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Edited by D. J. Bates

Beached birds at selected Orkney beaches 1976 - 8

P. HOPE JONES

Oil in slicks and blobs on the sea, in contrast to the refined variety in the petrol pumps, seems to have increased alarmingly in the last year. This survey was done at an early stage in oil developments in Orkney and so provides baseline data for assessing subsequent damage to birds.

In 1975 only a few of Orkney's extensive beaches were being regularly covered for the national beached bird survey, and it was considered that an area with such substantial breeding populations of seabirds should be better monitored, and throughout the year if possible. Additionally, it was felt that spillages at Occidental's oil terminal on Flotta could increase the amount of seaborne oil in Orkney waters, Scapa Flow in particular, leading to a concomitant increase in the frequency of oiled birds on beaches.

The Nature Conservancy Council commissioned the Royal Society for the Protection of Birds to carry out a series of seabird projects in Orkney between March 1976 and February 1978, and this paper reports on some of the results obtained from beached bird surveys carried out during this period. Copies of the raw data and of the final report are lodged at the Huntingdon and Sandy headquarters of the respective organizations.

Aims and methods

The project's main aims were to carry out beached bird surveys in order generally to increase Orkney coverage for the national scheme, and in particular to monitor a selected sample of Scapa Flow beaches throughout the year.

Twenty-three sites were chosen: four on the west coast, facing the Atlantic; five on the east coast, facing the North

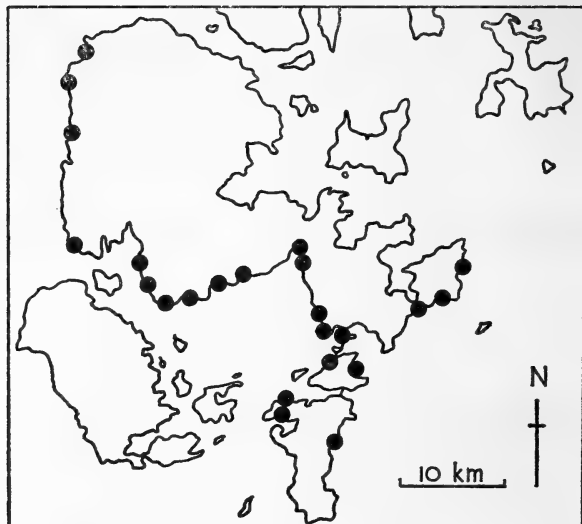


Fig. 1. Map of southern Orkney showing the location of the 23 sample beaches.

Sea; one facing into the Pentland Firth; and thirteen on the shores of Scapa Flow (fig. 1). The total length of shoreline was 34 km. Only a few of the beaches were sandy; most sites comprised angular cobbles or flattened stones resulting from the erosion of Orkney's sandstone slabs, and there were extensive drifts of decaying seaweed in places.

The survey method was based on the national scheme, but was not identical. Essentially, for each of the 23 sites, it comprised a relatively slow walk along a beach and back again, looking at the spring high tide mark once a lunar month for two years, and recording all corpses of birds and wild mammals and all live beached birds. It was early decided that a degree of standardization was preferable in order at least to reduce the numerous variables present in the system. The first standardization was to carry out the counts on the spring tide lines when it would be necessary to cover only the highest fresh tideline on the beach. The choice between new moon and full moon spring tides was arbitrarily resolved in favour of the latter, and the first day's counting took place on the day of the full moon or the day after it, with the remaining counts following immediately, the whole series normally taking between four and six days for completion.

Each tideline was walked in two directions from the access point. Beached birds having been noted, the corpses were then

thrown well above the highest tideline or else removed for further study. Additional birds found on the return walks were recorded separately; in this paper the grand totals are used. The spring tideline was usually easy enough to follow, and the two journeys were made at a moderate to slow walking pace—a speed anyway necessitated by the difficult nature of the terrain. All bird remains were identified where possible, the specimens being divided into categories of one wing, two wings, and whole birds (this last including everything with more than two-wings-plus-sternum).

Pattern of arrival through the year

Monthly details for the two years are set out in table 1. The very high figures in late summer are due largely to the arrival of corpses of juvenile Kittiwakes (discussed later), but even when these are omitted, it is still evident that the basic pattern was of low numbers in winter, increasing through spring to high numbers in late summer.

Table 1. Numbers of beached birds per kilometre, totalled for 23 Orkney beaches monthly, March 1976-February 1978

	First year	Without juvenile Kittiwakes	Second year	Without juvenile Kittiwakes
March	2.6		4.3	
April	4.7		1.8	
May	5.0		4.6	
June	—		—	
July	6.9	6.9	22.7	6.2
August	31.8	8.0	20.9	6.8
September	8.1	4.5	3.8	3.4
October	2.1		1.7	
November	2.8		0.4	
December	1.7		1.9	
January	1.4		2.7	
February	2.1		2.4	

One of the most interesting results to emerge from these surveys is evident from a comparison of Orkney data with those for the whole country (fig. 2). In both cases there is a peak of beached bird arrivals in August—and perhaps for both this reflects a mortality of juvenile birds—but whereas the national picture shows an even greater peak in midwinter, this is completely absent from Orkney. This, of course, assumes that the two years of the Orkney contract were normal in terms of beached bird arrivals; this cannot be proved, but there were no indications to the contrary.

The simplest explanation for this divergence is that many of Orkney's breeding seabirds are summer visitors, and so the

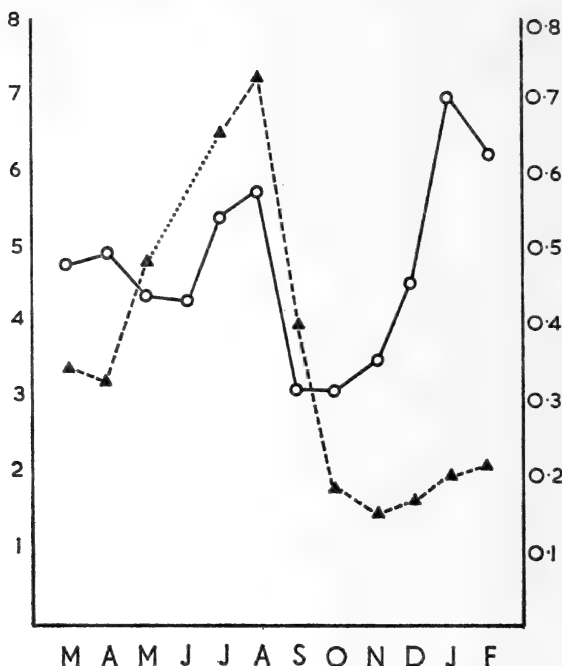


Fig. 2. Mean numbers of beached birds per kilometre per month: Orkney data (left-hand scale) compared with the national pattern (right-hand scale). National: solid line and circles. Orkney: dashed line and triangles (note (a) juvenile Kittiwakes excluded; (b) June data incomplete).

numbers present in the area are much lower during the winter, whereas the trend is reversed around many coasts further south in the rest of Britain and Ireland. The Orkney monthly figures (even without juvenile Kittiwakes) were often about ten times higher than the national ones. This must, to an unknown (but large) extent, be an artefact due to the more intensive surveillance during the contract: *all* birds and wings counted, birds recorded also on the return trip along each beach, etc., and fig. 2 must therefore be used mainly in comparing the two areas in terms of through-the-year pattern.

Species patterns

In sum, 57 species were recorded on the surveys; numbers of species per month varied between 19 and 28, averaging 24, but this parameter did not show any obvious patterns with season of the year. The overall Orkney picture—a late summer peak and a midwinter trough—hides several variations

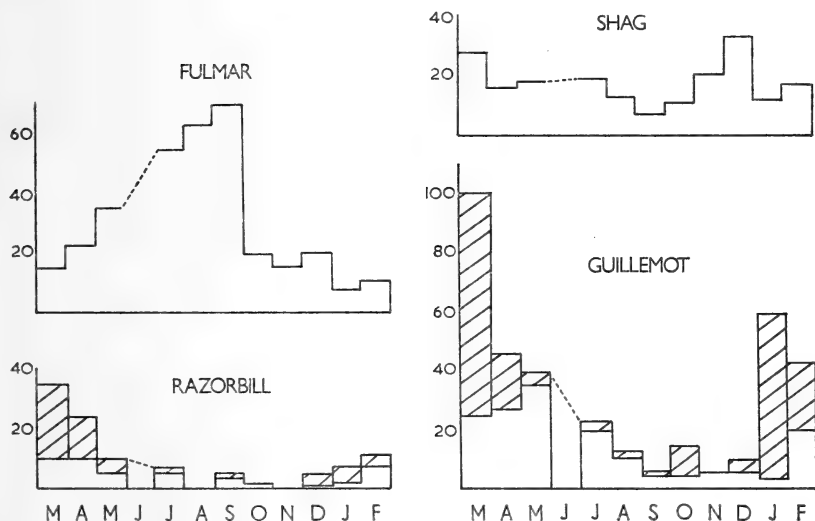


Fig. 3. Monthly totals of beached birds (from the Orkney sample sites) for two years combined for Fulmar, Shag, Razorbill and Guillemot. June data incomplete. Cross hatching (auks only) indicates oiled birds.

between species, and so monthly patterns for Fulmar, Shag, Razorbill and Guillemot are shown in fig. 3.

Fulmar numbers show a very obvious build-up through the spring to late summer—presumably peaking at the time when many young birds are fledging. Shags, on the other hand, show a more diffuse pattern, though in both years there was an early winter peak and another, smaller, one in early spring.

Razorbill and Guillemot are similar in showing a distinct early spring peak, whilst Guillemot in the second year also produced good numbers in January (Guillemots occur occasionally in Orkney waters in winter and early spring, but Razorbills are apparently scarce then). With these two species, any natural mortality pattern is almost bound to be hidden by the periodic arrivals of oiled birds, but since one cannot normally say what proportions were dead before oiling, the problem is insuperable. However, fig. 3 also shows the proportion of oiled birds in the monthly totals for the two species, and evidently much of the late winter/early spring peak was due to oiling. The histograms for unoiled birds peak at different times from those for all birds, but it still seems as though there was a spring peak in arrivals of Razorbills and Guillemots.

Kittiwakes are a special, and very interesting, case. There was very little oiling in this species and the arrival pattern for beached adults is an obvious build-up to a midsummer peak with a complementary winter trough. There was little variation between years, either in numbers or in monthly distribution. From July to September, in both study years, the summer peak was stretched upwards by massive arrivals of corpses of juveniles on the beaches, particularly the west coast, to give the patterns shown in fig. 4. The reason for one August peak in 1976 and joint July/August peaks in 1977 is simply a function of the dates of the beached bird surveys in relation to the hatching/fledging times of the Kittiwakes: in 1976 the counts were in mid July when only few Kittiwakes were at the advanced fledging stage, whereas in 1977 the counts were very late in July, by which time the fledging season was well advanced. Mortality in pre-fledging Kittiwakes is considered by many to be mainly due to the young birds falling from nests before becoming capable of full flight (Hodges 1975), and with tens of thousands of young Kittiwakes being produced in Orkney each summer it would be surprising if there were *not* several hundreds found dead, so the phenomenon is probably quite usual, though it may vary quite considerably from one year to the next in the number of young birds beached.

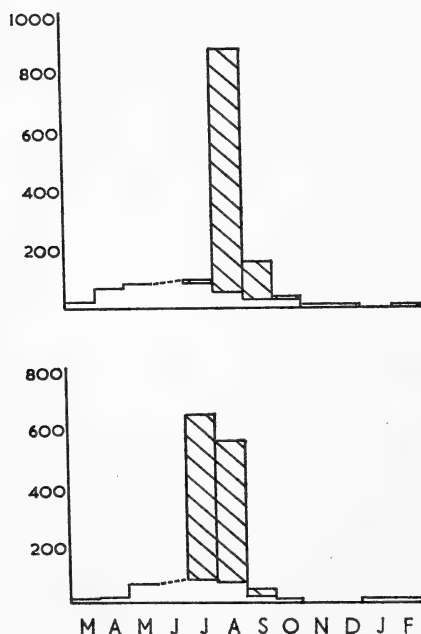


Fig. 4. Monthly totals of beached Kittiwakes at 23 Orkney sites in two years. Upper: 1976/7; lower: 1977/8. Cross-hatching, July-October, indicates juveniles.

Numbers varied greatly with the locality, the west coast beaches heading the league, presumably because of their close proximity to massive breeding colonies. The average number found per kilometre of searched beach (July to October totalled) was very similar at 28 in the first study year and 31 in the second, but the value differed considerably with area—122 and 152 per kilometre in the two years on the west coast, to between two and four per kilometre in both years within Scapa Flow. This brief, but very intensive, flurry of beached juvenile Kittiwakes inflates the annual totals of beached birds very dramatically, so various of the analyses have been made with the express omission of this group.

Oiled birds

One of the main aims in beached bird work is to establish the proportion of oiled birds amongst the corpses and live beached birds found on the tideline. In this Orkney study, the gross figures were 279 birds oiled out of a total of 4,979 birds found, that is, a very low oiling rate of 5.6%. However, of the grand total of birds found, nearly half were juvenile Kittiwakes, so when this category is removed, the oiling rate rises to a more realistic 9.4% (279 out of 2,982). Bourne & Bibby (1975) calculated the proportion of oiled bodies from beached bird surveys, 1967-73, to be 45% in eastern and 10% in western Scotland, though with up to 80% in parts of south-east England and on the Channel and North Sea shores of continental Europe. The Orkney figure can be further broken down, as shown in table 2, where the two species Guillemot

Table 2. Total numbers of oiled birds found on beached bird surveys of 23 Orkney beaches, March 1976 - February 1978

	Total birds found	Total oiled	% oiled
Red-throated Diver	1	1	—
Great Northern Diver	3	1	—
Fulmar	378	3	0.8
Gannet	42	2	4.8
Shag	199	1	0.5
Eider	63	1	1.6
Long-tailed Duck	18	6	—
Velvet Scoter	2	2	—
Redshank	9	1	—
Common Gull	153	1	0.6
Herring Gull	291	2	0.7
Kittiwake	765*	7	0.9
Guillemot	403	190	47.1
Razorbill	108	56	51.9
Black Guillemot	36	3	8.3
Little Auk	2	1	—
Puffin	39	1	2.6

*omitting juveniles, July to October

and Razorbill comprise 88% of all oiled birds among the 17 species affected by this form of pollution. For both these auk species, about half the beached birds found were oiled, whereas no other species (for which over 30 individuals were recorded) could muster 10%. In the national situation (Cadbury & Meyer pers. comm.) 55% of auks are oiled (about half, as in Orkney) and 64% of divers and 39% of seaducks, but for these two groups the Orkney sample was not large enough for valid comparison, though out of 63 Eiders found in the 1976-8 counts only one was oiled.

In both years the west coast sites turned up about half of all the oiled birds found, even though the beaches in that area comprised only one-fifth of the shorelines examined. This proportion was similar for both years, even though there was a four-fold increase in arrivals of oiled birds in the second working year, due in large measure to the impact of three specific incidents off the west coast.

In March 1977 there was a spillage of North Sea crude oil from the terminal in Scapa Flow, and if such oil normally has the appearance shown in that incident, then it is easy to identify on beached bird corpses by virtue of its tawny cinnamon colour—which contrasts markedly with that of the black or brownish-black tarry covering resulting from contact with some other crude oils and fuel oils. Between October and December 1977, a small series of feather samples was taken from oiled birds found on Orkney beaches, and this was forwarded to the Laboratory of the Government Chemist by K. T. Standing of the RSPB's Edinburgh office. The main components were fuel oils, often with admixtures of other oils, and if this is typical of the pollution shown by most of the Orkney oiled birds then the main cause of oiling during the study period was fuel oil and bilge washings. Pollution by North Sea crude oil was restricted to the effects of two out of several spillages within Scapa Flow in 1977, one serious enough to warrant a published report (RSPB 1977), the other of no great consequence.

Observations and experiments

(a) Relative durability of corpses in the sea

Of the auks, 89% arrived as whole corpses, whereas only 25% of the Kittiwakes did so. These figures reinforced my impression in the field that the gulls as a group were more fragile and disintegrated more quickly in the sea than chunkier, thicker plumaged birds such as auks and divers.

During the summer (here an arbitrary period of April to September inclusive), the proportion of corpses of adult Kittiwakes

wakes that came ashore whole was between 18% and 31% for three groups of beaches; in juveniles, the proportion changed from 67% on the west coast, through 40% on the east coast, down to a mere 16% within Scapa Flow. This I interpret as a rapid disintegration of juvenile corpses as they are moved, in seawater, away from their natal colonies; it would appear that these juveniles were much more prone to come apart rapidly than were adults that died during the same period.

The durability of corpses in seawater and their ability to withstand the wave pounding (and perhaps destruction by seaweed fronds) are thus very important in interpreting the numbers of different species washed ashore whole or in bits, but as yet one can only point to this factor without being able to quantify it in any constructive manner.

(b) Corpses found on the return walk

Figures were kept separately for the numbers of beached birds found on returning along the same tideline as that examined on the outward walk. The major conclusion was that up to one fifth of the birds present on a tideline were missed by an observer who was looking hard for beached birds. And this cannot, of course, include those birds that must have been missed on both trips. Figures were remarkably constant from year to year, even though they varied slightly from one set of beaches to another.

This percentage is not necessarily universally applicable, since it applies only to the Orkney beaches sampled, and to only one observer, whose capability in spotting beached birds may, or may not, have been near the national average. However, it does highlight the existence of yet another variable, and shows that observers, however conscientious, can miss a considerable proportion of the beached birds actually present on any given site.

(c) Beached birds and wind direction

West and east coast sample beaches totalled 5.9 and 5.7 km respectively. An analysis was carried out comparing, for each month's counts, the wind direction (weighted according to its speed) at three-hourly intervals for one, five and ten days before the count. For five winter and five summer counts each year, the indices for both westerly and easterly component winds were compared with the numbers of corpses. The only correlation at the 5% level was that numbers on the west coast in winter were negatively correlated with east winds in the period ten days before the count (Kendall's rank correlation coefficient). For the rest, one must conclude that, at the 5% level tested, there was no correlation.

However, the total numbers of corpses found on west and east coast beaches was 1,613 of which 951 (59%) were on the west coast and 662 (41%) on the east. If all the wind indices are added for ten-day periods prior to counts at these sites, the totals are 1,400 (59%) for west winds and 959 (41%) for east winds. This is a chance concordance because the figures for separate years are slightly different, but it does suggest that the link between wind and numbers of corpses is more likely to be in the nature of a long term phenomenon than an immediate one, and that immediate correlations for single counts are perhaps often overridden by the changeable nature of the wind and by corpses remaining for quite a time on the tideline.

(d) Length of corpse stay on the tideline

Corpses can remain visible for quite a while if left high and dry at the top of a beach after a particularly high spring tide. However, many corpses brought in on neaps or ordinary springs will be disturbed by subsequent tides, and a series of counts was made on marked individual corpses to discover how many would be refound. Of 56 corpses set out in three tests on neap tidelines, and examined daily, 28 (50%) were still visible on the same beach after the next series of spring tides, seven (12%) were hidden under seaweed, six (11%) were shifted away some distance by the tides, one (2%) was removed by a scavenger, and the remaining 14 (25%) had disappeared without trace.

(e) Corpse disintegration

Corpses of beached birds obviously disintegrate over the course of time, and in fact many of them are well on the way by the time they are cast ashore. In two series of corpses put out above the high water mark it was found that a five month interval through the late winter and spring was sufficient to make five out of eight corpses almost unrecognizable, though two divers seemed hardly to change in this period—perhaps their feather structure and tough skin slowed the process of decay; on the other hand, a three month interval over the midwinter period seemed to effect relatively little change in the state of six more corpses. Although some of these carcasses may have mummified to some extent, an examination of two Guillemot corpses left for four months over the 1977/8 winter suggested that they would be very fragile, and likely to fall apart if moved. Thus corpses remaining at one place can last several months (and perhaps for a longer period in winter than in summer) but only if left almost completely undisturbed. Corpses moved about by seawater are likely to

disintegrate much more quickly, though this was not tested. A variety of tideline scavengers hastens the process of disintegration: in Orkney, gulls, Great Skua, Hooded Crow and Common Rat *Rattus norvegicus* were all heavily involved, together with invertebrate carrion feeders. Changes caused by chemical action and by microscopic organisms were not investigated.

Conclusions

The main value of the two year survey may perhaps only become apparent when there are sufficient data with which to make valid comparisons, that is, when the project has been repeated in the future.

The first essential in 1976-8 was to establish the pattern of beached bird arrivals at a variety of Orkney sites, and insofar as this was possible within the relatively short time of two years, it was done. Whilst the details will perhaps change considerably from year to year, it seems likely that the basic system of high numbers of beached birds in spring and summer, low numbers in winter, is the normal state of affairs for Orkney.

The second essential was to establish the oiling frequency amongst the beached bird arrivals. This showed the great disparity between the rates for Razorbills and Guillemots on the one hand, and a variety of different species on the other hand. One conclusion here was that it would be misleading to quote just one figure for the oiling rate for Orkney, but again if the project is repeated or continued, the figures for individual species can validly be compared.

As more oil is removed from below the North Sea (and possibly the Atlantic) there is an increasing likelihood of seaborne pollution from that source, and it will be valuable to know—in the event of an almost inevitable increase in bird oiling in Orkney waters—whether the increase is due to North Sea oil as such or to bilge water and tank washings from the greater volume of shipping associated with oil developments in northern British waters.

This two year survey forms the basis for monitoring numbers of beached birds ashore at selected sites in Orkney. Despite the variables involved in the collection and interpretation of data, I believe the system to be invaluable in providing indices to numbers of corpses arriving, species composition, and percentage oiling in different species, thus contributing to surveillance of the important seabird populations in the physically and economically turbulent waters of northern Scotland.

Acknowledgments

David Lea was of very great practical help throughout my beached birding stint in Orkney and it is a pleasure to thank him formally for all his assistance and support. James Cadbury gave considerable moral support and was most constructive with advice and suggestions at all stages of the project; this backing was greatly appreciated. Ian Lyster confirmed the identity of some very tatty beached bird specimens; Kevin Standring arranged for the analysis of several oil samples; Bill Bourne, Clare Lloyd, Peter Kinnear, Roger Mitchell, Andrew Ramsay, Alex Simpson and Tim Stowe were very helpful in discussing various aspects of the project. To all these people I tender my grateful thanks for their help. This work was commissioned by the Nature Conservancy Council as part of its nature conservation research programme.

Summary

From March 1976 to February 1978 beached birds were recorded monthly at 23 sites in Orkney. The basic pattern of arrivals was of low numbers in winter (contrasting with the national picture) increasing through spring to high numbers in late summer, though the pattern varied with individual species. There were massive arrivals of corpses of juvenile Kittiwakes, especially on the west coast, in July and August. The overall oiling rate was 9.4% (omitting juvenile Kittiwakes), but 52% of Razorbills and 47% of Guillemots were oiled.

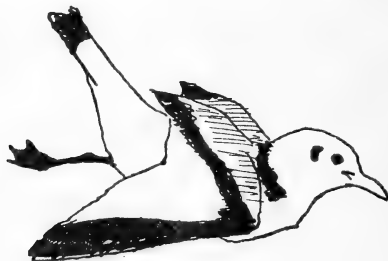
Up to at least one fifth of visible tideline corpses could be missed by an observer, and a good proportion may anyway be hidden under seaweed. Wind direction, very changeable in Orkney, perhaps had a long term influence on numbers of corpses beached.

There is likely to be an increase in oiling of northern waters, perhaps by North Sea crude oil, but more likely by bilge water and tank cleanings from the great increase in shipping connected with the oil industry; this survey will provide a yardstick for comparing basic parameters, such as numbers of corpses, species composition and percentage oiling, with future data.

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KITTIWAKE
John Busby

The seabirds of Berwickshire

S. R. D. and E. S. da PRATO

(Plates 1-4)

The Berwickshire seacliffs (fig. 1) have long been recognized as an important seabird breeding area with the added advantage of easy access from the land. The cliffs themselves include the highest on the Scottish east coast while the adjacent sea area is amongst the least polluted anywhere around North Sea coasts, and in spring and early summer the cliff tops are rich in wild flowers. Together these features combine to create an area of great conservation value and the Nature Conservancy Council (NCC) has designated the richest stretch, from St Abbs Harbour to the west of Fast Castle Head, as a Grade One Site of Special Scientific Interest. St Abb's Head itself which holds many of the breeding seabirds and receives the greatest visitor pressure has recently been declared a reserve of the Scottish Wildlife Trust (SWT) and is wardened throughout the summer.

It is perhaps surprising that such well known seabird colonies have been so little studied. Few counts of the Berwickshire cliffs have been made, unlike the Farne Islands to the south and the islands in the Firth of Forth to the north, where most sites are censused annually. This paper summarizes the present status of Berwickshire seabirds using data obtained in May and June 1978. It also compares present numbers and

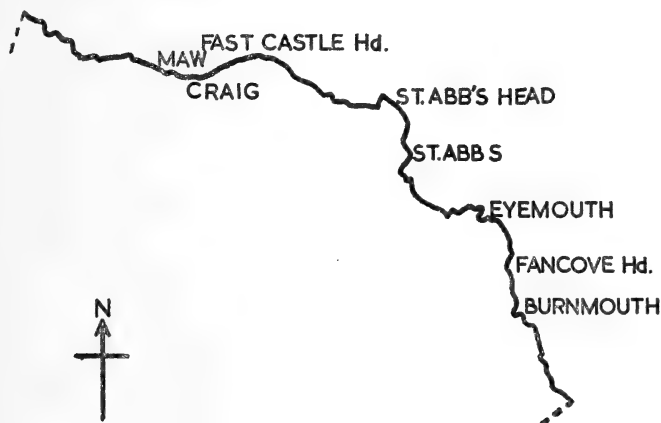


Fig. 1. The Berwickshire coast showing places mentioned in the text.

distribution with previous censuses and with regional and national population figures to determine the relative importance of the Berwickshire colonies and where possible to identify population trends. Finally some suggestions for further seabird work in the area are made.

There are many problems associated with the methods and subsequent interpretation of seabird counts (Lloyd 1975, Harris 1976). A much fuller account of the 1978 and earlier surveys together with site descriptions, count totals and sections and detailed maps of distribution are contained in an NCC Report (da Prato & da Prato 1978). In addition approximately 100 10 x 8 inch black and white photographs of the major seabird cliffs, mostly taken from the sea, are being prepared to allow future comparisons of gross changes in distribution. Sets of these prints will be held by the NCC in Edinburgh, and by the SWT.

Surveys and methods

I. J. Patterson covered the whole of the Berwickshire coast between 26th May and 7th July 1957 (some Herring Gulls not counted) and again between 25th May and 12th July 1958, the bulk of both counts being done before mid June (Patterson 1958 and in da Prato & da Prato 1978). Being a local person familiar with the terrain he obtained good coverage; the main problem in interpreting these early counts is that Guillemots were counted as pairs rather than the modern practice of total birds on breeding ledges. The next complete census was Operation Seafarer in 1969-70 when of the four counters R. S. Baillie must take the credit for counting the major colonies at and to the north of St Abbs. Unfortunately several sections were not counted till late June or July and some of the count figures seem rather low—lower in fact than those of 1957-8.

In 1976 and 1977 the NCC commissioned counts of the St Abbs-Fast Castle stretch. The 1976 survey (Nisbet & Fraser 1976) was rather late and largely exploratory. A revised programme in 1977 gave a good series of counts for St Abb's Head and much higher figures for the difficult ground to the north (da Prato, da Prato & Ewins 1977). These surveys led to a monitoring programme at sample sites on St Abb's Head which started in 1978.

Although repeat counting of sample sites increased accuracy it is not practical on really big areas and it fails to provide information on the total distribution or magnitude of colonies. The 1978 survey was planned to be a direct comparison with the 1957-8 and 1969-70 counts. Methods were those established by Kinnear and Hope Jones in Orkney and Shetland (Hope Jones 1977) except that Razorbills were counted as

apparently occupied sites as well as total birds on ledges. With Guillemots all birds on breeding ledges were counted; with other species nests were the count unit except for the relatively few Puffins whose inaccessible burrows meant that total birds ashore had to suffice. Counts in 1978 were timed to coincide with the peak incubation/young chick stage of auks and Kittiwakes and took place between 07.00-15.00 BST from 4th to 17th June with additional counts up to 20th June for stretches without auks. An extra count of Herring Gulls on St Abb's Head was made in May.

Results and assessments or ornithological importance

This section shows how the most recent counts of Berwickshire seabirds compare with those for the Firth of Forth, the Farne Islands and estimates of the total populations breeding in Britain and Ireland (table 1). Figures for Britain and Ireland are from Cramp *et al.* (1974) which uses data collected in 1969-70 during Operation Seafarer. More recent counts at certain sites, notably the difficult northern colonies, have shown that Seafarer tended to underestimate populations (see,

Table 1. Comparisons of seabird populations between Firth of Forth, Farne Islands and Berwickshire coast against total British Isles estimates

	British Isles total (1969-70) ¹	1% Berwickshire level coast (1978)	Firth of Forth ²	Farne Islands ³
Fulmar	306,000	3,060	1,271	76
Cormorant	8,100	81	33	193 (usually 200-250)
Shag	31,600	316	281	430
Lesser Black- backed Gull	47,000	470	7	} (Reduced to 2,620)
Herring Gull	333,000	3,330	2,615	
Kittiwake	470,000	4,700	18,101	5,000
Guillemot	577,000	5,770	14,790	12,000
Razorbill	144,000	1,440	702	1,000
Puffin	490,000	4,900	<100 ?	4,750
				c.13,000

Notes. All figures are for pairs except Guillemot which refer to birds ashore on breeding ledges. Seafarer considered 577,000 to be the British Isles population in pairs but since they assumed each bird ashore represented half a pair the figures can be compared directly.

1. Data from Cramp *et al.* (1974).
2. Data from Campbell (1978).
3. Data from Galloway & Meek (1977).

for example, Harris 1976) while genuine increases are known to have occurred since 1969 in several areas. This means that the totals quoted for Britain and Ireland are almost certainly too low and this should be borne in mind when assessing the relative importance of the Berwickshire coast.

The period since Seafarer has seen considerable interest in the assessment of wintering populations of waders and wild-fowl in northwest Europe, including Britain, and international conventions in 1971 and 1974 established that any site holding 1% or more of the known west European population was considered of international importance. Birds of Estuaries Enquiry Reports published by the British Trust of Ornithology have also used 1% levels in determining criteria whereby populations can be said to be nationally important within the British Isles. When summarizing census work done in the Forth estuary in recent years Campbell (1978) also applied 1% levels in assessing the significance of seabird populations breeding in the Forth. Berwickshire populations that exceed 1% of the Seafarer total are Kittiwake (4%) and Guillemot (3%) while Shag and Herring Gull are near to the 1% mark.

In comparing the Firth of Forth and Berwickshire it should be remembered that no terns or Gannets breed in Berwickshire but important colonies of both do so on Forth islands, while terns also breed on the Farnes. Guillemot and Kittiwake emerge as the two obviously important species while Shag, especially in view of fluctuations at other colonies, clearly merits further censusing.

The most important stretch of cliff for breeding seabirds continues to be from St Abbs Harbour to Maw Craig. Most of the auks (over 90%) breed on St Abb's Head and the cliffs immediately to the north. Kittiwakes are more generally distributed with important colonies scattered from St Abbs to west of Fast Castle. The only other area with numbers of auks is Fancove Head. Fulmars and Herring Gulls are much more widely distributed but their total numbers are considerably smaller than the Kittiwakes and Guillemots. Cormorants are confined to stacks west of Fast Castle. Shags nest in pockets, the majority on stacks near Fast Castle.

The high numbers of the cliff breeding species contrast with the relatively low populations of birds preferring more broken ground and the very small numbers of cliff top nesters, i.e. Puffin and Lesser Black-backed Gull. This pattern is very different to island colonies in the Forth where both gulls and Puffins are numerous. The only reasonable explanation is the effect of ground based predators in Berwickshire which are absent on the islands. Foxes *Vulpes vulpes* are often seen on the Berwickshire cliffs and local fishermen have seen young



PLATES 1-4. The seabirds of Berwickshire by S. R. D. and E. S. da Prato (pages 13-20).

PLATE 1. (a) Kittiwake, the most numerous Berwickshire seabird.

(b) Guillemot, the second most numerous species.





PLATE 2. (a) Shag; this species would repay further censusing.
(b) Puffin; unlike island colonies Berwickshire cliffs have a small population confined to inaccessible slopes.



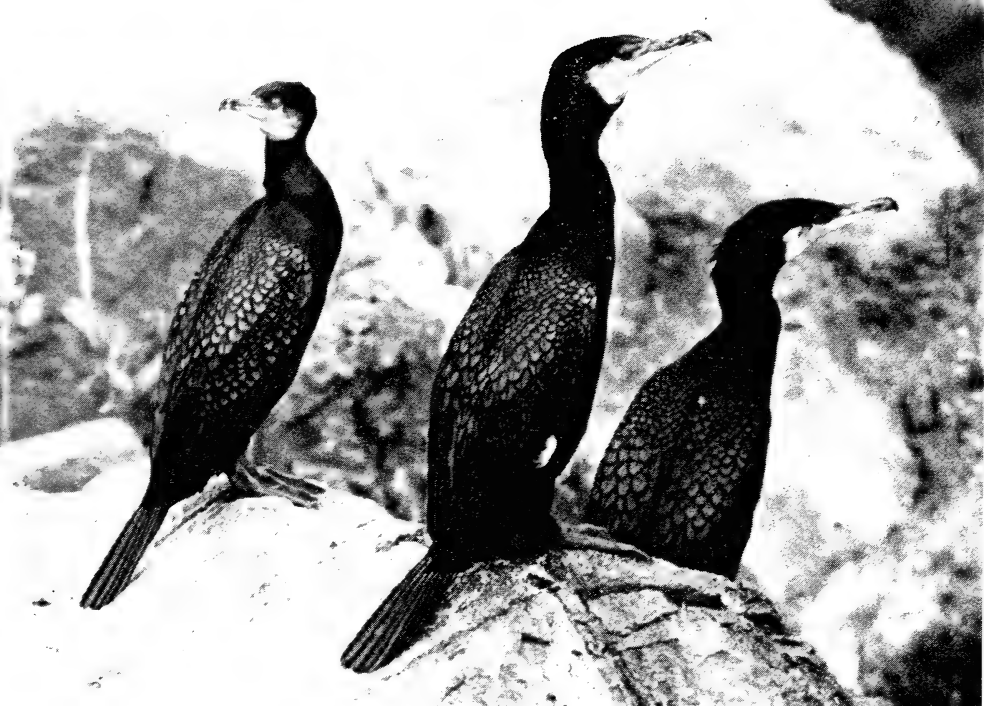
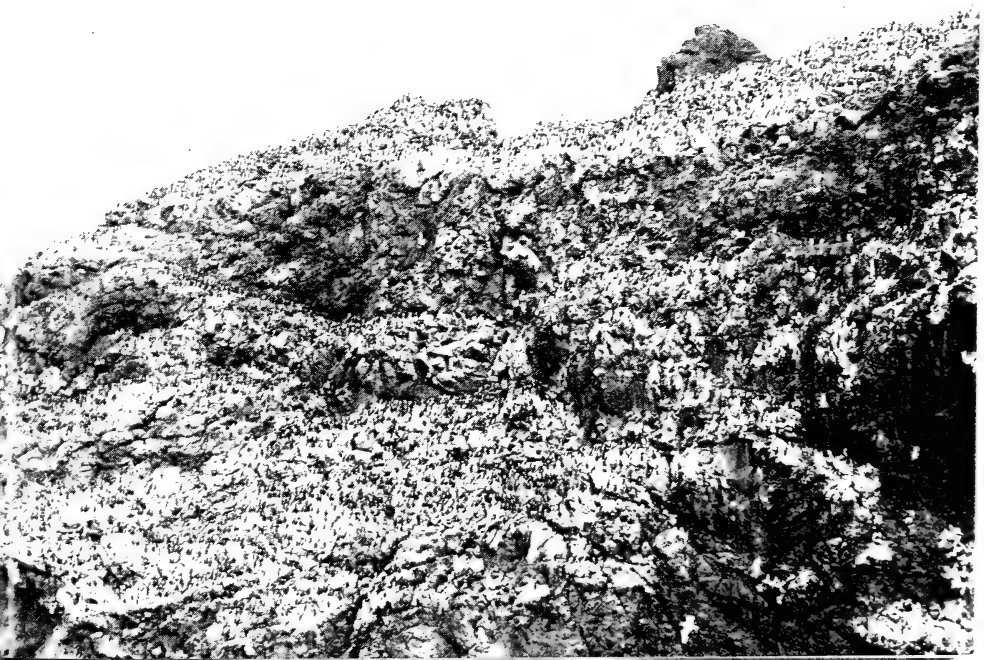


PLATE 3. (a) Cormorant, a recent colonist.

(b) Foul Carr (St Abb's Head), the biggest concentration of Guillemots in Eerwickshire with 2,500-3,000 birds normally present. Shortly before this picture was taken on 26 June 1977 3,600 were counted. Even offshore stacks at St Abb's Head can be easily counted from the clifftops.



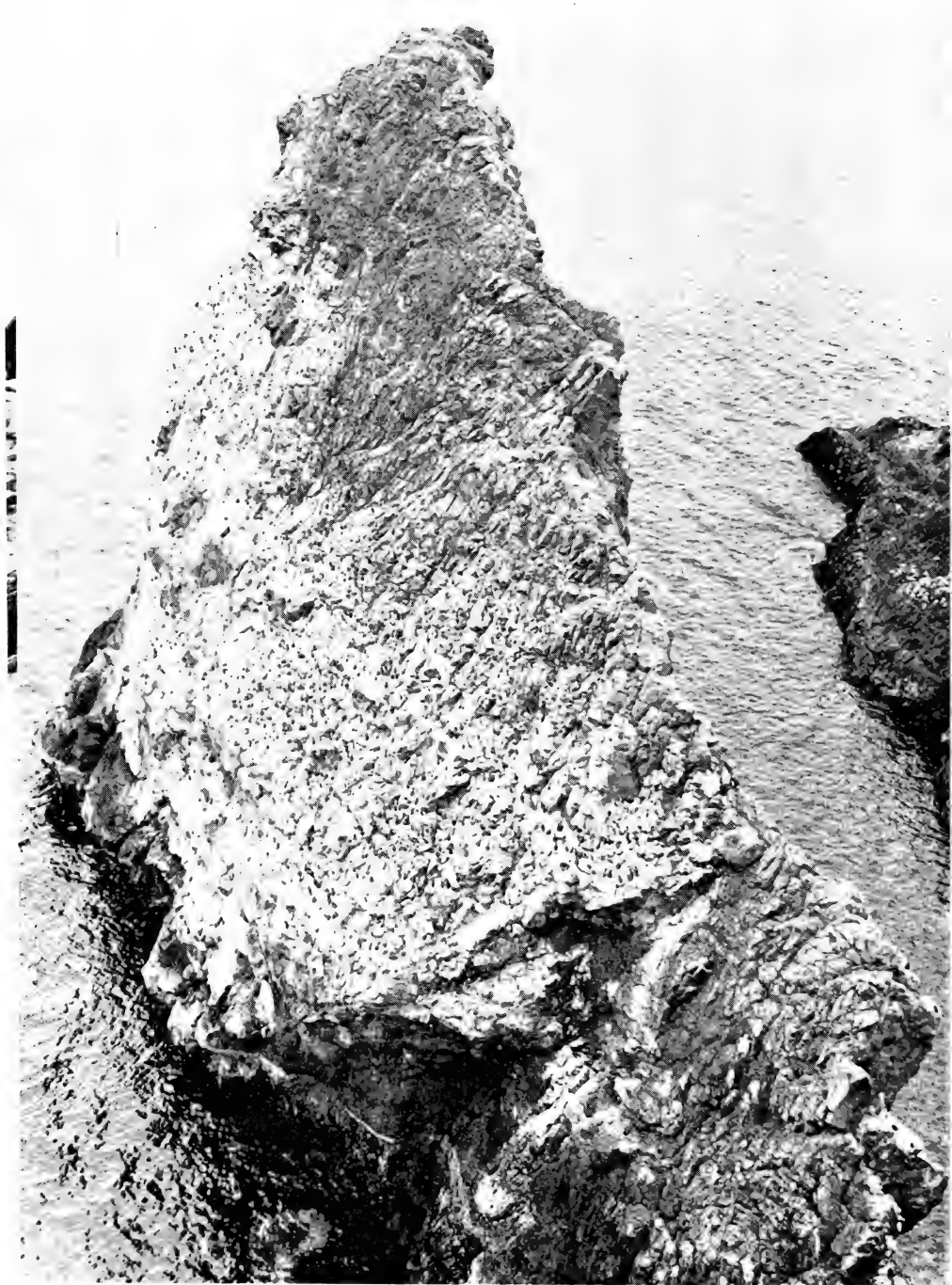


PLATE 4. Cleaver Rock (St Abb's Head) northwest face from clifftop. This face holds around 1,400 Gulllemots in June.

gulls being taken by Foxes. There is one record of a Fox eating a young Shag (G. Evans pers. comm.). Whether other mammals are also involved is not known except for the two legged species. Regrettably egg collecting and vandalism still occur, especially at St Abb's Head, although the problem seems largely confined to a few weekends in early summer and the presence of a warden may now act as a deterrent.

Changes in status

Table 2 shows the 1978 census results compared with those of Seafarer in 1969-70 and the 1957-8 counts. In 1976 and 1977 only part of the coast was censused; as this is the most important stretch and holds nearly all the auks, figures for all species except Fulmar and Herring Gull have been included for these two years. The only other sizeable concentration of auks and Kittiwakes is between Eyemouth and Burnmouth, especially at Fancove Head. In 1978 this stretch held 1,423 Kittiwake nests, 55 Razorbill sites and 130 Guillemots ashore on ledges.

Table 2. Berwickshire seabird counts 1957-78

	1957	1958	1969-70	1976*	1977*	1978
Fulmar	536	590	759	—	—	1,271
Cormorant	0	0	0	31	37	33
Shag	273	291	124	307 (max)	302 (max)	281
Lesser Black-backed Gull	—	7	6	5	5	7
Herring Gull	—	3,635	1,516	—	—	2,615
Kittiwake	6,365	6,601	10,820	12,176	15,223	18,101
Guillemot	5,580	5,123	6,731	11,424	12,280	14,790
Razorbill	291	287	257	443	528	702
Puffin	79	84	20	70	c.60	<100?

Notes. For count details see text.

*Incomplete coverage : St Abbs-Fast Castle only.

Given the difficulties of interpreting seabird counts any discussion of changes in status based on single counts can only proceed with caution. However the increases recorded for Kittiwake, Guillemot and to a lesser extent Razorbill are so large that genuine expansion must have occurred although it would be unwise to quantify this, especially with the auks. Apart from the higher totals obtained in recent counts, more species now nest to the west of Fast Castle Head where only gulls and Fulmars were recorded 20 years ago. The increase in Berwickshire totals is paralleled in the Firth of Forth where certain small island colonies can be counted accurately (R. W. J. Smith pers. comm.).

The contrast between the fortunes of cliff and slope nesting species has already been mentioned. The increase in Puffin and large gull populations so apparent on island colonies in southeast Scotland has no parallel in Berwickshire. Indeed the reverse may have happened with Herring Gulls although the June count dates were rather late for this species which has usually finished incubation by then. If control of gulls is indeed the work of Foxes this is no bad thing even if they also limit the Puffins. The destruction of Foxes would not necessarily help Puffins since other mammals like Rats *Rattus* or Stoats *Mustela erminea* may be at work. A number of headless Fulmars have been found, again indicating Fox predation; the big broken cliffs seem very suitable for Fulmars which occur in relatively low numbers compared to northern colonies.

Cormorants are recent colonists at a time when new colonies have appeared on islands in the Forth. Since the main Forth colonies probably originated from Farnes birds (Smith 1969) it is surprising that Berwickshire was not colonized sooner. There is a potential conflict here given the freshwater angling interests in the county. Berwickshire Shags occupy an important position being intermediate between the Forth and Farnes. Shag populations are known to fluctuate and in the Farnes crashes in their numbers in 1968 and 1975 have been linked to red tides, more specifically paralytic shellfish poisoning caused by *Gonyaulax*, since not all red tides are toxic to birds (Coulson *et al.* 1968, Armstrong *et al.* 1978). It is certainly tempting to ascribe the low Seafarer count of Shags to the 1968 outbreak but the late (13th July) count date chosen for the important Fast Castle area which holds the bulk of the Shags could be the real culprit. The 1978 figure of 281 nests is remarkably similar to that of 20 years previously but we simply do not know for certain what fluctuations have occurred in between.

The future

We now have adequate data on the distribution and approximate size of Berwickshire seabird populations. St Abb's Head is a particularly advantageous site for seabird studies since no boat trip is needed to reach it and the topography is such that most ledges can be easily examined from an opposite promontory. Under NCC auspices a monitoring scheme started at selected sites on St Abb's Head in 1978; this should provide an indication if events at sea are harming the Guillemots or Kittiwakes. Continued coverage of at least some of the Berwickshire colonies must be maintained in view of the increase in oil pollution incidents reported around Scottish coasts. The increases in the auk and Kittiwake populations

are impressive but could easily be reversed. Oil from a Liberian registered tanker killed Guillemots at St Abbs in April 1979, while if the Ekofisk blowout in 1977 had occurred in July or August Berwickshire auks would almost certainly have been caught as they moved across the North Sea. The oil menace is well known but the effect on seabirds of over-fishing may in the long term prove even more serious.

Ornithologists often comment on our dearth of knowledge of seabirds in the non-breeding period. Clearly there are genuine difficulties with birds at sea but the question of Guillemot attendance at colonies through the winter could be particularly well studied in Berwickshire where birds visit the cliffs from October. Shag numbers also seem a suitable study although a whole colony would need to be chosen rather than the sample ledges appropriate for the commoner Guillemots.

Many species of seabirds are seen passing the Berwickshire cliffs. The commonest is the Gannet but none were recorded ashore until local fishermen noticed a single bird on a ledge for several weeks at St Abb's Head in summer 1979. Another species that might breed in the near future is the Great Black-backed Gull as a pair held territory near Fast Castle in 1978.

Acknowledgments

Dr I. J. Patterson kindly provided details of the 1957-8 counts. Mr C. O. Badenoch of Southeast Region NCC made available details of Seafarer, 1976-7 counts and the monitoring programme. NCC also helped with transport, typing and duplicating. Mr Peter Hood allowed us to photograph seabird cliffs from his fishing boat.

Summary

In June 1978 the whole of the Berwickshire coast was censused for seabirds. The major concentrations were found from St Abbs Harbour north past Fast Castle Head to Maw Craig and around Fancove Head. Berwickshire totals are compared with the latest available national, Firth of Forth and Farne Islands figures. Kittiwakes (4%) and Guillemots (3%) are both nationally important as to a lesser extent are Shags. Berwickshire holds lower totals of Puffins, Fulmars and gulls than island colonies, probably due to predation by Foxes. Comparisons are made with earlier counts and cliff nesting species show increases but others do not. The colonies around St Abb's Head are particularly suitable for monitoring due to their topography and easy access. Suggestions are made for future studies.

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Birdwatching at Loch Garten

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Loch Garten - Ospreys: Ospreys - Loch Garten, to most people they mean one and the same. In 1976 we were refused permission to erect the AA Osprey directional signs because the official road signs now say Loch Garten, and that in effect means Ospreys. Even now there are still a few locals who think we will sell the reserve should the Ospreys fail to return to breed. In this article I will give my reasons why Loch Garten and the surrounding area is a reserve in its own right, with a breeding pair of Ospreys as a worthy bonus.

The reserve, which comprises 614 ha, is situated on the floor of the Spey Valley between the Cairngorms in the south and the Monadhliaths in the west, and forms part of the larger Abernethy Forest. The topography of the area was formed during the last Ice Age, the valley floor being ground smooth by the moving glaciers, with the softer areas of rock scooped out a lot deeper to form hollows. As the ice retreated these hollows became lochs, and quite often the surrounding land, because the natural drainage had been changed by the ice and debris, became waterlogged. This situation is typical of the Loch Garten area, where two lochs form the centre of an area dominated by peat, which in many areas is quite waterlogged. Two thirds of the reserve is in the peat dominated category, with the other third made up of sands and gravels, the finer particles of glacier debris.

This mix makes the reserve rich in habitat diversity, covering four main types: Scots Pine *Pinus sylvestris* woodland, moorland, bog, and open water. This diversity helps to maintain a rich bird life, covering a total of about 110 species annually, of which about 60 regularly breed. The whole reserve is a Grade I Site of Special Scientific Interest, and, being part of Abernethy Forest, contains many of the older, natural Caledonian pines. A short walk from the road by Loch Garten, along the western shore, will take you through a mixture of pine types, from dense naturally regenerated pine to open mature pine about 80-100 years old, and with a fringe of trees along the loch side in the 150-180 year old range, natural descendants from the ancient woodland that once covered the whole of the Highlands. By working through pollen deposits in the peat it has been found that Scots Pine has been present in the Loch Garten area since the vegetation re-formed after the last Ice Age, 7-8,000 years ago, and many of the relict species dependent on native pine woodland occur, usually in good numbers.

A morning walk early in the year from the roadside by Loch Garten along the western shore and on to the second loch within the reserve, Loch Mallachie, would probably reveal the smaller woodland resident birds still in their winter flocks. Coal Tits will be the commonest, with varying numbers of Goldcrests, Crested Tits, Treecreepers and the occasional Blue Tit. Blue Tits, whilst joining the winter flocks in the woods, do not stay there to breed. They favour the birch *Betula* woodland around the farms. If the cone crop is good, Scottish Crossbills will usually be in residence and if your visit is in late March they will probably be sitting on eggs. If there is snow on the ground, evidence of the less obvious residents will be found. Foxes *Vulpes vulpes* have regular routes on the paths between the lochs, as their tracks will show, and both Roe *Capreolus capreolus* and Red Deer *Cervus elaphus* tracks will be seen. If the snow is late in lying, Capercaillie tracks will show that the males have started lekking, as their footprints will be accompanied by evidence of their wings, held down from the body, trailing in the snow.

At whatever time of year a visit is made, a walk down the track to Loch Mallachie will probably be the most rewarding. From April to June I carry out a common bird census (CBC), covering different areas of the reserve, and the mature woodland on the way to Loch Mallachie contains the densest breeding populations. Our commonest breeder by far is the Chaffinch, followed by Coal Tit or Willow Warbler, and, depending on the severity of the winter, Goldcrest, Treecreeper and Wren. As yet, there has not been any detailed census

work on the moorland section of the reserve, but in any year the Meadow Pipit would feature well up the list.

Apart from the commoner residents, the woodland holds good breeding numbers of summer visitors. The Siskin, a summer visitor in this part of the world, has bred in good numbers in some years, and up to 30 pairs of Redstarts are spread fairly evenly over the woodland part of the reserve. Spotted Flycatchers tend to like the more mature open woodland, and though not as common as the Redstart they are well represented. Pied Flycatchers, a rare species locally, have attempted to breed in two years recently, the first attempt failing due to predation by a Red Squirrel *Sciurus vulgaris*, and the second attempt failing because of the lack of food during a very cold summer. Whinchats also breed, usually close to the Osprey hide, and Tree Pipits, though not common, liven up the more open areas in the woods with their parachuting song flights.

In any year the reserve supports four species of First Schedule protected birds. Three of these comprise the birds most sought after by visitors to the reserve, namely Osprey, Scottish Crossbill and Crested Tit, the fourth in this group being Sparrowhawk. The Osprey is relatively easy to see, the present nest site having been used since 1959. A large hide at the site is fully equipped with powerful binoculars to allow visitors intimate views of the birds throughout the breeding season. But for Scottish Crossbill and Crested Tit more effort is required. Again, the best area being from the road end of Loch Garten down the track to Loch Mallachie.

Crossbills, though often overlooked, are easiest to find when they are feeding in noisy family groups or later in the year when they have gathered into small flocks, when their constant harsh *chip* call and constant cascade of empty pine cones help to locate them. Probably the best time is late May and through June when the cones are ripe and the small flocks have started to form. Crested Tits on the other hand are usually quite easy to locate, either in the winter flocks or during the breeding season. The call is a high pitched trill, very obvious once heard, and with the birds almost oblivious to the quiet visitor, very good views can be obtained. The early part of the breeding season—April and May—is perhaps the noisiest as the birds call to one another during nest building and courtship feeding and to proclaim their territory, and again in late May and June as the young are being reared. As mentioned earlier, these birds are specially protected and a licence is required to visit their nests.

One other species that is looked for, often in vain, is the Capercaillie. Early morning walks in the woodland around

Abernethy should reveal a bird, though usually a tail-end view as it crashes off through the trees. Probably the best way to see these elusive birds is to use a car as a hide and drive round the roads in the hope that a bird feeding on grit by the roadside can be found. A careful approach, remaining in the car, will usually afford the best views without disturbing the bird. Its status in the reserve appears to be quite healthy and each year 13-15 nesting territories are located. But the most impressive Capercaillie sighting so far occurred in 1978 when 26 birds were seen attending one lek, six of which were males in full display. There is usually one case each year of a male Capercaillie landing on the Osprey nest to display. If the female Osprey is on eggs she does not take readily to this kind of intrusion and either the male will chase the Capercaillie off or she will do it herself. During an incident in 1976 the female hit the displaying Caper so hard that he fell to the ground stunned, injuring himself so much that we had to put him down.

During the breeding season both lochs are fairly quiet, with only a handful of Mallard breeding, along with Tufted Duck, Teal and occasionally Wigeon. Water Rail probably breed on Loch Mallachie, with the odd pair of Reed Buntings and a single pair of Sedge Warblers. However, during the autumn and winter, until they freeze that is, the lochs are used by roosting wildfowl, both during the day and at night. Over the last couple of winters at dusk the traffic in and out from Loch Garten has been busy. Up to 1,000 Greylag Geese have been roosting on the loch each night, and as they fly in 300-400 Mallard are just flying out, heading for their feeding areas. Goldeneye, Goosander, Wigeon, Teal and Pochard are also regulars at this time of year, and family groups of Whooper Swans regularly drop in, probably on route to Insh Marshes. Loch Garten is also a regular roosting site for up to 3,000 Black-headed Gulls during late March and April, the birds flying in from all the local breeding sites for what sounds like an all-night talk-in.

If on your walk to Loch Mallachie you look down for a while instead of up, you will find that the ground is covered by three dominant plants, Heather *Calluna vulgaris*, Blaeberry *Vaccinium myrtillus*, and Cowberry *Vaccinium vitis-idaea* the main constituents of the ground flora of many pinewoods. If your visit is in late summer when the bird populations are becoming less obvious have a closer look at the ground and you may find pinewood species such as Creeping Ladies Tresses *Goodyera repens*—a small orchid—or Intermediate Wintergreen *Pyrola media*, the commonest of three winter-greens to be found on the reserve. The list of plants to date

covers some 240 species, including a scarce pinewood plant, the Twinflower *Linnaea borealis*.

The status of beetles, moths and dragonflies has been assessed and in each case local and rare species have been found. Many of the rarer beetles are dependent on native pine and are excellent indicators of how well you are managing your woodland. Some of the local dragonflies occur because the reserve has, in places, the right association between mature timber and open water and moss covered pools. The track to Loch Mallachie is a good place to look for them. Two regulars will be the Common Blue *Enallagma cyathigerum* and Large Red Damselflies *Pyrrhosoma nymphula* but the local Northern Emerald *Somatochlora arctica* also occurs here, often resting on the pine trunks.

In such a short article I can hardly do justice to the reserve as so many things have to go unmentioned, but if you are tempted to visit you are welcome. There are no formal visiting arrangements unless a party is to be accompanied. Access is only restricted in a sanctuary area around the Osprey site during April to August. The Osprey observation post is open to the public from late April until the birds depart, usually at the end of August, from 10.00 to 20.30 daily.

Stewart Taylor, RSPB, Grianan, Nethy Bridge,
Inverness-shire PH25 3EF

Short Notes

Lesser Golden Plover in Dumfriesshire

On 23rd November 1975 at Eastpark wildfowl refuge, Caerlaverock (Dumfriesshire) our attention was drawn to a 'grey' plover amongst the Golden Plover flock. Although superficially the bird resembled a Grey Plover it was obviously not that species. After detailed observations we concluded that the bird was a Lesser Golden Plover of the American race *Pluvialis d. dominica*.

Description A little smaller than nearby Golden Plovers and noticeably slimmer. Overall coloration medium grey, the back appearing darkest. Underparts pale grey. Head well marked with distinct off-white supercilium; forehead white, especially just above beak; dark line from ear coverts to upper breast. Underwing pattern appeared similar to Golden Plover, but axillaries medium grey.

Similarities between this bird and the Fair Isle specimen (1: 68-70) were remarkable, but in view of recent observations of aberrant Golden Plovers (see following note) we urge great caution in identification of this species.

This was the third Scottish record of the species and the second of the American race. It was reported by other observers as remaining until 26th February 1976, the first British record of wintering.

ALAN BROWN, R. H. HOGG

Aberrant Golden Plover

In late July 1979 we were informed that a Lesser Golden Plover was present at Musselburgh (Midlothian) and we understood that grey axillaries, diagnostic of the species, were said to have been seen. Close observations over the following week, however, proved the bird to be an aberrant Golden Plover.

It was strikingly grey and could easily be picked out from the flock of Golden Plovers at a considerable distance. The pale supercilium was more prominent than the Golden Plovers' but overall the bird was the same size and shape. Good views of the underwing showed it to be completely white, including the axillaries. The flanks beside the join of the wing were grey, however, and it is possible that observers who obtained a brief view of the bird in flight may have mistaken this area for grey axillaries.

It is clear that observers faced with a bird superficially resembling a Lesser Golden Plover should first of all satisfy themselves that it is not an aberrant Golden Plover (see also note on similar bird on Islay, *British Birds* 71: 271-2).

ALAN BROWN, PETE ELLIS

Calandra Lark on Fair Isle

On 28th April 1978 R. A. Williams found a Calandra Lark at Field, Fair Isle. Together with other observers I arrived at the site shortly afterwards and with the aid of a tripod-mounted telescope very good views were obtained.

Description A large pale lark, perhaps a third larger than Skylarks alongside. Upperparts mid brown, pale buff edges to feathers giving streaked appearance; crown darker than mantle and more heavily streaked. Sides of face warm rufous buff contrasting with crown; pale spot between eye and malar region; inconspicuous buff supercilium from base of bill to rear of ear coverts; broad white moustachial stripe bordered beneath by thin dark brown stripe ending on sides of throat. Throat pure white; upper breast washed warm buff, darker streaks becoming heavily streaked in centre, forming pectoral band; two black crescentic neck patches blended with streaks on lower edge of pectoral band; belly white, flanks off white with a few dark streaks. Median coverts dark brown with broad buff edges forming a wing bar; greater coverts similar with broader edges; tertials pale buff with darker centres; secondaries dark brown with broad buff

edges and white tips; primaries darkest brown with narrow buff edges. Tail dark brown with prominent white outer feathers. Underwing blackish with paler axillaries and white trailing edge to secondaries. Bill heavy and bunting-like, pale horn above, straw colour beneath; eye appeared dark and legs dark flesh.

It did not call often but a *churreeep* note was heard in flight, when the large size and black underwing with white trailing edge afforded easy identification; the legs dangled in the manner of a Corn Bunting. The flight was heavy and floppy compared with that of Skylark, with broad based wings with blunt tips.

The bird frequented fields of newly sown oats and was seen to feed on oat grains and small insect larvae and earthworms. It was well camouflaged against the earth and generally kept a low stance but when alert stood erect, the white belly and dark neck patches then making it quite conspicuous. It was watched till late in the afternoon but not seen subsequently.

This would appear to be the first Scottish record and the second for the British Isles, the first being at Portland, Dorset, on 2nd April 1961. Peter Davis in Williamson's *Fair Isle and its Birds* (1965) gives a record for Fair Isle in spring about 1925 but no details were known. The species breeds throughout the Mediterranean region to Afghanistan and the northern Caspian; northern populations winter in southern parts of the range and in Egypt.

I. S. ROBERTSON

Obituary

FRANK FRASER DARLING

(23 June 1903 - 22 October 1979)

Sir Frank Fraser Darling was a Yorkshireman by birth and a Scot by adoption. His name has been synonymous for half a century with natural history and land use in the Highlands and Islands of Scotland. For 30 years he was a leading figure in the world conservation movement, travelling widely in North America and Africa to repeat in foreign settings what he first did in Scotland. His ecological work possessed visionary as well as scientific qualities and his advice was stamped with an authority born from a rare insight into natural processes as well as experimental results. He was a pessimist in the world of human devastation, to the relief of which he devoted his life and which he could never bring himself to eschew in favour of the optimistic speculator.

Frank Fraser Darling saw his life as an odyssey in the world of interaction between man and nature, fired by the ecology of Elton and conservation of Leopold. His work in Scotland which produced such classics of natural history as *A Herd of Red Deer* (1937), *Bird Flocks and the Breeding Cycle* (1938), *A Naturalist on Rona* (1939) and *Natural History in the Highlands and Islands* (1947) saw the progressive development of the naturalist-extraordinary who sought in the world of human affairs to integrate rather than separate mankind from nature. *Crofting Agriculture* (1945) and earlier works on the seasonal activities of farmers and fishermen and the care of farm animals were a contribution to human ecology which culminated in the *West Highland Survey* (1955). Though he did reach great heights thereafter, he always looked upon this as the work for which he should be remembered and was disappointed that it did not receive greater acclaim in Scotland.

The war found him isolated, reclaiming derelict land on Tanera and embittered by the social and political scene in Britain. This he describes in *Island Farm* (1943) in an unsettled period which later saw the West Highland Survey and the disruption of his family life. In 1945 he was a member of the Ramsay Committee set up to provide a blueprint for National Parks in Scotland. Nothing came of it, but he took consolation in the setting up of the Nature Conservancy in 1949 in the work of which he was to play a part as Director of the Red Deer Survey in the early 1950s.

Disenchanted with the reception of his work and ideas in Britain, Fraser Darling turned at this time to a much more sympathetic scene in America where he filled a gap left by the prototype philosopher-ecologist Aldo Leopold who died in 1948 and of whom he was a devotee. Leopold propounded a conservation ethos in the fast industrialization of the USA and Fraser Darling translated this into the environmental impacts of the industrial revolution in Britain, particularly the devastation of the Scottish Highlands, and into the excesses of exploitation of colonial territories by imperial powers which he described for Northern Rhodesia in *Wildlife in an African Territory* (1960).

He already had a well-established international reputation when in 1959 he was appointed Vice-President of the Conservation Foundation in Washington DC and played a wide ranging international role with Julian Huxley, Max Nicholson and Peter Scott from Britain, Jean-Paul Harroy from Belgium, Harold Coolidge and Edward Graham from the US, and others, in promoting the activities of the now powerful International Union for the Conservation of Nature and Natural Resources (IUCN) of which he later became a Vice-President and the recipient of IUCN's highest award, the John Philips Medal

(1975). At this time he was also created a Commandeur of the Order of the Golden Ark, Netherlands.

Though he had kept his home and family in Britain, it was not until the late 1960s that Fraser Darling moved back into the British scene. The troubles of the '40s and '50s that had marred his life had drifted away. The late '60s were marked with the countryside movement in Britain culminating in Prince Philip's Study Conference 'The Countryside in 1970'. Fraser Darling was received back like a lost elder statesman. He was appointed to the Nature Conservancy (1969-73), delivered the Reith Lectures *Wilderness and Plenty* (1969), was Knighted (1970), became a member of the Royal Commission on Environmental Pollution (1970-3) and had honorary degrees conferred by the Universities of Glasgow, Heriot-Watt, Ulster and Williams College Massachusetts, USA.

After an absence of some 30 years from Scotland except on short business visits, Sir Frank and Lady Fraser Darling returned to live in the Scottish Highlands which throughout his life he always regarded as his first laboratory. It was here successively as a student of genetics of Scottish Blackface sheep, Chief Officer of the Imperial Bureau of Animal Genetics and as a Leverhulme and Carnegie Fellow in the '30s, he had made his name as a scientist and naturalist. His most important ornithological contribution was in the social and breeding behaviour of seabirds, particularly gulls, postulating a relationship between the size of breeding assemblies and breeding success.

His health declined in the mid 1970s soon after he came back to live in the Highlands which he loved more than any other part of the world. During this time I had the privilege of sitting with him, recalling vignettes of Treshnish and North Rona, of the Great Smokies and Yosemite, of Amboseli and the Serengeti. I come again upon his words in *Island Years* which show his love of birds and Scotland: 'This morning had brought the welcome sound of common sandpipers to the lochans, that long-continued piping which is as moving to me as any music Pan himself might make . . . and then the ecstatic, vibrant flight over the lochan with a paean of his piping.'

JOHN MORTON BOYD

Review

Bird Families of the World edited by C. J. O. Harrison, illustrations by A. Cameron. Oxford, Elsevier-Phaidon, 1978, pp. 264, 31 x 23 cm. £9.95.

This is not just another glossy bird book, but a well thought out presentation covering description, distribution, behaviour, feeding, nest-

ing and young, economic importance, and composition of each bird family of the world, living and extinct. In most cases a representative member of the family is used as an illustration. Forty two authors have contributed to the book, many being recognized authorities. Only one bird artist is involved, but Ad Cameron has made a massive contribution with coloured illustrations of great clarity of over 900 species.

W. G. HARPER

Notice

Survey of breeding terns in Orkney and Shetland Recent localized surveys of breeding Arctic Terns in Orkney and Shetland suggest that numbers may have decreased since the last major census during Operation Seafarer. A survey is planned for 1980 and, although we will be employing two surveyors, extra help would be welcomed to ensure that coverage is comprehensive. We will be contacting counters known to visit particular colonies but anyone else who may be in these islands (or indeed any other remote part of Scotland) during June and July and who would be willing to help is asked to contact the RSPB Research Department or our local representatives David Lea (Orkney) and Bobby Tulloch (Shetland) who will be able provide instructions and recording cards. Dr L. H. Campbell, RSPB, The Lodge, Sandy, Beds.

The Scottish Ornithologists' Club

SCOTTISH BIRDS 10(7)

We are very short of copies of the autumn 1979 number of the journal and if any member does not want to keep their copy it would be most helpful if it could be handed to a branch secretary, or posted to the club secretary at 21 Regent Terrace, Edinburgh EH7 5BT; postage will be refunded. This will be greatly appreciated and may save the club having to reprint that number.

SIR LANDSBOROUGH THOMSON'S AUTOBIOGRAPHY

The typescript of Sir Landsborough Thomson's autobiography, which he entitled *The Romance and Science of Birds*, has now been deposited by his literary executors in the club library where it may be consulted. Besides giving a detailed account of the long and distinguished career of one of the founding fathers of modern ornithology, the text is an invaluable source of information on the development of ornithology and conservation over the first three quarters of the twentieth century.

Conference News

SOC conference, North Berwick, October 1979 The theme of the 1979 conference was Scotland and the Arctic which, despite recent winters, are not synonymous. It seemed a popular choice judging by the number of contributors to Friday's informal slide show who chose to dwell on

their own Arctic experiences. I suspect that Friday evening is often the highlight of the weekend for many members because it captures the informal club atmosphere so well. The SOC is greatly indebted to Bobby Smith and his team who work the projector while the rest of us relax. The quality and variety of the slides improves every year and a record 14 members participated. Unfortunately the commentaries did not always match the photography. Some people overran their time and a few had trouble focusing their slides along with their jokes, probably due to the limited optical qualities of brewer's glass.

On Saturday morning Jeremy Greenwood introduced the theme of the Arctic and how wildlife adapts to its rigorous conditions. The introduction is probably the hardest talk to give but after a detour through the tropics he presented a comprehensive and lucid review of the themes that interest biologists in the Arctic as well as his own work on Snow Buntings. Malcolm Ogilvie followed with the birds common to both Scotland and the Arctic. This remit was really too wide to allow in-depth discussion of species such as Barnacle Geese that have been intensively studied. Harry Green rounded off the morning on Greenland waders in Britain and showed remarkable composure for someone speaking at his first SOC conference with his best slides somewhere in the post.

Sunday morning started with John Innes on the Cambridge expedition to Norway's Hardangervidda to study breeding waders. The main Scottish connection was colour ringed Purple Sandpipers and at least one of these birds visited North Berwick ahead of the speaker. We saw many interesting slides of habitat and nesting waders but not enough of the expedition's results. Next, Chris Spray gave a well presented talk on Mute Swans in the Hebrides. Although introduced, these are now wilder than mainland birds and large neck collars are needed to identify individuals in the field. So far they have escaped the effects of vandalism and pollution but not overhead cables which kill many birds from non-breeding flocks. David Merrie then described how, with a variety of helpers, and materials ranging from plastic containers to lumps of turf, he has created nest rafts for divers. These are most useful on lochs where the banks are subject to human disturbance or fluctuating water levels. Both Red- and Black-throated Divers have used the rafts and the scheme seems very promising.

Finally Hugh Boyd introduced a Canadian Wildlife Service film on Greater Snow Geese which combined good photography with a rather banal soundtrack. This was remedied in his follow up talk which concentrated on problems of censusing geese and the influence of shooting on American wildfowl management.

Conference closed with President Valerie Thom proposing the customary, but entirely justified, thanks to the contributors and staff. It was the third successful North Berwick conference but a few doubts remain and some surfaced at the AGM. Not everyone secured places and many of the younger and more active Scottish ornithologists weren't there. The talks concentrated too much on the Arctic and we heard little on what the birds do when in Britain. Why not, just for a change, have a conference on those local birds that are within reach of everyone?

STANLEY DA PRATO

Scottish ringers' conference, Glasgow, November 1979 For the second time a format of a day and a half proved very effective. The series of talks on Saturday and Sunday was complemented by an informal gathering in the University College Club on the Saturday evening. This gave the opportunity for renewing acquaintances and discussing topics of mutual interest. As usual the talks ranged over a wide variety of species. The main emphasis was on raptors and seabirds together with a strong

interest in waders and a couple of passerines thrown in for good measure.

Sparrowhawks (Mick Marquiss), Kestrels (Gordon Riddle and Andy Village) and Merlins (Brian Little and Eric Meek) have all been the subject of intensive study with techniques such as radio telemetry as well as superbly organized team efforts. Items on House Martins (David Bryant) and Grey Wagtails (Mike Nicholl) made sure passerines were not forgotten and the seabird contributions were on Arctic Skuas (Bridget Furness), Storm Petrels (Eddie Maguire) and Shags (Hector Galbraith and Bob Swann). Peter Evans outlined the Durham University studies of waders at Teesmouth, providing much food for thought for the increasing number of Scottish ringers interested in waders. Keith Brockie gave us a number of breeding waders from the high tops in Norway.

A feature of all the Scottish ringers' conferences has been 'The view from headquarters' and this year it was Bob Spencer's turn to travel north from Tring. The major recent development has been the computerization of handling recoveries which should enable the BTO staff to undertake more analyses in future.

Altogether a most enjoyable weekend and full marks to the Clyde Ringing Group for efficient organization and excellent domestic arrangements. This was in spite of considerable uncertainty caused by so many people arriving virtually unannounced, and causing some headaches with the catering. One hopes that ringers will show consideration by booking in good time for the 1980 conference in Dundee to be organized by the Tay Ringing Group—who started the whole thing going with the first conference in 1975.

A. R. MAINWOOD

Current Notes

These notes include unchecked reports and are not intended as a permanent record, nor will they be indexed. Please send reports via local recorders at the end of March, June, September and December.

Good numbers of thrushes arrived in October with a sprinkling of rare warblers such as Blyth's Reed, Booted and two Radde's. Both Isabelline Wheatear and Isabelline Shrike also occurred. Exotic wildfowl including Black Duck, Red-crested Pochard, Canvasback and Barrow's Goldeneye appeared in autumn and winter, although the enjoyment they provided was tarnished by the inescapable possibility of captive origin.

