Hounsborne revealed very little movement, as did a watch from Brandon Point by Major Rutledge from 28 to 30 August. During this period we have a daily series by John Phillips from St.Ives from July 25 to September 5. Later in the autumn we have a most interesting series by G. Huyskens from Cabo de Bares from October 4th to 26th, later than this post has been covered before. In 200 hours of watching 42,000 Gannets were seen to pass, the peak being 4,614 on 18th. Cory's Shearwaters were much more in evidence than in other watches here, and more than any other Shearwaters. The peak movement was on 14th when 1,456 passed west, and it would appear that the departure of this species occurs at this time.

## IRISH SEA SEA-WATCHING

R.G. Gibbs

Sea-watching has been carried out from a number of Irish Sea sites in recent years, inspired by the interesting results of the Atlantic Seawatch Scheme. The purpose of this paper is not to attempt an analysis of the data, but rather to place on record the observations that have been made so far.

### a) East side of the Irish Sea.

Point Lynas at the north-east corner of Anglesey was thought to be a promising site after the published observations of Eades (Seabird Bulletin 2 1966). Watching was carried out in 1967 and 1968 by several observers and the data is held by Malcolm Taylor (Charles Salt Research Centre, Orthopaedic Hospital, Oswestry, Salop). Eades suggested that the large numbers of birds he recorded had sheltered in the lee of Anglesey from autumnal westerly gales, and then battered their way north-west past Pt Lynas to avoid being blown onshore as the gales veered north. So far no one else appears to have observed movements under the same weather conditions. Such passage as has been observed takes the form of a westerly movement. There is almost always no corresponding reverse movement of any importance, except for feeding movements of auks, kittiwakes, terns, fulmars, gulls (Herring, Lesser and Greater Black-backed), cormorants and shags from local colonies. The Gannets seen regularly at the Point are presumably making for southern colonies and pass Pt Lynas on their way out of Liverpool Bay. This movement can also be observed from the Great Orme and from Anglesey near Puffin Island. Any similar movement of Manx Shearwaters may take place further out to sea, as these birds are only occasionally seen at Pt. Lynas. From the little evidence available, Manx Shearwaters seem to appear at Pt. Lynas after adverse weather conditions, possibly as a result of south or south-westerly gales having pushed birds up St. George's Channel and many having 'spilled over' into Liverpool Bay. Whether they actually seek shelter off the east coast of Anglesey (as suggested by Eades) is not clear.

During July and August adult Kittiwakes from the Puffin Island colony make dawn and dusk feeding movements up the east coast of Anglesey past Pt. Lynas. Early morning movements tend to be dispersed over several hours whereas dusk movement towards the colony occurs in the space of one or two hours before sunset. Adjustments to this movement take place in response to bad weather and the occurrence of fish at the Point. Both tend to break up the diurnal feeding movements.

Arctic, Common, Sandwich, Roseate and a few Little Terns may be seen feeding in the vicinity of Pt. Lynas during July and August. No movements which could be called migratory were noted during September. It is possible that the majority of birds pass down the Menai Straits, rather than round Anglesey. Certainly Sandwich Terns may be seen in the Straits well into mid-October.

The few skuas (both Arctic and Great) seen in Autumn from Pt. Lynas were all moving west. They are perhaps attracted to the Liverpool Bay area by the presence of large numbers of terns, but it is not known whether they have entered the Irish Sea from the north or south.

Bardsey Bird Observatory has collected the most complete series of systematic catches in the area over the last few years; they are recorded on the observatory's non-standard seawatch forms, but no detailed analysis has been attempted. The 1968 Report has an article on sea-watching, showing hourly rates of passage in each direction during watches carried out from the west coast of the island. A six hour watch was achieved from dawn every day between 20th August and 24th September, with a total of 263 hours between 19th August and 1st November. Numbers of the more interesting seabirds recorded during 1968 were as follows: Balearic Shearwater 26, all but 2 between 20th Sept. and 17th Oct.; Sooty Shearwater 25 on 29th and 30th Sept.; Arctic Skua 33 in Sept.; Bonxie 8; Pomarine Skua 2. The paucity of skuas

and southern shearwaters is noticeable, and cannot be blamed on lack of observation, at least during the period of intensive watching mentioned above. Details of species seen on sea-watches in previous years are given in the systematic list in each Annual Report (although without indication of the direction of movement), and exceptionally good days are described in the monthly summary section. A sample is given below from the 1967 Report.

'During the afternoon of 5th Sept. (wind north-west, decreasing), a sudden south-westerly movement involving thousands of displaced seabirds took place; a few hours watching produced, among others, 13 Storm Petrels, a further (adult) Sabine's Gull, 2 Sooty Shearwaters, 3 Balearic Shearwaters and at least 12 skuas'. George Evans, the Warden of Bardsey Bird Observatory, has speculated recently on the origin of these heavy seabird movements following south-west gales (in Bardsey B.O. Newsletter 25, Dec. 1968). George's theory is that some birds, seen heading south down the west coast of the island, and departing into the Irish Sea on a south to south-west heading, have in fact come out of Cardigan Bay (especially the northern half) which is, he suggests, 'a huge catchment area for buffeted petrels, shearwaters, gulls, terns, skuas and many others'. In other words, these birds heading south/south-west past Bardsey have never been north of the island at all! In the past, most observers have tended to assume that these birds have been displaced well to the north of Bardsey by south-west gales and are returning from the vicinity of, perhaps, the Isle of Man, Liverpool Bay or Anglesey. George Evans suggests that this may only be the case when the previous wind had a strong southerly component. Whether, in fact, these birds have approached Bardsey from the north or east can be tested fairly easily, as in the latter case they must pass through Bardsey Sound (between the island and the mainland) if they are to pass south down Bardsey's west coast. George intends to study this, with the help of sea-watching visitors, during the coming season.

Other sources of observations in North Wales include the Bird Reports of the Merseyside Naturalists Association and the Cambrian Ornithological Society. These give a useful picture of some occurrences of the rarer species such as Leach's Petrel and the skuas, but do not contain details of systematic watches.

Interest in sea-watching has increased in South Wales also. Observations from the Glamorgan coast are detailed by W.E. Jones in Seabird Bulletin No.2, while a recent paper by W.E. Waters (Nature in Wales 11, (1), 20-27 (1968)) describes seabird movements at St.David's Head in the Autumn, which are mainly in a south-west direction. David Saunders has been watching from Strumble Head during autumn 1969, a form of light relief from the Seafarer cards no doubt. The largest movements observed so far have all been to the south-west. 822 Gannets moved in that direction during three hours watching on September 9th, while in 3½ hours on Sept. 27th, a total of 1,218 Kittiwakes and 1,130 auks was observed. 17 Arctic Skuas were noted in a total of 18½ hours watching, while other interesting species seen included Balearic Shearwater, Eider, Red-breasted Merganser and Bonxie.

#### b) Watching from the West side of the Irish Sea.

The chief activity on the Irish side until recently has been at the entrances to the Irish Sea rather than on the long east coast. Records of intensive watches in the years 1959/60 are available in private circulation form from T. Ennis (Flat 5, 116 Hollywood Road, Belfast BT4 1NY) for Rathlin Island, at the entrance to the North Channel, the Maidens Lighthouse, (in the Channel) and St.John's Point, County Down. Watching at St.John's Point on an observatory basis became regular thereafter, and from 1964 came under the aegis of the Northern Ireland Ornithologists' Club. In 1965 manning was also carried at Benbane Head, near Rathlin Island in the spring, and in 1966 an extensive series of records was collected and made available to the Seabird Group. These records have never been analysed from an Irish Sea point of view. Watches from Benbane Head from Feb. 27th to April 17th 1966 were disappointing and this site has not been developed since. St.John's Point registers a

fairly constant north-east flow of seabirds, presumably leaving feeding grounds in the northern part of the Irish Sea rather than on passage up the Channel. Manx Shearwaters in spring 1965 passed in numbers up to 500 per hour in early April and at up to 1,000 per hour in August and auks at over 500 an hour in May. Passage through this section of the Irish Sea to the north was indicated, however, by the sighting of Bonxies (5 in three weekends of April) and Red-throated Divers (100 per day north-east on 1st and 2nd May and heavy passage also in the middle of the month). Unlike most species (except terns) divers passed south-west in the autumn, with a peak of 52 per hour (where identified mainly Great Northern) on Sept. 18th, suggesting that these species may use North Channel to enter the Irish Sea. There is little indication in the direction taken by the small number of skuas seen (in 22 hours in August and September 2 Bonxie north-east, 1 south-west, 2 Pomarine south-west, 7 Arctic south-west, 5 north-east, and 3 unidentified south-west) that the skuas use the North Channel on their way south. The numbers of the southern shearwaters in this section of the Irish Sea compared with the numbers seen at Inishtrahull and Malin Head at the same time suggests that the narrow North Channel is a major barrier to these species. The only shearwaters other than Manx recorded at St. John's in August in 1965 were 2 Sooty's. Watching has now largely been discontinued as a result of the failure to use records of sea-watching profitably, and regrettably before any co-operative watch has been mounted with simultaneous watching from the Scottish coast.

At the other end of the Irish Sea two watching points have been developed, Carnsore Point and Hook Head in County Wexford. The former is the obvious place to observe movement from the Irish Sea to the open Atlantic, but Hook Head is a more attractive site for general observation as it is physically more suitable for sea-watching. Hook Head also appears more productive, probably because it registers the concentration of seabirds in the sea area south of Ireland (i.e. outside St. George's Channel) when the weather conditions are such as to fill the inner zone. Details of watches in May, July, August and September 1966 by the Northern Ireland Ornithologists' Club, and in April and August 1969 by Mr. C.C. Moore of Dublin have been made available to the Group, though no analysis has been attempted. In April massive movements of Manx Shearwaters westwards are recorded at Hook (e.g. 1½ to 2 thousand per hour on 10 and 11 April 1969), and also to a lesser extent of Kittiwakes (521 in 1½ hours on 11th). Bonxies also pass west (5 in 9 hours in April), while Red-throated Divers pass east (24 east, 2 west in 9 hours). In May, July and to a lesser extent, apparently, in August extensive movements of Kittiwakes reaching 500 per hour are recorded, presumably feeding movements from colonies in St. George's Channel. Manx Shearwater movements both ways but more often east, are no doubt again largely feeding movements of birds from colonies in the South Irish Sea. The southern shearwaters reach this area, single Cory's being recorded in July and August, and Sooty's in August and September. Amongst the records received by the Group Balearic Shearwaters do not feature, in strong contrast to the records from St. Ives, Cornwall. It is possible that these shearwaters enter these seas from the south only under drift from strongly developed systems, and for this reason evacuate the area southwards rather than westwards. Over the last two years, Major Rutledge has watched regularly in the autumn, and this year (1969) in the spring from the Wicklow coast, and has a series of value in the study of scoter, skuas (which were especially numerous in 1969) and Manx Shearwater movements. He has made details of these movements available to the Group, and proposes to write them up himself after one more season.