Cory's/Great Shearwater Peterhead (Aber) 3 Oct. **Sooty Shearwater** 350 Fair Isle 8 Sep, 300 on 10th. **Storm Petrel** one trapped in wader net at night, Dalmeny (W Loth) 1 Sep. **White-fronted Goose** European *A. a. albifrons* Collieston (Aber) 14 Oct. **Snow Goose** 6 Ythan-Strathbeg (Aber) October; one Aberlady (E Loth) December. **Barnacle Goose** Fair Isle max 65 on 1 Oct; 550S Strathbeg and 100S Drums (Aber) 5 Oct; Fife max 60S Fife Ness 5 Oct. Six species of goose in one flock at Rattray (Aber) 6 Oct: **Greylag**, **Pink-footed** (one biscuit coloured) 30 **Barnacle**, **Brent** Pale-bellied *hrota*, 2 European **Whitefront**, blue (intermediate) **Snow**. **Black Duck** Paisley (Renf) late Dec (1st for Scotland). **Red-crested Pochard** Kilconquhar (Fife) into November at least. **Canvasback** ♂ West Linton (Peeb) 8 Oct (1st British if accepted as wild bird). **Steller's Eider** still resident South Uist (O Heb) September. **Surf Scoter** Southernness (Kirk) mid Dec-Jan. **Barrow's Goldeneye** Irvine (Ayr) Nov-Dec (same comment as for Canvasback). **Quail** Rattray 13 Oct. **Dotterel** Fair Isle 5th and 20 Sep. **Temminck's Stint** Fair Isle 14-19 Sep. **White-rumped Sandpiper** Musselburgh (Midl) c.19 Oct. **Pectoral Sandpiper**

Fair Isle 11 Sep. **Curlew Sandpiper** small influx September. **Jack Snipe** 15 Fair Isle 14 Oct. **Woodcock** 50 Fair Isle 22 Oct, 110 on 29th. **Whimbrel** late one Musselburgh 29 Oct. **Greenshank** 33 Eden estuary (Fife) 25 Aug. **Red-necked Phalarope** Fair Isle 16 Sep. **Grey Phalarope** Valley Strand (N Uist) 19 Sep; Fair Isle 26 Sep; 2 L Bornish (S Uist) 2 Oct. **Arctic Skua** Ythan 10 Nov. **Long-tailed Skua** Lochmaddy (N Uist) 15 Aug. **Mediterranean Gull** Seafield (Midl) 2 Jan. **Sabine's Gull** Fair Isle 16 Sep. **Ring-billed Gull** Irvine 1 Jan (3rd for Scotland). **Sandwich Tern** Musselburgh 17 Nov; Yellowcraig (E Loth) 2 Dec. **Turtle Dove** singles S Uist 28 Sep-10 Oct. **Short-eared Owl** 11 Fair Isle 29 Oct. **Wryneck** odd ones Fair Isle-St Abbs (Ber) early Oct. **Short-toed Lark** Fair Isle 3rd, 15-21 Oct. **Shore Lark** St Abbs 7 Oct; Fair Isle 18 Oct; Bridge of Don (Aber) 17-23 Nov. **Swallow** Inverallochy (Aber) 1 Dec. **House Martin** Old Aberdeen 6 Nov. **Richard's Pipit** 53 bird-days Fair Isle 1-26 Oct, 10+ individuals, max 5 on 6 Oct; one Girdleness (Kinc) 13 Oct. **Citrine Wag-tail** Fair Isle 2-4 Oct. **Waxwing** 2 Ythan 13 Oct; 2 Stonehaven (Kinc) 24 Nov; 3 Hillhead (Aber) 25 Nov. **Robin** 50 Fair Isle 6 Oct. **Black Redstart** Rattray 28-29 Oct; Peterhead 29 Oct; Girdleness 27 Oct-5 Nov, 2 on 30 Oct; Fife Ness 5 Oct; St Abbs 7 Oct; (but none Fair Isle all autumn). **Redstart** 25 Fair Isle 6 Oct; 50 Rattray 6 Oct; 25 Foveran (Aber) 7 Oct; late one St Abbs 27 Oct. **Stonechat** Siberian *maura/stejnegeri* Foveran 1 Nov. **Isabelline Wheatear** Girdleness 17 Oct-10 Nov, trapped 23 Oct (1st Scottish, 3rd British). **Wheatear** 200 Fair Isle 8 Sep. **Ring Ouzel** 7 Fife Ness 2 Oct; 12 Fair Isle 14 Oct. **Blackbird** 300 Fair Isle 14 Oct, 500 on 29th. **Fieldfare** 2,000 Fair Isle 14 Oct, 8,000 on 29th. **Song Thrush** 2,000 Fife Ness 2 Oct; 1,400 Fair Isle 13 Oct. **Redwing** 1st 3 Garrynahine (Lewis) 27 Sep; 1,000+ Fife Ness 2 Oct; 15-20,000 'thrushes' Brent Field (North Sea) 13 Oct; 65,000 Fair Isle 14 Oct (most ever). **Lanceolated Warbler** Fair Isle 20 Sep. **Blyth's Reed Warbler** trapped E Mainland (Ork) 5-8 Oct (1st for Scotland since 1928). **Reed Warbler** (or Marsh) 4 Aberdeen area 3-8 Oct; St Abbs 6-7 Oct, late 3 on 27th. **Booted Warbler** Newburgh (Aber) 13-16 Oct. **Icterine Warbler** Fair Isle 8 Sep; Fife Ness 2-7 Oct. **Subalpine Warbler** Fair Isle 4 Oct. **Barred Warbler** 5 Fair Isle 8 Sep, singles 29 Sep, 1 Oct; Orkney early Oct. **Garden Warbler** 22 Fair Isle 7 Sep; late one St Abbs 27 Oct. **Blackcap** 20 Drums (Aber) 5 Oct; 20 Rattray 6 Oct; 100+ Fife Ness 5-7 Oct; 60 Fair Isle 29 Oct. **Arctic Warbler** Fair Isle 30 Sep; possible Strathbeg 5 Oct. **Pallas's Warbler** Fair Isle 6 Oct; Girdleness 16 Oct. **Radde's Warbler** trapped Fife Ness 5 Oct; Cruden Bay (Aber) 7 Oct; (4-5th for Scotland). **Chiffchaff** 35 Rattray 6 Oct. **Goldcrest** low numbers, max 60 Rattray 6 Oct. **Spotted Flycatcher** late one Girdleness 27 Oct. **Red-breasted Flycatcher** only reports Girdleness 5 Oct, Drums 6 Oct. **Pied Flycatcher** low max 17 Fair Isle 7 Sep. **Isabelline Shrike** Fair Isle 26 Oct (3rd Scottish). **Red-backed Shrike** Fair Isle 8 Sep; Drums and Sandford Bay (Aber) 7 Oct. **Great Grey Shrike** few: 5 Orkney-Fife; (none Fair Isle all autumn). **Jackdaw** 270 Fair Isle 22 Oct. **Siskin** 40 Foveran and 60 Whinnyfold (Aber) 7 Oct. **Scarlet Rosefinch** 7 Fair Isle during 1 Sep-6 Oct; Drums 6 Oct; Cruden Bay mid Oct. **Bullfinch** Brent Field c.13 Oct; 2 Northern *P. p. pyrrhula* Don (Aber) 27 Oct. **Lapland Bunting** 8 Fair Isle 29 Oct; Girdleness 2-5 Oct and 24 Oct; Don 9-10 Oct; 9 Greg Ness 20 Nov, 3 on 24th; Musselburgh max 30+ on 16 Dec. **Little Bunting** 2 St Abbs 2-4 Oct; Fair Isle 6-8th, 13th Oct. **Yellow-breasted Bunting** Fair Isle 9 Sep, two 29-30th, one 1 Oct.

Late news—**Ring-necked Duck** ♂ Woodend L, Coatbridge (Lan) from 19 Jan; ♂ L Ryan (Wig) 27 Jan. **King Eider** ♂ L Ryan from Dec.

D. J. BATES

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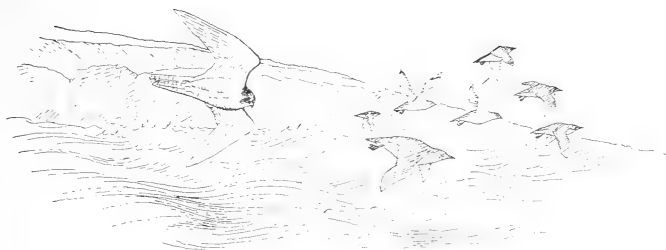
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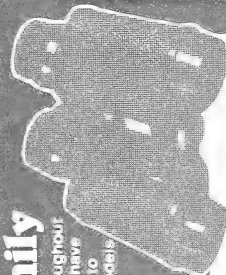
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Volume 11 No. 2

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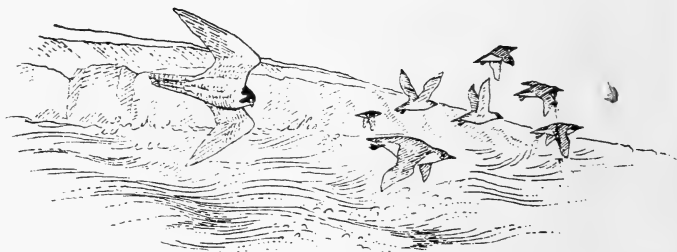
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Vol. 11 No. 2

Summer 1980

Edited by D. J. Bates

Golden Eagles on Rhum

P. CORKHILL

(Plates 6-7)

Rhum is one of the few places where Golden Eagles feed to any extent on seabirds. This study indicates that, as with coastal breeding Peregrines, toxic chemicals from the marine food chain are depressing breeding success years after the performance of inland pairs has returned nearly to normal. The results are of even greater interest in view of the current attempt to reintroduce Sea Eagles to the area.

The island of Rhum lies 24 km west of Mallaig (Inverness-shire). Most of its 10,000 ha are mountainous, reaching an altitude of 800 m. Prior to its establishment as a nature reserve in 1957 the island had been managed as a sporting estate. Evans and Flower (1967) recorded that until 1886 at least five pairs of Golden Eagles bred but thereafter persecution was heavy and possibly none nested successfully until the early 1950s. Thereafter persecution was reduced and at least three pairs were reported to rear an eaglet each year prior to 1957. Since 1957 wardens on Rhum have kept an annual check on the breeding population. In view of the Nature Conservancy Council's current project to reintroduce the White-tailed or Sea Eagle it is important to document the existing status of Golden Eagles. For security reasons details of breeding localities are not included.

Nest sites

It is well known that Golden Eagles normally have several eyrie sites within the breeding territory, only one of which is used in any given year. On Rhum 20 nest sites are known from four breeding territories and the variation within each territory may be from a few metres to 3 km apart. All nest sites are on rocky mountain ledges or sea cliffs and vary greatly in their aspect, altitude and accessibility. At least one

Table 1. Breeding success in four territories in four five-yearly periods 1957-76

	No. of years territory occupied	No. of years breeding attempt recorded	No. of years failed	Total young reared	Young per breeding attempt	Young per occupied territory per year
Territory A						
1957-61	4	4	3	1	0.25	0.25
1962-6	5	5	5	0	0	0
1967-71	4	3	2	1	0.33	0.25
1972-6	5	5	3	2	0.4	0.4
Average					0.24	0.22
Territory B						
1957-61	5	4	2	2	0.5	0.4
1962-6	3	2	0	2	1.0	0.66
1967-71	5	3	0	3	1.0	0.6
1972-6	5	5	4	1	0.2	0.2
Average					0.57	0.44
Territory C						
1957-61	3	2	2	0	0	0
1962-6	4	3	2	1	0.33	0.25
1967-71	3	1	1	0	0	0
1972-6	5	4	4	0	0	0
Average					0.1	0.06
Territory D						
1957-61	5	4	1	3	0.75	0.6
1962-6	3	2	1	1	0.5	0.33
1967-71	5	4	2	2	0.5	0.4
1972-6	4	3	2	1	0.33	0.25
Average					0.54	0.41
Total	68	54	34	20	0.37	0.29

is known to have been formerly occupied by Sea Eagles and other sites on the sea cliffs would seem to be suitable for either species.

Breeding success

Initially each season one or two visits were made to each site to determine which nests were in use and whether incubation was in progress. These nests were visited later, when the chicks would be growing, to record progress and ring any eaglets in accessible sites. A further visit was sometimes made after fledging to search for food remains. With this level of surveillance some breeding attempts that failed at an early stage may have escaped detection, but it is unlikely that any successful breeding went undetected.

Throughout the 20 year period three or four pairs were present each breeding season but it was sometimes difficult to decide if a territory was occupied by non-breeding birds since it is not clear to what extent vacant hunting ground, perches and roosts may be used by birds from adjacent territories. For the purpose of this paper I have recorded an occupied territory following the regular sighting of one or more adults during the breeding season, nest building activity, or the presence of regularly used roosts as indicated by droppings and pellets.

Table 1 details the breeding success in the four territories (A, B, C, and D) over the 20 years 1957-76, subdivided into four five-year periods. Information is available for 68 territory-years, including 54 breeding attempts when a nest was built or an existing nest repaired. The average number of chicks produced per breeding attempt was 0.37 per year (0.29 per occupied territory per year).

Comparative information on the breeding success of Golden Eagles elsewhere in Scotland during this period is available in Everett (1971), in Lockie & Ratcliffe (1964) and in Lockie *et al.* (1969). Everett's data are directly comparable and show that breeding success on Rhum was poor when related to an average breeding success of 0.58 young per breeding pair (0.47 per occupied territory) for seven areas in Scotland during the period 1964-8. In fact only Galloway (0.19 young per breeding pair), fairly recently colonized by Golden Eagles and suffering a high level of human disturbance, had poorer success.

More information about the causes of failure is available for 28 attempts (table 2). Most nests containing broken eggs were found in the early 1960s and of these one clutch was discovered half eaten, apparently by the eagles themselves. Addled eggs that were subsequently deserted were a regular

Table 2. Causes of failure in 28 breeding attempts for which information is available

Nest prepared but no eggs produced	Eggs broken in nest	Eggs added and later deserted	Chick died
5	9	12	2

feature of breeding failure and were collected whenever possible for toxic chemical analysis. Four possible explanations for the poor reproductive performance of Golden Eagles on Rhum present themselves for consideration: (1) human disturbance, (2) a senile population, (3) an inadequate food supply, (4) contamination by toxic chemicals.

Human disturbance

Human disturbance is not considered to have been a contributory factor to breeding failure on Rhum. In general, nest sites are not well known and are in areas little frequented by the general public. Visitor pressures on the reserve have not been excessive and on two occasions when a pair did nest in a relatively busy locality they were successful. A possible exception to this general rule was territory C in some seasons.

Senility

The explanation that the Rhum Golden Eagle population consists of old individuals resident since the relaxation of persecution also seems unlikely. There is evidence of population turnover in the past 20 years: the corpses of four adults have been found, another distinctive female has disappeared from the population, and in another territory a paired bird showed traces of immature plumage. The decline in breeding success has not been progressive (table 3) as might be expected in a population becoming senile, and senility as a factor limiting breeding performance has not emerged in studies of other long-lived birds.

Table 3. Breeding success in four five-yearly periods 1957-78

	1957-61	1962-6	1967-71	1972-6
No. of breeding attempts	14	12	11	17
No. of young reared	6	4	6	4
Young reared per breeding attempt	0.43	0.33	0.54	0.23

Food supply

The question of whether the available food supply on Rhum is adequate to maintain an active breeding population of

Golden Eagles is one that demands careful consideration and two factors are especially relevant. A considerable flock of sheep was held on the island prior to its purchase by the Nature Conservancy, with numbers fluctuating from 1,500 to over 5,000, and some small mammal species usually preyed upon by eagles in Scotland, especially lagomorphs, are not present on the island.

Information on the food available to eagles on Rhum is documented in published accounts and the reserve records. Lockie & Ratcliffe (1964) noted that over large areas of western Scotland where other prey are deficient eagles survive by eating the calves of Red Deer *Cervus elaphus* and deer carrion. The pre-1957 food supply on Rhum was augmented by a substantial sheep flock and latterly Red Deer numbers were similar to today, having been reintroduced to the island after the crofting era. During the period 1957-76 the Red Deer population fluctuated around 1,200-1,600 as recorded by the annual spring census.

Management has been directed towards maintaining a stable population of c.1,500 and in most seasons 150-200 adults are culled, their entrails, which are readily eaten by the eagles, providing a regular source of carrion from early August to late December when natural deer mortality is normally low (Lowe 1969). It has been normal management practice, when resources allow, to search in spring for deer corpses. Lowe showed that most mortality occurred in late winter and early spring and that the severity of winter weather is important. He calculated annual mortality rates of 3.5% for hinds and 3.2% for stags resulting in 50 corpses in an average year due to natural mortality.

In spite of a healthy population of Ravens and Hooded Crows a great deal of this carrion remains on the hill uneaten (pers. obs.). Deer carcasses are found well scattered around the seaward fringes of the island and in late winter and early spring the flesh stays fresh and palatable to the eagles for as long as two to three weeks. The period when newborn deer calves are available to the eagles extends from late May to July but most calves are normally born in June (F. Guinness pers. comm.).

A thriving population of feral goats frequents the western sea cliffs and management has been directed towards maintaining a population of c.100, thus confining them to their traditional grazings. This has normally entailed an annual cull of 10-20 individuals, the carcasses being available to the eagles during the autumn and winter. Goat kids are usually born during January to March on Rhum, when severe weather must

Table 4. Diet in four territories in winter and summer 1957-76

	A		B		C		D		Total W	Total S	Total year
	W	S	W	S	W	S	W	S			
Red Deer adult	22(21)	-	11(10)	1(1)	21(19)	1(1)	20(18)	4(1)	74	6	80(22.3%)
calf	-	3	-	1	-	4	-	3	-	11	11 (3.6%)
Goat	3(3)	-	4(4)	-	18(17)	3	5(4)	1	30	4	34 (9.4%)
Common Rat	12(12)	1	4(4)	-	14(13)	-	6(4)	2	36	3	39(10.8%)
Rabbit	-	-	-	2	-	-	-	-	-	2	2 (0.6%)
Fulmar	3(2)	6	1(1)	1(1)	24(21)	30	2	3(2)	30	40	70(19.4%)
Gulls	2(2)	15	1(1)	7(2)	3(1)	2	1(1)	5	7	29	36(10%)
Manx Shear- water	1(1)	3	-	-	-	5	7(1)	20	8	28	36(10%)
Kittiwake	-	4	-	-	-	1	-	3	-	8	8 (2.2%)
Red Grouse	1(1)	12	3(3)	-	-	-	2(2)	1	6	13	19 (5.3%)
Hooded Crow	1(1)	4	-	-	-	-	-	-	1	4	5 (1.3%)
Other birds	7	3	3	2	2	2	-	1	12	8	20 (5.5%)
Total mammals	41(40%)	62(60%)	23(56%)	10(24%)	61(47%)	69(53%)	41(48%)	45(52%)	140(69%)	26(17%)	166(46.5%)
Total birds	62(60%)	62(60%)	18(44%)	18(44%)	69(53%)	69(53%)	45(52%)	45(52%)	64(31%)	130(83%)	194(53.5%)
Total seabirds (% total food items)	34(33%)	34(33%)	10(24%)	10(24%)	65(50%)	65(50%)	41(48%)	41(48%)	204	156	360(100%)

Notes Includes observations of feeding birds, items found in nests, at plucking posts and occurrence in pellets. The recording of any prey item in any of the above circumstances scores one point on the diet table, figures in parenthesis show the number of times a particular prey species was recorded in pellet form. 144 pellets were analysed of which 40 contained remains from more than one species.

A, B, C, D=territories; W=winter months October-March; S=summer period April-September.

Common Rat=Rattus norvegicus.

affect survival rates. A small number are also born during the summer.

Rhum is also well well-known as a breeding centre for seabirds with large sea cliff colonies of auks, Kittiwake, Fulmar and gulls. In addition the mountain tops contain a huge colony of Manx Shearwaters. Moorland populations of Golden Plover and Red Grouse are also available as prey.

Elsewhere in the Small Isles and within easy flying distance, sheep carrion and Rabbits *Oryctolagus cuniculus* are available, although the islands of Eigg and Canna also have resident eagles.

Information on the diet of the Rhum eagles was obtained from pellet analysis, observations on feeding birds and by searching plucking posts and nest sites for food remains. The data are presented in table 4 which contains all recorded observations over the 20 year period. Pellets were much easier to find during the winter when it was presumed the birds spent much more time at roosting sites. To detect any seasonal change in diet the year has been divided into two six-monthly periods. Records from different breeding territories are also presented separately to bring out any peculiarities resulting from differences in availability of a particular food item or preferences of individual birds. No attempt has been made to evaluate the importance of individual prey species using a weighting system of prey units because of the difficulties involved in trying to compare prey of vastly different weights (e.g. deer and Fulmar) when larger prey are often only partly consumed.

Table 4 shows that diet changed with the seasons and included a far greater proportion of mammal prey during the winter. This reflects both an increase in the amount of carrion available and the general scarcity of avian prey, since the large seabird colonies are empty for most of the winter. It is perhaps surprising that deer calves did not figure more prominently during the summer, either as carrion or as prey. Eagles are capable of killing young deer but risk attack by the hind. It seems probable that in the absence of pressures from a general food shortage the eagles prefer avian prey during the summer, usually seabirds.

It is notable that, with the exception of the Rabbit kills in territory B, all prey was available on Rhum itself. I feel sure that had the Rhum eagles been hunting elsewhere regularly then sheep carrion would have figured in the diet (see Newton 1972).

It is my opinion therefore that the poor breeding success of the Rhum eagles was not the result of deficient food supply for the following reasons.

(a) Most breeding failures (see table 2) occurred at a time of year when there was an abundance of food, as reflected by the presence of uneaten carrion on the hills and the arrival back at the breeding colonies of large numbers of seabirds.

(b) The summer crop of Red Deer calves represented an under utilized food resource indicating the eagles found it easy to provision themselves and any young at this time of year from the preferred food supply, seabirds.

(c) It is to be expected that a food shortage within the immediate breeding territory would persuade the birds to hunt further afield. There is no evidence that this occurred regularly.

(d) Eggs that failed to hatch after the normal incubation period were a regular feature of breeding failure. In studies of other species that suffer food shortage during the breeding season (e.g. some tropical seabirds) eggs and young chicks were abandoned because of the parents' inability to provision themselves and care for their nests simultaneously.

(e) Birds entering the breeding season in poor physical condition resulting from food shortage might be expected to lay later in the season. Although detailed data were not available for comparison there were no general signs of a delayed start to the breeding season on Rhum.

(f) It was rare to see more than one eagle feeding at a time on a kill or deer corpse although mated pairs regularly hunted together outside the breeding season. Had food been in short supply one would have expected to encounter larger numbers of eagles attempting to feed from a single deer corpse, with fighting taking place. This behaviour was never noted.

Toxic chemicals

Eleven eggs, mainly addled and from deserted nests, were collected under licence for analysis. The results of analyses for organochlorine insecticides in the first five eggs (in Lockie *et al.* 1969) showed an average total concentration of 3.06 micrograms per gram (mpg) wet weight, mainly consisting of DDE. These early analyses did not include searches for PCBs. The average total concentrations for 44 other eggs from Scottish Golden Eagles analysed at the same time was, however, only 1.61 ppm. PCBs were recorded in a single egg in 1971 but the recorded level of 3.0 mpg could possibly have resulted from a cracked shell allowing evaporation and concentration of the contents.

In 1975 two eggs, including one freshly laid from a clutch of two in territory C, were analysed by Dr Bogan at the University of Glasgow Veterinary School. The results showed

the usual levels of DDE for Rhum eggs (2.32 and 2.69 $\mu\text{g/g}$ wet weight) and the presence of PCBs (12.4 and 13.4 $\mu\text{g/g}$ in lipid) at noticeably higher levels than inland localities (Bogan in prep.). These levels of PCBs are not high compared to some found in seabirds but the sensitivity of Golden Eagles to PCBs is unknown.

Conclusions

The evidence, both circumstantial and analytical, suggests that the poor reproductive performance is the result of contamination by toxic chemical residues. The limited hunting ranges of the Rhum eagles in the clean environment of the nature reserve indicates that seabirds provided the only possible pathway to contamination. The fact that territory C produced the fewest chicks (see table 1) and consumed the highest percentage of seabirds, especially Fulmars (see table 4), is unlikely to be just a chance effect, especially as territory B produced the most chicks and consumed the lowest percentage of seabirds. Adult seabirds were taken as the main prey during the breeding season and therefore the eagles received their annual dose of contamination after they had already produced their own clutches. If the bulk of toxic chemical residues are being carried in the bodies of eagles during the breeding season then analysis of unhatched eggs is unlikely to provide insight into the true level of contamination. The poor reproductive performance observed may well be the result of a combination of the effects of toxic chemical contamination, affecting both the hatchability of eggs and subtle changes in the metabolism and behaviour of the eagles themselves.

Ratcliffe (1972) concluded that the lack of improvement in the breeding success of coastal Peregrines is attributable to their exposure, through seabird prey, to multiple contamination present in marine food chains. It is also interesting to note that the presence of broken eggs in nests and the consumption of their contents by the parent birds, both noted by Ratcliffe to be symptoms of toxic chemical contamination in Peregrines, have been recorded in respect of the Rhum eagles.

Elsewhere in the Small Isles the situation is similar. Swann & Ramsay (1978) have commented upon the poor breeding performance of Golden Eagles on Canna and recorded that many Fulmars are taken as prey. On Eigg, where two pairs of eagles normally attempt to breed, success has been mixed. One pair which take substantial numbers of Fulmars have had poor success in recent years (D. Ferguson pers. comm.) but the second pair recorded as taking Rabbits and sheep carrion have been more successful and probably reared two young

in 1976. There are no substantial seabird colonies within the territory of the latter pair.

It is difficult to ascertain whether the present rate of reproduction by eagles on Rhum is sufficient to maintain the population when so little is known about adult and juvenile survival rates. Everett (1971) tentatively suggested that an annual reproductive rate of 0.5 young per pair may be adequate to maintain a viable adult population. If this figure is correct the rate on Rhum of 0.37 young per breeding pair/0.29 per occupied territory is insufficient to maintain the population without immigration from areas where breeding success is higher.

Acknowledgments

I wish to thank P. Wormell for allowing me to use unpublished information, G. MacNaughton for showing me eagle breeding sites, past and present, and Dr J. A. Bogan of the University of Glasgow Veterinary School for allowing me to use unpublished data. Many people, especially J. Love, provided field observations. Thanks are also due to Dr C. M. Perrins and T. Greer of the Edward Grey Institute for helpful comments on the first draft of this paper.

Summary

Breeding success and feeding habits of the three or four pairs of resident Golden Eagles on Rhum have been recorded for 20 years. Breeding success has been generally poor and an examination of the possible causes for this strongly suggests that contamination by toxic chemicals through marine food chains and seabird prey is depressing reproductive performance.

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GOLDEN EAGLE
AND MANK
SHEARWATERS

J. A. LOVE

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The impact of an oilspill in the Firth of Forth on Great Crested Grebes

LENNOX CAMPBELL

(Plate 5)

Oil and troubled waters again. A small leak caused nearly 1,400 casualties including at least two thirds of 300-350 Great Crested Grebes in the Forth. Scotland's breeding population is only 150 pairs and the Forth is a major wintering area. How much damage had been done?

In February 1978 a small spillage of oil at Leith Docks (Midlothian) affected more than 1,387 birds of 27 species. Most severely hit were Scaup (220), Pochard (244), Eider (179), Guillemot (100) and 241 Great Crested Grebes (subsequently referred to simply as grebes) of which at least 200 died. Full details have been given by Campbell *et al.* (1978). Whilst the overall impact of this incident was unlikely to be great, considerable alarm was expressed at its possible effects on the small Scottish breeding population of Great Crested Grebes, which Smith (1974) estimated to be about 150 pairs in 1973.

Accordingly the SOC rapidly organized a survey of the breeding population during 1978, the results of which are summarized in this paper. Data on the wintering population within the Firth of Forth (mainly collected by the author since 1974) are included to enable the impact of the incident to be viewed in a wider perspective.

The wintering population in the Firth of Forth

Flocks have been regularly recorded at Seafield (Leith) and scattered 10 km east to Cockenzie (East Lothian) since at least 1960, with peaks over 500 in several winters since 1964. However, it is only recently that it has become clear that large numbers may be present for several months each winter, not only at Seafield but also 5-10 km west at Silverknowes (Midlothian), between Cramond and Granton. For much of the day feeding grebes are widely dispersed but tend to concentrate into relatively dense groups in late afternoon when they are most easily counted and when peak numbers are invariably recorded.

Peak counts since 1974/5 are shown in table 1. Numbers from Seafield eastwards have remained similar in recent years but there are firm indications that Silverknowes has been increasingly important. Peak numbers tend to be recorded at Seafield and eastwards in December or January but at Silverknowes the peak is usually not before February. Although insufficient detailed data are available the two flocks are obviously closely inter-related and do not constitute discrete groups.

Table 1. Peak counts of Great Crested Grebes each winter

	1974/5	1975/6	1976/7	1977/8	1978/9
Silverknowes	109(F)	113(M)	385(F)	204(D)	545(F)
Seafield-Cockenzie	427(D)	405(J)	583(D)	474(D)	508(J)*

*Count by P. A. Hockey; all others by L. H. Campbell. Month of peak in brackets (December-March).

It is not known whether the same individuals remain within the Forth throughout the winter, but there are indications that there may be a regular turnover. Generally numbers tend to fall in January and early February before a second, late winter peak. That this second peak may represent an influx of new birds was clearly demonstrated by events after the 1978 oil spillage. Following the death of at least 200 of an estimated 300-350 birds present in early February, numbers rose to 561 (435 Seafield eastwards, 126 Silverknowes) in late February, much as usual for the time of year. Although small numbers of grebes winter elsewhere in the Forth (e.g. Blackness, Bo'ness, Largo Bay) simple redistribution of these would not account for increased numbers at Silverknowes and Seafield. Indeed, numbers at these alternative sites also tend to rise in late winter. Thus although a large proportion of grebes present at the time of the incident were killed, this mortality

represented a considerably smaller proportion of total numbers visiting the estuary throughout the whole winter.

The Scottish breeding population in 1978

Despite the short notice at which the survey was arranged, local recorders were able to organize reasonably comprehensive coverage and the results are shown by county in table 2.

Table 2. Breeding distribution of Great Crested Grebes

Number of pairs recorded on :

	Lochs covered in both surveys						Lochs covered in one survey only	
	Pairs in both years		Pairs in one year only		1973	1978	1973	1978
	1973	1978	1973	1978				
Aberdeenshire	4	(2)	2	2(1)				
Angus	6	(3)	5-6					6(3)
Ayrshire	2-3	(2)	3	2(2)				
Clackmannanshire								3(1)
Dumfriesshire	3	(1)	1				5(4)	
Fife	15	(4)	17	7(7)	2(1)			
Kinross-shire	2-4	(1)	16					
Kirkcudbrightshire	9-10	(5)	5+				1(1)	3(3)
Lanarkshire							8(7)	
Midlothian	5	(5)	5	1(1)	2(2)			
Peeblesshire	1	(1)	1				1(1)	
Perthshire	24	(9)	23	7(4)	1-2(2)	7-8(3)		3(3)
Renfrewshire	10	(5)	7-10	1(1)		6(4)		2-4(3)
Roxburghshire	2	(1)	1			1(1)		
Selkirkshire	2	(2)	2		4(4)			5(5)
Stirlingshire	5	(4)	6-7	1(1)			2(1)	2(1)
West Lothian	4	(1)	3-5					
Wigtownshire	1	(1)	1				6(2)	
Totals	95-99	(47)	98-105	21(17)	9-10(10)	37-38(24)		24-26(19)

- Notes 1. The number of lochs on which pairs occurred are shown in parenthesis.
 2. All dates for 1973 are taken direct from the table in Smith (1974).

Table 3. Summary of Great Crested Grebe censuses

		Lochs covered during :		Total
		Both surveys	One survey only	
1973	Pairs	116-120	37-38	153-158
	Lochs	74	24	98
1978	Pairs	107-115	24-26	131-141
	Lochs	74	19	93

Lochs known to have been visited during both surveys have been separated from those visited only once or where data for one year are uncertain. The results are summarized in table 3.

Two points should be borne in mind when comparing the results of the two surveys. Firstly, some lochs may have changed in their suitability as breeding areas. For instance, as a result of greatly increased disturbance one loch that held four pairs in 1973 held none in 1978. Conversely, one did not actually exist in 1973 and held two pairs in 1978. Secondly, because of the rushed nature of the more recent survey many of the 24 lochs visited only in 1973 probably held some pairs in 1978. However, it is less likely that many of the 19 lochs visited only in 1978 held pairs in the earlier survey.

With these points in mind it is suggested that the breeding populations in both surveys were similar, lying between 150 and 160 pairs. County by county there were no consistent trends. Declines in the two main strongholds, Perthshire and Fife, were offset by increases in other areas, such as Selkirkshire and Kinrossshire (Loch Leven). Data for intervening years supplied by some observers indicated that there may have been some localized increases in numbers and that 1978 levels were in fact lower than the immediately preceding years. For instance, there were between 20 and 30 pairs on Loch Leven in 1977 but only 16 in 1978 and up to four in 1973. However, there was nothing to suggest that such changes were general.

It is also evident that many lochs hold breeding pairs irregularly. At least 27 (probably more than 40) of the 117 lochs holding breeding pairs did so in one of the survey years only, which emphasizes the importance of comprehensive coverage in surveys of this species.

Several recorders reported low breeding success in 1978 but this was certainly not a general observation. For instance, four young were reared in Midlothian, the first for many years. In fact, in comparison with 1973, which was itself a poor year, 1978 was notably better (69 young recorded as opposed to 33 on lochs covered in both surveys). Similarly, despite the less comprehensive nature of the recent survey, more unmated birds were recorded in total (at least 40 compared with 30 in 1973).

Discussion

The data above clearly show no evidence of any immediate effect on the Scottish population of grebes. Total breeding numbers, the numbers of non-breeding birds and the size of the winter population in 1978/9 were all similar to, or in excess of, levels prior to the oiling incident. However, three quarters of the corpses examined were first year birds (Camp-

bell *et al.* 1978) and since first breeding may be deferred until the second year (Cramp *et al.* 1977) the impact of the oiling might not be evident until several years after the incident.

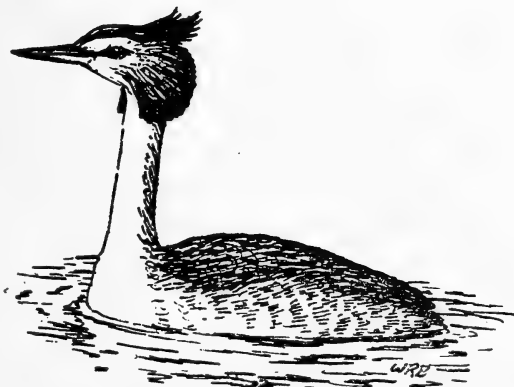
It is thought more likely that the majority of birds wintering in the Forth are immigrants and that Scottish breeders do not return until the second half of the winter. From mid February onwards increasing numbers of displaying birds in breeding plumage are present both on the sea and on some of the breeding lochs inland.

In the wider European context, the numbers killed in the incident must be considered of minor importance. For example, over 20,000 are believed to winter in Switzerland, 6,000 pairs breed in the Netherlands and Denmark (Cramp *et al.* 1977) and the British population is in excess of 2,000 pairs (Sharrock 1976).

However, the incident and subsequent survey work clearly illustrated three important points. Firstly, it highlighted the general lack of information on the origins of Scottish wintering species that are not easily caught for ringing studies. Secondly, it emphasized the importance of the role of the amateur ornithologist in enabling surveys to be carried out successfully at short notice. Finally, it showed how vulnerable bird populations may be to even very small localized spills if these occur where birds are concentrated.

Acknowledgments

Particular thanks are due to the local recorders and individual observers, without whom this survey would have been impossible; also to R. W. J. Smith, organizer of the 1973 survey, for much helpful advice, to Dr C. J. Bibby who commented on the first draft of this paper, and to P. A. R. Hockey for the count data during 1978/9.



GREAT CRESTED GREBE W. R. Brackenridge

Summary

As a result of oil pollution in the Firth of Forth in February 1978 200-241 Great Crested Grebes died. In a survey of the Scottish breeding population in 1978 150-160 pairs were estimated to be present, similar to 1973. There was no evidence that Scottish populations had been affected and it is suggested that most grebes wintering in the Forth are immigrants.

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Birdwatching on Rhum

J. A. LOVE

Rhum became a National Nature Reserve in 1957. It is a large and mountainous island of predominantly wet heath with grassland only in the glen bottoms near the coast. Since it was cleared of its indigenous population in 1826 the only cultivation is around Kinloch on the east coast. Most of the island is cliff-bound with occasional small boulder beaches. The woodland at Kinloch was planted at the turn of the century, but in recent decades the NCC has undertaken a programme of reafforestation of native trees. There are numerous freshwater lochs from which radiate a complex of burns and small rivers. The main mountain mass—the root of a Tertiary volcano—rises to 800m in several peaks. The island merits nature reserve status on geological grounds alone, but also possesses much of biological interest. Access, by prior arrangement with the resident chief warden, is by steamer from Mallaig.

The outstanding ornithological interest of Rhum lies in its extensive mountain-top colonies of Manx Shearwaters, estimated at over 100,000 pairs, and in the reintroduction of the Sea Eagle which has been going on since 1975. The Rhum hills have a long history of occupation by shearwaters and the peak of Trollaval doubtless derives its name thus. A night in the colony is a ghostly and unforgettable experience and it is not



PLATE 5. Great Crested Grebe on nest (Kirkcudbrightshire, July 1979).

B. S. Turner

Following heavy casualties from an oilspill in the Firth of Forth, the SCC organized a breeding census in 1978 to assess the impact on Scotland's breeding population (see p. 43).



PLATES 6-7. Golden Eagle studies.

PLATE 6(a) Adult with chick, calling to mate circling above.

(b) Another adult at nest with chick.

B. S. Turner

C. E. Falmar

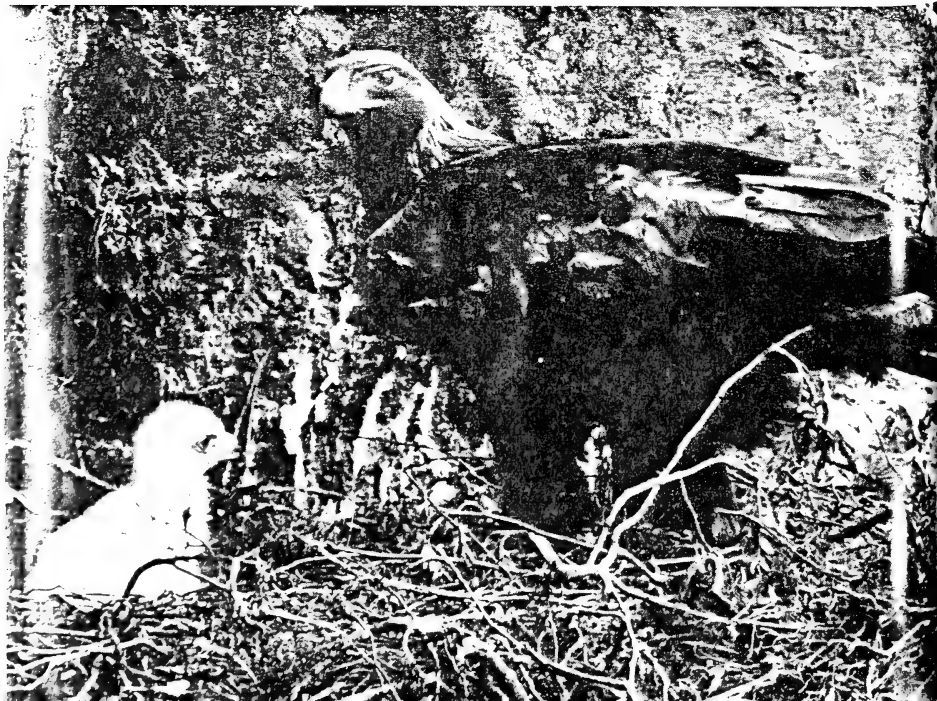




PLATE 7. Golden Eagles on Rhum.

J. A. Love

(a) Portrait of first year Golden Eagle. It was released on Rhum in 1977 having been taken illegally on the mainland for falconry.

(b) Chicks in nest amid Manx Shearwater remains, June 1976. Toxic chemicals in seabirds may be limiting Golden Eagle breeding success on Rhum (see p. 33).





PLATE 8. Storm Petrel ringed on Allsa Craig (Firth of Clyde) 1 July 1979.

Luring Storm Petrels into mistnets with tape recordings at night has revealed their presence, at least as non-breeders, in areas where they had previously been unsuspected (see p. 51).

B. Zonfrillo

difficult to perceive how the Vikings attributed the nocturnal activities of shearwaters to trolls. In the sixteenth century Dean Monro recorded how the young were harvested each summer to supplement the diet of the islanders. There is much speculation as to why the Manx Shearwaters of Rhum should excavate their nest burrows above the 650m contour. It is too easy to assume that by doing so they avoid predation by rats, for these rodents will ascend even in winter to feed upon unhatched eggs and dead chicks. Over much of the island the rainfall may exceed 25cm per annum and my own view is that the prolonged run-off and constant waterlogging of the coastal slopes renders them unsuitable for burrow nesters. It is true that the greatest precipitation occurs on the mountain tops which are frequently in mist, but their coarse, porous soil drains very rapidly. Other coastal burrow nesters such as Puffins and small petrels are scarce or absent.

Last century it was claimed that both Leach's and Storm Petrels once bred on Rhum but this has never been confirmed. In 1975 Storm Petrels were caught ashore using tape lures and they may also be seen at sea from the steamer. The sandstone cliffs in the southeast support several small colonies of Guillemots, Razorbills, Fulmars and Kittiwakes. Unfortunately these are almost impossible to view from the land, and the annual census has to be done by boat. Herring and Lesser Black-backed Gulls, Shags, Eiders and Black Guillemots breed all around the coast.

Red-throated Divers feed mostly at sea but about a dozen pairs nest inland on the freshwater lochs. Some of these also support a pair or two of Mallard or Teal or Common Sandpiper. This wader also breeds on the coast together with Ringed Plover and Oystercatcher. The tidal sand and mud at Kinloch and Kilmory attract small flocks of migrant waders such as Dunlin, Sanderling, Redshank and one or two Greenshank or Whimbrel. Turnstone and Purple Sandpiper are surprisingly infrequent and it is also curious that neither Greenshank nor Dunlin should nest on the moors. A few pairs of Curlew nest while Golden Plover and Snipe are the only common breeding waders. Flocks of 50-100 plovers winter on the coast.

Ring Ouzel, Dipper and Stonechat are welcome if infrequent encounters in the extensive, boggy and seemingly barren interior, which is otherwise attractive only to Snipe, Meadow Pipits and Red Grouse. Excessive burning and overgrazing in the past has resulted in a poor heather cover so that the estate had to release many captive-bred grouse to achieve respectable game bags. Early last century Ptarmigan still bred but have now disappeared. Small flocks of Snow Bunting turn up on passage, and in 1979 one bird remained on the tops well into May.

Harvie-Brown referred to five pairs of eagles on Rhum, in all likelihood meaning both White-tailed and Golden Eagles. The last pair of Ernes bred in 1907 while the Golden Eagles too succumbed to persistent persecution by keepers. An attempt is in progress on the island to reintroduce White-tailed Eagles. Golden Eagles have long since returned naturally and four pairs breed. However, their success is poor, with on average only one chick being reared per annum. High concentrations of DDE and PCBs have been detected in eagle eggs from Rhum, and seem to derive from the Fulmars, gulls and shearwaters often taken as prey. Pesticides accumulated through the marine food chain seem also to have been responsible for the disappearance about ten years ago of the Peregrine on Rhum, but in recent years this spectacular falcon has been more in evidence, while in 1977 a fifth pair of Golden Eagles took up residence. In that year also a record total of three eaglets were fledged and thus, encouragingly, the pesticide problem could be showing indications of easing—particularly important to the White-tailed Eagle reintroduction.

Since Rhum lacks Rabbits, hares and voles it is deficient in other raptors. Buzzards have nested on only one or two occasions, and any which remain to overwinter seem to rely more on bird prey, especially, it seems, migrant thrushes. Buzzards are frequent on Eigg and Canna, both of which have Rabbits. About six pairs of Kestrel (feeding upon insects, lizards and mice) and a similar number of Merlin (specializing in small birds such as pipits) breed on the island. In some years a single pair of Sparrowhawks may nest in the Kinloch Woods.

At the turn of the century some 30 ha of mixed woodland were planted around Loch Scresort, and these Kinloch Woods now form an important reservoir from which small birds can colonize the more recently established plantations. Their bird community is typical of any west Highland mixed wood, with



MERLIN *Donald Watson*

Chaffinch, Robin, Blackbird and Willow Warbler, and lesser numbers of Goldcrest, Wren, Song Thrush, Dunnock, Wood-pigeon and Coal Tit. A few pairs of Woodcock breed, while large numbers pass through each winter. As many as 300 were shot annually by the estate early this century. Pink-feet, Greylags, White-fronts, Barnacle Geese and Whooper Swans are regular each spring and autumn but rarely stop.

The island's indisputable asset is variety. Rhum is only 24 km from the mainland, it is large and possesses a wide variety of habitats. The weather is often inclement and the insect life is notorious in its thirst for human blood, but few islands could match such a diversity of breeding birds.

John Love, Bayview, Isle of Rhum, Inverness-shire

Short Notes

Status of Storm Petrel in Clyde and Forth

During 1978 experiments in the Clyde area revealed that Storm Petrels make regular nocturnal visits to the vicinity of the mainland and islands where breeding is not known to occur (Maguire 1978, Report on Storm Petrel ringing in Kintyre, *Copeland Bird Observatory Report for 1978*). They were lured by playing a tape of their churring song on a cassette recorder situated on the landward side of a mistnet parallel to the shore. This technique produced unprecedented results.

During 1978 and 1979 over 500 were trapped, mainly on the east coast of Kintyre (Argyll). Smaller numbers have also been caught in 1979 on Ailsa Craig (plate 8), Pladda and at two sites on the Ayrshire coast. The nearest known breeding site is the newly discovered one on Sanda (Maguire 1978).

Recent work by A. R. Mainwood on the Summer Isles (Wester Ross) has shown that wanderers are more readily attracted to the tape recorder than breeders (1978, *Ringers' Bulletin* 5: 33). My own experiments were carried out mainly between July and September in both years, a period coinciding with the peak wandering behaviour of non-breeders. Limiting dates of response by Storm Petrels to tape lures in Kintyre were 3rd June (1979) and 1st October (1978). Our results suggested that wandering Storm Petrels were perhaps more widespread in Scottish waters. I was especially interested in testing my theory on the east coast, where breeding colonies are unknown south of Orkney.

Around midnight on 18/19th August 1979 R. Morton and I tape lured and trapped a Storm Petrel at Fife Ness. A heavy swell was running which I am sure accounted for the paucity

of the catch. The bird had almost certainly been coasting along the tideline to have heard the recorder which was barely audible at 20m.

The Storm Petrel's habit of moving inshore at night can be taken advantage of using this technique. In fact, armed with a tape recorder, it is possible that ringers could change its known status on the east coast of Scotland (and England) virtually overnight!

EDWARD J. MAGUIRE

During the week of 4-10th August 1979 I. P. Gibson, A. Beck, R. and K. Gregory and I mistnetted 22 Storm Petrels at night at Pilgrims' Haven on the Isle of May, using a small cassette recorder as suggested by E. J. Maguire. Some had vascularized brood patches possibly indicating breeding, although a similar condition can be precipitated by other factors and is of doubtful significance. On 7th August we controlled one ringed in the Summer Isles (Wester Ross) on 16th August 1978 but we did not retrap any of our birds.

Apart from old records at the lantern in late autumn there are only five other occurrences (8: 96) including a pair disturbed once from 'a cleft in the rock' in May 1922 (Rintoul & Baxter 1935, *A Vertebrate Fauna of Forth*) although nothing was found to suggest breeding. In 1904 a Storm Petrel was found on an egg on the Bass Rock, the only record of nesting anywhere in the Forth, and two summered off Inchkeith in 1913 (Rintoul & Baxter 1935).

Attempts at tape luring on the May by R. Morton and me in late October 1978 proved fruitless. However, it is now obvious that in summer Storm Petrels frequent the vicinity of the island, probably in fair numbers, but usually coming inshore only at night. One bird in 1979 was netted only three minutes after switching on the tapes. More ringing will have to be done to establish its true status (see Maguire 1980 [in press] *Breeding of the Storm Petrel and Manx Shearwater in Kintyre, Argyll, Western Naturalist*). With this in mind it would be worth examining all the Forth islands for breeding. They might breed on the Isle of May, although proving this could be difficult owing to the vast number of Rabbit and Puffin burrows. The Storm Petrel is virtually impossible to census accurately due to its small size and nocturnal habits, and many colonies must remain undiscovered around the Scottish coast.

B. ZONFRILLO

Whilst catching waders at Dalmeny (West Lothian, 3½ km east of the Forth Road Bridge) on 1st September 1979 we mistnetted a Storm Petrel at 21.30 GMT. A cassette recording

of Dunlin and Knot roost calls was playing behind a mistnet parallel to the water's edge, which was 3m away when the bird was caught. The batteries had become spent and the tape was playing much too slowly, emitting a sound resembling a rusty hinge.

HUGH CLARK, MICHAEL WILKINS

Shelduck killed in territorial dispute

On 6th April 1979 on the Dornoch Firth at Spinningdale, Sutherland, D. Waterhouse observed two drake Shelducks have a fierce encounter a short distance out on the water while the two ducks were milling around. When the commotion stopped one drake joined the two females and all three flew away. The other drake was left floating on the water and shortly the incoming tide brought it ashore. It was dead but on examination no marks of injury could be found. Presumably the other drake had drowned it.

Although the literature refers to violent territorial encounters I cannot find any resulting in death. I thank M. W. Pienkowski for his comments.

D. MACDONALD

The 1978/9 survey of Corncrakes in Britain

In spite of the problems of censusing a bird that is rarely seen and calls mainly at night, most of the present range of the species in Britain was covered by the joint BTO/SOC inquiry in 1978. This included the majority of the Hebridean islands, though Corncrakes on Tiree were censused in 1977 and 1979 and those on Iona in 1977. Orkney was partially covered in 1978 but a special survey of Corncrakes and Corn Buntings in the archipelago was organized in 1979. Confirmation of breeding is difficult to obtain but Corncrakes present in May but apparently not subsequently were treated as non-breeders. This note provides a summary of the results, full details of which will be published elsewhere.

Breeding was confirmed or considered probable in 160 10-km squares, which represents only 30% of the 528 squares in which they were recorded with a similar status in Britain during the 1968-72 Atlas survey. In Scotland the change was most marked in the east (88 squares reduced to ten, an 89% reduction) and southwest (from 67 squares to 20, a 70% reduction). If the Corncrake continues to withdraw westwards it may soon disappear as a regular breeder on the Scottish mainland, though two areas in west Sutherland still have fairly high densities. Only ten of the 160 squares in which Corncrakes were apparently breeding had more than 15 calling

	Number of calling Corncrakes	
	Confirmed/probable breeders	Non-breeders
Shetland	3	2
Orkney (1979)	102-104 (15% total)	1
Outer Hebrides	260 (37% total)	9
Inner Hebrides (including Iona 1977 & Tiree average 1977/9)	233-240 (33% total)	1
West Sutherland	38-40	-
West (WesterRoss-Argyll)	17	-
Northeast (Caithness-east Inverness)	9	-
Perthshire & Stirlingshire	4	-
Southwest (including Clyde isles)	19-20	12
Southeast	1-2	-
Total Scotland	686-699	25
England	11	4
Isle of Man	-	3
Wales	1	-
Total Britain	698-711	32

birds. Six of these were in the Uists and Benbecula (Outer Hebrides), two on Tiree and one each on Colonsay and Iona (Inner Hebrides). Three quarters of the squares held less than six calling birds.

Habitat was recorded for 183 Corncrakes in the Outer Hebrides, 190 in the Inner Hebrides, 74 in Orkney and 73 on the Scottish mainland. In the Outer Hebrides 48% of these were in the marshes, compared with 10% in the Inner Hebrides, 14% in Orkney and 23% on the mainland. Marshland and other semi-natural habitats adjoining farmland may be important as cover for Corncrakes when they first arrive and for broods after the hay has been cut. Much of such habitat has, however, disappeared from the more intensively farmed areas of Scotland. The cover provided by quick growing and tall sown grasses may attract Corncrakes, but such meadows are mown for silage or hay while the birds are still nesting or have small young which cannot escape from the large fields.

The 1978/9 survey has provided the first opportunity to obtain a fairly accurate figure for the population of Corncrakes in Britain. That this was possible is, however, a sad reflection of the seriously diminished numbers of this species and there can be little optimism for its long term future in western Europe. The Irish Wildbird Conservancy's survey in 1978 revealed that while Corncrakes were still widespread but local in northwest Ireland, they were very scarce in the southeast.

The organizer gratefully acknowledges the help received from the local recorders, regional representatives and the 214 contributors.

C. JAMES CADBURY

Starving Oystercatchers in Deeside after severe snowstorm

In 1979, Oystercatchers had returned inland to Deeside (Aberdeenshire and Kincardineshire) by early February as usual. On 21st March 23 cm of snow fell on lower Deeside, and next day it melted only at springs and streams, roadsides under trees, and south-facing river banks. Conditions stayed like this for a week, with frost all day in the shade.

At Crathes most Oystercatchers were in flocks along the Dee, but on 22nd March 12 single birds were on roadsides under trees, already lethargic and with ruffled plumage, in the last stages of starvation. They allowed cars to within 2 m before moving, and two on the road had been run down. At Echt one rose in front of a dog from a watery ditch 2 m below field level, alongside a dry-stone dyke. It flew into a snowdrift and lay there apparently dead, with wings spread and head flopped. Only when about to be picked up did it fly away normally; the apparent feigning of death may have been anti-predation behaviour. Eight others at Echt probed singly at 1 m wide grassy patches beside springs, allowing a dog up to 9 m before flying, and one stood lethargic on the snow. By comparison I saw only three Lapwings along roadsides, again unwilling to fly, and only one had been killed by a car.

During 21st-25th March I found 33 Oystercatchers dead on or beside 50 km of roads; some disappeared later due to scavenging by Crows and Rooks. The birds lived on roadsides at night as well as day. Out of about 160 seen alive in daylight, all were probing for food, most had bills discolored by earth, and none was heard singing. On 24th March two flew over the Slug pass towards the coast, but most stayed inland. On 26th March three single birds still probed roadsides under trees at Crathes, and only on 28th March did the snow there and at Echt melt enough for the flocks to disperse more widely and probe through 2-5 cm of snow in the middle of some fields.

Surprisingly, conditions further up Deeside were better for the birds. Near Dinnet they were in loose flocks on 25th March, with many pairs, some of them displaying and singing. About half preened, slept, or bathed in a pool, and none had ruffled plumage. Drifting had been so strong that more than half the grassy ground was snow-free, the birds were getting many earthworms, and none was found dead on 30 km of roads.

Six cocks and six hens (none in their first winter) were found uninjured and freshly dead at Crathes and Echt between 22nd March and 2nd April. I judged their condition by feeling their breast muscles, using grades from 5 (breast flat with the sternum not projecting) through 4+, 4, 4-, etc. to 1 (emaciated, with sternum projecting). Only one cock and one hen had grade 2, one each grade 1+, and the rest grade 1. None had any fat even on the heart and gut. All the gizzards contained mud, two had remains of earthworms, and one a beetle wing. The cocks' mean weight was $324 \text{ g} \pm$ standard error 8, range 287-344, and the hens' 348 ± 9 , range 328-379. (These are similar to P. J. Dare's (1977, *Ibis* 119: 494-506) weights for six dead emaciated hens in cold weather (mean 315 g, range 270-350). He found that Oystercatchers normally grow heavier in winter, and in mid March reach maximum weight for the year, with much fat on the breast.) The heaviest hen had a 3 mm ovum in its ovary, but the others contained no developing ova.

Even in early April, after the thaw, Oystercatchers at Crathes and Echt were still not singing as often or as loudly as before the snow, and did not do so again till late April. Yet a hen Lapwing killed at Finzean on 4th April contained a fully pigmented egg about to be laid, weighed 296 g, and was plump with a body condition of grade 4.

After deep snow in January or February, Oystercatchers in Deeside return to the coast. Why did they not do so this time? Possibly it was because late March is so near the nesting season, and because deep snow in late March seldom lies so long. At any rate, Oystercatchers seem less well adapted to snow than Lapwings; of course, living inland is a more recent evolutionary change for the normally coastal Oystercatcher than for the Lapwing.

ADAM WATSON

Food of Snowy Owls in Outer Hebrides

In the years 1972-4 Snowy Owls were frequently seen on the Isle of Lewis (Outer Hebrides). A pair first made their appearance on 18th May 1972 and remained in the same area until 1974, the female being last seen on 21st January and the male on 26th July. There were three different individuals seen at least once, on 3rd June 1972, and yet another bird must have been present subsequently for in February 1975 the skeleton was found of a Snowy Owl that had been ringed on Fair Isle as an adult male on 9th June 1972.

The owls spent most of the day roosting on moorland, usually perched on peat stacks, fence posts or a pile of stones and sometimes in sheltered hollows. Some pellets were found

at these perches in July 1972. Seven intact pellets averaged 77 x 31mm and these, together with five fragments, consisted of the remains of at least 13 juvenile Rabbits *Oryctolagus cuniculus*. There were traces of sand in all pellets, two strands of grass in one and Snowy Owl feathers in another two. The weight of Rabbits (estimated from the length of long bones) varied between 130 and 700gm with an average of 320gm. To judge from this sample the owls fed exclusively on Rabbits, less than half grown, which they probably caught on machair adjacent to the moor.

The Snowy Owls of Fetlar fed mainly on Rabbits but their diet also included nesting birds, particularly Oystercatchers and Arctic Skuas (Tulloch 1968, *British Birds* 61: 119-132). In the Arctic Snowy Owls often feed exclusively on lemmings (e.g. Watson 1957, *Ibis* 99: 419-462) but where these are less numerous the prey includes birds and mammals up to the size of Arctic Hare (Bannerman 1955, *The Birds of the British Isles* vol. 4). It is therefore not surprising that in Scotland, in the absence of lemmings, young Rabbits formed a major part of the summer diet.

It was strongly rumoured that at least two of the Lewis Snowy Owls succumbed to human persecution, a sad end to an otherwise promising situation. One could surely think of no bird more endearing to the crofters of Lewis than one that ate Rabbits.

M. MARQUISS, W. A. J. CUNNINGHAM



SNOWY OWL J. Busby

Reviews

RSPB Guide to Birdwatching by Peter Conder. London, Hamlyn, 1978, 176 pp., 28 colour photographs, 50 plain photographs, drawings, diagrams and maps, 18½ x 12½ cm, £2.50.

Peter Conder has enthusiastically created a book that is a wealth of information and up to date. It is well finished with not an inch of space wasted, nearly every page having delightful line drawings or photographs. It leads the reader from the bare essentials of birdwatching through the intricacies of identification and counting to more applied aspects of amateur ornithology. The first half is perhaps the most useful to the person in the field, though the later chapters on geographical distribution, ecology and habitat, and conservation, to name a few, are of more general interest. Every chapter has its subject material dealt with very systematically though there is often little relation between the photographs and the text. Many experienced birdwatchers will learn much from this book and it will be especially useful for newcomers to the subject.

JAMES M. DICKSON

The Birdwatcher's Guide to the Wetlands of Britain by M. A. Ogilvie. London, Batsford, 1979, 189 pp., 20 plain photographs, 6 maps, 22 x 14 cm. £4.50.

This attractive book is further evidence of Malcolm Ogilvie's wide-ranging knowledge of British wildfowl, and of his apparently limitless energy. It is well constructed and effortless to read. The most important areas for wintering wildfowl and waders in Britain are described region by region. Unlike most guides, it gives an idea of the numbers of the various species likely to be seen. However, the selection of sites solely on the criterion of biomass does not necessarily serve the birdwatcher's interests. It results in relatively few localities being included. Tayside is afforded eight pages, while Strathclyde only warrants one page, and the Central Region is dismissed in 13 lines. Anyone looking for a comprehensive account of the wetlands and their birds will turn to the now ageing Stationery Office publication *Wildfowl in Great Britain*. Birdwatchers with less scientific requirements are probably looking for information about smaller, less obvious waters, where the odd rarity might turn up, rather than an area that is a certainty for 1,000 Mallard. This revives the conflict between the need for information and that of security—a conflict that remains unresolved.

IVAN T. DRAPER

A Guide to Shetland Birds by Bobby Tulloch and Fred Hunter. Lerwick, Shetland Times Ltd, 3rd edition 1979, pp. v + 46, 16 pages of plain photographs, 22 x 15 cm. £1.50.

All bird watchers visiting Shetland will find this guide invaluable. There are 20 pages giving short accounts of the different areas and islands and general information, followed by 12 pages giving the status of all Shetland's breeding birds and regular visitors, and finally a species list of birds recorded in Shetland up to May 1978 which can be used as a tick list.

The Birds of Gwent by P. N. Ferns et al. Gwent Ornithological Society, 1977, pp. xii + 152, 11 full-page plain photographs, 21 x 14 cm. £3.50.

This nicely produced hard-cover book updates Humphrey's *Birds of Monmouthshire* of 1963, and Ingram & Salmon's work of 1937.

The Herons of the World by James Hancock and Hugh Elliott. London, London Editions Ltd, 1978, pp. 304, 63 colour plates, numerous pencil drawings, 29 distribution maps, 35 x 23 cm. £45.00.

This finely produced book stands alongside Ripley's *Rails of the World* and Forshaw & Cooper's *Parrots of the World*. It covers the 61 species of herons, egrets and bitterns in the world. Each is given a full page painting of superb quality, finely reproduced, by Robert Gillmor and Peter Hayman, while the 'Green' Heron which has races of widely different colouring from East Africa to America and the Galapagos, and the 'Great Blue' Heron in America which has a pure white race, are each given two plates.

The first 35 pages deal with the classification of the group, and short accounts of plumage and moult, breeding, feeding, migration and dispersal, and conservation. Each species is then described, with an average of three pages of text, covering distribution, migration, habitat, general appearance and identification, and behaviour. Distribution maps are grouped in an appendix, and there is a bibliography of roughly 1000 references.

Not as much detailed information is given for each species as is to be found in *Birds of the Western Palearctic* or in Palmer's *Handbook of North American Birds*, but these cover only a fraction of the species to be found in Hancock & Elliott (21 in BWP, 15 in Palmer). It is perhaps a defect in the book that distribution maps are given for only 29 of the 61 species. There are none, for example, for the Purple Heron, Little Bittern, Night Heron, or even for the Cattle Egret which has had such a remarkable range expansion in recent years. However in all cases distributions and movements are well described in the text.

The whole book is a model of clarity of writing and with its superb paintings makes a fine production. The price is not high for a book of this quality.

Endangered Birds—Management Techniques for Preserving Threatened Species edited by Stanley A. Temple. University of Wisconsin Press (published in London by Croom Helm) 1978, xxiii + 466 pp, 31 plain photographs, 23 x 15 cm. £8.95.

This book consists of 50 papers presented at a symposium held in Madison, Wisconsin, in August 1977, sponsored by, amongst others, the International Council for Bird Preservation and by the World Wildlife Fund. The majority of papers are by North American workers, covering a wide range of management techniques, but in the Old World the conservation of the Bald Ibis in Turkey and of White-tailed Sea Eagles in Sweden is described, and there is a paper on the work of our own Wildfowl Trust. The book concludes with an interesting critical summary by Ian Nisbet. Those with a serious interest in endangered birds will find the book a valuable source of material. Its cost is surprisingly low.

W. G HARPER

Wild Geese by M. A. Ogilvie, illustrated by Carol Ogilvie. Berkhamsted, T. & A. D. Poyser, 1978, 350pp, 16 colour plates, over 40 drawings, 40 maps, 24 x 16cm. £7.80.

This is an important book that should be acquired by everybody interested in geese. For the first time it gathers together all available information about all species (apart from the somewhat deviant Hawaiian Goose) under the headings of classification, identification, ecology (food and feeding), breeding, population changes (counting and ringing methods), distribution, migration, exploitation and conservation. As the majority of species are highly adaptable, and no doubt there will be consid-

erable changes in distribution and behaviour in the future, this information provides a reference against which changes can be measured. Fortunately geese cannot read and so there will be plenty of opportunity for readers of this book to note the many deviations from normal behaviour, e.g. roosting in fields by Pinkfeet in midwinter in hard weather, or to study behaviour not yet fully covered, e.g. initial breeding behaviour before departure from winter quarters.

We must all thank Malcolm Ogilvie for compiling this fine book, together with his wife Carol who has prepared the identification plates (to which, however, proper justice does not appear to have been done in some of the reproductions) and the many delightful black and white illustrations, and also all those who joined in providing the mass of information which the book so well draws together.

WILLIAM BROTHERSTON

Waterfowl: Ducks, Geese and Swans of the World by Frank S. Todd.
Seaworld Press, San Diego, 1979, 399 pp, 776 colour photographs,
6 drawings, map, 2 tables, 28 x 28cm. £25.

The author appears to have had several aims in producing this book; a guide to the waterfowl of the world; a new review of their classification; and a simple guide to waterfowl aviculture. The most important aim however is to use this book as a vehicle for the publication of his marvellous and encyclopaedic collection of photographs. This is a coffee table book with a bit of meat to it. The species account is informative and readable and while it is not exhaustive there is more than enough for all but the most avid waterfowl enthusiast. One criticism of the text is with the treatment of all subspecies as distinctive entities. Some, like the Brent Goose populations, are certainly distinct, but others, like the Faeroese Eider, hardly deserve mention.

The fact that many of the photographs are of captive birds does not detract from their excellence. Almost every species and many subspecies are illustrated (albeit by mounted specimens in the case of extinct populations) and many of the plates have a nice feel to them, showing birds in their breeding habitats, against interesting backgrounds or exhibiting some point of behaviour. Another excellent feature is the full and descriptive captions accompanying each plate. Clearly any book with over 700 plates of the highest quality will be expensive but this is a welcome change from the usual coffee table books and could well be worth buying if you have £25 to spare.

R. D. MURRAY

Also received

Some Funny Birds in the World of Man by A. P. Norman. Bognor Regis, Tiercel Books, 1978, 64 pp, drawings, 30 x 21 cm. £4.95. 'Makes play with real bird names and an ornithological style of writing'.

Upgrading of Natural Values in the central Netherlands by I. G. Nijland & H. E. van de Veen. Foundation for Critical Wildlife Management, 1978, Stichting Kritisch Faunabeheer, Postbus 76, 's-Graveland, Netherlands. 16 pp, 29 x 21 cm. US\$3.50.

The Observer's Book of Birds of Australia by P. & P. Slater, London. Warne, 1979, 202 pp, many colour photos, also plain photos, drawings, 8 maps, 14 x 9 cm. £1.95. 'Includes 150... species and covers all families.'

From the Edge of Extinction: Endangered Species in North America by D. Stewart. London, Warne, 1979, 191 pp, drawings, 24 x 16 cm. £6.95.

Current literature Articles and reports on the status and distribution of birds in Scotland are listed here. Strictly biological studies such as ecology or behaviour are excluded, as are references from widely read journals such as *British Birds* and *Bird Study*. Most listed items and many others are in the club library and we are grateful to everyone who has made donations. The library also welcomes copies of ornithological work on any subject published outwith the main bird journals.

Forth Naturalist and Historian vol 3 1978. 1979. Includes papers on ringing recoveries, Stirling and Clackmannan bird report 1977, Register of Ornithological Sites, Gartfairn Wood heronry, Golden Eagle success and site tenure.

BTO/SOC Corncrake Survey 1978. C. J. Cadbury.

The Breeding Bird Community of the Aber Bogs, Loch Lomondside, in 1978. C. M. Waltho 1979. (NCC report.)

Inchmoan—the ever changing bird island of Loch Lomond. J. Mitchell 1979. *West Dunbartonshire Naturalist Report* No 4: 2-9.

Loch Lomond Bird Report No 7 for 1978. J. Mitchell (comp) 1979. South West Region (Scot) Nature Conservancy Council.

The Birds of Colonsay and Oransay (sic). D. Alexander 1979. Glen Cottage, Colonsay.

Nature Conservation Interests in the Clyde Estuary. Symposium at Paisley College of Technology, 23 June 1978. Nature Conservancy Council, South West (Scotland) Region.

Shetland Bird Report 1978. B. Marshall et al. (comp) 1979. Shetland Bird Club.

YOC Phone-in Report: Spring Migration 1979.

North-East Scotland Bird Report 1978. A. G. Knox & M. V. Bell (eds) 1979. Aberdeen University Bird Club.

Clyde Area Bird Report 1977. I. P. Gibson (ed) 1979. Clyde-Muirshiel Regional Park.

Highland Ringing Group: Report 3. T. Mainwood, 13 Ben Bhraggie Drive, Golspie, Sutherland.

Mouling Eiders in Orkney and Shetland. P. Hope Jones & P. K. Kinnear 1979. *Wildfowl* 30: 109-113.

Preliminary results of winter dye-marking on the Firth of Forth, Scotland. M. W. Plenkowski & H. Clark 1979. *Wader Study Group Bulletin* 7: 16-18.

Islay Birds Check List. C. G. Booth (1979). Islay Museums Trust.

The Natural Environment of the Outer Hebrides. J. M. Boyd (ed.) 1979. *Proceedings of the Royal Society of Edinburgh* 77B. £15. (Symposium proceedings including avifaunal papers).

A Report of the Expedition to the Island of Mingulay (Outer Hebrides) May 26th-June 1st 1979. Huntington School, York.

Survey of Shorebird Feeding Distribution and Movements on the Eden Estuary NE Fife, including a Study of the Invertebrate Food Source. J. P. Johnston et al. 1979. Nature Conservancy Council.

The Birds of Baddingsgill Reservoir, Tweeddale (Peeblesshire). A. W. & L. M. Brown 1979.

Notices

Birds of the Endrick Mouth John Mitchell (22 Muirpark Way, Drymen, by Glasgow, G63 0DX) would welcome unpublished notes for an annotated checklist of this area of Loch Lomond.

Photographs for Scottish Birds Photographers (that means most of you) are reminded that good pictures of birds, and sometimes their habitat, are always welcome, particularly if they accompany papers or short

notes submitted for publication. Whilst glossy black and white prints are preferable, colour transparencies can also be acceptable if the image is large, well contrasted and crisp. In addition, any photographers, amateur or professional, who would like their work featured in *Scottish Birds* should send a selection of unpublished black and white prints to the editor.

The symposium **Estimating Populations of Terrestrial Birds** will be held 26-31 October 1980 at Asilomar, near Monterey, California. The invited papers, given by authors from the United States, Canada, Europe, New Zealand, and Australia, will cover a wide range of subjects. The principal topics will be the problems, methods, and analyses of bird censusing. There will be a variety of field trips during and after the symposium to explore methods of censusing and habitats of coastal and interior California. The Asilomar conference grounds are located in a State Park on Monterey Bay and provide an attractive and stimulating setting. For further information write the organizers: Dr C. John Ralph and Dr J. Michael Scott, Bird Census Symposium, P.O. Box 43, Hawaii Volcanoes National Park, Hawaii 96718.

The Scottish Ornithologists' Club

ANNUAL CONFERENCE

The 33rd annual conference and 44th annual general meeting of the club will be held in the Marine Hotel, North Berwick, East Lothian, during the weekend 24-26 October 1980. The conference programme and booking form is enclosed with this number of the journal; the AGM agenda will be printed in the autumn number.

BRANCH MEETINGS

Will members please note that the dates of the first meetings of branches next winter will be as follows:

- September** 22nd Aberdeen
 23rd Edinburgh, Inverness and Wigtown
 24th Ayr, Dumfries, St Andrews and Thurso
 25th Dundee, New Galloway and Stirling
- October** 6th Glasgow (1980 AGM)

The venue and times of all meetings are unchanged; full details of all winter meetings will be published in the syllabus of lectures and sent to all members with the autumn number of the journal early in September.

Branch News

Aberdeen On 14th January Aberdeen members welcomed club president Miss Valerie Thom to the branch. We thoroughly enjoyed her fine film on the life and work of the Fair Isle population during the 1950s. Many of the sequences shown are important records of the way of life on the island at that time, for while much was happening to affect the future of Fair Isle as a principal bird migration station, she had recorded the equally important pressures on the native crofting population.

Following her presentation invited guests and committee members joined Valerie at a reception in the Zoology Department Refectory. An excellent meal was preceded by the showing of a video recording of BBC

Nationwide's visit to the BP Forties Field which dealt with the activities of birdwatchers (in particular Alan Morley) on the platforms and the type of information being gathered on the movements, numbers and condition of migrants. I should like to thank the staff of BP at Dyce and in particular Mr Stan Howe for making the reception possible and for the assistance of Professor George Dunnet and his department.

BRIAN J. STEWART

Current Notes

These notes include unchecked reports and are not intended as a permanent record, nor will they be indexed. Please send reports via local recorders at the end of March, June, September and December.

A generally mild winter was enlivened by Lapland Buntings and two tern species. Nearctic species continued to turn up. The first blizzards of spring were followed by a strong influx of migrants; Fair Isle had perhaps its best March ever.

Winter

Black-throated Diver unusual records in Dec : Lindean resr (Selk); 5 birds in 4 Shetland localities. **Shag** 1500S/hr Rattray (Aber) 19 Jan. **Bittern** Newburgh (Aber) Jan, captured after collision with wires. **Whooper Swan** Shetland census 275 on 4 Nov, only 6% juvs; one killed by car on Whalsay in Dec had been resident for 20+ years; also 275 Inchinnan (Renf) Jan. **Bean Goose** Aberlady (E Loth) 28 Dec; 5 Kinross Feb. **Snow Goose** 4 wintered Ellon (Aber). **Brent Goose** only report : Virkie (Shet) 27 Jan. **Ring-necked Duck** Scatness (Shet) 8 Dec-7 Jan; Woodend Loch (Lan) 9 Jan-1 Feb, then Gadloch 24 Feb. **King Eider** as usual L Fleet (Suth) Apr; but none Shetland for second successive winter. **Surf Scoter** Southerness (Kirk) last seen 7 Feb; Kirkcaldy (Fife) 17-18 Feb; L Fleet Apr (regular 1974-7, now returned at last?). **Rough-legged Buzzard** Glen Dye (Kinc) 10 Feb. **Golden Eagle** Noss (Shet) Dec-Jan, possibly also at Voe. **Crane** L Eye (Ross) Dec-Jan; Glensaugh (Aber) 16 Feb. **Avocet** Aberlady 7th & 14 Feb; Ythan (Aber) 17 Feb. **Herring Gull** 10,000 large, dark, arctic birds stormbound Spiggie (Shet) 9-16 Dec. **Glaucous Gull** max 7 (guess where?) Fraserburgh (Aber) 19 Jan. **Ivory Gull** Sullom Voe (Shet) 29 Dec. **Sandwich Tern** Musselburgh (Midl)-Gosford (E Loth) in Jan; Ayr 20 Jan is a new winter area. **Arctic Tern** Stornoway (O Heb) 6 Feb is exceptional. Out of 177 dead, oiled birds on Shetland's E coast 13-19 Dec, 79 were **Little Auks**; a few gale-blown Lothians coast 20-23 Mar. **Little Owl** pairs at new sites in Dumf and E Loth. Waxwing only reports Kenmay (2) and Hillhead (Aber) Jan. **Brambling** 100 on tideline in snowstorm Aberlady 21 Mar, part of the spring hard weather movement. **Two-barred Crossbill** 2 New Galloway (Kirk) Feb/Mar. **Common Crossbill** max 25 Tynningame (E Loth) Feb-Apr. **Hawfinch** Mid Yell (Shet) 2 Jan; Banchory (Kinc) 18 Jan. **Lapland Bunting** wintered Musselburgh (max 19) and Gregness (Kinc, max 8); Aberlady 2 Feb; 2 Cairnbulg (Aber) late Mar; Fair Isle 16 Mar.

Spring migration

European White-fronted Goose nominate *albifrons* Stornoway 22 Mar. **Bufflehead** ♂ L Bee (S Uist, O Heb) 14-20 Mar—the first for Scotland, although there is a dubious 1870 record for nearby Eriskay. **Rough-legged Buzzard** Glen Tanar (Aber) 22 Mar. **Lapwing** 500 Fair Isle 26 Mar. **Woodcock** 40+ Fair Isle 28 Mar. **Lesser Yellowlegs** Cairnbulg mid Mar-5 Apr. **Sabine's Gull** Prestwick (Ayr) 29 Mar—spring records are excep-

tional. **Cuckoo** 1st Ardnamurchan (Inv) 29 Mar. **Swallow** 1st Barns Ness (E Loth) 30 Mar. **Dunnock** 230 Fair Isle 28 Mar—a record. **Robin** 160 Fair Isle 27 Mar, 220 on 28th. **Black Redstart** St Andrews (Fife) 28 Mar, 3 Fair Isle 28 Mar; Barns Ness 29 Mar. **Wheatear** 1st Aberlady 25 Mar. **Blackbird** 200 Fair Isle 26 Mar, 420 on 27th, 570 on 28th. **Song Thrush** 75 Fair Isle 27 Mar. **Mistle Thrush** 14 Fair Isle 30 Mar. **Chiffchaff** 1st Fair Isle 28 Mar. **Goldcrest** 35 Fair Isle 28 Mar; 50 St Abbs (Ber) 29 Mar. **Jackdaw** 20 Fair Isle 27 Mar. **Chaffinch** 560 Fair Isle 28 Mar. **Hawfinch** Fair Isle 28 Mar.

Late news

Black-throated Diver 30 Sinclair's Bay (Caith) 4 Apr. **Fulmar** 12,000+N Noss Head (Caith) 20 Apr, 8+ blue phase Noss and South Heads in Apr. **Sooty Shearwater** 3 Little Minch (Hebs) 7 Apr—they should still be in the Falkland Islands at this time. **Gannet** 2,063N/5 hrs Noss Head 20 Apr. **Great White Egret** Ruthwell (Dumf) 9-11 Apr, when seen leaving high to NW—5th Scottish record. **Purple Heron** 1W East Linton (E Loth) 17 Apr. **Steller's Eider** ♂ Peninerine (S Uist)—still there since 1972. **Arctic Skua** 1st Noss Head 8 Apr. **Great Skua** 1st Noss Head 29 Mar, 52N + 4S/6 hrs 20 Apr. **Mediterranean Gull** single adult nestbuilding in Black-headed gullery Apr (locality suppressed). **Little Tern** 1st 2 Aberlady 27 Apr. **Little Auk** 4 Little Minch 10 Apr. **Wryneck** Gosford (E Loth) 27 Apr. **Black Redstart** Wick (Caith) 28 Mar. **Wheatear** 1st Wick 24 Mar. **Chiffchaff** probable Siberian *tristis* Wick late Feb. Northern **Bullfinch** 2 nominate *pyrrhula* Wick Jan-Feb. **Hawfinch** Ackergill (Caith) 29 Mar. **Evening Grosbeak** ♂ Nethybridge (Inv) late Mar—only previous record St Kilda Mar 1969.

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The Scottish Ornithologists' Club

THIRTY-THIRD ANNUAL CONFERENCE

MARINE HOTEL, NORTH BERWICK

24th - 26th October 1980

PROGRAMME

Friday 24th October

- 4.30 - 9 p.m. Conference office open for members and guests to register and collect name cards.
- 6.15 p.m. Meeting of Council.
- 7 - 9 p.m. Dinner.
- 8.30 - 9.30 p.m. FILM AND SLIDE PROGRAMME in the lecture theatre.
- 9.30 p.m. Lounges open for informal discussions and refreshments.
- 10 p.m. Bookshop closes.

Saturday 25th October

- 8 - 9 a.m. Breakfast.
- 8.45 - 9.15 a.m. Conference office open for registration.
- 9.20 a.m. Official opening of the Conference by the President, Miss Valerie M. Thom, in the lecture theatre.
- 9.30 - 10.30 a.m. LECTURE on 'The Conservation of Wildlife Habitats' by Dr Derek Ratcliffe, Chief Scientist, Nature Conservancy Council.
- 10.30 - 11 a.m. INTERVAL for coffee.
- 11 - 11.55 a.m. LECTURE on 'Wild Birds and the Law: the problem issues' by Richard Porter, Head of Species Protection Department, R.S.P.B.
- 11.55 a.m. - 12.50 p.m. LECTURE on 'The effect of rare birds upon human beings' by Ian Wallace.
- 1 p.m. INTERVAL for lunch.
- 2 p.m. Afternoon free for private excursions.
- 2.15 p.m. - 4.15 p.m. RESEARCH WORKSHOP - Wintering Wader Populations. This is an optional session for those carrying out research on waders. **Chairman**: Dr Ian Taylor, Chairman, SOC Research Committee. Location: TV Room at east end of 1st floor.
- 4.5 p.m. TEA.
- 5.15 p.m. Bookshop closes.
- 5.30 p.m. 44th ANNUAL GENERAL MEETING OF THE CLUB in the main Dining Room.
Note The agenda will be published in the autumn number of *Scottish Birds*.
- 7 for 7.30 p.m. ANNUAL DINNER in the lecture theatre (dress informal).

Sunday 26th October (see overleaf)

Sunday 26th October

- 8.15 - 9.15 a.m. Breakfast.
- 9.30 - 11 a.m. A series of short talks on ornithological research in Scotland will be given: Pied Flycatchers' use of nest boxes by Henry Robb; Wintering Terns in West Africa by Alistair Smith; and Waders in the Moray Firth by Bob Swann.
- 11 - 11.30 a.m. INTERVAL for coffee.
- 11.30 a.m. FILM. Details to be announced later.
- 12.30 p.m. CLOSING remarks by the President.
- 12.45 p.m. Lunch.
- 2 p.m. CONFERENCE DISPERSES: informal private excursions.

Conference Office

Outwith the registration hours the Conference Office and the Exhibition Rooms will be open most of the weekend for members to see the exhibits. A wide selection of new books from the SOC Bird Bookshop will be on display for purchase or orders, and paintings by wildlife artists will be displayed for sale in these rooms. In addition to exhibits by various organisations, Messrs Charles Frank Ltd. will have their usual extensive selection of binoculars and telescopes.

Film and Slide Programme

The programme from 8.30 to 9.30 p.m. on Friday evening is intended to give members and guests an opportunity of showing 2" x 2" slides or 16mm films. These must however be submitted beforehand to the Conference Film Committee and should be sent by 17th October 1980 at latest to the Club Secretary, 21 Regent Terrace, Edinburgh EH7 5BT. The slides should be titled and sent with brief notes on what will be said about them, to enable the Committee to make a selection and to form a good programme.

INFORMATION

1. **General** The conference will be held in the Marine Hotel, North Berwick. Numbers staying in the hotel are limited to 176, but 260 can be accommodated for the annual dinner and 270 in the main lecture theatre. Priority at the dinner and lectures will be given to those staying at the Marine Hotel. There are twin bedded rooms but very few single rooms and, for the benefit of others, members are urged to make arrangements to share with a friend. In addition there are 8 four bedded rooms. Reductions are made to members sharing the four bedded rooms provided that all beds in the rooms are filled. If more than 150 members and guests stay at the Marine Hotel, the SOC is guaranteed the sole use of the whole premises for the entire weekend.

The Marine Hotel has undergone considerable alterations since the 1979 conference and is now graded as a 4 star hotel. This upgrading, as well as the general increase in all costs during the year, has meant an increase in the residential charge of about 24%, although we have been given a considerable reduction from the charge normally made for a weekend conference. To keep the cost down, council agreed that instead of a full buffet lunch there will be a bar snack lunch on both days.

2. **Reservations** for residents and non-residents must be made on the **BOOKING SHEET** (see back page of this programme). The hotel manager has been instructed not to accept any booking except those made by the club secretary. Early booking is advised to avoid disappointment.
3. **Charges** The special Marine Hotel conference charge which covers the annual dinner, but not wines at the dinner nor the registration fee (see below), is £37.00. This includes bed, all meals and coffees, service charge and VAT, from Friday afternoon to Sunday lunch inclusive. For those prepared to share in the four bedded rooms there is a reduction of £8 for the weekend, provided that all beds in the rooms are occupied. All resident charges, except the registration fee, are payable direct to the Marine Hotel.
4. **Registration** Everyone attending the conference must register at the conference office on arrival. The registration fee, which must be paid in advance when booking, is £2 for the whole conference or £1.25 if attending for one day only. Members attending only the Annual General Meeting do not require to pay a registration fee.
5. **Annual Dinner** The cost for members and guests staying at the Marine Hotel is included in the special conference charge payable to the hotel. Advance booking by non-residents is essential; tickets must be paid for in advance when returning the conference booking sheet. The cost is £8.50 per person, inclusive of service charge and VAT, but not wines. Wine for the dinner can be booked during the conference.
6. **Other meals** Non-residents can obtain dinner (£5.25 fully inclusive) on Friday night and bar snack lunch (£1.75 fully inclusive) on both Saturday and Sunday by prior arrangement with the hotel reception staff. Morning coffees for all are included in the registration fee.
7. **Cancellations** Once a booking has been made any member who has to cancel **must inform the club secretary** as soon as possible; their place can then be offered to a member on the waiting list, and any advance payment will be refunded. The secretary will cancel any residential booking at the Marine Hotel; except in unavoidable circumstances, a charge of 50% of the full hotel rate will be made for any booking for which the secretary does not receive cancellation in advance from the member.

8. **Other hotels** in North Berwick which are open in October are :

Blenheim House Hotel, High Street (0620 2385)
 County Hotel, 17 High Street (0620 2989)
 Golf Hotel, Dirleton Road (0620 2202)
 Royal Hotel, Station Road (0620 2401)

The last two are within 5 minutes walk of the Marine Hotel and have confirmed tariff for the weekend of the conference as follows :

Golf Hotel : Bed & Breakfast from £8 plus service charge of 10% and VAT at the standard rate.

Royal Hotel : Bed & Breakfast £10 including VAT.

Charges at the other Hotels should be confirmed when booking.

Members not staying at the conference hotel may take meals, other than breakfast, at the Marine Hotel by prior arrangement with the club secretary. Charges are given in paragraphs 5 and 6 above.

Annual Conference 24th - 26th October 1980

MARINE HOTEL, NORTH BERWICK

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3. I/We will not be staying at the Marine Hotel but wish to attend the Annual Dinner.

Name(s)

Address

I/We enclose £8.50 per person for the Annual Dinner:

Note Section 3 should not be completed if you stay at the Marine Hotel; the Annual Dinner is included in the Hotel charge.

4. In response to members' requests all those attending are asked to state how they wish their name to appear on their name card. Please print clearly EXACTLY how you wish your name to be written:

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Please return this sheet to: The Secretary, Scottish Ornithologists' Club, 21 Regent Terrace, Edinburgh EH7 5BT.

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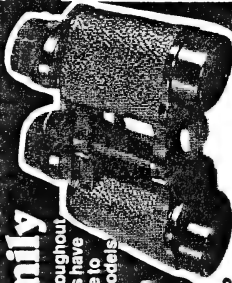
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SCOTTISH BIRDS



THE JOURNAL OF THE
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Vol. 11 No. 3

AUTUMN 1980

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Earlier this year the publicity given to our report on the poisoning of birds "Silent Death" appeared to have been effective in reducing the number of reported poisoning incidents. However there has been a sudden up-surge in May and the number of incidents so far appears to be the same as last year. The number of birds of prey involved is most disturbing, and includes 11 buzzards and 2 golden eagles. One of the eagles was an adult female which was about to lay.

EGG COLLECTING

Eagles in the Highlands again suffered from the attentions of egg collectors. In one relatively small area three eyries were robbed. RSPB staff working with police apprehended four egg collectors and two clutches of eggs were returned to the eyries. One of these eggs hatched and so far the chick is still doing well.

The cases of four egg collectors are not fully concluded but at the time of writing the youngest (18 year old) was fined £400.

FALCONRY

A considerable number of peregrine chicks have been disappearing from eyries all over Britain in the last few weeks and yet again they appear to be changing hands for large sums of money.

This upsurge in chick stealing may well be prompted by the forthcoming new controls on falconry. This year we have recovered more young peregrines than ever before and several prosecutions are pending.

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SCOTTISH BIRDS

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Vol. 11 No. 3

Autumn 1980

Edited by D. J. Bates

White-tailed Eagle reintroduction on the Isle of Rhum

J. A. LOVE

(Plates 9-12)

In 1968 four young White-tailed or Sea Eagles from Norway were set free on Fair Isle in an attempt to re-establish the species in Britain (Dennis 1968). One male disappeared soon afterwards, the other died a year later; the two females left the island during that period (Dennis 1969) but one or both may yet survive.

Seven years later the Nature Conservancy Council decided to repeat the experiment but this time on the Isle of Rhum—an island with several advantages over Fair Isle. Not least is its location in the heart of the species' former range and close to the last known nest in Britain. This is said to have been on Skye in 1916 (Baxter & Rintoul 1953). The last breeding attempt on Rhum was barely a decade earlier in 1907 (Love 1978 and in prep.). Fish are still reasonably plentiful in the waters of the Inner Hebrides, while Rhum itself has respectable colonies of auks, gulls and Shags but relatively few Fulmars. The oil spat out by young Fulmars was instrumental in bringing about the demise of one of the two male Fair Isle Sea Eagles (Dennis 1969). Rhum is especially noted for its extensive mountain-top colonies of Manx Shearwaters, estimated by Wormell (1976) to number over 100,000 pairs. Red Deer (1,500) and feral goats (180) contribute to a seasonal abundance of carrion on the island; there are no sheep, Rabbits nor hares.

Complications and dangers arise in transporting eggs, or implanting either eggs or young into the nests of foster parents (such as Golden Eagles) or even in attempting to catch and translocate established pairs from their breeding territories. It was decided to adopt the technique employed on Fair Isle, essentially that of the falconers' hacking-back. The young are retained until they familiarize themselves with their

new surroundings. Once free they return to the vicinity of their cages and utilize food dumps which are continually replenished. Thus they gradually learn to fend for themselves.

With appropriate licences from the Norwegian authorities and the generous aid first from Dr Johan Willgohs and subsequently from Capt Harald Misund, young aged six to eight weeks are taken from eyries in northern Norway. Latterly it has proved possible to take a single chick from broods of two so that the adults can successfully complete their breeding cycle. The convenient air base at Bodö, together with the kind co-operation of the RAF, permit the swift and safe transport of the chicks to Kinloss in Scotland. From there they are taken by car to Mallaig, and thence by boat to Rhum. This whole journey is completed within 12 hours incurring the minimum of stress to the birds.

Once installed in their individual, paired cages on the remote coast of Rhum, the young are fed on a 'natural' diet of locally-caught fish, gulls and Crows (shot with a rifle) and meat/offal from deer and goats (Love 1979). After a statutory month in quarantine, and a further one or two months in captivity when they would normally be still fully dependent on the parents, the eagles are released. Each is first weighed, measured and provided with a BTO ring on one leg and an individual combination of colour rings on the other. Fuller details of these stages of the operation are presented by Love & Ball (1979).

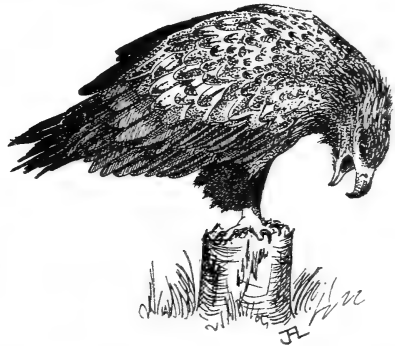
The first eaglets were imported from Norway to Rhum on 26th June 1975. Unfortunately, the only male died shortly afterwards, apparently from kidney failure. The three females were successfully reared, and the first was released on 27th September. She regularly fed and roosted on top of one of the occupied cages. The second, set free on 29th October, was seen only sporadically but on occasions fed alongside the first. After the final eagle was released on 1st November sightings ranged over a wider area, and about this time the first must have left the island. In mid November she was found dead at Morvern (Argyll) some 60 km to the south, apparently lying under power cables.

The other two females were often seen on Rhum at deer carcasses and grallochs (the discarded entrails of shot deer) until the following February. One returned briefly to the island at the end of April. An immature Sea Eagle seen in Orkney on 6th May 1976 is unlikely to have been from Rhum. One was certainly sighted at Arisaig on the nearby mainland on 3rd August. Presumably it was this bird that returned to Rhum on 9th December and frequented Canna during April and May 1977. It may have moved south, for on 24th February 1978 a Sea Eagle in third-year plumage was seen on Islay and later

the following May just across the water on the Antrim coast of Northern Ireland.

A further ten eaglets were received in June 1976, and eight of them were placed in cages; the other two were held in the open on running tethers. There were several initial problems with this latter technique and on separate occasions that autumn both birds escaped. But by watching them going to roost at night and later dazzling them in a powerful torch beam they were both recaptured in a long net almost immediately.

The first caged pair was released on 23rd November and the female was returning to the food dump within two days; the male was seen only rarely. They were seen feeding together at a deer carcass at the end of January, while in March—three months after their release—they regularly frequented Kilmory Glen in the north of the island.



SEA EAGLE REGURGITATING A PELLET

J. A. Love

A second male was released on 24th January 1977 and another on 28th February: they frequented the food dump for only two or three weeks. A female released on 15th April was prevented altogether from locating the dump by inadvertent human disturbance, persistent mobbing by Crows and by unexpected bad weather: her decomposing remains were washed up on the shore at Canna about one month later. A sixth eagle, another female, was set free on 1st May. She was observed regularly during the succeeding weeks and on 27th May was seen to bathe in the shallows of a freshwater loch. Thereafter sightings of any of the 1976 birds became rare, although two were seen in the Lochailort area during the summer of 1977. On 7th August one was seen at sea between Rhum and Skye, where it landed momentarily on the water amongst a flock of auks.

The remaining caged pair was shifted alongside the tethered pair in a fenced enclosure on the open hill. It was intended

to retain these four until mature and thence to use them in a captive-breeding programme. Any young thus produced would supplement the release of imported young. But on 4th May 1977 a male called Beccan (after a monk who lived on Rhum in the seventh century) made a second escape and thereafter eluded all attempts to recapture him. He did however return periodically to feed with his still-captive siblings, and within a month could capture and kill gulls for himself. He has retained a short length of leather attached to one leg which functions as an excellent recognition feature: thus a detailed picture of his movements has been assembled. Although spotted up to 30 km away he has remained mostly in the immediate vicinity of Rhum. In retrospect his escape has proved a fortuitous event for he has since provided many interesting and exciting interactions with several of the released eagles.

Only four were imported in 1977 and one of these was retained on tethers to replace the escaped Beccan. A pair was released on 18th October but only the female, Vaila, returned to use the food dumps. A radio transmitter weighing about 20 gm was mounted on a tail feather of the other female (weighing $6\frac{1}{4}$ kg). She was released a few days later on 4th November and for five days her movements were followed from dawn to dusk. Thereafter signals became scattered and infrequent but she remained on the island until mid February 1978. Vaila returned to accompany and display to the new releases from 24th November 1978 to January 1979, and again the following winter.

Three males and five females were taken to Rhum in June 1978. Within two weeks one female while engaged in active wing exercises suffered fractures to both tibia. She received treatment at the Glasgow Veterinary College, and then convalesced in—appropriately—Eaglesham, under the care of Mrs Carol Scott and George Watt. On her return to Rhum in October complications arose with swollen wing joints which left her unable to fly properly. She exhibited some improvement when tethered out in the open but ultimately she succumbed during a period of wet and stormy weather in September 1979.

The other seven fledged successfully and the first was released sporting another tail-mounted radio. Beccan reappeared at this time and he sometimes fed alongside the young female. The 29th September was a very stormy day with driving rain and the plumage of the young bird became waterlogged. She had come down to feed alongside the tethered eagles but I managed to catch hold of her when she experienced difficulty clearing the surrounding fence. She fed

in the comfort of her cage and was released a second time three days later. A male which had been released with a radio on 16th September immediately joined up with her. However, one week later both radios suddenly and simultaneously ceased to function, presumably due to leaks in the waterproof casing. The male remained around and associated with the other eagles as they were released during October and November. This flock of up to six with Beccan as its nucleus came to feed alongside the tethered eagles and roosted on a crag nearby. They also quickly located other food: two were found feeding at a deer gralloch within an hour of the beast having been shot.

On one occasion Beccan had to yield food to a noisy and persistent young male: he left the youngster to feed and went off to procure himself a second helping. The 1977 female, Vaila, who had also joined the flock, was similarly harried but she neatly countered by soaring to a height and devouring her prey on the wing! Later one of the youngsters also achieved this feat but with less accomplishment and



SEA EAGLE EATING PREY IN FLIGHT J. A. Love

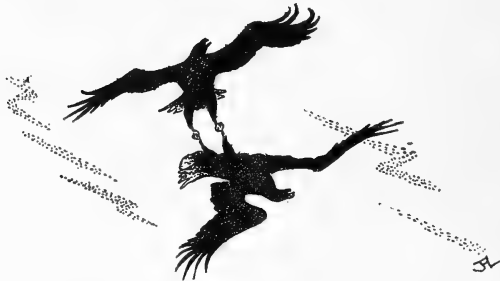
at a lesser height. The 1978/9 winter was rich in such interactions and despite the prolonged cold weather at least four of the seven new releases remained together in February. They then moved *en masse*, with Beccan, to another locality, where some of them have remained. Beccan himself regularly commutes back to Rhum.

In October 1978 one of the tethered females (then two and a half years old) took ill suddenly with a bacterial or viral infection, and she died a day or so later. About that time too it had been finally decided, for a variety of reasons, to abandon the captive-breeding programme, and to release the remaining three tethered birds. The first male was set free on 8th February, but disappeared almost immediately and must have died soon afterwards: his remains were found two months later on the beach at Canna.

Beccan was soaring above as the only female, Sula, was being freed from her tethers. He stooped at her excitedly, and she responded by flipping over to present talons. She finally came to land, and later bathed in a pool, while Beccan watched nearby. Thereafter Sula remained on the island feeding on seabirds. Catching the occasional Fulmar soon resulted in her acquiring an oily patch on her breast; fortunately constant preening appears to have cleaned it off.

The final tethered male, Ronan, was set free on 24th April 1979 and within six weeks he had killed several gulls, two Eider and a day-old deer calf. Ronan's predatory skills were developed at an early age for, while still in captivity, he caught and killed a Hooded Crow which was boldly stealing scraps within too close a range of the eagle's tethers.

Sula, Ronan and Beccan were present during August and September 1979, while six eaglets (acquired that June) were being released. As in the previous year up to six eagles often associated together and frequently indulged in attempted talon-grappling.



SEA EAGLES TALON-GRAPPLING
J. A. Love

In the summer of 1978 six of the 13 then released could still be accounted for. In February 1979 at least four of the seven released four months previously were known still to be alive. To date a total of 29 Sea Eagles have been released on Rhum—13 males and 16 females. Only three, one male and two females, have been recovered dead—all having died within two months of release, indicating this to be a critical period. But those that successfully utilize the food dumps and survive the first few months would seem to have much better chances of subsequent survival. Fifteen of the 29 have been confidently identified four or more months after their release—some of them as much as three or four years later; others have been seen but not recognized individually. Thus a *minimum* survival of around 50% may not be an unreasonable estimate.

The technique tried and tested on Fair Isle has proved adequate to implant young Sea Eagles into a vacant habitat. Their subsequent survival has been good, and seems to be

enhanced by the presence in the vicinity of the food dumps and of 'decoy' birds awaiting release. The brief period spent in captivity is adequate to imprint at least some of the young upon their release site. It is interesting however that the three most tenacious in this respect were retained on tethers for one to three years. Most of the eagles have eventually left the island but such dispersal is to be expected amongst immatures. It is particularly encouraging that some have since returned and now demonstrate strong attachment to particular areas. All but three of the accepted sightings have been within an 80 km radius of Rhum.

Not only does the gregarious habit of the young bring them back to food dumps located near still captive eagles, but it also attracts them to congregate at natural carrion. In this respect too, Crows and Ravens act as important indicators of a potential food source. The older, more experienced birds have even been recorded giving up food to food-begging youngsters.

The young learn to hunt for themselves at an early age and without any parental example. Their diet contains considerable carrion, mostly deer but also goat, seal and sheep. Over four seasons careful observation on one sheep walk has failed to demonstrate any live lambs being taken. One eagle did kill a day-old deer calf which was known, however, to have been deserted by its mother. On neighbouring islands Rabbits have featured in the diet. There is only one observation of a fish being carried (at an inland freshwater loch) but doubtless the eagles feed on stranded fish or may pirate fish from gulls and Otters, as is frequent in Norway (Willgohs 1961). Live seabirds are an important constituent of the diet—mainly gulls but also Fulmar and Eider. One eagle learnt to snatch Kittiwake chicks by alighting momentarily on the nest ledges. The eagles are frequently seen to chase Crows, and Crow feathers have been found in pellets. Thus it has been shown that the western seaboard of Scotland is still eminently capable of sustaining Sea Eagles.

However, one or two problems remain to be overcome. Since the Sea Eagle ceased to breed in Britain many territories have become tenanted by Golden Eagles. Frequent mobbing by this smaller but more aggressive species has failed to deter the Rhum Sea Eagles however. At present coastal Golden Eagles are experiencing poor reproductive success so this may prove an opportune moment to replace them with Sea Eagles. The main cause, which is shared with coastal Peregrines, appears to be an accumulation of DDT and PCBs through the marine food chain, until the top predators receive doses sufficient to impair breeding (Corkhill 1980). This of

course immediately raises a doubt as to whether the reintroduced Sea Eagle will be able to breed normally. But perhaps it may prove less vulnerable since part of its diet—fish—is derived from lower down the food chain, and terrestrial carrion forms a very important constituent of its diet. There are also indications that pollutions levels may be ameliorating slightly, for on Rhum Peregrines are poised to make a comeback, and in 1977 five pairs of Golden Eagles (instead of the usual four) succeeded in rearing an unprecedented total of three young.

The young Sea Eagles show a strong tendency to interact with one another, and frequently attempt to talon-grapple even on their maiden flight. Not surprisingly it is the older birds that are most accomplished and are now completing the whole manoeuvre of screaming, interlocking talons in mid air, tumbling and disengaging. During the autumn of 1979 and the ensuing spring one or two of the older eagles have been observed carrying an occasional stick to ledges on sea cliffs but have yet to reach full adulthood. Sea Eagles will attain sexual maturity at an age of about five years. Those seen regularly on Rhum or its vicinity include two males and a female each four years of age, and a female aged three. The signs are indeed encouraging that the ultimate goal of the reintroduction project is in sight—that Sea Eagles will once again breed upon our shores.

Postscript Eight chicks arrived on 23rd June 1980 for release this autumn, and importations are planned to continue for several years.

Acknowledgments

The project team consists of Dr J. M. Boyd, M. E. Ball, J. A. Love and R. T. Sutton of the Nature Conservancy Council, Dr I. Newton of the Institute of Terrestrial Ecology and R. H. Dennis of the Royal Society for the Protection of Birds. Many others have been involved but in particular we should like to thank Capt Harald Misund, Dr J. F. Willgohs, RAF Kinloss, M. Williams, Mrs C. Scott, G. Watt, Dr M. Marquiss, P. Corkhill and R. L. Swann. The World Wildlife Fund gave financial assistance in 1979-80.

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J. A. Love, Bayview, Isle of Rhum, Inverness-shire

Isle of May Bird Observatory and Field Station report for 1979

Prepared for the Observatory Committee by J. M. S. ARNOTT,
Honorary Secretary

The Observatory was manned from 21st March to 30th October, with the exception of short periods in April and May. Dr M. P. Harris, Mark Tasker and others helpfully supplied observations for these periods and at other times. During the year 147 species were observed, ten down on 1978, and including two new birds for the island, Sabine's Gull and Gyrfalcon.* Other rarities included Pomarine Skua, Roseate Tern, Richard's Pipit,* Marsh Warbler, Icterine Warbler, Subalpine Warbler,* Red-breasted Flycatcher, Scarlet Rosefinch,* and Little Bunting.* A record number of Puffins was ringed, and a record passage of Redwings was seen in the autumn. A pair of Common Terns attempted to breed for the first time since 1957. Tape luring at night revealed the presence of a considerable number of Storm Petrels in August.

Migration highlights

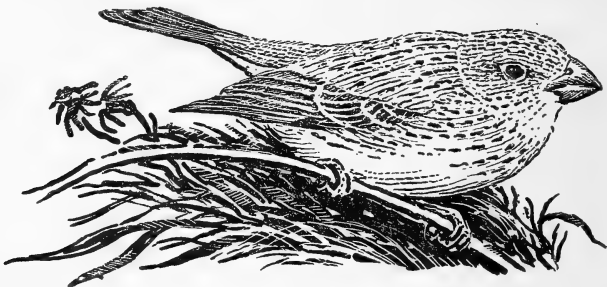
With only a few exceptions in the autumn, migration was on a rather small scale in 1979. After a slow start in spring a slight passage started on 8th April when the northerly winds backed easterly, and this built up on 11th to 200 Blackbirds and 200 Redwings. A white Gyrfalcon* was observed on 13th, and was seen to kill a Puffin. On 16th two Stock Doves arrived, the first of 19 throughout the year, following 14 in 1978 and a gap before that to 1962. There was a small fall on 11th May, a calm, misty day, with 70 Willow Warblers, 15 Wheatears, six Whinchats, four Whitethroats, and the first Grasshopper Warbler and Blackcap. This small movement continued through the westerly winds of 12th and 13th with up to 30 Wheatears, five Tree Pipits, two Yellow Wagtails, two Ring Ouzels and two Cuckoos. The only other highlights of an exceptionally quiet May was the arrival of a Subalpine Warbler* on 23rd, together with three Spotted Flycatchers which were

*Indicates subject to acceptance.

generally down in numbers this year. There were no Pied Flycatchers in spring, and no Wrynecks all year.

The autumn migration began in style with the unusually high number of 154 Swifts on 28th July. On 4th August a Pomarine Skua was seen chasing Kittiwakes along the cliffs, and that night five Storm Petrels were mistnetted with a tape lure at Pilgrims' Haven. In the past these have been seen only very occasionally on the May, and never in August, but during the following week 17 others were caught, one of them previously ringed on the Summer Isles (Wester Ross), and four more were seen. Sixteen of the trapped birds had well formed brood patches, some of them well vascularized. The nearest known colony of Storm Petrels on the east coast is in Orkney, and it now seems possible that there is a colony in the Firth of Forth, perhaps on the Bass Rock.

Returning waders built up to 361 Purple Sandpipers on 16th August and 347 Turnstones on 23rd. Also among waders the high number of 20 Whimbrels passed through on 13th, and two Black-tailed Godwits on 21st. Passerine migration was light until 25th August when about 30 Willow Warblers arrived together with small numbers of Garden Warblers, Whitethroats, Pied Flycatchers, Whinchats and an Icterine Warbler. Passage the following day included 250 Manx Shearwaters and 200 Swallows, and a Scarlet Rosefinch* and one of four autumn Wood Warblers arrived. The 27th had at least ten Sooty Shearwaters, two Little Gulls and, for the second year in succession, a Budgerigar.



SCARLET ROSEFINCH *Donald Watson*

Meadow Pipit passage peaked at 1,220 on 19th September with a steady stream of birds flying over against a moderate westerly wind in the early morning. Again with a westerly wind, but following strong southeasterlies the previous day, the thrush migration began in earnest on 5th October with over 1,000 each of Song Thrushes and Redwings flying over throughout the day. At least 1,000 Bramblings, 100

Skylarks and 100 Siskins were also seen, as well as 20 Reed Buntings, a Little Stint, an Osprey, and a Yellow-browed Warbler. The wind was from the southeast for the following week but this produced only a slight passage in good visibility, including a Sabine's Gull on 9th, until 13th, a day of poor visibility, when over 10,000 Redwings passed over the island. This exceeded the previous record in a day of 8,000 in 1978. There were also several hundred other thrushes and finches present. Another large number of Redwings occurred on 22nd October, again with southeasterly winds, when over 4,000 arrived, together with 2,000 Blackbirds, 200 Bramblings and 180 Robins.

Passage dates of some migrants

Sooty Shearwater 14 Aug-28 Sep, 10 on 27 Aug.
 Manx Shearwater 5 Aug-28 Sep, 119 on 7 Aug, 250 on 26 Aug.
 Arctic Skua Singles 1st and 23 July, 4 Aug on, 14 on 26 Sep.
 Great Skua Singles on 10th and 19 July, 4 Aug-20 Oct.
 Sand Martin 11 May-6 Jun; 26 Aug-27 Sep, 47 on 9 Sep.
 Swallow One 18 Apr, 6 May-22 Oct, 200 on 26 Aug.
 House Martin 13 May-20 Jun; 15 Aug-18 Oct, 145 on 18 Sep.
 Tree Pipit 5-29 May; 11 Aug-19 Oct.
 Meadow Pipit To 20 May, 200 on 11-12 Apr; 2 Sep on, 1,220 on 19 Sep.
 Redstart 15 Apr-30 May; 2 Sep-27 Oct.
 Wheatear 3 Apr-16 Jun, 50 on 13 May; 4 Jul-15 Oct.
 Blackbird To 26 Apr; 22 Sep on, 2,000 on 22 Oct.
 Fieldfare To 19 May; 1 Oct on, 300 on 13 Oct.
 Song Thrush To 16 Apr; 27 Sep on, 1,000 on 5 Oct.
 Redwing To 20 Apr; 30 Sep on, 10,000+ on 13 Oct.
 Sedge Warbler 14 May-8 Jun; 31 Jul-30 Sep.
 Whitethroat 11 May-18 Jun; 18 Aug-8 Oct.
 Garden Warbler 19 May-6 Jun; 9 Aug-27 Oct.
 Blackcap 11-17 May; 21 Sep on, 50 on 2-4 Oct.
 Chiffchaff 26 Mar-28 Jun; 8 Sep on, 20 on 13 Oct.
 Willow Warbler 15 Apr-27 Jun, 70 on 11 May; 27 Jul-7 Oct.
 Spotted Flycatcher 23 May-25 Jun; 12 Aug-6 Oct.
 Pied Flycatcher None in spring; 17 Aug-6 Oct.

Unusual occurrences

Storm Petrel 26 during 4-10 Aug, most in any year.
 Osprey One 5 Oct.
 Gyrfalcon* One 13 Apr.
 Water Rail One 3 Oct.
 Woodcock 40 on 26 Oct.
 Black-tailed Godwit 2 on 21 Aug.
 Whimbrel 20 on 13 Aug.
 Spotted Redshank One 2 Aug.
 Pomarine Skua Singles 4-9 Aug, 17 Sep.
 Sabine's Gull One 9 Oct.
 Glaucous Gull Singles 22 Mar, 15 Oct.
 Roseate Tern One 30 Jun, first since 1966.
 Common Tern One pair attempted breeding, first since 1957.
 Black Tern One 7 Sep.
 Little Auk One 20 Apr.
 Richard's Pipit* One 2-5 Oct.

Meadow Pipit 1,220 on 19 Sep.

Blue-headed Wagtail *Motacilla flava flava* One 29 May, first since 1970.

Nightingale One 31 May.

Bluethroat One 17 May.

Redwing 10,000+ on 13 Oct.

Marsh Warbler Singles 10th and 13 Jun.

Icterine Warbler One 25-27 Aug.

Subalpine Warbler* One 23 May-1 Jun.

Yellow-browed Warbler 2 on 30 Sep-2 Oct, one 5th and 10 Oct.

Red-breasted Flycatcher One 17 Oct.

Common Crossbill One 26-27 Oct, first since 1962.

Scarlet Rosefinch* One 26 Aug.

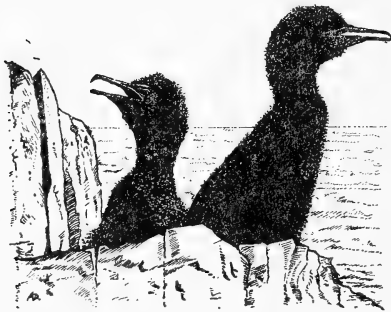
Little Bunting* One 4 Oct.

Rarities in 1978

The records marked with an asterisk in the 1978 report as being subject to acceptance have all been accepted by the *British Birds* Rarities Committee. They were Thrush Nightingale on 6-8 May, Rustic Bunting on 22-24 May, and Yellow-breasted Bunting on 6 September.

Breeding population (all numbers refer to pairs)

Thorough counts by Hector Galbraith and Mark Tasker produced totals of 108 Fulmars and 978 Shags, both up on previous years, and 4,940 Kittiwakes. Three pairs of Shelducks



SHAG CHICKS

Andrew Dowell

bred and two broods were seen, but the other breeding duck, the Eider, had a bad year. Only 12 young were seen in late July from 286 nests. There were 25 Oystercatchers, and for the fourth year running Lapwings bred. There were six nests with only five males, but no fledged chicks were seen. The annual cull of Herring and Lesser Black-backed Gulls was undertaken by NCC staff in early June. For the first time since 1957 a pair of Common Terns attempted to breed. One egg was seen at the late date of 27th June, but it disappeared. Other breeding birds were Razorbills, Guillemots, Puffins, feral Rock Doves, Swallows (three), Song Thrush (one), Pied Wagtails (three double-brooded, 24 fledged young), Meadow Pipit (one double-brooded), and Rock Pipits, still depressed at eight.

Ringling

The ringing total of 4,450 (1978 4,995) reflected the lower numbers of migrants, and included another record total of Puffins at 1,993. Since 1973 10,711 Puffins have been ringed. Storm Petrels (22) were ringed for the first time and other unusual captures were Sparrowhawk, Treecreeper, Marsh Warbler, Subalpine Warbler,* and Red-breasted Flycatcher. A record number of 581 Blackbirds was ringed, and other high totals were Fulmar (50), Shag (443), and Long-eared Owl (seven). The lowest figures for many years were recorded for Wren, Fieldfare, Whinchat, Goldcrest, and Pied Flycatcher.

Recoveries

During the year 201 recoveries of 16 species were reported, though 89 of these resulted from culls of gulls on the May and the Farnes. The 44 Shag recoveries followed the usual east coast pattern with the exception of one in Arran and one in Holland. Most of the 14 Puffin recoveries were local, but one was from France and for the first time one came from the west coast at Glenelg. A selection of recoveries follows, with the age code in brackets:

	Ringed	Recovered	
Lesser Black-backed Gull (1)	16. 6.76	20. 5.79	Tetouan, Morocco.
Herring Gull (1)	3. 7.72	17.11.79	Leigh-on-Sea, Essex.
Meadow Pipit (2)	3.10.76	28.11.79	Seville, Spain (shot).
Robin (4)	16.10.78	18.10.78	Spurn Point, Yorks (controlled).
Redstart (4)	22.10.79	31.10.79	Seaford, Sussex.
Blackbird (3)	13.10.72	25. 1.79	Colwyn Bay, Denbigh.
Blackbird (3)	12.10.78	21.10.79	Sund, Hordaland, Norway.
Sedge Warbler (4)	29. 5.78	27. 5.79	Edinburgh (controlled, breeding).
Blackcap (3)	15.10.78	18.10.78	Tjome, Vestfold, Norway.
Blackcap (2)	22. 9.76	8. 2.79	Tizi Ouzou, Algeria.
Brambling (2)	14.10.75	17.10.79	Stockholm, Sweden.

The Storm Petrel controlled on the May on 7.8.79 was ringed on Priest Island, Summer Isles, on 16.8.78.

Research

Dr M. P. Harris of the Institute of Terrestrial Ecology continued his long-term study of the Puffin colony, and the Psychology Department of St Andrews University their work on the behaviour of gulls and Puffins. Dr J. L. S. Cobb of St Andrews University supervised a further monitoring study of marine fauna. The NCC's summer Reserve Warden, Mark Tasker, monitored the breeding populations of birds and contributed many useful records to the observatory. To him and

to those other observers who made thorough and accurate records of their observations or who helped in other ways our thanks are due. And it is a pleasure once again to thank our boatman Mr Jim Smith and the Principal Lightkeepers and their staff for their great help.

*J. M. S. Arnott, East Redford House,
Redford Road, Edinburgh, EH13 0AS*



PUFFIN *Keith Brockie*

Birdwatching on the Forth estuary

D. M. BRYANT

It is unlikely that much of the Forth estuary (as distinct from the maritime firth beyond Queensferry) will ever be designated an area of outstanding natural beauty. Fortuitous combinations of earth banking or trees (or mist!) may allow an occasional illusion of wilderness but even a casual glance will usually betray its true character: an industrial landscape. Tall chimneys and massive cranes are obvious to travellers crossing either the famous Forth Bridges which lie at the eastern boundary of the estuary or the Kincardine Bridge in the middle reaches. Plumes of smoke come from power stations, the petrochemical industry, and factories, which along with mining and Grangemouth docks are the foci of industrial activity in the area.

Amidst all this human activity, wildlife can be found and enjoyed. The sight of a mixed flock of Pintail and Shelduck silhouetted at dusk against the flares of the petrochemical works has many elements of the classic scenes of wildfowl at sunset but with less of a taint of cliché. As with all estuaries, a knowledge of tides can make all the difference between success and failure. Visits to the Forth estuary are most productive during the six hours spanning high water.

Summer has rather little to offer visitors apart from Yellow Wagtails in the Grangemouth area, and Common Terns and Shelduck scattered as breeding birds. By July, how-

ever, moulting and passage waders can be seen and Shelduck have begun to congregate at Kinneil. The most rewarding months for birds are August-September and January-February and the main interest the waders and ducks. Rare birds are not a speciality of the area but they have included King Eider, Green-winged Teal, Spoonbill, Gull-billed Tern, Pectoral Sandpiper, Temminck's Stint and Lesser Golden Plover in recent years.

The tidal Forth begins above Stirling, although the river is not generally saline at this point and merely backs up at high water. Not generally rich in this reach it does nevertheless attract flocks of duck when nearby fresh waters freeze over. Goosanders, Goldeneye, Pochard and Tufted Ducks gather at Cornton just to the west of the Auld Brig in the town centre and to the east by the Abbey at Cambuskenneth. Downriver between Stirling and Alloa around 100 Whooper Swans feed on riverside fields and often roost on the river by the disused mine at Manorneuk.

At nearby Tullibody Island and along the Banded shore many wildfowl gather during the winter. The hard spell in early 1979 saw upwards of 3,000 ducks and geese, with Goosanders and Tufted Duck prominent, illustrating the importance of the site as a winter refuge. Formerly of international importance as a refuge for Teal, numbers have declined with the clean-up of the Cambus Distillery effluent: an example of the dynamic effect of industry on wildlife, so conspicuous on the estuary as a whole and deserving more study by birdwatchers. A good way to see the birds near Tullibody Island is to walk eastwards along the north bank of the Forth from the village of Cambus (where a cul-de-sac allows easy access to the riverside) along to the old railway bridge which now serves on occasions as a populous roost for up to 100 Cormorants.

Until recently, the mouth of the River Black Devon was an excellent spot for migrant waders. Sadly it has been embanked for dumping rubbish and its important function as a nursery for Shelduck has been lost. On the estuary as a whole, reclamation poses the greatest threat to the viability of the area. Between Alloa and Kincardine Bridge the mudbanks and river are best viewed from the southern sea wall by walking westwards from the bridge. Geese, ducks and waders occur in surroundings relatively free of industry which makes for a good compromise between birdwatching and a healthy stroll.

Skinflats, a reserve of the RSPB, lies between Kincardine Bridge and Grangemouth Docks. Over the past decade it has gathered an impressive species list, numbering over 140, and with wader numbers often exceeding 10,000 it must be reck-

oned the best birdwatching site on the estuary. The sea wall is an excellent vantage point on flow and ebb tides. At high water, however, care should be taken to avoid disturbing the waders roosting on the saltmarsh. Skinflats is a good site for plovers at migration times with Grey and Ringed numbered in hundreds and Golden Plovers in thousands. Raptors are frequent and include Kestrel, Sparrowhawk, Merlin, Peregrine and Short-eared Owl. Twite and occasionally Snow Buntings can be found on the seaward side of the wall and Corn Buntings behind. The saline lagoons lying just behind the embankment at the southern end of Skinflats appear ideal for passage waders but have tended to be rather disappointing in recent years even though records from the late sixties were outstanding. By taking a car from the centre of Grangemouth along the West Docks Road excellent views of the large flocks of Shelduck, Knot, Redshank and Dunlin can be expected.

To the southeast of Grangemouth Docks the Grangeburn empties into the Forth via a partly enclosed pan. It is one of the most reliable autumn sites for Curlew Sandpipers when rising tides herd feeding waders into the burn mouth or encourage them to roost on the adjacent reclaimed land. Telescope watching from the East Docks Road can reveal a wide variety of ducks, including Red-breasted Merganser and Pintail on the open pools, and perhaps also a Merlin or Kestrel perched on a prominent stake, or Snipe and Shoveler on the reed fringed pool within the docks area.



PINTAIL *Donald Watson*

The best views of Kinneil mudflats, which lie between the docks and Bo'ness, are from the southern boundary. Access is via the sewage works track, which runs north from the main Bo'ness-Grangemouth Road. Large flocks of Great Crested Grebes are present in autumn and late winter, a flock of Scaup is frequent and Shelduck can be seen the year round. The tightly packed autumn moulting flock, with over 2,000



PLATES 9-12. White-tailed Eagles on Rhum (p. 65).

J. A. Love

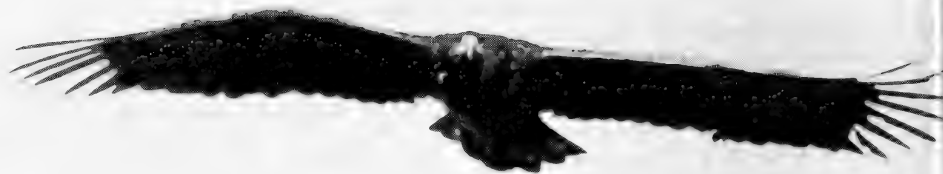
PLATE 9 (above) 4th year ♂ (Ronan), December 1979.

PLATE 10 (overleaf) (a) 4th year, ♀ (Sula) in flight, March 1980. (b) The same bird in 3rd year plumage, January 1979.

PLATE 11 (a) 3rd year ♀ (Colla), August 1978. (b) ♂ (Ronan) in 3rd year plumage, January 1979.

PLATE 12. 1st year ♂ (Beccan), July 1976.

In flight the outline differs from Golden Eagle by more massive, squarer wings, wedge-shaped tail, and well projecting head. The bill too is bigger. The tail becomes white when adult.







Shelduck shoulder to shoulder, is as thrilling a sight as their high tide flights from the feeding grounds to the dockside roost in winter. The small sewage settling tank just to the east of the Avon mouth is attractive to stints, Ruffs and Common Sandpipers in autumn and the large enclosure nearby is a good viewpoint for waders. It is not unusual to see over 5,000 waders here in winter, mostly Knot and Dunlin.

In some years, when several thousands of terns, mainly Common and Sandwich, have come to the estuary after breeding, the plunging and chasing of six species of terns and three species of skuas is especially spectacular. Arctic, Roseate and Little all occur at Kinneil, although Skinflats is the best for Black Terns. Little and Glaucous gulls are also seen regularly in the Grangemouth area, although the most reliable site is Longannet on the north shore.

Blackness Castle overlooks a sandy bay to its east, where a good selection of shorebirds may be seen. Usually more impressive, however, in terms of the number and variety of waders and ducks, is Torry Bay on the north shore. This area can be worked well by foot or visited more fleetingly by car. The track along the northern perimeter gives excellent views of the foreshore: rocky, sandy and muddy in different parts. Mallard, Wigeon, Red-breasted Merganser, Redshank, Curlew, Knot, godwits (Bar- and Black-tailed) and Dunlin are the most conspicuous but all of the more frequent estuarine species will generally be found. The *Zostera* beds scattered across the bay are exploited by the Wigeon flocks and have recently attracted Brent Geese in small numbers. To the east of Torry Bay, the foreshore is built up yet pleasant and attracts small numbers of most species, although Turnstone and Oystercatcher are the most noteworthy.

Immediately adjacent to the Forth Road Bridge is a reed covered marsh, attractive to dabbling ducks and roosting waders, known as Cultness or St Mary's Hope. It was the site of Europe's first Wilson's Phalarope, and among commoner waders, Ruffs are regular. Its attractiveness to wading birds appears to have declined recently: perhaps it is a site which deserves active management to encourage passage, wintering and breeding birds.

Two very important wader roosts lie on the north shore of the Forth between Torry Bay and Kincardine Bridge: the ash settling pans of Kincardine and Longannet Power Stations. It is necessary to obtain permits to visit these sites but at high water on spring tides they can hold many thousands of waders and provide rewarding views of flighting and resting flocks. The ash pans of Longannet Power Station (lying off Culross Village) also regularly hold over 1,000 Sandwich Terns roost-

ing in autumn and raptors are regular in their pursuit of the finch flocks which feed on the sparse vegetation.

Large groups of Cormorants gather near the Forth bridges. Similar dense flocks can be seen diving near Kincardine Bridge and hundreds frequently move into the upper estuary near Alloa for a short period. All movements appear to be related to the run of the tide but much work needs to be done to understand exactly what is going on. Seabirds such as Kittiwakes, Gannets and Manx Shearwaters also come into the estuary during gales. The relationship between wind direction, strength, time of year and the species occurring would make a valuable study. Closely linked to this question, and perhaps most intriguing of all, is the overland movement of seabirds. There is good evidence that Kittiwakes, Gannets, skuas, Fulmars and others fly westwards from the Skinflats area, but the conditions under which this occurs and the reasons for it remain obscure.

These and many other questions will undoubtedly remain to provide a background to any birdwatcher's visit to the estuary, providing of course that the estuary itself and its wildlife are not destroyed. There is intense pressure from industrial concerns to reclaim land in the most important part of the estuary, the Grangemouth area, and the threat of oil and other forms of pollution is always present.

*Dr D. M. Bryant, Department of Biology,
University of Stirling, FK9 4LA*

Short Notes

Black Stork in Outer Hebrides

On 27th August 1974 in North Uist (Outer Hebrides) my wife and I met a birdwatcher who described an 'odd heron-like bird' he had just been watching at Vallay Strand. Being convinced from his description that the bird must have been a Black Stork we immediately went to the spot but despite an extensive search could not find it. We did establish however that what must have been the same bird had been seen the previous evening (26th) by the local postman. We eventually caught up with the bird on 30th August feeding in a small reeded loch 3km southeast of Grenetote. Identification as an adult Black Stork was immediate by size, shape and plumage.

Description Head, neck, upper breast, back and wings glossy black with greenish sheen particularly noticeable on mantle and wing coverts. Remaining underparts white, just extending around carpal joints in a small notch. Long legs deep red; bill also deep red and giving impression of being very slightly upturned due to straight upper edge

of upper mandible but curving lower edge of lower mandible; narrow patch of bare red skin extending from bill just around eye.

When seen briefly in flight the wings seemed both longer and narrower than those of White Stork. The plumage generally was very fresh and the soft parts brightly coloured, thereby showing no signs of being an escape from captivity. The bird fed by wading through water about 30cm deep with slow, deliberate steps, occasionally shooting its bill into the water; it never kept still like a heron. Whenever a small fish was caught it would carry it to dry land to adjust its head first for swallowing. On one occasion when a fish was caught in the centre of the pond the stork flew to the bank to do this. Towards dusk the bird flew north towards the estuary and was not seen again. This record is the third for Scotland.

J. B. O. ROSSETTI

[Breeds Iberia and from eastern Europe to Pacific, also southern Africa; may be extending range into central Europe; European birds winter mainly in Africa. British records have increased, becoming annual since 1974, mostly in spring. There was at least one more in Scotland in 1977.—ED.]

Unusual food of Shelduck

During the severe winter of 1978/9 Shelduck feeding ecology was investigated on the Clyde estuary (Thompson in prep.).

At Finlaystone Point on 20th January 1979 several Shelduck dabbled on a pool edge. Although *Hydrobia* snails were in the pool bottom the Shelduck were apparently feeding on exposed tubes (0.5-1.0cm long) of the tube worm *Tubifex costatus* abundant at the edge. On many days around high tide Shelduck often ran fronds of *Fucus* through their bills. They did not, however, appear to break off pieces of this alga.

At Woodhall the shore is crossed by wooden stakes encrusted with barnacles *Balanus balanoides* and small numbers of Edible Periwinkles *Littorina littorea*. On 14th February the mud surface was frozen. Shelduck did not feed on the mud or in the water as they would normally have done. Instead the flock of 83 floated 150m offshore where eight of them fed by running their bills up and down the stakes. If more than two attempted to scrape feed on a stake the third was chased off by one of those already present. Subsequent examination revealed very fragmented *Balanus* on which the Shelduck must have been feeding. The continuous nature of the feeding action indicated they were not selectively picking off *Littorina*.

As a food item *Balanus* has not been mentioned in the literature.

In mid November 1978 several Shelduck fed on a field pond 300m from Longhaugh Bay. During early March C. M. Waltho observed Shelduck grazing on fields adjacent to exposed tidal flats at Ardoch.

These observations seem to indicate that Shelduck are opportunist feeders, especially during inclement weather. More observations of this nature would be gratefully appreciated by the author.

DESMOND B. A. THOMPSON

(*Department of Biology, Paisley College,
Paisley, Renfrewshire*)

Montagu's Harrier in Sutherland

On 23rd May 1979 an almost fully adult male Montagu's Harrier was seen from the bothy window on Handa (Sutherland) while it hunted in typical harrier fashion low over the ground. It was watched for about five minutes and then again briefly five minutes later.

Description Head, back and upper tail grey; small paler grey area on rump. Sides of breast streaked dark; several faint bars under tail. Upper wing pale grey; extensive black primaries; broad black bar along edge of coverts, showing through under wing; slight brownish area on upper wing-coverts.

This is the first record on Handa and the first in Scotland since 1963.

R. I. THORPE

Erythristic Herring Gull eggs in Caithness

On 28th May 1977 I found a nest containing two erythristic eggs in a Herring Gull colony in Caithness. Their translucent white background was sprinkled with warm pinkish red blotches, heavier in a band towards the narrow end on one of the eggs.

Another nest was found on 22nd May 1978 only yards from the previous site. These two eggs were darker and duller. The background was dirty white as if soiled during incubation and the blotches were more widespread and more rusty in colour. They were gone on 16th June. None were found in 1979.

A. SUTHERLAND

[I. H. J. Lyster has brought another clutch to light in the Royal Scottish Museum: three taken at Loch Nevis, Inverness-shire, in 1961. For other records and a discussion of erythrism see 9: 143-7.—ED.]

Common Nighthawk in Orkney

On 12th September 1978 while mistnetting in a sheltered valley with low bushes and cattle present 3 km east of Kirkwall (Orkney) I noticed a vampire-like shape quartering the area. The bird was soon lost in the dusk. However, when J. R. Lister Hogarth and I approached the net a nightjar-like bird with a white flash on the wing had been caught. It was taken indoors and photographed and with the help of E. J. Williams we took the following description.

Description General appearance of upperparts brownish with white barring; feathers dark brown to black with brownish white tips, the amount of brownish white increasing towards the tail; one or two feathers had pale rufous brown edges; some feathers had a greenish sheen like a Starling, mostly where the wings met the body; rump brownish with white crescentic bars. Chin brownish black with fairly broad whitish or rufous tips; breast and throat had white inverted V with buff tips to feathers; flanks and belly distinctly barred brownish black and pale buff; under tail-coverts creamy buff with narrow brownish black bars. Tail forked; blackish brown with whitish wavy barring; all feathers rounded and narrowly tipped white. Primaries blackish narrowly tipped white; bold white flash on primaries; secondaries blackish, tips tending to pale brown; alula and primary coverts uniform brownish black; feathers between alula and edge of wing blackish with brownish white fringes; pure white edging just below carpal joint; secondary coverts brownish black with whitish half-bars on distal portion; median coverts brownish with whitish vermiculations forming a pale panel; lesser coverts blackish brown glossed green, variably tipped whitish; underwing blackish brown with buffish barring on coverts. Eye very dark; bill blackish with large nostrils; inside mouth pinkish; short rectal bristles; legs pinkish.

The bird several times uttered a short harsh *churr* in the hand. It was identified as a Common Nighthawk and ringed and released at night near Finstown.

ANDREW D. K. RAMSAY

[The first for Scotland; the six previous British Isles records (seven birds) were also in autumn, all but one in Scilly. Breeds widely in North America; winters South America. It may seem odd to call such a rarity *Common Nighthawk*; it has been known by various names; here we follow current American terminology.—ED.]

Scottish Crossbills feeding on carrion

On 4th March 1978 we were watching Scottish Crossbills at a Sutherland breeding site which holds six breeding pairs, and at that stage two incubating females and three empty

or incomplete nests had been located. One male was seen to fly to the top of a Scots Pine *Pinus sylvestris* from where he uttered subsong. No female had been seen and no sounds heard to suggest the presence of one. During previous observations DSW had found similar behaviour to indicate that a female was feeding or building nearby. A close inspection was made of the tree, which was isolated and less than 10m in height. The presence of a female could not be detected from below. After four minutes the male flew to a stand of pines 100m away, where nesting was suspected, following a female which had appeared from a point inside the tree canopy.

From the base of the tree a nest could be seen at 4½m, well sheltered from above by foliage, and GGB climbed to investigate. It was found to be that of a Woodpigeon and on it sat a dead Woodcock, quite well embedded into the accumulation of pine needles. The position of the nest beneath foliage precluded the possibility that the bird had fallen there by chance, for instance after being shot. A tuft of three contour feathers on the Woodcock's back were displaced and protruding from the general contour, obviously having been pulled at quite strongly and not the result of injury. The bird was removed and examined more closely on the ground. The eyes had been burst and the skin of the neck had been exposed and picked at. The skin was actually broken and a slight fresh seepage of blood could be seen. An area about 5cm long on the back had also been exposed and picked at. We do not think the crossbill was gathering feathers for nest building—they are occasionally used but we can recall only ever seeing white ones—and we saw no insects on which she might have been feeding. It appears that the female crossbill had actually been feeding off the dead Woodcock.

Woodcock have been recorded in trees in the past, and the presence of this one in a pigeon's nest may be explained by recent weather conditions at the site. Very severe snowfalls occurred during the last days of January, and the ground in the area was covered by 0.3-1.5m of snow for most of February with the ground cover of heather obliterated. It seems reasonable to suppose that the Woodcock roosted in the nest which at the time would have been the safest type of cover available. The Woodcock showed no obvious signs of decomposition, being quite firm and without smell, suggesting that it had not been dead for too great a time. However, the bird had been in the nest long enough for pine needles to have accumulated and become slightly compacted around it on the nest rim, which could be a result of the severe blizzard and subsequent thaw and rain. This would support the hypothesis that the Woodcock took cover and died in the pigeon's nest at the time of the snows.

At another Sutherland site on 24th March 1976 DSW recorded a female Scottish Crossbill, accompanied by a green male with an orange head, fly down to an old sheep carcass on which a little dried and blackened flesh remained. From 10m she was seen to spend a minute or more picking at the flesh. The male's interest became aroused and he too joined her on the carcass. She then took a strand of wool from the ground nearby and carried it to a nearby pine. Here it was placed in a fork 1.8m from the ground. No other material was present at this time. Later a nest constructed largely of wool and moss was completed. As far as we know it was not laid in. These barren nests appear to be fairly common among pairs showing immature plumage. Even when they do lay, egg laying is often delayed and failure rate is high.

Similar feeding behaviour is not entirely unknown. Nethersole-Thompson (1975, *Pine Crossbills* p. 146) mentions a female nibbling at a Capercaillie skeleton, and another carrying a bone of a Mountain Hare *Lepus timidus*, both during March and evidently for calcium.

G. G. BATES, D. S. WHITAKER

[D. Nethersole-Thompson writes: 'During the build up for egg laying crossbills do need protein and often take insects (see *Pine Crossbills* p. 146). I do not know of a crossbill feeding on carrion, but R. B. Payne (1972, *Condor* 74: 485-6) watched a hen Red (Common) Crossbill collecting fragments of bone from old carnivore faeces and suggested that this was done for egg production. Tordoff's captive Red Crossbills also attacked bones. I think, therefore, that it is extremely likely that these foods are taken to assist in egg formation.']

Reviews

The Gannet by Bryan Nelson. Berkhamsted, T. & A. D. Poyser, 1978, pp. 336, 32 monochrome plates, many text figures and tables, 24 x 16 cm. £9.

This book provides a comprehensive and up-to-date account of the biology of the Gannet. Dr Nelson is undoubtedly the foremost authority on the species and much of the material in this book comes from his own researches. He has in addition brought together a great deal of new information from Europe, North America, South Africa and Australia. The book is written in a beautifully clear, flowing style which makes it a delight to read. Technical jargon has been avoided so that even the most complex ideas will be easily understood by all. The author's enthusiasm and dedication are evident throughout.

The book is in seven chapters, four of which are devoted to the Gannet's ecology and behaviour with the main emphasis on the breeding season. There is an entire chapter on breeding behaviour which is particularly engrossing. A careful read of this before a trip to a gannetry

will make the adventure more rewarding and infinitely more memorable. The ecological sections include a highly detailed account of the Gannet's world distribution and numbers, a substantial chapter on breeding ecology, and smaller pieces on movements and feeding. The remaining three chapters include a fascinating discussion of the species' past and present relationships with man, a brief comparison of the Gannet with other members of the Sulidae and a description of the species' plumage, structure and voice. Each chapter ends with a detailed summary that enables the reader to determine the contents of the chapter at a glance.

The book is very well produced and is illustrated throughout by John Busby's drawings. These are described on the dust jacket as 'brilliant and evocative'. Few could disagree. At £9 this book must surely be a bargain.

I. R. TAYLOR

Ireland's Wetlands and their Birds by Clive Hutchinson. Dublin, Irish Wildbird Conservancy, 1979, pp. 201, many maps, figures, tables, photographs and drawings, 24 x 17½cm, £4.50.

This book is based upon counts of wildfowl and waders obtained during the Irish Wetlands Enquiry from 1971-5 under the auspices of the Irish Wildbird Conservancy; information from Northern Ireland is also included. Details are provided in the form of a register of Ireland's wetland habitats together with wildfowl and wader numbers recorded in these areas, followed by an account of each species involved. A short section also discusses other wetland species e.g. divers, grebes and gulls. Numerous maps, figures and tables illustrate the considerable quantity of information collected. Many illustrations and photographs are also included and although some of these are rather poorly reproduced this is a minor fault in such an economically priced book. It must have been a daunting task to collate and summarize in a highly readable form all the information contained in this book. It should prove invaluable to either the birdwatcher visiting Ireland or as a work of reference for those interested in duck and wader movements. Our knowledge of the birds of Ireland's wetlands has been greatly enhanced and one can only hope that a similar work can be undertaken for Scotland.

ALLAN W. and LYNDESAY M. BROWN

Greenshanks by D. & M. Nethersole-Thompson. Berkhamsted, T. & A. D. Poyser, 1979, pp. 275, 20 plates, numerous tables & drawings, maps, 24 x 16 cm. £8.80

This is an account, written in personal, narrative style, and drawing heavily on field notebooks, of a study from 1964 of Greenshanks breeding in Sutherland, with data from a different habitat in Speyside in the 1930s and 1940s (the subject of the senior author's out-of-print 1951 book) and some material from correspondents elsewhere in the species' range. The descriptions of habitat and general behaviour are as evocative as any of Desmond Nethersole-Thompson's work and the accounts of the time and effort in obtaining even small amounts of field information may clarify in readers' minds the difficulties of such work—into which the whole family has been enlisted, apparently without serious rebellion!

While I have nothing but admiration for the authors' dedication, I found the book disappointing. There is a wealth of detail in text and appendices (including some contributions by other workers) but there seems to be a lack of synthesis (exacerbated by poor arrangement of chapters). I found myself wondering where the work was leading. A long term study seems to me to present opportunities for examining

why numbers of Greenshanks are as they are and what affects them: studies of production and survival of young and adults, possible factors affecting this such as food and predation. Yet, despite several suggestions that food supply presented problems in some years, there are no details of variations in prey numbers (although sampling had apparently been undertaken); and a colour marking programme, necessary for the identification of chicks and males in later years and of females away from nests (with distinctive eggs) was not started until 1974. This is all the more surprising because the earlier study identified many of the problems and such work would have helped answer many of the questions raised in the book. The wide topics of 'groups, populations and breeding density' are given only 13 pages of the 215 of text, whereas other topics less dependent on such rarely possible long-term studies are treated in great detail e.g. long descriptions of habitat, nests and eggs (including some repetition) and an excellent section on voice, complete with numerous sonagrams.

Apart from minor quibbles, such as the lack of a map which would clarify many descriptions and the annoying habit of turning assumptions into statements of fact, this is a readable and valuable book, but it is marred for me by the thought that, with a few extra elements—which would have taken virtually no extra time or effort, given that already put into nest-finding—the watchers could have gained so much more information to answer the questions they pose.

M. W. PIENKOWSKI

A Hebridean Naturalist by Peter Cunningham. Steornabagh, Acair, 1979, 71 pp, drawings, 20 x 21 cm. £2.95

This book is not a coherent and comprehensive account of the natural history of the Hebrides. It is a collection of Nature Notes, concentrating on birds, that were originally published in the *Stornoway Gazette*. Though some of the original immediacy of the items is lost, they have a delightful vitality and an authenticity that springs from the author's intimate knowledge of Hebridean birds. Lovers of the Outer Isles will surely wish to have this book by their bedsides, to be dipped into at intervals rather than consumed at one sitting, like a box of rare chocolates.

Arctic Summer: Birds in North Norway by Richard Vaughan. Shrewsbury, Anthony Nelson, 1979, 152 pp, 7 colour, many plain photographs, 2 maps, 23 x 15 cm. £6.25

This is an account of a bird photographer's safari to the Varanger peninsula in northern Norway, just inside the arctic regions and alive with exciting birds. The author has an easy and enjoyable style. He tells us not only about the birds and the people he met but also indirectly about himself. In learning Norwegian, contacting local ornithologists, and not wasting a moment of his time in the field he showed a determination which was rewarded with success. This is not a work of serious ornithology but all interested in the birds of the northlands would do well to read it. One's only criticism is of the standard of reproduction of the monochrome plates: the colour plates are, in contrast, superb.

Population Ecology of Raptors by Ian Newton. Berkhamsted, T. & A. D. Poyser, 1979, 399 pp, many plain photographs, drawings, diagrams and maps, 26 x 16 cm. £10.80

There are those who believe that serious ornithology only makes enjoyable reading for the average birdwatcher if it has been completely watered down. According to this view, histograms and tables must be

expunged, bibliographic references replaced by a brief list of 'further reading', and the material presented as a series of homely tales from nature. Not unexpectedly, Ian Newton has proved what nonsense this is. His book is a thoroughly good read. It is enjoyable and even exciting. Yet it contains 50 graphs, 68 tables, and about 800 references.

The book's success lies not only in the writing but also in the way in which it has been packaged. It is well laid out and illustrated with many photographs and some fine drawings by Jim Gammie. The pictures are not mere decoration (though many are decorative): they show habits and habitats as well as the birds themselves. Poysers deserve to be congratulated on this publication.

This book is much more than a review of the population ecology of raptors. It also presents much work on behavioural ecology and conservation. The relationships between the sexes, breeding strategies and behaviour, and movements are reviewed and shown to be interrelated not only with each other but also with the density and dispersal of populations and with breeding and mortality rates. Observations on raptors from all over the world are drawn together to form the basis of all the discussions. Many of the points covered are relevant to other animals and this book is a useful addition to the ecological literature as well as a fascinating account of an interesting group of birds.

The presentation of so much data in the form of graphs and tables allows the enthusiast to check the author's conclusions for himself. They also show how voluminous are the basic observations and, therefore, how soundly based are the general conclusions. Following Jane Goodall, the 1970s produced a crop of studies in which detailed observations were made of small numbers of individuals of various birds and mammals. Though such work is useful, it is severely limited because the conclusions may be overly influenced by the idiosyncratic behaviour of a few individual animals. It is a relief to find the decade closing with a book in which the broad picture is not obscured by too close a view of individuals—and to find that such a book can be at least as entertaining as the collections of anecdotes with which we have been too often assailed.

JEREMY J. D. GREENWOOD

Birdwatcher at Large by Bruce Campbell. London, Dent, 1979, 272 pp, drawings by Donald Watson, 22 x 13 cm. £7.95.

Many birdwatchers keep records; these vary from bare lists to the more literary accounts of idyllic days in the field. Bruce Campbell has kept careful notes throughout a varied career as a keen amateur and professional ornithologist. He draws on these journals to relive some pleasurable bird outings around Edinburgh, in Argyllshire, Wales, Ireland and Oxford. Various well known birdwatchers figure in these pages but disappointingly one learns very little about them or indeed about the author of this book. This is not quite the autobiography promised on the dustcover but it is a thoroughly enjoyable account of one man's birding.

Wildlife of Scotland edited by Fred Holliday. London, Macmillan, 1979, 198 pp, many colour and plain photographs and drawings, maps, 25 x 19 cm. £8.95

This is an immediately attractive book. It is well produced and beautifully illustrated. There are ten chapters devoted to the main natural habitats and geographical areas in Scotland. Each is written by a well known naturalist who provides a comprehensive introduction to his subject covering the history and the current problems related to con-

servation. These are separate essays standing independently. This inevitably leads to repetition and an eventual sense of frustration in that no topic can be fully developed. The Scottish Wildlife Trust should be proud of this handsome book and grateful to the Gulf Oil Corporation who supported it.

I. T. DRAPER

Current literature Articles and reports on the status and distribution of birds in Scotland are listed here. Strictly biological studies such as ecology or behaviour are excluded, as are references from widely read journals such as *British Birds* and *Bird Study*. Most listed items and many others are in the club library and we are grateful to everyone who has made donations. The library also welcomes copies of ornithological work on any subject published outwith the main bird journals.

Hebridean Naturalist: Magazine of the Western Isles Natural History Society vol 1 No 1/2. I. S. Angus 1978. £1.50.

St Abb's Head Seabird Monitoring: 1st Year Results - 1978. R. Weatherhead 1979. Nature Conservancy Council SE Scotland Region.

St Abb's Head Seabird Sample Counts: 2nd Year Results - 1979. R. Weatherhead & C. O. Badenoch 1979. Nature Conservancy Council SE Scotland Region.

The past and current status of the Greenland White-fronted Goose in Ireland and Britain. R. F. Ruttledge & M. A. Ogilvie 1979. *Irish Birds* 1: 293-363.

Observations on the Shelduck Population of the Loch Lomond National Nature Reserve. E. M. Bignal 1980. Nature Conservancy Council, South West (Scotland) Region.

The Yellow Meadow Ant as a food source for the Green Woodpecker and Chough. J. Mitchell & J. M. Cameron 1979. *Glasgow Naturalist* 19: 510-511. YOC/ENHS Water of Leith survey 1978. M. Porteous 1979. *Edinburgh Natural History Society Journal* 1979: 18-22.

Forth Island bird count 1979. R. W. J. Smith 1979. *Edinburgh Natural History Society Journal* 1979: 22-24.

Borders Bird Report '80 (sic - 1979). R. D. Murray (ed.). 30p. (Berwickshire, Roxburgh, Peebles, Selkirk).

Breeding Seabird Census, 1979: Pennan Head, Lion's Head and Troup Head (Banff and Buchan). S. North 1979.

Grampian Ringing Group Report 2: S. Baillie & J. Hardey (eds.) 1979.

Fair Isle Bird Observatory Report for 1979. G. Waterston & J. Arnott (eds.). £1.25.

Hebridean Naturalist: Magazine of the Western Isles Natural History Society No 3 1979. G. Ponting & F. Thompson (eds.). £2.20.

The Feeding Distribution of Birds on the Clyde Estuary Tidal Flats 1976-77: A Report to the Nature Conservancy Council. J. B. Halliday 1978. Department of Biology, Paisley College of Technology.

Perthshire '79 Bird Report. E. D. Cameron (ed) 1980. Perth Museum & Art Gallery, George St, Perth; 75p post free.

Notices

Seabirds at sea recording project The Nature Conservancy Council and the Seabird Group have launched a project aimed at recording seabirds in the habitat where least is known about them: out at sea. One main aim is to produce an atlas of seabirds at sea, showing the distribution (and perhaps density) of birds on and over the continental shelf waters around Britain and Ireland. A knowledge of the patterns of location and abundance of seabirds at sea is vital in oilspill contingency planning.

Any birdwatcher going out to sea can help towards the completion of the atlas by collecting seabird data on standard forms: you'll enjoy seeing the seabirds, and you'll also contribute towards their conservation. Details of the scheme are available from the Seabirds at Sea Team, 17 Rubislaw Terrace, Aberdeen AB1 1XE.

Whooper Swans On 17 January 1980 52 were marked at Caerlaverock with black-lettered yellow rings and wing tips and tails dyed yellow. Please send records to M. A. Brazil, Dept Psychology, Stirling University, or the Wildfowl Trust.

Isle of May The new bird observatory secretary and SOC local recorder is Bernard Zonfrillo, 28 Brodie Road, Balornock East, Glasgow, G21 3SB. All concerned thank his predecessor J. M. S. Arnott for his incumbency.

The Scottish Ornithologists' Club

ANNUAL CONFERENCE : 24-26 October 1980

The programme and booking form for the 1980 conference was sent to members with the summer journal; it is included with this number for all who joined the club at the start of the 1980/81 session.

44th ANNUAL GENERAL MEETING - AGENDA

The 44th annual general meeting of the club will be held in the Marine Hotel, North Berwick, East Lothian, at 5.30 pm on Saturday 25 October 1980. The agenda is :

1. Apologies for absence.
2. Approval of minutes of 43rd annual general meeting of the club held at the Marine Hotel, North Berwick on 27 October 1979.
3. Matters arising.
4. Report of Council for session 43.
5. Approval of accounts for session 43.
6. Appointment of auditor.
7. Election of Honorary President. The council recommends that Professor V. C. Wynne-Edwards be elected an Honorary President of the Club.
8. Election of new council members. The council recommends the following elections : D. L. Clugston, B. Stewart and Dr I. R. Taylor to replace Miss N. J. Gordon and Dr J. J. D. Greenwood who retire by rotation, and Mr R. L. McMillan who has resigned.
9. Any other business.

HONORARY PRESIDENTS AND MEMBERS

The SOC constitution states that the club may elect one or more honorary presidents nominated by council in recognition of services to Scottish ornithology. As shown in the agenda for the next AGM printed above, it is with very great pleasure that council has nominated Professor V. C. Wynne-Edwards to become an honorary president.

Council is empowered under the constitution to elect those who have rendered distinguished service to Scottish ornithology, up to twelve in number, as honorary members; confirmation of their appointment is not required at an AGM. At its meeting in March council agreed to confer honorary membership on three members and is very pleased to announce

that the following accepted the invitation and are now honorary members of the club :

Dr John Berry, Dr Ian Pennie and Mr Donald Watson.

NEW BRANCH IN THE BORDERS

The Council of the Club announces the formation of a new Branch in the Borders. Following a very successful series of meetings early in 1980 and the recruitment of new SOC members bringing the total in the area to just over 60, Mr Malcolm Ross asked Council to approve the formation of a new Branch of the Club.

The **Borders Branch** will hold its winter meetings in Galashiels; full details of the programme are printed in the 1980/81 lecture syllabus sent out with this journal. The first AGM will be held in April 1981. Anyone interested in local activities should contact Mr Malcolm B. Ross, The Tubs, Dingleton Road, Melrose, Roxburghshire TD6 9QP (Melrose 2132).

The Council welcomes the formation of this new Branch and extends its good wishes for the future. It hopes that members living in the Borders will enjoy the indoor meetings and excursions which have been planned, and will participate in any fieldwork which may be arranged.