#### c) Observations made at sea.

There is a great potential for collecting observations made at sea now that some of the ferries run during the day (e.g. Liverpool to Dublin and the I.O.M. boats). The University College of North Wales Marine Biology research vessel 'Prince Madoc' regularly operates in the Irish Sea and often has ornithologists aboard. Observations from such sources would be very useful in plotting feeding areas in the Irish Sea. On

27th August 1968, for example, very few birds were seen on a trip from Anglesey to the Isle of Man until the vessel was ten miles south-south-east of the Calf of Man. Here a feeding flock of several hundred Kittiwakes, terns and Manx Shearwaters was observed, and it was later found that the instrument giving a continuous record of surface water temperature showed that there had been a sudden increase in water temperature of nearly 2 degrees at the spot where the birds were feeding. This was probably the boundary between an area of thermal stratification and one where the water column was mixed from top to bottom.

## CONCLUSIONS

The main factors inhibiting the development of systematic sea-watching in the Irish Sea are the absence of large scale movements of 'interesting' seabirds (such as are seen on the west coast of Ireland and the east coast of England), and the absence of a figure of Garth Pettitt's stature to stimulate observations, circulate records and encourage analysis of data in the area. Nevertheless, interesting problems do emerge, such as:—

(i) Do any seabirds such as skuas and shearwaters actually migrate through the Irish Sea to and from breeding grounds further north?

(ii) The nature of feeding movements in the Irish Sea—are the auks, shearwaters, Gannets and Kittiwakes to be seen in the Irish Sea and from headlands and islands just local breeding birds, or do birds enter the area from the north or south to feed?

(iii) Analysis of the heavy movements to be seen at Bardsey and elsewhere after heavy gales in the autumn. Are these birds displaced from elsewhere in the Irish Sea, or have they come from further afield?

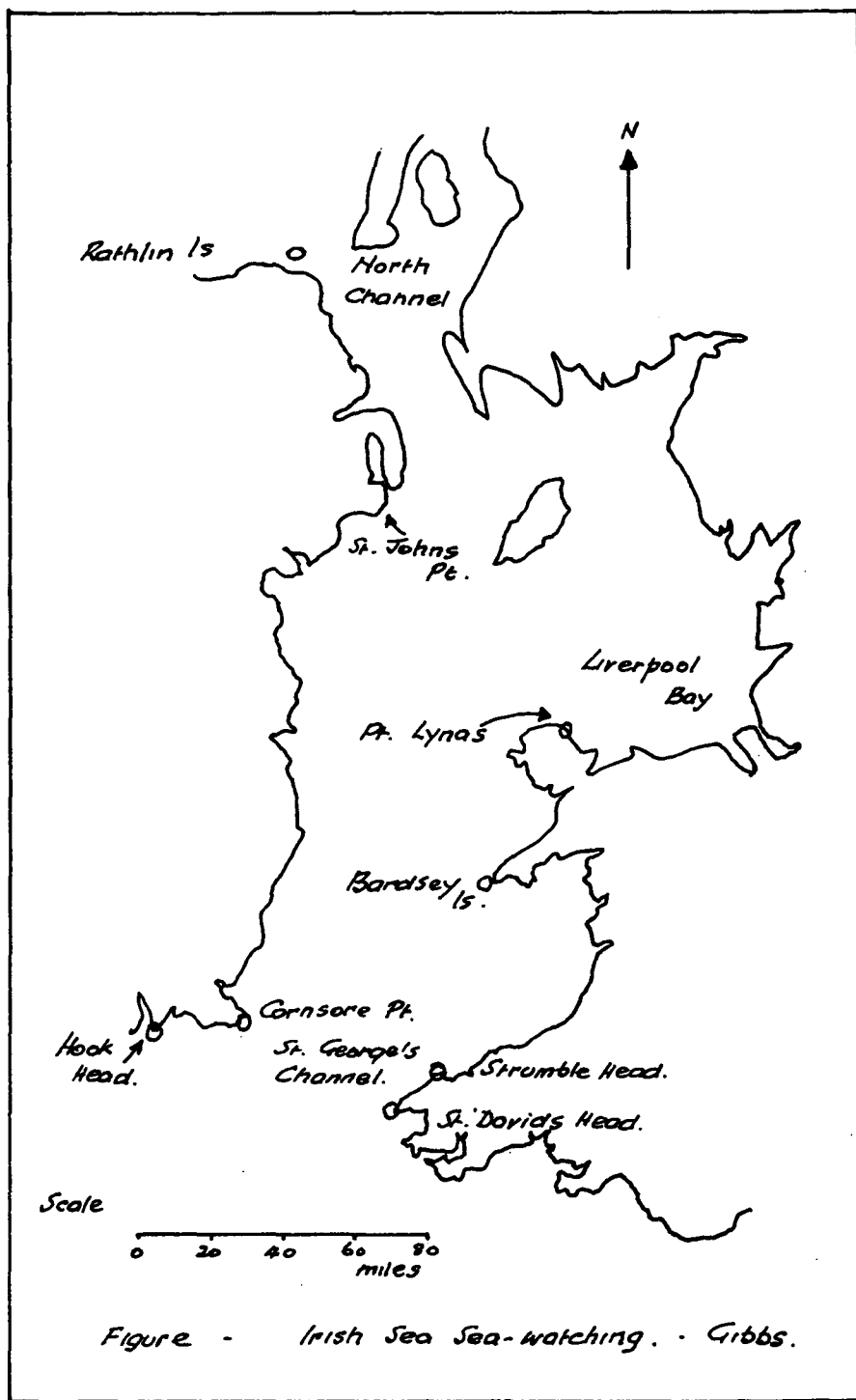
(iv) Do southern (i.e. Balearic, Sooty, Great, Cory's) Shearwaters enter the Irish Sea regularly?

If any annual variation in this can be detected, what are the causes—weather conditions, sea temperatures etc?

## ACKNOWLEDGEMENTS

Garth Pettitt wrote the section on observations from Ireland.

Malcolm Taylor and George Evans also made helpful comments.



## SEABIRD MOVEMENTS IN N.E. SCOTLAND, 1968 AND 1969

N. Elkins and M.R. Williams.

Little regular seawatching is carried out in Scotland, but in mid-July 1968 regular observations were begun from Rattray Head, Aberdeenshire, with a view to providing some information on the visual movements of seabirds in N.E. Scotland. From the end of August to early November 1968 these observations were supplemented with watches from Buchan Ness, about 10 miles to the south. This paper deals with movements from mid-July 1968 to February 1970. No analysis of weather movements is dealt with. The detailed records have been placed with the Seabird Group.

### METHODS

At Rattray Head most of the watching was carried out from the lighthouse tower, about 75 feet AMSL, but occasionally from the dunes at 50 feet AMSL. The lighthouse stands on rocks about 350 yards from HWM, and has an uninterrupted view from NW through E to SSE. At Buchan Ness the watching was done from the rocks about 20 feet AMSL, but after 8th October the foghorn tower, about 60 feet AMSL, was used to gain more height with rougher seas. If seas were rough observations could not be made with very great accuracy from either station.

The number of hours watched was as follows:—

Autumn 1968	July 16 to November	101
Winter 1968/9	December to February	14
Spring 1969	March to April 2, April 16 to May 13, May 13 to June 25	64½
Autumn 1969	August to October	42
Winter 1969/70	November to February	76½

All species were counted except for a few at the beginning of watching in 1968. No attempt was made to separate immatures from adults. Razorbills and Guillemots were classed to auk spp., and Common and Arctic Terns were classed as Commic Terns.

All times referred to are G.M.T.

### ACKNOWLEDGEMENTS

We should like to thank H.M. Dott, D.W. Oliver, G.M. Crichton and D.S. Flumm for sending valuable notes.

### REFERENCES

- Balfour, E., Anderson, A., and Dunnet, G.M. (1967)—Orkney Cormorants—their breeding distribution and dispersal. Scot. B.: 4:481–493.
- Bourne, W.R.P. and Patterson, I.J. (1962) The spring departure of Common Gulls (*Larus canus*) from Scotland. Scot. B. 2:3–17.
- Dott, H.E.M. (1968) Attendance of Fulmars (*Fulmarus glacialis* (L)) at a breeding area during autumn and winter. B. Sc. thesis Aberdeen University.
- Gibbs, A. et al (1965)—note in Brit. Birds. 58: 57–58.
- Lockley, R.M. (1953) On the movements of the Manx Shearwater at sea during the breeding season. Brit. Birds. 46: 1–48 (Suppl).
- Nelson, J.B. (1964) Some aspects of breeding biology and behaviour of the North Atlantic Gannet on the Bass Rock. Scot. B. 3: 99–137.
- Phillips, J.H. (1963) The distribution of the Sooty Shearwater around the British Isles. Brit. Birds. 56: 197–203.
- Phillips, J.H. and Lee, the late S.M.B. (1966) Movements of Manx Shearwaters off Erris Head, Western Ireland, in the autumn. Bird Study. 13: 284–296.
- Thomson, A.L. (1966) An analysis of recoveries of Great Skuas ringed in Shetland. Brit. Birds. 59: 1–15.



### RED-THROATED DIVER

A small passage north in late July 1968 with a peak of 11/hr. on 18th. Small passage south in late August, but the main passage was from 7 September, reaching a peak at Buchan Ness of 30/hr. on 29th, followed by a large movement from 5 to 6 October, with a peak of 72/hr on 5th at Buchan Ness. After this the passage was random all winter and spring, with a southward movement from 17 to 20 November (peak 40/hr. on 18th), and another of 29/hr. on 30 December, all in morning watches. Spring peaks were 10/hr. on 11 March, 1 and 21 April.

Autumn passage in 1969 was much smaller than in 1968, mainly southward in September, mostly in the mornings. Peak 5S/½hr. on 29 October. Small random movements in winter with peak of 8/hr. on 15 December, but a large southerly movement during the last week of January, tailing off in early February. Peak 101 S/hr. on 23 January.

The autumn passages would appear to tie up with the figures (unpublished) recorded for 1967 by H.E.M. Dott. Off the Sands of Forvie, 6 miles south of Buchan Ness, Dott recorded very few on the sea until 27 September, then a large increase peaking at 103 on 1 October, and 178 on 22 October. Very few birds are on the sea at Rattray and Buchan Ness at this time, and Dott suggests that the sea off the Sands of Forvie is a moulting area for the Red-throats, based on observations of state of plumage (changing plumage and missing primaries).

Passage was often in small flocks of 10 or so birds.

### GREAT NORTHERN DIVER

Two individuals were seen off Rattray Head at the end of July 1968 and then again from 2 July, with a small trickle south, peaking at the same time as the Red-throated Divers on 5 October with 11/hr., after which there were none until 22 October, when a period of small random movements began. The peak was 7/hr. on 17 November. The last were 3 on 7 May, except for singles N., on 2 and 8 June. In autumn 1969 there were fewer than in 1968, the first N. on 29 September. A few during winter, peaks of 5/hr. on 10 December and 1 January. The pattern in late January and February 1970 followed that of the Red-throats, with a peak of 12 S/hr. on 23 January.

### MANX SHEARWATER

Movement was predominantly northward at all seasons, the only exceptions being a few birds S in April, May and June 1969.

In July 1968 this movement was recorded from 16th to 29th at Rattray Head, reaching a peak of 81/2 hrs. on 18th, but otherwise no more than 10/hr. Passage was also noted off Arbroath on 25th (4N in ½ hr.) and 27th (14N in 1½ hrs.) (G.M. Crighton, pers. comm.). Passage was again recorded from Buchan Ness from 24 August to 1 September, but there were none at Rattray at this time. The peak in this movement was 11/hr. on 26th. None were then seen except on 5 October, when there was 1 N at Rattray and 2 N at Buchan Ness. However, D.W. Oliver (pers. comm.) recorded a movement in mid-September off Fife Ness with 36 N in ½ hour on 11th and on 20th there were 6 right inside the Moray Firth off Munloch and Rosemarkie, in bad weather.

In the spring of 1969 there were small movements from 18 to 30 April, with peak of 15/hr. on 18th. None in early May but more in June, between 1st and 24th. Autumn passage was over a similar period as in 1968, from 2 August to 29 September, mainly between 22 and 26 August, peak 58/hr. on 24th. In late autumn 1 N 29 October, and 2 N 2 November.

Presumably the summer birds were Shetland breeders returning from breeding in the North Sea, while the later movements were more migratory birds moving out of the North Sea after being forced south by bad weather (Lockley (1953); Phillips and Lee (1966)).

## GREAT SHEARWATER

Eight N in 1½ hrs. on 3 August 1969, and 2 N on 5th.

## SOOTY SHEARWATER

Passage was later and more protracted than Manx, from 26 August to 11 October, all except 2 on 29 September moving N. At Buchan Ness there were 5/hr. on 26 August, then none till 8 September. There was a peak of 8/hr. on 11th, but none after 12th, but at Rattray Head passage was not recorded until 13th, with a peak of 33/hr. on 14th, falling off after 24th. 2 moved S on 29th, and then the last ones were 1 N on 9 October, and 2 N on 11th. At Buchan Ness the last birds were 2 N on 5 October, and 5 N on 6th. An interesting but inexplicable fact was that on no day were they recorded from both Rattray Head and Buchan Ness. D.W. Oliver (pers. comm.) recorded a northerly movement off Fife Ness from 14 to 16 September with a peak of 16 in ½ hr. on 14th. This coincides with the peak at Rattray, and on the same day 2 were passing N off Clyth in Caithness. This suggests a northward movement along the whole of Scotland's east coast, and this movement continued on 15th.

In 1969 the autumn movement was much less protracted, but still all northerly and at the same period as peak Manx movement, 22 to 24 August with a peak of 26/hr. on 23rd and a total of 48 birds in 5½ hours watching. 2 went N on 3 August at Buchan Ness. On 29 September 2 went N at Rattray Head.

Phillips (1963) shows very few records from NE Scotland, although they are fairly common further south—but this was obviously because of lack of observers rather than birds. Phillips suggests birds entering the North Sea leave via N. Scotland, which would explain the predominant northward movement, although Gibbs et al. (1965) shows evidence that they also move S through the Straits of Dover and into the English Channel.

## FULMAR

At Rattray Head in mid-August 1968 D.S. Flumm (pers. comm.) recorded a predominantly northward movement of up to 500/hr. No counts of Fulmars were made by the authors until the end of August after which they moved regularly both N and S at up to 230/hr.; but around late morning on 15 September numbers dropped suddenly and only odd birds were then seen until the end of October. In 1969 similar large movements took place in early August, with 336 N and 139 S in 1½ hours on 3rd., and 1,006 N and 68 S at Buchan Ness on the same day. Few then occurred until 22 to 26 August when a large northerly movement occurred at the same time as the movement of shearwaters, with 1,110/hr. on 22nd and 1,563 on 23rd, both in early morning. Only occasional birds were seen after 19 September.

After the autumn exit in both years movement did not begin again until the end of October and early November. In 1968 51/hr. passed S on 9 November, and then movements were small and random, with no more than 40/hr. on 15 December. In 1969 the first movement in this period was 37 N/hr. on 2 November, and then 61 N/hr. on 22nd. Very few in December, with small southerly movements from 23 January to 20 February, totals up to 100/hr., though less than 35/hr. after 4 February. It was noticeable during the winter that the numbers passing did not reflect the numbers present at nearby colonies. On 30 October 1968 and again in November birds were present on the cliffs and on the sea at the Bullers of Buchan, whereas numbers passing Buchan Ness, one mile away, were negligible. Dott (1968) records that in November to January Fulmars visiting cliffs do so directly from the sea and therefore do not pass along the coast as they do earlier in autumn.

In spring 1969, movements were predominantly northward, and in the morning, only small in March, but building up in April with 106/hr. on 1st, 347/hr. on 17th, 318/hr. on 18th, and 249/hr. on 30th, easing off in May. The largest southerly movement was 52/hr. on 23 April.

In June all movements were random and very small with totals per hour no more than 77, and no diurnal variation, the drop from mid-May no doubt being due to

egg-laying and incubation.

Single dark-phase birds were seen off Buchan Ness on 7 and 12 September 1968.

#### GANNET

Passage noted at all times. No distinction was made between adults and young, but it was noticed that immature birds decreased considerably in October. No real pattern emerged from counts in 1968. Peak counts were at Rattray Head, 175 S/hr. 7 September, 227 N/hr. 5 October, and 269 N/hr. 24 October. Quite often little correlation was seen between Rattray Head and Buchan Ness, possibly due to many feeding birds at both spots, and birds were always in greater numbers at Rattray. There was a large northward movement at the end of October, probably adults leaving Bass Rock (Nelson 1964).

Small northerly movements in November and December, peaks 69/hr. on 10 November, and 54½/hr. on 29 December, but counts after mid-January 1969 showed a southerly trend, 75/hr. on 19 January, perhaps Bass Rock birds returning.

Movements in March were mainly small except for 111 N/hr. on 9th and 199 S/hr. on 23rd. In the latter half of April there were mainly northerly movements, with a peak of 166/hr. on 18th, easing off and becoming small random movements in early May with totals no more than 103/hr. In June very small movements of no more than 33/hr., with a tendency for all to be in the afternoon later in the month. Again the low numbers here can be correlated with laying and incubation.

As with most other species movements were smaller in 1969 than in 1968, peaks 62½/hr. on 1 October, with largest movements 137 N½/hr. on 29 October and 111 N/hr. on 16 November. Small trickle in December with 10½/hr. on 22nd. Larger numbers in early January with 127 N/hr. on 4th, but totals during late January and February, never exceeding 75/hr. and mainly southerly. Little after mid-February.

At Rattray Head up to the first week in September 1968, there was a tendency for the larger southward movements to be at dawn, with northward movements in the afternoon and evening, suggesting feeding movements, but no such pattern was noted at Buchan Ness. No marked diurnal rhythm was discernible in spring and summer 1969.

#### CORMORANT

At Rattray Head from mid-August to mid-September, there was a distinct southward movement with peaks of 114/hr. 1 September, 171/hr. 7th and 89/hr. on 15th. This was reflected at Buchan Ness on 7 September with 42/hr., but here the main movements seem to be entirely feeding/roosting. 7 September was particularly interesting at Buchan Ness, as at the same time the usual feeding movement was taking place (66/hr.). The local birds were moving along the coast while the southward moving birds were out at sea, and at times quite high. These were probably Orkney Birds (Balfour et al. 1967). These southward movements were all in the morning. The feeding birds move N at Buchan Ness in the morning, and S in the evening to roost on the cliffs and stacks to the south. From the end of October apparent feeding/roosting movements at Rattray Head continued all winter, with northerly movements at dawn and southerly at dusk, with peaks of 146 S/hr. 15 November, 204 N/hr. 17 November, and 169 N/hr. on 30th, but most involving less than 40 birds. Very little movement in spring, no more than 20 to 30/hr., except for a northerly passage on 5 and 6 March with a peak of 198/hr. on 5th, probably Orkney birds returning.

Little movement occurred in autumn 1969 compared with 1968, mainly southerly, peak 32/hr. on 20 September. Some movement in mid-November associated with Shags, with 54 N½/hr. on 22nd. Small numbers in December with 18/hr. on 28th, but more frequent in January with 21/hr. on 4th, but no more than 17/hr. later in January and in February, with no apparent correlation with Shags.

#### SHAGS

At Buchan Ness almost exclusively a feeding/roosting movement as Cormorant. Many birds feed off Buchan Ness and some remain in cliff area to the south, but the

majority move to Peterhead and to the north but not as far as Rattray. Nearly all movements were noted close to the shore. Counts in 1968 showed that as daylight shortened, movements became more intense i.e. 178 N 26 August; 217 N 7 September; 255 N 12 September and 345 N 29 September; 72 S 24 August; 143 S 6 September; 205 S 24 September and 453 S 9 November, with even larger numbers later. The more intense movements N suggest a more protracted return to the cliffs in the p.m. Morning movements began about sunrise, ceasing about 10.00 hrs., with the S movement beginning at 11.00 hrs. with main movements all afternoon, ceasing about ½ hr. before sunset.

Few Birds were noted at Rattray Head except for a small movement (31 S/hr.) on 7 September with Cormorants. By mid-November Rattray Head counts became similar to those at Buchan Ness, mainly feeding/roosting movement. Afternoon counts at the latter station rose to 532 S/hr. on 19th when counts ceased. At Rattray Head numbers rose gradually from 170 N/hr. on 17 November to 232 N/hr. on 7 December, with 171 S/hr. on 23 December, although the occasional watches in January and February showed little movement. The general northerly morning movement was apparent again from March with peaks 124/hr. on 5th (c.f. Cormorant), 299/hr. on 11th, with lesser peaks of 173/hr. 23rd, and 251/hr. on 1 April, falling to 96/hr. on 18th. The only movement S was on the afternoon of 23 April with 45 in ½ hr. Little movement in May with less than 25/hr., and even fewer in June.

Autumn counts in 1969 showed no more than 26/hr. at Rattray Head and feeding movements began here in mid-November as in 1968.

#### LONG-TAILED DUCK

In 1968 the first birds arrived at the end of September, but no real movement occurred until a month later. Peaks were 28/hr. on 27 October, 25/hr. on 17 and 18th, 22/hr. on 6 March and 25/hr. on 30 April. There was a tendency for the larger movements to be in the morning. The last were 5 S on 12 May.