BRANCH SECRETARIES

Will members please note the following new appointments :

Borders M. B. Ross, The Tubs, Dingleton Road, Melrose, Roxburghshire TD6 9QP (Melrose 2132).

Edinburgh S. R. da Prato, 38 Carlawerock Grove, Tranent, East Lothian (Tranent 612 015).

Glasgow S. N. Denney, 55 Morar Crescent, Bishopbriggs, Glasgow G64 3DN (041 772 4087).

ENDOWMENT FUND

Members are reminded that the club's Endowment Fund was established for the advancement of ornithology. Any legacy or donation will be very gratefully received and should be sent to the club secretary.

The Fund is administered by the council of the club which is empowered to make grants from the accumulated free income. Applications for a grant should normally be submitted to the club secretary by 31st December each year, so that they can be considered at a council meeting usually held in March. Applications received after 31st January will not be considered for a grant given in the financial year ending on 30th June following.

CLUB TIES, BADGES AND CAR STICKERS

SOC ties, badges and car stickers—all with the club emblem—the crested tit—are available from the club secretary and some branch secretaries at the following prices :

Ties in maroon, dark blue or green—£2.75 each (£2.85 by post).

Badges 50p each (60p by post). **Car Stickers** 15p each (25p by post).

SCOTTISH BIRDS

We would like to thank all those members who responded to our request and returned their copy of the autumn 1979 number (10: 7). We received over 50 copies and we are particularly grateful to those who did not wish to have postage refunded. Copies will still be welcome and should be sent to the club secretary or handed to your branch secretary.

Copies of most back numbers of the journal from Volume 1 No 1 (autumn 1958), and also some complete unbound secondhand volumes, are available; for details and prices write to the club secretary.

WINTER EXCURSIONS

AYR BRANCH

Sunday 5 October 1980 ABERLADY BAY. Leader, Donald Smith. Meet Wellington Square, Ayr 9 am (lunch).

Saturday 1 November TROON, BARASSIE. Leader, Jim Miller. Meet Wellington Square, Ayr 1.30 pm or Gasworks 2 pm.

Sunday 7 December DOONFOOT & PRESTWICK. Leader, Bruce Forrester. Meet Wellington Square, Ayr 1 pm.

Sunday 7 February 1981 CAERLAVEROCK. Leader, Roger Hissett. Meet Wellington Square, Ayr 9 am (lunch).

Sunday 8 March HUNTERSTON & PORTENCROSS. Leader, John Burton. Meet Wellington Square, Ayr 1.15 pm or Hunterston road end 2 pm.

DUNDEE BRANCH

All excursions, except that to Strathbeg, leave Crichton Street at 10 am (bring lunch & tea).

Sunday 19 October 1980 LOCH OF STRATHBEG. Leave 8 am Lindsay Street (bus outing).

Sunday 16 November LINTRATHEN. Leader B. Pounder.

Sunday 7 December DUNKELD AREA.

Sunday 18 January 1981 TENTSMUIR POINT and MORTON LOCHS.

Sunday 22 February TAY REED BEDS. Leader B. Lynch.

Sunday 22 March MEIKLEOUR. Leader S. Laing.

Sunday 26 April CRAWTON. Leader B. Pounder.

Conference News

SOC northern meeting, Inverness, April 1980

The opening film on Friday evening, 'Highland Winter' by Alister Brebner, followed by sounds of moorland birds presented by Derek McGinn, and impressive slides by Malcolm Harvey of Inverness-shire glens, established the northern flavour of this second northern conference (the first one was in 1962). Roy Dennis's talk on Canada Geese of the Beaulieu Firth, telling us that they came from other places, chiefly Yorkshire, for the moult, acknowledged that places outside the Highlands existed.

The talk on Saturday morning by Bob Swann on waders in the Moray Firth was complemented by Roger Broad with his talk on ducks of the Moray Firth. The developments in such places as Nigg Bay, with all the associated pressures, provided the impetus for both surveys—as regards waders by the Highland Ringing Group, and the ducks by Greg Mudge. Roy Dennis wound up this session by talking about Goldeneyes. In Scotland nestboxes were introduced in the 1960s and the first brood appeared in 1970, and by 1979 there were 21 sites at which 16 were successful, producing 110 chicks.

The charms of Chanonry Ness were reinforced by the discovery that it was a good place to watch birds from your car, and whilst waders and Eiders were in rather short supply, Douglas Willis painted a wonderfully evocative picture of divers coming in in groups early on a winter's morning, whilst the description of Manx Shearwaters ahead of an approaching squall merited a painting by Keith Shackleton. Fol-

lowing outings on Saturday afternoon, Doug Weir spoke on Alaska with the subtitle 'Examples of environmental problems faced by Alaskan birds and relevance to recent "colonization" of Scotland'. We were given food for thought with the suggestion that a comparative study of the Redwing and Song Thrush in Scotland would probably prove interesting.

On Sunday morning we were 'taken' to Priest Island by Tony Mainwood where 20,000 Storm Petrels have been ringed since 1975 and where possibly 2,000 pairs breed. This was followed by a 'visit' to the Insh Marshes by Russell Leavett, with particular reference to the Whooper Swan, whose arrival in October each year coincides with the first floods. The peak count of 184 represents 7.3% of the British wintering population. Martin Cook then spoke on Crested Tits which, having only the previous day spent two hours relentlessly searching Rothiemurchus to discover one specimen, we were crestfallen to find could reputedly be seen without difficulty at the hotel rubbish bins at Coylumbridge. Our final talk was by John Love on the Sea Eagles on Rhum where 29 birds have been released since 1975, and it is felt that the prospect for breeding now looks quite good.

S. SHIMELD

Current Notes

These notes include unchecked reports and are not intended as a permanent record, nor will they be indexed. Please send reports via local recorders at the end of March, June, September and December.

Departing and lingering wintering visitors

Black-throated Diver 59+ St Andrews (Fife) 16 Mar—exceptional count; 3 Harray (Ork) 18 May; singles Westwater resr (Peeb) 26 May, Tynningame (E Loth) 22 Jun. **Long-tailed Duck** 2 ♀♀ on fresh water St Abbs (Ber) 8 Jun. **Brunnich's Guillemot** 2 dead Aberlady (E Loth) 9 Feb (preserved); one dead Burrafirth (Shet) 24 Feb. **Brambling** Fair Isle 13 Jun. **Common Crossbill** one dying Burravoe (Shet) and pair killed by car Islay (I Heb) 17 Apr. **Lapland Bunting** Fetlar (Shet) 4 Apr; Fair Isle max 3 on 26 Apr. **Snow Bunting** Fair Isle 19 Jun (none reported from breeding sites this year).

Spring migrants and rarities

Bittern booming in Borders reedbed 9 Jun. **Snow Goose** Kirkwall (Ork) 11 May; Boewing (O Heb) 15 May. **American Wigeon** Stenness (Ork) 12 May. **Gadwall** Scatness (Shet) 15 Apr; pair South Ronaldsay (Ork) May/June. **Teal** pair of Green-winged *carolinensis* St Kilda (O Heb) 26 Apr. **Garganey** South Uist (O Heb) 22 May. **Ring-necked Duck** Asta Water-Tingwall L (Shet) from 23 Mar, 2 late Apr. **Steller's Eider** Papa Westray (Ork) May-Jun. **Surf Scoter** Burray (Ork) 4 May. **Ruddy Duck** pair Holm (Ork) 3 May. **Red Kite** Strathbeg (Aber) 10 Mar; Peebles early June. **Marsh Harrier** Islay 13 May; Fair Isle 16 May; 2 Aberdeenshire in May. **Montagu's Harrier** Isle of May mid May. **Rough-legged Buzzard** with (Common) **Buzzard** Birsay (Ork) 12 Apr. **Osprey** Evie (Ork) 9 May; Islay 15 May; Fair Isle 29 May. **Quail** St Ola (Ork) 23 Apr; Fair Isle 9 Jun, 24 Jun. **Corncrake** 1st Sanday (Ork) 16 Apr; Fair Isle 13 May only. **Crane** 2 Stenness (Ork) 13 Apr; 2 Ormiclate (S Uist) 18 May. **Avocet** Pool of Virkie (Shet) 29 Mar-1 Apr. **Little Ringed Plover** Lochwinnoch (Renf) 12 May. **Dotterel** 1-2 trips Dumfriesshire in May; 3 Fair Isle 12 May. **Temminck's Stint** Fair Isle 17-18 May, 4 Jun; L of

Mey (Caith) 1 Jun; Irvine (Ayr) 7 Jul. **White-rumped Sandpiper** Musselburgh (Midl) 31 May-1 Jun—spring records are exceptional. **Pectoral Sandpiper** Fair Isle 4 Jun. **Ruff** pair displaying Orkney 21 Jun (none 22nd). **Spotted Redshank** Aberlady 27 May; Fair Isle 16 Jun. **Wood Sandpiper** Lewis 31 May. **Wilson's Phalarope** L of Mey 1-6 Jun. **Red-necked Phalarope** 1st Outer Hebrides 14 May. **Arctic Skua** early one St Andrews 14 Feb. **Long-tailed Skua** Fair Isle 5-7 Jun. **Franklin's Gull** sub-adult Irvine 2-6 Jul—1st Scottish record. **Ivory Gull** freshly dead Unst (Shet) 27 Apr. **Snowy Owl** Fair Isle 21 May. **Hoopoe** Royal Botanic Garden (Edinburgh) 2 Jul. **Wryneck** max 6 Fair Isle 18 May. **Short-toed Lark** Fair Isle 17-18 May, 3 Jun. **Skylark** 350 Fair Isle 1 Apr. **Shore Lark** Fair Isle 13 Apr. **Yellow Wagtail** max 5 Aberlady 10 May; Grey-headed *thunbergi* Fair Isle 4 Jun. **Nightingale** 4 Fair Isle during 14-27 May. **Bluethroat** Fair Isle 11-30 May—6 on 18th; 2 Isle of May mid May; St Abbs 17 May; ♂ singing Highlands mid June. **Black Redstart** max 5 Fair Isle 17 May. **Whinchat** 21 Fair Isle 12 May. **Wheatear** 200 Fair Isle 14 Apr. **Black-eared Wheatear** Isle of May 2-23 May. **Sedge Warbler** 32 Fair Isle 16 May. **Marsh Warbler** Wick (Caith) in May. **Icterine Warbler** Fair Isle 4 Jun. **Subalpine Warbler** Fair Isle 16 May; Isle of May 24 May. **Lesser Whitethroat** 13 Fair Isle 17 May. **Willow Warbler** 70 Fair Isle 12 May. **Firecrest** singing Deeside (Aber) late May; Bass Rock (E Loth) 7 Jun. **Red-breasted Flycatcher** Isle of May early June. **Collared Flycatcher** Stronsay (Ork) May/June. **Golden Oriole** Fair Isle 29 May. **Red-backed Shrike** Fair Isle 17 May-19 Jun—5 on 18th and 30 May; singles Isle of May mid May, Mainland (Ork) 21 Jun. **Rose-coloured Starling** Orkney 17 Jun. **Two-barred Crossbill** reported on bird table near larch wood Auchterarder (Perth) late May. **Scarlet Rosefinch** 2 Fair Isle during 30 May-6 Jun. **Hawfinch** Kirkwall (Ork) 10 Apr. **Ortolan Bunting** Fair Isle 16 May. **Rustic Bunting** Fair Isle 25 Apr; reported Islay late May. **Little Bunting** Fair Isle 11 May. **Yellow-breasted Bunting** Fair Isle 4 Jul.

Breeding and summering birds

Red-necked Grebe pair built nest in C Lowlands but perhaps no eggs laid. **Black-browed Albatross** returned to Hermaness (Shet) gannetry 15 Mar (still unmated!). **Osprey** 21 pairs bred with good success rate. **Temminck's Stint** possibly 3 pairs again breeding at one site; single birds at 2 other sites. **Purple Sandpiper** pair at Highland site where 2 broods last year. **Wood Sandpiper** 3 nests in 200m at one site. **Red-necked Phalarope** 2 (both ♂♂?) at a mainland site again. **Roseate Tern** only c20 pairs Inchmickery (Forth) with little success. **Wryneck** birds singing in E Highlands as usual—2-3 at one Aberdeenshire site. **Yellow Wagtail** breeding reported Westray (Ork). **Grasshopper Warbler** widespread; 14 singing Lochwinnoch.

Late news **Black Stork** Aberuthven (Perth) 3 Aug. **Temminck's Stint** Gladhouse (Midl) 21 Jul. **Pomarine Skua** Turnberry (Ayr) 10 Jul. **Laughing Gull** St Kilda from 30 Jun, noted feeding on 'sausages, army, fried.' **Tawny Pipit** Aberlady 20-21 Jul. **Red-backed Shrike** St Andrews 17 Jun.

D. J. BATES

SYLLABUS OF LECTURES - 1980/81

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Michael Densley very much regrets that he is unable to visit these branches. A speaker for the November meeting will be announced locally.

WILDFOWL COUNTS IN SCOTLAND

For more than 20 years the task of organising the winter Wildfowl Counts in Scotland was undertaken by a succession of dedicated SOC members; first by Miss Rintoul and Miss Baxter, then by Miss Betty Garden and finally by Miss Valerie Thom. When Miss Thom resigned in 1971, no overall Scottish Organiser could be found to continue the work centrally, and so a number of Regional Organisers were appointed who deal direct with the Wildfowl Trust in Slimbridge. The Club agreed to be responsible for appointing Regional Organisers when necessary in future, and a copy of the counts for all parts of Scotland is maintained in the Club's Reference Library in Edinburgh.

A list of the Regional Organisers is given below, and anyone who is interested in helping with the counts is asked to write to their nearest Organiser. If there is none please contact Slimbridge.

Shetland D. P. P. Eva, 6 Westerloch Brae, Lerwick.

Orkney P. Reynolds, Creyer Cottage, Evie, Orkney.

Wester Ross, Inner and Outer Hebrides A. Currie, Glaiseilean, Broadford, Isle of Skye, IV49 9AQ.

Outer Hebrides N. Buxton, 42 Aird, Tong, Isle of Lewis, Western Isles.

Caithness S. Laybourne, Old Schoolhouse, Harpsdale, Halkirk, Caithness, KW12 6UN.

Inverness-shire, Easter Ross, Sutherland (East) C. G. Headlam, Dallachie, Fearn, Ross-shire, IV20 1TN.

Banffshire, Morayshire, Nairnshire J. Edelsten, 14 South High Street, Portsoy, Banffshire, AB4 2NT.

Aberdeenshire, Kincardineshire A. Duncan, 12 Cairncry Avenue, Aberdeen, AB2 5DS.

Angus B. Pounder, 64 Forfar Road, Dundee, Angus.

Perthshire (East) E. D. Cameron, Strathclyde, 14 Union Road, Scone, Perth, UH2 6RZ.

Argyllshire Vacant.

Fife, Kinross-shire Mrs J. A. R. Grant, Brackmont, Crail, Fife.

Clackmannanshire, Perthshire (West), Stirlingshire R. Keymer, N.C.C., 12 Hope Terrace, Edinburgh, EH9 2AS.

Dunbartonshire, Lanarkshire, Renfrewshire R. A. Jeffrey, 1a High Calside, Paisley, Renfrewshire.

Bute J. B. Simpson, Estate Office, Rothesay, Bute.

Lothians R. W. J. Smith, 33 Hunter Terrace, Loanhead, Midlothian, EH20 9SJ.

Ayrshire A. G. Stewart, 31 St Andrews Avenue, Prestwick, Ayrshire, KA9 2DY.

Borders A. Bramhall, 28 Blakehope Court, Tweedbank, Galashiels, Selkirkshire, TD1 3RB.

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Notices to Contributors

Papers, longer articles and short notes

1. The high cost of production and distribution means that it is of the utmost importance that contributions are concise, interesting and readable to justify their publication. Authors of papers are advised to submit a draft to an expert referee before offering it to the editor. Material should be typed on one side of the sheet only, in duplicate, with double spacing and wide margins.

2. Authors are urged to consult recent issues of *Scottish Birds* for style of presentation, in particular of headings, tables and references. Headings should not be in capitals nor underlined. Tables and figures must be designed to fit the page. Tables should be used sparingly and be self explanatory, and, like figure captions, typed on a separate sheet.

3. Short notes, if not typed, must be clearly written and well spaced.

4. English names of species (but not group names) of birds, other animals and plants, except domestic forms, have initial capitals for each word, except after a hyphen. English names and sequence of birds follow Voous (1973-7) 'List of recent Holarctic bird species' (*Ibis* 115: 612-638; 119: 223-250, 376-406). Scientific names are generally unnecessary for species in this list but they are required (underlined, with no brackets) for subspecies, species not in the list, and for other animals and plants, except domestic forms, where these receive significant mention.

5. Proofs are sent to all contributors and these should be returned without delay. Authors of papers and longer articles are entitled to 25 free copies of the journal but these must be requested when returning proofs. Extra copies can be supplied at cost.

6. Illustrations of any kind are welcomed, whether alone or to illustrate an article. Drawings and figures should be up to twice the size they will finally appear, in Indian ink, neatly lettered, on good quality paper separate from the text. Photographs, either glossy prints or colour transparencies, should be sharp and clear with good contrast.

Scottish Bird Report

1. Records should be sent to the appropriate local recorders, a list of whom is published regularly, but in cases of difficulty they can be forwarded by the editor.

2. These records should be on one side of the sheet only, well spaced and in species order, following the Voous sequence (see 4. above). The only exception is that Aberdeenshire and north Kincardineshire records should be in place and date order. Observers should consult previous reports for the sort of information required. To avoid duplication of records by the recorders, names of other observers present should be given where appropriate.

3. Notes for the year should be sent promptly, generally in early January, but some recorders prefer more frequent records and regular contributors are asked to consult local recorders about this. Reports of occasional visits to areas outwith the observer's regular territory, such as holiday lists, should usually be sent to recorders as soon as possible. Records of rarities, including species only locally rare, should be sent to recorders without delay.

4. The editor will be glad to receive, preferably via the local recorders, records of special interest for publication in *Current Notes*. Please send them at the end of March, June, September and December for publication in the issues following.

5. To save recorders' (often considerable) time and expense, correspondents should enclose a stamped addressed envelope or indicate that no acknowledgment is required.

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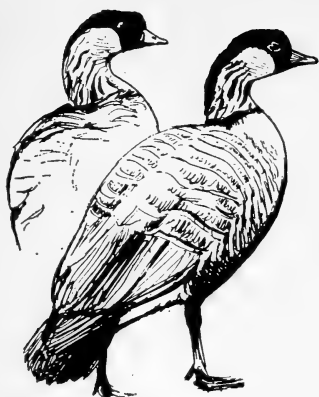
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Bird mortality following the *Esso Bernicia* oil spill, Shetland, December 1978

M. HEUBECK and M. G. RICHARDSON

(Plate 13)

The latest chapter on the blacker side of the oil boom reports how the industry again failed to cope with a spill that left over 3,700 birds dead. The casualty list was surprisingly varied, ranging from divers to buntings. The Great Northern Diver losses are particularly worrying in view of the small European population.

Just over a month after opening, the Sullom Voe oil terminal (Shetland) experienced its first major oil spill when heavy fuel oil leaked from the 190,000 tonne tanker *Esso Bernicia*. The spillage occurred around midnight on 30th December during the final stages of berthing after one of the three attendant harbour tugs caught fire and released its tow. The *Esso Bernicia* struck a loading jetty sustaining an 8m gash in her own fuel tanks and spilling 1,174 tonnes of oil into the sea.

During the following day the bulk of this oil was contained in the vicinity of the terminal jetties by Vikoma booms and over the next four days calm seas and light onshore winds kept the oil in the jetty area. Clean-up activity was hampered however by the low temperatures, blizzards and a lack of equipment, and recovery of oil within this period was restricted to drag lines removing oil and oiled substrate from the shore.

On 3rd January both main booms containing the oil deflated due to mechanical failures. At 09.00 on the 4th the wind veered to the north, pressing one boom against the jetty pilings and causing it to partially sink with the loss of all the oil which was spread rapidly throughout the northern section of Sullom Voe.

The distribution of oil pollution

Strong tidal currents spread the oil rapidly throughout Yell Sound and heavy floating oil and sheens were seen during an aerial survey on 5th January in patches from Whalsay and Out Skerries in the east (30 km from the terminal) to the Ramna Stacks (RSPB reserve) in the north. Unknown quantities of oil also moved northwards out of Yell Sound lightly polluting sections of the western and northern coasts of Unst although no oil was seen to move northwards along the east coast of Yell.

Relatively small amounts of oil remained on the sea by 18th January and the oil on the shore had stabilized to a degree and was not refloating off. From our surveys we estimated that 105 km (65%) of the coasts of Yell Sound and Sullom Voe were polluted and more than 30 km were heavily contaminated (fig 1). A more detailed account is given in Richardson (1979).

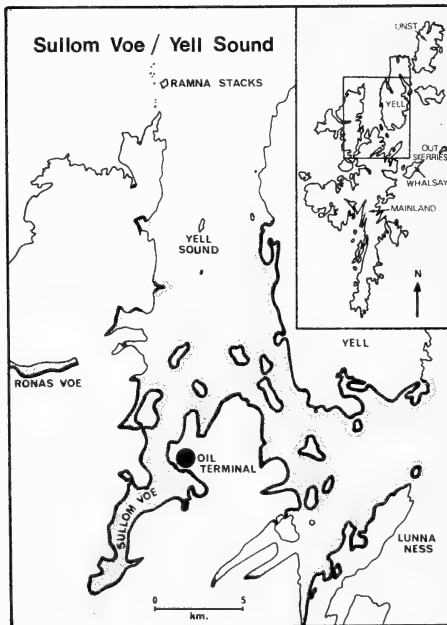


Fig. 1. Yell Sound - Sullom Voe showing the coastline surveyed (heavy lines and shading).

In the first few days following the spill, the only oiled birds seen in the area were a Goosander and ten gulls. However, following the collapse of the booms and the subsequent escape and rapid movement of large quantities of oil, it became clear that seabird mortality was likely to be considerable.

Methods

We assessed bird mortality in two ways: by intensive beached bird surveys and by continuing the programme of counting waterfowl and seabirds in the Sullom Voe/Yell Sound area started in 1975. The methods used in these surveys and the ornithological interests of the area have been detailed elsewhere (Richardson *et al.* in press). Between 4th January and 13th March, 162 km of the coastline of Yell Sound and Sullom Voe were surveyed on foot by NCC, Aberdeen University and RSPB staff with assistance from the Shetland Bird Club and the general public (fig. 1). Most of this coastline was surveyed at least twice and some stretches more than ten times during the ten week period. More distant areas such as Whalsay, Out Skerries, Nesting and Ronas Voe were also examined periodically.

One survey of the area was made by boat on 28th November 1978, prior to the spill, and four surveys were made on the 10th and 23rd January, 16th February and 6th April (Heubeck 1979a).

All corpses were removed from shorelines, identified and checked for rings and dumped on the moor behind the beach. Virtually all of these birds were thickly coated in viscous oil and became stuck fast to the grass so that the chances of them being carried back to the beach by scavengers were considered minimal. The corpses of 57 Great Northern Divers, one Black-throated Diver and 95 Tysties (Black Guillemot) were collected during this incident. These were deep frozen and later sent to the Royal Scottish Museum (Edinburgh) for further research and preparation as study skins. The skin of the single White-billed Diver is now lodged in the Department of Zoology Museum, University of Aberdeen.

Beached bird surveys

Between 31st December and 13th March 3,702 oiled birds of 49 species were found on the shores of Sullom Voe, Yell Sound and some more outlying areas. Less than 3% were found alive and these were humanely destroyed. This mortality is tabulated in the Appendix.

During this period, oil and oiled birds were also found on beaches throughout Shetland from northern Unst to Fair Isle. Whilst we recognized that birds oiled in the Sullom Voe/Yell Sound area could have flown or been carried by currents considerable distances, many records of oiled birds in Shetland were excluded from the *Esso Bernicia* figures on geographical grounds. Subsequent analyses of oil on both beaches and corpses confirmed that fuel oil from the *Esso Bernicia* reached the north coast of Unst. It was, however, also evident

from analyses carried out by British Petroleum that a number of other different oils (crude oil sludges, weathered crude oils and a variety of fuel oils) were affecting seabirds around Shetland at that time (D. F. Duckworth, pers. comm.). These mortalities, including a large kill of auks in the south and west Mainland during early March, are detailed elsewhere (Heubeck 1979b).

Six species made up over 85% of the identified mortality attributed to the *Esso Bernicia* spillage: Great Northern Diver (146), Shag (683), Eider (570), Long-tailed Duck (306), Guillemot (336) and Tystie (633).

Most dead Great Northern Divers were found on the west coast of Yell Sound and Lunna Ness, favoured haunts of these birds. In addition, the pattern of oiling on many of these divers suggested that they had become oiled whilst asleep and then sought shelter in the voes along the west coast of Yell Sound.

The majority of dead birds found in Sullom Voe were sea-duck (mainly Eider) whilst Shags were the commonest fatalities on the Yell Sound islands (an area known to hold large feeding and roosting concentrations). On the south coast of Yell 101 Long-tailed Ducks were found and these probably represented the traditional wintering flocks present to the north and west of Lunna Ness.

Most of the birds killed in Sullom Voe and Yell Sound were either duck (30%), Cormorants or Shags (23%) or auks (34%, largely Tysties). All other bird families represented less than 5% of the identified total. For instance, despite being common in the area, gulls accounted for only 4.8% of the identified total whilst only 18 Fulmars were found dead and oiled (the estimated breeding population in Yell Sound and Sullom Voe is around 8,000 pairs (Bettencourt da Camera *et al.* 1979).

Boat surveys of live birds

The number of waterfowl counted in Sullom Voe at the end of November was 654. Surveys during previous winters showed that most species increased in number as winter progressed with peak numbers present during February and March (Richardson *et al.* in press). Assuming that the 1978/9 season would have followed this same trend we estimated the number of waterfowl in Sullom Voe at the time of the spill to be approximately 730. This difference between observed and estimated numbers is shown in fig. 2.

The survey on 10th January found that of the 339 birds alive in the voe 13% were oiled. This number was reduced to 105 by the 23rd. Even this low number was undoubtedly inflated by the immigration into the voe of Shags and Cormor-

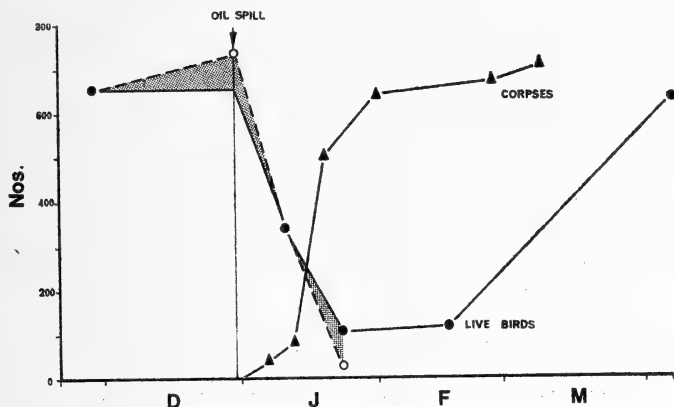


Fig. 2. The accumulated numbers of dead oiled seabirds and waterfowl found in Sullom Voe (triangles) compared with the numbers of live birds seen in the voe during boat surveys. Filled circles represent observed number of live birds, open circles represent estimated (predicted) number of live birds. That the observed number of live birds on 23rd January is higher than the predicted number is doubtless due to immigration (see text).

ants (whose distribution often changes in relation to tides and thus food availability), freshwater duck (whose numbers on the sea are often determined by the freezing of adjacent lochs) and small numbers of returning Razorbills and Guillemots. Excluding these, the estimated mortality of waterfowl exceeded 95% (table 1).

Similarly, the estimate of mortality in southern Yell Sound (where more than 1,500 waterfowl corpses were found) was greater than 75% (table 2).

There is good correlation between the decrease in live birds recorded during boat surveys of Sullom Voe and the accumulated total of dead, oiled birds found in the area (fig. 2). This tends to refute suggestions made at the time of the spill that emigration of birds from the area was a principal reason for the observed decline.

Fig. 2 and tables 1 and 2 indicate that the numbers of birds remained depressed into February but that by early April birds of a wide range of species had moved into Yell Sound and Sullom Voe. In Sullom Voe this not only included the commoner species (e.g. 426 Eider) but also the less numerous: Slavonian Grebe (two), Velvet Scoter (nine) and Red-breasted Merganser (27). All species normally present in the voe during winter (except Great Northern Diver) were again represented just three months after the incident.

Table 1. Boat surveys of Sullom Voe

Figures in brackets refer to birds oiled but still alive and these are included within the totals.

A. Sedentary species (during winter)

	28.11.78	10.1.79	23.1.79	16.2.79	6.4.79
Great Northern Diver	9	—	—	1	—
Slavonian Grebe	13	5	—	—	2
Eider	342	130(33)	9	31(1)	426
Long-tailed Duck	87	46(3)	—	2	17
Common Scoter	—	—	1	—	—
Velvet Scoter	16	10	—	4	9
Red-breasted Merganser	50	40	9(1)	6	27
Tystie	63	19(6)	3(1)	2	6
Totals	580	250(42)	22(2)	46(1)	487

B. Mobile species*

Red-throated Diver	—	—	—	1	75
Cormorant	8	10	23(1)	24	8
Shag	36	6(1)	28(1)	17	17
Whooper Swan	—	1	—	3	—
Wigeon	4	—	—	—	—
Mallard	7	38	17	3	—
Goldeneye	19	34(1)	4	8(1)	7
Guillemot	—	—	6	9	2
Razorbill	—	—	5(1)	2	38(1)
Guillemot/Razorbill	—	—	—	3	—
Totals	74	89(2)	83(3)	70(1)	147(1)

*Includes species whose numbers are affected by tides, the freezing of adjacent freshwaters and also spring arrivals.

Table 2. Boat surveys of southern Yell Sound

	28.11.78	23.1.79	6.4.79
Red-throated Diver	—	1	67
Black-throated Diver	5	—	—
Great Northern Diver	44	2	15
Cormorant	43	34	54
Shag	716	202	199
Eider	209	24	213
Long-tailed Duck	125	16	9
Red-breasted Merganser	—	1	3
Guillemot	8	29	77
Razorbill	—	19	169
Guillemot/Razorbill	—	4	—
Tystie	447	35	75
Little Auk	4	—	—
Puffin	—	—	8
Totals	1601	367	889

Ringing recoveries

All birds found during beached bird surveys were examined for rings and 13 ringed birds were found (six Cormorants, six Shags and one Guillemot). These birds were all of Shetland origin and it is notable that the Cormorants and five of the Shags were ringed as pulli during 1978. All the ringed Cormorants originated from one colony, Clett Stack at Westerwick on the west coast of Mainland, while two of the Shags were ringed on Fair Isle, two at Sumburgh Head (south Mainland), one on Fetlar and one on Foula in 1961. The Guillemot was also ringed on Foula, as an 'adult' in 1970.

Discussion

The actual mortality caused by this incident was undoubtedly greater than the 3,702 corpses found, since:

(a) Birds may have drifted or flown out of the Sullom Voe/Yell Sound area and either sunk at sea or washed ashore along **unsurveyed** coastlines. Evidence from fishing boats trawling in Yell Sound indicates that some birds thickly coated in fuel oil sank (R. Duffie, pers. comm.).

(b) Birds were overlooked on oiled shores amongst the general morass of strandline debris. In addition, snow was often lying down to the low tide mark, particularly in January. Repeat surveys of shores by experienced personnel indicated that up to 50% of corpses, especially of the smaller species such as Tysties and Long-tailed Ducks, could be overlooked on some occasions.

(c) A number of corpses were removed from shores during both mechanical and manual cleaning operations.

We estimate that the majority of birds oiled within Sullom Voe came ashore actually within the voe. In Yell Sound, the proportion which beached locally may have been lower. Previous oil spill incidents in more open sea situations have put estimates of the total kill at two to ten times the number found (Bourne *et al.* 1967, Hope Jones *et al.* 1978, Barrett 1979). We suggest that the *Esso Bernicia* incident may have killed double the number of corpses found, but probably not more.

The effects on birds

The species killed by this oil spill were typical of other in-shore incidents, with seaduck, divers, grebes and other sedentary diving species being the principal casualties (Buck & Harrison 1967, Greenwood & Keddie 1968, Campbell *et al.* 1978). The mortality of divers (all four species) and Tysties was of particular significance. To put the mortality of each species into some perspective, table 3 indicates the number

Table 3. The effect of the 'Esso Bernicia' oil spill expressed as percentages of the estimated breeding or wintering populations in Shetland

Figures from P. K. Kinnear (pers. comm.)

Breeding species	Estimated population (individuals)	% killed
Red-breasted Merganser	200	17
Tystie	4,000	16
Eider	6-8,000	7-10
Cormorant	960	4
Shag	22,400	3
Wintering species		
Great Northern Diver	3-400	37-49
Velvet Scoter	30	23
Long-tailed Duck	1,500-2,000	15-20
Slavonian Grebe	50-100	8-16

The mortalities of all other species were less than 1% of their estimated Shetland populations.

killed expressed as a percentage of either the estimated Shetland breeding or wintering populations (figures from P. K. Kinnear pers. comm.).

Comparison have been made between the numbers of Great Northern Divers (66) killed in the *Amoco Cadiz* spill (Hope Jones *et al.* 1978) and the size of the breeding western Palearctic population in Iceland, estimated at 100-300 pairs (Cramp *et al.* 1977). In view of the numbers wintering in Scottish waters (in excess of 1,000 birds), it seems likely that there is also migration of Great Northern Divers from Greenland and Canada to European waters in autumn, for this passage is known to occur in Red-throated Divers (Cramp *et al.* 1977). It is possible that biometrics and analyses of gizzard grit of the birds now in the Royal Scottish Museum will throw some light on the breeding locations of Great Northern Divers wintering in Scotland.

The high mortality of Great Northern Divers following the *Amoco Cadiz* disaster was thought to have been partly due to the fact that many were in wing moult and unable to escape from the area (Hope Jones *et al.* 1978). However, all of the 146 Great Northern Divers found oiled during the *Esso Bernicia* incident were in winter plumage and full winged, emphasizing this species' particular vulnerability to floating oil.

Fortunately the numbers of Red-throated Divers affected by this incident were relatively small, with these birds only returning in appreciable numbers to Sullom Voe/Yell Sound during March and April (tables 1 and 2). However, Bundy (1976) has indicated that many of Shetland's Red-throated

Divers (c.50% of the British breeding population) feed throughout the spring and summer months in Sullom Voe and Yell Sound. Future oil spillages, both acute and chronic, could therefore seriously affect this species.

The mortality of 633 Tysties represents the largest single recorded kill of this species in an oiling incident in the British Isles. The Operation Seafarer survey produced a figure for the British and Irish population of 8,343 pairs (2,330 pairs in Shetland), although the authors (Cramp *et al.* 1974) admit that this could be an underestimation. A more recent estimate of 4,000 individuals in Shetland (P. K. Kinnear pers. comm.) is, in our opinion, also too low. What is certain is that the effect on local numbers was severe.

Oil spill contingency planning

The *Esso Bernicia* incident highlighted a number of deficiencies in the local oil spill contingency plan (SVOSAC 1979). This had been developed around predicted spillages of North Sea crude oil with the recognition that a bunker fuel oil spill was so remote as to be discounted. The inability of dealing effectively with spilt heavy fuel oil, either with chemical dispersants or mechanically, was apparent in May 1978 during the *Eleni V* incident (HMSO 1978) and was again demonstrated in the present case. Failures occurred in all types of boom used and it proved impossible to prevent the majority of oil moving out of the relatively sheltered waters of Sullom Voe into the fast tidal streams of Yell Sound.

The oil industry and the local authority are currently investigating ways of strengthening their anti-pollution contingencies, including the provision of booms at strategic locations in Sullom Voe designed to reduce oil leaving the voe.

Acknowledgments

Without considerable assistance from members of the Shetland Bird Club and general public, unfortunately too numerous to mention, this work would not have been completed. For their help in beached bird surveys and the collection of corpses we are particularly indebted to Bobby Tulloch and David Lea (RSPB), Bob Davis, Steve North, Peter Reynolds (NCC), Gus Jones, Neil McKenzie and Miss Joyce Gammack (under contract to the NCC). We are also grateful to John Lemlin (Esso) and Dr Bill Syrratt (BP Environmental Control Centre) for considerable logistic support and to Ian Lyster (Royal Scottish Museum) for his co-operation. Our thanks go to Dr Bill Bourne, Prof George Dunnet, John Forster and Peter Hope Jones for their helpful comments on the manuscript.

Summary

A spill of 1,174 tonnes of heavy fuel oil from the tanker 'Esso Bernicia' at the Sullom Voe oil terminal (Shetland) on 31st December 1978 polluted an estimated 105 km of the shoreline of Sullom Voe and Yell Sound. The effect on birds was both local and severe, with a known 3,702 birds

of 49 species killed. Particularly affected were six species: Great Northern Diver (146), Shag (683), Eider (570), Long-tailed Duck (306), Guillemot (336) and Tystie (633). These species made up over 85% of the mortality.

An estimated 95% of seabirds and waterfowl present in Sullom Voe at the time of the spill were killed and at least 75% in Yell Sound. The total estimated mortality is thought not to exceed double the number of corpses found.

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**Appendix. Birds killed by the 'Esso Bernicia' oil spill,
31st December 1978 to 13th March 1979**

	Sullom Voe	Yell Sound	Elsewhere	Total
Red-throated Diver	4	2	1	7
Black-throated Diver	—	3	—	3
Great Northern Diver	15	109	22	146
White-billed Diver	—	1	—	1
Diver sp.	—	—	1	1
Slavonian Grebe	6	2	—	8
Grebe sp.	1	—	—	1
Fulmar	—	11	7	18
Gannet	—	—	2	2
Cormorant	10	24	5	39
Shag	99	530	54	683
Grey Heron	2	—	—	2
Whooper Swan	1	—	—	1
Pink-footed Goose	—	1	—	1
Mallard	2	1	—	3
Tufted Duck	1	—	—	1
Scaup	—	—	1	1
Eider	253	288	29	570
Long-tailed Duck	49	229	28	306
Common Scoter	—	1	—	1
Velvet Scoter	7	—	—	7
Scoter sp.	1	1	—	2
Goldeneye	2	—	—	2
Red-breasted Merganser	21	12	1	34
Goosander	1	—	—	1
Duck sp.	1	1	1	3
Moorhen	—	1	—	1
Ringed Plover	1	—	—	1
Golden Plover	5	—	—	5
Dunlin	1	—	—	1
Purple Sandpiper	2	2	—	4
Snipe	—	1	—	1
Curlew	6	4	2	12
Redshank	2	1	4	7
Turnstone	8	1	—	9
Wader sp.	1	1	—	2
Black-headed Gull	2	2	1	5
Common Gull	2	2	2	6
Herring Gull Great	15	11	1	27
Black-backed Gull	12	29	10	51
Kittiwake	9	22	4	35
Gull sp.	13	10	5	28
Guillemot	20	202	114	336
Razorbill	—	10	6	16
Tystie	72	445	116	633
Little Auk	—	6	8	14
Puffin	3	24	12	39
Auk sp.	1	15	9	25
Rock Dove	—	3	1	4
Pigeon sp.	—	1	—	1
Short-eared Owl	1	—	—	1
Rock Pipit	1	—	—	1

	Sullom Voe	Yell Sound	Elsewhere	Total
Blackbird	1	2	—	3
Hooded Crow	8	2	—	10
Raven	—	1	1	2
Starling	3	11	1	15
Snow Bunting	1	—	—	1
Passerine sp.	—	—	1	1
Unidentified sp.	209	323	29	561
Totals	875	2,348	479	3,702
Corpses/km	21.9	20.6	—	—

How many Lesser Whitethroats breed in the Lothians ?

S. R. D. da PRATO

(Plates 14-15)

Several species of small passerines that breed in southern England normally only occur in Scotland as passage migrants although they breed at higher latitudes in Scandinavia. When breeding is discovered this is often quoted as evidence for range expansion and this in turn has been linked to theories of climatic change (Williamson 1975) or even post glacial recolonization (Murray 1979). Two problems affect such theories. They are virtually impossible to prove or disprove in a scientific sense as they are not amenable to testing, which means they rely on the circumstantial evidence of changes in status of a number of relatively scarce species. Since this information can be readily collected by people in their spare time, papers on such topics have become a popular feature of local bird reports and certain journals. This raises the second problem: how accurate are the basic data? Studies of warblers in Midlothian suggest that with a secretive species like the Lesser Whitethroat a breeding population can exist without local birdwatchers being aware of its presence.

This note describes how mistnetting by the Edinburgh Ringing Group has proved Lesser Whitethroats breeding at one site for at least six years and intermittently at several others. At first it was thought that only isolated pairs were involved but colour ringing backed up by intensive observation in the 1979 season has shown that there are too many young birds about in summer to be the progeny of only one or two pairs. However, the really significant point is the dearth of sight records by other observers. The Lothians are among the

better watched areas of Scotland, yet apart from migrants on the coast the local recorders received only three sight records of Lesser Whitethroats in possible breeding habitat between 1974 and 1979, all from Edinburgh R.G. members who knew what to look out for, while fieldwork for the *Atlas* (1968-72) produced one record of possible breeding. Although a genuine increase in the numbers of Lesser Whitethroats breeding in Scotland may have occurred the evidence is so far inconclusive. The only ringing recovery to date was a bird found breeding in coastal scrub in East Lothian in 1976 by D. R. Langslow which had been ringed as a juvenile near Doncaster (Yorkshire) on 24th August 1971. This suggests northwards expansion but the bird could have been moving south when ringed. Sharrock (1976) commented that the *Atlas* results were essentially similar to the occasional scattered records quoted by Baxter & Rintoul (1953).

The first bird was caught in the main study site on 25th June 1974. As the site is surrounded by open fields and the bird had a vascularized brood patch it was almost certainly breeding there. Breeding adults have been mistnetted every year since 1974, when regular trapping began, except 1976 when only recently fledged young were caught but adults were heard singing (once) and alarming. To date (1979) 44 Lesser Whitethroats have been caught at breeding sites, 20 adults and 24 birds of the year. Of this total 36 birds have been trapped at the main study site, 15 of them in 1979. This sudden increase in captures is more likely to be due to the very intensive fieldwork in 1979 than to a sudden increase in the Lesser Whitethroat population.

Besides mistnetting, a Common Bird Census (CBC) has also been carried out at the main site since spring 1973, yet the first indication of breeding Lesser Whitethroats was the bird in the net in June 1974. Since then we have tried to locate singing birds in spring but even censusing at dawn and dusk twice per week in May rarely produces more than the occasional sight record or alarm call. Indeed in 1978 when four adults and two young birds were trapped the CBC map was so sparse that the BTO Populations Section commented that Lesser Whitethroats didn't seem to be holding territory that year.

Our studies show that Lesser Whitethroats arrive in Midlothian from the first week in May, slightly earlier than the majority of Common Whitethroats. The birds are much harder to locate than any of the seven other warbler species recorded in the study area. This may be partly due to the low density diminishing territorial conflict but is also a characteristic of the species. Howard (1907-14) noted that singing Lesser

Whitethroats were likely to be unmated cocks and our experience in 1979 agrees with this, the only singing being in late June when a male appeared in the study area after the pair known to be breeding had fledged their one chick.

Territories have always been on a warm, south facing bank in a jungle of hawthorn, rose, bramble and gorse interspersed with nettles and other herbage. Nest sites were about a metre above the ground in a bush, the sites being much more enclosed than those used by the many pairs of Common Whitethroats that also nest in the study area. Nests were searched for in only two years: 1975 and 1979. On both occasions Lesser Whitethroats were the first warbler chicks ringed in these years, ahead even of the many Willow Warblers, a species where the males start arriving in late April.

Lesser Whitethroats, like other warblers, leave the nest before their wing and tail feathers are fully grown. This means they spend the first week of fledged life hopping through cover as they can only fly from twig to twig. At this stage the parents become noisy and the harsh *tak* call is distinctive once learned. This *tak* call seems to act as a warning to the chick which immediately freezes in a hunched position and only moves when the observer is a metre or two away.

The adults collect food mainly from the hawthorn bushes near the nest area. They rarely hunted more than c.7m from the position of the chick, collecting food such as aphids, caterpillars and a variety of small flies. Their feeding habits resembled those of Willow Warblers more than Common Whitethroats, with hunting taking place more often in the mid to upper canopy of mature hawthorn than in the nettle, rose, young hawthorn and the bases of mature hawthorn where Common Whitethroats collect food when feeding chicks. Unfortunately the secretive habits of Lesser Whitethroats did not allow data to be obtained on their feeding habits outwith the period of feeding chicks.

We have no evidence for double brooding in Lesser Whitethroats and there is a general tendency for Scottish warblers to be single brooded. Even Common Whitethroats which reputedly double brood (Campbell & Ferguson Lees 1972) only occasionally do so in Midlothian. Unless birds are individually marked, e.g. by colour ringing, it is extremely difficult with small passerines to differentiate genuine double brooding from replacement clutches and birds pairing again after initial failure due to predation of their first mate. However, the early fledging of young Lesser Whitethroats could allow a second brood to be started depending on when—and where—the parents start to moult.

The process of moult is absolutely critical to a bird yet it has had scant attention compared to nest centred studies. Trans-Saharan migrants basically have the choice of moulting quickly on the breeding grounds or delaying moult till they reach tropical Africa. Both strategies are found within the genus *Sylvia* and some species, notably the Common Whitethroat, seem prone to perform at least part of their autumn migration with moult suspended or incomplete (Pimm 1973, Swann & Baillie 1979). This also applies to some Scottish birds (Ballantyne & da Prato 1976) and we now know that a few individuals can even breed while in moult (da Prato in prep.) which makes it very difficult to know when their breeding cycle is definitely finished. At least some Lesser Whitethroats complete moult in the Lothians, possibly in under 40 days as suggested for English birds (Spencer & Mead 1979). If they all do this their strategy is similar to Willow Warblers which in Midlothian rear a single brood and then go into a rapid moult which effectively ends breeding for the season.

Once fledged and independent of their parents—around two weeks after leaving the nest—young warblers leave the natal area. Late broods leave even sooner. At this stage they are not fully feathered and quickly undergo a partial moult. This allows bare areas, e.g. the belly, to feather over and in the Lesser Whitethroats the characteristic black face patch appears. Spencer & Mead (1979) suggest that until post juvenile moult is complete young warblers will not move any great distance but we need more information on this important period in their lives. What is very striking is the number of young warblers that move through our study sites in late summer. These birds rarely stay for more than a few days but their weights are not high enough to permit long distance migration (da Prato & da Prato 1977). It seems there is a general drift by young birds before they move south on migration proper.

In 1979 only one Lesser Whitethroat fledged in the main site yet another nine young birds were present for short spells in July or August. This suggests that the surrounding countryside contains several pairs, especially as some of these pairs will fail and the progeny of those that succeed will not all be netted in our study site. If we speculate that each 10-km square in the Lothians holds an average of three to five pairs of Lesser Whitethroats (*The Atlas* estimated 25-50 pairs per 10-km square in England) and if squares largely composed of unsuitable habitat are excluded then the population may be between 50 and 100 pairs. This figure is really only an informed guess; however it is probably a much better guide to the true status of the species in southeast Scotland than the

occasional references in bird reports. One wonders what other species might have Scottish breeding populations that have been similarly overlooked?

Postscript : the 1980 season

A pair of Lesser Whitethroats took up territory in the main study area in May but failed to rear any young. Netting at this site was less intensive than in 1979 but young Lesser Whitethroats wandered through the site on at least nine occasions in July and early August. More time was spent netting in the surrounding countryside and when this paper went to press in late August 22 Lesser Whitethroats had been trapped at seven sites and unringed birds seen at another five. One wonders whether 50-100 pairs is too low an estimate for the Lothians.

Acknowledgments

Thanks go to the local recorders K. S. Macgregor and R. W. J. Smith, to L. L. J. Vick who found the first nest, and the various ringers who helped with mist netting, especially Mrs E. S. da Prato who also helped with observations of colour ringed birds.

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Birdwatching in Ayrshire

ANGUS HOGG

With an area of 2,931 km², Ayrshire is Scotland's seventh largest county. Perhaps its topography could best be described as a half saucer with the rim representing the upland area which forms a convenient border to its landward side. The coastline extending for 135 km faces on to the outer reaches of the Firth of Clyde. The county is drained by six major rivers, the Garnock, Irvine, Doon, Girvan, and Stinchar, with the Nith reluctantly heading off eastwards. It is the enormous diversity of the habitat contained within its compact area, which is unlikely to be rivalled in many other parts of Scotland, that offers the birdwatcher almost unlimited variety.

Inland the hills reach up to 772m on Shalloch on Minnoch and provide some magnificent scenery, particularly in the south which is still a wilderness area of great value. A deserted, snow covered Mullwharchar may only contain a few Snow Buntings and an ever optimistic Raven in January, but by April the area begins to welcome the return of the Golden Plover and Meadow Pipit. Ring Ouzels and Wheatears, amongst the first of our migrants, breed on the scree strewn slopes.



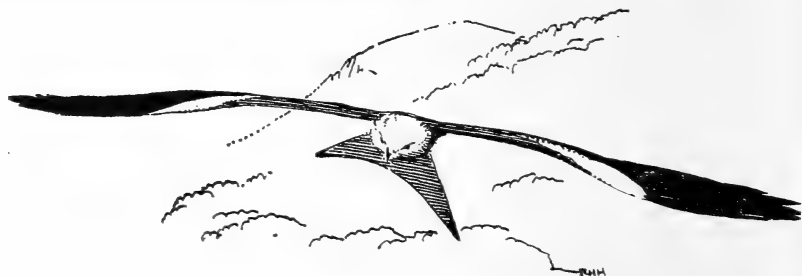
SNOW BUNTING *A. Hogg*

Conifer afforestation of much of the hill land has deprived it of some species but has brought in many more, and no visitor to a planted area can now ignore the songs of Sedge Warbler, Grasshopper Warbler, Whinchat and of course Chaffinch during the breeding season. Common Crossbills too in the mature larch and spruce can look impossibly orange against a December snowscape, as the cock birds proclaim their breeding territories.

Moving lower down to the river valleys with their scattered and declining hardwood stands, the rich, rolling pastureland

supports a greater wealth of birdlife. If you can ignore the raucous cries of Rooks in March you might just hear the first Chiffchaff. By May the same woods will be alive with the songs of Blackcaps, Garden Warblers, Redstarts, Spotted Flycatchers, and the resident thrushes, finches, and tits. But the real gem is the plaintive Wood Warbler found only in small numbers in the south of the county. These days the Green Woodpecker is beginning to make his presence known around Fairlie and Portencross, and the number of Jays in the Girvan valley has increased dramatically. Raptors too enjoy a slightly more enlightened period of game preservation with the Sparrowhawk and Kestrel doing well, and the Buzzard still plentiful in the valleys of the Stinchar and Girvan.

Fortunately hedgerows are still a common feature of Ayrshire farmland and Whitethroats and Dunnocks thrive, especially if the farmer has one of those impenetrable pockets of gorse on his land. Here the Linnets and Yellowhammers make up for the ever declining population of Corn Buntings. Sadly, the Corncrake seems certain to enter the category of former breeders long before the Corn Bunting. Farmers recall with just a hint of regret that its rasping call was once common throughout the county only 20 years ago. How much nicer it must have been in the valleys of south Ayrshire in the 19th century when the bird made itself a thorough nuisance at night and the Red Kite kept it company by day! The elegant Barn Owl is still the more valuable for the variety it continues to lend to these same farming areas.



RED KITE A. Hogg

Now, it doesn't take a trained meteorologist to tell you that the west of Scotland catches most of the rain that's on the go, but this can have its compensations too. As farmland floods, wildfowl move in during the autumn, and one pool near Maybole has recorded 12 species of ducks, five of geese, and all three swans in the last five years. The value of these areas is inestimable to migrating waders, with the same wetland hosting Whimbrel, Black-tailed Godwit, Spotted Redshank and

Wood Sandpiper, along with large numbers of Lapwings, Golden Plovers, Curlews and Snipe. True marshland is becoming a scarce commodity since local government and farmers rarely attach anything but an economic value to land. However, the few areas left support breeding Water Rails, a wide range of ducks including Shoveler, Teal, and Pochard, as well as a winter population of Jack Snipe.

Riversides and lochs provide plenty of interest, too, whether it's watching the stumpy Dipper performing miracles *underwater*, or listening to the wonderfully thin, piping song of the Common Sandpiper in late April. Great Crested Grebes grace most of our larger lochs, Martnaham being noteworthy in this respect and also for its wintering wildfowl which have included Smew in recent years. Loch o' th' Lowes is a useful stopping-off point for migrating birds, with many of the Solway's wintering Barnacle and Pink-footed Geese using it as a signpost, before heading out down the Nith valley.

Ayrshire's coastline itself offers great diversity, with a shingle bar at the Stinchar mouth, rugged cliffs near Ballantrae, sand dune system at Turnberry, and saltmarsh at Irvine. The latter site *must* be visited on a cold, clear winter day when the Wigeon and Teal can be seen at their finest. Redshanks, Oystercatchers, and Curlews crowd on to the mudflats as the tide recedes, only to have their nerves shattered by a stooping Peregrine or a low-level run by an equally unexpected Merlin. Offshore, Eiders, Goldeneye, Scaup, and Red-breasted Mergansers bob on a seldom calm sea. To the north lie the largely reclaimed mudflats of Hunterston. With the coming of industry the birds have been forced to concentrate on smaller areas but have not suffered otherwise. The numbers of Shelduck and waders have shown no decline and in 1978 they were joined by a visiting Spoonbill.

To the south Doonfoot is always worth a visit. The large gull flocks will almost certainly contain Glaucous Gull throughout the year, while Iceland Gull is still regular in spring, and Mediterranean Gull has appeared twice in recent years. The shoreline here is well worth inspection during April and May with migrant Wheatears, Whinchats and White Wagtails stopping en route to their breeding grounds. Perhaps the most typical of the birds of the marram grass zone is, however, the jaunty little Stonechat which took such a hard knock during the winter of 1978/9.

If seabirds are your passion then a trip to Turnberry Point during August or September will give you plenty to look at. Try to imagine a heaving sea fighting against a southwesterly gale with up to 6,000 Manx Shearwaters and hundreds of Gannets, Fulmars and Kittiwakes all involved in the struggle.

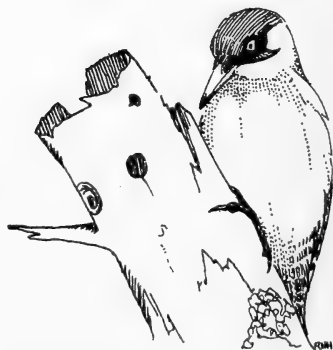
Now throw in a few of the scarcer seabirds: Leach's Petrel, Great Shearwater, or Sabine's Gull, and you'll soon appreciate that seawatching can also be exciting.

But then, of course, I've forgotten to mention the islands, Ailsa Craig, Lady Isle and Horse Island, each with its own seabird spectacle. By far the most breathtaking is that huge volcanic plug, Ailsa Craig, with its Gannet colony of over 14,000 pairs whitewashing one end, and Kittiwakes, Guillemots and Razorbills squabbling over what's left. Puffins are now few in number, but a recent ringing programme raises the question of whether or not Storm Petrel might be breeding. Even here odd migrants occur from time to time, and the Hooded Crow has a lonely breeding outpost.

To describe Ayrshire's birdlife adequately would take very many more pages than afforded here, but past status guides and annual reports are available, the former currently undergoing revision. Nor have I made reference so far to that delight of the twitcher—the rarity. The following rarities have all been seen in the county in the last decade: Cory's Shearwater, Little Bittern, White Stork, Ring-necked Duck, King Eider, Barrow's Goldeneye, Red-footed Falcon, Gyrfalcon, Crane, Marsh Sandpiper, Lesser Yellowlegs, Wilson's Phalarope, and Roller. You want to add a few? Well, whether it's rare birds or merely a splendid variety of commoner breeding birds you want to see, Ayrshire's got plenty to interest the birdwatcher. Why not give it a visit sometime and you'll see what I mean?

Angus Hogg, School House, Crosshill,

Maybole, Ayrshire, KA19 7RH



GREEN WOODPECKER *A. Hogg*

Short Notes

Unusual death of a Shag

On 4th April 1979 R. Plant found a dead immature Shag on the beach at Portobello (Midlothian) with an 11 cm Horse Mussel *Modiolus modiolus* clamped on the tip of its upper mandible. He informed W. Stout of the *Evening News* who brought it to the SOC in Regent Terrace that evening when it was photographed with the mussel still firmly stuck and therefore still alive (plate 13).

The bird was examined on 6th April by J. W. Macdonald of the Ministry of Agriculture, Fisheries and Food Veterinary Laboratory at Lasswade who reported it to be a female in good condition. It had died from a massive haemorrhage under the skin of the upper neck although there was no external damage. The lungs were waterlogged and the tip of the upper mandible was fractured, both of which possibly happened after death. The mussel had by now become detached.

While the circumstances of death cannot be known with certainty, and the Shag is not known to feed on molluscs, it seems possible that it attacked the open mussel under water, fatally injured itself struggling to get free, but also loosened the mussel from the substrate so that both were soon cast ashore.

D. J. BATES

Communal roost of Hen Harriers

At 18.05 GMT on 28th February 1978, while driving past a reedbed in Argyllshire, we saw a ringtail Hen Harrier land amongst the reeds. During the next 20 minutes more harriers (all ringtails) arrived to settle in the marsh. Although the terrain prevented continuous observation of all the birds, we considered there were 13 individuals. The evening was dry, fairly mild, clouding over after a generally sunny afternoon, and it was not dark until about 18.45. The roost site is a *Phragmites* bed of 50 ha with several pools and dense thickets and isolated bushes of willow *Salix*. The marsh lies at an altitude of 30m between an abrupt wooded hill and a rounded heathery hill and is open to a wide valley. The surrounding country is largely uncultivated: heather/grass moor and mossland, riverside meadows, and some immature conifer plantations.

On the following evening (1st March) the site was watched from the east in poor weather: a strong, cold south to south-easterly wind driving heavy rain, and it was almost dark by

18.15. However, at least 18 harriers—16 ringtails and two grey males—arrived at the roost between 16.55 and 18.08. Most early arrivals were from the northeast and observation was therefore concentrated in that direction. These birds were flying into the wind and along the line of the neighbouring river valley. A possible four additional birds—two grey males and two ringtails—were first sighted over the middle of the roost and therefore were not certainly new arrivals. All birds seen arriving were flying fairly low (up to 6m above the reed heads). Some dropped into the reeds almost immediately, but most spent some time prospecting landing spots, and some, having settled, rose again to move to other locations. Some ringtails prospecting for roosting spots flushed others which had already settled, and one observer considered that in these instances the disturbed birds were small individuals, i.e. females were apparently able to displace immature males. This activity, plus the screening effect of the willow thickets and the darkening backcloth of rising ground, hindered observations. Therefore some birds seen arriving may have passed without settling (see below) and others may have arrived undetected from the west.

On 2nd March the weather was again poor, with strong southwest wind and (from 17.07) heavy rain. We watched from the southwest but incoming harriers were harder to sight and follow against the buff and brown background of reeds, trees and moorland. The first ringtail appeared from the east at 17.03 but flew right across the marsh and away to the west. Subsequently, until 18.13, at least seven harriers flew in and settled in the roost, again arriving from east and northeast. A possible three additional ringtails were first sighted over the middle of the roost. At 18.25 the poor light forced us to give up the watch, although it was not really dark until 18.45.

Although birds were fewer, this watch revealed some aspects of behaviour not previously noted—(1) the bird which overflowed the roost site; (2) the fifth bird to arrive, having prospected the reedbed, landed on a (probably sheltered) peat bank at the edge of the marsh and did not move into the roost area until eight minutes later; (3) several ringtails and a grey male landed and settled in isolated willows or on the edges of the willow thickets, mostly at or just above the general level of the reed heads but in a few instances on more exposed branches. These birds had not dropped into the reeds by the time poor light prevented further observation.

There are several features of topography and of roost activity as observed at this Argyll site similar to those recorded by Watson (1977, *The Hen Harrier*)—(1) a level wet site with dense, tall vegetation; (2) roost probably inaccessible to



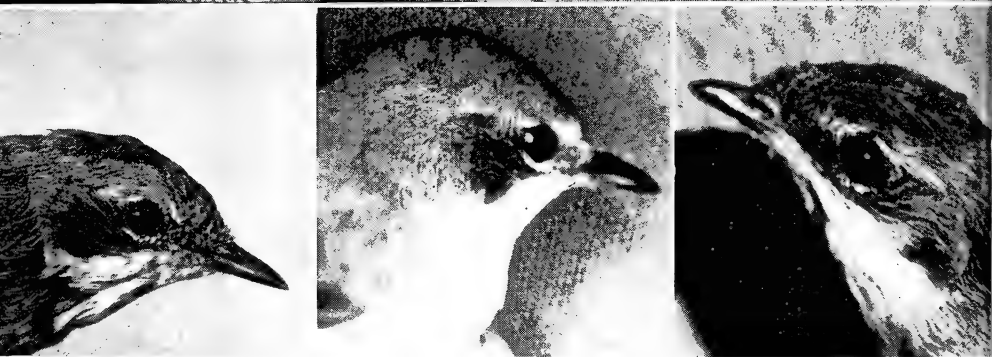
LATE 13 (a). Some of the Great Northern Divers killed after the *Esso Bernicia* oilspill in Shetland in December 1978 and now preserved as flat study skins in the Royal Scottish Museum (Edinburgh) (p. 97).

Royal Scottish Museum

(b) Shag found dead with a Horse Mussel attached to its bill, Portobello (Midlothian) 4 April 1979 (p. 117).

W. Stout





PLATES 14-15. Warblers in the Lothians (p. 108).

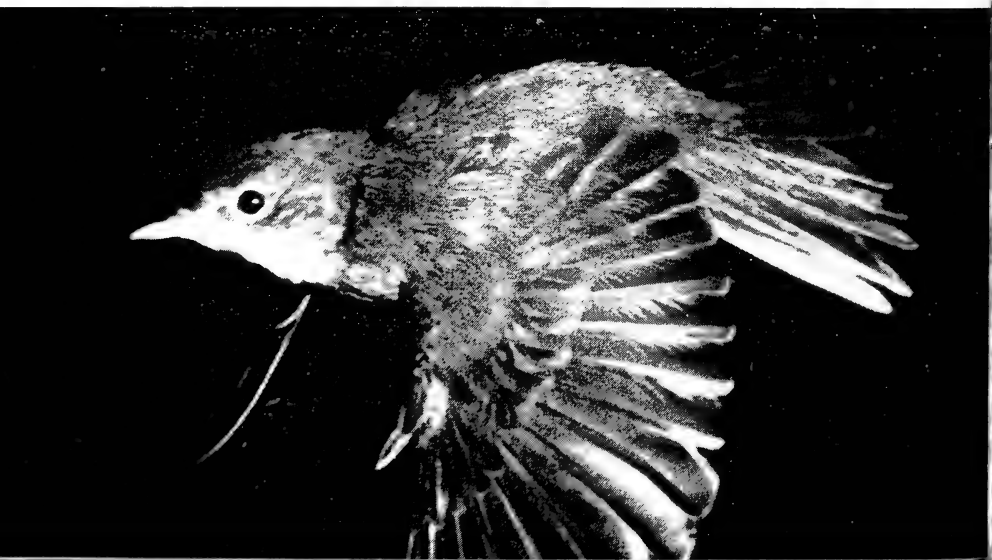
E. S. & S. R. D. da Prato

PLATE 14 (a) Lesser Whitethroat breeding adult.

(b c d) Lesser Whitethroat heads showing variation in the characteristic dark facial patch due to age and abrasion: (b) one year old in June—note heavy wear; (c) freshly moulted adult in August; (d) juvenile in early July before first summer partial moult.

PLATES 14 (e)-15. Flight photographs using flash at 1/8000 second.

PLATE 14 (e) (Common) Whitethroat juvenile (July). PLATE 15 (a) Grasshopper Warbler adult (July). (b) Sedge Warbler adult (June). (c) Willow Warbler juvenile (July).



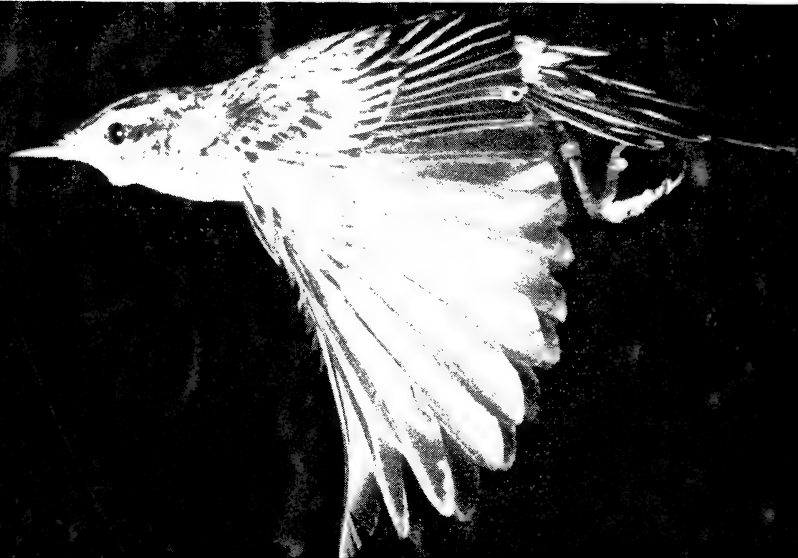




PLATE 16. Dr George Waterston (obituary p. 121).

J. MacGeoch

casual human intruders; (3) arrival of harriers within a time-span of just over an hour, with no mass arrivals; (4) tolerance by harriers of human presence and vehicular traffic on nearby roads. However, one feature not in accord with Watson's assessment of the normal pattern was that several birds perched for some time on exposed bushes in spite of strong wind and rain, and were not seen to drop into the reeds.

S. MITCHELL, D. J. BAIN, D. THOROGOOD

Hen Harrier's interaction with Otter

On 9th December 1979 at 10.00 GMT I was watching a ring-tail Hen Harrier in the vicinity of one of their roosts in Gallo-way. It was hovering more persistently above one spot than was usual for a hunting harrier. It landed on a fence post and on the ground for about seven minutes before again hovering persistently with legs lowered, just touching a post without landing. At the same time an Otter *Lutra lutra* jumped up, its forefeet landing on the post, just below the harrier, which continued to hover above. The Otter apparently moved away for the harrier followed, hovering above the undergrowth until it had landed in it out of sight nearby two minutes later.

Watson & Dickson (7: 24-49) found no direct evidence that Otters attacked Hen Harriers at their roosts although they were considered predators. Donald Watson (1977, *The Hen Harrier*) gave an instance of a ringtail at its roost diving on two Otters. The above incident gives further evidence that both will react (apparently offensively) to each other, even during the day.

R. C. DICKSON

Great Skuas hunting disabled prey

In 1963 a pair of Oystercatchers reared three young near my house at Whiteness (Shetland). On 28th June, just when the young had started to fly, I noticed that one of them had a slight limp and seemed to have injured its left leg. On 5th July the bird was able to fly quite strongly but the leg appeared worse, causing some difficulty in walking. As I was watching the family party feeding, a Bonxie (Great Skua) flew over. The adult birds immediately flew up to mob it, calling vigorously, while the young also took flight. The Bonxie suddenly turned and dived at one of the young, knocking it to the ground. Before the Bonxie could land to continue its attack, the Oystercatcher managed to scramble under a pile of rocks. The Bonxie then flew away, pursued by the adult Oyster-

catchers. When the birds had settled down I was able to observe that the attacked Oystercatcher was the one with the injured leg. Two days later the Oystercatchers left the area and I do not know whether the bird survived.

On 8th August 1970 at the Pool of Virkie (Shetland) I saw three Bonxies chasing a group of immature Kittiwakes. A Bonxie pulled one of the Kittiwakes down, holding it by the neck feathers, and kept it on the ground by standing on its wing. As I walked over to the struggling birds the Bonxie flew off leaving the Kittiwake on the sand. On examination the bird, though dazed, appeared otherwise unhurt from the attack. I was surprised, however, to find that it was blind in its right eye, either congenitally or from some former injury. I released it 15 minutes later, when it flew away strongly. During the next four days I saw Bonxies kill three immature Kittiwakes but on each occasion the attack was made over water, the Kittiwakes being drowned and eaten so that I was unable to examine the bodies for signs of possible physical defects.

In *British Birds* 58: 342 M. P. Harris gives an account of a Kestrel apparently selecting a blind Starling out of a flock.

C. J. BOOTH

Status of Collared Dove in Islay

Collared Doves were almost certainly present in Islay (Inner Hebrides) from 1961. There were eight in 1963 (3: 299) and then a general increase, so widespread that they were usually not considered worth recording. In August 1972 there were more than 50 at Laphroaig distillery, 45 at Islay House farm and more than 50 at Port Ellen distillery. There were c.80 in Bowmore in November 1977, and flocks in several other places. In 1978 there was a noticeable decline and a flock at Bridge House kennels which had been c.40 was down to eight. By the end of 1979 it was difficult to find more than ten in one place; the flock in Port Ellen was recorded as eight and that at Bowmore as nine.

The main food source was spilt barley and the distilleries confirm that there has been no alteration in the amount spilt. Evidently from the number of Rock Doves, Pheasants and Rooks still feeding on the roads there is no serious decline in this supply. There is not sufficient evidence to pronounce on their success as breeders. I thought at first that two poor summers (1978-9) and colder winters here had perhaps caused the northern limits to recede, but having recorded pairs and groups of up to six birds in small woods widespread through-

out the island, and pairs nesting in open farm buildings this spring (1980), it would seem that they are no longer dependent on spilt grain and that there has been a change in habitat rather than a decline in total. The experience of other observers would be interesting.

C. G. BOOTH

Obituary

GEORGE WATERSTON, OBE, LL D, FRSE

(10 April 1911 - 20 September 1980)

(Plate 16)

George Waterston, founder secretary, past president (1972-5), and latterly Honorary President of the Scottish Ornithologists' Club, died in hospital after a long illness. He was born in Edinburgh, fifth of that name in direct descent from the George Waterston who in 1752 founded the firm of printers and stationers. His mother was a Sandeman and George therefore inherited the genes of two distinguished Scottish families.

George's interest in birds began as an Edinburgh Academy schoolboy and in 1929 a small group who had either just left or were about to leave school met together in the Waterston home to form the Inverleith Field Club. This turned out to be a largely social organization so four years later, by mutual agreement, a second club was formed, the Midlothian Ornithological Club, with the serious study of birds as its sole objective.

But George was already searching beyond the confines of the club and had made contact with three persons whose influence and inspiration shaped his whole life and kindled the passion that never left him—his love for and dedication to Fair Isle. These three were Surgeon Rear-Admiral J. H. Stenhouse and the Misses E. V. Baxter and L. J. Rintoul. Stenhouse had taken over Dr William Eagle Clarke's Fair Isle migration studies and met George who had frequented the Royal Scottish Museum since his school days. He was so impressed by George's interest and enthusiasm that he soon realized that here was the successor needed to carry on this work.

The Misses Baxter and Rintoul, similarly inspired by Eagle Clarke, had identified the Isle of May as a place of importance equal almost to Fair Isle. Their work was passed on to the MOC and the first members to visit the May were George Waterston and Frank Elder in 1932. Very soon plans were prepared for what was to be the first co-operatively manned migration study centre in Britain.

George's first visit to Fair Isle was in 1935, accompanied by A. G. S. Bryson. Thereafter followed annual visits until the outbreak of war in 1939. On at least one occasion he stayed with George Stout at Field where he had to admit that conditions were a bit rough. 'Once I arrived to find Fieldy gutting a sheep on the kitchen table. We lived on that sheep for a fortnight but when I saw Fieldy about to throw the head on the midden I suggested that he should make sheep's heid broth. That evening I lifted the lid of a great black pot boiling on the fire to see what was for dinner, and there was an appalling greasy scum with the sheep's heid boiling merrily in the middle—complete with eyes, teeth and wool!' By this time it was George's burning ambition to establish on Fair Isle an observatory similar to that on the Isle of May.

1936 saw the formation of the Scottish Ornithologists' Club with George as honorary secretary, a position he held until he was appointed half-time salaried secretary in 1955. Also in 1936 he made an expedition to Lapland with J. H. B. Munro, reaching Rybachi Peninsula which is now part of Russia. This was the famous occasion of George's arrest and detention for straying across the Russian frontier.

The war brought George as a lieutenant in the Royal Artillery to a new island—Crete—in 1941. After the capture of Crete by the German forces he remained in hiding, with little food and no water other than what could be drained from the radiators of wrecked vehicles, until he was taken prisoner. The story of the prison camp has been told before, of meeting Ian Pitman and planning the Fair Isle observatory. In Ian's words: 'You had to concentrate on something that interested you and take it for granted that you had a future. With one man it was designing a new type of tattie-howking machine, with George it was Fair Isle.'

Then there was the remarkable association with Professor Stresemann. Erwin Stresemann was not a Nazi sympathizer and it is perhaps not realized what a tremendous personal risk he took in befriending and corresponding with the British prisoners. George learned that Stresemann had been in Crete after the German occupation and was preparing a paper on the birds of Crete and sent him all his Crete bird notes (Stresemann 1943 [pub. 1944]. *Überblick über die vögel Kretas und der vogelzug in der Aegaeis*, *Journal für Ornithologie* 91: 448-514). On p. 451 are acknowledgments to six contributors including 'G. Waterston, 31 Jan.-20 May 1941' and on p. 470 a separate acknowledgment of the help given by Lt. G. Waterston.

In the prison camp he developed the disability that was later to dominate his life, and when told by a German medical

officer that nothing could be done in the camp hospital, George, never missing an opportunity, replied, 'There is a surgeon in Edinburgh who can put me right. His name is Henry Wade.' The response was astonishing: 'You are quite right. I know of Henry Wade.' Repatriation followed, and that extraordinary moment of emotion when the first landfall was the Sheep Rock of Fair Isle!

After hospital treatment George joined James Fisher for 18 months on the Agricultural Research Council's Rook Survey before rejoining the family business. The office at the back of Waterston's shop in George Street, Edinburgh, soon became the headquarters of the SOC and of much other ornithological business. Events then began to move rapidly. Fair Isle came on the market. With the help of Ian Pitman George promptly bought it and for six years was Laird of Fair Isle before transferring ownership to the National Trust for Scotland. The Fair Isle Bird Observatory Trust was set up and the observatory founded in the war-time camp with Kenneth Williamson as director. George was appointed secretary and remained so until his death.