In 1969 none were recorded in the autumn, the first being on 2 November, after which there were small random movements during the winter, not exceeding 21/hr.

#### VELVET SCOTER

This species passed in very small numbers. In 1968 there was a northward passage from 7 to 10 September, with peak 28/hr on 8th. There was a movement of 12 N on 6 November but otherwise little movement over winter, and very little after 23 March 1969. Autumn movements in 1969 smaller than in 1968; 2 N, 10 S at Buchan Ness on 3 August, 1 S at Rattray on 6th. More after 31 October with small northerly movement from 29 December to 4 January.

The autumn birds did not associate with Common Scoter although in summering flocks in the area up to forty Velvets are found with Commons.

#### COMMON SCOTER

A northward passage at the end of July 1968, peak 49/hr. 23rd, with none moving south. A corresponding northward passage was also observed further south at Arbroath (89/1½ hr. 27th, 44/½ hr. 1st August) (G.M. Crichton, pers. comm.) and at Fife Ness (120/½ hr. 30th) (D.W. Oliver, pers. comm.). This may be correlated with the decrease in summering flocks off the East coast. A flock of up to 400 to 600 Scoter summer off the Balmedie area near Aberdeen. The movements from the end of August onwards show little pattern except that the main movements almost entirely occurred in the morning, with peaks of 83 S/hr. 7 September, 75 N/hr. 10 September, and 67 N/hr. 5 October. After 11 October movements were very small, and confined to parties of no more than a dozen birds. Both Rattray Head and Buchan Ness showed similar movements, but occasionally there was very little similarity, which indicates the presence of feeding flocks in the area. The only major movements over winter were two morning movements, 41 N/hr. on 15th and 31 N/hr. on 30 December. In the spring 43 passed in one hour on 30 April.

Very little in autumn 1969, with 22/hr. on 3 August. Few more in winter with 25 N/hr. on 16 November, and 11 S/hr. on 26 December. Increasing in January with 32 N/hr. on 1st and 58/hr. on 23rd, but few in February except in 1st week with 33 S/hr. on 2nd.

#### ARCTIC SKUA

In 1968 the autumn passage lasted from July to mid-September, with odd birds in October, all mainly southerly. The largest passage was from 8 to 16 September, peak 7 S/hr. at Rattray Head on 11th, although D.S. Plumm (pers. comm.) recorded 24 S in 3½ hrs. on 16 August at Rattray Head and 14 S the next day in 1¼ hrs. The last was on 28 October. Spring movements in 1969 were all singles N from 20 April, except for 2/hr. on 30 April and on 7 May.

In 1969 the autumn passage was from 3 August to 11 October with main passage from 19 to 24 August (42 in 3 hrs. on 24th). Only singles N after 25 September, and last one N on 2 November.

#### GREAT SKUA

Movements were northerly at almost all times. Passage in 1968 from end of July to end of October (peaks 8 N/hr. on 23rd and 25th August). Last 1 N on 9 November. 1969 autumn birds moved from 29 July to 8 October. Peak 4 N½ hr. on 24 August, not more than 2-4/hr. otherwise, and only singly after 18 September. Last 2 N on 16 November.

In the spring of 1969 single birds passed N between 18 and 27 April. Thomson (1966) shows that first year Shetland birds disperse through the North Sea and Channel. However the definite northward movement found off NE Scotland suggest that they may move round the top of Scotland after first moving south into the North Sea as Shearwaters seem to do.

#### POMARINE SKUA

One passed S on 29 September 1969.

#### GULL SPP.

Counts of Gulls were extremely difficult and unrepresentative at both stations for different reasons. At Rattray Head gulls tended to move along the dunes, and therefore were not counted from the lighthouse. At Buchan Ness they roost on the cliffs in large numbers, mainly Herring with some Great-Black-backs. They meet gutting fishing boats as they pass, following them north to Peterhead harbour, after which they return south to the cliffs, passing Buchan Ness. Herring Gulls present in the harbour also appear to move south in the evening to the cliffs. Some movements were noted which may possibly be more dispersive.

There was a southward movement of Great Black-backed gulls at Rattray Head (counted from dunes) from 29 August to 8 September 1968, also noted at Buchan Ness, with peaks of 201/hr. 31 August (Rattray Head) 123/hr. 1 September (Buchan Ness) and 94/hr. 8 September (Buchan Ness). Occasional Lesser Black-backed gulls moved south, last seen in 1968 on 11 September. There was a large movement in February 1969 which was interesting. On 7th there were movements N of Great Black-backs, Herring and Common gulls, continuing until 11th. On 8th there was an estimated 1,000/hr., and on 9th, an hours count in mid-afternoon showed 2,464 birds. In a sample count of 100, there were 22 Great Black-backs, 60 Herring and 18 Common. 4% of the Herring were immature, and 3% of Great Black-backs. By 10th, they had eased off and by 11th 400/hr. were passing. No movements were noted on 12th, but many were present in the vicinity. In addition large numbers of Common Gulls were present at the beginning of April 1969. According to Bourne and Patterson (1962) Common Gulls have been detected on Radar, and observed to migrate NE in spring, many leaving the coast at Rattray Head. On the eve of the 2nd, large numbers were resting on the beach N of Rattray Head, an estimated 15,000, with smaller flocks on the S beach. All were gone on 3rd, but there were more flocks

a few days later. It seems safe to assume that these birds were migrants which left for Scandinavia overnight, especially as weather conditions were ideal at this time.

### KITTIWAKE

Massive southward movement at Rattray Head at the end of July 1968. Although no distinction was made between adults and immature birds, it was noted that these movements consisted predominantly of adults. In the period 27 July to 5 August, 15,511 birds were counted moving south in 8½ hours, with a peak of 3,477/hr. on 2 August. It was observed that the birds arrived at the Head in two streams, one from the NW along the coast, and the other from due N in from the sea. This suggests two populations—Moray coast birds on one hand, and Northern Isles birds on the other. It was interesting to find that at Arbroath in the same period, few birds were seen moving south, rather a mainly northward movement, peak 166/hr., 25 July (G.M. Crighton pers. comm.).

Large movements were noted at the end of August (351/hr. 25th) still predominantly south, and again in September (682/hr. 21st) but the latter seemed to be more at random, and appeared to be weather movements. There were a few substantial northerly movements (238/hr. 8 September) and a movement of 341/hr. was noted at Clyth, Caithness on 14 September.

By early October numbers were falling off, and after 8th only occasional weather movements were recorded, which continued over winter. There was a peak on 9 November at Buchan Ness of 74 N/hr., but most movements November to February were of no more than 50/hr.

Large movements in spring with 258 S/hr. on 5 March 1969 and 997 N/hr. on 9th. A large southerly passage from 23 March to 1 April would probably be birds returning to the large Aberdeenshire and Kincardineshire colonies. During this period there were many counts over 500/hr., with peaks of 1,402/hr. on 23rd, and 1,121/hr. on 24th, falling off after 27th. However, from 17 to 21 April, there was a northerly passage of up to 603/hr. on 17th and then a southerly from 23 April to 12 May, with many counts over 600/hr. and over 1,000/hr. between 7th and 12th, and a peak of 1,506 in ½ hr. on 9th. No diurnal variation was noted at all, and it is difficult to find a reason immediately for the dramatic changes in direction of movement. An analysis of weather conditions may throw some light on this.

In June movements were more random, but still mostly southerly, with the largest numbers in the morning, perhaps feeding, with a peak of 640/hr. on 8th, falling off after that.

Although there were only small numbers at Rattray Head in early August, a count at Buchan Ness on 3rd showed 54 N 1,285 S/hr. Peak at Rattray in August was 111 N/hr. on 24th. From 19 September, there was a considerable northerly movement, with 668 N 170 S/hr. on 19th, rising to 944 N/hr. on 29 September, then falling off quickly. No birds were recorded moving south from 25 to 29 September. Little movement after 3 October, but a massive northerly movement on the afternoon of 29 October, far in excess of any previous record, produced an estimated 30,000 to 35,000/hr. The birds were moving low over the water and were first noticed at 13.00, continuing until 15.30 hours. Five minute estimates every 15 minutes up to 15.00 hours showed 3,000/5 minutes, decreasing to 2,000/5 minutes for the last half hour, ending abruptly at 1,530 with only a few seen later. A rough calculation shows that an estimated 80,000 odd birds passed during the period—all in a NW gale, force 8 to 9.

A movement of 648 N/hr. on 2 November was the last large count, and no more than 9/hr. were recorded in December, although there were 138 N/½ hr. on 22 November. There was a southerly movement in the last week of January 1970 with 133/hr. on 23rd, but very few after 29th, with no more than 20/hr. in February.

### COMMON/ARCTIC TERN

Passage mainly southward from mid-August to mid-September 1968, then tailed off abruptly, with only odd birds up to end of September, last being 1 N, 2 S on 29th at Buchan Ness, with a bird N at Rattray on 6 November. Peak passage was 7 to 8

September, with 807 S/hr. on 8th. Small northward movements were noted, peak 78/hr. 8 September, but these were morning movements before large southerly evening movements. The largest southerly movements occurred mainly in late afternoon and evening, often in flocks of up to 100 birds. Passage occurred at night, and also in dense fog, when the birds seemed to follow the coast.

Very little spring movement, first seen were 3 N on 18 April, with peak of 14 N/hr. on 30 April.

Little in autumn 1969 compared with 1968, a mainly southerly passage with peak of 18 S½ hr. on 24 August, the last being 7 S on 23 September.

#### SANDWICH TERN

Passage in autumn 1968 similar to 'Commic' terns, but much smaller, peak of 72 S/hr. on 3 September. Did not associate with other terns. Only occasional birds seen after 15 September, last being 2 S on 5 October at Buchan Ness.

More movement in spring 1969 than the previous species. Mid-April gave a small northerly movement of 62/hr. on 20th, then no more than 10–20/hr. into May. Few in June. The only passage noted in autumn 1969 was a few birds moving south in mid-September, the last being 2 S on 22 September.

Counts of terns were not begun until end August 1968, due to considerable feeding flocks and some breeders at Rattray, but G.M. Crighton recorded a predominantly northward movement at Arbroath at the end of July, and D.S. Flumm recorded southward movements at Rattray beginning on 16 August.

#### AUK SPP.

Large passage north towards end July 1968 at Rattray Head with a peak of 280/hr. 18th, and 163/hr. 23rd. Very few birds were seen after 27th. A northward movement of 114/hr. occurred at Arbroath on 25th, with a decrease after 27th. (G.M. Crighton Pers. comm.). Birds again began to appear after the first week of September, and then irregularly for the rest of the period. Most movements were very small, all less than 30/hr. but occasionally large movements occurred, i.e. 200 N/hr. 24 September, on 5 to 6 October with a peak of 202 N/hr. at Buchan Ness and 141 S/hr. at Rattray Head, and 159 N/hr. on 27 October. These were possibly bad weather movements, although on 5 October 1 hour at Rattray produced 59 N, 141 S, while the next hour at Buchan Ness gave 149 N, 10 S. One is at a loss to explain this anomaly.

In November there was plenty of movement, with birds ashore at the Bulters of Buchan from 10th. All the winter movements were random, mostly 65–80/hr., but on 20 November there were 337 S/hr. Little movement from December to February but increasing in March with a predominantly morning northerly passage, with peaks 776/hr. on 11th, 232/hr. on 1 April, 261/hr. on 18th, and 206/hr. on 30th. In early May movements were few, at random, with up to 89/hr. In June there was much movement, again at random, with no diurnal variation, and peaking at 288/hr. on 4th, and 322/hr. on 17th.

Apart from 114/hr. at Buchan Ness on 3 August, there were only small movements at Rattray Head during autumn, with totals of no more than 44/hr., except for 111/hr. on 13 September. A massive northerly movement at the end of October and mid-November, peaks 6,140 N in 2 hours on 26 October, and 425½ hr. on 29th, with 2,120 in 2 hours on 16 November. Small random movements in December with no more than 25–30/hr. A few more, mainly north, in early January with 63 N/hr. on 4th, but by the last week of January a very large movement south, continuing to a lesser extent into February, but falling off after 11th. Peak in this period was 2,373 S/hr. on 23rd January.

#### TYSTIE

A small trickle at Buchan Ness from 24 August to 8 September 1968, all northward, and none in summer plumage. There were up to three birds at times on the sea off the Ness. D.S. Flumm recorded 1 S 15 August, and 2 S the next day at Rattray Head.

In 1969 a few north in autumn, first 2 on 22 August, last 1 29 September. Singles N on 2 January, 29 January, and 13 February. A very small number passed north during both winters.

#### PUFFIN

A small movement at the end of July 1968 associated with the other auks, mainly northerly, with a peak of 38/hr. 23 July at Ratray Head. None seen after 24th except for a few (7 N/hr.) with auks on 23 to 24 September.

Odd birds in winter colour with more movement from mid-April to end of April mostly northerly in morning (cf. auks), peaks 26½ hr. on 19th and 14/hr. on 30th, then none in early May. In June small movements, peak 43/hr. on 5th. In autumn 1969 none recorded at Ratray Head, but 51/hr. at Buchan Ness on 3 August.

#### LITTLE AUK

Three flew south on 11 and 20 November 1968. A marked 'flight' from 23 January to 7 February, 1970 although there could have been some moving previous to the 23rd during a short break in counting. All birds moving south, with main movement from 23 January to 2 February. Peaks were 126/hr. on 23 January, 109/hr. on 26 January and 94/hr. on 2 February. Last were 3 on 7 February. This movement coincided with oiling on the east Scottish coast with 307 dead Little Auks found in 500 dead birds on 4 February in Aberdeenshire.



## SEAWATCHING ON THE COAST OF MOROCCO

John R. Hopkins

From April to June 1969, I was studying birds in Morocco, and on several occasions was able to carry out seawatches at various places on the Atlantic Coast.

The Atlantic seaboard of Morocco is generally fairly low and often backed by agricultural or marshy land. There are a few areas of cliffs rarely more than 100 feet in height, and south of Agadir the country rapidly deteriorates into hilly hamada-type desert. I was particularly interested in carrying out seawatching south of Agadir (where the petrels and shearwaters of the Atlantic islands may well occur), but unfortunately recent winds had covered the only tracks in the area with fifteen feet of soft sand and access was impossible. As a result my observations are restricted to the Atlantic coast north of Agadir.

A total of ten days was spent seawatching at five localities, between 5th April and 22nd May 1969. The two most productive areas were Cap Rhir and Cap Cantin, which are the major projections on the Atlantic coast of Morocco. At both sites seawatching conditions were excellent, both as regards access and height above sea level. Several days were spent at Tarhazoute (between Cap Rhir and Agadir), but due to its position the results were poor. The only observations of note were on 28th April when 309 Lesser Black-backed Gulls flew north between 0700 and 0800 hours (local time), 57 flew north in ten minutes around 1530 hours and a further 134 flew north between 1615 and 1645, all moving into a north force 5 to 6 wind. The interesting point about these birds, apart from the obviously concentrated passage on this day, was that of the 57, most were adults of the British race, while of the 134 75% were adults of the Scandinavian race. It seems possible that the two races may, on occasion, travel separately in what may be termed 'loose flocks' of some size—perhaps different wintering areas are indicated. In addition to the gulls only a few terns and the odd Gannet moved north on this day and the presence of c.1,000 Lesser Black-backed and Herring Gulls around fishing boats off-shore seemed to have no effect on the gulls moving north.

A few hours seawatching at both Asilah and Casablanca were unproductive as regards numbers of birds, but 75 Common Scoter and 1 Arctic Skua offshore at Casablanca on 9th April were interesting.

A total of 28 hours, spread over 7 days, were spent seawatching at Cap Rhir and Cap Cantin, and casual observations were made at many other times during this period. Very little correlation with weather was found, but on six of the seven days the wind was between the north and north-east, so there was no great room for variation in any case. In this connection it is interesting that of the 24 days I spent on Morocco's Atlantic seaboard in late April and May, 21 had wind directions between north-west and north-east.

Watching was mainly carried out between 0600 and 0900 hours, but on two occasions late morning and early afternoon were watched, and on one occasion watching was continuous from 0600 to 1930 (dusk). In general, early morning saw the bulk of the movements observed, with another, very much smaller, peak in the evening. Afternoons were dead apart from a few terns and gulls and small numbers of seabirds feeding offshore (usually Gannets and terns). The results of watching at Cap Rhir on 29th and 30th April, and 16th and 17th May, and at Cap Cantin on 20th, 21st and 22nd May are set out below under species headings.

### CORY'S SHEARWATER

On 9th Mar 1964, Smith (1965) saw 600 entering the Mediterranean from the west-south-west, but had no records from further south (except for a few off Cap Cantin in June 1963). My only records were of 5 moving north between 1400 and 1730 hours on 21st May at Cap Cantin and 1 Great/Cory's moving north at 0615 on 22nd May at the same place—all far out. This species, although present for most of

the year in the Mediterranean, disperses in winter, and it would seem that if there are concentrated movements back to the breeding grounds in spring, they must occur well out to sea, with no significant coastal passage.

#### SOOTY SHEARWATER

One recorded flying north at Cap Rhir on 30th April was apparently the first spring record for Morocco. It occurred in calm conditions; the previous day winds had been north-east force 5–6.

#### MANX SHEARWATER

Only 3 birds were seen; 2 north at Cap Rhir on 17th May and 1 north at Cap Cantin on 21st May, all before 0700. They were too far out for subspecific identification, but may have been feeding birds from the colonies on the Atlantic Islands.

#### PETRELS SPP

One flew north at Cap Rhir on 17th May, and three north at Cap Cantin on 21st May. Unfortunately none were specifically identified, but the first bird had flight similar to that of Storm Petrel, and the others similar to that of Leach's Petrel. It would be interesting to know whether the species found on the Atlantic Islands occur off the coast of Morocco.

#### GANNET

Smith (1965) noted no spring passage and suggested that the species kept well out to sea, possibly to avoid the Iberian peninsula. However I saw a total of 1477 Gannets in the period of watching, almost invariably flying north. Passage was noted regularly, in wind conditions varying from force 0–1 to north-east 6, but peaks (475 in 1½ hours and 485 in 1½ hours) occurred on days following north-east 5–6 and north-east 6 winds respectively. I would tentatively suggest that passage normally occurs farther offshore but that in adverse weather conditions birds move closer inshore—this might account for Smith's negative reports. Of the 1477 birds seen, only 53 were adult, and 5–10% of the remainder were in sub-adult plumage.

#### COMMON SCOTER

Spring passage was noted by Smith at the end of February; he also had records of fairly large numbers summering. I noted 17 moving north at Cap Cantin on 21st May and 9 at the same place the following day.

#### POMARINE SKUA

On 29th April 3 flew north at Cap Rhir and on the following day one flew north at the same place. Apart from one old record from Tangier, these are apparently the first records for Morocco. In view of the large winter concentrations found off Rio de Oro and around the Cape Verde Islands (Fisher and Lockley), it would seem that these are not observations of vagrants, and there is probably a regular passage off the coast of Morocco. It would be interesting to know whether a significant proportion of the wintering population passes close inshore or whether most are farther out to sea until reaching Europe.

#### ARCTIC SKUA

2 north at Cap Rhir on 30th April and 1 north on 21st May at Cap Cantin. 1 Skua sp. north on 17th May at Cap Rhir was probably of this species.

#### BLACK HEADED GULL

Only one recorded, flying north at Cap Rhir on 30th April.

#### LESSER BLACK-BACKED GULL

A total of 458 were noted, all flying north. Of 180 examined closely, 80% were 2nd winter. On two occasions peaks followed days of strong winds (viz. 146 in 1½ hours

following north-east 5-6 and 101 in 1½ hours following north 6) but a third peak (124 in 1 hour) followed north-north-east 3-4.

#### SABINE'S GULL

F. Roux suggested that this species leaves the Southern Atlantic in May and crosses Moroccan waters on its way north. I failed to see a single Sabine's Gull throughout my stay, and I think that the species must pass well out to sea without any regular inshore movements. It would be worth carrying out seawatches south of Agadir and in Mauretania, to see whether there is a coastal passage farther south, which then moves out to sea to avoid Iberia.

#### BLACK TERN

One north at Cap Cantin on 21st May and 1 north at the same place on 22nd May. Surprisingly these were the only Black Terns seen on sea passage. Large numbers pass through Morocco in spring and, despite the statements in Etchecopar and Hue, the species is not common crossing the desert (R.E. Moreau). Most birds therefore probably use a coastal route, the main body passing in March and early April. But it seems odd that in the second half of April and May I saw only a handful of Black terns throughout Morocco, whereas in Britain passage can often be quite protracted.

#### SANDWICH TERN

A total of 253 was observed, almost invariably flying north. There was no apparent correlation with weather, and the rate of passage was fairly constant.

#### COMMON/ARCTIC TERN

41 noted flying north—the same remarks as under the above species apply. It is interesting that this species should occur in so much smaller numbers than Sandwich terns at this time of year.

#### TERN SP.

Although all the birds of the previous two species were observed to pass quite close inshore, on 29th April at Cap Rhir two parties of unidentified terns were seen very far out, moving north. The parties were of 60 and 20 and it seems possible that there is some passage occurring at or beyond the limits of observation from shore. The wind on this day was north-east 4-5.

#### LITTLE TERN

Only 1 record, 2 moving north at Cap Rhir on 29th April.