The dream was fulfilled but stresses and uncertainties brought on further ill health; family ties were loosened as George was now completely dedicated to Fair Isle and Scottish ornithology. The final break came when the RSPB made him an offer of half-time employment as Scottish representative (later Director, Scotland) and the SOC agreed to pay a salary to their secretary. For a time he worked from a room in the National Trust for Scotland building in Charlotte Square, but George had a vision of a Scottish ornithological centre to house the SOC, the RSPB and FIBOT. This became a reality with the purchase of 21 Regent Terrace in 1959 but at the same time his energies had so broadened the field of bird protection in Scotland that a full-time RSPB director was required, a post he held for 13 years. His first marriage had come apart some time before and in 1958 he married Irene Kinnear who shared all his interests and travels and by her devotion enabled him to lead as full a life as possible during his years of illness.

In the mid sixties George's attention turned to Greenland and the Canadian Arctic where with Irene he joined several scientific expeditions and built up a notable collection of Arctic literature. Signs of renal failure began to appear, however, and in 1972 he found himself unable to cope with the demands of his RSPB work and the following year the Waterstons moved to their Humbie cottage. George still had the physical capacity for another Arctic expedition but soon a

failed kidney transplant condemned him (and Irene even more so) to the inexorable tyranny of a home kidney machine.

Defeat was utterly unacceptable to this man and he and Irene made three more visits (complete with home kidney machine in a caravan!) to the Highlands. Driven by devotion and determination he attended the opening of the new Fair Isle hall in July, but this was his final visit for only two months later he was laid to rest in the old churchyard at Humbie. This time Fair Isle came south as among the mourners was his old friend Jerry Stout of Leogh.

George had two great attributes in his life and work. The first was his enormous capacity to get things done: his philosophy of life was that whatever must be done someone can and will be found to do it. Secondly his vast wealth of personal contacts throughout Scotland, from county officials and sheriffs to landlords, crofters and gamekeepers. He was essentially a Scotsman devoted to Scotland, but on the other hand was no narrow nationalist. He was fond of the lighter forms of Scots verse and in a relaxed moment it was a delight to hear him recite faultlessly his favourite—'Tam and the Leeches', and he was proud too of his family relationship with Tam's creator, Dr David Rorie.

In his life's work George had a unique influence on the spread of interest in the study of birds in Scotland and the furtherance of bird protection north of the Border. This was publicly recognized in 1964 by the award of the OBE for his services to British ornithology and conservation. Ten years later Dundee University conferred upon him the honorary degree of LL D for his outstanding work in these fields.

We have lost a great Scotsman and there are many beyond the membership of his club who will share this loss with Irene and his family.

IAN DURANCE PENNIE

HENRY MONTAGU DOUGLAS-HOME

(21 November 1907 - 19 July 1980)

Throughout the country many, in all walks of life, must mourn the death of Major the Hon. Henry Douglas-Home. In the heyday of wireless broadcasting Henry endeared himself to the nation through the many talks he gave as 'The Birdman'. Though he was characteristically modest about it, his reputation as an ornithologist is well established both at home and abroad and his advice and opinion were widely sought. Perhaps it is not so well known that, when he became less active, he devoted much time to painting beautiful pictures of all the birds of Berwickshire.

Every summer for many years parties from all parts of the country visited the Hirsell. It was a date that was looked forward to in the calendar of excursions. 'The Major', as he was generally known, was always waiting at the stables to greet the visitors and after a short talk set off with the party. On the way his information and anecdotes were always laced with humour which added a sparkle to the day, whatever the weather. Though often in much pain from a knee injured in a riding accident many years ago, he always gave kindly consideration to any question whether from the youngest or oldest member of the party, however elementary it might be. Many will cherish memories of summer days walking with the Major through the beautiful woods of the Hirsell, along the banks of the Leet, by the lake and picnicking on the lawns at Springhill. By the end of the day, however weary he might be, no one could persuade Henry to leave until he had waved good-bye to the last bus or car leaving the lakeside, maybe at six or seven in the evening.

I am glad that Henry was eventually persuaded to write an autobiography. His book *The Birdman*, while full of information, also conveys his charm, his sense of fun and the cheerfulness that was his attitude to life.

To those who knew him well the warm friendship, so generously given, his ready wit and unfailing courtesy to all and sundry will ever be sorely missed.

J. I. MEIKLE

Reviews

Guide to Living Birds by J. F. Webb, J. A. Wallwork & J. H. Ellgood, London, Macmillan, 1979, 291 pp, many drawings, diagrams and maps, 21 x 13 cm. £4.95.

This is part of a series devoted to a family by family description of each class of the vertebrates. While the approach used may suit other vertebrates, where data are incomplete and sketchy, it is not particularly suitable for birds. Instead of using the accepted systematic list of families, the authors have used one of their own that divides birds into three groups: ground, aquatic, and perching birds. The list of characters that defines a family are generally incomplete and occasionally inaccurate in its stress. The maps are poor and the illustrations wooden and misleading. Much better and certainly more attractive presentations of family characteristics can be found in many books dealing with the birds of the world.

R. D. MURRAY

A Century of Bird Books by Peter Tate. London, H. F. & G. Witherby, 1979, 256 pp, many plain text photographs, 24 x 16 cm. £10.50

This is a well produced book which is divided into two distinct parts. The first deals in turn with fine bird books, books on British birds,

foreign birds, county and regional studies, monographs, travel and biography, aspects of behaviour, birdwatching and field guides. A large number of books are dealt with in an extremely, maybe over, enthusiastic fashion, and a little more critical treatment like that which starts to emerge in the field guide section would not have been out of place. Many bird books are hardly worth the shelf space given to them! The book is illustrated by a series of 30 photographs of distinguished authors and a large number of photographs of book covers. The former are interesting and worth showing but most of the latter seem to serve no useful purpose.

The second part is a listing of all the titles known to the author of bird books published in Britain since 1875—about 2,000 titles in all—very clearly displayed but maddeningly divided into more or less, but not quite, the same divisions as the first part of the book. This list appears to be pretty thorough as all the 100 of my books I checked were there and the only mistake I detected was that the *Fauna of the Moray Basin* is dated 1895 (not 1896). This section is potentially valuable but its use is drastically curtailed because the place of publication is not given and most journals (including *Scottish Birds*) require this in reference lists. Such a full list could have saved me, and our librarian, much laborious searching.

It is difficult to see the market for this book. I doubt that many bibliophiles will buy it, and it's a bit expensive for a present. This is a pity because it is the fruit of much detailed work and it might so easily have slotted into an unapparently unoccupied niche.

M. P. HARRIS

The Country Life Book of Birds of Prey by Gareth Parry and Rory Putman. London, Country Life Books (Hamlyn), 1979, pp. 120, 35 colour plates, many plain photographs, drawings and maps, 35 x 27 cm. £20

Gareth Parry, a young Welsh artist, was commissioned to paint 35 birds of prey. The resulting finely detailed colour plates of Accipitridae, falcons and owls in typical habitat form the basis of the book and cover 30 European species (23 of which were mentioned in the *Scottish Bird Report 1978*). The narrative by Rory Putman, lecturer in animal behaviour and ecology, provides a general introduction to the biology of birds of prey and their relationship to man, including falconry and the pesticide problem. This section is illustrated with habitat photographs, line engravings and distribution maps. Each colour plate is accompanied by a well-written descriptive text of the species and its main characteristics. The book is of good quality, well presented and interesting. The text provides no fresh information for the informed reader. The plates do not always demonstrate the main identification points mentioned in the text and much of the fine detail would not be visible in the field. Overall a good introduction to birds of prey.

J. WILCOX

Handbook of the Birds of Europe, the Middle East and North Africa: the Birds of the Western Palearctic, Volume II: Hawks to Bustards edited by Stanley Cramp et al. Oxford University Press, 1980, 695 pp, 79 colour plates (full and half page), 16 colour and one plain photographic plates (eggs), many drawings, diagrams and maps, 26 x 21 cm. £30

This volume is likely to prove one of the most popular of the series as it includes those orders of such wide interest as the Accipitriformes (raptors) and the Galliformes (game birds) as well as the Gruiformes

(rails, cranes and bustards). The format is similar to volume one with a general description of each family, followed by descriptions of field characters, habitat, distribution, population, movements, food, social pattern and behaviour, voice, breeding biology, plumage and measurements for each species. All but accidentals are illustrated to show flight pattern and characteristic plumage. The downy young of most Galliformes and Gruiformes are also shown, and there are helpful sketches throughout the text.

Although more than 250 people were consulted in the production of this book, a tight editorial control has been maintained in each section. I found the description of social pattern and behaviour the most interesting and was pleased to see the term skydance given acceptance, a term which, while it may not satisfy the purist, so beautifully evokes the displays of many raptors. Inevitably, some of the finer points in this section may need to be modified in time, such is the effort currently devoted to these studies, but as general accounts for the better known species they are unlikely to be surpassed in the foreseeable future.

My criticisms of the book are slight. In the descriptions of families there are often whole pages without a break for a new paragraph; as the facts contained here are so condensed, it would have been a great help to the reader wishing to locate particular information quickly if there were subheadings either in bold type or capitals throughout this text. Further, a comprehensive introduction was given in volume one. Nevertheless, we have only reached volume two and already the cost is £30 per volume; one can only guess with some trepidation at the cost of the later volumes. In view of this, many people may only be able to buy the single volumes of most interest to them. It would therefore help to include in each a brief key for *inter alia* the colours used on the distribution maps, the fact that standard deviations and sample sizes are given after measurements, and most important, the abbreviations used in the annual cycle diagrams for moult and breeding (P, B, E, Y for primaries, body feathers, eggs and young respectively). I was surprised at the small samples on which most weights and measurements were based. For many raptors and game birds there are far more data which would readily have been made available if they had been requested. The range map of the sedentary Hazel Grouse in the western Palearctic (p. 387) has been superimposed on that of the sedentary Capercaillie (p. 435). This results in the Capercaillie apparently having different winter and summer ranges. All red areas (summer range) should be considered as maroon (present all year) and the grey areas (winter range) should be ignored on this map.

There are some who feel that the concept of a handbook may be outdated because of the wealth of data in the scientific literature and the rapidly increasing number of monographs for individual species and whole families. Volume two of BWP should finally dispel their doubts. To have so much information made available in one book for the general reader, together with a comprehensive bibliography of more than 2,500 references for the specialists, amply justifies this undertaking, and the editors are to be both thanked and congratulated on the results of their truly Herculean task. This volume has maintained the high standard set by its predecessor and is as indispensable, especially as the German *Handbuch der Vögel Mitteleuropas* has not been translated.

Finally, a word of thanks to the publishers: at a time when the GPO regards the label 'Books, handle with care' more as a challenge than a request, and all too many arrive looking as if they had come via Murrayfield, the packaging is excellent and both my volumes have arrived none the worse for their ordeal of 'trial by post'!

N. PICOZZI

Also received

Silent Death : The destruction of birds and mammals through the deliberate misuse of poisons in Britain by C. J. Cadbury, Royal Society for the Protection of Birds, The Lodge, Sandy, Bedfordshire, SG19 2DL, 1980, 27 pp, 1 plain photo, diagrams, maps, 21 x 30 cm, softback, £2.

Care and Rehabilitation of Injured Owls : A user's guide to the medical treatment of raptorial birds—and the housing, release training and captive breeding of native owls by K. McKeever, Lincoln, W. F. Rannie (PO Box 700, Beamsville, Ontario, LOR 1B0, Canada), 1979, 112 pp, plain photos, diagrams, 28 x 22 cm, softback, \$10.

The Hawaiian Goose : An Experiment in Conservation by J. Kear & A. J. Berger, Calton, Poyser, 1980, 154 pp, 1 colour, 46 plain photos, drawings, diagrams, maps, 24 x 16 cm, £9.

The Butterflies of Scotland : A Natural History by G. Thomson, Croom Helm, London, 1980, 267 pp, many colour & plain photos, diagrams & maps, 23 x 17, £19.95.

Current literature Articles and reports on the status and distribution of birds in Scotland are listed here. Strictly biological studies such as ecology or behaviour are excluded and so are references from the widely read journals **British Birds**, **Bird Study**, **Ringing and Migration** and **Ibis**. Most items listed and many others are available for reference in the club library and we are grateful to the contributors. The library welcomes copies of work on any ornithological subject.

The winter attendance of Fulmars at land in NE Scotland. M. A. Macdonald 1980. *Ornis Scandinavica* 11 : 23-29.

Factors affecting the numbers of Gullmots *Uria aalge* present on cliffs. P. J. B. Slater 1980. *Ornis Scandinavica* 11 : 155-163. [Copinsay (Orkney).] *Autumn Wader Passage at Alemoor Reservoir, Roxburghshire* : 1974-76. T. W. Dougall & D. B. McGinn.

Caerlaverock Bird Report No. 1 - 1979. M. Wright (comp.) 1980. Nature Conservancy Council, South West (Scotland) Region, The Castle, Loch Lomond Park, Balloch, Dunbartonshire, G83 8LX.

Bird and mammal numbers in relation to human impact at ski lifts on Scottish hills. A. Watson 1979. *Journal of Applied Ecology* 16 : 753-764.

Census methods for murrets, Uria species: a unified approach.. Occasional Paper Number 43, Canadian Wildlife Service. T. R. Birkhead & D. N. Nettleship 1980.

Nature Conservation and the Clyde Estuary. Report of Symposium at Paisley College of Technology on 12 November 1979. Nature Conservancy Council, South-West (Scotland) Region, The Castle, Loch Lomond Park, Balloch, Dunbartonshire, G83 8LX.

Birds of Berneray and Mingulay 1979. Royal Air Force Ornithological Society 1980 (interim report). Ministry of Defence, Lands 3, Tolworth Tower, Ewell Road, Surbiton, Surrey, KT6 7DR.

Ayrshire Bird Report 1979. R. H. Angus Hogg (ed) 1980. SOC (Ayrshire Branch).

The spring migration of Ringed Plovers through Britain in 1979. P. N. Ferns 1980. *Wader Study Group Bulletin* No. 29 : 10-13.

Numbers, passage and local movements of Redshanks *Tringa totanus* on the Clyde estuary as shown by dye-marking. R. W. Furness & H. Galbraith 1980. *Wader Study Group Bulletin* No. 29 : 19-22

Recent recoveries of waders ringed in Britain and Ireland. G. H. Green 1980. *Wader Study Group Bulletin* No. 29 : 24-26.

Shetland Bird Report 1979. B. Marshall et al. (comp.) 1980. Shetland Bird Club.

Loch Lomond Bird Report No. 8 1979. Anon. (comp.) 1980. Nature Conservancy Council, South West Region, Scotland.

A Report on the Breeding Success of the Peregrine in the Loch Lomond/Trossachs Area of Scotland in 1979. J. Mitchell 1980. Nature Conservancy Council, South West (Scotland) Region, The Castle, Loch Lomond Park, Balloch, Dunbartonshire, G83 8LX.

Notices

'British Birds' subscriptions SOC members are still entitled to subscribe to *British Birds* at the special rate of £12 instead of £16. See the leaflet sent with the last number of *Scottish Birds* or write to Mrs Erika Sharrock, *British Birds* (Circulation), Fountains, Park Lane, Blunham, Bedford MK44 3NJ.

The seabirds of Berwickshire (11: 13-20) Dr W. R. P. Bourne has pointed out that when using unpublished details of Operation Seafarer counts we should have made specific acknowledgment to the Seabird Group, as stipulated in introductory notes with the summaries deposited for public reference, and that reference to the Nature Conservancy Council (NCC) could be misleading. We readily acknowledge our debt to the Seabird Group and thought this was made abundantly clear in our paper through reference to the Seafarer book. The details reached us from NCC without any introductory notes. This correction in no way detracts from NCC's valuable support for seabird census work in recent years. S. R. D. & E. S. da Prato.

Dyed seabirds Last summer colonies along the west coast of Britain and Ireland were visited by expeditions to colour dye adult seabirds (notably Gannets, Puffins and Guillemots) yellow, blue, red or green. The tail of Gannets, throat and breast of auks, and upperparts of wings of Fulmars and Kittiwakes may be dyed. Following these expeditions (from mid July to mid October) a cruise manned by a team of biologists/ornithologists carried out a series of transects west of Britain and Ireland to determine seabird and cetacean densities in different regions, look for colour dyed birds, and relate concentrations of seabirds and cetaceans to concentrations of different fish species (using experimental fishing and echo sounding techniques). It may throw light on where different seabird and cetacean species concentrate and this will be important for any future action necessary in the event of oil spillages in these regions. I would be grateful if anyone seeing dyed birds would contact me at: Edward Grey Institute, Zoology Dept., South Parks Road, Oxford OX1 3PS. P. G. H. Evans.

Movements of wader populations in western Europe It is becoming increasingly clear that many of the waders for which Western Europe is the major wintering area depend not on one but on a series of estuaries during the non-breeding season and so may be particularly susceptible to the large scale developments proposed for many of the wetlands in this area. For their conservation it is vital to know more about the patterns and timing of movements and the numbers involved. Accordingly a study supported by the Nature Conservancy Council and the European Economic Community is being organized by the Wader Study Group and Durham University. This autumn and winter waders of various species will be marked by colour dyes and temporary leg flags in the large estuarine complexes of the Wattenmeer/Waddenzee (Denmark/Germany/Netherlands) and the Wash (England). While casual sightings of these marked birds will be very welcome, to obtain the most valuable infor-

mation from this project there should be frequent coverage of as many sites as possible (both where such birds are expected and where they are perhaps less likely to occur) around the British Isles and western Europe. Anyone who is prepared to help by checking a site is requested to write as soon as possible to M. W. Pienkowski, Wader Study Group, Dept. of Zoology, University of Durham, South Road, Durham DH1 3LE. (Sightings of colour-marked waders sent to this address will also be forwarded to the relevant study group if they do not concern the present one, as the Wader Study Group now maintains an international register of colour marking schemes. When birds are traced, details of marking will be sent to those reporting sightings.)

The Scottish Ornithologists' Club

REPORT OF COUNCIL For Year to 30 June 1980

Membership On 30 June 1980 the club had 2732 members, representing a net increase of 30. Although fewer than usual failed to pay their subscriptions by the due date and were then automatically taken off the membership list, a greater number resigned at the beginning of the session after retaining membership for the first year of the increased subscription rates. Inflation inevitably affected new membership, but even so 332 new members joined, including 61 juniors and 8 children nominated for family membership. 7 members took out life membership and 4 existing members were made honorary members. 338 members paid the reduced rate for pensioners. In the table family members are counted as two people; nominated children pay no subscription.

Year to 30 June	1975	1976	1977	1978	1979	1980
Honorary	4	4	1	1	1	5
Life	22	29	29	49	51	58
Ordinary	2175	2406	2536	2572	2357	2387
Junior	252	299	282	271	211	208
Nominated children	63	80	98	87	82	74
	<u>2516</u>	<u>2818</u>	<u>2946</u>	<u>2980</u>	<u>2702</u>	<u>2732</u>
	-135	+302	+128	+34	-278	+30

Covenants The income from covenanted subscriptions is a very considerable help to the club, and council records its gratitude to all those who have signed a deed of covenant. The number of covenanted subscriptions rose from 710 to 756 covering 890 members; this increase almost compensated for the loss in revenue for the year which resulted from the reduction in the standard rate of income tax.

Death Council records with deep regret the death during the year of Sir Frank Fraser Darling; an obituary appeared in *Scottish Birds*.

Finance The accounts again show the club to be in a satisfactory financial situation. Once more this was mainly due to income from the bookshop; sales rose by 26%, but increased postal charges and other expenses resulted in a somewhat smaller increase in overall surplus.

Branches After a series of successful meetings in the spring, Malcolm Ross of Melrose applied to council for authority to form a *Borders* branch of the club. The application was welcomed by council which approved full branch status since over 60 members were recorded in the area.

This, the thirteenth branch of the club will normally meet in Galashiels, and an increase in members is confidently expected from the start of next session. Mr Ross is congratulated for his enthusiasm and hard work in forming this new branch.

Winter meetings and excursions throughout the year took place in all other branch areas. Good attendances at these, and at the annual weekends in the Solway area and Argyll, reflect the wide interest in bird-watching and indicate that the varied programmes arranged for both lectures and excursions meet with members approval. Many members are responsible for the organisation of weekends, excursions and indoor meetings, and council recognises with gratitude the work done and time given by them all.

Annual Conference The 32nd annual conference and 43rd annual general meeting of the club were again held at the Marine Hotel, North Berwick from 26-28 October 1979. While the location is somewhat far south for some Scottish members, the venue is admirable and enables all the events of the weekend to take place in the same building, fostering the club spirit for which SOC conferences are renowned. Some 300 members and guests attended the weekend, including those who had been on the waiting list last year, and once again the conference was fully booked. An account appeared in *Scottish Birds* 11: 29.

Northern meeting In response to requests from members living in the north of Scotland, a meeting was arranged for the weekend 18-20 April 1980 in the Drumossie Hotel, just south of Inverness. Roy Dennis and members of the Inverness branch are congratulated for arranging a most enjoyable and informative weekend with high quality talks. 140 members and guests attended this excellent meeting, an account of which is in the autumn 1980 journal.

Scottish Birds Four issues with 164 pages of text and plates, and the index to volume 10, were published during the year. The editor is congratulated on publishing all four issues on schedule; this enabled all members living in Britain to receive their copy at the start of each quarter.

Scottish Bird Report The decision to publish the SBR separately from the journal was reported last year, and the 1978 report was the first to be printed on its own. While it had been hoped to publish it in time for distribution with the autumn journal, this proved to be impossible in spite of the considerable work put in by local recorders and compilers, and it was sent to members with the winter journal early in December. In view of the large number of records submitted each year, all of which have to be collated and edited, it is unlikely that autumn publication will ever be possible; members should normally expect to receive their copy with the winter journal. The 1978 report was bound in volume 10 after the index, but was paginated separately.

Research and fieldwork Surveys organised by other ornithological bodies were again supported by club members, with help being given to the RSPB beached bird survey, the Wildfowl Trust goose and wildfowl counts, and the BTO common bird census and ringing. The research committee plan shortly to initiate a Scottish survey to be covered by existing branches and their members. A request by the BTO to support the 1981 national Nightjar survey was approved. Council gratefully acknowledges the decision of the BTO to allow a copy of the Scottish data from national surveys, and also a copy of ringing recovery data, to be held in the SOC reference library.

Conservation During the year plans of the route proposed by the South of Scotland Electricity Board for the power lines from Torness power station on the East Lothian coast were made public. As the route passed

directly across flight paths of Pink-footed and Greylag Geese on their way to and from traditional feeding grounds, council wrote to the SSEB expressing concern at the route proposed, and urging that a recommended alternative which would avoid most of these areas should be taken. The outcome of further enquiries by the Board is awaited.

Proposals by the Highland Regional Council to develop ski-ing facilities in the Coire an t-Sneachda, Coire an Lochain and Lurcher's Gulley on Cairngorm were announced early in 1980. Together with many other organisations, council protested most strongly, on behalf of the club, against the proposals. It believed that the increased disturbance would have detrimental effect on the breeding success of rare birds which occur in the area and also that any development there would represent a major visual intrusion in an area much enjoyed by birdwatchers, and others, for its remoteness compared with the heavily-used ski slopes further east on Cairngorm. It is likely that a public enquiry is to be held into the proposals.

Endowment Fund As noted in the last annual report, the research committee is now responsible for making recommendations to council on applications for grant from the endowment fund. Of the nine applications received eight were approved for grant, totalling £735. The following grants were made: £40 to Martin Cook to continue his study of Crested Tit distribution; £70 to Jim Dickson and Ian Alexander to study Long-eared Owls in forestry plantations; £70 to Michael Nicholl and Keith Brockie to study Heron movements from colonies in east central Scotland; £100 to Bruin Thompson for studies on Mute Swans in the Hebrides; £50 to Bob Swann and Andrew Ramsay for their continued studies on Manx Shearwaters and Shags on Canna; £155 to the Clyde Ringing Group towards the purchase of a cannon net, with the proviso that the net remained the property of the club for five years; £150 to the Highland RG for wader studies in the highlands; and £100 to the Grampian and Tay RG towards the cost of an expedition to Norway to colour-ring Purple Sandpipers.

Scottish Centre The Scottish Centre for Ornithology and Bird Protection continued to be visited by many home and overseas birdwatchers who sought advice on places to visit during their stay in Scotland; the usual large number of postal enquiries were also received.

Throughout the year the SOC council and committees met in the Centre, which was used regularly through the winter for branch and informal group meetings. Other organisations which used the premises for meetings were the Fair Isle Bird Observatory Trust for its AGM and executive committee, the Isle of May Bird Observatory and Field Station Committee, and the Scottish Advisory Committee of the RSPB.

Bookshop Book sales continue to rise and reached over £78,500, once again an increase of over 25% on the previous year. This continued growth in sales, due partly to an increase in customers and partly to the higher cost of books, reflects the interest in ornithological and natural history books as well as the ever widening circle of overseas customers. Great credit is due to the bookshop staff for their hard work and the personal interest they take in customers' orders. It is always a pleasure to meet customers, particularly those from overseas, when they visit the bookshop. The policy announced last year of allowing free postage to SOC members, except for orders under £5, brought in a number of new members, particularly from overseas.

Council is again very grateful to the BTO for inviting the club to

display books at its annual conference at Swanwick, and at the Scottish Ringers Conference organised by the Clyde Ringing Group in Glasgow.

Library The increased allocation to the library enabled more new books to be purchased than in recent years. It also, with sums raised from the sale of seldom-used books from the lending section, allowed a large number of current and back volumes of journals to be bound. The librarian is congratulated on the work he has achieved in the past year and the orderly way in which the library is kept. Once again donations of books, journals and reprints have been received, and council acknowledges these most gratefully. A bequest from the late Miss Stella Wallace, a former club member, was particularly welcome.

Club representation Frank Hamilton and Dr Derek Langslow continued to represent the club on the British Section of the International Council for Bird Preservation, and Bede Pounder on the Duck Working Group of the International Wildfowl Research Bureau. Council records its appreciation to all three for their service to the club.

Secretarial staff After 18 months on the staff, Mrs Maureen Suess left in April to further her studies; we wish her success. Miss Doddy Ridley, daughter of a staff member, very ably helped for over three months in the summer.

Acknowledgments Each year council records its appreciation to many members who have contributed towards the running of the club and its branches; without their enthusiasm, interest and encouragement to new members, resulting in continued recruitment, and this year in the formation of a new branch, the club would not be able to maintain its place as the focus for ornithology in Scotland. Council once again records its thanks to all those who have served on the committees of the club and its branches, have given lectures, served as local recorders and compilers, and helped in other ways throughout the year by giving their time and expertise for the benefit of the club and its members.

The club is also very well served by its staff and council acknowledges with gratitude the loyalty, efficiency and willingness of all who work at 21 Regent Terrace.

For the Council,

VALERIE M. THOM, President.

Revenue account for the year ended 30 June 1980

INCOME	30/6/80	30/6/79
Subscriptions received for year	£11412	£11452
Income tax received on covenanted subscriptions	1717	1771
Dividends and interest received (gross)	1254	693
Surplus on bookshop (sales £78794)	18582	16246
Sale of "Scottish Birds"	698	652
Sundry sales less sundry purchases	45	40
Donations	110	236
Conference	126	244
	<hr/>	<hr/>
	£33944	£31334
	<hr/>	<hr/>

EXPENDITURE

Branch expenses including lectures	...	...	£1457	£976
Travel expenses of council members and delegates to conferences	...	...	673	592
Secretarial and editorial expenses	...	...	19317	16486
Office expenses	...	...	2188	2044
Scottish Centre for Ornithology and Bird Protection: Club's share of running expenses			1828	1168
Cost of books purchased by library, and binding	...	...	335	335
Expenses in production of 1978 SBR	£135			
less contribution from "Scottish Birds" Appeal Fund	...	...	135	—
Cost of publishing "Scottish Birds" and 1978 SBR (less 1979 raffle income £555 and advertising revenue £1306)	...	...	4597	3421
Subscriptions paid	...	...	71	75
V.A.T. not reclaimable	...	...	142	—
			<u>£30608</u>	<u>£25097</u>
Excess of Income over Expenditure	...	...	3336	6237
			<u>£33944</u>	<u>£31334</u>

Balance Sheet as at 30 June 1980

	30/6/80	30/6/79
GENERAL FUNDS OF THE CLUB		
Accumulated surplus from previous year	£8006	£1769
Add surplus for year	3336	6237
	<u>11342</u>	<u>8006</u>
Life Membership Fund	4013	3363
"Scottish Birds" Appeal Fund	1515	1651
	<u>£16870</u>	<u>£13020</u>
REPRESENTED BY		
Cash in hand and at bank	£1077	£735
Cash in Edinburgh & Paisley Building Society	2628	2970
Bookshop stock	16050	12251
Tie, badge and car sticker stock	486	250
Debts due to club	4385	2687
Investments at cost as below	2506	1798
	<u>27132</u>	<u>20691</u>
Less		
Subscriptions paid in advance	£46	36
Debts due by club	10090	7606
Due to Endowment Fund	126	29
	<u>10262</u>	<u>7671</u>
Total net assets	<u>£16870</u>	<u>£13020</u>

Investments as at 30 June 1980

	Market value	At cost	At cost
Safeguard Industrial Investments Ltd.—			
875 Ord. shares of 25p each	£831	£508	£508
£1280—10½% Treasury Stock 1979	—	—	1290
£2100—10% Treasury Stock 1983	1927	1998	—
	<u>£2758</u>	<u>£2506</u>	<u>£1798</u>

Endowment Fund

(The free income of which is available for the advancement
of ornithology)

Revenue account for the year ended 30 June 1980

	30/6/80	30/6/79
INCOME		
Interest and dividends received (gross)	£917	£679
EXPENDITURE		
Grants as detailed in Report of Council	£735	£495
Excess of income for year	<u>£182</u>	<u>£184</u>

Balance Sheet at 30 June 1980

Endowment Fund as at 30 June 1979	£3556	£3417
Add Donation	5	—
Increase in cost value of re-investment	—	139
	<u>3561</u>	<u>3556</u>
Accumulated revenue as at 30 June 1979	2061	1807
Excess of income for year	182	184
Grant refunded	—	70
	<u>£5804</u>	<u>£5617</u>
Made up of :		
Investments at cost as below	£3151	£3151
Edinburgh and Paisley Building Society :		
Capital account	407	407
General account	2461	2201
Due by club's general funds	125	28
	<u>6144</u>	<u>5787</u>
Less Grants allocated but not yet paid	340	170
	<u>£5804</u>	<u>£5617</u>

Investments as at 30 June 1980

	Market value	At cost	At cost
£1220 9½% Treasury Stock 1983	£1107	£1140	£1140
£440 British Printing Corporation—8½% unsecured Loan Stock 1993/98	257	441	441
500 St Andrew Trust Ordinary 25p	635	570	570
1952 M & G Equity Investment for Charities	3172	1000	1000
	<u>£5171</u>	<u>£3151</u>	<u>£3151</u>

EDINBURGH, 4th September 1980.—I have audited the foregoing revenue accounts for the year to 30 June 1980, and the balance sheets as at that date. I have accepted as correct subscriptions and other receipts shown as received in the books and the value placed on the bookshop stock. Subject to this I certify that in my opinion the foregoing accounts are correctly stated and sufficiently vouched.

(Signed) ROBERT CAVEN,
Chartered Accountant.

COUNCIL AND OFFICIALS OF THE CLUB FOR SESSION 44

Hon. Presidents Sir Charles G. Connell, W.S., LL.D., F.R.S.E.; Sir Arthur B. Duncan; W. J. Eggeling, C.B.E., B.Sc., F.R.S.E.; Professor V. C. Wynne-Edwards, C.B.E., LL.D., M.A., D.Sc., D.Univ., F.R.S., F.R.S.C., F.R.S.E., F.I.Biol.

President Miss Valerie M. Thom.

Vice-President Dr Ivan T. Draper.

Law Agent D. G. Andrew, W.S.

Council (elected at AGM) A. Anderson, J. M. S. Arnott, D. L. Clugston, Mrs H. Halliday, R. H. Hogg, T. Irving, Dr D. R. Langslow, B. Stewart, Dr I. R. Taylor, Hon. D. N. Weir. **Young Member** (elected by Council) J. M. Dickson.

Branch Representatives (elected by their Branch) A. Anderson (Aberdeen); R. H. Hogg (Ayr); R. T. Smith (Dumfries); Dr J. J. D. Greenwood (Dundee); L. W. G. Alexander (Edinburgh); Dr D. N. Brooks (Glasgow); R. H. Dennis (Inverness); Mrs H. Halliday (New Galloway); J. S. Wiffen (St Andrews); H. Robb (Stirling).

STAFF

Secretary, Treasurer and Business Editor Major A. D. Peirse-Duncombe.

Editor and Bookshop Manager D. J. Bates.

Membership Secretary Mrs R. D. Smillie.

Hon. Treasurer and Librarian W. G. Harper.

Bookshop and Clerical Mrs H. L. Harper, Mrs D. J. Ridley, Miss H. Barul.

BRANCH AND GROUP OFFICE BEARERS

Aberdeen Chairman, B. Stewart; Vice Chairman, S. M. D. Alexander; Secretary, A. Duncan; Committee, T. D. H. Merrie, G. Rebecca, L. Steele.

Ayr Chairman, R. H. Hogg; Vice-Chairman, D. A. Smith; Secretary, J. Miller; Committee, J. Burton, B. C. Forrester, Dr R. Hissett, Mrs E. M. Hissett.

Dumfries Chairman, Dr N. E. Armstrong; Vice-Chairman, Dr E. C. Fellowes; Secretary, J. W. Barclay; Committee, W. Austin, Miss A. MacDonald, R. T. Smith, R. M. Wright.

Dundee Chairman, B. M. Lynch; Vice-Chairman, P. A. Kemp; Secretary, Dr K. M. Watson; Committee, F. V. Ellmore, Mrs J. A. R. Grant, B. Pounder, D. B. Thomson.

Edinburgh Chairman L. W. G. Alexander; Vice-Chairman, I. V. Balfour-Paul; Secretary, S. R. D. da Prato; Committee, Mrs L. M. Brown, J. M. Dickson, Mrs E. Ferro, P. W. G. Marriott, J. B. Murray.

Glasgow Chairman, Dr D. N. Brooks; Vice-Chairman, H. Galbraith; Secretary, S. N. Denney; Committee, D. Carnduff, Dr J. T. Knowler, C. E. Palmar, W. S. Taylor.

Inverness Chairman, R. H. Dennis; Vice-Chairman, R. L. Swann; Secretary, Mrs E. M. McQuarrie; Committee, R. A. Broad, J. Carruthers, D. B. McGinn.

New Galloway Chairman, Mrs H. S. C. Halliday; Vice-Chairman, Miss J. E. Howie; Secretary, Dr G. A. Fleming; Committee, J. Aitken, Admiral Sir Nigel Henderson, R. E. S. Wass, Rev. G. Yeo.

St Andrews Chairman, J. S. Wiffen; Secretary, Miss D. E. Rowling; Committee, Dr R. W. Byrne, T. W. Dougall, P. K. Kinnear, Lt. Cdr. E. F. B. Spragge.

Stirling Chairman, H. Robb; Vice-Chairman, C. E. Barth; Secretary, A. B. Mitchell; Committee, W. R. Brackenridge, J. Gearing, R. L. Gooch, Miss M. H. Knox.

Thurso Chairman, Mrs P. M. Collett; Secretary, S. Laybourne.

Wigtown Chairman, Dr P. G. Hopkins; Secretary, G. Sheppard; Committee, D. L. Irving, G. Shaw.

COMMITTEES

Management Miss V. M. Thom (Chairman), D. G. Andrew, J. M. S. Arnott, Dr I. T. Draper, M. K. Hamilton.

Library A. T. Macmillan (Chairman), Ritchie Seath (Hon. Librarian), D. L. Clugston, Dr J. J. D. Greenwood, P. W. G. Marriott, Dr I. D. Pennie, Mrs Irene Waterston.

Editorial A. T. Macmillan (Chairman), J. M. S. Arnott, D. L. Clugston, R. H. Dennis, F. D. Hamilton, S. R. D. da Prato, Miss V. M. Thom.

Research Dr I. R. Taylor (Chairman), A. W. Colling, R. H. Dennis, Dr J. J. D. Greenwood, Dr D. R. Langslow.

CLUB REPRESENTATION

British Section, International Council for Bird Preservation : F. D. Hamilton, Dr D. R. Langslow.

International Wildfowl Research Bureau, Duck Working Group : B. Pounder.

HONORARY MEMBERS

Dr John Berry, William Brotherston, Maxwell Hamilton, Dr Ian Pennie, Mrs Irene Waterston, Donald Watson.

NOTICES

DUMFRIES WEEKEND

The annual weekend excursion to the Solway goose grounds has been arranged with the County Hotel Dumfries, from Friday, 20th to Sunday, 22nd February 1981.

Accommodation: inclusive terms £25 (including service charge and V.A.T.) as follows: bed on Friday 20th; breakfast, packed lunch, dinner and bed on Saturday 21st; breakfast and packed lunch on Sunday 22nd. Dinner on Friday night is £5.50 extra per person (including service charge and V.A.T.). A limited number of rooms with private bathrooms are available for the additional charge of £2.00 per night.

Members may bring guests and should book direct with the Manager, County Hotel, Dumfries (tel. 5401), notifying him that they are attending the Club excursion. Members should also advise the Hotel in advance if they require Dinner on the Friday night.

Those not staying at the County Hotel are invited to attend an informal meeting at the Hotel on Friday at 8.30 p.m., when details of the weekend excursions will be announced. An informal programme of slides will be shown on the Saturday evening. Members or guests who may have slides of interest are asked to bring them to the Hotel, and to contact the Club Secretary on the Friday evening to discuss their inclusion in the programme. A selection of books from the Bird Bookshop will be taken to the Hotel for sale during both evenings. It is advisable to bring warm clothing, gum boots if possible, and thermos flasks for the excursions.

ARGYLL WEEKEND

The Stirling branch intend to repeat their Argyll weekend based at a country cottage near Ford in early March 1981. Accommodation is limited. The charge will depend on the number attending. Anyone interested should contact the Stirling branch secretary, Sandy Mitchell, 10 Kenilworth Court, Bridge of Allan, Stirlingshire FK9 4EJ. Tel. 078-683 2461 (please send sae if writing).

DUMFRIES BRANCH SECRETARY

The new secretary, elected at the Branch AGM in September is J. W. Barclay, Jerona, Robb Place, Castle Douglas, Kirkcudbrightshire (tel. 0556 2909).

INVERNESS BRANCH A.G.M.

The Inverness Branch AGM will take place on 31 March 1981 and not as shown in the syllabus. Venue and time are unchanged.

INVERNESS BRANCH - WINTER EXCURSIONS

Saturday 14 February 1981 BEAULY FIRTH. Leader Bob Swann. Contact Branch Secretary for departure time and location.

Sunday 29 March BURGHEAD and FINDHORN. Leader Derek McGinn. Leave Cathedral car park, Inverness 9 am.

Both excursions take lunch and tea. Names to and further details from Branch Secretary: please state if car seats are required or available (sae if writing).

Weekend Friday 1 to Monday 4 May Details will be announced later.

Branch News

Glasgow Branch outing to lure Storm Petrels at Portencross. At midnight on 1st August, a night of monomorphous placidity, the mysterious west coast sect known as the Procellarians assembled on the foreshore at Portencross to witness the great manifestation. After a minute or two of invocation the 27-strong sect experienced a materialization. Great praises rang out in the still air and flashguns popped. After an hour or so there was a second coming, this time perhaps sent to us on this special occasion by the great Hydroborean who exists in misty Kintyre and who bountifully bestows his messengers upon us. Staunch (or should it be devout?) Procellarians who remained until the fourth hour witnessed a third, fourth and fifth coming. At this hour a wind sprang up and the manifestations vanished into the inky darkness; so too did the Procellarians. A unique, chastening and oily experience.

B. ZONFRILLO

[We endeavour to cater for all tastes.—ED.]

Current Notes

These notes include unchecked reports and are not intended as a permanent record, nor will they be indexed. Please send reports via local recorders at the end of March, June, September and December.

Stray summer records—**White-tailed Eagle** 2 (ad & imm) O Heb Jul-Aug. **Peregrine** 5 sites Shetland; 4 pairs bred. **Quail** max 7 Fair Isle; calling North Uist (O Heb) 28 Jul. **Greenshank** bred Shetland (probably 1st ever). **Glaucous Gull** did not breed Shetland after one hybridizing with Herring Gull 1975-9. **Snowy Owl** in Shetland 2 ♀♀ moved from Fetlar to Unst in May, the remaining ♀ laid an egg on 2 Jun which disappeared on 4 Jun.

Westerly winds from 21 August brought in shearwaters and a Bonaparte's Gull. Easterlies on 30 August resulted in an influx of Ruffs, a passage of Great Skuas, and falls of chats, warblers and flycatchers. Westerly gales in mid September fetched in a Cory's Shearwater, Storm and Leach's Petrels, three Buff-breasted Sandpipers and four Sabine's Gulls. Easterlies again on 22-23 September produced good falls of passerines, although some areas missed out because of fog. Fair Isle reported its best late August and September for migration for years, and did rather well for buntings.

Cory's Shearwater Minch (O Heb) 19 Sep. **Great Shearwater** Troon (Ayr) 21 Aug; 2 Fair Isle 23 Aug. **Sooty Shearwater** rather few in North Sea but 3 off Corsewall Point (Wig) 30 Aug and again 13-14 Sep. **Manx Shearwater** 4,000 Turnberry Point (Ayr) 28 Aug; one inland Westwater (Peeb) 7 Sep. **Storm Petrel** 5 trapped Isle of May 9-16 Aug; one Sanda (Arg) 6 Jul had been ringed Isle of May 10 Aug 1979; 30 off Corsewall Point 14 Sep. **Leach's Petrel** 11 Corsewall Point 13-14 Sep; one Forties Field (North Sea) Sep/Oct. **Surf Scoter** Blackdog (Aber) from late Jul, 2 in late Aug; Harris (O Heb) 8 Sep. **Smew** Langbank (Renf) Aug (for 2nd year). **Honey Buzzard** Beatrice Field (Moray Firth) late Sep. **Marsh Harrier** North Ronaldsay (Ork) late Sep. **Osprey** Fair Isle 8 Sep. **Eleonora's Falcon** Erskine Bridge (Renf) 18 Aug (1st Scottish, 2nd British record if accepted). **Grey Plover** 282 Aberlady (E Loth) 7 Sep. **Temminck's Stint** Fair Isle 12 Aug; Fife Ness 29 Aug. **White-rumped Sandpiper** Musselburgh (Midl) 6-12 Aug. **Buff-breasted Sandpiper** Irvine (Ayr) 13 Sep; Lewis (O Heb) 14 Sep; Fair Isle 17-20 Sep. **Ruff** widespread influx 30 Aug-Sep, max 60 Fife Ness, 51

Linwood (Renf), 39 Stenness (Ork). **Jack Snipe** 12 Fair Isle 27 Sep. **Grey Phalarope** Brims (Caith) 27 Jul; North Ronaldsay Sep; Forties Field 1-3 Oct, also **phalarope sp** 9 Oct. **Long-tailed Skua** Seafield (Midl) 6 Oct. **Great Skua** 120N Barns Ness 30 Aug; 13W Newhaven (Midl) 16 Sep. **Sabine's Gull** 2 off Corsewall Point and one Barassie (Ayr) 14 Sep; inland Melrose (Rox) 26 Sep. **Bonaparte's Gull** Barassie 22 Aug. **Ross's Gull** Barra (O Heb) 5 Jul. **Roseate Tern** one off Corsewall Point 14 Sep. **Ring-necked Parakeet** 4W Aberlady 13 Aug (1st Scottish record?—and, we hope, the last). **Kingfisher** Benbecula (O Heb) 21 Aug. **Wryneck** few—max 5 Fair Isle 23 Sep. **Short-toed Lark** Fair Isle 18 Aug, 21 Sep. **Richard's Pipit** Isle of May 22 Sep. **Tree Pipit** 60 Fair Isle 23 Sep. **Meadow Pipit** 1,500 Fair Isle 4 Sep; 1,000 Isle of May 22 Sep. **Red-throated Pipit** Fair Isle 20-24 Sep. **Yellow Wagtail** 4 Guardbridge (Fife) 16-27 Aug; 5+ St Abbs (Ber) 30 Aug. **Duncock** 120 Fair Isle 23 Sep. **Robin** 550 Fair Isle 23 Sep. **Redstart** 30+ St Abbs 30 Aug; 70 Fair Isle 23 Sep. **Whinchat** 80 Fair Isle 30 Aug. **Wheatear** 200 Fair Isle 25 Sep. **Ring Ouzel** 120 Fair Isle 23 Sep. **Fieldfare** 1st Fair Isle 15 Aug. **Song Thrush** 50+ Isle of May 22 Sep; 1,100 Fair Isle 23 Sep. **Redwing** 1st Fair Isle 24 Aug, 400 on 23 Sep; 80+ Isle of May 22 Sep. **Reed Warbler** 4 Fair Isle 30 Aug, six 23 Sep; 3 Isle of May 21-22 Sep. **Icterine Warbler** 9 Fair Isle 31 Jul-19 Sep, max 3 on 30 Aug; 2 Isle of May early Aug and early Sep; Fife Ness 23 Sep; 2 St Abbs 1 Sep. **Melodious Warbler** Fair Isle 22 Sep. **Barred Warbler** Fair Isle max 7 on 30 Aug, six 11 Sep; Isle of May early Sep; 3 Orkney Sep; St Abbs 1 Sep, 11 Oct; Pease Bay (Ber) 14 Sep. **Garden Warbler** 28 Fair Isle 30 Aug, 40 on 11 Sep. **Blackcap** 60 Fair Isle 23 Sep. **Arctic Warbler** Fair Isle 11-14 Sep, 21 Sep. **Yellow-browed Warbler** singles Orkney, Forties Field and Isle of May late Sep. **Bonelli's Warbler** Drums (Aber) 22-24 Sep (4th Scottish). **Willow Warbler** 350 Fair Isle 30 Aug, 400 on 11 Sep. **Goldcrest** Fair Isle from 28 Aug, 75 on 23 Sep; 45 St Abbs 15 Oct. **Firecrest** 3 St Abbs 30 Aug. **Red-breasted Flycatcher** 7 singles Fair Isle-St Abbs 14 Aug-28 Sep, including Forties Field and one catching flies at Isle of May observatory window. **Pied Flycatcher** 50-100 St Abbs 30 Aug. **Red-backed Shrike** 8 Fair Isle-Isle of May-St Abbs 18 Aug-22 Sep. **Woodchat Shrike** Fair Isle 25-26 Aug, 4-5 Sep. **Rose-coloured Starling** Arbroath (Angus) c.9 Oct. **Chaffinch** 320 Fair Isle 23 Sep. **Brambling** 260 Fair Isle 23 Sep. **Siskin** 250 Fair Isle 20 Sep, 300 on 23 Sep; 150+ Isle of May during 20-27 Sep. **Scarlet Rosefinch** 14 Fair Isle 24 Aug-Sep, max 4 on 10 Sep; 7 Orkney 11-26 Sep; Isle of May 22 Sep. **Lapland Bunting** 25 Fair Isle 24 Sep, 27 Sep. **Snow Bunting** 1st Musselburgh 7 Sep. **Pine Bunting** Fair Isle 14 Oct (5th Scottish). **Yellow-browed Bunting** Fair Isle 14 Oct (1st Scottish). **Rustic Bunting** Fair Isle 14 Sep, 4 during 22-30 Sep. **Little Bunting** Fair Isle 6-7 Sep, 22 Sep-1 Oct. **Yellow-breasted Bunting** 6 Fair Isle 27 Aug-29 Sep, max two 30-31 Aug.

Late news

Black Stork Newton Wamphray (Dumf) 19 Oct. **Stonechat** one of the Siberian races Isle of May mid Oct. **Bean Goose** L Leven (Kinr) from 2 Oct. **Blue-winged Teal** 2 Caerlaverock (Dumf) mid Oct. **Temminck's Stint** Aberlady 17 Oct. **Brünnich's Guillemot** Fair Isle mid Oct (alive!). **Tengmalm's Owl** trapped Binscarth (Ork) 14 Oct. **Yellow-browed Warbler** 2 St Abbs late Oct. **Firecrest** St Abbs late Oct. **Rustic Bunting** Fife Ness late Oct.

D. J. BATES

WITHOUT COMMENT

'We looked carefully over the gulls roasting on the lower slopes of Oiseval above the camp and soon marked out . . . a Laughing Gull . . .'

—*Stornoway Gazette* 25 July 1980

What do you call a woodpecker with no beak?—A heid-banger.

THE SCOTTISH ORNITHOLOGISTS' CLUB

THE Scottish Ornithologists' Club was formed in 1936 and membership is open to all interested in Scottish Ornithology. Meetings are held during the winter months in Aberdeen, Ayr, the Borders, Dumfries, Dundee, Edinburgh, Glasgow, Inverness, New Galloway, St Andrews, Stirling, Thurso and the Wigtown District at which lectures by prominent ornithologists are given and films exhibited. Expeditions are organised in the summer to places of ornithological interest.

The aims of the Club are to (a) encourage the study of Scottish ornithology and to promote an interest in wild birds; (b) co-ordinate the activities of Scottish ornithologists; (c) encourage ornithological work in Scotland; (d) encourage conservation of Scottish birds and protection of threatened and rare species; (e) hold meetings for discussion and to arrange ornithological field meetings, and (f) appoint local recorders and publish material relating to Scottish ornithology, including *Scottish Birds*, the club journal.

There are no entry fees for Membership. The Annual subscription is £5, or £2 in the case of Members under twenty one years of age or Students under 25, who satisfy Council of their status as such at the times at which their subscriptions fall due. The Life subscription is £100. Family Membership is available to married couples and their nominated children under 18 at an Annual subscription of £7.50, or a Life subscription of £150. *Scottish Birds* is issued free to Members but Family Members will receive one copy between them. Subscriptions are payable on 1st October annually.

Scottish Birds, which is published quarterly, includes papers, articles and short notes on all aspects of ornithology in Scotland. The club also publishes the annual *Scottish Bird Report*.

Application for Membership form, copy of the Club Constitution, and other literature are obtainable from the Club Secretary, Major A. D. Peirse-Duncombe, Scottish Centre for Ornithology and Bird Protection, 21 Regent Terrace, Edinburgh, EH17 5BT (tel. 031-556 6042).

APPLICATION FORM

Date.....

Name(s)

Address

Date of birth if under 21 or student under 25
(or nominated child under 18 on family membership)

Type of membership

I enclose cheque/postal order/cash for £.....

Signature

Proposed by

Seconded by

(If you do not know any members who can propose or second you please leave blank)

Please detach and send with your subscription to The Club Secretary, Scottish Ornithologists' Club, 21 Regent Terrace, Edinburgh, EH7 5BT.

Notes—

1. Those entitled to draw the State old age pension may pay a reduced subscription of £3 (single) or £4.50 (family) on application to the Club Secretary.
2. Banker's Order and Deed of Covenant forms can be supplied by the Club Secretary.

Notices to Contributors

Papers, longer articles and short notes

1. The high cost of production and distribution means that it is of the utmost importance that contributions are concise, interesting and readable to justify their publication. Official reports originally prepared for other bodies usually need to be completely redrafted. Authors of papers are advised to submit a draft to an expert referee before offering it to the editor. Material is considered on the understanding that it is not being offered elsewhere.

2. Two copies should be sent, typed on one side only with double spacing and wide margins. Authors are urged to consult recent issues of *Scottish Birds* for style of presentation, in particular of headings, tables and references. Headings should not be in capitals nor underlined. Tables and figures must be designed to fit the page. Tables should be used sparingly and be self explanatory, and, like figure captions, typed on a separate sheet.

3. Short notes, if not typed, must be clearly written and well spaced.

4. English names of species (but not group names) of birds, other animals and plants, except domestic forms, have initial capitals for each word, except after a hyphen. English names and sequence of birds follow Voous (1973-7) 'List of recent Holarctic bird species' (*Ibis* 115: 612-638; 119: 223-250, 376-406). Scientific names are generally unnecessary for species in this list but they are required (underlined, with no brackets) for subspecies, species not in the list, and for other animals and plants, except domestic forms, where these receive significant mention.

5. Proofs are sent to all contributors and these should be returned without delay. Authors of papers and longer articles are entitled to 25 free copies of the journal but these must be requested when returning proofs. Extra copies can be supplied at cost.

6. Illustrations of any kind are welcomed, whether alone or to illustrate an article. Drawings and figures should be up to twice the size they will finally appear, in Indian ink, neatly lettered, on good quality paper separate from the text. Photographs, either glossy prints or colour transparencies, should be sharp and clear with good contrast.

Scottish Bird Report

1. Records should be sent to the appropriate local recorders, a list of whom is published regularly, but in cases of difficulty they can be forwarded by the editor.

2. These records should be on one side of the sheet only, well spaced and in species order, following the Voous sequence (see 4. above). The only exception is that Aberdeenshire and north Kincardineshire records should be in place and date order. Observers should consult previous reports for the sort of information required. To avoid duplication of records by the recorders, names of other observers present should be given where appropriate.

3. Notes for the year should be sent promptly, generally in early January, but some recorders prefer more frequent records and regular contributors are asked to consult local recorders about this. Reports of occasional visits to areas outwith the observer's regular territory, such as holiday lists, should usually be sent to recorders as soon as possible. Records of rarities, including species only locally rare, should be sent to recorders without delay.

4. The editor will be glad to receive, preferably via the local recorders, records of special interest for publication in Current Notes. Please send them at the end of March, June, September and December for publication in the issues following.

5. To save recorders' (often considerable) time and expense, correspondents should enclose a stamped addressed envelope or indicate that no acknowledgment is required.

WILDFOWL COUNTS IN SCOTLAND

For more than 20 years the task of organising the winter Wildfowl Counts in Scotland was undertaken by a succession of dedicated SOC members; first by Miss Rintoul and Miss Baxter, then by Miss Betty Garden and finally by Miss Valerie Thom. When Miss Thom resigned in 1971, no overall Scottish Organiser could be found to continue the work centrally, and so a number of Regional Organisers were appointed who deal direct with the Wildfowl Trust in Slimbridge. The Club agreed to be responsible for appointing Regional Organisers when necessary in future, and a copy of the counts for all parts of Scotland is maintained in the Club's Reference Library in Edinburgh.

A list of the Regional Organisers is given below, and anyone who is interested in helping with the counts is asked to write to their nearest Organiser. If there is none please contact Slimbridge.

Shetland D. P. P. Eva, 6 Westerloch Brae, Lerwick.

Orkney P. Reynolds, Creyer Cottage, Evie, Orkney.

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Vol. 11 No. 5

Spring 1981

Edited by D. J. Bates

George Waterston - a tribute

(From an address to the 33rd annual conference, North Berwick,
25 October 1980)

George Waterston's name has long been synonymous with that of the Scottish Ornithologists' Club. The SOC was George's brainchild. As its first secretary he was instrumental in setting-up the club, in stimulating its revival and expansion in the early post-war years and in initiating the first ornithological conference—away back in 1947. That was a joint BOU/SOC affair but it led to the regular pattern of SOC conferences with which we are now so familiar. Other milestones in the club's career that we owe to George are the memorable Bird Islands Cruise of 1966, the establishment of the Scottish Centre for Ornithology and the Bird Bookshop. He not only had the vision to see the opportunities but also the strength of purpose to ensure that they were realized.

When he ceased, in 1959, to act as SOC secretary George was immediately elected a council member and at the end of his five year term became an Honorary President. This ensured his continuing involvement in the club's affairs—and that involvement remained an active one right up to the time of his death. There were many ways in which George was unique, one of them being that he did not serve as club president until eight years *after* he had been elected an Honorary President—normally, of course, this sequence is reversed. His term of office as president was unfortunately marred by the ill-health which dogged the last years of his life. But, where many a lesser mortal might have sat back and taken things easy, George continued attending council and library committee meetings whenever he was able to do so, making periodic flying visits to his beloved Fair Isle, and responding enthusiastically to bird news from his many friends.

That enthusiasm was among George's most memorable qualities and it must, I am sure, have inspired and encouraged many of you in your early birdwatching days as it did me. Infectious enthusiasm, and the ability to charm people into doing what he wanted—what more useful qualities could any-

one working in the bird protection field wish for? Add to these modesty, sincerity and friendliness and it is obvious why George was so popular and why he will be so greatly missed.

As a person George will long be remembered with affection and respect. As the moving spirit behind so much of what the SOC is and does he should, I believe, also be remembered in a more tangible way. Council has agreed that some form of memorial would be both appropriate and desirable; we would welcome suggestions from members as to the form such a memorial might take.

V. M. THOM (*President*)

The breeding habitats of waders on North Uist machair

R. J. FULLER

(Plates 17-18)

Machair is outstanding for its breeding waders. Over a large area as many as six species breed at densities comparable with almost anywhere in Europe.

The west coasts of the Outer Hebrides, particularly of North Uist, Benbecula and South Uist, are famous for their machair formations. These floristically rich grasslands have relatively few species of breeding birds but their populations of waders are outstanding in a national context (Fuller, Wilson and Coxon 1979). Numerically the most important species are Oystercatcher, Ringed Plover, Lapwing, Dunlin, Snipe, and Redshank.

The habitat distribution of machair waders has been described in broad terms by Fuller, Wilson and Coxon (1979) but remarkably little quantitative information exists on densities and distribution. Fuller (1978) compared population densities of Ringed Plover and Dunlin on different parts of the machair in 1977 and Wilson (1978) published densities on several small areas of machair on South Uist. This paper describes the distribution and densities of nesting waders between different land types on Baleshare, an 880 ha machair island off North Uist.

The study area

Machair is technically the predominantly level sandy plain lying in a narrow belt along the west coasts of the Uists and Benbecula (Ritchie 1976, 1979). Sometimes the term machair

is applied in a broader context to distinguish the greener, relatively fertile west from the peatlands of the interior and the east. Baleshare encompasses extensive tracts of all the land types which are typical of the west coasts of the Uists.

Eight land types were defined on Baleshare, principally on the basis of topographical and drainage characteristics. The distribution of each type is shown in fig. 1 and their areas are given in table 1 (below).

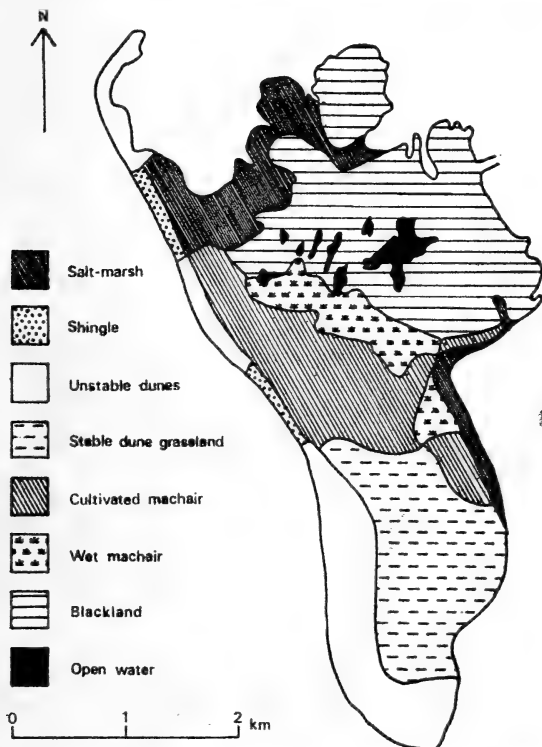


Fig. 1. The approximate distribution of major land types on Baleshare, North Uist. The shell sand beaches of the west coast are omitted for the sake of clarity.

Shell sand beach Along the exposed west coast there is a narrow fringe of unvegetated sand with small amounts of unstable shingle on the upper levels.

Saltmarsh The more sheltered coasts support heavily grazed grass swards which are subject to flooding on the highest tides only.

Shingle Very narrow strips of shingle occur at several points inland from the shell sand beach where there are no backing dunes.

Unstable dunes The shell sand beach is bordered by unstable dunes for much of its length. These widen into an extensive system at the southern end of the island. The unstable dunes consisted of hummocks with much marram *Ammophila arenaria* and bare sand; they were completely dry.

Stable dune grassland The hummocks were lower than on the unstable dunes and were covered with a short closed sward. Between the hummocks there were intervening level plains which held standing water outside the breeding season. This land type is probably a hillocky form of the machair plain (Ritchie 1979).

Cultivated machair An entirely level and dry plain which is cultivated on a strip rotation (Wilson 1978).

Wet machair A level and permanently wet form of grassland lies between the cultivated machair and the blackland.

Blackland The term blackland refers to the non-sandy soils which on Baleshare are confined to the northeast of the island. This ground is frequently undulating with many outcropping rocks and, in the lower parts, marshes. There are several lochs and all the habitations are situated in this zone. The blackland is now grassland and it exists in its present form as a result of the peat being stripped off long ago. The land was largely under cultivation in the past (Caird 1979) and has probably been much fertilized artificially with shell sand, seaweed and manure. Some sand may have blown over the blackland from the dunes and machair plain.

Three types of blackland could be recognized: wet blackland—ground with large areas of continuous marsh; damp blackland—ground with smaller scattered marshes; dry blackland—predominantly dry ground.

Methods

The work was carried out between 24th May and 9th June 1979. The island was divided into zones that were uniform in respect of the above machair forms. Areas were calculated using a planimeter. Each zone was visited on foot in dry, fairly windless weather. A series of transects enabled all the ground to be viewed so that virtually all territory holding birds that were not sitting tightly on nests should have been visible. In addition each zone was counted from suitable vantage points prior to or after disturbing birds on the transect counts. The

positions of all birds were recorded on 1: 10,000 outline maps. The criteria given by Fuller (1978) were used to define pairs of Oystercatcher, Ringed Plover, Dunlin and Redshank. Where Lapwings occurred at high densities often the best method was to count the total numbers of birds in flight. It was assumed that both individuals of each pair of Lapwings were counted. Snipe were so inconspicuous that estimates could be based only on numbers of drumming or chipping birds. Obvious non-breeding flocks were not recorded. Whenever it was not clear to which zone a pair belonged it was divided between the zones concerned.

Census accuracy

The main sources of likely error in this type of mapping census have been given in Fuller (1978). Additional problems with the present study are that a few birds may have been counted twice where territories straddled a boundary of two zones not counted on the same day. Most waders are capable of laying repeat clutches but adults that failed late and did not relay may not have been included in the census. Where Lapwings bred at high densities disturbance attracted birds from the entire neighbourhood and allocation of pairs to habitats was sometimes difficult. Greenhalgh (1971) has emphasized the problems of mapping Redshank because of their absence of territory. The estimates of Snipe numbers are probably very inaccurate; drumming birds were difficult to allocate to machair zones, the relationship of drumming birds to number of pairs is unknown and numbers of drummers are probably strongly influenced by weather conditions, time of day etc. The data for Snipe cannot, therefore, be directly compared with those for the other species.

The virtual absence of any vertical vegetation structure on machair meant that detectability of birds on a single thorough census visit was generally high. However, Dunlin, Snipe and Redshank all sit tightly on eggs and, because a large proportion of these birds were incubating during the census period, their numbers could have been underestimated. C. Pickup (pers. comm.) has found that mid June censuses of Redshank at Balranald (North Uist) detected twice as many Redshank as work in mid May.

Oystercatcher, Ringed Plover and Lapwing may have been more prone to overestimation in view of their movements and frequent mixing with other individuals when disturbed at all stages of breeding. However, at Balranald C. Pickup found that a method of censusing Lapwing similar to the one I employed on Baleshare gave results that were very close to counts of incubating birds. The census period could not have

Table 1. Estimated pairs of nesting waders on Baleshare (North Uist) in 1979 shown in relation to machair habitats
Breeding densities (pairs/km²) are given in brackets. The figures for Snipe are not strictly comparable with those for the other species due to census difficulties (see text). Statistical tests are explained in the text.

	Oystercatcher	Ringed Plover	Lapwing	Dunlin	Snipe	Redshank	Total
Saltmarsh (106 ha)	22.5 (21)	11 (10)	37 (35)	14.5(14)	0	10 (9)	95 (90)
Shingle (13 ha)	3.5 (27)	3.5 (27)	1 (8)	0	0	0	8 (62)
Unstable dunes (119 ha)	7 (6)	1 (1)	1 (1)	0	0	0	9 (8)
Stable dune grassland (160 ha)	19 (12)	7 (4)	39 (24)	3 (2)	0	0	68 (43)
Cultivated machair (132 ha)	16 (12)	24 (18)	49 (37)	5 (4)	1 (1)	4 (3)	99 (75)
Wet machair (52 ha)	10 (19)	2.5 (5)	54 (104)	15 (19)	7(14)	11 (21)	99.5(191)
Wet blackland (59 ha)	10 (17)	1 (2)	44.5(75)	1 (2)	8(14)	14.5(25)	79 (134)
Damp blackland (91 ha)	14 (15)	1.5 (2)	36 (40)	1.5 (2)	1 (1)	6 (7)	60 (66)
Dry blackland (129 ha)	13 (10)	0.5 (0)	10.5 (8)	1 (1)	5 (4)	0.5 (0)	30.5(24)
Total (861 ha)	115 (13)	52 (6)	272 (32)	41 (5)	22 (3)	46 (5)	548 (64)
χ^2	15.41, P>0.05	62.25, P<0.001	188.85 P<0.001	97.24 P<0.001	66.56 P<0.001	90.23 P<0.001	296.33 P<0.001

been both accurate and any later because large numbers of flying juvenile Lapwings might have confused the distribution. In some non-machair nesting habitats wader chicks are known to move considerable distances from the nest site, usually to damp feeding grounds. It is possible that this may occur on machair but casual observations suggest that the nesting and rearing grounds are the same for most species; 128 recaptures of ringed Lapwing chicks on Baleshare in 1979 revealed very few movements of more than 200m.

The only way to achieve 100% accuracy would be to count nests. However, there are density variations within the different types of machair which would necessitate large areas to be covered in order to produce valid comparisons of density and this precluded labour intensive nest finding. The results of this study can be regarded as an adequate reflection of the distribution of waders between their nesting habitats on Baleshare in 1979. With the exception of Snipe, the census accuracy was probably high enough to allow tentative comparisons with other published studies.

Results

The census results are shown in table 1. Separate X^2 tests were made to determine whether each species was evenly distributed between the nine types of machair that were censused. The expected numbers of pairs were calculated on the assumption that the total populations of each species would be distributed in proportion to the areas of the different machair types. Oystercatchers were evenly distributed ($P > 0.05$) but each of the other species showed strong selection for certain nesting habitats ($P < 0.001$). When wader numbers were summed irrespective of species ('total' column in table 1), certain machair types were found to hold significantly larger populations than others ($P < 0.001$). Differences between species were tested for using a 6 x 5 contingency table. To obtain the sufficiently large expected values that are required for this analysis the data for Snipe, shingle and unstable dunes were omitted and those for damp and dry blackland were combined. The result was highly significant ($x^2 = 101.68$, $P < 0.001$) indicating that there were strong differences in nesting habitat selection between the five species.

No species other than the common six machair waders were found. The 548 pairs were divided between the six species as follows: Oystercatcher 21.0%, Ringed Plover 9.5%, Lapwing 49.6%, Dunlin 7.5%, Snipe 4.0%, Redshank 8.4%.

The shell sand beaches of the Outer Hebrides support very few nesting waders (Fuller, Wilson and Coxon 1979). I made

no systematic census of those on Baleshare but many casual observations failed to reveal any nesting waders.

Saltmarsh was favoured by all species except Snipe. It supported the second densest population of Dunlin. Shingle assumed importance for Oystercatcher and Ringed Plover in terms of density but in view of the small area involved it may not be comparable with the other machair forms. This is the traditional habitat for the species so high densities are to be expected. Unstable dunes were almost completely devoid of waders but stable dune grasslands held moderate numbers of Oystercatcher and Lapwing. The cultivated machair was outstanding for Ringed Plover in terms of total pairs, and density was second only to the limited areas of shingle. Cultivated land is of paramount importance to the Ringed Plover population on the Uists and Benbecula (Wilson 1978). The only other waders to nest at moderate densities on this land were Oystercatcher and Lapwing.



LAPWING R. A. Richardson

The wet habitats formed the major nesting habitats for Lapwing, Dunlin, Redshank and probably Snipe. Lapwing bred most densely on the wet machair and this was the main nesting zone for Dunlin which, unlike the other three wetland waders, was virtually absent from the blackland. Moderate densities of Lapwing persisted in damp blackland but dry blackland was avoided. Only Oystercatcher achieved moderate densities on dry blackland.

The two wet types of grassland supported the greatest overall densities of waders. Saltmarsh and cultivated machair were also major nesting grounds. On blackland populations were positively correlated with the amount of marshland. The stable dune grassland was occupied at much lower densities than the cultivated machair which would revert to a similar grassland in the absence of regular ploughing. Unstable dunes were of no importance as a wader nesting habitat.

Discussion

The results of this study describe the distribution of six species of waders in relation to different types of west coast land on North Uist. They cannot, however, be taken as more than a superficial picture of habitat selection in these waders. Although the land of Baleshare was readily divisible into the types described earlier I did not measure which attributes of the habitat were significant to the waders. For example no account was taken of the degree of wetness or the density of tussocks. Such variables may account for differences in density within the same type of machair. The classification of wader habitats may be unsatisfactory in that it could mask any concentration of waders at the boundaries of zones but there was no firm evidence that such concentrations occurred.

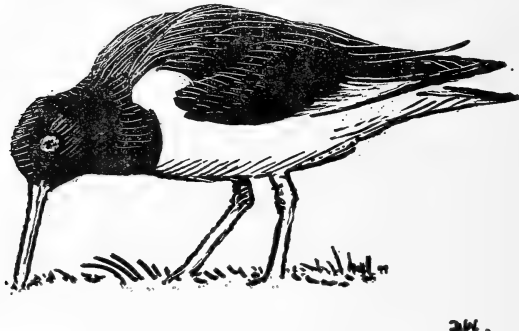
There are several factors that might be responsible for determining the distribution of waders between the machair types on Baleshare. Perhaps the two most likely are the structure of the vegetation and the availability and accessibility of food. There is little evidence that species on Baleshare are showing unusual habitat restriction compared with other British localities supporting fewer wader species, therefore any form of competitive habitat exclusion seems unlikely. One possible exception, however, is the absence of Dunlin from the blackland marshes. Acidic wetlands are a typical Dunlin habitat in upland Britain but Oystercatcher, Lapwing and Redshank are scarce breeders there compared with the Uist blackland marshes.

The three species that largely avoided the drier ground—Dunlin, Snipe and Redshank—all tend to sit tightly on their eggs, only flushing at the last possible moment. This behaviour may be most successful when the nest is fairly well concealed and the wetter machair and blackland tend to provide more cover in the form of longer tussocks, and nest cups are perhaps more easily constructed in the soft damp soil. Oystercatcher, Ringed Plover and Lapwing all nested on dry ground although only Ringed Plover showed a strong preference for it. All these species readily leave the nest at the first sight of a potential predator and they do not have concealed nests.

The tight sitting birds may, therefore, be poorly adapted for nesting on the dune grassland, cultivated machair and dry blackland. However, vegetation structure may also be important in producing different predation rates of young waders between different habitats. A large Common Gull colony is situated on the stable dune grassland at the southern end of Baleshare and these birds consume wader eggs and small chicks. The absence of the smaller waders from the stable dune grassland is unlikely to be fully explained by the prox-

imity of the gulls. On similar dry grassland elsewhere on North Uist, numbers of Ringed Plover and Dunlin are also relatively low and Wilson (1978) found low densities of Ringed Plover on uniform grassland. Oystercatcher and Lapwing clutches are vulnerable to gull predation yet these birds nest literally within the gull colony; it is possible that the large waders may in some way be better adapted to withstand gull predation.

Examination of the feeding ecology of the adults and chicks of each species might throw further light on the significance of their habitat distributions. For example, Oystercatcher was the only ubiquitous nesting wader on Baleshare and this may reflect its adaptability and versatility as a feeder (Dare 1966,



OYSTERCATCHER A. D. Watson

Heppleston 1971). Lapwing, although showing a wide range of habitats, preferred to nest in the wetter areas; food availability might influence egg formation or chick survival. All species tended to avoid the unstable dunes. The feeding value of these highly unstable sands is probably extremely poor—there is virtually no soil or humus layer in which invertebrates are likely to occur in large numbers.

The RSPB reserve at Balranald, 10 km northwest of Baleshare, encompasses a very similar range of land types to Baleshare. The habitat distribution of waders at Balranald compares very closely with Baleshare (C. Pickup pers. comm.). Also, in 1979 a wader census of Balranald carried out by C. Pickup estimated a total of 644 pairs which broke down as follows: Oystercatcher 16.1%, Ringed Plover 10.7%, Lapwing 49.4%, Dunlin 7.1%, Snipe 6.2%, Redshank 10.4%. These are remarkably close to the ratios on Baleshare.

There have been no complete wader censuses elsewhere in Britain with which to compare the present results. Other

regions holding large nesting populations of waders are Shetland, Orkney and parts of Caithness. The Outer Hebridean machair is probably exceptional in that six species breed at high densities over such an extensive area. The total densities in the wetter habitats are probably higher or equal to those anywhere else in Britain. Wader nesting populations in various European study areas have been compared by Larsson (1976). It appears that densities in the two wet habitats on Baleshare may be broadly similar with some wetland sites in southwest Finland and the Netherlands but rather lower than on Swedish shore meadows.

Oystercatcher densities are similar to those on the Sands of Forvie NNR but much higher than inland Aberdeenshire (Vines 1979). Exceptionally Oystercatchers do breed more densely, e.g. on Skokholm (Dyfed) (Harris 1967). The Orkney farmland Lapwings may be similar to those in the most favoured Outer Hebridean habitats; Spencer (1953) mentioned that one farm of a square mile held 200 pairs (77 pairs/km²). Redshank densities on the wet machair and wet blackland were comparable to those recorded by Greenhalgh (1971) on Morecambe Bay and Ribble saltmarshes but the species breeds more densely on the Wash saltmarshes (Cadbury 1973).

In 1977 I estimated that the total machair Ringed Plover population was 800-900 pairs, an overall density of 15.7 pairs/km². Such a high Ringed Plover density over an extensive area (which included several tracts of unsuitable habitat in the form of sand dunes) are unlikely to be paralleled elsewhere in Britain. The same is probably true for Dunlin which averaged 6.14 pairs/km² in 1977 but locally were far more abundant. Throughout the machair Dunlin show a strong preference for damp machair grassland (Fuller 1978). None of the published Dunlin densities (e.g. Greenhalgh 1969, Yalden 1974, Bundy 1978, Bell 1979) are anywhere near as high as those on wet machair at Baleshare. In their favoured *dubhloch* areas, Dunlin densities in Caithness may be as high as 12 pairs/km² (D. R. Langslow pers. comm.) which is similar to the density on Baleshare saltmarsh but less than that on wet machair.