#### PUFFIN

On 30th April, at Cap Rhir, I came in from the north-west and turned south along the shore. This is the extreme southern limit of the range of this species, and Puffins are normally only recorded in winter off Morocco.

#### REFERENCES

R.D. Etchecopar & F. Hue (1967); *The Birds of North Africa*. J. Fisher & R.M. Lockley (1954); *Sea Birds* (New Naturalist series). R.E. Moreau (1967) *Ibis*, 109; (232-259). J.B. Philips (1963). *Ibis*, 105; (347-356). K.D. Smith (1965). *Ibis*, 107; (493-526). K.D. Smith (1968). *Ibis*, 110; (451-492). Thomson (1939)—in Fisher and Lockley.

## NOTES ON SEABIRDS IN THE FAEROES

Peter Tate

### INTRODUCTION

In 1967, Patrick Wright and I spent four weeks (July 27th. to August 24th.) in the Faeroes, six days on the island of Svino, four on Fuglo and eight on Myggenaes. We also spent a few days around Sorvag (Vago), Klaksvig (Bordo) and a day at Torshavn (Stromo).

The 1966-67 winter in the Faeroes was very bad and this, followed by an unusually poor summer probably helped to account for the decrease in the number of seabirds, especially among the cliff-nesters (on Myggenaes, for example, where many of the nesting cliffs are exposed to south-west gales). We neither found nor heard of any oiled birds during our stay.

### SYSTEMATIC LIST

The following are some notes on the birds seen which might be of some use for reference.

#### LEACH'S PETREL. *Oceanodroma leucorhoa*.

Seen on Myggenaes Holm at night, also one bird on West Myggenaes. One nest, with one egg which hatched on August 18th. was seen on the Holm.

#### STORM-PETREL. *Hydrobates pelagicus*.

Breeding on Myggenaes Holm and West Myggenaes.

#### MANX SHEARWATER. *Puffinus puffinus*.

Breeding birds were seen only on Myggenaes, especially on the lower slopes, where Abraham Joensen, the Lighthouse Keeper, estimated there to be c.1000 pairs. With the spread of Puffins on Myggenaes it is possible that this colony is decreasing, since Puffins will attack shearwaters in the nest and occupy it themselves. One adult was ringed (using a Danish ring), caught at night on the Holm, but most nights were too light for dazling. The underwings of this bird and another caught were both slightly mottled.

#### FULMAR. *Fulmarus glacialis*.

Abundant on all islands visited, often nesting on inland cliffs. The young are unable to fly until the end of August, before which time some are taken by islanders either to eat or sell in Torshavn (at 2/6 per bird).

#### GANNET. *Sula bassana*.

It was hoped that an estimate of the number of nests in the colony on Myggenaes Holm could be made, but the whole colony cannot be seen from either land or sea. The lighthouse keeper estimated the number of nests to be c.2000. On West Myggenaes 9 nests were found, an increase of four over the previous year. In 1955 there were two and in 1932 only one. This is representative of the growth of the whole colony. The keeper also reported that about 1,000 birds were taken each year by the islanders for food. This shows that despite continued human predation, the colony is increasing.

#### SHAG. *Phalacrocorax aristotelis*.

Common in small groups (1-10) everywhere around the coast with noticeably bigger groups near Sorvagfjord and on Myggenaes. On Tindleholmur there were 100-200 on the rocks on August 12th.

**COMMON SCOTER.** *Mel nitta nigra*.

Two pairs, with young, on Sorvagsvaten (12 birds in all) on July 27th. This species was suspected to breed in the southern islands, and in 1966 the Brathay Exploration Group saw parties of 5 and 8 in the northern islands which is the first breeding record.

**EIDER.** *Somateria mollissima faeroensis*.

Common around the coasts of Svino and Fuglo where the chicks varied from newly hatched to four or five weeks old. Two nests were found on Svino, one by a wall c.150 yards from the coast, and another (clutch of 3), about three-quarters of a mile from the sea and 250 feet above sea-level. Two young hatched on August 1st. and one egg was found in the nest, broken.

On Myggenaes, Eiders were not so common although a small group was seen daily around the harbour and a flock of 76-100 at the western end on several days.

**ARCTIC SKUA.** *Stercorarius parasiticus*.

A colony of c.20-30 pairs on the south-west slope of Keldufjall (Svino) with, on July 30th., flying young. Odd birds were seen all over the island. This species nests very close to the Greater Black-backed Gulls and on the plateau we twice saw them being mobbed by the gulls whenever they came anywhere near.

In Borgadalur, Myggenaes (August 13th.) there were several around and 23 unoccupied nests were counted on high tufts of grass and not covering the whole area by any means. Elsewhere they were seen occasionally, especially on Fuglo.

Of 24 birds seen at Borgadalur, 6 were light phase birds, a 3 to 1 ratio of dark to light phase forms, if this is of any significance.

**GREAT SKUA.** *Stercorarius skua*.

It was intended to colour-ring Bonxie chicks at the Svino plateau colony to coordinate with the ringing done in Iceland, the Shetlands and the Faeroes in 1966 and, it is hoped, in 1968 by the Brathay Exploration Group. However six hours searching on July 10th., showed that it was too late for unfledged young. There was no success on two other days, both in bad weather. According to the islanders, two weeks previously there had been almost full grown young in the area. One or two birds on the ground were approached but they were just able to fly.

In the hills between Arnefjord and Klaksvig (Bordo), seven birds, probably from the Svino colony, were seen. One or two were seen every day on Fuglo and four on Myggenaes.

**GREATER BLACK-BACKED GULL.** *Larus marinus*.

Very common, colonies on Svino plateau and on the south-west slopes of Kelvufjall, near the Arctic Skuas.

**LESSER BLACK-BACKED GULL.** *Larus fuscus*.

Common on all islands.

**HERRING GULL.** *Larus argentatus*.

None seen on Svino and Fuglo. Less common than the last named species elsewhere.

**BLACK-HEADED GULL.** *Larus ridibundus*.

12 seen in Sorvag Bay (August 12th.)

**KITTIWAKE.** *Rissa tridactyla*.

Very common on Myggenaes. In 1966 c.1000 pairs were counted in a bay near the village, in 1967 the numbers were down to c.600 pairs. Joensen suggested that the gales on Myggenaes in the summer of 1967 must have caused the reduction.

**ARCTIC TERN.** *Sterna macrura*.

Common, colonies were seen on all islands visited. The young were all old enough to fly during the visit, except for one caught and ringed on Fuglo. On Myggenaes Holm, many were found to have broken wings, probably trodden on by sheep.

**RAZORBILL.** *Alca torda*.

All had left the cliffs.

**GUILLEMOT.** *Uria aalge*.

Common everywhere, although none remaining on the cliffs at Myggenaes on arrival.

**BLACK GUILLEMOT.** *Cephus grylle*.

Common.

**PUFFIN.** *Fratercula arctica*.

Probably the commonest seabird in the Faeroes, but almost impossible to estimate the numbers. Joensen said that many fewer had been caught by 'Fleyging' (catching with a long, large, hand-net) in 1967 than for several years. Cats, which are increasing on Myggenaes, and skuas, are the Puffin's main predators.

**OTHER BIRDS SEEN**

Mallard, Kestrel, Oystercatcher, Lapwing, Golden Plover Turnstone, Snipe, Whimbrel, Redshank, Dunlin, Rock Dove, Skylark, Hooded Crow, Wren, Wheatear, Meadow Pipit, Rock Pipit, Starling, Snow Bunting and House Sparrow.

**ACKNOWLEDGEMENTS**

Thanks are due to the Seabird Group (and particularly to Dr. W.R.P. Bourne), for assistance, including a token grant.

## FURTHER OBSERVATIONS ON THE BREEDING BEHAVIOUR OF SANDWICH TERNS

J.H. Taverner

IN A PREVIOUS PAPER (Taverner 1965), I described how Sandwich Terns *Sterna sandvicensis* at the Needs Oar colony in Hampshire behaved in an abnormal way in that their young did not gather in a group by the shore before they could fly. Instead, they stayed in the nesting area, families keeping quite separate from each other. Further observations throughout 1969 revealed a behaviour pattern that would be quite impossible in colonies where the young gather together during fledging.

In 1969, the colony consisted of 179 pairs, all but a handful nesting in an extremely compact group situated at the junction of Rice Grass *Spartina townsendii* and shingle, the nests spreading over both habitats. The colony covered about 350 square feet and the young remained in this area for a period after hatching. When the chicks were half-grown, most of the terns left the area and moved deeper into the vegetation, away from the shore. The families kept apart from each other until eventually they were scattered over an area about 100 yards square. In doing this, the Sandwich Terns were moving into a dense mass of Black-headed Gulls *Larus ridibundus*, some 10,000 pairs of which were nesting on the island, so that a tern family was surrounded by breeding gulls. As in previous seasons, the terns made no attempt to assemble on the shore but unlike previous seasons, very few remained in the nesting area until they flew.

The most striking feature of this behaviour, however, was that the adult terns would not tolerate other adult or young Sandwich Terns near their own young once they had moved away from the nesting site. Typical of this was an incident that I observed from a hide in the middle of this area. When I was installed in the hide, I found that several Sandwich Tern families were visible from my position. They had not nested at this point but had moved there from the nesting site on the shore. One adult remained with its young all the time whilst its partner was away fishing, the largest young being about three weeks old at this time. Apparently, the young terns were never left unguarded. One adult tern was immediately in front of my hide with a single chick and after a while, a pair of adult Sandwich Terns walked past accompanied by their own chick. As they approached, the single adult became very agitated and started to threaten the intruding family and as they passed at the nearest point, the original adult struck out at one of the other adults and the two engaged in a fierce bout of fencing, at times gripping each other by the bill and wrestling. As the fight was going on, the intruding chick changed course and came very close to the first chick. As it did so, the first parent broke off its engagement with the other adult and turned on the intruding chick which was now very close to its own young, aiming some savage blows at its back. The chick retreated with its own parents coming to the rescue and after another bout of fencing between the opposing adults, the two families parted and the intruders moved on.

I spent several periods in the hide at this point in the season and although the above incident was the most marked example of the Sandwich Tern's intolerance of others near its chicks, I saw several other similar occurrences and at all times I noted that a Sandwich Tern family was by itself and not with others of its kind. This intolerance of other terns would be impossible in a colony where the young gather together and it adds weight to the idea that the behaviour of Sandwich Terns after hatching is not a stabilized, innate pattern but is learned and suited to the surroundings. Perhaps the wealth of vegetation cover at Needs Oar provides the best refuge for the terns in times of danger so that they prefer to take cover there instead of gathering on the shore and relying on their numbers as a means of defence.

This movement of the Sandwich Terns out amongst Black-headed Gulls allowed observations to be made on the inter-relationship of the two species. Sandwich Terns are said to rely on Black-headed Gulls for the protection of their nests (Cullen 1960) and whilst I find this to be the case at Needs Oar, the terns seem more than able to hold their own in competition with the larger gull. This competitiveness was

especially evident when it came to the choice of a nesting site. By the time the terns arrived in early May, there was no area left on the island that was both large enough to hold the terns and free from gull nests. There were so many gulls nesting in 1969 that they had covered all suitable sites on the island. In fact, the terns selected an area where the density of gull nests was particularly high, although very few of them had eggs because the clutches are collected for sale up to the time of the terns' appearance. As usual, the Sandwich Terns arrived *en masse* and laid almost at once so that within the space of just over a week, the gulls found themselves in the middle of a dense mass of incubating terns where previously there had been none. A few of the gulls that had escaped the collector had single eggs and some of these remained in their territories but all those that had not started to lay and even some of those with eggs deserted the area and their nests were taken over and used by the terns. This meant that one or two terns laid in a nest that contained a gull's egg and eventually sat on a mixed clutch but I was not able to see what happened when such a mixed clutch hatched. The few gulls that were left amongst the terns seemed to co-exist very amicably but the vast majority of the gulls left the area to the terns and moved to another part of the colony. Apparently they were driven out, being unwilling to exist in such a dense concentration of another species. This could be the value of Sandwich Terns assembling elsewhere and arriving in groups at their breeding sites. Since their nesting cycle is a little later than that of Black-headed Gulls, they must arrive at a colony when the gulls have eggs (collection of gull eggs at Needs Oar makes the timing of the birds' breeding unusual) so that an isolated pair of Sandwich Terns may find it difficult to establish a territory and if they arrived separately, other terns may find it impossible to build up a colony around the first-comers. Perhaps it is the mass arrival and the inability of the gulls to adapt to such numbers rapidly that enables the Sandwich Terns to settle together in a dense concentration.

The terns also seemed quite capable of keeping the gulls away from their young when they moved out into the gulls' nesting area. Any gull that came too close to a Sandwich Tern chick was attacked and driven away by the parent tern. On one occasion, a young gull had taken cover in the same patch of vegetation as a young Sandwich Tern whilst I was erecting my hide. When I was installed, the two chicks emerged from hiding and the adult tern in attendance came down. Immediately, the adult tern attacked the young gull which was quite well grown, delivering a rain of blows on its back until the gull had vacated the area.

The only difficulty that the terns seemed to experience was when they were bringing food to young that had moved out amongst the gulls. In previous seasons, terns returning with fish have had to fly through a dense mass of gulls to reach their young but on reaching their nesting site, they were landing amidst a solid pack of terns and they were unmolested by the gulls. In 1969, however, the incoming terns first had to find their families and since these moved about to some extent, this meant a parent bringing fish had to fly around for a while amongst the gulls. Furthermore, once it had located its young, a tern would have to come down and land in an area thick with gulls. Consequently, they sometimes found themselves mobbed by gulls that were trying to take their fish.

### Summary

This paper describes observations during 1969 in a colony of Black-headed Gulls and Sandwich Terns. Sandwich Terns were found to behave in a way that would be impossible in normal colonies where the young gather together on the shore after hatching. It is suggested that the behaviour of the species following hatching is adapted to the habitat and is not an innate pattern. Sandwich Terns were also found to be very competitive in their relationship with Black-headed Gulls, even though they rely on the gulls for the protection of their nesting site.

### References

- Cullen, J.M. (1960): 'Some adaptations in the nesting behaviour of terns'.  
*Proc. XII Int. Orn. Congr., Helsinki*, 1958, pp.153-157.  
 Taverner, J.H. (1965): 'Observations on breeding Sandwich and Common Terns'.  
*British Birds*, vol.58, pp.5-9.



## BLACK TERNS FEEDING ROUND SURFACING FISH AND DOLPHINS

J.S. Ash

It is known that there is a heavy Black Tern *Chlidonias Niger* migration over the Mediterranean, but it may be useful to place on record a further observation of the birds feeding in association with schools of dolphins and shoals of fish.

On a journey south from Nice, France, to Calvi, Corsica, on 19th August 1968, only two Black Terns were seen, both flying steadily south. Incidentally, there was only one Cory's Shearwater *Calonectris dionedea* on this voyage and an immature Arctic Skua *Stercorarius parasiticus* flying west 2 or 3 miles off Calvi.

With a large Black Tern passage in this sector of the Mediterranean the chain of large étangs and lagoons along the east coast of Corsica might be expected to attract them. However, between 19th August and 5th September we only saw 35 over them, including gatherings of 17 and 12. A further 41 off-shore included two parties of 14 and 26 which flew in towards the shore at dawn after a stormy night, but turned to fly north parallel to the coast.

On the return voyage from Calvi to Nice on 6th September many Black Terns were seen. We left Calvi at 1630 and saw the first 2 Terns at 1750. From then until the light failed at 1905 a total of 114, clearly identified as this species, was counted from one side of the ship. In addition to these there were several hundred other terns, almost certainly the same species, at greater distances from the ship. A few birds were flying steadily north-west and one was resting on a piece of flotsam, but most were feeding.

There was a light northerly breeze and the sea was calm. After the first Black Terns had been sighted the surface of the sea was continually broken by hundreds of presumed dolphins (possibly 8 feet or more long, with curved not triangular dorsal fins) and fish, probably *Gymnosarda* or *Thunnus* sp., about two feet long. The terns fed from the surface in close association with these; indeed so close that they were sometimes splashed with the spray they sent up. The only other birds feeding with them were 4 Cory's Shearwaters and 6 Levantine Shearwaters *Puffinus yelkouan*.

I should like to thank Dr. W.R.P. Bourne for his helpful comments on this note.

## FLIGHT SPEED OF GUILLEMOTS

E.I.S. Rees

When auks are disturbed from the water by a ship steaming into the wind, they usually fly ahead for some distance before wheeling away to one side. This chance observation was made when a Guillemot *Uria aalge* seemed to be unable to make headway against a gale. It was put up ahead of the research vessel Prince Madog and flew for nearly a minute only 20–30 feet ahead and 15–20 feet above the water. It was apparently unable to make any headway and finally turned downwind close to the ship. An anemometer sited 40 feet above the water gave simultaneous readings of 45–50 knots, the fluctuations being due to the pitching motion. As the birds flew well above the tops of the waves only slight allowance need be made for the difference in height of the anemometer reading. A figure of 45 knots may be taken as the maximum speed in level flight of this bird. The incident occurred off Anglesey during an easterly gale on 15th November 1968.

## AN ATTEMPT TO CENSUS THE PUFFIN ISLAND HERRING GULLS

E.I.S. Rees

Puffin Island, Anglesey is believed to have the largest colony of nesting Herring Gulls *Larus argentatus* in the British Isles. Owing to its size and the dense vegetation a complete count would be impossible. This attempt to census the Herring Gulls was made to test transect techniques that could be used at this and other colonies during the 1969 Operation Seafarer census.

On 23rd May 1968 two transects were examined. They were run across the island from north-west to south-west. A 50 metre surveyors tape was stretched out and a 10 metre long rope was used to measure the other axis to one side of the tape. Five people spread out along the rope moved slowly over the ground and called out details of the nests to a sixth person. Owing to the dense vegetation on the island the observers found it quite difficult to find all the nests even when they were as closely spaced as this. In the areas where the Alexanders *Smyrnium olusatrum* reached heights of over 5 feet the nests had to be searched for after finding the trampled areas where the birds had landed.

There was a marked variation in the density of the nests which could be tied in to the height of the vegetation and the terrain. On the south-east face the density exceeded 12 per 100 sq. metres but in the centre of the island it fell to only 1.6 per 100 sq. metres. In other areas with moderate height vegetation on moderate slopes the density was 4-7 nests per 100 sq. metres.

To calculate the population for the whole island it is necessary to make allowances for the variations in density on different parts of the island. For this reason the average density cannot simply be multiplied by the total area of the island. If the two ends of the island are taken separately the middle section can be taken as a nearly flat area 200 metres wide and 700 metres long. On one side of this rectangular area the sloping east face forms a separate area with a high density of nests. On this basis the main part of the top of the island is estimated to have 5,640 nests and the east face 5,420. Estimates for the north-east and the south-west ends are based on their areas and the vegetation height. Together they add about 3,600 to the total, bringing the estimated total for the whole island to 14,660 nests.

## ANNUAL GENERAL MEETING

The Annual General Meeting of the Seabird Group was held on 3rd January 1970 at 6 p.m. in the Portland Building, Nottingham University.

1. The Minutes of the 3rd Annual General Meeting held on January 4th 1969 were accepted as the proper record of that meeting.
2. The Fourth Annual Report for 1969 (previously published in Bird Study 16:255-6, December 1969, and now published herein) was accepted.
3. In the absence of Mr. T.R.E. Devlin it was reported that accounts for the previous two years had been completed and were now with the Auditors. In these circumstances discussion was deferred until the next meeting.
4. The motion, proposed by the Executive Committee, to enlarge this body by two additional members to nine, of whom six are to be elected by the membership was carried by two thirds of those present.

Note: this proposal was presented in order to overcome the difficulty experienced in securing a quorum of the Executive Committee and because the growing volume of business makes it desirable to have more people familiar with the affairs of the Group. Mr. Devlin had resigned as Treasurer and Mr. Crudass as Editor, but the latter had agreed to become Treasurer in which case it was considered desirable that he become an elected member of the Committee. The Committee wished to retain the services of Mr. Devlin, particularly in connection with work on oil pollution, and to regain Dr. Dunnet's on his return from New Zealand.

5. The election to the Executive Committee of Messrs Bourne, Crudass, Devlin, Dunnet, Merne and Pettitt was carried.
6. There was no further business.

## THE SEABIRD GROUP ANNUAL REPORT FOR 1969

The fourth year of the Group has found us occupied with major enquiries. Stanley Cramp has continued to serve as Chairman and B.O.U. Representative, and has devoted much time to our affairs among many other responsibilities. W.R.P. Bourne and T.R.E. Devlin have served as Secretary and Treasurer, C.M. Perrins and David Lea as B.T.O. and R.S.P.B. Representatives and O.J. Merne and John Crudass as elected Representatives on the Executive Committee, the last being replaced by R.G. Pettitt at the Annual General Meeting following his return from abroad. John Crudass has continued to edit the Bulletin producing the 6th and 7th numbers in October and February, and is now engaged in preparing the single printed Annual Report that will replace it in future. The membership has now risen to 210.