Ringed Plover and Dunlin populations were estimated to be lower on Baleshare in 1977 than 1979. Although coverage of the machair was generally comprehensive in 1977 the blackland was not covered because densities of both species were known to be very low on this grassland. Several pairs of both species were also certainly overlooked at the complex north side. When these pairs are excluded the Ringed Plover figures show high constancy (39 and 40 pairs). The corrected Dunlin estimates, 24 and 33 pairs, represent an apparent increase of 37.5%.

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Summary

A census of all nesting waders was carried out during the summer of 1979 on the machair island of Baleshare, North Uist. A total of 548 pairs (64 pairs/km²) was divided between six species: Oystercatcher 21.0%, Ringed Plover 9.5%, Lapwing 49.6%, Dunlin 7.5%, Snipe 4.0%, Redshank 8.4%. Different types of machair and associated land were defined primarily on topographical and drainage features. Each species, except Oystercatcher, showed strong habitat preferences which differed between species. Total densities of waders were significantly higher in certain habitats than others; unstable dunes and two types of dry grassland supported the lowest numbers while the wettest machair held the greatest densities.

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Summer diet of the Grey Heron

N. GILES

(Plate 18)

Heron diet varies widely with season and habitat. This study compared two nearby heronries and found that Roach was the staple prey in one and Water Vole in the other. The importance of these species also changed through the summer.

Dietary studies upon the Grey Heron in Europe have been reviewed by Nicholson (1929), Milstein *et al.* (1970) and Cramp *et al.* (1977). Methods used included examinations of gut contents, items regurgitated as a fright reaction by nestlings (Owen 1955), and analysis of pellets from beneath the nests. Milstein *et al.* (*op. cit.*) discussed the usefulness of pellet analyses and concluded that pellets, whilst usually only containing keratinised or chitinous remains, e.g. rodent fur and beetle elytra, may nevertheless be of value in assessing the relative proportions of bird and mammal prey.

Whilst investigating the effects of bird predation upon the morphology and behaviour of Three-spined Sticklebacks *Gasterosteus aculeatus*, I studied two heronries in west Stirlingshire to assess the importance of sticklebacks in each heron population. Lennox Castle heronry was probably first used in 1974 (J. Mitchell, pers. comm.). Gartfairn Wood heronry is an old, well established colony on Loch Lomondside and is one of the largest in Scotland with a maximum of 39 breeding pairs in recent years. Mitchell (1979) has summarized information on this heronry. In 1974 Lennox Castle heronry numbered four breeding pairs (J. Mitchell, pers. comm.) rising to six successful nests in 1978.

Methods

Methods were designed to provide a complete picture of heron diet whilst ensuring minimal disturbance. Weekly visits were made to each heronry from 25th February to 11th August 1978; all six nests at Lennox Castle were studied together with six nests situated in a distinct group separated from the main colony at Gartfairn. Food species taken by herons were collected upon plastic sheets spread underneath each nest. The sheets retained any food items dropped from the nest above and any regurgitated by fledglings; pellets were often strewn around an area larger than that covered by the sheets and a complete weekly collection was made from beneath each

tree. Data from the six study nests at each heronry were combined, no comparison being made between individual pairs of birds within a heronry; a monthly comparative analysis between the two study sites is presented in the following section.

Pellets were softened in water and then dissected under a binocular microscope, all bones and exoskeletal remains being stored for later identification; mammalian fur samples were slide mounted prior to examination. Mammalian fur samples were identified by comparison with previously prepared reference slides of the fur of known species and with reference to Day's Key (Day 1966). Mammalian skulls, lower jaws, and limb bones were identified using Yalden's Key (Yalden 1977) and Van den Brink (1967). Fish bones and scales were identified by reference to Webb's Key (Webb undated) and Maitland (1972), and by comparison with specimen bones from known species. At the time of each visit to a heronry the presence and habitat of all feeding adult herons was noted and later compared with the items collected from the heronry at the time of the visit.

Results

No food was found at either heronry during February or March; at this time the adult birds were laying and incubating eggs, feeding during non-incubatory periods, and probably leaving pellets and other food remains at the feeding grounds. The figure represents a monthly analysis of the occurrence by number of major food species found at both heronries.

At Lennox Castle pellets were regularly found below the nest trees throughout the breeding season and varied in size (total length along longest axis) between 1.5 cm and 9 cm (mean size 3.8 cm, $n = 132$). Pellets were uniform in shape and texture, being composed almost entirely of mammalian fur together with varying amounts of beetle exoskeletal remains and mammalian skull and limb bones. At Gartfairn, pellets were rarely found beneath the nest trees and totalled only eight throughout the study (mean size 2.1 cm), the food remains recovered being composed of whole or partly digested fish together with small numbers of small mammal bones and beetle elytra.

In April at Gartfairn 90% of the food items recovered were large masses of Common Toad *Bufo bufo* spawn coinciding with the first audible indications of hatching young in the nests; the only other items recorded were two small Eels *Anguilla anguilla* and a single adult Minnow *Phoxinus phoxinus*.

The diet of young fledglings at Lennox Castle in April was markedly different, however, with toad spawn masses totalling

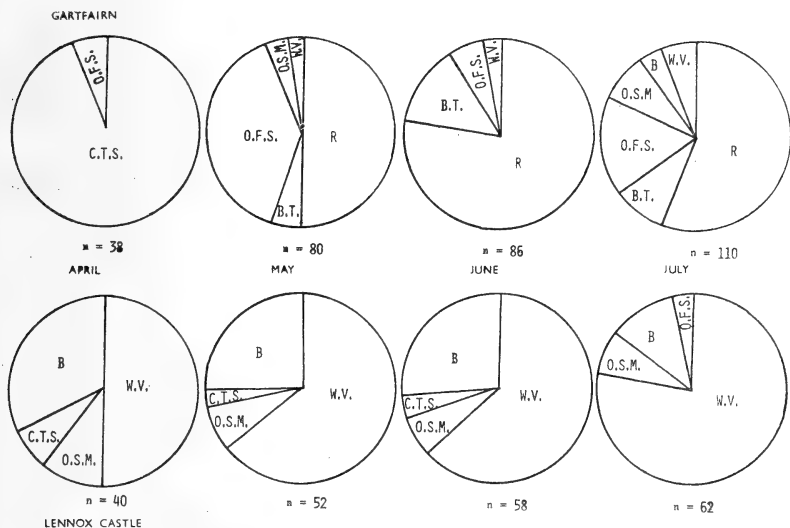


Figure 8. Monthly analysis of dietary items at Gartfairn and Lennox Castle; n = number of food items found at each heronry each month.

Key : B = beetles, B.T. = Brown Trout, C.T.S. = Common Toad spawn, O.F.S. = other fish species, O.S.M. = other small mammals, W.V. = Water Voles.

only 8% of the items recovered. The most important prey, identified from pellet remains, was the Water Vole *Arvicola terrestris* (50% of total). Beetles totalled 30% by number of items recovered and were almost entirely accounted for by *Dytiscus marginalis*.

The number of Water Voles represented by each pellet was estimated either from the number of skulls and lower jaw bones present or by the assumption that large pellets, composed entirely of fur, contained the remains of at least two voles. Milstein *et al.* (*op. cit.*) have conducted a pepsin digestion experiment upon vole skins and report that the fur from a single female *Arvicola* represents only 2.46% of the total body weight. From the size of the Lennox Castle pellets (mean = 3.8 cm) it is apparent that the fur from more than a single Water Vole must have contributed to the final pellet size (estimating fur volume per animal by eye from voles examined in the laboratory) and in the case of the largest pellets (9 cm) it is probable that upwards of four adult voles are represented by a single pellet. This estimate is supported by the occurrence in some pellets of *Arvicola* skull and limb bones from at least three animals.

In May the Gartfairn birds switched to an almost exclusively fish diet with adult Roach *Rutilus rutilus* forming 50% of prey, together with Perch *Perca fluviatilis*, Three-spined Sticklebacks, Stone Loach *Noemacheilus barbatulus*, Eels, Minnows and Brown Trout *Salmo trutta*. Small mammals were of little importance in terms of numbers but may contribute appreciably to the bulk of food. *Arvicola* totalled 4%, with three small Rabbits *Oryctolagus cuniculus* and single Pigmy Shrew *Sorex minutus* being recorded.

In May at Lennox Castle Water Voles again dominated the pellet contents, forming 65% of the total identified prey species. *Dytiscus marginalis* was again the most important beetle both in terms of overall numbers and bulk of food consumed; ground beetles occurred in smaller numbers. Toad spawn was still taken, together with a single adult toad. Small mammals, other than Water Voles, were a single Common Shrew *Sorex araneus*, a Field Vole *Microtus agrestis*, three small Rabbits and a single unidentified *Sorex* species.

In June at Gartfairn spawning adult Roach caught in the nearby River Endrick formed 80% of all identified food items; at this time the plastic sheets beneath the study nests and the ground beneath the majority of nests within the heronry were littered with scales, vertebral columns, opercular bones and pharyngeal teeth of adult Roach. Small Trout accounted for 18% of prey together with smaller numbers of Minnows and Three-spined Stickleback adults. The only small mammal remains found during the month were those of Water Voles which totalled only 3%.

At Lennox Castle in June the diet was again dominated by Water Voles which formed 62% of species recorded. Other mammals were young Rabbits (four), *Sorex* (three), and a single Common Rat *Rattus norvegicus*. Small amounts of toad spawn were found together with numerous (28%) beetle remains, again mostly *Dytiscus marginalis*.

The July diet of herons at Gartfairn showed a widening of prey selection with Roach dropping in importance to 55%, other fish being Trout (13%), Perch (8%), Pike *Esox lucius* (6%), Minnows (5%), Three-spined Sticklebacks (4%) and Stone Loach (2%). Mammals recorded were Water Voles (9%), Rabbits (8%) and *Sorex* (3%). Small numbers of head capsules and elytra of *Dytiscus marginalis* (total 3%) were recovered from pellets composed of plant fragments and sand grains.

In July at Lennox Castle Water Voles peaked in importance, forming 78% of all items identified; other mammals were Rabbits (two), Common Rat (one) and *Sorex* (two). A single young Pike (total length 10 cm) and an adult Perch (total length 14 cm) were recovered, these being the only fish found



PLATE 17. Breeding habitats of waders at Baleshare (North Uist) (p. 142).

R. J. Fuller

(a) Damp machair grassland with many hummocks—the richest habitat with good numbers of Oystercatcher and high densities of Lapwing, Dunlin, Snipe and Redshank.

(b) Elackland showing scattered rocks and water bodies—less fertile than the machair but again with good numbers of Oystercatcher and high densities of Lapwing, Snipe and Redshank in the wetter parts.





PLATE 18 (a) Redshank, (b) Dunlin—two waders typical of Hebridean machair
(p. 142).

W. A. J. Cunningham

(c) Encrick Marshes and Gartfairn Wood (Loch Lomondside)—feeding and
nesting habitat for one of the largest heronries in Scotland (p. 153).

J. Mitchell





PLATES 19-20. Gannets on Ailsa Craig (p. 159).

PLATE 19. Part of the gannetry with the Ayrshire coast in the distance.

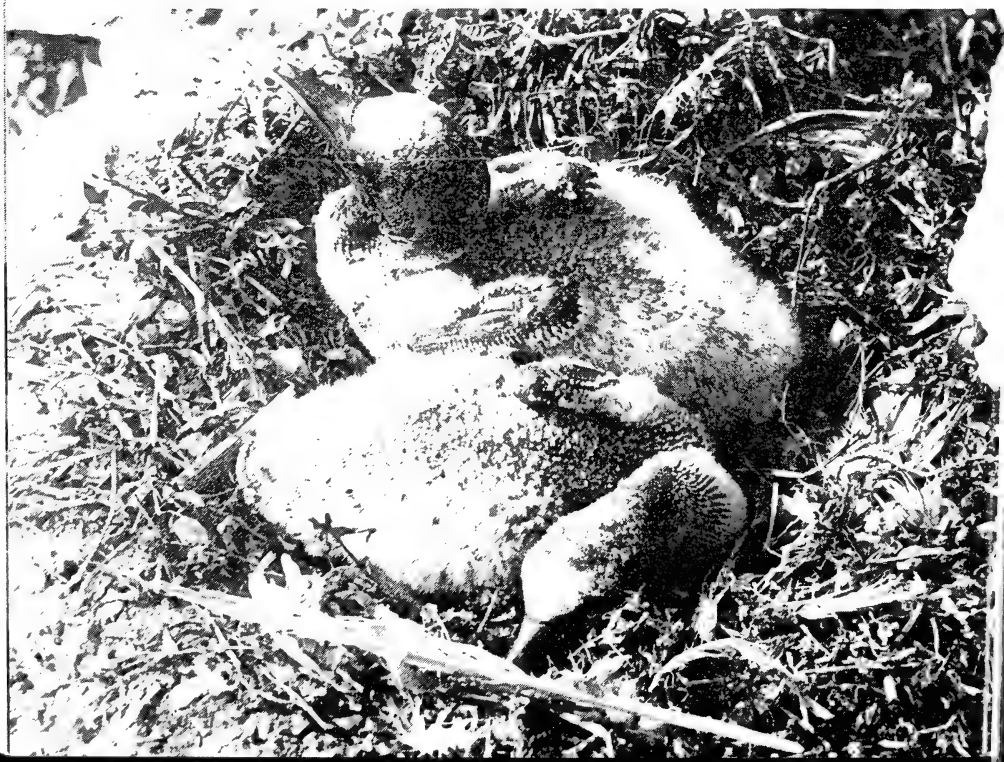
D. A. Smith



PLATE 20 (a) Gannet on nest, Ailsa Craig.

D. A. Smith

(b) Two Gannet chicks in one nest, Ailsa Craig, June 1980—probably the result of two females laying rather than genuine twins. *B. Zonfrillo*



at Lennox Castle heronry throughout the study period. *Dytiscus marginalis* formed 12% of prey, with exoskeletal fragments occurring both in pellets formed mainly from *Arvicola* fur and also in pellets composed of aquatic plant material which occurred less frequently.

Discussion

Cramp *et al.* (*op. cit.*) in their major literature review state that the diet of the Grey Heron varies with season and between habitats. Owen (*op. cit.*) also reached this conclusion from heronries within a small area, concluding that the varying proportions of species taken at different heronries correlated with feeding grounds. The diet was also found to vary from year to year, with the timing of the breeding season coinciding with the greatest availability of prey.

During the present study the Gartfairn herons selectively took large Roach which were locally abundant in the River Endrick when the fledglings were growing. The Lennox Castle herons similarly selected a single species, the Water Vole, which predominated in all food samples throughout the breeding season and which produces peak numbers of young at the time when the fledgling herons at Lennox Castle are in need of a high food intake (Southern 1964).

Observations made upon feeding adult herons adjacent to the Gartfairn and Lennox Castle heronries revealed a marked difference in habitat choice with Lennox Castle birds usually feeding in small groups which actively stalked prey amongst bankside vegetation and in open meadows. Gartfairn birds seldom used such areas for feeding and were most often seen hunting solitarily on the banks of the nearby River Endrick, Mar Burn, and Loch Lomond. Social groups of herons in fields adjacent to both heronries were often seen, especially early in the breeding season, but active feeding in open grassland was only seen frequently at Lennox Castle.

The preponderance of Water Voles in the diet of Lennox Castle herons corresponds to the feeding habitat chosen by the adult birds. Water Voles commonly occurring along field ditches and in open meadows (Van den Brink 1967; Southern *op. cit.*). Nicholson (*op. cit.*), Lowe (1954) and Milstein *et al.* (*op. cit.*) have all reported heron populations where Water Voles form a high proportion of prey and where fish are rarely taken. Dement'ev and Gladkov (1951) found Grey Herons in Russia to take large numbers of the vole *Microtus socialis* in years when it was particularly abundant. It is of interest to note that both Trout and Three-spined Sticklebacks occur in large numbers close to Lennox Castle heronry but that neither

species was recorded in the diet of the herons throughout the 1978 breeding season.

Heronries where mammals are rarely taken are also well documented (see Milstein *et al.*, *op. cit.*). This is the case at Gartfairn where the predominantly fish diet also corresponds to the feeding site, the high incidence of mature Roach (of total length 22 cm and larger) in the diet being directly associated with the annual spawning migration of mature Roach into the lower reaches of the River Endrick from the south basin of Loch Lomond (Maitland 1966). The Mar Burn, situated only 400 m from the Gartfairn heronry, is very commonly fished by herons and it is probable that many of the small Trout (average total length 9 cm) taken in May, June and July were caught from this water. Adult Minnows and Trout samples from the burn often showed scarring of the flanks from past encounters with predatory birds (unpublished data). Three-spined Sticklebacks taken by Gartfairn herons in May, June and July were almost certainly caught in the Mar Burn and a concurrent study of stickleback ecology in the burn showed that only the largest were taken (mean size 45 mm) including both males in breeding coloration and gravid females.

No stickleback fry were recovered from the food items at the heronry despite the fact that they were very abundant in the burn, forming small separate shoals amongst aquatic vegetation during June and July. Owen (1955, 1960) has described heavy predation of Three-spined Stickleback adults and fry by herons at High Halstow in Kent with large numbers of fry being taken in late June and July.

Acknowledgments

I thank J. B. Pendlebury of the Nature Conservancy Council who kindly granted access to Gartfairn Wood which is part of the Loch Lomond National Nature Reserve, and J. Mitchell of NCC who provided helpful advice and encouragement throughout the study. Dr R. C. Macgillivray kindly granted access to Lennox Castle heronry. This research was financed by a Science Research Council Research Studentship and undertaken at Glasgow University Zoology Department.

Summary

The diet of Grey Herons during the 1978 breeding season was studied at two heronries, Gartfairn and Lennox Castle. Despite the proximity of the heronries, diet differed greatly between them. Gartfairn birds selectively preyed upon adult Roach from the River Endrick and consistently hunted solitarily along river and stream banks. Lennox Castle birds often hunted in small groups, stalking Water Voles in open meadows and bankside vegetation.

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Birdwatching on the Clyde islands

J. A. GIBSON

(Plates 19-20)

The islands of the Clyde are undoubtedly one of the most fascinating areas of the west of Scotland, and for the bird-watcher have an interest not duplicated elsewhere. They range from the importance of Ailsa Craig and the size of Arran down to a host of tiny islets barely cut off from the mainland at low tide, and fall naturally into five groups—(1) Ailsa Craig; (2) Arran, with Holy Island and Pladda; (3) Bute, with Inchmarnock and the Burnt Islands; (4) the Cumbraes; and (5) the small islands.

The Ailsa Craig Gannet colony is one of the great gannetries of the world, and is unique in having been counted virtually every year from 1936 to date, apart from a small gap during the war years. During this time the colony has increased from

some 5,000 to 16,000 nests. They are confined to a $1\frac{1}{2}$ mile stretch of the west cliffs, and the closely packed nests provide probably the most spectacular yet easily accessible bird-watching sight in western Europe. The best way to see the Gannets is to walk round the shore under the bird cliffs, but if at all possible try to sail right round Ailsa before landing. This makes a wonderful impact; indeed the ideal thing is to sail right round both before and after visiting the island.



DISPLAYING GANNET *J. Busby*

There is a foreshore all around Ailsa, but at high tide the shore is completely cut off at the southwest corner, near Stranny Point, and the average birdwatcher should certainly not attempt to walk right round within $1\frac{1}{2}$ hours of high tide, although much depends on fitness and agility. It is also important to keep near the shore line, far out from the cliffs, since small stones, so frequently dislodged by seabirds, are continually falling down and it is sheer folly to walk anywhere near the foot of the cliffs without wearing protective head gear.

What else can you see on Ailsa? There is a large nesting colony of Kittiwakes, much reduced over recent years to some 5,000 nests. The Guillemots and Razorbills, once so numerous that last century the main industry on Ailsa was collecting auks for their feathers, are now sadly reduced to under 5,000 pairs of Guillemots and 2,500 pairs of Razorbills. Local oiling disasters always seem to be present and are making the population decline steadily worse. Despite this, these remain among the most easily accessible large auk colonies in the country. The once gigantic colony of Puffins is now reduced to a few dozen pairs, and the Puffin decline can be

traced from the accidental introduction of the Brown Rat to Ailsa in 1889. There are a few nesting pairs of Black Gulls, some 30 pairs of Fulmars, usually about a dozen pairs of Shags, and the odd Cormorant. About a dozen pairs of Great Black-backed Gulls nest regularly, but there are also a great many non-breeding birds; these, and the mixed colony of some 2,000 pairs of Herring and Lesser Black-backed Gulls, are almost entirely confined to the sloping ground at the cliff tops.

The most interesting land birds include a pair of Peregrines and a pair of Ravens (both usually successful nesters) and more recently a pair of Buzzards. Somewhat surprisingly, there is a well known small colony of Wrens. Others include Rock Pipits and Meadow Pipits in numbers, some Wheatears, and occasional pairs of Blackbird, Song Thrush and Robin. Many Eiders, and sometimes Red-breasted Mergansers, now nest along the shore, and there is usually at least one pair of Oystercatchers. There are a good many migrants and casual visitors at other times, particularly after fog, and possibly the oddest visitor was a Treecreeper. In winter, Glaucous Gulls are very regularly seen, and sometimes there are surprising numbers of Woodcock and Snow Buntings.

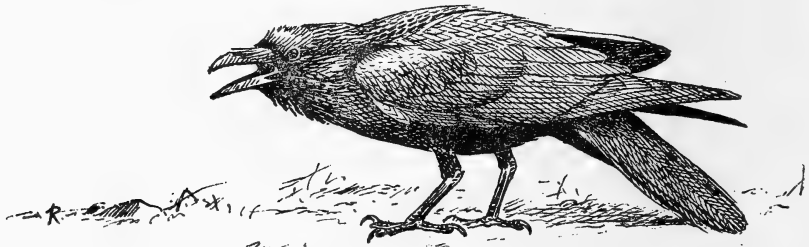
The real reason for visiting Ailsa, however, remains its wonderful Gannet and other seabird colonies. If your stay on the island is to be short, say up to two hours, then it is better to go south, under the Main Craigs. If you have a whole day trip, first go north under the Barestack and then south below the west cliffs, but don't attempt to walk right round without first consulting the boatman about the time of high tide. If you have some extra time you could also walk up to visit the old castle, but don't waste time climbing to the top of the Craig unless you have the good fortune to spend a few days on the island. Inland the birds are merely the gulls and small passerines; the real interest lies at the cliffs. Whatever else you do, make sure you save some time for the sail round under the bird cliffs.

Access to Ailsa is normally from Girvan on the Ayrshire coast and arrangements can usually be made in advance with the lighthouse boatman, at present Mr Tom Harrison (telephone Girvan 2631). It is also sometimes possible to stay at the lighthouse; permission should be sought from the Commissioners of Northern Lighthouses, after local arrangements have been made with the lightkeepers on Ailsa. During migration times a stay at the lighthouse is well worth while.

The Island of Arran is one of the great glories of the Clyde area, and has often been called the Highlands in miniature. Although it is visited every year by thousands of holiday-

makers, particularly to Brodick, Whiting Bay and Lamlash, the island is still surprisingly wild and empty even at the height of the tourist season.

The Golden Eagle and Peregrine nest on Arran, the Buzzard has increased until it is now relatively common, and the Hen Harrier is increasing every year, nesting not only on the open moorland but well inside some of the new forestry plantations. Kestrels are everywhere, and a few pairs of Merlins nest on the moors. Several pairs of Red-throated Divers nest at moorland tarns. Ptarmigan have recently returned to nest in the north. Several pairs of Ravens also nest, and all these birds can be seen without too much effort even by quite inexperienced birdwatchers.



RAVEN R. A. Richardson

There are a good many small colonies of Common Gulls near the moorland tarns, and there is a large spreading colony of Herring and Lesser Black-backed Gulls over some of the hills and moors to the north and the west. Arran formerly possessed the biggest colonies of Great Black-backed Gulls in the west of Scotland, with several groups of nearly 100 nests each, mainly at the hill lochs near the Boguillie in the north. These have now virtually vanished, but they may yet return and the area is certainly well worth a visit.

There are few freshwater lochs for ducks, although in autumn and winter there are large offshore flocks of Mallard and Wigeon, particularly in the Kilbrannan Sound, which may number many thousands. Shelducks nest in the south of the island in surprising numbers, many Eiders and some Red-breasted Mergansers nest all round the shore, and large rafts of Eiders are common offshore in autumn and winter. A little further offshore in autumn there are occasional surprisingly large rafts of Manx Shearwaters.

On Arran there are few real mudflats suitable for waders, although Lapwings, Ringed Plovers, Curlews, Snipe, Woodcock and Redshanks nest in some numbers and there are still a few Dunlins. On a good many occasions Redshanks have

been found nesting actually on the shore, a somewhat unusual feature. Fulmars and Black Guillemots nest in suitable areas, mainly in the south. At Brodick Castle there is a very old established heronry. The Kingfisher is now returning but the Great Spotted Woodpecker seems to be markedly decreasing. Some years Grasshopper Warblers seem to be particularly common, and there are still a few nesting Nightjars.

Flocks of Snow Buntings can be seen in winter, and there is now a large wintering flock of Greylag Geese around Shiskine in the west. Possibly the birds most typical of Arran are the Oystercatchers, which nest nearly everywhere all round the shore, and are outstandingly tame, remaining on their nests and paying surprisingly little attention to parked cars or nearby picnic parties.

Do be careful when walking on the moors; wear stout footwear or boots, for there are plenty of Adders. Do bear in mind, moreover, that grouse shooting and deer stalking are very much a part of estate income on Arran. For generations proprietors have been extremely generous in allowing hillwalkers free access to virtually all parts of the island, so do not abuse this privilege and respect requests not to visit parts of the island at certain times of the year.

Finally, for further information and assistance contact the Isle of Arran Natural History Society, c/o the Arran Nature Centre at Brodick, where visiting naturalists are made warmly welcome.

Holy Island is now a field research station of the Universities Federation for Animal Welfare, and permits to visit should be sought from UFAW Field Officer, Mr Howard Walker, Claveron Cottage, Lamlash (telephone Lamlash 348). There are very impressive mixed colonies of Herring and Lesser Black-backed Gulls; Great Black-backed and Common Gulls also nest, and there are occasional nesting Shags. Holy Island is an old established breeding station of the Peregrine (alternate site), and there is usually a pair of Ravens and cliff nesting Buzzards. A few terns nest along the shore, as also do Mallards, Mergansers, and Eiders in some quantity. Holy Island is noted for its chats, and Whinchats, Stonechats and Wheatears all nest, some years in surprising numbers.

The distance right round the shore is nearly four miles, some of it rough boulders, and at least a full afternoon is desirable for a visit; longer if possible.

The island of Pladda, lying about one mile off the south-east tip of Arran, is now a reserve of the Scottish Wildlife Trust. Although few of the large predatory gulls nest, the formerly extensive nesting colonies of terns are now sadly reduced. Ducks are very common, however, with Mallard,

Mergansers, and especially Eiders and Shelducks, nesting in quantities all round the shore. At least a dozen pairs of Black Guillemots nest regularly, as also do many Oystercatchers, and there are a few nesting Shags. Many Jackdaws nest in the small cliffs. Starlings nest in the pier and have been found nesting even in December and January. There are a good many nesting Rock Pipits. At the lighthouse a surprising number of unusual birds have been taken on migration.

In summary, Pladda is very flat, walking is easy, and the birds can be seen without difficulty; a visit makes a splendid outing for the birdwatcher, and is particularly suitable for those no longer quite so fit. Access is by motor boat from Kildonan, and permits can be obtained from Mr Howard Walker (as above).

(To be concluded)

*Dr J. A. Gibson, Foremount House,
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Short Notes

Garganey breeding in Clyde faunal area

The Garganey has hitherto been proved to breed in Scotland only once, at Aberlady (East Lothian) in 1928, although suspected to have done so in Strathspey in 1947 also. In the Clyde faunal area records have increased remarkably since 1970. The prolonged presence of a pair on a marsh during the spring of 1979 aroused considerable interest. However, although the drake was often obvious, the whereabouts of the duck was uncertain until 13th June when she appeared with a brood of eight ducklings. Later the whole brood was seen to have flown successfully. I am indebted to several local birdwatchers, and to Roy Dennis for providing helpful information for this note.

ANGUS HOGG

Two Whimbrels laying in one nest

Although Whimbrels may have bred on Hirta, St Kilda (Outer Hebrides) several times between 1884 and 1963, the first proof of breeding was in 1964 (Macmillan & Turner 1964). Since then at least one pair has nested or probably nested almost every year observations have been made, making this the furthestmost south and west regular breeding site in Britain. In the three years 1977-9 six to eight eggs have been found in a single scrape. The data presented below have been collected from many sources (see Harris & Murray 1979) and

are fragmentary because no systematic attempts have been made to find or follow nests as the species is on Schedule One of the Protection of Birds Acts 1954-67.

1964-76 Single nests with eggs were found in seven years and a pair probably bred in three other years. A pair summered in 1970 but made no attempt to breed. There were two additional pairs present in 1972 and one in 1976 but there was no evidence of them nesting. Young hatched in at least four years but they soon disappeared.

1977 Six eggs were found in a scrape on the Cambir on 26th June. The eggs were still present on 18th July but had gone by 27th July. Three adults were often seen together in the territory. No young were seen.

1978 Four eggs were found in a scrape on the Cambir on 24th May, and there were seven there on 28th May. No young were recorded. Only two birds were ever seen in the area.

1979 On 22nd June there were seven eggs in a single scrape under an overhanging rock—an unusual site—on the Cambir and eight eggs four days later. The eggs probably came from two females as they fell into two distinct types, four were brownish and four were greener. None hatched and when they were about a fortnight overdue the seven eggs remaining were taken on 2nd August, at least a week after the last adult was seen, and are now deposited in the Royal Scottish Museum. Six of the eggs appeared to be infertile while the other had a grown embryo. Only two birds were ever seen in the area.

Witherby *et al.* (1943) gave records of nests with 5-8 eggs for 13 species of British wader including five eggs for Whimbrel. Bannerman (1961) mentions seven eggs in a Whimbrel nest. They assumed that these were due to two females laying in the same nest. The six Whimbrel eggs on Hirta in 1977 could be explained by one male and two females. However, in 1978 and 1979 only two adults were seen near the territory and we had thought there were probably two females and no male. Lesbianism has rarely been proved in waders but G. Trafford in Nethersole-Thompson (1973) collected two female Dotterel off a nest of six infertile eggs in Norway.

The embryo in the 1979 egg suggests three possibilities. Firstly a third bird may have been overlooked; secondly a female may have been fertilized by a male which then died (a fairly common fate of Whimbrel on Hirta) or otherwise passed on; or thirdly one female may have displaced another and laid in the same scrape. Perhaps the first is the most likely but this still does not explain why only one egg was fertilized.

Scotland is at the southern fringe of the Whimbrel's range with a population of under 200 pairs, mostly in Shetland (Sharrock 1976). St Kilda must be marginal habitat and there is no record of young having fledged.

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M. P. HARRIS, S. MURRAY, W. WRIGHT

[Taking eggs of Schedule One species requires a licence even when they are deserted.—Ed.]

High incidence of ring recoveries from Long-eared Owl pellets

Berstane Wood in St Ola, Kirkwall (Orkney) covers 5 ha of mostly deciduous trees with conifers in one corner. Long-eared Owls use the conifers as a winter roost although the wood is also a roost for very large numbers of Starlings, Blackbirds and thrushes. The table shows the maximum numbers recorded each winter in recent years.

Maximum winter counts at roost

	1975/6	1976/7	1977/8	1978/9
Long-eared Owl	20-25	15-20	1	20-22
Blackbird	500	500-1,000	1,000	1,200-1,500
Fieldfare	50	230-300	250	50
Song Thrush	25	40	40	40
Redwing	350	10,000	10,000	10,000
Starling	50	15,000	17,500	10,000

During the spring and summer of 1979 just over 500 Long-eared Owl pellets were collected, mostly from the conifer wood but with a small quantity from the adjacent deciduous area. These contained the usual remains of small rodents and almost 40% contained bird remains. Glue (1972, *Bird Study* 19: 91-95) found that from 51 samples analysed from a wide variety of habitats in Britain and Ireland bird remains were present in 46 (90%) and of all the vertebrate prey items found 15% were birds. However in four of the samples bird remains were numerically the main prey. South (1966, *British Birds* 59: 493-7) found that at a winter roost in south Lancashire 10.7% of prey items were birds.

Among the Berstane Wood pellets were 26 BTO rings, all from birds trapped in the wood. There were 19 Blackbirds, two Song Thrushes, one Redwing and four Starlings. The number is remarkable since the total of rings extracted from Long-eared Owl pellets during 1967-74 under the BTO scheme was only 16 (Glue & Morgan 1977, *Bird Study* 24: 111-113).

Trapping is done on a large scale at the winter roost and in the surrounding area which accounts for the availability

of ringed birds as prey. An indication of the number of birds ringed at Berstane Wood for the winters 1975/6 to 1978/9 is as follows. The figures are for birds ringed for the first time and do not include controls which are many: Blackbird 820, Fieldfare 40, Song Thrush 110, Redwing 2,150, Starling 1,575, others 150.

The weather during the winter and spring of 1978/9 was unusually severe with many days of snow cover in the Berstane area. Records from the Meteorological Office at Kirkwall Airport only 2km away indicate there was snow cover on 53 days during December to March, compared with an annual mean of 15 days.

Although the Long-eared Owl is renowned for feeding on birds it is debatable whether our figures are typical of Berstane Wood. Bird prey is readily available but the prolonged snow cover probably greatly reduced the availability of rodents and made birds more vulnerable through hunger. The Starling roost normally lasts until March but was abandoned in January. Whether this was due again to the prolonged snow cover causing food shortage, the predation of the owls, or both, is again open to debate.

A few Long-eared Owls breed in Orkney but most in the winter roost are probably migrants; 29 have been ringed in recent years with three recoveries—

Ringed	Recovered	
3. 1.79	17. 4.79	North Ronaldsay, 50 km NNE (controlled).
4. 2.79		
retrapped		
26. 2.79	6. 5.79	local, 2km south (found dead).
22.12.78	18. 5.79	Jokkmok, Lappland, Sweden, 66°35'N, 20°08'E (found dead).

I thank A. D. K. Ramsay for his notes and ringing data, E. Ross for details of the three rings he found, and D. Lea for help with various versions of this note.

R. G. ADAM

Reviews

Elephant Island: An Antarctic Expedition by Chris Furse. Anthony Nelson, Shrewsbury, 1979; 256 pages; 14 colour, many plain photos; drawings; 7 maps; 23 x 16 cm; £8.50.

Elephant Island is named after the Elephant Seals that breed there in large numbers. Because of its ice-covered and mountainous nature and its reputation for ferocious weather it remained unexplored until 1970. This book is an account of a second expedition in 1976. I suspect the reader will find its aims and achievements too modest to sustain interest.

The story is told entirely in diary form by expedition members and this makes it difficult to follow what is happening. Since the members never become properly established as characters their personal and domestic affairs seem unimportant and take up too much space. The rich bird and seal life receive frequent mention but is not dealt with in sufficient depth. This is unfortunate when wildlife constitutes the principal importance of the island.

J. HUNT

Birdwatcher's Yearbook 1981 edited by J. E. Pemberton, Buckingham Press, Maids Moreton, 1980, 320 pages, plain photos, drawings, diagrams, 22 x 13 cm, softback, £4.95.

This book is in two sections. The first third is made up of feature articles, ranging from 'Birdwatching for young people' to 'Scientific use of museum bird collections'. All the articles are readable and interesting.

The rest of the book is made up of 24 chapters. These are for reference and cover such diverse topics as all British bird observatories, bird reserves, county trusts, recorders, libraries etc., all complete with names and addresses. The range is wide and, for the active birdwatcher or conservationist, most useful. Scattered throughout the book are advertisements for binoculars, places, books etc.

One assumes it is planned to produce this yearbook annually, something along the lines of the *Guinness Book of Records*. However, with repetition of much of the reference section, one wonders if there will be sufficient demand in the years to come. In the meantime, this first volume is very useful and deserves to sell well.

FRANK HAMILTON

Current literature Articles and reports on the status and distribution of birds in Scotland are listed here. Strictly biological studies such as ecology or behaviour are excluded and so are references from the widely read journals **British Birds**, **Bird Study**, **Ringing and Migration** and **Ibis**. Most items listed and many others are available for reference in the club library and we are grateful to the contributors. The library welcomes copies of work on any ornithological subject.

Breeding seabirds at the Mull of Galloway. R. C. Dickson 1977. *Western Naturalist* 6: 3-12 (published 1980).

Birds and invertebrates of the Clyde estuary tidal flats. J. C. Smyth *et al.* 1977. *Western Naturalist* 6: 73-101 (published 1980).

Canada Geese breeding, and other geese wintering, on Island of Colonsay. M. Clark 1977. *Western Naturalist* 6: 103 (published 1980).

Mink predation of Shelduck and other wildfowl at Loch Lomond. E. Bignal 1978. *Western Naturalist* 7: 47-53 (published 1980).

The food of Short-eared Owls in Orkney. P. B. Heppleston 1978. *Western Naturalist* 7: 55-62 (published 1980).

Breeding of the Storm Petrel and the Manx Shearwater in Kintyre, Argyll. E. J. Maguire 1978. *Western Naturalist* 7: 63-66 (published 1980).

The status of the Whooper Swan in Lewis and Harris, Outer Hebrides. W. A. J. Cunningham & N. E. Buxton 1980. *Hebridean Naturalist* No. 4: 6-10.

The birds of 1979. P. Cunningham 1980. *Hebridean Naturalist* No. 4: 20-25.

Breeding Manx Shearwaters *Puffinus puffinus* on Rhum: An updated population assessment on selected areas. D. B. A. & P. S. Thompson 1980. *Hebridean Naturalist* No. 4: 54-65.

Torrs Warren, West Freugh, Wigtownshire. C. N. Clayden 1980. *Adjutant: the journal of the Army Bird-watching Society* 10: 22-24.

Edinburgh Ringing Group: Seven: 1979. 1980. Includes 'East Lothian islands in winter' and 'Wader movements within and through the Firth of Forth'. Price 40p (60p including postage from J. H. Eallantyne, 6 Mansfield Place, Edinburgh, EH3 6NB).

Notices

BTO Nightjar survey The *Atlas* shows the Nightjar to be uncommon and hints that a thorough census is desirable to establish the current situation, which subjective impressions suggest is worse than the 1968-72 map indicates. Whilst previous surveys in 1952 and 1957-8 may have been incomplete in Scotland, the *Atlas* shows declines in the west from Skye, Ardnamurchan, Morven, Mull, Islay, Jura and Kintyre. In the northeast it has apparently gone from Caithness and east Sutherland while just hanging on in Nairn and Moray. The central Highlands are virtually deserted and there are only a few records from the Lothians and Berwick. The majority of Scottish Nightjars are now to be found in Ayrshire, Dumfries and Galloway where they appear to have recolonized since 1957-8. I am organizing a national survey in 1981 and would welcome assistance from all Scottish ornithologists and visitors. Record cards and instructions are available from BTO Regional Representatives, the SOC office, or direct from myself. With the present massive afforestation much new suitable habitat is being created. Being a mobile opportunist in finding suitable nesting sites, if only for a year or two, Nightjars may well be more widespread than at present suspected.

F. C. Gribble, 22 Rickerscote Avenue, Stafford, ST17 4EZ

Whooper Swans In 1980, 46 were marked in Iceland with blue leg and neck bands with white codes numbered from 1J01 to 1J46. Please send records to M. A. Brazil, Dept. Psychology, Stirling University or to the Museum of Nat. Hist, P.O. Box 5320, Reykjavik, Iceland.

The Scottish Ornithologists' Club

HONORARY MEMBER

At the annual general meeting of the club on 25 October 1980 Mr Maxwell K. Hamilton retired as Honorary Treasurer. He was elected in 1963 and in recognition of seventeen years service Council elected him to be an Honorary Member of the club. At the meeting he was presented with an inscribed candelabrum, donated by members elected to Council during his term as Treasurer.

INVERNESS BRANCH SECRETARY

Will members please note that the new secretary of the Inverness branch is Mrs Sally Moore, Smithfield Farm, Tomatin, Inverness IV13 4YN (tel: 08082 378).

BORDERS BRANCH A.G.M.

The Borders Branch AGM will take place on 23 March 1981 and not as shown in the syllabus. Venue and time unchanged.

SUMMER EXCURSIONS

Details of excursions planned by branches are enclosed with this number of the journal.

1980 RAFFLE

The draw took place after the annual dinner at the Conference last October. £699 of tickets were sold and after deducting the 1st prize, printing and postage costs, a net profit of £595 was put towards club funds. Everyone who bought or sold tickets is congratulated on this

very fine effort which was a net £37 more than in 1979. Special thanks are due to those individuals and firms, and two branches, for donating all the 22 prizes. A list of winners can be obtained from the club secretary by sending an SAE.

SOC ANNUAL CONFERENCE - 1981

The next conference will be held at the Marine Hotel, North Berwick, East Lothian, from 30 October - 1 November 1981. Details will be published in *Scottish Birds*; bookings can only be accepted on the official booking sheet which will be sent to all members with the autumn journal.

Conference News

SOC conference, North Berwick, October 1980 The Friday night slide show continues to be a great success. A strong American flavour reflected the growing interest in birdwatching stateside. The conference was opened next day by Valerie Thom who paid tribute to George Waterston. Dr Derek Ratcliffe gave us a comprehensive study of the problems facing wildlife habitats. He conveyed a great knowledge of his subject and left us with a challenge: to demand a greater say in public spending on matters affecting conservation. Richard Porter dealt well with wild birds and the law. The problems are many and it is sad that prosecutions are mainly brought by a charitable body. The effects of rare birds upon human beings was the subject of D. I. M. Wallace who raised several points of controversy which unfortunately left no time for questions. Among the improvements to the system of recording rare birds he suggested issuing licences to qualified birdwatchers—would endorsements be issued for misidentification? This would lead to more red tape—just what we are trying to avoid.

Despite a gloriously sunny afternoon 60 people turned up at the first wader workshop. Mike Pienkowski led with the movements of European waders, which has plenty of scope for birdwatchers to contribute sightings of colour marked birds. Hector Galbraith, David Bryant and Keith Brockie spoke on ringing studies on the Clyde and Forth and on Purple Sandpipers. Iain Taylor drew things to a close and the general opinion was that it had been fruitful and well worth repeating.

The dance was a great success thanks to the DJ David Scott. Although autumn was upon us there was a considerable amount of lekking and display probably due to the large number of grouse on the tables.

On Sunday Henry Robb spoke on Pied Flycatchers' use of nestboxes and showed the impact an amateur can have on a local bird population. Alistair Smith took us to west Africa to show us terns in winter. They are now looked upon by the children as forms of amusement and as many as 20 Sandwich Terns are caught per day with hooks and nooses. Alistair informed us of some unusual feeding habits of the native birds. Waders in the Moray Firth were dealt with by Bob Swann, not only in a Scottish context but in a European one. His results are all the more important when one considers the present and proposed development of the area. It was fitting that after their great breeding season the film *Osprey* should be shown to draw things to a close.

Is it not time for the conference to revert to Stirling and the fair spread of travelling time between the various groups?

LOGAN D. STEELE

Scottish ringers' meeting, Dundee, November 1980 The 6th Scottish ringers' meeting was held over the weekend of 22nd/23rd November

and was ably organized and hosted by the Tay Ringing Group. Ever since the first in 1975 these conferences have consistently had just the right mix of the results of professional and amateur research. This creates a stimulating and lively atmosphere which frequently spills out of the lecture theatre and generates discussion late into the night (and early morning). This social aspect is important (some would say more so than the talks) in that it provides an opportunity for folk with like interests to get together to discuss past work and recharge their batteries for future efforts.

This year's conference was no exception. Personal highlights of the talks were Jeremy Greenwood on Greenland, Bob Furness on waders and Eric Meek and Brian Little on Goosanders. Also speaking were Iain Taylor (Barn Owls), Andrew Douse (Common Gulls), Mick Marquiss (Oystercatchers), Chris Redfern (Lapwings), Henry Robb (Redstarts), Alan Morley (Birds from oil rigs) and Paul Green (Rooks and Jackdaws). Chris Mead gave the annual 'View from the Ringing Office' and also spoke on bird banding in Texas. The success of the social get-together on the Saturday evening could be judged by the numbers of people drinking only orange juice with lunch on Sunday!

All in all a great success. It is up to the Highland Ringing Group to continue the tradition next year in Carrbridge and I, for one, shall certainly be there.

HECTOR GALBRAITH

Current Notes

These notes include unchecked reports and are not intended as a permanent record, nor will they be indexed. Please send reports to the editor via local recorders at the end of March, June, September and December

The period October to December is covered here. Autumn was rather disappointing outside the Northern Isles. Easterlies were few and far between and the falls on the mainland tended to be rather small; even Fair Isle reported low numbers of thrushes. Despite this, Fair Isle tempted a few stalwarts to hire a plane to see yet another first for Britain, a **Yellow-browed Bunting**. As if that wasn't enough a **Pine Bunting**, and the 2nd live British **Brünnich's Guillemot** were there at the same time (cosmic minds beware). Not to be outdone, Orkney produced no less than 2 **Tengmalm's Owls** (the previous 2 records were also there) and later Shetland increased the Northern Isles monopoly with 2 **Ivory Gulls**, one of which (an adult) was feeding on a stranded Killer Whale. (In the midwinter twilight up there I suspect that white birds are the only ones visible.) So far I have not heard of any Waxwings so keep an eye on your cotoneasters.

White-billed Diver Whalsay (Shet) 4 Nov. **Sooty Shearwater** late ones after a poor season: Rattray (Aber) 12 Oct, Peterhead (Aber) and Wick (Caith) 31 Oct, Wick 2 Nov. **Whooper Swan** 388 (42 juvs) Strathbeg (Aber) Oct. **Bewick's Swan** 6 Strathbeg, 2 Newburgh (Aber) 9 Nov, Dirlleton-Aberlady (E Loth) max 9 in Nov; 11 L Leven (Kinross) Dec, 60+ Caerlaverock (Dumf) Nov; best year for Scotland this century. **Pink-footed Goose** 14,200 Meikle (Aber) early Oct, 12,000 Aberlady 8 Nov, 18,000 West Water Resr (Peeb) Dec. **Greylag Goose** 800 Meikle early Oct. **Snow Goose** Strathbeg Oct, Perthshire Oct, Aberlady 27 Oct-3 Nov. **Brent Goose** Artrochie (Aber) 10 Oct, 2 Pale-bellied hrota Slains (Aber) Oct, 6 Dark-bellied *bernicla* Aberlady 5 Nov. **Shelduck** 148 Aber-

lady 21 Dec. **Teal** 1,375 Slains early Oct. **Blue-winged Teal** 2 Caerlaverock Oct. **King Eider** single ♂♂ Port Glasgow (Renf) and L Fleet (Suth) Nov-Jan. **Surf Scoter** ♂ Drums (Aber) to 8 Oct. **Smew** Davan (Aber) 26 Oct very early, Inverness 26 Dec. **Red-breasted Merganser** 2,200 Beaully Firth (Inv) Dec; **Goosander** 1,550 Beaully Firth Nov-Dec (both highest ever counts). **Rough-legged Buzzard** NW Ochils (Perth) 1 Nov. **Osprey** juv dying Highlands 17 Dec. **Red-footed Falcon** ♂ Aberdeen 28 Sep. **Quail** Shapinsay (Ork) 9 Nov. **Water Rail** 14 Strathbeg 29 Oct. **Grey Plover** 240 Aberlady 19 Oct. **Little Stint** Ythan (Aber) 5 Oct. **White-rumped Sandpiper** Fair Isle 7-8 Oct. **Curlew Sandpiper** Virkie (Shet) 2 Nov. **Ruff** 49 Fenton Barns (E Loth) Oct, 27 Newburgh 25 Oct. **Long-billed Dowitcher** Caerlaverock Nov-Jan. **Bar-tailed Godwit** 1,050 Aberlady Nov. **Green Sandpiper** Kemnay (Aber) 25 Oct, 2 Strathbeg 26 Oct. **Common Sandpiper** Don (Aber) 31 Oct. **Pomarine Skua** Aberlady 7 Oct, Peterhead 25 Oct, Whalsay 5-8 Nov. **Ivory Gull** juv Virkie Nov, adult (feeding on dead Killer Whale) Yell (Shet) Dec. **Sandwich Tern** 3 Gullane (E Loth) 20 Dec. **Arctic Tern** Scalloway (Shet) 28 Oct. **Black Tern** Girdleness (Aber) 3 Oct. **Guillemot** 3,500 Beaully Firth Dec. **Brünnich's Guillemot** Fair Isle 16-17 Oct, Brent oil field 26 Dec. **Turtle Dove** Strathbeg 8 Oct, 1 Nov; Ythan 24 Oct. **Tengmalm's Owl** ♀ trapped Binscarth (Ork) 14 Oct, a 2nd ♀ found dead 18 Nov. **Swift** Don (Aber) 8 Nov. **Hoopoe** Fair Isle 8-18 Oct, Ayton (Ber) 6 Nov, St Abbs (Ber) 8-9 Nov. **Great Spotted Woodpecker** Fair Isle 23 Oct.

Short-toed Lark 2 Fair Isle 4-11 Oct, one 21 Oct. **Woodlark** Skerries (Shet) 23 Oct. **Shore Lark** 2 Tynninghame (E Loth) 8-9 Nov, Musselburgh (Midl) mid Nov, Ythan 9 Nov. **Swallow** St Andrews (Fife) 24 Nov. **House Martin** St Andrews 17 Nov. **Richard's Pipit** 2 Fair Isle 14 Oct. **Robin** 50 Fair Isle 7 Oct. **Bluethroat** Skerries 12 Oct, Mid Yell (Shet) 15 Oct. **Black Redstart** one ringed Isle of May c.20 Oct, ringed bird Tantallon (E Loth) 25 Oct; Tentsmuir (Fife) 26 Oct. **Stonechat** Siberian race *maura/stejnegeri* 3 Fair Isle 12 Oct, one 15 Oct. **Swainson's Thrush** Scatness (Shet) 25-29 Oct (1st Scottish record). **Blackbird** 500 Fair Isle 22 Oct, 650SSW/2 hrs Barns Ness (E Loth) 31 Oct. **Fieldfare** 800 Fair Isle 22 Oct. **Song Thrush** 200 Fair Isle 7 Oct. **Redwing** 700 Fair Isle 22 Oct. **Sedge Warbler** Fair Isle 26 Oct (late). **Reed Warbler** Lerwick (Shet) 7 Oct, Fair Isle 31 Oct (late). **Barred Warbler** Holm (Ork) 16 Oct. **Whitethroat** Cruden Bay (Aber) 4-5 Nov. **Garden Warbler** Aberdeen 10 Nov. **Yellow-browed Warbler** Lerwick 6 Oct, Veensgarth (Shet) 11 Oct, Tresta (Shet) 17 Oct, another 2 Nov. **Chiffchaff** 80 Fair Isle 12 Oct, 22 Fetlar (Shet) 13 Oct, northern races *abietinus/tristis* 16 Aberdeenshire coast 6 Nov, St Abbs 15 Oct, Coldingham (Ber) 18 Oct, Wick Oct-Nov. **Willow Warbler** northern race *acredula* Cruden Bay 12 Oct, St Abbs 15 Oct. **Firecrest** Rhum (Inv) Oct, Newburgh (Aber) 3 Nov, Cruden Bay 4-6 Nov. **Red-breasted Flycatcher** 2 Fair Isle 12 Oct, Ackergill (Caith) 8 Nov. **Long-tailed Tit** 3 Stromness (Ork) 24 Oct. **Great Tit** Sandwick (Shet) 20 Oct, Skerries and Burra (Shet) 23 Oct, 5 Whalsay 23 Oct. **Treecreeper** Bressay (Shet) 27 Oct, Kergord (Shet) 8-9 Nov. **Red-backed Shrike** Whalsay 9 Oct, Aberdeen 6-13 Nov. **Great Grey Shrike** Fair Isle 26-28 Oct. **Brambling** 300 Comrie (Perth) Dec, 150 Peebles 26 Dec. **Arctic Redpoll** 2 Fetlar 13 Oct, North Ronaldsay (Ork) 13 Oct. **Common Crossbill** 35 Peebles 26 Dec. **Scarlet Rosefinch** Fair Isle 1st-2nd, 11-12th, 26-29 Oct, North Ronaldsay 13 Oct. **Bullfinch** northern race *pyrrhula* Kergord (Shet) 2 Nov, Weisdale (Shet) 4-5 Nov, 2 Voe (Shet) 2-8 Nov. **Lapland Bunting** 3 Musselburgh Nov-Dec. **Snow Bunting** 220 Fair Isle 26 Oct. **Pine Bunting** 2 Fair Isle Oct. **Yellow-browed Bunting** Fair Isle 12-23 Oct. **Rustic Bunting** Fair Isle 2 Oct, 11 Oct, 2 on 12 Oct, one 14 Oct. **Little Bunting** North Ronaldsay 13 Oct.

Late news (January) **American Wigeon** Black Isle (Ross); **Ross's Gull** 3 Shetland; **Whinchat** pr Selkirk.

PETE ELLIS



YOUNG ORNITHOLOGISTS CLUB

The YOC has now a membership of over 110,000 children. It is tempting at such a time to be complacent but really this membership presents us with many new problems to be solved. Never before has the responsibility of the YOC been so great—never have we had the opportunity of educating such a large number of young people and we may need all the help we can get.

I believe the strength of the YOC lies in the exciting national competitions and projects which are contained in the first-class bi-monthly colour magazine *Bird Life*, but just as important are the local activities which take place in many parts of Britain and Ireland. It is vitally important that our network of YOC leaders continues to grow and this is especially true in Scotland where there are very large areas where there are no YOC activities and children who join are not given the encouragement which comes from belonging to a local group.

It is therefore important that we increase the number of YOC leaders during 1981. New volunteers need not be expert ornithologists or be people with lots of free time. Some of the most valuable YOC local activities are run on a monthly basis by adults taking a comparatively small number of local children to nearby birdwatching areas. The main concern of the new volunteer is, I am sure, that they will be put in embarrassing situations by knowledgeable teenage members: let me assure you that this need not be the case! Group leaders are those who work alongside the children, helping them to identify the birds and being prepared to say "I don't know" or "Let's look it up when we get home".

If anyone is interested in becoming a YOC leader, please contact Peter Holden, National Organiser of the YOC, The Lodge, Sandy, Bedfordshire, SG12 2DL

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Vol. 11 No. 6

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Edited by D. J. Bates

Earlier colony attendance by Guillemots and Razorbills

K. TAYLOR and J. B. REID

(Plate 22)

Cliff nesting auks are now seen on their breeding ledges much earlier in the winter than formerly. How widespread is this new habit, what are its causes, and why do some colonies attract many more birds in winter than in summer?

Most Guillemots and Razorbills leave their breeding colonies in July and the rest at the beginning of August in Britain. Many Scottish Razorbills travel to Scandinavian waters in late summer and autumn, as do some Scottish Guillemots, but movements of Guillemots are still imperfectly known (Cramp *et al.* 1974, Mead 1974). While at sea after leaving the colony, moult of primary feathers renders Guillemots flightless for several weeks, but Razorbills may drop their remiges later than Guillemots (Birkhead & Taylor 1977). The birds return to the breeding site in winter, well before the onset of egg laying. The present study reviews information on the timing of this winter return for three colonies—Fair Isle, the Farne Islands and the Isle of May—where records are available from the 1950s to the 1970s (Bell 1962-6, *Birds in Northumbria* 1970-77, *Fair Isle Bird Observatory Reports* 1958-78, Isle of May Bird Observatory records, Eggeling 1974). Information from other areas is also presented to describe and assess the recent seasonal pattern of Guillemot and Razorbill colony attendance in the north of Britain. Population figures are quoted here in the units given by the counter.

Previous descriptions of colony attendance since the 1950s

In the 1950s Baxter & Rintoul (1953) recorded that Guillemots and Razorbills did not normally visit the breeding cliffs in Scotland until February. Bannerman & Lodge (1963) con-

sidered that while Guillemots 'exceptionally' came ashore in Britain in December, northern colonies were reoccupied after the turn of the year, with Razorbills landing in late February. About 1964, the pattern of Guillemot attendance on Fair Isle began to change, with birds being seen ashore in December and November between 1964 and 1967 (Dennis 1967). By the 1970s, winter records of Guillemots ashore were available from other Scottish colonies (e.g. Greenwood 1972), and Mead (1974) stated that some birds were at colonies in October. No similar trend of progressively earlier return to the breeding site was noted for the Razorbill, except that on Fair Isle they returned a few weeks earlier between 1964 and 1967 than was usual in previous years (Dennis 1967).

Attendance at Fair Isle, the Farne Islands and the Isle of May

The first recorded autumn and winter landings of Guillemots and Razorbills on Fair Isle are plotted as mean landing dates over three year periods from 1958-78 in fig. 1. There was a significant tendency for both species to return progressively earlier after 1963 (Spearman's rank correlation coefficient: Guillemot $r_s = -0.71$, $p < .01$; Razorbill $r_s = -0.57$, $p < .05$, $n = 15$). During this period the Fair Isle Guillemot population rose from 1,500-2,000 pairs in 1959 to 5,640 pairs in 1965 and c.10,000 pairs in 1969 and 1975. The Fair Isle Razorbill

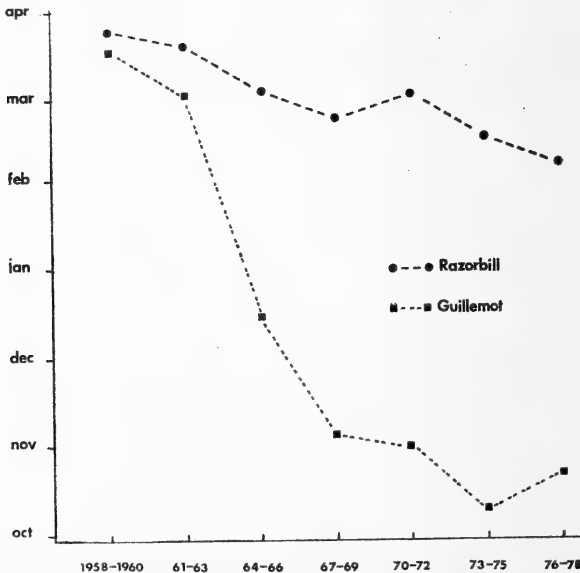


FIG. 1. Mean autumn/winter landfall dates for Fair Isle auks.

population increased from 750-1,000 pairs in 1965 to 1,200 pairs in 1969 and possibly 2,500 pairs in 1975 (Davis 1965, Cramp *et al.* 1974, Scottish Bird Report 1975).

The mean date Guillemots were last seen ashore on Fair Isle was 4th August (standard deviation ± 6 days) in the 1960s and 7th August in the 1970s. The mean date Razorbills were last seen ashore was 2nd August (s.d. ± 7 days) in the 1960s and 8th August (s.d. ± 7 days) in the 1970s.

On the Farne Islands records are dependent on dates of first observer visits to the colony. A comment that a return of Guillemots on 6th January 1952 was 'unusually early' should be viewed in this context (Watt 1953). Mean Guillemot return date was 14th November (s.d. ± 8 days) for 1961-5 and 3rd November (s.d. ± 11 days) for 1970-77. The Pinnacles colony increased from 1,300 pairs in 1971 to 2,400 pairs in 1977. Desertion of the Pinnacles occurs mainly in the first fortnight in August.

There are records of Guillemots and Razorbills ashore on the Isle of May in October, November and December since the 1950s. Our observations in 1978, and information in the observatory records, suggests that both species begin to visit the island in early October, the number of birds ashore increasing over the next few weeks, so that many thousands of Guillemots and several hundred Razorbills may be seen ashore by the end of October. Counts of these auks ashore on the Isle of May in autumn and winter 1952-79, together with approximate breeding population estimates for the fol-

Table 1. Autumn and winter Guillemot records, Isle of May

Date	No. ashore	Breeding pairs following season
1.11.52	c.50	2000
23.10.55	75	"
1.11.55	100	"
24.11.59	59	"
23.11.60	'many'	2000+
3.11.62	1000	"
1.11.64	1000+	"
24.10-25.11.66	2000+	"
5.10.70	170	"
2.11.70	2000	"
—,11.71	4400	3000-4000
—,12.72	4300	4000+
10.10.73	200	"
20.10.74	1200	"
23.12.74	16,000	"
14-17.10.75	400+	"
23.10.77	13,000	"
10-17.10.78	500+	"
23-30.10.78	'thousands'	"
17.10.79	1350	"

Table 2. Autumn and winter Razorbill records, Isle of May

Date	No. ashore	Breeding pairs following season
3.10.55	2	300-400
31.10.65	c.10	"
31.10-25.11.66	10+	"
5.10.71	100	"
—11.71	800	"
10.10.73	65	400-500
23.12.74	500	"
14.10.75	50+	"
23.10.77	2000+	"
10-17.10.78	50+	"
23-30.10.78	1000	"
15.10.79	50	"

lowing breeding season, are shown in tables 1 and 2. In December 1974 and October 1977 the number of Guillemots ashore was in excess of the estimated breeding population on the island in the following breeding seasons. In October 1977 and 1978 the number of Razorbills ashore was also greater than the estimated breeding population. These recent pre-breeding season counts were made by observers who knew the size of the island's auk populations during the breeding season. Most Razorbills and Guillemots leave the Isle of May by the end of July.

Attendance at other colonies around Britain

There are only a few recent autumn and winter landfall records for Guillemots and Razorbills at other colonies in the north. In Shetland, Venables & Venables (1955) noted that Guillemots did not come ashore until early February, but recent records (*Shetland Bird Reports* 1969-77) include Guillemots on land in late December or January between 1969 and 1971, and from October from 1974 onwards. Shetland Razorbills, noted by Venables & Venables (1955) as making a landfall in the second week of March, were seen ashore in February from 1969 onwards. In Orkney, Guillemots were ashore in October 1971, and 'thousands' were on the Copinsay ledges in mid October 1977 (*Scottish Bird Report* 1971, Hope Jones 1978). In Caithness, Guillemots were ashore in December 1971 and November 1972 (*Scottish Bird Reports* 1971, 1972).

While attendance by Guillemots at English colonies from mid October onwards is now normal, autumn sightings of Razorbills ashore are unusual (T. Birkhead pers. comm.). Guillemots were ashore at Bempton in November 1870 (Cordeaux 1872). In Wales Guillemots have been seen ashore in December for many years (Fisher & Lockley 1954), but Razor-

bills do not come on land until later, such as those on Skokholm which usually return in March (Lloyd 1972, 1976). In Ireland Guillemots were ashore on Great Saltee in October 1955 and 1957 (*Irish Bird Reports* 1955, 1957). North of Britain there was a traditional belief among Faeroese seabird fowlers that Guillemots came ashore on the island of Skuvoy on 25th January (Norrevang 1977).

Discussion

The change in the pattern of Guillemot attendance on Fair Isle which began in 1964 was considered by Dennis (1967) to be associated with a local increase in small fish such as sandeels (*Ammodytidae*). *Ammodytes marinus*, one of the main prey of Guillemots, spawns in February and March in Scottish waters and has a major spawning ground around Orkney (Langham 1971). In 1965 a tenfold increase in the abundance of the young of spring spawning species such as sandeels was recorded in the western English Channel (Russell 1973). While this may have reflected a much broader change in marine populations in the Northern Hemisphere (Cushing & Dickson 1976), it is not known whether there were similar changes in the Orkney area at this time.

An increase in local food abundance might allow birds to moult near the colony and thus return early to the breeding site but does not by itself explain why birds should come ashore in autumn and winter. While food supply appears to be the ultimate factor controlling the phasing of the breeding cycle in many northern seabirds (e.g. Salomonsen 1955), intraspecific competition for nest sites may be an important proximate factor. Birkhead (1978b) showed that more intraspecific aggression occurred among Guillemots ashore from November to March than at other times and considered that this aggression was indicative of nest site competition. Such competition is more intense in the densely breeding Guillemot than in the relatively dispersed breeding Razorbill and may partly explain why Guillemots come back earlier to the breeding site.

The idea that early return of Guillemots to the breeding site is a result of pressure on nest sites is suggested by the Fair Isle data, where birds tended to return to the colony progressively earlier during a period when the estimated breeding population on the island increased fivefold.

Guillemots are flightless for 40-50 days during the post-nuptial primary moult, which takes about 63 days (Birkhead & Taylor 1977). Observations of Guillemots ashore at northern colonies in October, where most birds do not leave the ledges until late July or early August, suggest that some birds return

to the breeding ledges very soon after post-nuptial primary moult.

Proper interpretation of the significance of large numbers of auks ashore in winter on the Isle of May requires more accurate breeding population estimates than those made to date. Standard census methods are described by Birkhead & Nettleship (1980). Estimation of the ratio of breeding pairs to individuals present at the colony is of crucial importance in censusing cliff breeding auks (cf. Birkhead 1978a). In the absence of a ratio for the Isle of May it is not possible to say whether winter counts in excess of the estimated breeding population indicate that the island is used by auks from other colonies at this time of year. At one Guillemot colony on Skomer (Wales) where the ratio was accurately estimated, the number of birds ashore at times of peak attendance in the pre-laying period was slightly greater than double the number of pairs later breeding there (Birkhead 1977). Since recent Isle of May winter counts give Guillemot numbers ashore three to four times greater than the estimated number of pairs later breeding there, the need for more rigorous censusing in summer, as well as winter, is obvious. Although it is possible that the counts included non-breeders and immatures, there are unlikely to be enough present in the population to explain the large discrepancy. There are few data on the geographical spread of colonies that have auks ashore in winter, and, as previously noted by Bourne & Dixon (1974), a lack of information on changes in numbers of birds ashore at single colonies in winter.

More counts should be made of Guillemots and Razorbills at the breeding colonies in winter, evidence presented here suggesting that observers could fruitfully begin studying many Scottish colonies from early October onwards. Winter counts have conservation importance, since large pre-breeding aggregations of auks, such as on the Isle of May during the winter, mean that an oil spill could be more damaging in winter than in the breeding season.

Acknowledgments

We thank Dr Tim Birkhead and Dr Mike Harris for information and comments on earlier drafts, and Bernard Zonfrillo and Hector Galbraith for help in collecting Isle of May data. The senior author was supported by a Science Research Council post-graduate studentship.

Summary

Over the last two decades the seasonal pattern of colony attendance by Guillemots and Razorbills at some colonies in the north of Britain appears to have changed. Both species are now seen ashore earlier in winter than was previously considered normal. On the Isle of May both species have been seen ashore in October since the 1950s. The recent

pattern of attendance is documented for several colonies where records of autumn and winter auk visits are available. There is a scarcity of winter information for most other northern auk colonies. Early return to the colony may be due to intra-specific competition for nest sites, progressively earlier return to Fair Isle after 1963 being associated with an increase in the island's breeding populations. It is unlikely that the birds could come ashore much earlier than recorded to date since they are flightless for a period before this while moulting the primary feathers. There is a need for more, and more detailed, observations of Guillemots and Razorbills ashore at their colonies outside the breeding season. Winter auk counts could have conservation importance, but proper interpretation of such counts will require rigorous censusing of breeding populations.

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The Lesser Black-backed Gull on the Isle of May

NEIL DUNCAN

More attention has been paid to the Herring Gull than to the Lesser Black-back on the Isle of May. Since the cull began the Lesser Black-backed Gull's place in the island's seabird community has gained in importance and its numbers are now increasing steadily.

This paper reports on some aspects of the population ecology of the Lesser Black-backed Gull on the Isle of May (Firth of Forth). In recent years considerable attention has been paid to the biology of the Herring Gull on this island (see the papers of Parsons 1975, 1976, *et al.* 1976 for reproductive biology; Duncan & Monaghan 1977 and Parsons & Duncan 1978 for movements and dispersal; Chabrzyk & Coulson 1976 and Duncan 1978 for population dynamics with particular reference to the Nature Conservancy gull cull). It might be a consequence of the importance attached to the Herring Gull that attention seems to have been diverted from the sizeable population of Lesser Black-backs on the island. In fact, the Lesser Black-back is becoming increasingly important in relation to the numbers of other species breeding in this major seabird breeding station, and in 1979 they constituted almost 20% of the large gull population.

Most of the data in this paper were collected between 1974 and 1977 in the course of more detailed studies on the Herring Gull, and comparisons with this species are made where ap-

propriate. Since much of the Lesser Black-back data were collected incidentally there are many gaps left to fill, especially in the assessment of breeding success. However, interest in the gull population on the island is likely to continue, and it seems worthwhile summarizing what is known about the Isle of May population with reference to status, movements and breeding success. Details of the Isle of May have been fully described in published accounts already (see especially Eggeling 1960, 1974).

Methods

(1) Breeding Lesser Black-backed and Herring Gulls were censused by counting all nests before each annual cull by dividing discrete topographical areas into longitudinal transects 2m in width and counting all nests, whether with eggs, chicks, or completed nests prior to egg laying. There was good separation of the species according to nest habitat, and inaccuracies through confusing the two were thought to be minimal. Doubt in any particular area or individual nest was usually dispelled by direct observations of the birds on their territories.

(2) Nests of a sample of Lesser Black-backed Gulls were staked and numbered early in the breeding seasons of 1974 and 1975. The timing of laying was investigated by daily nest checks, and clutch size was measured. Chicks were marked two or three days after hatching by using a unique combination of colour rings for each individual. These rings were stapled in position and designed to fall off after several weeks. The survival of chicks was followed until about their twentieth day by which time it was assumed that they would fledge successfully.

(3) Past ringing records deposited with the Isle of May Bird Observatory were examined up to 1977 and the location of each recovery or sighting of an Isle of May Lesser Black-back plotted.

The growth of the population

The Lesser Black-backed Gull did not breed on the May until 1930, but according to Eggeling (1974) the population increased steadily. By 1972 the population was estimated at about 2,500 pairs and analysis of the counts (Eggeling 1974, table 4, p. 138) indicates that the increase averaged 14.3% p.a. from the early 1930s. J. C. Coulson (pers. comm.) independently estimated the numbers of Lesser Black-backs as 10% of the total gull population in 1972. This count indicates that the numbers of pairs of Lessers was in the region of 2,100. This rate of growth was similar to that of the Herring Gull which had increased since its founding in 1907 at an average of 13% (Chabrzyk & Coulson 1976). Figure 1 illustrates the increase in numbers of breeding pairs of Lesser Black-backed and Herring Gulls respectively. To make the relationship linear the natural log of the number of gulls is plotted against time. The standard errors of the slopes are not significantly different, indicating there is no statistical difference between the rates of increase of the two species.

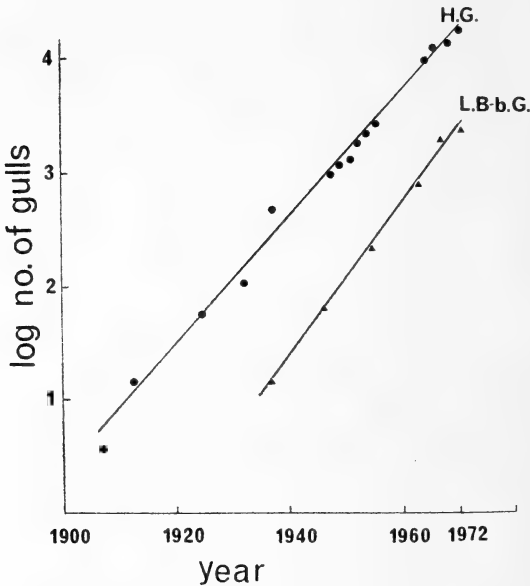


Figure 1. The rate of increase of the Lesser Black-backed Gull (triangles) compared with the rate of increase of the Herring Gull (dots) on the Isle of May since the first breeding records of the species. The log of number of pairs is plotted against year.

The population since culling began

The first gull cull on the Isle of May took place in 1972 and has since continued annually. The greatest effort has been directed towards lowering the numbers of Herring Gulls but attempts have been made to reduce the Lesser Black-backed population as well. Eggeling (1974) stated that about 1,700 Lessers were destroyed in 1972, and a further 1,100 in 1973. These figures appear to be estimates rather than accurate counts and hence are not considered in table 1 which gives a more detailed appraisal of recent effects of culling since 1974 when this study began. The totals killed are the sum of those culled and recovered on the island (N. J. Gordon pers. comm.), an estimate of the numbers of gulls which took narcotic baits on the island but died at sea or inaccessible places, and a small number of gulls taken in the course of recruitment experiments in the colony as a whole. Each year the numbers of gulls dying away from the island was estimated at 10% of the numbers recovered dead on the island (Duncan 1978).

Table 2 presents a breakdown on figures obtained in the yearly census since 1974. The population was at its lowest in 1975 and since then there has been a steady recovery despite the annual cull. For reference purposes, the Isle of May has

Table 1. The breeding population of Lesser Black-backed Gulls on the Isle of May 1974-9 (expressed as individuals, not pairs) and the numbers killed by culling. Numbers killed include birds dying at sea (estimated to be 10% of the number recovered on land) and a small number culled in recruitment experiments.

	No. of breeding gulls	No. of non-breeding gulls	No. killed by culling	% breeding population killed
1974	1,590	100	581	36.5
1975	1,302	70	276	21.2
1976	1,484	50	349	23.5
1977	1,682	50	26	1.5
1978	1,710	50	133	7.8
1979	1,870	50	202	10.8

Table 2. The number of pairs of Lesser Black-backed Gulls breeding in different areas on the Isle of May, 1974-9 and the percentage annual change

	1974	1975	1976	1977	1978	1979
North Ness	22	4	8	6	7	8
Rona	144	85	106	98	103	144
East Tarbet	19	12	8	11	3	3
West Side*	225	214	236	285	295	312
East Side**	178	150	164	197	201	218
South Ness	207	186	220	244	246	250
Totals	795	651	742	841	855	935
% change since previous year		-18.1	+14.0	+13.3	+1.8	+9.4

*Altarstones to Pilgrims' Haven

**High East Tarbet to Kirkhaven

been divided into six areas which are well known by visitors to the island.

Summing up, it can be seen that the population has increased by about 140 pairs since 1974, and fig. 2 portrays the extent of the population change during the period of culling: these changes are compared with the extent of changes in the Herring Gull population over the same period.