'Operation Seafarer', the national census of breeding seabirds has proceeded as planned, with James Fisher as Chairman of the Census sub-Committee, David Saunders as Organiser. Between 95 and 98 percent cover of the coasts of Britain and Ireland was promised beforehand, including all major sites and enough of the results are already in to indicate that it should not be too difficult to fill the last gaps in 1970 and complete the survey as planned. We are indebted to some thousand observers for assistance, including a number who took part in fifteen major expeditions, and also to the Royal Air Force, Fleet Air Arm and Irish Air Corps for assistance with aerial surveys. Fuller acknowledgements and some early results will be found in BTO News No.36.

The Beached Bird Survey administered by the RSPB has continued to produce growing results; those for the first year are reported in *Birds* for January-February 1969, (2(7): 176-178). The result of the first year of participation in an international beach survey on a week-end in February will be reported in *Birds* for January-February 1970; we were happy to be able to entertain the organiser of the International Survey, Eckhart Kuyken of Ghent in Belgium during the summer. Other recent work on oil pollution will be reviewed in the *Ibis* shortly, while special

surveys of oil pollution incidents on the east and south-east coasts and in the Irish Sea during the spring and of a wreck of seabirds in the north-west in the autumn are being prepared by J.J.D. Greenwood, Peter Stuttard, E.I.S. Rees, Peter Hope-Jones, Graham Stewart and others. The Group also participated in discussions organised by the Nature Conservancy on the design of recording forms on beached birds and a leaflet providing guidance for those dealing with birds affected by oil pollution.

A new development is more attention to gulls, whose increase is giving rise to various problems. The coastal breeding population is of course being counted during the course of 'Operation Seafarer', and Stanley Cramp is conducting a special survey of the new and growing habit of nesting on buildings, while the Group has secured the inclusion of gulls in the new BTO/RSPB estuary surveys. A session devoted to 'Gulls as pests' was organised by the Group at the BOU spring meeting at Durham on the afternoon of 13 April, and is reported in the *Ibis* for July (111:445-448). The Secretary served as the expert witness on radar and bird-strikes at the Local Enquiry into the suitability of Foulness as a site for the third London airport in May, where evidence on the comparative status of gulls at Heathrow and Foulness presented in BTO News No.33 was a main topic of discussion, and he is now representing the Group on the committee supervising work which the BTO is undertaking for the RAF Director of Flight Safety on the bird-strike hazard to aircraft.

A limited programme of sea-watching was organised in the west in liaison with members of the Royal Naval Bird-watching Soc. by Garth Pettitt in both the spring and autumn, and several papers on results here, one on work in the Irish Sea by R.G. Gibbs and one on work by N. Elkins and M.R. Williams in Aberdeenshire are in preparation for the Report. The results of the 1967 survey of breeding Little Terns compiled by R. Norman and D. Saunders were published during the early spring (*Brit. Birds*, 62:4-13) and attracted considerable attention in the press, while we are already beginning to receive news of the good results of conservation measures introduced in various places following the survey. Priority is now being given during the preparation of the results of 'Operation Seafarer' to identifying ways in which similar services can be performed for other seabirds.

We are as usual indebted to a vast number of people, few of them members of the Group, for a wide variety of assistance during the year. We wish that more of them would join us, but whether they do or not we are always happy to offer assistance with and receive news of any problems involving seabirds. We are grateful to World Wildlife Fund for further support for 'Operation Seafarer' from their Torrey Canyon Seabird Appeal, and to the West Wales Naturalists' Trust, the British Trust for Ornithology, and an anonymous donor in Ireland for other grants. We remain indebted to the National Ornithological Societies for a variety of services and hope for continued support with the further plans for research and conservation which we are now formulating.

W.R.P. Bourne.  
Honorary Secretary.

<b>BALANCE SHEET</b>	<b>THE SEABIRD GROUP</b> as at	<b>31ST OCTOBER 1968</b>
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<b>1967</b>	General Fund		
	Income and Expenditure Account		
	Balance 1st January 1968	49. 6. 3	
	Add: Surplus for period	<u>110. 5. 0</u>	
49			159.11. 3
	Census Fund		
	Income and Expenditure Account		
	Balance 1st January 1968	121. 0. 0	
	Add: Surplus for the period	<u>1,470. 9. 6</u>	
121			1,591. 9. 6
<u>170</u>			<u>1,751. 0. 9</u>
	Representing		
	General Fund		
	Current Assets		
188	Balance at Bank—Current Account	71.19. 8	
6	Deposit Account	<u>120. 0. 0</u>	
194			191.19. 8
	Less: Current Liabilities		
	Subscription in Advance	6. 3. 5	
	Creditors	<u>26. 5. 0</u>	
24			32. 8. 5
			<u>159.11. 3</u>
	Census Fund		
	Current Assets		
	Balance at Bank—Current Account	139. 5. 9	
	Deposit Account	1,351. 1. 4	
	Cash in Hand	<u>101. 2. 5</u>	
			1,591. 9. 6
<u>£170</u>			<u>£1,751. 0. 9</u>

### AUDITORS REPORT

We have examined the above accounts and have compared them with the relevant books and vouchers, and certify them to be correct in accordance therewith.

37/39 High Holborn,  
London, W.C.1.

MILLER, PRIDEAUX & CO.,  
CHARTERED ACCOUNTANTS.

**THE SEABIRD GROUP**  
**INCOME AND EXPENDITURE**  
**ACCOUNT** for the 10 months ended **31ST OCTOBER 1968**

12 months to 31st December 1967

<b>Income</b>			
124	Subscriptions—Current Year	188.10. 0	
10	Previous Years	<u>43.11. 1</u>	232. 1. 1
1	Donations		9. 6. 3
7	Sales of Bulletin		1. 6. 9
35	Grants		- - -
<u>177</u>			<u>242.14. 1</u>
<b>Expenditure</b>			
123	Cost of Bulletin	79. 5. 7	
	Administration Expenses		
	Postage	8.10. 8	
	Telephone	2.15. 0	
	Printing &	8.12.10	
	Stationery		
	Audit and	26. 5. 0	
	Accountancy	<u>          </u>	
29		46. 3. 6	
7	Committee Travelling Expenses	7. 0. 0	
13	Sundry Expenses	<u>- - -</u>	
<u>172</u>			<u>132. 9. 1</u>
<u>£ 5</u>	Balance being excess of income over expenditure		<u><u>£110. 5. 0</u></u>

**THE SEABIRD GROUP  
CENSUS FUND**

**INCOME & EXPENDITURE  
ACCOUNT**

for the 10 months ended

**31ST OCTOBER 1968**

**Income**

Grants—

World Wildlife Fund  
Royal Society for the  
Protections of Birds

1,400. 0. 0

1,000. 0. 0

2,400. 0. 0

19. 8. 0

Deposit Account Interest

2,419. 8. 0

**Expenditure**

Organiser's Fee

555.18. 4

Travel and Subsistance

185.12. 1

Grants Paid Out

79. 0. 0

Administration Expenses:

Postage

21.19.11

Telephone

23. 1. 2

Printing and Stationery

53. 7. 8

Sundry

30. 9. 4

128. 8. 1

948.18. 6

Balance being excess of income over expenditure

£1,470. 9. 6



**THE SEABIRD GROUP**  
as at

**BALANCE SHEET** **31ST OCTOBER 1969**

**1968**

		<b>General Fund</b>	
		Income and Expenditure Account	
		Balance 1st November 1968	159.11. 3
		Add: Surplus for period	<u>98. 0.10</u>
160			257.12. 1
		<b>Census Fund</b>	
		Income and Expenditure Account	
			1,591. 9. 6
1,591		Less (Deficit) for period	<u>(148. 0. 1)</u>
			1,443. 9. 5
			<u>£1,701. 1. 6</u>
			<u>£1,751</u>

Represented by:-

		<b>General Fund</b>	
		Current Assets	
		Balance at Bank—	
	72	Current Account	205. 6. 5
	<u>120</u>	Deposit Account	<u>126. 9. 0</u>
192			331;15; 5
		Less: Current Liabilities	
	26	Creditors	57.13. 4
	<u>6</u>	Subscriptions in Advance	<u>16.10. 0.</u>
32			74. 3. 4
			<u>257.12. 1</u>
			<u>160</u>
			<u>£1,751</u>
		<b>Census Fund</b>	
		Current Assets	
		Balance at Bank—	
		Current Account	113. 2. 0
		Deposit Account	1,246.18. 8
1,591		Cash in Hand	83. 8. 9
			1,443. 9. 5
			<u>£1,701. 1. 6</u>
			<u>£1,751</u>

**REPORT OF THE AUDITORS**

We have examined the above accounts and have compared them with the relevant books and vouchers, and certify them to be correct in accordance therewith.

37/39 High Holborn,  
London, W.C.1.

MILLER, PRIDEAUX & CO.,  
CHARTERED ACCOUNTANTS.

# THE SEABIRD GROUP

## INCOME & EXPENDITURE ACCOUNT

for the year ended

31ST OCTOBER 1969

10 months to 31st October 1968

	<b>Income</b>		
	Subscriptions—		
	Current year	160.10. 0	
	Previous year	13. 0. 0	
	In Advance	<u>4. 8. 5</u>	
132			177.18. 5
9	Donations		7. 2. 2
1	Sales of Bulletin		12.10. 0
-	Grants		20. 0. 0
-	Deposit Account Interest		<u>6. 9. 0</u>
<u>242</u>			<u>223.19. 7</u>
	<b>Expenditure</b>		
79	Costs of Bulletin	42.14. 4	
	Administration Expenses:		
	Postage	16. 3. 9	
	Telephone	1. 8. 4	
	Printing &		
	Stationery	31.17. 4	
	Audit and	26. 5. 0	
	Accountancy		
46		75.14. 5	
7	Committee Travelling Expenses	7. 0. 0	
-	Sundry Expenses	<u>10. 0</u>	
132			<u>125.18. 9</u>
<u>£110</u>	Balance being excess of income over expenditure		<u>£ 98. 10</u>

**THE SEABIRD GROUP  
CENSUS FUND**

**INCOME & EXPENDITURE  
ACCOUNT**

for the year ended

**31ST OCTOBER 1969**

10 months to 31st October 1968

		<b>Income</b>		
		Grants—		
		World Wild Life Fund	2,300. 0. 0	
		West Wales Naturalist Trust	<u>50. 0. 0</u>	
2,400				2,350. 0. 0
-		Donations		50. 0. 0
19		Deposit Account Interest		71.14. 0
<u>2,419</u>				<u>2,471.14. 0</u>
		<b>Expenditure</b>		
556		Organisers Fee	1,275.16. 8	
186		Travel and Subsistence	367. 6. 1	
79		Grants paid out	550. 1. 6	
		Administration Expenses:		
		Postage	68. 7.10	
		Telephone	46.12.11	
		Printing &		
		Stationery	264. 5. 5	
		Sundry	<u>47. 3. 8</u>	
	128		<u>426. 9.10</u>	
949				2,619.14. 1
<u>£1,470</u>		Balance being excess of expenditure over income		<u>£ (148. 0. 1)</u>