Breeding success

It has been difficult to measure breeding success of gulls on the Isle of May since the onset of culling, and although some study areas of the island were left uncultured in 1975 through agreement with the NCC so that breeding success of Herring Gulls could be measured, these were not areas particularly favoured by Lesser Black-backs. Generally, the peak of laying is about eight days later than that of the Herring Gull (pers. obs.) and although many clutches have been started

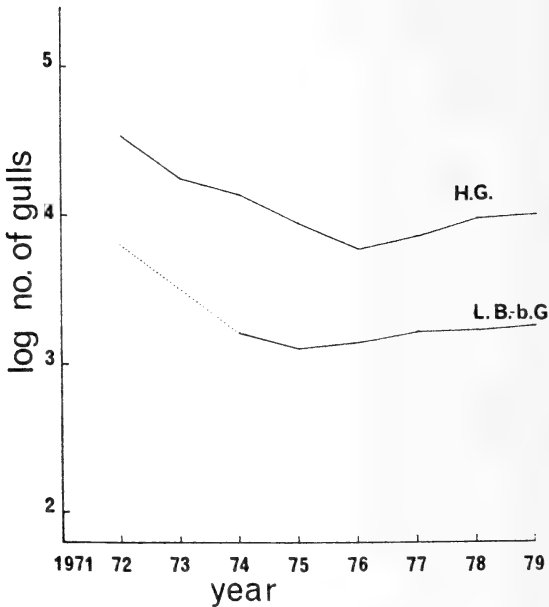


Figure 2. Population trends of the Lesser Black-backed Gull on the Isle of May compared with the Herring Gull since the onset of culling in 1972. The population was not known in 1973. The log of number of pairs is plotted against year.

at the time of the cull, which has usually been undertaken in the last week of May, less than 20% of clutches have been completed. The disruptive effect of the cull was such that clutch size and breeding success became extremely hard to measure with certainty.

In 1974 and 1975 a sample of Lesser Black-back nests were kept under observation during the breeding season. Clutch size was recorded in both years, and fledging success in 1975 only.

Table 3. Summary of aspects of breeding biology of the Lesser Black-backed and Herring Gull on the Isle of May, 1974 and 1975

	Lesser Black-backed Gull		Herring Gull	
	1974	1975	1974	1975
Sample size (n)	48	53	120	223
Date at which 50% of clutches were completed	22 May	23 May	16 May	19 May
Mean clutch size	2.72	2.70	2.76	2.64
Mean no. chicks fledged/pr.	—	1.10	—	0.85

Table 3 summarizes data on breeding, making comparisons with the Herring Gull in the same year.

Some results of ringing

Lesser Black-backs have not been ringed in numbers proportional to those of the Herring Gull on the Isle of May. Nevertheless, since the early 1950s more than 1,000 have been ringed on the island (mostly as chicks). Numbers of recoveries have been sufficient to arrive at some conclusions relating to movements from the island, but insufficient to illustrate seasonal trends in dispersal. Between 1954 and 1977 there were 76 recoveries reported to the BTO by the public, and a further 100 Isle of May ringed gulls were culled on the Isle of May and elsewhere in the years 1972-9. Fifteen of these were recovered breeding in other colonies (see fig. 3) but there has been no evidence of gulls changing colony after first breeding.

Ringing has enabled information to be collected on two aspects of Lesser Black-back biology: firstly, dispersal from the natal colony, and secondly, the degree of philopatry (re-



Figure 3. The pattern of recoveries of Lesser Black-backs ringed on the Isle of May between 1954 and 1977. Triangles indicate birds found breeding in other colonies (recovered in culls). Dots indicate birds recovered by the general public and reported to the BTO. Gulls culled on the Isle of May are not recorded, and one adult ringed in October and recovered at Nyksund, Sortland, Norway is not recorded.

turn to the natal colony). Recoveries of ringed birds (excluding those culled on the Isle of May) are plotted in fig. 3. There are no revelations since it is well known that the gulls reach the west coast of Morocco and further south during winter dispersal as sub-adults. There is no conclusive evidence of adult birds wintering in the British Isles.

Philopatry can only be proved through adequate samples of marked individuals. There is good evidence that a large proportion of Herring Gulls do not return to their natal colony to breed (Chabrzyk & Coulson 1976, Duncan & Monaghan 1977) but there is no reference to the Lesser Black-back on this subject and further study is required.

In all, 9.6% of the Lesser Black-backs ringed as chicks on the Isle of May before 1974 have been recovered breeding on the May (table 4), and a further 1.3% have been recovered in culls in other colonies, notably the Farne Islands. Forty five per cent of the gulls ringed as adults have been recovered on the May. Sixteen ringed as chicks in other colonies have also been

Table 4. The numbers of ringed Lesser Black-backed Gulls recovered in the culls 1972-9

	1972	1973	1974	1975	1976	1977	1978	1979	Totals
Numbers ringed as									
chicks	23	25	12	12	1	0	1	1	75
adults	7	1	1	1	0	0	0	0	9
Ringed as chicks									
elsewhere	9	2	2	3	0	0	0	0	16

recovered, and despite the much smaller proportion of Lesser Black-backed Gulls culled on the island compared with Herring Gulls (about 4,300 as against over 39,000) this is a higher total than for the Herring Gull—which amounts to only eleven in all. However, there is no firm evidence that recruitment from other colonies is greater than has been suggested for the Herring Gull (Chabrzyk & Coulson 1976, Duncan & Monaghan 1977) since the numbers of Lesser Black-backed Gulls ringed in other colonies are probably greater. This has been the case on the Farne Islands where Lesser Black-backs outnumbered Herring Gulls by about ten to one in the 1960s (J. C. Coulson pers. comm.).

Discussion

Compared with the reduction in numbers of Herring Gulls on the Isle of May since 1972, the control of Lesser Black-backs seems to have been slightly less successful. In 1979 the Lesser Black-back stood at 44% of its estimated pre-cull level (1972, J. C. Coulson's count), while the Herring Gull population had been reduced to about 26%. While there may be fac-

tors regulating recruitment in Lesser Black-backs which are different from the Herring Gull (Duncan 1978) the most likely explanation is a difference in culling effort, with less emphasis on the Lesser Black-back. Had the Lesser Black-back population remained uncultured, by 1979 it would probably have stood at about 5,300 pairs, but it is significant that increases have been recorded in each year since 1976 despite an annual cropping of the population with the attendant disturbance.

Breeding success of Lesser Black-backs was marginally greater than for the Herring Gull in the seasons where this was investigated. This was expressed by higher fledging success and may be explained in some measure by the species breeding later. Thus birds which are disturbed during culling in May have an opportunity to replace clutches, and some may not have started by the time the cull finishes. The figure for breeding success was similar to those found by Brown (1967) working at Walney and Harris (1964) working on Skomer.

Generally, it appears that the Lesser Black-back population on the Isle of May is thriving despite the effects of the cull. Recruitment through immigration from other colonies is probably important and at least a proportion of the population has been able to breed successfully in recent years despite the annual cull.

Acknowledgments

It is a special pleasure to thank those who have helped in recent years with gull studies on the Isle of May. A. W. Colling and N. J. Gordon have been particularly helpful and the Isle of May Bird Observatory Committee have supplied records of past ringing and population counts. Dr Jasper Parsons contributed much by his ringing efforts in the 1960s. Drs J. C. Coulson and Sarah Wanless greatly improved the presentation of this paper by their constructive criticism. The work was undertaken whilst in receipt of a NERC Studentship 1973-7.

Summary

1. Prior to 1972 the rate of increase of the Lesser Black-backed Gull population on the Isle of May averaged 14.3% p.a., which was similar to that of the Herring Gull (13% p.a.).

2. Since the onset of culling in 1972, c.4,300 Lesser Black-backs have been killed and the population in 1979 stood at about 935 pairs (44% of the highest pre-cull total).

3. Mean clutch size was 2.72 and 2.70 in the breeding seasons of 1974 and 1975 respectively. In 1975 the average number of young fledged per pair was 1.10 (cf. 0.85 for the Herring Gull).

4. Recoveries of Lessers ringed on the Isle of May have been plotted. Of these 100 have been recovered in culls on the island and 15 culled in other colonies.

5. It appears that the Lesser Black-back population on the May is thriving despite the annual gull cull.

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Birdwatching in Galloway

DONALD WATSON

(Plate 21)

From the shining mudbanks of the Nith estuary to the precipitous cliffs of the Mull of Galloway is little more than 80 km as a goose flies. Looking back from the Mull across the wide expanse of Luce Bay, the Stewartry mountains seem remote, belonging to a different world, as indeed they often do climatically, gathering the clouds while the coast basks in sunshine. Diversity of habitat makes the small region of Galloway (the Stewartry of Kirkcudbright and Wigtownshire) outstanding for variety of birds. This first of two articles is confined to inland areas.

The Ken-Dee valley contains the richest inland sites for wildfowl. Here, lowland and upland intermingle. The landscape has a gentle quality, with its mounded fields and clustered woods, dominated by the profile of the Rhinns of Kells mountains riding the northern horizon. South of the old railway viaduct many marshy bays formed when the hydroelectric



PLATE 21. A pair of Ravens in Galloway photographed through a Rowan tree in May 1980.

Jack Orchel

Ravens have declined there with the loss of sheep carrion (see Birdwatching in Galloway, page 188).



PLATE 22. Guillemots on the west

A familiar sight perhaps, except
(see Earlier colony attendance)



Isle of May, October 1978.

B. Zonfrillo

The birds are in winter plumage
(see also *Albatrosses and Razorbills*, page 173).



PLATE 22 Gullenots on the west side of Isle of M... October 1978
B. Zorrillo

A familiar sight of... ps, except for a bar...
(see Earlier colony) ...ndance of Gullenots and P...
After plumage...
page 173.

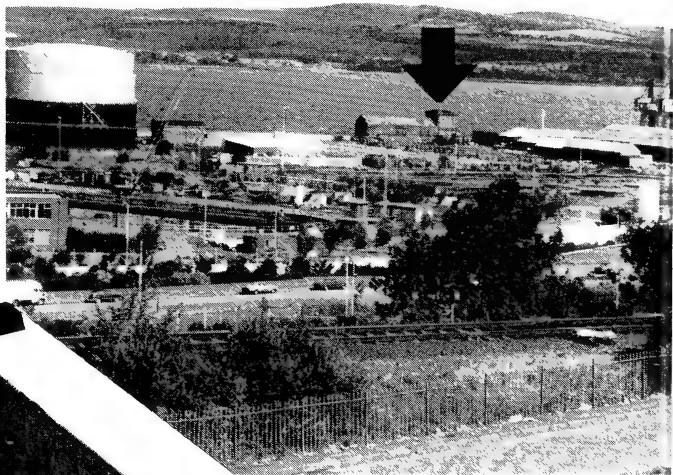
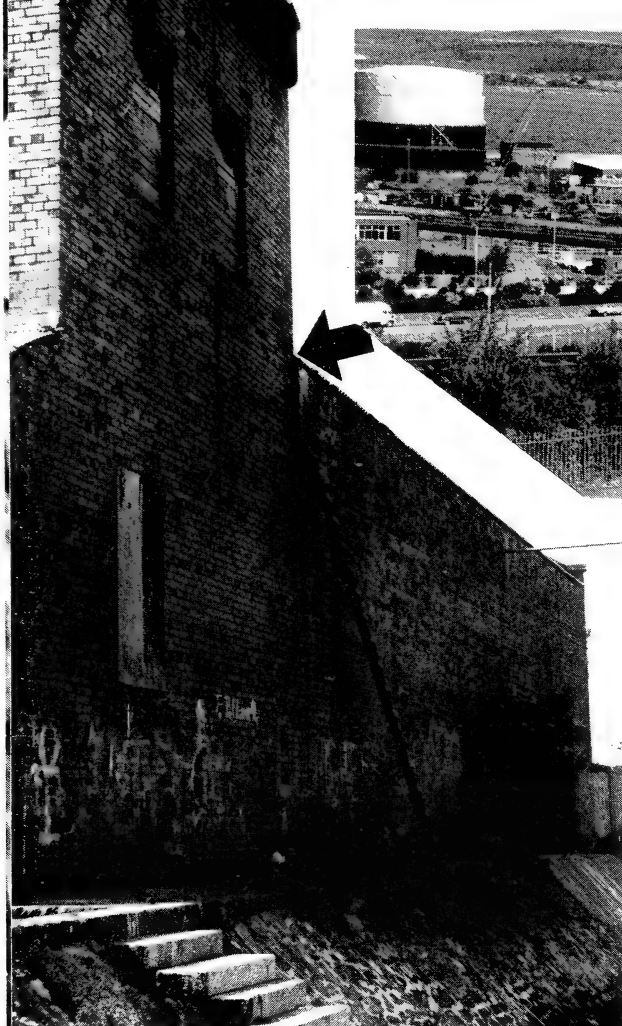


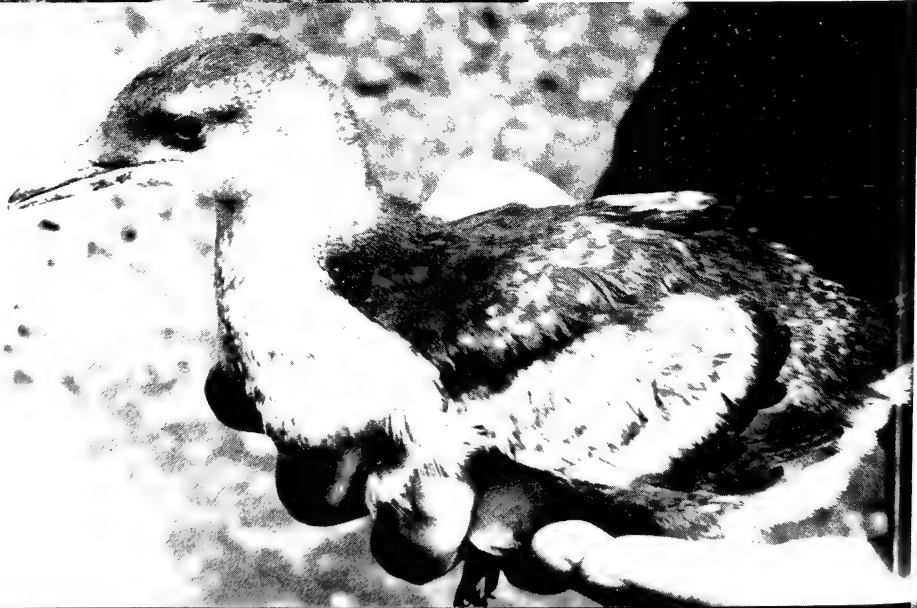
PLATE 23. Black Guillemots breeding in the inner Clyde estuary (page 195).

(a) The industrialized Renfrewshire shore of the inner Clyde—hardly a place to expect breeding Black Guillemots! In 1979 and 1980 they bred in holes in the eaves of the waterfront building shown by the arrow.

(b) One of the nest sites is arrowed above the ladder where the wall is whitened with droppings.

(c) One of a brood of two raised here in 1979.

D. Carnduff



power scheme raised the water level in 1935. These have made an excellent feeding habitat for dabbling duck, including many Shoveler and Pintail, both of which also breed in small numbers.

There is some evidence that raising the water level was responsible for the establishment of the regular wintering flock of Greenland White-fronted Geese, though some had visited the area as far back as 1913. The recent decline of this flock from over 400 to under 300 has coincided with an increase at West Freugh in Wigtownshire, where 360 were counted in December 1980. Nowadays most of the geese in the Ken-Dee system are Greylags which, prior to 1939, were scarce inland. South of Loch Ken, around Threave, Bean Geese were then the dominant geese and even during the 1950s over 200 could still be seen from the A75 road, happily not then a Euro-route, as they fed on High Tae Drum, sometimes accompanied by up to three Lesser Whitefronts. A few Bean Geese still return to the same area but they are elusive during their short stay, between Christmas and early March.

Whooper Swans now feed increasingly on grass fields, notably at Greenlaw in the Dee valley, where 124 were counted in March 1978. Bewick's Swans were formerly rare in the district but some are now seen commonly among the Whoopers. In contrast Smew are much rarer than they were 15-20 years ago when small parties, including a good proportion of the dazzling white drakes, were frequent in hard weather. Duck counts, however, show little change in the numbers of commoner ducks in recent years. Despite much increased disturbance from power boating, post-breeding flocks of Goosanders on Loch Ken still often exceed 100 in August-September. They consist largely or wholly of ducks and their broods from nesting sites upstream, most adult drakes having left, perhaps for Scandinavia, in May-June. It is not known whether mink have had a significant effect on water birds in Galloway. They have certainly killed young Dippers, Teal ducklings and many nesting Black-headed Gulls. A critical study of mink is much needed.

The region contains a wealth of lochs. Generally those in the uplands, with rocky or peaty shores, are the least productive, though Loch Moan in Glentroll Forest Park has the largest Black-headed Gullery and many hill lochs have been colonized by feral Greylag Geese which were first introduced in 1930 to Lochinch, still their greatest stronghold. The Mochrum Lochs, on the low moors of Wigtownshire, are of special interest for their variety of breeding birds, including Common Terns, Red-breasted Mergansers and Dunlin. The large Cormorantry, usually sited on the islands of Castle Loch,

is known to have existed since the 17th century, but in 1979 and 1980 only a few pairs nested, on Mochrum Loch. Among the best lowland lochs are Lochs Milton, Arthur and Carlingwark in Kirkcudbrightshire and Loch Connel, Soulseat Loch and the Lochinch estate lochs (permission required) in Wigtownshire. Carlingwark Loch, close by Castle Douglas, is partly bordered by marshland where Water Rails are common and Spotted Crakes recorded; in winter a fine variety of duck can be seen, especially in the bay at the southwest end. Unfortunately an attempt to drain much of the marsh by opening up the Gelston burn may reduce its attraction for Water Rails, Sedge Warblers and Reed Buntings.

Despite increasing drainage, the pastoral landscape of lowland Galloway is still wonderfully varied. There is an abundance of rough uneven ground, often with bog or carr, where Barn Owls hunt more commonly than anywhere else in Scotland and wintering Hen Harriers are widespread. In recent years grey males have outnumbered ringtails in the Stewartry.



HEN HARRIER *Donald Watson*

They have three important winter roosting areas. The Chaffinch is by far the dominant species in winter flocks of finches and buntings, but Bramblings, Mealy Redpolls and Tree Sparrows locally add to a delightful variety of species. While the Corn-crake has become rare and the Corn Bunting decreased, Quail continue to be heard in barley fields near Beeswing. The lowlands have a network of secluded waterways, with nesting Dippers, Grey Wagtails and Common Sandpipers. The patient watcher may glimpse a Kingfisher, by no means a rarity even after the cold winter of 1978/9.

Though sadly diminished, hardwoods rich in birds are still to be found in all the major river valleys. Some of the best are in tributary glens, like the Garroch in the Glenkens, where Wood Warblers, Garden Warblers, Redstarts and Tree Pipits are plentiful in summer, Blackcaps and Pied Flycatchers in smaller numbers. The well known readiness of the last species to occupy nestboxes may be seen in the Forestry Commission's oakwoods in Glentool. The pockets of damp Alder and birch woodland that survive 'land improvement' are the headquarters of Galloway's numerous Willow Tits—roadsides at Woodhall and Loch Arthur are good places to see them, as

well as Long-tailed Tits, Redpolls, Siskins and Bullfinches. In 1974 a Marsh Tit sang from the Beeches above Loch Ken but no more have been identified. Little Owls have lately been seen in the vicinity of Laurieston.

Green Woodpeckers, though scarcer than Great Spotted, have been established in the Stewartry since 1954 and were still spreading as far west as Dunskey in Wigtownshire in 1979. Sometimes a groundfeeding Green Woodpecker may be disturbed in pure conifer forest in the uplands. Nuthatches remain tentative inhabitants of the region, the latest sightings being in Glentroot in 1976 and near New Luce in 1977. The Wood of Cree, with coppiced oaks and birches, has much charm but a restricted variety of birds. At Kilsture Forest, near Kirkinner in Wigtownshire, the Forestry Commission has made attractive walks through interesting mixed woodland. In this area Magpies, for reasons unknown, are conspicuously more common than in the Stewartry.

Profound changes in the birdlife of the uplands have arisen from very widespread conifer afforestation. In 1916 the Rev. C. H. Dick wrote of the Deugh valley near Carsphairn, 'Nowhere so inevitably as here does one recall these lines of Stevenson:

Where about the graves of the martyrs the Whaups are crying . . .
Hills of Sheep and the howes of the silent vanished races.'

Not so today, when by far the majority of hill roads present views of conifer plantations, with only the hilltops bare of trees. At first sight the birds gained from this afforestation seem more impressive than the losses. Short-eared Owls, Kestrels and Black Grouse, Whinchats, Redpolls, Willow and Grasshopper Warblers are just some of the species that multiply in the early stages. For some years the variety of nesting passerines is considerable and much greater than on the open moor. By far the majority of passerines leave the forests at the end of summer and do not return till March, April or May. In winter, Bullfinches may catch the eye as they rise from heathery verges, while in favourable years parties of Common Crossbills adorn the trees and solitary Great Grey Shrikes are as likely to be found in young plantations as anywhere. The arctic weather in early 1979 virtually exterminated a large population of Stonechats both in planted and unplanted hill ground.

Once the trees close up, these forests become increasingly impenetrable, especially since brashing of branches was abandoned. The most interesting patches are found where deer damage or windblow have occurred. Nightjars still nest in traditional places where trees have grown poorly and many

Woodcock breed. As the trees grow older and denser many species of birds are lost, while a few, like Sparrowhawk and Jay, arrive and there are fluctuating numbers of Siskins. At Talnotry magnificent cock Golden Pheasants, with their shadowy hens, creep from beneath the tall trees of Kirrough-tree forest in the gloaming.

Pleasant as it is to listen from a forest ride on a spring morning to the songs of Blackbird, thrushes, Chaffinch and Willow Warbler, these and other forest birds are extremely common in other habitats. Even Black Grouse, now chiefly associated with the plantations, abounded on rough pasture with hardwood scrub before they crashed mysteriously in



BLACK GROUSE *Donald Watson*

the 1920s. It must be remembered that the nearly 20% of Galloway planted with conifers is mostly in the uplands, especially on hill ground of moderate elevation which used to support the best breeding populations of moorland birds like Red Grouse, Golden Plover, Curlew, Skylark, Meadow Pipit and Wheatear. At Raploch Moss and more recently near Loch Skerrow planting has almost eliminated the last nesting Dunlin from the Stewartry.

Loss of sheep carrion has caused a great reduction in hill nesting Ravens and Buzzards, though the latter may be increasing on lower ground with plenty of Rabbits. There has been a sharp decline of breeding Merlins in their former stronghold east of the Cairnsmore of Fleet National Nature Reserve since most of their hunting grounds have been afforested. Local studies indicate that they depend on access to moorland birds for most of their prey. Ten years ago it looked as if Hen Harriers might become numerous breeding birds in the younger plantations but they have failed to colonize many of these and my observations show that males, which provide the food for incubating females, hunt mostly over unplanted ground.

The presence of Golden Eagles is a source of pride to many people in Galloway. Visitors, content with a sighting from a well known vantage point, may be unaware that the pair they see have reared no young and rarely had eggs in the past eight years. Difficulty in finding prey in deep forest is more probably

the cause than occasional disturbance. Only one pair, with the least afforested territory, has had consistent success. Peregrines in Galloway are not under the same pressure, since their favourite prey consists of passing pigeons. They are, however, by no means safe from illegal taking of eggs and young.

The Forestry Commission's intention to fell many blocks of trees at 35-40 years presents an opportunity to leave important open enclaves and to replant with much more hardwood. I am informed that the intention, at least, is not to replant with conifers close to streams and to increase the proportion of hardwoods in such sites. The Commission has long been helpful in bird protection but there is a need to encourage a similar attitude on some private ground.

The highest mountains in Galloway, just over 800 m, may seem puny by Highland standards. Nevertheless they formerly supported Ptarmigan and have a long history of sporadic occupation by Dotterel. They are visited by Snow Buntings in winter. To walk these heights on a rare fine day in early summer is to know the best of Galloway, even if you encounter no birds rarer than a sprinkling of Golden Plover on the summits or a Ring Ouzel piping from a dark corrie.

(To be concluded)

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Short Notes

Fluctuations in breeding Shags on the Isle of May

Potts *et al.* (1980. Population dynamics and breeding success of the Shag *Phalacrocorax aristotelis* on the Farne Islands, Northumberland. *J. Anim Ecol.* 49: 465-484) argued that Shags breeding on the Farne Islands and, by implication, the Isle of May are merely sub-populations of a larger contiguous east coast population. In the event of an abnormally high mortality reducing the breeding stock of one sub-population the effect may be buffered by immigration from neighbouring sub-populations. They have shown that this took place when, in May 1975, the Farnes breeding population was reduced to 37% of its previous level by a red tide. Subsequently immigration of first time breeders and a few adults, mainly from the Isle of May, quickly restored breeding numbers so that by the following breeding season the population was almost back to pre-crash levels (Armstrong *et al.* 1978. Further mass

seabird deaths from paralytic shellfish poisoning. *British Birds* 71: 58-68). This note records recent population levels on the Isle of May and describes the effect of emigration.

Since 1973 I have censused breeding Shags on the island, using as my criteria apparently occupied nests, i.e. nests with either eggs, chicks or sitting adults (table).

	1973	1974	1975	1976	1977	1978	1979	1980
Nests	1129	979	676	364	814	805	1015	1041

From June to August 1975 an unknown factor reduced the colony by approximately 30% just before and during the census. Ringing recoveries indicate that the mortality suffered during this period was equivalent to that normally suffered in a full year. The red tide which decimated the Farnes population one month earlier was apparently not involved (Armstrong *et al.* 1978) although immature Isle of May birds summing in the Farnes area were probably killed by the red tide, thus lowering recruitment to the May colony in the following year. 1976 saw a further reduction as lowered recruitment and emigration of birds to recolonize the Farnes took place. In 1977 numbers began to rise, probably due to overspill from the Farnes in addition to recruitment of native first time breeders, i.e. birds hatched on the island in 1974 and 1975. The population continued to grow until by 1979 numbers were not widely different from the 1973 total.

These population figures show well the expected dampening effect which emigration and immigration have on fluctuations imposed by severe mortalities when only part of a larger population is affected.

My thanks are due to Peter Lack for the 1980 count.

H. GALBRAITH

Mute Swan killing Bank Vole

On 3rd June 1980 at Duddingston Loch (Edinburgh) I observed a Mute Swan standing on the bank peck and bite something on the ground several times in quick succession before twice picking up and dropping a small mammal. When I investigated, the swan took to the water, but I found a freshly killed adult Bank Vole *Clethrionomys glareolus* at the site. The rear of the skull was crushed and the animal was bleeding from the mouth. There was no swan nest nearby. Mute Swans attack and kill other water birds fairly frequently, and occasionally eat amphibians, but I cannot find any records of them killing any mammal.

COLIN R. McLEOD

Black Guillemots breeding in the inner Clyde estuary

In 1979 a pair of Black Guillemots bred in a hole in the eaves of a building close to shipyards in the inner Clyde estuary at Port Glasgow (Renfrewshire) (plate 23). I was first told of their presence in late July by a shipyard worker who had seen the birds standing on the roof and flying to and from the estuary. He took me to the site and, while we watched, a Black Guillemot flew in from the estuary and entered the hole. We immediately heard what we took to be food begging calls of young birds. A few days later Iain Gibson and I extracted two well grown young and ringed them. In 1980 two pairs bred.

The nest sites, about 7 m above ground, were shallow cavities at the top of the wall covered by a corrugated asbestos roof. The birds gained entry at places where the brick had crumbled. The building, now used only as a shipyard workers' car repair club, is sited in an area of heavy industrialization, the Scott Lithgow Group's Kingston Shipyard being about 100 m to the east and their dry dock and its associated cranes and office buildings about 500 m to the west. Public access to the area is restricted, but the birds seemed undisturbed by workmen occasionally walking below the nest sites.

The use of man-made structures by breeding Black Guillemots is well known, the *Atlas* listing holes in harbour walls and other unusual sites. I can, however, find no record of the species breeding within a heavily industrialized area, or in an estuarine situation apart from the population in the brackish waters of the Baltic.

The Clyde at this point is 3 km wide with large areas of sandbanks exposed at low tide, and 10 km from seawater proper. Data collected monthly during 1979 by the Clyde River Purification Board at a point in the deep water channel off Port Glasgow showed that salinity ranged from an average of 14.22 parts per 1,000 (surface, low tide) to 29.34 p.p. 1,000 (bottom, high tide). Normal sea salinity is 33 p.p. 1,000.

A small fish dropped by an adult bird at the building was collected and later identified as Butterfish *Pholis gunnellus*, which is normal Black Guillemot diet.

The first record of a Black Guillemot off the Renfrewshire coast was in 1942 at Wemyss Bay, and all other records—mainly of individuals or parties up to five—are since 1972 when one was seen off Port Glasgow. Evidence of breeding in the inner Clyde first occurred in 1976 when three were seen displaying off Ardmore Point (Dunbartonshire) in early June and a juvenile was present there in August the same year. The nearest point where breeding has been recorded is Little Cumbræ, 35 km away (40 km by sea).

The shipyard Tysties look rather out of place against a backdrop of cranes and supertankers under construction but they have earned the affection of the workmen who generally seem keenly interested in the birds' wellbeing.

D. CARNDUFF

Tawny Owl nesting in abandoned car

On the evening of 15th May 1980 I was walking towards a rubbish dump in a mature Sitka/larch plantation near Glentool Village (Kirkcudbrightshire) when a Tawny Owl flew out of an old car abandoned on the dump. When inspecting the car I was astonished to find under the back seat a Tawny Owl chick plus one unhatched egg, the owlet being about one week old. The car was a very old Morris Oxford without windows. The owlet was ringed on 27th May (unhatched egg still present) and seemed healthy. David Glue informs me that this is to his present knowledge a unique Tawny Owl nest site.

ANDREW DOWELL

Obituary

LESLIE HILTON BROWN, OBE

Leslie Brown died in Kenya on 6th August 1980. An account of his education, professional work and publications appeared in *Ibis* (112: 427-8) in connection with his receipt of the BOU's Union Medal in April 1970. Here I give a personal recollection. It will suffice to say that after graduating at St Andrews he went on to tropical agriculture and became Chief Agriculturist in Kenya after 1960. Of more importance to us is that, despite this busy responsible job, he did far more ornithological research in his spare time than many professionals achieve full time.

I met him at Braemar in 1951 when he gave me a lift to the SOC conference in Edinburgh where he gave a talk on eagles. We discussed eagles all the way there and back. Later, he, Charles Palmar and I estimated the Scottish eagle population at 270-280 pairs. Subsequently Leslie and I studied Scottish eagles more deeply and he often stayed with me in Glen Esk while on holiday. I remember once returning past midnight after skiing in the Cairngorms. My wife had gone to bed but I found Leslie at the fireside with a bottle of whisky which we emptied while exchanging eagle news into the wee sma oors. Next day we climbed through deep snow into a blizzard.

Storm clad and winter-hardened, I marvelled at his determination, kilted and straight from Kenya.

Other memories stand out, like Leslie's skill at finding eyries, or his organization while we sat writing a draft. Another was his fireside conversation, telling us his adventures while living with primitive Kenyan tribes. Then there was his prickly individualism. Some found him cold and intolerant, but he admired grand wildlife and countryside, and natural rural folk, whether Kenyan tribesmen or Aberdeenshire hill farmers.

He often criticized sycophantic or authoritarian gamekeepers, and publicly objected to illegal persecution of birds of prey. I've known him ceremoniously fling piles of gin traps, collected on long hill walks, into deep salmon pools. As early as the 1940s he used to mark eagle eggs with indelible blue ink, adorned with four-letter words so that collectors would find the eggs of no value. He used to enthuse about the RSPB forming a young guerrillas section to burst locked gates, disturb deer stalks and grouse drives on offending estates, and terrorize miscreant keepers by turning up in force, picking teeth with a big sgian dubh each!

Leslie made a major contribution to our knowledge of eagles in Scotland and Africa, and did much to organize information on world birds of prey in several books, and popularize it in others. These and his many papers in *Ibis* and elsewhere made him a well known world ornithologist and will long outlive him.

So also will our memory of his character, as unusual as the work he did and published in his spare time. Heart trouble dogged him in recent times, but every year or so he toured Scotland, the United States and other countries, keeping in touch with eagle enthusiasts. He enjoyed spreading out a map of the Highlands, holding it down with a bottle of Glen Fiddich and two dram glasses. He would then put coins on crags with eyries to find gaps where other eagles might be expected. I and others will miss these special occasions. And we will miss the tall figure with the piercing eyes, stubbly beard, eagle-like eyebrows, and that serious face which could so readily break into a boyish grin when some mischievous thought came to him.

ADAM WATSON

Reviews

Collins Bird Guide: a photographic guide to the birds of Britain and Europe by S. Keith & J. Gooders. Collins, London, 1980. 768 pages; 613 colour photos; drawings; over 400 maps; 19 x 10 cm; softback £5.95.

The appearance of a new field guide, particularly one said to be revolutionary, poses a number of questions. Is it really different from those already available? Does it provide a better method of identification? Is it easier to use? The *Collins Bird Guide* is very different in appearance—tall, narrow and fat with floppy plastic covers. The species descriptions are excellent, very similar in style and content to Peterson, with an additional summarizing comment on each. The main difference is in the illustrations. These are photographs which are clearly reproduced with good colour renderings. They are grouped together at the beginning of the book, and are arranged according to the colour and anatomical or behavioural similarities of the birds. There can be very few birdwatchers who would not learn something from these attractive pictures. Good as they are, however, they do not offer a comprehensive guide to the various diagnostic features nor do they give an impression of the relative size of the different species. This new guide has many attractive features, but insufficient to displace the old favourite from my pocket or make me recommend it to a beginner.

Big Jake Calls the Waders. Haven Autoguides: Stereo SRTX/80/CUS 598. Millstream Records, Beach Rd, Weybourne, Holt, Norfolk, NR25 7SR.

This is a recording of Jake Ward's quite remarkable mimicry of wader calls arranged as a guide to identification. Having overcome an initial sense of astonishment that such sounds could be produced by the human voice, one can appreciate their success in presenting the wide range of wader calls in a memorable form. There is no artistic sense of atmosphere but this does not detract from the value of this record as a method of learning.

I. T. DRAPER

Observations of Wildlife by Peter Scott. Phaidon, Oxford, 1980; 112 pages; 39 colour, 66 plain illustrations; 28 x 22 cm; £7.95.

I found this book enjoyable. The paintings and sketches are cemented together with the author's personal view of life and nature conservation. The pictures themselves give much pleasure, particularly to anyone who has watched wildfowl, but the accompanying notes add a new meaning, often telling when, where and why they were created or why that particular style was used. Some notes are quite long and cover the biological or conservation background of the subject. A charming picture of Red-breasted Geese was painted during a certain committee meeting! The pictures also cover a wide range of Sir Peter's life from 1937 to 1980.

The main text should not be neglected. It deals with his approach to painting, his enthusiasm for the Wildfowl Trust and the need to encourage people to look at birds, his concern about the future of Planet Earth, and his extensive travels, including encounters with whales and fish. Throughout the book there are nice stories and anecdotes as well as some telling quotes. As the author says in the Epilogue, this is a patchwork of a book, but the many pieces merge to make a very pleasant one which is very good value.

FRANK HAMILTON

The Peregrine Falcon by Derek Ratcliffe. Poyser, Calton, 1980; 416 pages; 3 colour plates and many line & wash drawings by Donald Watson; one colour, c.60 plain photos; diagrams; maps; 24 x 16 cm; £12.

It is a pleasure to review this eagerly awaited book, although Dr Ratcliffe's own generous acknowledgment of my own Peregrine work makes criticism seem invidious. The dangers of pesticides and pollutants, especially to predators at the top of the food chains, are now well recognized, as is the value of monitoring predator populations and their contaminant

burdens, both as environmental barometers and to determine the measures needed to save the predators themselves. Yet these problems are recent and substantially date from 1945, the same year that the boy Derek Ratcliffe searched out his first Peregrine nests. It was as well that he did; in the years to come no other scientist's studies of one animal did more to identify and elucidate the problems of pesticides and wildlife. Moreover, although his work was scrupulously objective and he eschewed emotion and special pleading when others did not, it was largely as a result of his studies that the Peregrine became the fitting symbol of the desire for a cleaner Earth.

He begins by stating that he writes mainly of British Peregrines, that his book has no pretensions to scientific sophistication and that he has tried 'to write the story of the bird in an ever changing scene, to which it has so far adapted with remarkable success'. The books brings together his many publications and more recent data up to 1979, supplemented by his wide knowledge of current Peregrine studies by others in Britain and abroad, and of the literature. The 16 chapters cover history of relations with man, habitat throughout Britain, population trends, distribution and numbers, food and feeding, nesting habitat, the breeding cycle (two chapters), movements and migration, breeding density and territory, population regulation and dynamics, relations with other birds, pesticides, other enemies, appearance, form and variation, conservation and the future. The chapters are well organized but the layout results in some repetition. For many this will underline important points and help to connect the story but will be less to the taste of others. The major tables, usually broken down into districts and periods of years, cover distribution and number of nesting places, populations and breeding in 1930-39 compared to 1961, 1962, 1971 and 1979, food, features of nests, egg size, weight and shell thickness, clutch and brood size and organochlorine residues in livers and in eggs.

The intention to present the story simply and clearly is fulfilled. Nicely interpolated Peregrine anecdotes give freshness, as do Donald Watson's fine variety of illustrations and a very good selection of photographs. Many will enjoy the informal inside account of the pesticide story and the comments on the attitudes of some interested parties, which add a human dimension. I strongly recommend the book to all interested in Peregrines, and in the problems facing British wildlife in general.

Despite the modest disclaimer in the preface it is inevitable that this book will be regarded as a major scientific work on the Peregrine. The amount of new material and the value of a worker's own compilation of his studies make it an important work for serious students in Britain and abroad. From this viewpoint the book will attract some criticism, of varying validity. It is understandable that the role of mercury based pesticides in the Fenno-Scandian declines is not discussed but some mention of it might have been made. The necessity to calculate a British population baseline, here 1930-39, against which future trends can be assessed, is evident but the possible effects on the baseline of chronic local persecution at the time might be underestimated. Some people may feel that the discussions and conclusions advance little further than in the papers up to 1973.

It appears to me that, firstly, the author is constrained by a perhaps greater appreciation than the rest of us of the uncertainties of Peregrine population ecology, and secondly, that he has scrupulously avoided anticipation of the results of current studies by other British workers. Some disagreement with his views may result from differences in the main study areas of individual workers; I see the food spacing relationship as simpler and more direct than he does, probably because my experience is much more limited to grouse-eating Peregrines. Certainly I

agree with most of his conclusions and comments, as on the oiling of Peregrines by Fulmars; his views are supported by events on the c.10 mi² Chowiet Island (Alaska) where five pairs of Peregrines breed successfully among over 200,000 Fulmars, with no evidence of oiling.

Although well up to date, the book could not include some exciting recent events, notably the successful 1980 breeding in the wild of three pairs of captive bred Peregrines in the northeast U.S. and the spectacular recovery in 1979-80 of an inland boreal population in Alaska and the Yukon Territory. Finally, after again commending this book, every reviewer is allowed one anecdote: I once knew a head stalker who pole-trapped Peregrines, in all sincerity to protect the Choughs nesting on the estate.

DOUGLAS WEIR

Also received

Recording Natural History Sounds by R. Margoschis. Print and Press Services, Barnet, 1977; 109 pages; plain photos; diagrams; 22 x 15 cm; £4 (hardback), £2.75 (softback).

Wood Engravings of Birds by C. E. Jackson. Witherby, London, 1978; 144 pages; colour plate, many plain illustrations by Bewick, Thorburn, Tunnicliffe *et al.*; 24 x 15 cm; £5.95.

Highland Wildlife by Richard Perry. Croom Helm, London, 1979; 202 pages; 16 plain photos; 22 x 14 cm; £6.95.

The Guinness Book of Woodland Birds by Michael Everett. Guinness Superlatives, Enfield, 1980; 160 pages; 50 colour photos; over 50 drawings by R. A. Hume; over 50 maps; 20 x 14 cm; £3.95.

The books reviewed above are available from the SOC Bird Bookshop

Current literature Articles and reports on the status and distribution of birds in Scotland are listed here. Strictly biological studies such as ecology or behaviour are excluded and so are references from the widely read journals **British Birds**, **Bird Study**, **Ringing and Migration** and **Ibis**. Most items listed and many others are available for reference in the club library and we are grateful to the contributors. The library welcomes copies of work on any ornithological subject.

The breeding populations of terns in Orkney and Shetland in 1980. I. D. Bullock & G. H. Gomersall 1980. RSPB report.

BTO/SOC Corncrake survey 1978/79. C. J. Cadbury.

Tay Ringing Group Report 1978-79. 1980. (Includes papers on sexing Dippers, winter waders, breeding Grey Wagtails, Heron movements and mortality, and Lapwing movements).

North-East Scotland Bird Report 1979. A. G. Knox *et al.* 1980. Aberdeen University Bird Club.

Wick High School Bird Report 1979. K. W. Banks (ed.).

The effects of [sic?] song-bird populations of upland afforestation with spruce. D. Moss *et al.* 1979. *Forestry* 52: 129-150.

Stirling and Clackmannan bird report 1978. — 1979. C. J. Henty 1980. *Forth Naturalist and Historian* 4: 49-73 (1979).

Peregrines and man in the Stirling region. J. Mitchell 1980. *Forth Naturalist and Historian* 4: 75-85 (1979).

The Birds of Glen Clova. B. M. Lynch 1980. SOC Dundee Branch. 35p.

Lothian Bird Report 1979. G. F. Bell *et al.* (ed.) 1980. 85p + postage from G. F. Bell, 434 Lanark Road, Edinburgh, EH13 0NJ.

Sea birds and the Bravo blow-out at Ekofisk, North Sea. F. Mehlum 1980. *Polska Akademia Nauk: Acta Ornithologica* XVII: 119-126.

Ornithological Interest of Some Inland Waters in Wigtownshire. J. E. Howie 1980. Nature Conservancy Council, 19/20 Belgrave Square, London, SW1X 8PY.

- Heronry Report for Loch Lomondside*, 1980. J. Mitchell 1980. Nature Conservancy Council, South West Region.
- 1980 *Census of Breeding Waders on the Ring Points: Loch Lomond National Nature Reserve*. J. Mitchell 1980. Loch Lomond NNR.
- Wintering seaducks in the Moray and Dornoch Firths, Scotland. G. P. Mudge & D. S. Allen 1980. *Wildfowl* 31: 125-30.
- Population study of Golden Plover *pluvialis apricaria*, using marked birds. R. Parr 1980. *Ornis Scandinavica* 11: 179-189. (Study area Kincardineshire.)
- The spring migration of Sanderlings *Calidris alba* through Britain in 1979. P. N. Ferns 1980. *Wader Study Group Bulletin* 30: 22-25.
- The Results of the National Wildfowl Counts and Birds of Estuaries Enquiry 1979-80*. D. G. Salmon (ed). Wildfowl Trust. 75p including postage from BTO.

Letter

Status of Ring-necked Parakeet in Scotland

The party of Ring-necked Parakeets *Psittacula krameri* seen flying along the East Lothian coast (11: 140) is not, as suggested, the first Scottish record of this species. On the morning of 18th April 1976 I saw a male bird near Dunbar (East Lothian) and what may have been the same individual was seen the next day near Gullane, flying out over the Firth of Forth towards Fife (R. Nisbet pers. comm.). The weekend had started with easterly winds and fog and numbers of migrants were seen at the same time as the parakeet.

There is, of course, a feral population in England where breeding has been recorded as far north as Cheshire. Concern has been expressed over this, especially in fruit growing areas where the birds could prove to be a pest. An inquiry into their status (*BTO News* 93: 7, 102: 5) has already produced Scottish records from Dundee and Wick in 1977-80, Moffat 1979-80, and Loch Lomond and Aberdeen in 1980 (B. Hawkes pers. comm.) but as yet no evidence of breeding north of the border. In view of their expansion in England and the birds' apparent ability to withstand cold winters, breeding in Scotland seems a distinct possibility. However, Ring-necked Parakeet has never featured in the *Scottish Bird Report*, which seems unfortunate as there is a need to document the birds' expansion throughout the British Isles.

S. R. D. DA PRATO

Notices

Garganey and Cirl Bunting records As a result of representations from several people, the Rare Breeding Birds Panel has agreed to add Garganey and Cirl Bunting to its list. Since the panel's most recently published report is that for 1979 (*Rare breeding birds in the United Kingdom in 1979, Brit. Birds* 74: 17-36) it is possible for these additions to be made retrospectively: Garganey and Cirl Bunting will be included in the panel's 1980 report as well as subsequent ones.

Observers are requested to send details of all breeding season sightings of these species in 1980, 1981 and subsequent years to the relevant county or regional bird recorder who will, as usual, then pass them on to the panel on its special forms. Please notify mere presence in the breeding season in suitable habitat (as well as probable and confirmed breeding); both species appear to be decreasing and we stress that **all** breeding season records are required.

Working Group on Granivorous Birds (INTECOL) The third International Congress of Ecology will take place in Warsaw from 5-11 September 1982. The Working Group on Granivorous Birds (INTECOL) is organizing inside the congress a special symposium. The role of granivorous birds (especially Corvidae and Columbidae) in ecosystems is suggested as a theme of symposium. The theme will include the problems: (1) population dynamics, (2) biomass and production rates, (3) energetics, (4) impact of granivorous birds in ecosystems, (5) management of pests. The time for oral contributions at the symposium is limited to 15 minutes. The programme of the symposium has to be arranged at the end of 1981, i.e. based on titles and one page abstracts of papers. The poster presentation will be also possible. All correspondence should be sent to Prof. Dr Jan Pinowski, Institute of Ecology PAN, Dziekanow Lesny, 05-150 Lomianki, Poland, or by telex 817378 IEPANPL.

Northeast Scotland bird atlas A local atlas project covering Grampian Region (apart from Moray District) was launched in January. It will run until the end of 1984, after which maps will be produced for summer, winter and passage distribution. The area has been divided into almost 400 sites; it is hoped that most of these sites will be covered at least 12 times during the four year period, once for each month of the year. If this can be achieved, it should be possible to summarize accurately the seasonal changes in the distribution of species. Initial response has been very encouraging. However, with such a large area to cover, all offers of help will be gratefully accepted, even if you are only in the area for a day or two on holiday. If you are interested in taking part or would like further details, please contact Steve Buckland, Statistics Department, Aberdeen University, AB9 2UB.

Grampian Merlins A long term study of Merlins breeding in Grampian region has begun. Information on breeding sites (old or new) or sightings of birds in breeding habitat would be welcomed by Graham W. Rebecca, 31 Rainneshill Gardens, Newmachar, Aberdeenshire.

(Notices must reach the editor at least four months before publication.)

The Scottish Ornithologists' Club

ANNUAL CONFERENCE

The 34th annual conference and 45th annual general meeting of the club will be held in the Marine Hotel, North Berwick, East Lothian, during the weekend 30 October to 1 November 1981. The conference programme and booking form will be sent to all members with the autumn journal early in September. Reservations for the conference can only be accepted on the booking form; the Marine Hotel has been instructed not to accept any booking except through the club secretary.

BRANCH MEETINGS

Will members please note that the dates of the first meetings of branches next winter will be as follows:

- September** 21st Borders and Glasgow
 22nd Edinburgh, Inverness and Wigtown
 23rd Ayr, Dumfries, St Andrews and Thurso
 24th Dundee, New Galloway and Stirling
- October** 5th Aberdeen

The venue and times of all meetings are unchanged; full details will be published in the syllabus of lectures sent to all members with the autumn number of the journal early in September.

LOCAL RECORDERS

Please note the following new Local Recorders to whom records for the 1981 *Scottish Bird Report* should be sent :

Orkney C. J. Booth, 'Ronas', 34 High Street, Kirkwall, Orkney.
Lanarkshire Dr E. S. Alexander, 3 Lilac Hill, Hamilton, Lanarkshire
 ML3 7HG.

GEORGE WATERSTON MEMORIAL FUND

Members will be interested to know that at the time of going to press (30 April) £2,625 had been donated. Details were enclosed with the spring journal and contributions are still welcomed; these should be sent to The Secretary, SOC, 21 Regent Terrace, Edinburgh EH7 5BT, together with an SAE if an acknowledgment is required.

WANTED - ELECTRIC DUPLICATOR

The electric duplicator in the SOC office has broken and is too costly to repair. If any member knows of one which is no longer required, and can be donated to the club, please contact the club secretary at 21 Regent Terrace, Edinburgh EH7 5BT (tel. 031 556 6042). Arrangements can be made to collect it if necessary.

BRANCH SECRETARIES

Will members please note the following new appointments :

Ayr B. C. Forrester, 29 Crandleyhill Road, Prestwick, Ayrshire (0292 75670).

Edinburgh Miss J. Wilcox, 18 Howdenhall Gardens, Edinburgh EH16 6UN (031 664 8893).

Current Notes

These include unchecked reports and are not intended as a permanent record, nor will they be indexed. Please send reports to the editor via local recorders at the end of March, June, September and December.

The period January to March is covered here. The mild winter weather produced a strange mixture of species. Gulls have been particularly interesting. Large numbers of **Glaucous Gulls** have been widespread. In Shetland 120-150 were seen on Unst, and Fraserburgh attracted up to 26. **Iceland Gulls** have also been widely distributed but in smaller numbers. Shetland yet again stole the show with 3 adult **Ross's Gulls**. It seems strange that there is still not a Scottish east coast record south of Caithness. Wildfowl were much in evidence; 74 **Bean Geese** in the Carron Valley was the largest flock in Scotland for several years. An **American Wigeon** in Udale Bay and at least 3 **Ring-necked Ducks** in SW Scotland attracted a number of observers. The most elusive bird was the **Gyr Falcon** which tantalized many birders in the Lammermuirs. A **Long-billed Dowitcher** which wintered at Caerlaverock entertained many visitors, though only a lucky few saw the **Little Bunting** which paid a brief visit there in February. The mild weather was no doubt responsible for the reports of wintering 'summer visitors'. A pair of **Whin-**

chats at Selkirk, a **Black Redstart** at Dunbar and a **Firecrest** on the Black Isle were well north of their normal wintering ranges, though **Great Shearwaters** at Ayr and Fraserburgh were in the wrong hemisphere. All indications suggest an early start to the breeding season, though first prize for optimism must go to a **Blackbird** incubating eggs in Ayrshire in January.

White-billed Diver dead Noss Head (Caith) 22 Jan, Whalsay (Shet) Feb. **Fulmar** 9 blue phase Fraserburgh (Aber) 14 Feb. **Great Shearwater** Fraserburgh 14 Feb, 2 Ayr 21 Feb. **Night Heron** Kelso (Rox) Jan. **Bean Goose** 74 Carron Valley (Stir) 15 Feb. **Snow Goose** white phase Skene (Aber) Mar. **Canada Goose** one of smaller races with Barnacles S. Walls (Ork) 19 Mar. **Brent Goose** Pale-bellied *hrota* Eden Estuary (Fife) 7 Feb-1 Mar, Cotehill L (Aber) 15 Feb. **American Wigeon** ♂ Udale Bay (Ross) Jan. **Teal** Green-winged *carolinensis* Stornoway (Lewis) 4 Jan. **Ring-necked Duck** single ♂♂ L Insh (Inv) Jan-Mar, Soulseat L (Wig) Jan-Feb, Gadloch (Lan) Jan, Woodend L (Lan) Jan. **King Eider** 2 ♂♂ Golspie (Suth), Mar, ♂ Sullom Voe (Shet) 10 Mar. **Surf Scoter** ♂ Golspie Mar. **Smew** ♂ L Strathbeg (Aber) 15-28 Jan, ♂ Sullom Voe 6 Jan, 2 ♂♂ Kelso Jan, single redheads Stranraer (Wig) 11 Jan-1 Feb, Hensol (Kirk) Jan, L Davan (Aber) Jan, Martnaham L (Ayr) Jan-Mar, Ayr 9 Feb-16 Mar.

Rough-legged Buzzard 3 Aberdeen Mar. **Gyrfalcon** grey phase Whitadder Resr (E Loth) and Hule Moss (Ber) Feb-Mar, Shetland Mar. **Ruff** 15 Eden Estuary 21 Mar, 29 Aberlady 24 Mar. **Long-billed Dowitcher** Caerlaverock (Dumf) Jan-Mar. **Spotted Redshank** Ardersier (Inv) Jan-Feb, Eden Estuary 8 Jan. **Green Sandpiper** Tarholm (Ayr) Jan-Feb. **Little Gull** Ayr 9 Feb, Girdleness (Aber) 19 Feb. **Iceland Gull** 10 singles various sites Jan-Mar, total 4 Ayr Jan-Mar, 12 Lewis Jan-Mar, 4 Fraserburgh Feb, 4 Girdleness Feb, 6 Scalloway (Shet) Mar, 2 Inverness Mar. **Glaucous Gull** various sites Jan-Mar, max 8 Scalloway Jan, 7 Wick Jan, 10 Noss Head 11 Jan, 120-150 Unst (Shet) 23 Jan, 2 Elgin (inland) Feb, 26 Fraserburgh 3 Feb, total 10 Ayr Jan-Mar, total 13 Lewis Jan-Mar. **Ross's Gull** Unst 22 Jan, Scalloway 24 Jan, Quendale (Shet) 28 Jan. **Sandwich Tern** 2 Forth Jan-Mar, 3 Prestwick 28 Mar. **Brünnich's Guillemot** dead Johnshaven (Angus) 25 Jan. **Little Auk** singles Yell Sound (Shet) 6 Jan, Fraserburgh 14 Feb, Fortrose (Ross) Mar, 2 Echnaloch Bay (Ork) 28 Jan, 2 Port Seton 14 Feb, 3 dead Aberdeenshire Mar, 3 dead Fife Mar. **Kingfisher** Botanic Gardens Edinburgh Jan-Mar.

Sand Martin Linlithgow L (W Loth) 21 Mar. **Swallow** Danna (Argyll) 1 Apr. **Waxwing** Peterhead (Aber) 11 Jan, 2 Edinburgh Jan, 2 Caithness Feb. **Black Redstart** Dunbar Jan, Fair Isle 16 Mar-2 Apr. **Whinchat** 2 Selkirk Jan. **Wheatear** Great Cumbrae (Bute) 14 Mar, Glenshee (Perth) 15 Mar. **Ring Ouzel** Westwater (Midl) mid Mar. **Blackbird** incubating Ayrshire 27 Jan. **Blackcap** 4 singles Aber/Kinc Jan-Feb, Edinburgh Feb, 2 Stornoway Jan-Feb. **Chiffchaff** singles Aberdeen Jan, Ackergill (Caith) Jan, total 5 St Andrews (Fife) winter, total 11 Borders Jan. **Willow Warbler** Prestwick 28 Mar. **Firecrest** Black Isle 21 Mar. **Willow Tit** 2 Hule Moss 22 Mar. **Great Grey Shrike** Glen Tanar (Aber) Jan, Hule Moss 11-15 Mar. **Chough** shot Ayr 31 Jan. **House x Tree Sparrow** hybrid ♂ Fair Isle 16 Mar. **Brambling** 100 Penicuik Mar. **Lapland Bunting** 8 Musselburgh Jan, 2 Gullane 23 Jan, 7 S. Uist 15 Feb. **Little Bunting** Caerlaverock 25 Feb.

Late news (April) **Ring-necked Duck** ♂ Kilmichael (Arg); **Sandhill Crane** Fair Isle from 26th.

PETE ELLIS

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Vol. 11 No. 7

AUTUMN 1981

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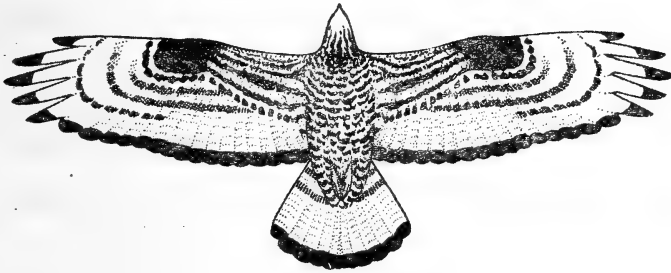
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Editor D. J. Bates

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SCOTTISH BIRDS

THE JOURNAL OF THE SCOTTISH ORNITHOLOGISTS' CLUB



Vol. 11 No. 7

Autumn 1981

Edited by D. J. Bates

A count of Gannets on Boreray, St Kilda

S. MURRAY

(Plates 25-26)

St Kilda holds the largest gannetry in the world with something like a quarter of the total population. But how accurately can Gannets be monitored in such a difficult and dangerous site?

The St Kilda group is famous for its seabirds, and Boreray, with its adjacent Stac Lee and Stac an Armin, was thought to have 28% of the world population of the Gannet in 1973 (Cramp *et al.* 1977). Prior to the evacuation of the resident human population in 1930 large numbers of Gannets were killed but since then they have been unmolested and rarely even counted. This paper reports on the Gannets of Boreray in 1979.

The first estimate of the population on the group in this century was made by Wigglesworth in 1902, who based his suggested 15,000 pairs on the numbers of eggs collected from the top of Stac Lee on 14th May 1902 (Wigglesworth 1903). In 1931 Harrison attempted to make a direct count from a boat in difficult conditions. He estimated a total of 21,300 adults but stressed that 'these figures clearly have a wide margin of error' (Harrison 1933). Further counts made from the sea by Fisher and others found 16,900 pairs in 1939 and 17,035 in 1949 (Fisher & Lockley 1954).

The first systematic survey of the colonies was made between 11th and 21st May 1959 by Boyd (1961). He plotted the distribution and extent of all the nesting areas from aerial photographs, augmented by others taken from the sea and land. He divided the colony into 116 distinct sections, including 89 on Boreray itself. These were further divided into sub-sections and each was demarcated on aerial photographs. He then made four counts of birds on each of these sections from the photographs. The means of these counts gave 25,569 individuals on Boreray, 11,442 on Stac Lee and 10,178 on Stac

an Armin. He converted the total of 47,189 birds to 44,526 pairs, using a conversion factor obtained by counting the number of pairs present among 100 birds in a sample of aerial and land photographs.

The next estimate was made in July 1969 by Dixon (1973) from 13 aerial photographs covering only 24 sections of the colony (17 on Boreray, seven on Stac Lee). Using counts from the photographs, and assuming the same distribution of birds on the island and stacs as given in Boyd (1961), Dixon estimated the total population as 52,099 pairs. On 18th May 1973, 19 sections of Boreray and one of Stac an Armin, equal to 36% of the colony in 1959, were photographed from the sea. From counts of these photographs Dixon (1973) suggested a total population of 59,258 occupied nests. 'This represents a 37% increase over 1959, which is 2.1% per annum for the period, or well within the colony's own capacity for increase' (Nelson 1978, p. 61).

The 1979 count methods

I tried to make a direct count of nests and obvious pairs on Boreray between 27th May and 1st June, a time of year when birds are incubating eggs or brooding small young, and the situation is not too confused by non-breeding birds, large young or off duty adults. No attempt was made to count the stacs, as the majority of Gannets on both are hidden from Boreray. Direct counts were preferred because these are more accurate than those from photographs (Harris & Lloyd 1977).

The large size of this gannetry and the intimidating scale of the cliffs of Boreray have led to a belief that it is impossible to make an accurate count from the land. However, I had previously made 13, often prolonged, visits to the island and found ways across the 384 m high west cliffs from Clesgor to Geargo and eventually a through route at two levels from Geo Tarnanach to Sunadal. By such tortuous routes virtually all the colony can be viewed from the land. I spent two days checking the accessibility of colonies and finding sites that allowed the best views of the nesting ledges. Using drawings and polaroid photographs the views from the various sites were compared to determine potential overlaps and hidden ground. Photographic coverage was virtually complete so it is thought that few, if any, areas were overlooked or counted twice. Eventually 13 count sites were chosen: nine of them are easily accessible to anyone with a head for heights, the others might be considered hazardous.

Using obvious natural features, the colonies were divided into 25 discrete areas covering all 89 of Boyd's Boreray sections. Twelve of these areas were counted from the land, one

from the sea and eleven partly from the land and partly from photographs. One area was not counted. All the photographs used in the count were taken from the sea. Except for three covering section 89, all were of areas that were hidden or only partly visible from the land. Detailed descriptions of these areas and how they were counted, with maps and photographs, are deposited with the SOC.

Despite the scale of the cliffs, nests are easy to count through binoculars since most Gannets nest on narrow ledges in open situations. I counted birds on nests, and pairs where the birds were sitting on apparently suitable nest sites. There is no check on the accuracy of these counts but they were carefully made under fairly good conditions. Three areas were also counted by two other observers. Their totals were 1,115, 799, 463, and 1,227, 779, 429 nests/pairs, compared with my counts for the same areas of 1,017, 870, 467 respectively. Mullach an Tuamail was counted from Sunadal by myself and one other, the totals being 3,259 and 3,360 respectively.

My counts from photographs were also of birds on nests and obvious pairs, but interpreting these was difficult and depended on the quality of the photographs. Three sections were counted from colour slides projected through an enlarger; birds, nests and the colony limits were clearly visible. The majority were counted from black and white, full plate prints. These were divided into sub-sections, using as far as possible natural features, and counted through a binocular microscope at x4 magnification.

These prints varied considerably in contrast and definition. The best showed clearly defined Gannets and nests; the worst, ill defined white dots, but the majority of birds were clearly identifiable. Sitting birds were counted as nesting or site owning, standing individuals were not. Obvious pairs, that is birds standing so close as to be nearly touching, were included as nesting. Photographs were counted four times and mean counts are given here. Unlike the counts done from colour slides, which gave small and consistent variations from the mean, those done from black and white prints varied widely, from 8.7% to 19.6% of the means. This is partly a reflection on the quality of the photographs, the greater number of birds involved, and the rather imprecise method of deciding what was counted. Nonetheless it gives as reasonable an estimate as any other approach to interpretation of indifferent photographs.

In three out of four areas where both direct and photographic counts were done, the counts from photographs were from 10.2% to 19.4% higher. In the fourth case the photographic count was 15.8% lower. This contrasts with Harris &

Lloyd (1977) who found that counts of individual Guillemots and Kittiwake nests from photographs were invariably lower than field counts. My field counts are probably lower because it is fairly easy in the field to detect when two Gannets standing together are not actually nesting; this is impossible in a photograph. Another reason why field counts are to be preferred is that it is easier to determine hidden areas in the field than it is from photographs.

To find the variation in counts made by different observers of part of the Grassholm gannetry, I took part in tests carried out by Harris & Lloyd (1977) (I am observer number 2 in their paper). Of nine other people tested, seven had counts higher than mine and only two had lower counts. Thus I may tend to undercount on photographs. If so, my count of the Gannets on Boreray could be an underestimate. However, my own field counts were mostly lower than those from photographs, which suggests, if anything, an overestimate.

Results and discussion

In 1979 I counted 17,033 nests/pairs on Boreray, 11,757 by direct counts and 5,276 from photographs. The area I did

Table. Counts of pairs/nests of Gannets on Boreray

	Section number	May 1959	May 1979
Creagan Fharspeig	1- 2	44	56
Creagan na Rubhaig Bana	3-12	1736	1236
Mullach an Tuamail	13-41	5655	3815
Geo Sunadal	42-47	1915	1959*
Udraclete	48-50	1025	1011
Geargo	51-57	2538	No count
Ant Sail	58-63	1781	1685
Mullach an Eilein (lower)	64-66	1247	837
Mullach an Eilein (upper)	67-72	1425	1074
Na Roachan (lower)	73-78	2582	1684
Na Roachan (upper)	79-82	1335	1238*
Clagan na Ruskochan (west))	83-88	2627	2150
Clesgor			
Clagan na Ruskochan (east)	89	223	288

24,133

17,033

19,010

(derived total)

Notes

1. All 1959 totals are of pairs derived from figures in Boyd (1961).
2. 1979 totals are of nests/obvious pairs.
3. * Indicates counts which are known to be too low. Estimates from photographs suggest 100-200 pairs hidden from a land view of section 43 and 50-100 pairs on section 79.
4. The derived total is given on the assumption there was 10.4% of the Boreray population (1,977 nests/pairs) on Geargo in 1979, as there was in 1959.

not count had 10.4% of the total for Boreray in 1959. If the same applied in 1979 the total island estimate would be 19,010 (table).

Separate figures for Boreray are not given by Dixon (1973) and in Boyd (1961) they are expressed as individuals, but calculations from the published tables in these papers using Boyd's conclusion that 54.2% of St Kilda Gannets nest on Boreray gives estimates of 24,133, 28,238 and 32,118 pairs for 1959, 1969 and 1973.

All these counts were made in different ways, so the results are not directly comparable. Boyd counted individuals on photographs of the entire colony. Dixon had only partial coverage for both his counts, but the sections covered on Boreray were much the same for both years. In 1969 he worked from aerial photographs taken in July, a month when the situation is much complicated by non-breeding birds. In 1973 the photographs were taken in May, entirely from the sea. His calculations were then based on Boyd's sections, as delineated in his paper. He was unsure of the exact boundaries between sections, so he could have overestimated the section sizes, and the number of birds within a section, thereby increasing the entire gannetry in proportion.

To judge from areas where the 1959 and 1979 photographs are of good enough definition to allow close comparison of birds and ledges, there has been little change in the extent of the colonies. Then, as now, birds occupied nearly all available space on the rock walls and cliffs on the east and west sides of the island. There has been no expansion on to nearby, equally steep, grass slopes. 'On both the Bass Rock and Ailsa Craig, where the numbers of birds have been increasing at c.3% per annum over a comparable period, marked changes in colony extent have been noted' (S. Wanless, pers. comm.).

Only one definitely new nesting area was identified in 1979. This was on the landward side of Clagan na Ruskochan, where there were 16 nests. Just a single Gannet appears on the 1959 photograph. In addition Gannets were seen and were probably nesting among Guillemots on the lowest and most northerly point of Ant Sail. None were recorded there in 1959, but could easily have been overlooked.

Stac an Armin

The south face of Stac an Armin as seen from Boreray summit has three distinct groups of Gannets. The upper colony is covered by section 115, the large centre colony and the lowest and smallest colony are both included in sections 109 and 116. These sections also cover part of the west face and in 1959 totalled 712 individuals. The 1979 total for these sections

was 1,095 nests/obvious pairs. It is not possible from Boyd's paper to work out exactly how many birds were on this centre colony in 1959, but comparison with photographs taken in later years clearly show the increase in colony extent since 1959.

This colony is a compact and clearly definable group, ideal for photographic monitoring, and anyone who lands on Boreray would do well to photograph it from the summit or nearby. This was done by S. Wanless in July 1980 who counted 840 occupied sites. My total in May 1979 using similar criteria but expressed as nests/obvious pairs was 828.

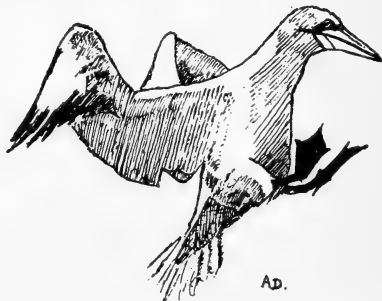
Counts were not done of other sections on the stac but photographs taken from the sea suggest little change in colony limits since 1959. The total for Stac an Armin in 1959 was 9,617 pairs and a suggested figure for 1979 is a minimum of 10,000 pairs.

Stac Lee

No attempt was made to count this colony in 1979. The fact that the 1959 and a 1971 count of the south face from aerial photographs agree so closely suggests that this area is more or less full (Dixon 1973) so it is curious that ledges on the south side are unoccupied to a height of c.50 m. These are the only feasible walking routes to the summit, but as there have only been two ascents in the last 50 years, human disturbance is unlikely to have prevented colonization of these ledges. The north face also has a ledge, c.60 m long and free of Gannets. Unless they are in some way unsuitable as breeding sites they are areas that might be colonized in the future. The 1979 population is probably similar to the 1959 total of 10,775 pairs.

Conclusion

The different counting techniques make it difficult to decide whether or not there has been any change in the number of



GANNET
Andrew Dowell

Gannets on Boreray. However, the population certainly appears not to have increased greatly there, if at all, in the last two decades. It is suggested that the whole gannetry of St Kilda contains 40,000 pairs \pm 20%, a population similar to 1959.

Acknowledgments

I wish to thank Dr J. M. Boyd for access to the 1959 photographs and T. J. Dixon for clarifying several points. Drs M. P. Harris and S. Wanless improved the manuscript with their criticisms and the SOC kindly supplied a grant towards the cost of hiring a boat.

Summary

A census of 90% of the gannetry on Boreray in May 1979, by direct counts and from photographs taken from the sea, found numbers similar to 1959, but these counts are not directly comparable since different methods were used. However, comparison with the 1959 photographs showed little change in colony extent. No detailed counts were done of Stac an Armin or Stac Lee but an increase was noted at one colony on Stac an Armin. It is suggested that the St Kilda gannetry contains c.40,000 pairs \pm 20%, similar to 1959.

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Colonization of Foula by Gannets

R. W. FURNESS

The Gannet population of the British Isles increased at an average of 3% per annum, from 54,500 pairs in 1939 to 141,000 pairs in 1969. Although the number of pairs nearly trebled in this period, the number of colonies only increased from 14 to 16 (Nelson 1978). Gannets are conservative by nature and some form of social inertia inhibits the colonization of new breeding areas. For this reason it is particularly interesting that Gannets have recently founded two new colonies in Shetland. Three nests were built on Fair Isle in 1974 but no

eggs laid, while eight nests were completed, five eggs laid and three chicks fledged in 1975 (Scottish Bird Reports). This colony has been steadily increasing since then by immigration from elsewhere.

Gannets first bred successfully on Foula in 1980, but the process of colonization began several years earlier. Expeditions, including ornithologists, from Brathay Exploration Group have visited Foula every summer since 1956 and have made notes on the status and numbers of Gannets as well as other breeding and migrant birds. Before 1960 it was rare to see more than 40 Gannets passing Foula in one day. In 1961 daily counts ranged as high as 400, and Gannets were recorded patrolling the cliffs for the first time.

The first record of Gannets settling on the island was in July 1970, when 28 spent several days on the cliffs and one was seen carrying seaweed towards the Kame. In 1971 up to 54 roosted on the cliffs and stacks below the Kame and Logat. In 1972 there were up to 360 present. Of these, nearly half appeared to be in adult plumage, nearly half had some black secondaries or rectrices so were 3-4 years old, and the remaining few were dark above with pale head and underparts so were mainly two years old (Nelson 1966). Between 1972 and 1980 numbers on the ledges and stacks rarely exceeded 250, but at least 50 were present on most days between June and early August.

The ratio of plumage classes appearing to be 2 years:3-4 years:adult remained about 1:4:4 over these nine years, so it is clear that different birds were present on the cliffs in different years. After each winter many apparently adult birds must have moved to another colony rather than returning to Foula.

Although a bird was first seen carrying nest material in 1970, no nestbuilding occurred until 1975. In 1976 three nests were completed in June but no eggs laid. None were built in 1977 although numbers on the cliffs were as high as in 1976. Two were built in 1978, but again too late for eggs to be laid, and again in 1979 no nests were completed. In 1980 at least 15 pairs began building and 13 nests were completed. Six birds appeared to be incubating or brooding on 30th June, and at least four of these were seen to turn eggs. On 12th July one adult was standing guard over a small chick while three were brooding or incubating. Many of the nonbreeders had left the cliffs by this date or were only returning irregularly to the island. Later in July three more eggs hatched successfully but the subsequent fate of the chicks is unknown.

Nelson (1966) found that almost all Gannets on the Bass Rock laid before the end of May and late-laying birds had a

much lower breeding success. As the incubation period is about 45 days the pairs on Foula probably laid in early June, considerably later than in an established colony. A very late breeding season is typical of seabirds breeding for the first time and is normal for a newly established colony (Nelson 1980).

Three areas on Foula have been used regularly by roosting Gannets. The most frequent, and the area where breeding occurred in 1980, is a large rock shelf near the foot of the Kame and the top of a stack (Da Stab) by this shelf. There is room for expansion at the expense of nesting Fulmars and Guillemots and several hundred pairs of Gannets could occupy the area. On Wester Hoevdi a single broad ledge has been used regularly for roosting, as has Gaada Stack, a small sloping-topped stack at the north tip of the island presently covered by nesting Fulmars and Razorbills. Both sites are rather small.

Much of the Foula coastline is unsuitable for nesting Gannets as the cliffs tend to be very steep and unbroken, and where this is not the case there are large boulder screes more suitable for Shags, Puffins and Razorbills, so it seems unlikely that the Foula gannetry will ever become comparable to those on Noss and Hermaness, the two well established Shetland colonies.

The Gannet is one of the favourite victims of piracy by Great Skuas. It is easily outflown by the Great Skua and forced to alight on the sea or regurgitate food. It is worth noting that the colonization of Foula by Gannets brings them into close contact with the largest Great Skua colony in the North Atlantic. The 200 or so Gannets are outnumbered by more than 30:1 by the Great Skuas but even so they appear to have raised chicks to at least three weeks old in their first year of breeding on the island.

Acknowledgments

I thank all those who noted numbers and activities of Gannets on Foula and in particular M. J. Wareing, N. Williams and M. Tasker in 1980. The Seabird Group, the Nature Conservancy Council, Glasgow University and the Scottish Ornithologists' Club provided financial support.

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Isle of May Bird Observatory and Field Station Report for 1980

Prepared for the Observatory Committee by
B. ZONFRILLO, Honorary Secretary

(Plate 24)

Observatory coverage commenced on 29th March and, apart from some short spells in summer, lasted until 25th October. NCC summer warden Peter Lack provided invaluable assistance as did Dr M. P. Harris and S. Murray. Numbers of many passerine species were lower than in recent years but ringing totals were higher for many breeding species. The Puffin colony continues to increase and Common Terns bred successfully for the first time since 1957. A Montagu's Harrier was new for the island. Rarities included Grey-headed Wagtail *Motacilla flava thunbergi*, Black-eared Wheatear,* Siberian Stonechat *Saxicola torquata maura*,* Richard's Pipit,* Rustic Bunting,* Scarlet Rosefinch* and Little Bunting.* Scarce species ringed were Icterine Warbler (3), Barred Warbler (3), Yellow-browed Warbler, Red-breasted Flycatcher and, for the second year in succession, a Subalpine Warbler.*

Migrants

A snowfall in late March perhaps slowed up many migrants but by 4th April a Tree Pipit and four Black Redstarts had joined the first Wheatear of spring. Fine sunny weather brought the first warblers with a Blackcap and Chiffchaff on 10th, a Willow Warbler on 14th and a Whitethroat on 16th. Other mid month migrants included Ring Ouzel, Whinchat, House Martin, Swallow, Common Sandpiper and a Short-eared Owl.

Easterly winds in early May brought another influx of birds, including a string of rarities. The first of these, a male Black-eared Wheatear,* arrived on 2nd May and stayed until 16th; it was netted and ringed on 5th May. On 13th May a Blue-throat and a Rustic Bunting* were seen and a Montagu's Harrier found the island and its migrants worthy of an overnight stay. A Grey-headed Wagtail was identified on 16th and another rarity (for the May) was a House Sparrow on 18th. Migrants such as Green Sandpiper, Red-backed Shrike and Grasshopper Warbler passed through during May, and on 24th a beautiful male Subalpine Warbler* was trapped, only to be followed half an hour later by an equally fine male Blue-

*Indicates subject to acceptance.

throat. On the last day of May three flycatchers were noted as the only migrants on the island, one Spotted, one Pied, and one Red-breasted which was trapped. Another House Sparrow appeared on 6th June and on 17th a Roseate Tern was seen offshore.

A flock of 20 Common Scoters offshore on 2nd July heralded the start of autumn migration. A Reed Warbler was trapped on 4th. Easterly winds late in the month resulted in Icterine Warblers being trapped on 30th and 31st. On 4th August 70 Whimbrels were recorded with 67 of these in a single flock. Another period of easterly winds in late August resulted in a Barred Warbler trapped on 28th. On 29th 100 Swallows preceded a deterioration in overnight weather conditions. On 30th a fall of assorted migrants spread themselves over the island. Waders included two Jack Snipe, two Bar-tailed Godwits, a Green Sandpiper, five Ruff and eight Common Sandpipers. Passerines included the first Redwing, 40 Whinchats, 100 Wheatears, ten Redstarts, three Yellow Wag-tails, 40 Pied Flycatchers, seven Spotted Flycatchers and 15 Tree Pipits. Warblers dominated the influx with 250 Willow, 80 Garden, two Icterine, and another Barred Warbler. A Red-backed Shrike and a Wryneck were also added to the list for that day.

On 3rd September a Black Tern flew past the Low Light as did five Whooper Swans on 11th. A Red-backed Shrike was trapped on 11th. Sixty Goldcrests arrived on 14th September and another Black Tern was seen offshore. Mist and north-east winds brought down the best fall of the autumn beginning on 21st September with two Reed Warblers and two Lapland Buntings. The next day 1,000 Meadow Pipits were the major species in a large passage of birds. These included a Richard's Pipit,* another Reed Warbler, a Yellow-browed Warbler, a Red-breasted Flycatcher, a Little Bunting,* a Rustic Bunting* and a Scarlet Rosefinch.* An eagle of sorts drifted over the island on 24th.

Far offshore on 12th October a phalarope was watched but could not be specifically identified. Gale force northeasterly winds blew in October but the accompanying clear skies meant that any migrants passed over the island. Only a Siberian Stonechat* on 12th could be claimed as notable. Raptors preyed on surviving migrants and on 22nd a Peregrine, Merlin, Sparrowhawk, two Long-eared and three Short-eared Owls made life difficult for those remaining. A Water Rail, three Black Redstarts and eleven Woodcock evaded the raptors but many of the thrushes did not. Thrush numbers for all species were much lower than in recent years. Finally, two Yellowhammers were trapped on 23rd.

Dates and numbers of some passage migrants and unusual species

(Maximum in a day in brackets)

Sooty Shearwater 28 Aug-16 Oct (max 5).

Storm Petrel 10 Aug-9 Sep (max 4).

Montagu's Harrier 13-14 May (1).

Whimbrel 4 Aug (70).

Wood Sandpiper 13-15 May (1).

Glaucous Gull 19-20 Apr (1); 26 Sep-24 Oct (singles).

Roseate Tern 17 Jun (1).

Black Tern 3 Sep (1), 14 Sep (1).

Wryneck 5-12 May (max 2); 30 Aug-26 Sep (singles).

Sand Martin 13 Apr-1 Oct (max 7).

Swallow 12 Apr-23 Oct (max 150).

House Martin 13 Apr-9 Oct (max 100).

Richard's Pipit* 22-24 Sep (1).

Grey-headed Wagtail 16 May (1).

Bluethroat 13-24 May (max 2).

Redstart 15 Apr-24 Oct (max 5).

Siberian Stonechat* 12 Oct (1).

Wheatear 4 Apr-14 Oct (max 100).

Black-eared Wheatear* 2-16 May (1).

Ring Ouzel 14 Apr-24 Oct (max 6).

Redwing 1,200 on 3 Oct, poor numbers.

Sedge Warbler 10 May-16 Sep (max 2), poor numbers.

Reed Warbler 15 May-22 Sep (max 2), 6 birds, more than usual.

Icterine Warbler 30 Jul-3 Sep (max 2) 6 birds, more than usual.

Subalpine Warbler* 24 May (1).

Barred Warbler 28 Aug-5 Sep (max 2), 4 birds.

Lesser Whitethroat 2 May-15 Jun (max 12); 23 Aug-12 Oct (max 2).

Whitethroat 16 Apr-4 Sep (max 2), very poor numbers.

Garden Warbler 10 May-23 Oct (max 80).

Blackcap 12 Apr-24 Oct (max 30).

Yellow-browed Warbler 22 Sep (1).

Chiffchaff 12 Apr-22 Oct (max 5).

Willow Warbler 14 Apr-12 Oct (max 250).

Red-breasted Flycatcher 31 May (1); 22 Sep (1).

Pied Flycatcher 28 May-28 Sep (max 40).

Red-backed Shrike 12 May (1), 20 May (2); 30 Aug (1), 11-12 Sep (1).

Scarlet Rosefinch* 22 Sep (1).

Rustic Bunting* 13 May (1); 22 Sep (1).

Little Bunting* 22-23 Sep (1).

Breeding birds

Accurate counts of Fulmars, Shags and Puffins showed increases in breeding numbers. Fulmars occupied 143 sites, laid 80 eggs and produced 70 chicks; all fledged. Interpreting seabird counts presents certain difficulties, but it is now clear that previous reports of Fulmars on the Isle of May refer to occupied sites and not pairs breeding. Puffins are very difficult to assess but Dr Harris and his team estimated around 8,500 occupied burrows. Puffins have now spread to central parts of the island and are literally outside the front door of the Observatory. Young birds often wander indoors at night, en route to the shore. Shag numbers also showed an increase

with an estimated 1,093 active nests. An adult Gannet spent a day on the Maiden rocks.

No drastic declines in the Razorbill, Guillemot and Kittiwake populations were recorded; indeed the winter attendance of these birds shows some, as yet inexplicable, fluctuations. Guillemots returned in October in 'thousands' but on 15th October over 4,000 Razorbills were observed on and off the island, with few Guillemots around. Breeding Razorbills number about 500 pairs. Winter visits of auks last only a few hours. An albino Guillemot was seen on 27th June.



RAZORBILL *Bernard Zonfrillo*

Only 174 Eider nests were found, over 100 less than last year, but 30-40 chicks fledged, far better than last year's dozen. Pre-cull Herring Gulls and Lesser Black-backed Gulls were estimated at 4,000 and 440 breeding pairs respectively. The NCC's cull accounted for some 600 gulls. A pair of Shelduck raised six young while 25 nests of Oystercatchers could only produce seven young. Four pairs of Lapwings laid twice but all eggs and young were eaten by gulls. Happily, a pair of Common Terns nested, raising two young successfully, the first to do so since 1957. A pair of Arctic Terns also laid but the eggs vanished. Feral Rock Doves bred and a pair of Stock Doves were suspected. Breeding passerines were—Swallow, four pairs; Meadow Pipit, three pairs; Rock Pipit, 13 pairs; Pied Wagtail, three pairs; and Starlings produced their usual batch of young.

Ringling

The snowfall in March destroyed the aged Bain Trap, but despite this setback better than average numbers of birds were ringed. In October Derek Skilling and his group built a new Gully Trap which was instantly effective. Of 5,354 birds ringed, 2,025 were nestlings, mainly seabirds. Record numbers of Puffins were ringed by Mike Harris and his assistants, 2,130 in all. Peter Lack and Norman Atkinson accounted for most of the 857 Shags and 208 Kittiwakes ringed. These, together with those for Fulmar (83) and Razorbill (23), were also new ringling records. Out of 70 Fulmar chicks on the island 69 were ringed, including eight on the hitherto unclimbed rock stack The Cleaver.

Windy weather meant that only five Storm Petrels were caught during August but one was netted on 9th September in the gully immediately below the Low Light. Passerine numbers were boosted by large catches of Willow Warblers, Goldcrest and Blackbirds. Notable species ringed were Black-eared Wheatear,* Subalpine Warbler,* Icterine Warbler (3), Reed Warbler (4), Barred Warbler (3), House Sparrow, Sparrowhawk and Common Tern (2) chicks. Numbers of Lesser White-throats, Garden Warblers, Siskins, Swallows and Pied Wag-tails showed an increase over past years but those of Song Thrush, Redwing, Robin and Whitethroat were much lower.

Ringing recoveries

Herring Gull and Shag recoveries, as usual, constituted the bulk of notifications, with both being recovered up and down the North Sea coast of Britain. Of note was an Isle of May Shag controlled alive and well on the Farne Islands 17 years after being ringed as a chick. In return a Lesser Black-backed Gull ringed as a chick on the Farnes 16 years ago was unfortunately part of the Isle of May cull. A near geriatric Puffin was retrapped on the May 19 years after being ringed, while another colour ringed bird was observed carrying fish on Sanda Island (Kintyre) four years after being ringed on the May. A colour ringed Great Skua sighted off the May in September had been ringed on Foula (Shetland) during 1978. Other recoveries of interest are as follows (age code in brackets).

Ringed on Isle of May		Recovered/controlled	
Storm Petrel (4)	10.08.79	06.07.80	Sanda Island, Kintyre (control)
Storm Petrel (4)	04.08.79	03.08.80	West Yell, Shetland (control)
Storm Petrel (4)	14.08.80	04.09.80	Sanda Island, Kintyre (control)
The last bird took only 21 days to circumnavigate Scotland; an over-land route is possible but unlikely.			
Kittiwake (1)	07.07.75	19.12.79	Helgoland, West Germany (shot)
Puffin (1)	07.07.79	05.04.80	Terschelling, Holland (oiled)
Ring Ouzel (4)	30.04.74	23.10.80	Sandied, Rogaland, Norway (dead)
Blackbird (5)	30.03.79	25.12.79	Chaumont-sur-Yonne, France (killed)
Song Thrush (4)	30.04.78	10.12.79	Castellina Marittima, Livorno & Pisa, Italy (shot)
Redwing (4)	14.10.79	22.12.79	Marmande, Lot-en-Garonne, France (killed)

The Ring Ouzel is only the second recovered. The wintering areas are shown by the dates of the other recoveries. The Song Thrush is surprisingly only the second from Italy; there are several past recoveries from the other thrush-eating countries of southern Europe.

Ringed on Isle of May

Reed Warbler (4) 07.06.79

Recovered/controlled

22.06.80 Owston Ferry, Epworth,
Humber-side (controlled breeding)

This record demonstrates the overshooting of spring migrants and is the first recovery from the May.

Willow Warbler (3) 10.08.80

27.08.80 Zandvoort, Noord-
Holland (control)

Ringed elsewhere

Blackcap (4♀) 13.10.79

Willow Warbler (4) 07.05.80

Willow Warbler (4) 24.05.80

Willow Warbler (4) 24.04.80

Pied Flycatcher (1♂) 30.06.79

Controlled on Isle of May

Ulleroy, Farsund, Norway 22.10.79

Dungeness, Kent 10.05.80

Portland Bill, Dorset 02.06.80

Schiermonnikoog, Holland 03.05.80

Holystone, Northumberland 05.06.80

Observatory notes

One new plant was added to the island list—Lungwort *Pulmonaria officinalis*—and the colony of Henbane *Hyoscyamus niger* continues to spread, its poisonous foliage disliked even by Rabbits. The influx of Painted Lady butterflies *Vanessa cardui* started in early June and reached a peak of 200 on 13th August. A southeast wind on 6th June brought in a selection of lepidoptera including a rare Hummingbird Hawk Moth *Macroglossum stellatarum*, the second for the island and the first this century. Rona, the northmost part of the Isle of May, lived up to its translation 'a haunt of seals', holding the majority of the 310 Grey Seal *Halichoerus grypus* pups counted in November.

In the interests of safety the old crumbling lookout building was demolished—some of its timbers helping to fabricate the new Gully Trap. On 3rd June a Royal Navy cruiser anchored a short distance offshore and proceeded to fire off blank salvoes, to the total panic of most birds. Refurbishing the Low Light and rebuilding the Bain Trap began in autumn and hopefully this can be completed within the next year. My thanks are due to the observers whose contributions to the logs helped make up this report, particularly to Peter Lack, and to those who donated their labour and useful equipment towards improvements. The Principal Lightkeepers and their staff are to be thanked for their help, particularly in times of emergency. Finally, thanks to our boatman Jimmy Smith whose diligence and co-operation are much appreciated.

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Birdwatching in and around Perth

VALERIE M. THOM

With the whole of Perthshire to draw upon it may seem odd that I have chosen to write of the immediate vicinity of Perth. Many of the earlier articles in this series have dealt with places that are ornithologically fascinating but which are accessible only to the energetic and physically active. Yet there is much good birding to be had with a minimum expenditure of energy, and there are many birdwatchers who are unable to visit islands or explore untracked moorland or marsh. I have decided, therefore, to focus on the opportunities available to the less mobile birdwatcher within a ten mile radius of Perth. Many of the places I describe are observable from the roadside and the remainder involve only gentle walks along well marked public tracks!

The River Tay, tidal right up to Perth and a major reason for the city's existence, seems as good a place to start as any. Below busy Tay Street the river generally holds an assortment of gulls and Mallard—often mongrels—awaiting titbits from the passers-by, and Goosanders are often to be seen between the bridges. But it is above the old bridge, beside the North Inch, that you have the best chance of seeing that Perth speciality, the Mandarin Duck. This long-established flock originated from a private collection in grounds adjoining the river, to which many of the birds still return for breeding and feeding. But in recent years there have been increasingly frequent reports of Mandarins several miles from Perth: one down the Carse at Inchyra, a duck with a brood at Scone, and 25 on a pond two miles out of town. In 1979 one opportunist Mandarin even took over a Tawny Owl nestbox and successfully hatched four young in it.

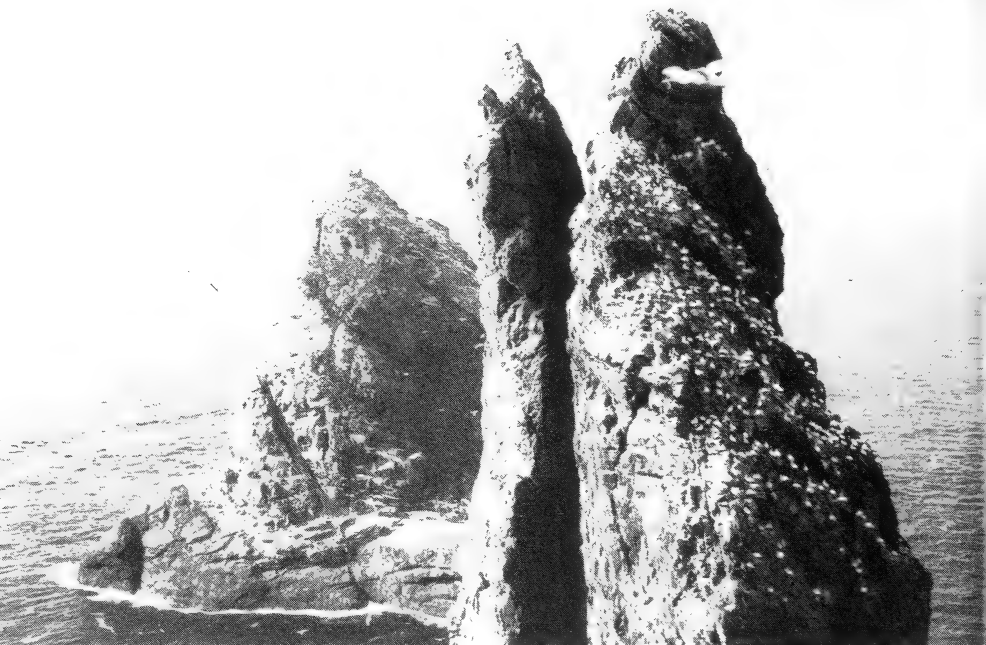
To the north of the town the strip between the A9 and the river, until recently farmland with Skylarks overhead and Goldfinches decorating the thistle patches, is now a mess of housing scheme and industrial estate. But the riverside path is still there, and indeed improved for the walker, and the waterside birds have been little affected by the development. This stretch of the Tay, opposite Scone Palace, can hold as many as 700 Tufted Duck in midwinter, when all the lochs in the area are frozen, and occasionally has a sprinkling of Goldeneye. In spring the shingle islands attract Ringed Plover, Common Sandpiper and Common Terns, some perhaps staying there to nest and others passing on up-river to sites further inland. Around this area there is also a chance of catching a glimpse of a Kingfisher. Up to four pairs have bred near Perth



PLATE 24. Two Isle of May attractions in 1980 (see p. 214). *Peter C. Lack*
(a) Subalpine Warbler ♂ 24 May. Note the white moustachial stripe between
the grey head and pinkish throat.

(b) Black-eared Wheatear ♂ 2-16 May. An indistinctive specimen but note the
black of the wing reaching the scapulars and the extent of white down the tail.
The mantle is sandy brown, the crown greyer.
Both species have a Mediterranean breeding range.





PLATES 25-26. Counting Gannets on Boreray, St Kilda (see p. 205).

PLATE 25 (a) The towers of Ant Sail on the north coast with Stac an Armin behind.
S. Murray

(b) South coast of Boreray from the summit of Clagan na Ruskochan.

J. McDougal



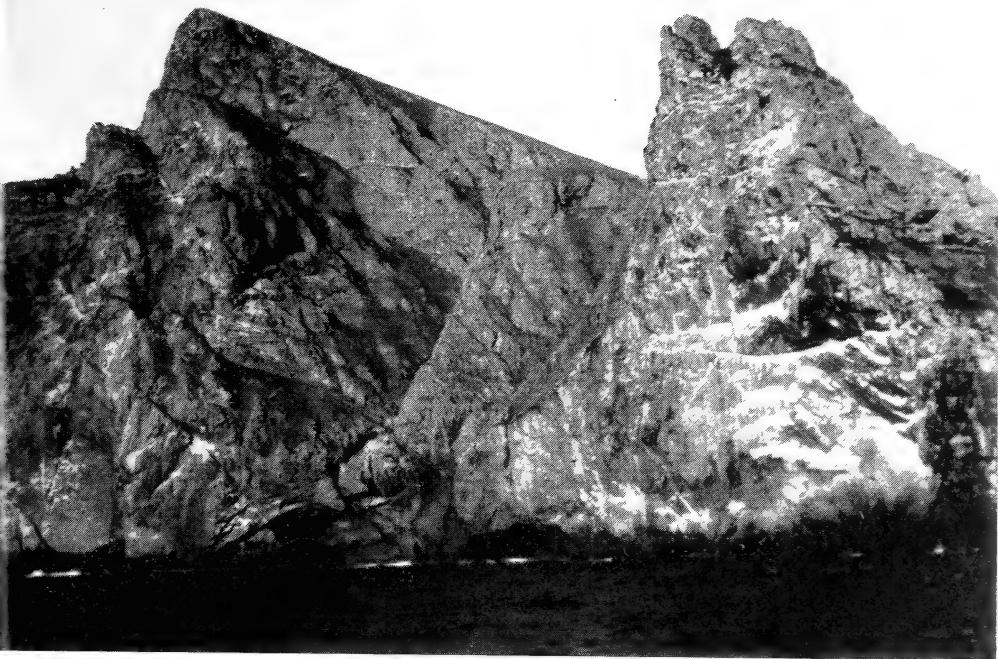


PLATE 26 (a) Boreray summit and Clagan na Ruskochan (on right). The main Gannet ledge here is centre right.

S. Murray

(b) The same Gannet ledges from above.

S. Murray

(c) Ledge built by St Kildan fowlers to improve access to this part of the colony.

J. McDougal

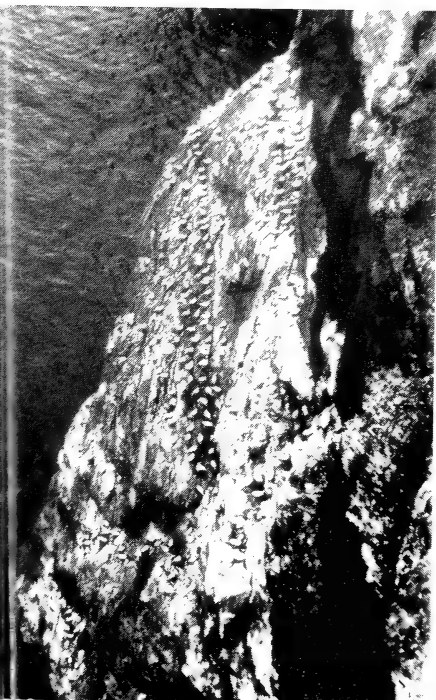




PLATE 27. Cormorant (first year plumage) with half swallowed Salmon *Salmo salar*, River Laggan, Islay (Inner Hebrides) c.1930.

A. Cameron (Islay Museum Collection) per G. Booth

The Salmon is c.50 cm long (the ruler is 27 inches/69 cm). The circumstances of death were not recorded. Dr D. H. Mills says this Salmon is near the size limit for Cormorant prey but there are other records of fish of this size being taken, although it must be a major effort, requiring a considerable period without disturbance, to

in recent years, with the most regular reports of sightings coming—naturally—from the local trout hatchery.

Perth is fortunate in the variety of the woodlands that surround it. Whichever direction you go you can find birch scrub, mature deciduous policy woods, and conifer plantations of varying age, extent and composition. There has been some loss of Beech and oak recently, it is true, and also some clearance of scrub and hedges, but there are still enough stately homes and country seats in this area to ensure a fairly secure future for the more choosy birds of deciduous woodland. Many of these estates are open to the public during the summer, under the Scotland's Gardens Scheme, and these occasions still provide a welcome chance to visit the kind of habitat that tends to be private and well protected.

Blackcap and Chiffchaff are among the species likely to be heard, if not seen, in such places. Garden Warblers are common and there is a good prospect of Wood Warblers wherever there are oaks. Even the small oak wood at Battleby, headquarters of the Countryside Commission for Scotland, usually has a pair or two. Green Woodpeckers are widespread and there are certainly quite a few Hawfinches around, although so far the only sighting I have had myself was of one beside the A9 on a right-angled bend, where I only achieved a frustratingly brief glimpse. I did, however, get an excellent view of the Nuthatch that fed regularly at a bird table near Almondbank a few years ago. There have been several more recent records of this species in Perthshire so maybe it is not quite such a casual vagrant as we tend to think.

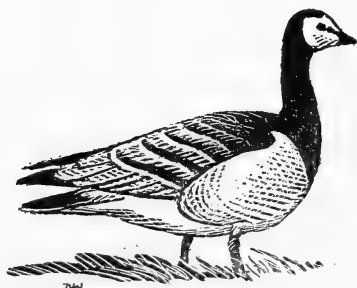
Right on the edge of the town, and belonging to the people of Perth themselves, lie the Kinnoull Hill woodlands, predominantly birch above but with Beech, Whitebeam, Sycamore and oak on the lower slopes. In summer the birches here are full of Willow Warbler song, parasol-fighting Tree Pipits and the thin calls of Spotted Flycatchers. In winter the tits take over—mixed parties of Long-tailed, Great and Blue, with the occasional Coal Tit and Treecreeper as hangers-on, all busily working their way over and through each clump of trees.

This wealth of woodland around Perth is reflected in the variety of birds that turn up in the town's gardens. The list for my own rather small suburban patch includes Redpoll, Tree Sparrow, Brambling, Fieldfare, Redwing, Great Spotted Woodpecker and Sparrowhawk. But to date the most astonishing visitor has been a green parrot which arrived on my birdtable one Sunday morning. Almost as surprising, perhaps, are the records of a Fulmar picked up in Tay Street one June, and the Hoopoe that provided a touch of exotic adornment on a local rubbish tip in September 1977!

To see much in the way of waders and wildfowl it is necessary to go a little further out of town. But Port Allen, on the edge of the reedbeds and tidal mudflats of the Tay and less than ten miles from Perth, boasts quite an impressive list of waders. Several hundred Golden Plover and Dunlin occur regularly, Knot have peaked at 150, and Grey Plover, both godwits, Ruff, Greenshank and Spotted Redshank turn up most years. Although Port Allen is quite well inland, Arctic Skua and Sandwich Tern have also been recorded there.

To the south and west of Perth the River Earn and the Pow Water both regularly flood onto the adjoining farmland, forming shallow muddy flashes which attract a variety of wildfowl. There are good roadside vantage points overlooking the meanders and oxbow lakes of the Earn just west of Aberdalgie—from which, incidentally, I saw my first Perthshire Osprey long before they settled at the Lowes—and around the Dalreoch Bridge area. Sizeable flocks of Wigeon occur here regularly and there are occasional Shovelers and Smew. A group of Whoopers quite often appears near Dalreoch too but the flat fields south of Bridge of Earn are a more regular haunt of theirs and it is here that Bewick's Swans have been recorded several times in recent years.

These areas are also good for goose spotting from the road and this is especially true of the old Crieff road, which runs through some of the best goose ground. Pinkfeet predominate in the immediate vicinity of Perth, with many passing over the town at morning and evening flight and sometimes spending the whole night circling overhead in the fog, presumably bemused by the hazy glow of street lights. But there are always some Greylags around too and as a rule odd individuals of other species. Maybe a dozen or so Barnacles, a couple of Whitefronts and a blue Snow will reward the painstaking observer who is prepared to scan the flocks carefully with a telescope and is fortunate in his position in relation to the light and the geese.



BARNACLE GOOSE *Donald Watson*

If I had to choose the group of birds I associate most closely with the Perth area it would undoubtedly be the geese. And if I had to confine my birdwatching to just one place that place would be the old Roman road running along the Gask ridge to the west of Perth. From that road I have seen young Great Spotted Woodpeckers noisily welcoming the arrival of a food-carrying parent and I have watched fascinated as a brood of downy Capercaillie chicks flew up into the nearest tree after their mother when I disturbed them.

But it is the goose count dawns that I will always remember best: the subdued gabble of the roosting birds, screened from my sight by trees; the curious Stoat sitting up to inspect the car and the nine cock Capers busy gleaning in the stubble—just two of the incidentals that have entertained me as I waited for the sky to lighten. The gradual crescendo of goose talk as dawn breaks and finally the thunder of wings as the flock rises off the water and streams away to the fields. This is surely one of the most exhilarating and uplifting experiences that birdwatching in Scotland has to offer. How fortunate that it is as available to those who cannot leave their car as it is to the young and energetic!

*Valerie M. Thom, 19 Braeside Gardens,
Cherrybank, Perth, PH1 1DB*

Short Notes

Black Duck in Renfrewshire

On 22nd December 1979, whilst undertaking a wildfowl count at Stanley Dam, Paisley (Renfrewshire), I found a drake Black Duck amongst a large flock of roosting Mallard. The bird remained until 28th December and was seen by a large number of observers.

Description Slightly larger than Mallard, being plumper in the body and fatter about the head. The whole body plumage appeared to be sooty coloured with just a hint of brown. Crown and upper nape dark and contrasted with the pale face which was flecked with darker markings. Dark stripe through eye. Bill unmarked yellow-green with black nail. In flight the upper wing showed a violet-blue speculum without any trace of white on either the leading or trailing edge. The underwing showed silvery white linings which contrasted quite noticeably with the dark of the rest of the wing and body plumage.

This is the first record for Scotland; there have been several others in the British Isles, including one hybridizing with Mallard. The species breeds and winters in North America.

DAVID L. CLUGSTON

Table 1. Weather conditions during seawatches

	29 Apr	30 Apr	1 May	2 May	3 May	4 May	5 May	6 May
Wind direction	SW	W	NW	N	NW	NW	NW	Calm
Wind force	4	6-8	4-6	3-4	3	1-3	1	0
Heavy snow/sleet showers	-	*	*	-	*	-	-	-
Light sleet/rain showers	-	-	-	*	-	*	*	-

Table 2. Numbers of Arctic Skuas

	20 Apr	24 Apr	27 Apr	28 Apr	29 Apr	30 Apr	1 May	2 May	3 May	4 May	5 May	6 May
Handa Sound	2	1	3	1	8	0	19	0	1	0	0	4
Meall a'Bhodha	-	-	-	-	3	16	4	0	74	14	2	0

Table 3. Flock details of Pomarine Skuas

	1 May	2 May	3 May	4 May	5 May
Duration of seawatches (GMT)	06.45-08.15	07.15-08.15	12.00-14.00	07.45-09.45	07.30-08.30
Total No. of birds	7	0	13	41	13
No. of flocks	1	0	4	8	1
Flock sizes	7	0	1, 6, 5, 1	2, 7, 1, 5, 1, 9, 10, 6	13

Spring passage of skuas at Handa

Throughout the spring of 1979 I was on Handa (Sutherland). A total of 74 Pomarine and 148 Arctic Skuas passed northwards between 20th April and 5th May. The weather was fairly calm, cool and wet from 20-28th April, then strong winds varying from SW to N brought heavy sleet/snow showers until calm conditions arrived on 6th May. From 29th April to 6th May I spent $11\frac{1}{2}$ hours seawatching from Meall a'Bhodha, the most westerly point of the island, overlooking the North Minch (table 1).

Arctic Skua Although there were six breeding and two non-breeding pairs during the summer, there was a definite passage of 148 birds on ten dates from 20th April to 5th May. They used two routes: either low offshore along the SW coast or high NE along Handa Sound on the mainland side of the island. Four arrived from Handa Sound on the evening of 6th May and remained on the island (table 2). Those passing along the sound were usually high and on several occasions parties of four were noted. Offshore the birds were usually low and single except for two flocks, both occurring in bad weather. One of 12 on 30th April passed close inshore along the SW coast, and on 3rd May a loose, low flock of 65, with birds breaking away to chase passing Kittiwakes, followed a line NE from the Point of Stoer across Eddrachillis Bay. This size of flock is exceptional; the average from Balranald (North Uist) is 1.65 and the largest nine birds (Davenport 1979, SB 10: 216-221). Details of light and dark phase individuals were not obtained.

Pomarine Skua As there are only three previous records from Handa (three 27th May 1972, four 11th June 1973, one 8th July 1975) the passage of 74 from 1st to 5th May was unprecedented (table 3). Most of the parties passed less than 200 m offshore and followed the coast NW out of Eddrachillis Bay some 10-15 m above the sea. The single birds were low over the sea and followed a line NE from the Point of Stoer. The flocks, with an average size of 5.3, usually appeared just after a passing front and recorded passage seemed dependent on adverse conditions and was not related to time of day. All passage occurred after sleet or snow showers on days with NW winds. Only one dark phase individual was recorded (1.4% of the total); the rest were light.

Long-tailed Skua One record, an adult flying N along Handa Sound on 14th June, was the first for Handa.

R. I. THORPE

[D. L. Davenport comments: 'The flock of 65 Arctic Skuas off Handa on 3rd May was followed by a flock of 28 (23 dark,

5 light) off Balranald the next day (P. Read, pers. comm.). These records show that large flocks of this species can occur, at least in the first week of May, and suggest that the main passage of Arctic Skuas precedes that of Pomarine Skuas by one or two weeks.]

Sandwich Terns in the Firth of Forth in winter

Recent winters have seen a marked increase in sightings of Sandwich Terns in the Firth of Forth with records every winter since 1975/6. The table gives an account of the minimum number of birds involved in each of the winter months, figures in parenthesis being the total number of sightings in each month (*Scottish Bird Reports, Lothian Bird Reports*). We cannot trace any earlier records of Sandwich Terns in Scotland in winter.

Winter	Dec	Jan	Feb
1975/6	—	1(1)	—
1976/7	—	1(1)	2(2)
1977/8	—	1(2)	1(1)
1978/9	1(1)	1(2)	1(1)
1979/80	1(2)	1(2)	—
1980/1	3(1)	3(3)	3(2)

Young seabirds tend to disperse further from the natal area than adults and British bred Sandwich Terns usually spend their first winter and often the following summer off West Africa (Cramp *et al.* 1974. *The Seabirds of Britain and Ireland*). With this in view, observations in the Forth early in 1981 seem of particular interest. From 29th January to 1st February we saw three Sandwich Terns daily off Dalmeny (West Lothian) while studying waders. On 31st January two of the terns flew together and one of these by its plumage was clearly a first winter bird. Our attention was caught by a familiar but distinctly unseasonal call from the young tern; it was calling in flight to the adult for food, as so often happens in late summer after the young fledge. We watched the adult catch a fish by the usual plunge diving technique and settle on the water beside the youngster and feed it. Further observations were not possible due to the demands of wader ringing.

Smith (*British Birds* 68: 142-155) says that parental dependence in juveniles has been observed in Britain until October when the last ones usually depart, but seems to have largely ceased by January in West Africa, the characteristic call of the young not being heard in Africa during his visit.

Two Sandwich Terns flying together off Gullane (East Lothian) on 14th March 1981 may have been the same birds

since one was seen to feed the other as at Dalmeny (G. L. Sandeman, pers. comm.).

S. R. D. DA PRATO, J. M. DICKSON, F. L. SYMONDS

[Wintering has been reported from several places in north-west Europe in the last decade. R. Hudson says there have been records from the south coast of England every winter since 1973/4, usually of single birds and with a maximum of three together. In view of the recovery of a first winter American Sandwich Tern on the Dutch coast in December 1978 (*Dutch Birding* 1: 60) we cannot assume that these Forth sightings refer to birds from local breeding colonies.—Ed.]

Crested Tit laying second clutch

Second clutches in Crested Tits in Scotland are very rare (Perrins 1979 *British Tits*) and only one case is recorded in *The Handbook of British Birds* (Witherby *et al.* 1943). In a nestbox study area at Culbin Forest (Morayshire) we recorded what we consider a genuine case of a second clutch in 1980.

In a box in a young Scots Pine *Pinus sylvestris* plantation within the forest a pair of Crested Tits laid a clutch of six eggs, and four young subsequently fledged during the last days of May. On 1st June the nearest adjoining nestbox, 30 m away, which had been empty when last checked on 19th May, was found to contain a half built nest. On 9th June the nest was complete and a Crested Tit was flushed from four eggs. This clutch was still being incubated on 20th June but the following day the nest contained three cold eggs and an adult bird was calling from the canopy nearby. On 24th June the three eggs, by now certainly deserted, were examined and found to contain dead, nearly fully developed embryos which could have hatched within one or two days if not abandoned. Human predation was suspected as the cause of this breeding failure.

Although the identity of the breeding Crested Tits in both clutches was not established the conclusions are that the same pair was involved. The species is widespread but at low densities throughout this large pine forest and it would appear most unlikely that the June clutch was the result of a second pair of birds laying a small, extremely late clutch so close to a recently occupied nest.

Perrins (1979) stated that for Great Tits the earliest pairs to have a first brood are usually the only ones to have a second brood since they alone raise their first broods sufficiently early for a second attempt to be worthwhile. In addition, for both

Blue Tits and Great Tits, clutches laid later in the season are markedly smaller.

Examination of our data reveals that the first clutch was begun about 21st April and the second clutch about 4th June. Our Culbin Forest nestbox records for the four years 1977-80 confirm the very late laying date and small size of this second clutch. The other 22 Crested Tit nests give a mean first egg date of 27th April, and a completed clutch size distribution of five eggs (six records), six eggs (12) and seven eggs (four). In any one year between four and eight pairs of Crested Tits use the nestboxes provided, and first egg dates for each year's sample are closely synchronized. Mean dates are 19th April (1980), 26th April (1978), 1st May (1977) and 2nd May (1979), with individual extremes of 17th April (1980) and 10th May (1979). Thus all these clutches were started during a 24 day period during the latter half of April and first half of May.

It is interesting that this single record of a second clutch should occur in the year with the earliest mean laying date, and that the first clutch was one of the earliest recorded.

BRIAN ETHERIDGE, JANET BANKS

Reviews

The Birds of the Gambia by J. V. Jensen & J. Kirkeby. Aros Nature Guides, Arhus (Denmark) 1980; 284 pp; over 100 plain photographs; diagrams; over 400 maps; 21 x 14 cm; softback; £11.80.

Visitors to the Gambia would do well to purchase this book. It is essentially a systematic list, giving the status, habitat and range of 489 species to be found in this, the smallest country in Africa. Most entries have useful distribution maps showing degrees of abundance of birds. Forty two pages deal with good birdwatching localities, complete with maps telling you how to get there, and with lists of the birds that may be seen at each place. The introduction gives a concise account of geography and climate etc. There is also a very full reference list. The maps are excellent but many of the black-and-white photographs are of poor quality.

Bird Atlas of Natal by Digby Cyrus and Nigel Robson. University of Natal Press, Pietermaritzburg, 1980; 320 pp; many drawings; 5 diagrams; 553 maps; 30 x 21 cm; 2 acetate overlays; £15.

In the past decade or so we have come to realize the worth of bird atlases both as baselines for future changes in distribution and simply as aids to birdwatching. Few are available for Africa. *Bird Atlas of Natal* is based on the quarter-degree 'square' (there are 166 in each species map) giving complete coverage of Natal. In each square, a clock-face symbol shows the months in which a particular species was recorded.

This gives the status and distribution of each species at a glance. The 530 species maps are grouped two to a page and are therefore large and easily interpreted. Rarer species have a separate section without maps and there is a 6-page checklist. The bird illustrations by Tony Clarkson are simple but effective and pleasing. This is a well planned and clearly presented piece of work which took five years to complete.

A. ANDERSON

The British Ornithologists' Guide to Bird Life by C. F. Lundevall, edited by Jim Flegg. Blandford Press, Poole, 1980; 318 pages; 128 colour plates; diagrams; 24 x 16 cm; £12.95.

This is a luxury field guide, but bigger, heavier, less informative and more expensive than other available books. Its main appeal lies in its large and attractive illustrations of more than 300 species by several non-named artists, which give for the most part a good general impression of the appearance of each bird combined with a remarkable amount of detail of plumage; no mean feat. They were originally made for a Swedish book of which this is the British edition, so the picture of the Greylag Goose is the pink-billed eastern race *rubrirostris* and the Lesser Black-backed Gull has the black wings of the Scandinavian race *fuscus*.

More serious than this is the total omission of Storm and Leach's Petrels, Manx Shearwater, Red-legged Partridge, Stone-curlew and Chough. The book is strong on north European owls and woodpeckers, but weak on south European birds and American vagrants. The text gives short, excellent descriptions for field identification and some information about breeding and food, but the summaries of status and distribution are so brief that they are quite inadequate. I thought that the irritating use of N. Britain for Scotland disappeared at least two generations ago.

JOHN ARNOTT

Wild Geese of the World by Myrfyn Owen. Batsford, London, 1980; 236 pages; 8 colour plates; 25 drawings; 30 diagrams; 25 maps; 25 x 19 cm; £15.

Yet another book on wildfowl by a member of the staff of the Wildfowl Trust might seem unwarranted. Despite the title, it is largely concerned with the geese of North America and northwest Europe on which most research has been concentrated. The species and races in Asia are discussed in the first chapter, which summarizes the number and distribution of each species, but are hardly mentioned elsewhere. In spite of a scientific appearance I found the text readable with a concise style. My only complaint with the presentation is that the axes on some of the graphs are not labelled clearly. Chapters include social behaviour, movements and migration, summer and winter biology and population dynamics. Detailed appendices give measurements and breeding data of all the species considered. The bibliography is up to date and contains about 420 references. The final chapter concerns conservation and exploitation. The largely laissez-faire attitude of Europeans contrasts markedly with the North American system of refuges and rigorously controlled hunting quotas. The price seems a little high for a book with few colour plates but it may have limited appeal. It is recommended for the keener birdwatcher and particularly wildfowl enthusiasts.

M. V. BELL

The Popular Handbook of Rarer British Birds by P. A. D. Hollom. Witherby; London; 2nd edition 1980; 190 pages; 56 colour plates; drawings; 22 x 13 cm. £12.

This book was originally published in 1960 as a companion volume to *The Popular Handbook of British Birds*: together they described virtually all the species recorded in the British Isles. In order to revise this book to the end of 1978 the author has had to expand the text to cater for the inclusion of an additional 50 or so species. All are illustrated in 16 attractive new plates by Norman Arlott. The Vooos sequence has been adopted throughout and close scrutiny reveals that, in line with current reappraisals, a number of old records have been reconsidered.

The original text remains little changed and only minimal new information has been incorporated except to update the recent occurrences in brief summary form. The new species are kept together in a second section, but one has to search the individual species accounts for the paragraphs on habitat, general habits and food—all sections that are clearly labelled in section one. Only status and distribution is separately titled and this differs from part one in listing the occurrences individually. These, however, are minor criticisms in what is a welcome revision of a useful and comprehensive book, but some may also find the un-integrated layout niggling in a popular handbook. The separation of old and new, apparently a decision resulting from technical difficulties of colour matching the new and the old plates, leads to, for example, comparison of White-crowned Sparrow with its nearest relative some 44 pages earlier and reference to the accompanying plates in two other places.

ROGER BROAD

Silent Death: the destruction of birds and mammals through the deliberate misuse of poisons in Britain by C. J. Cadbury. RSPB, The Lodge, Sandy, Beds., SG19 2DL; 1980; 27 pp; plain photo; diagrams, maps; 21 x 30 cm; softback; £2.

This important report deals with the growing misuse of poisons, mainly against birds of prey in the last 12 years. Excellent information is given on the main poisons and the laws relating to their acquisition and use. A large number of widespread incidents of misuse are tabulated and are comprehensively analysed. The discussion emphasizes concern over the effects on bird of prey populations. There are some omissions; secondary poisoning of Buzzards eating alphachloralose victims in Germany is mentioned but the author should have been able to discover that in a trial elsewhere captive Buzzards survived on a diet of chloralose victims. In field identification of incidents the serious danger of handling mevinphos baits should have been prominently mentioned. Given the scarcity of field studies, my evidence suggesting association between poisoning and a Raven population decline (SB 10: 31) might have been mentioned.

Recommendations are lengthy. The misuse of poisons overlaps the indistinct boundary between farming and game management operations and the organochlorine pesticide story should have taught conservationists that altering widespread use of chemicals on the land requires a formidable body of evidence. Lists of incidents highlight the problem of misuse but evidence of damage to populations is much more important. Hardly any investigations have been made and although I strongly support the RSPB's concern, the evidence given here does not justify the sweeping recommendations. Moreover a recommendation to make land-owners guilty by association unless they can prove innocence is understandable in the light of some disgraceful incidents but its injustice weakens the case.

DOUGLAS WEIR

The Natural History of Shetland (New Naturalist 64) by R. J. Berry & J. L. Johnston; Collins, London, 1980; 380 pages; 8 colour, 16 plain photo plates; 45 drawings & maps; 22 x 15 cm; £8.50.

To the growing band of birdwatchers taking an active interest in the birds of Shetland around the mid '60s the standard local reference was the Venables's *Birds and Mammals of Shetland*. However, the book was already a decade old at a time when extra eyes were adding much to the published record and the changing status of several species. So *The Natural History of Shetland* would seem to have a large gap to fill. Its coverage of the islands is surely the most comprehensive work so far with 14 chapters including 'Geological History', 'Natural History of Man', 'Vegetation', 'The Sea', 'Whales and Seals', 'Lochs and Burns', 'Shetland Naturalists', 'Oil and the Natural Environment', 'Conservation', and several on birds. Appendices include checklists of species from fungi to ferns, from fleas to birds. There is also an impressive list of places to visit. Covering so many wide-ranging subjects so well, a book of this size is a credit to its authors.

A penalty of covering so much is that the readability is a little heavy, in danger of becoming a series of checklists and references hard to relocate. Some sections are farmed out to specialist writers, but it is a pity their names are sometimes misspelt, as are some of the Shetland place names—there are two in figure 1. One of these—Lunnasting—also fares badly in the aerial photograph which is printed upside down and called the Walls Peninsula. The colour balance is sometimes poor in reproductions made from transparencies, although many are excellent, as are the black-and-whites.

At £8.50 the book is a must for all who have an interest in Shetland and is likely to remain the standard reference for many years. Of course I thoroughly recommend it: one third of it is devoted to birds!

DENNIS COUTTS

The books reviewed above (except the RSPB report) are available from the SOC Bird Bookshop

Current literature Articles and reports on the status and distribution of birds in Scotland are listed here. Strictly biological studies such as ecology or behaviour are excluded and so are references from the widely read journals **British Birds**, **Bird Study**, **Ringing and Migration** and **Ibis**. Most items listed and many others are available for reference in the club library and we are grateful to the contributors. The library welcomes copies of work on any ornithological subject.

Greylag and Pink-footed Geese in Britain 9th/10th November 1980. M. A. Oglvie 1981. Wildfowl Trust.

Population, movements and biometrics of the Purple Sandpiper *Calidris maritima* in eastern Scotland. N. K. Atkinson, R. W. Summers, M. Nicholl & J. J. D. Greenwood 1981. *Ornis Scandinavica* 12: 18-27.

Caithness Bird Report 1979. (No details.)

Fourth island bird counts—1980. R. W. J. Smith (no date). *Edinburgh Natural History Society Journal* 1980: 10-11.

Evidence of probable breeding of Storm Petrels on Ailsa Craig. B. Zonfrillo 1980. *Glasgow Naturalist* 20: 85-86.

Fife/Kinross-shire Bird Report 1980. K. Brockie & T. C. Smout (1981).

1980 *Borders Bird Report*. R. D. Murray 1981. 70p (including postage) from R. D. Murray, 143 Eskhill, Penicuik, Midlothian.

An Ornithological Survey of the Sanda Islands, Kintyre, in 1980. E. J. Maguire 1981. Nature Conservancy Council, South West Region, Scotland. The Castle, Loch Lomond Park, Balloch, Dunbartonshire, G83 8LX.

- The Status of Birds at Alemuir Reservoir, Roxburghshire 1970-75 with Additions and Revisions 1976-79.* T. W. Dougall 1980. (Address: Dept. of Geography, The University, St Andrews, Fife, KY16 9AL.)
- Birds in Cumbernauld and Kilsyth District* 1980. A. Wood (47 Kilbowie Road, South Carbrain, Cumbernauld, G67 2PZ) & A. Young (76 Liddel Road, Ravenswood, Cumbernauld, G67 1JE).
- Canna Report 1979-80.* R. L. Swann (14 St Drostan's, Drumnadrochit, Inverness-shire) & A. D. K. Ramsay (An Teallach, Finstown, Orkney).
- Orkney Bird Report* 1980. C. Booth *et al.* 1981. £1.50.
- Loch Lomond Bird Report No. 9 for 1980.* J. Mitchell (comp.) 1981. Nature Conservancy Council.

Notices

Ecology and conservation of the Chough on Islay During 1980 and early 1981 34 Chough were marked with BTO and colour rings: green, blue, yellow or white. A further marking scheme is planned for later this year. Please send sightings of any marked and unmarked birds from Islay and elsewhere, particularly in Scotland, to J. M. Warnes, Coull Farm, Isle of Islay, Argyll. Details of flock sizes, habitat type and feeding behaviour would also be appreciated.

Dye-marked Redshanks Redshanks are being dye-marked this summer in Iceland by members of a Tay Ringing Group/Dundee Museum expedition. Please send details of any sightings (giving colour of dye and position on the bird, along with date and place) to Dr M. Pienkowski, Dept. of Zoology, University of Durham.

Wing-tagged Herons In Fife and east Perthshire nesting Herons have been fitted with wing tags of various colours, each tag bearing an individual code number. Will anyone seeing a tagged bird please note the colours on both wings and try to read the numbers? Records gratefully received by either Mick Marquiss, Institute of Terrestrial Ecology, Bush Estate, Penicuik, Midlothian (telephone outside working hours Inverkeithing 412712) or Keith Brockie, Gardener's Cottage, Millhill House, Inchture, Perthshire (telephone Inchture 774).

Yellow Fulmars from St Kilda Fulmars have nested on St Kilda for centuries, but until 1878 they nested nowhere else in Britain. The Fulmar has now spread all round Britain but this population explosion seems to have come from the arctic, not St Kilda. From ringing studies we know where British Fulmars go in autumn and winter, but we know nothing of the movements of St Kilda Fulmars. I dye-marked Fulmars on St Kilda this summer with yellow on body, tail, wings, or a combination of these. The dye should remain visible until spring 1982 at least. Please send me the date and place of any sightings, the numbers of dye-marked and unmarked Fulmars observed and the positions of the dye. Hector Galbraith, 96 Neilston Road, Paisley PA2 6EL.

(Notices must reach the editor at least four months before publication.)

The Scottish Ornithologists' Club

ANNUAL CONFERENCE and ANNUAL GENERAL MEETING

The 34th annual conference and 45th annual general meeting of the club will be held in the Marine Hotel, North Berwick, East Lothian, dur-

ing the weekend 30 October - 1 November 1981. The conference programme and booking form, and the agenda for the AGM, are enclosed with this number of the journal. Members are reminded that bookings for the conference and at the Marine Hotel can only be accepted on the booking form; the hotel management have been instructed not to accept any booking except from the club secretary.

ENDOWMENT FUND

Members are reminded that the club's Endowment Fund was established for the advancement of ornithology. Any legacy or donation will be very gratefully received and should be sent to the club secretary.

The Fund is administered by the council of the club which is empowered to make grants from the accumulated free income. Applications for a grant must be made on a form available from the club secretary, and should normally be submitted to him by 31 December each year; those received after 31 January will not be considered for a grant in the financial year to 30 June following. Applications, with recommendations by the research committee to which they are submitted, are considered by council at its meeting in March.

CLUB TIES, BADGES AND CAR STICKERS

SOC ties, badges and car stickers, all with the club emblem—the crested tit, are available from the club secretary and some branch secretaries at the following prices :

Ties in maroon, dark blue or green—£2.75 each (£2.86 by post).

Badges 50p each (61p by post). Car stickers 15p each (26p by post).

SCOTTISH BIRDS

Copies of all back numbers of the journal from Volume 1 No 1 (autumn 1958), and also some complete unbound secondhand volumes, are available. For details of prices write to the club secretary.

WINTER EXCURSIONS

AYR BRANCH

Saturday 24 October 1981 IRVINE. Leader, John Burton. Meet Wellington Square, Ayr 11.30 am or Irvine harbour 12 noon (lunch).

Sunday 22 November CAERLAVEROCK. Leader, Donald Smith. Meet Wellington Square, Ayr 9 am (lunch).

Sunday 13 December DOONFOOT. Leader, Roger Hissett. Meet Wellington Square, Ayr 1.45 pm.

Saturday 13 February 1982 SOUTH AYRSHIRE LOCHS. Leader, Angus Hogg. Meet Wellington Square, Ayr 1 pm.

Sunday 14 March LOCHWINNOCH. Leader, Eleanor Hissett. Meet Wellington Square, Ayr 2 pm or Lochwinnoch Centre 3 pm.

DUNDEE BRANCH

All excursions leave Crichton Street at 10 am (bring lunch and tea).

Sunday 25 October 1981 CAMERON and KILCONQUHAR LOCHS. Leader Mrs J. Grant.

Sunday 29 November TAY ESTUARY—Bird count. Leader B. M. Lynch.

Sunday 13 December MORTON LOCHS and TAYFIELD. Leader D. B. Thomson.

Sunday 17 January 1982 LINRATHEN and BACKWATER. Leader B. Pounder.

Sunday 21 February MONIKIE and BALMOSSIE. Leader R. Corbet.

Sunday 21 March MONTROSE and BODDIN.

Sunday 18 April LOCH OF LOWES and DUNKELD. Leader S. Laing.

LOCAL RECORDERS

Please note the following new Recorders to whom records for the 1981 *Scottish Bird Report* should be sent :

Dumfriesshire Dr E. C. Fellowes, West Isle, Islesteps, Dumfries DG2 8ES.

West Lothian, Forth Islands (except May), Midlothian A. W. & L. M. Brown, 7 Trelawney Terrace, Penicuik, Midlothian EH26 0NB.

BRITISH BIRDS - COLOUR TRANSPARENCIES

The Edinburgh Branch Committee is anxious to build up a file of colour transparencies of birds on the British list. Should the proposed project be successful the slides would be indexed, listed and made available, on loan, to branches for talks. Any member willing to donate slides should forward them to The Chairman, Edinburgh Branch SOC, c/o 21 Regent Terrace, Edinburgh EH7 5BT.

Conference News

World Pheasant Association grouse symposium, Edinburgh, March 1981
Capercaillie and Black Grouse were the subjects of attention at Dalhousie Castle. The WPA, a young organization with open membership, exists to promote the conservation of all galliform birds and encourage improved aviculture. This conference, in bringing together workers from as far afield as China, as did the 1978 symposium (*SB* 10: 198, *Ibis* 122: 257), encouraged a profitable exchange of ideas and drew attention to the current predicament of woodland grouse in Europe. Introducing the conference Prof Dunnet mentioned the role organizations like WPA can play in promoting useful research. Later the likelihood of the WPA backing a study of Scottish Black Grouse was announced.

The value of long term studies was demonstrated by Prof Gullion who mentioned that what he once believed to be the best habitat for Ruffed Grouse had become deserted when better was provided. Unexpectedly high population densities of Ruffed Grouse developed where the forest structure enabled predators to be detected and eluded, and where a mixture of forest successional stages was provided. Forest devastation by wind appeared to play a most useful, if unscheduled, part in producing good habitat for this attractive North American grouse.

Gales in the west of Scotland were mentioned by Brodie to have improved the structure of some new forests which Capercaillie have begun to colonize. Some declines of Capercaillie were described in a paper calling for improved management and conservation of Capercaillie in Scotland and which described some approaches towards these goals. Reports of telemetry studies in Norway illustrated encouraging new developments in research on woodland grouse.

The proceedings will be published by the WPA (Daws Hall, Lamarsh, Bures, Suffolk CO8 5EX). The organizers are again to be warmly congratulated.

A. M. JONES

BOU annual conference, Glasgow, March 1981 : Review of Ornithology in Scotland What enjoyable events good conferences are! How do you define 'good'? Well, to most people 'good' in this context means something different, depending on what they want from a conference, and different people want different things. At a conference of this sort, some come to learn from the talks, some to criticize, some to look for money

or participants for a new project, but many come to meet old and new friends and chat. There are probably as many different reasons for attending any conference as there are people attending. How do people decide to go to a particular conference or not? Usually there are two main factors: (1) the programme, and (2) who else is likely to be there. The programme in particular is often the deciding factor, but it may fade into secondary significance at the conference itself if the people there turn out to be more interesting than the talks.

How did the BOU go this time? Although it had its high points, I wasn't over-impressed by the programme, for the main reason that I had already heard or read a substantial proportion of the papers given—inevitable with so many old hands performing. Also, very disappointingly, the organizers missed an excellent opportunity and the conference failed to live up to its title; there wasn't even the slightest hint of the review of Scottish ornithology we had been promised. Nevertheless, there was an excellent atmosphere and a great crowd present, and that, for me, made it a good conference. What you thought about it, if you were there, all depended on what you wanted and expected!

ALAN G. KNOX

Current Notes

The period April to June is covered here. Spring brought the welcome return of summer migrants and lots of rarities. Fair Isle provided yet another first for Britain, a **Sandhill Crane**, and followed up with **River Warbler**, 2 **Alpine Swifts** and **Rustic** and **Little Buntings**. Shetland yielded goodies like 5 **Red-footed Falcons**, 2 **Subalpine Warblers**, **Night Heron**, **Rose-coloured Starling** and another **Rustic Bunting**. Orkney came up trumps with **Trumpeter Finch** and the Isle of May rallied round with a **Sardinian Warbler**. Caithness and Aberdeenshire excelled themselves, the former providing the first 2 Scottish mainland records of **Thrush Nightingale** and 2 **Subalpine Warblers** and a **Great Reed Warbler**, whilst the latter turned up another **Thrush Nightingale** (killed by a cat), **Eye-browed Thrush**, **Woodchat Shrike**, **Tawny Pipit**, **Kentish Plover** and an obliging **Alpine Swift** which got on to many a list during its 3 day stay.

White-billed Diver Fetlar (Shet) 3 May, 17 May. **Night Heron** Unst (Shet) 8-9 May, Yell (Shet) 1 Jun-Jul. **Little Egret** Glenuig (Ross) 4 Jun. **White Stork** Gryfe reservoir (Renf) May, Cumnock (Ayr) Jun, Greenock (Renf) Jun. **Spoonbill** L. Strathbeg (Aber) Jun. **Mute Swan** 7 Fetlar 16 May. **Teal** ♂ Green-winged *carolinensis* Sandwater (Shet) Apr, Fetlar 5 Apr. **Garganey** (all in May) ♂ L. Spiggie (Shet) 9th, Hillwell (Shet) 13-15th, 3 ♂♂ Don (Aber) 13th, ♀ Aberlady (E. Loth). **Ring-necked Duck** Tingwall (Shet) 25 May-9 Jun. **King Eider** ♂ Sullom Voe (Shet) Apr, ♂ Blackdog (Aber) June. **Steller's Eider** ♀ Papa Westray (Ork) May. **Surf Scoter** ♂ Shell Bay (Fife) 25-27 Apr, 2 ♂♂ Blackdog Jun. Smew L. Davan (Aber) 25 Apr, pair L. Strathbeg 23 May. **Ruddy Duck** 10 Meikle L. (Aber) 9 May (1st county record), pair Stirling 24 May. **Honey Buzzard** 3 Orkney May, Fetlar 25 May, dead Gulberwick (Shet) 3 Jun, Tingwall 4 Jun. **White-tailed Eagle** imm. Fair Isle 9 A pr, imm poisoned Caithness Apr. **Marsh Harrier** (all in May) L. Strathbeg (2), Aberlady, E. Ross, Orkney, Lochwinnoch (Renf) 16th, Hailes (E. Loth) 29th. **Goshawk** N. Ronaldsay (Ork) 4 May. **Rough-legged Buzzard** Fair Isle 14 Apr, L. Strathbeg Jun. **Golden Eagle** Fetlar 17 Apr-5 May. **Osprey** Orkney 20 May, Yell 20 May. **Red-footed Falcon** 4 ♂♂ 1 ♀ Shetland 16 May-7 Jun. **Hobby** Orkney May, Grutness (Shet) 26 May, St Abbs (Ber) 2 Jun, Fair Isle 6-8 Jun.

Quail Fair Isle 18 May, 2-20 Jun, Papa Westray (Ork) 26 May, Tranent

(E. Loth) 29 May, Tynninghame (E. Loth) Jun, Hillswick (Shet) 23 Jun, Bigton (Shet) Jun. **Spotted Crake** Orkney 23 Apr. **Sandhill Crane** imm. Fair Isle 26-27 Apr (1st British record). **Little Ringed Plover** Lochwinnoch May. **Kentish Plover** ♀ Ythan (Aber) 10 May. **Temminck's Stint** Westwater reservoir (Midl) May, Hillwell 23-24 May, Wick 24 May. **Pectoral Sandpiper** Unst 3 Jun, Yell 8 Jun. **Curlew Sandpiper** Fair Isle 7 May. **Ruff** 22 Eden estuary (Fife) 4 Apr. **Black-tailed Godwit** 110 Eden estuary 4 Apr. **Spotted Redshank** 2 Eden estuary 5 May. **Pomarine Skua** Orkney 30 Apr, Collieston (Aber) 12 May, Dowlaw (Ber) 20 Jun. **Long-tailed Skua** Birsay (Ork) 19 May. **Little Gull** Orkney May, Aberlady 27 May. **Caspian Tern** West L. Tarbert (Arg) 6 Jun. **Turtle Dove** Drums (Aber) 14 May, Collieston 14 May. **Cuckoo** 1st L. Awe (Arg) 30 Apr. **Snowy Owl** Orkney 21 May, different bird Jun. **Alpine Swift** Fair Isle 18 Apr, 4-10 Jun, Aberdeen 4-6 Jun. **Bee-eater** Speyside (Inv) Jun, 2 Islay (Arg) 3 Jun. **Hoopoe** Fair Isle 12 Apr, Jun, Linlithgow (W. Loth) 13-15 Apr. **Wryneck** Fair Isle 18 Apr, Drums 14 May, St Abbs May, 18 Shetland May.

Shore Lark Papa Westray 22 May. **Tawny Pipit** Newburgh (Aber) 14 May (1st county record). **Tree Pipit** 80 Out Skerries (Shet) and 50 Fair Isle 12 May. **Yellow Wagtail** Out Skerries 12 Apr, Grey-headed *thunbergi* Fetlar 20 May, Unst 20 May, Whalsay (Shet) 14 May, Blue-headed *flava* Fetlar 20 May, Black-headed *feldegg* Fetlar 20 May. **Thrush Nightingale** Noss (Caith) 11 May (1st county record), another 12 May, 1 dead Newburgh (Aber) 12 May (1st county record). **Nightingale** Whalsay 12 May. **Bluethroat** (all in May) 12 Isle of May 11-14th, 16 Caithness 11-19th, 16 NE Scotland 12-14th, 33 Out Skerries 12th, 30 Fair Isle 12th, 13 Fetlar 12th, 50 Shetland May, singles St Abbs 11th, 16th, Fife Ness 14th, Kingsbarns (Fife), Orkney. **Black Redstart** 9 Shetland May, Sanday (Ork) 3 Apr, 3 Fair Isle 6 Apr, Rattray (Aber) 13 May, Drums 13 May, Wick 20 May. **Redstart** 120 Out Skerries 12 May. **Whinchat** 160 Out Skerries 12 May. **Eye-browed Thrush** Newburgh May (5th British record). **Fieldfare** 750 Fair Isle 12 May.

River Warbler Fair Isle 23-25 May (4th British record). **Savi's Warbler** Fair Isle Jun. **Marsh Warbler** 2 Fair Isle 2 Jun, Whalsay 4 Jun. **Great Reed Warbler** Noss 12-13 May (1st Caith record). **Icterine Warbler** Out Skerries 12 May, Tentsmuir (Fife) 15 May, 2 Fair Isle 24 May, 7 Jun, Fetlar 26 May, Gutcher (Shet) 26 May, **Melodious Warbler** Isle of May 6-8 Jun, Fair Isle 15 Jun. **Subalpine Warbler** Whalsay 8 May, Out Skerries 12 May, ♀ Wick 15 May, ♀ Noss (Caith) 29-30 May, ♂ St Abbs 26-27 Jun, ♂ L. Mullardoch (Inv) Jun. **Sardinian Warbler** Isle of May 3 May. **Lesser Whitethroat** 16 Out Skerries 12 May, 6 Noss Head 13-16 May. **Whitethroat** 53 Out Skerries 12 May. **Wood Warbler** Fair Isle 14 Apr. **Willow Warbler** 90 Fair Isle 12 May. **Willow Warbler/Chiffchaff** 250 Out Skerries 12 May. **Red-breasted Flycatcher** Geosetter (Shet) 19 May, Troswick (Shet) 20 May. **Pied Flycatcher** 50 Out Skerries 12 May, 34 Fair Isle 12 May. **Golden Oriole** Eday (Ork) 16 May, N. Ronaldsay May, L. Strathbeg 24 May, 6 Shetland 20 May-Jun. **Red-backed Shrike** 30 Shetland May-Jun, Orkney May, Wick 10 May, 14 May, 2 Ythan 12 May, ♀ E. Lothian 29 May, 7 Fetlar 17-28 May. **Great Grey Shrike** Glen Lyon (Perth) 20 Apr. **Woodchat Shrike** ♂ Rattray (Aber) 13 May (1st county record), Outer Hebrides (no date). **Rose-coloured Starling** Out Skerries 25 May. **Trumpeter Finch** Sanday 26-30 May. **Scarlet Rosefinch** 9 Shetland 11-24 May, 3 Fair Isle 19 May, 21 Jun, N. Ronaldsay 20th, 21 Jun. **Lapland Bunting** Fair Isle 4 Jun. **Ortolan Bunting** Fair Isle 11 May, Out Skerries 15-16 May, Fetlar 17 May, Sanday 28 May, Spiggie 20 May. **Rustic Bunting** Fair Isle 21 May, ♂ Eshaness 10 May. **Little Bunting** Fair Isle 3 May.

Late news **Caspian Tern** Hound Point (W. Loth) 3 Jul.

PETE ELLIS



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Vol. 11 No. 8

Winter 1981

Edited by D. J. Bates

Seabird populations of Foula

R. W. FURNESS

(Plates 28-30)

Foula has one of the biggest and most diverse seabird colonies in the British Isles but the spectacular cliffs make many species difficult to census. Dr Furness, who has been to the island every summer since 1971, puts Foula's seabirds in perspective against a background of oil and fisheries developments.

The first description of the seabirds of Foula (Shetland) dates from a visit in 1774: 'All the flights I had seen before were nothing to this: as far as the eye can stretch the whole precipice swarms, the sea around is covered, and the air in perpetual motion, flocking either to or from the rock' (Low 1879). Even the most recent surveys of Foula seabirds have tended to use similar language. Puffins were described as 'abundant' (Harris 1976) and 'present in countless thousands' (Jackson 1966). The sheer and unbroken nature of the huge cliffs of Foula, rising to 376 m at the Kame, the extensive steep grassy slopes, boulderfields and caves, many of which are accessible only from the sea and under exceptional weather conditions, make quantitative assessments of seabird numbers on the island very difficult.

Ornithological observations up to 1965 were reviewed by Jackson (1966). Few reliable estimates of numbers of cliff nesting species were available but the histories of the inland nesting species, particularly skuas, had been well documented. Two Dutch birdwatchers visited Foula in late June 1965 and published estimates of seabird numbers (Fabritius 1969) but many of their estimates have to be regarded as pure conjecture, particularly those for the nocturnal species. In 1968 Foula resident J. Holbourn made a detailed survey of seabird numbers but did not publish his results. During Operation Seafarer in 1969 (Cramp *et al.* 1974) counts of all seabirds on Foula were made by a Brathay Exploration Group expedition.

Unfortunately they grossly underestimated the numbers of most species as their counts were made late in the season (mid July) when many birds have left, and were only made from the clifftops so many colonies could not have been seen. Because they were the first ones published, these counts have been quoted on a number of subsequent occasions. In 1974 Harris (1976) made an extensive survey of Shetland seabird colonies, and included a brief visit to Foula during which he estimated seabird numbers from a circumnavigation and cliff-top counts.

In view of the severe limitations of these surveys and the major discrepancies between them I made a detailed census of all diurnal seabirds between 4th May and 6th August 1976, most counts being made in late June and early July. This paper presents a summary of this survey and incorporates published counts for other years.

Methods

A scale drawing of the entire cliff face coastline of Foula was made on a roll of paper using vertical and horizontal scales of 1:500. The cliff coastline was divided into 172 sections of 100 m. These were numbered onto a 1:10,000 map. In the field the position of each group of nesting birds was determined from the 1:10,000 map and sketched onto the scale drawing together with a note of the breeding habitat they occupied. Counts were made from the island wherever possible, and the remaining areas not visible from land were counted from a boat. The main counts were made between 15 June and 5 July and included three trips round the island in a small boat. Under the prevailing weather conditions several boulder colonies at the foot of cliffs were inaccessible, making estimation of bird numbers in these areas very difficult. All accessible boulder colonies were entered and examined in detail. Inland nesting species were censused by mapping onto a 1:10,000 map each year from 1975 to 1980. All the census maps are held by the author. A limited amount of monitoring of particular cliff colonies has been carried out by the author over the last ten years using both direct counting and photography.

Where possible counts have been made on similar dates each year to improve comparability. Optimal dates for counts, estimated from the author's experience on Foula, are given below for each species. Count methods and units largely follow Harris (1976) and were as follows.

Red-throated Diver Nesting pairs, 10 July. All lochans on Foula were checked for evidence of nesting. Sites where breeding has failed can be recognized by the presence of a nest platform and slipway even though adults may no longer be present. Trapping adults on Foula has shown that birds return to the same lochan each year and do not change site to lay a replacement clutch.

Fulmar Apparently occupied nest sites, 5 July.

Gannet Completed nests, 15 July.

Shag Apparently occupied nests, 1 July. For inaccessible colonies the number of adults visible on rocks and adjacent sea was taken as the census unit.

Eider Males and females on sea, late July. Nests are dispersed over the island and hard to find. Numbers of males around the coast remain

fairly constant all summer. Numbers of females on the shore increase from a very low level in May (when most are on eggs) to a consistent total late in July. On the assumption that little interchange occurs between Foula and other parts of Shetland between May and July these maximum counts are taken as a population index.

Arctic and Great Skuas Occupied territories, 20 June. Many individuals do not attack an observer entering the territory so the census method recommended by Cramp *et al.* (1974) is inappropriate. Counts were made from a distance overlooking undisturbed sections of the colonies.

Common, Lesser Black-backed, Herring and Great Black-backed Gulls Nests, 20 June. On Foula these species nest in isolation or in small sparse groups so the location of each nest can be recorded on a map.

Kittiwake Apparently occupied nests, 15 June.

Arctic Tern Incubating or brooding adults, 20 June.

Guillemot and Razorbill Birds on apparent nesting sites, 15 June. Where possible counts were made mid morning.

Black Guillemot Nests, 15 July.

Puffin Burrows, 19 July. A proportion of the Puffins nest in boulder areas or in fissures in the cliff face, particularly towards the tops of the cliffs. In these areas a subjective comparison was made of the numbers of fish-carrying adults with the number that would be seen in an area where nesting occurred in burrows.

Results

The Foula coast can be divided into 14 contiguous sections, each representing a stretch of fairly homogeneous habitat; inland areas are grouped as section 15 (fig. 1). Numbers in each coastal section are given in table 1. Accuracy of the count totals is not known, but varies between species. Black Guillemots are often very difficult to census, but on Foula most colonies are in accessible boulder beaches and the nests can be found, allowing an accurate census. In contrast, most

Fig. 1. Coastal sections of Foula used in seabird counts (table 1): divisions between sections are (clockwise from section 1) Skerries of Strem Ness (1/2), North Geo of Northveedal (2/3), Head o da Taing (3/4), Head o da Baa (4/5), Da Doon Banks (5/6), Granny Geo (6/7), Lamatuns (7/8), Byre o Hoevdi (8/9), Holterhols (9/10), Da Rokness (10/11), Da Clay Pool (11/12), Soberlie Hill (12/13), East Howvdi (13/14), Brough Stack (14/1), inland (15).

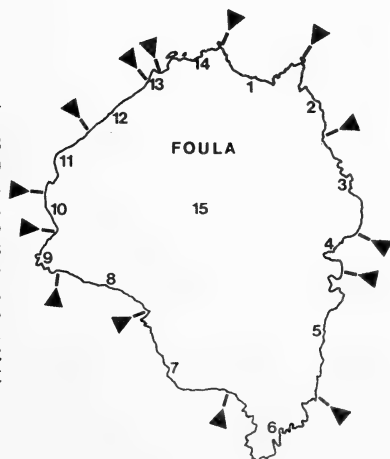
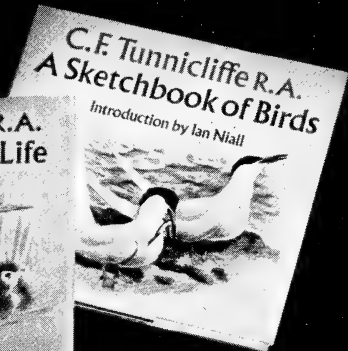
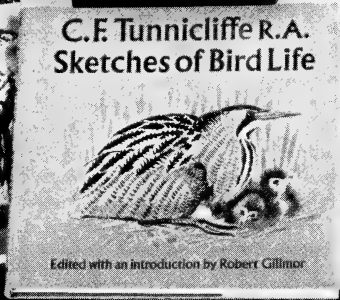
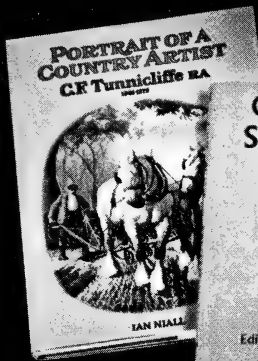


Table 1. Numbers of cliff nesting species in each coastal section on Foula in 1976
For census methods see text.

Area	Fulmar sites	Gannet nests	Shag nests/birds	Kittiwake nests	Guillemot birds	Razorbill birds	Black Guillemot nests	Puffin burrows/ birds
1.	306	0	28	0	0	0	70	4
2.	13	0	0	0	0	0	0	0
3.	1,079	0	72	86	10	83	0	180
4.	90	0	0	0	0	0	0	0
5.	1,669	0	554	203	671	1,217	0	1,460
6.	562	0	161	0	0	290	47	80
7.	1,570	0	1,040	425	1,550	1,650	0	36,700
8.	3,700	0	890	200	1,400	1,850	0	13,620
9.	910	0	30	550	17,300	500	0	1,560
10.	1,240	0	400	570	16,700	3,100	0	1,100
11.	11,260	3	0	1,016	14,700	100	0	11,650
12.	9,550	0	50	40	4,200	300	0	2,600
13.	3,980	0	0	1,300	1,675	180	0	400
14.	1,246	0	132	1,180	1,815	1,103	0	817
15.	1,380	0	0	0	0	0	0	0
Total	38,555	3	3,357	5,570	60,021	10,373	117	70,171
Estimated maximum % error	20%	0%	20%	10%	30%	50%	10%	40%

Razorbills nest in boulderfields below cliffs where access is difficult. Subjective estimates of the maximum probable errors (assessed from the small number of repeat counts and general knowledge of the area) are given below the total for each species. Numbers and count accuracy for inland nesting species are given in table 2.

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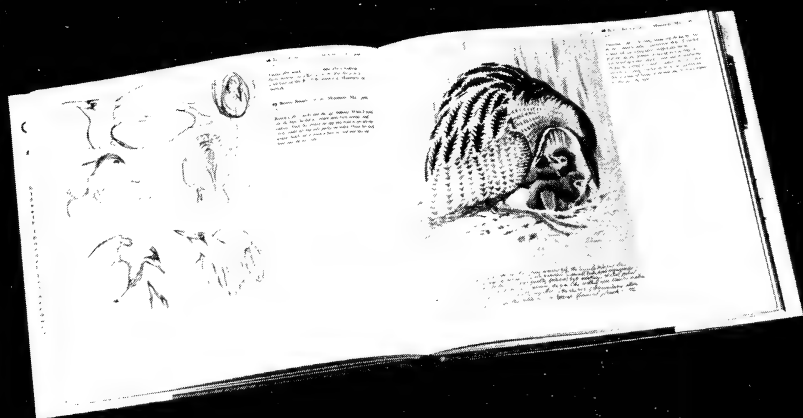
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Table 2. Numbers of inland nesting seabirds on Foula in 1976

	Number	Units	Estimated maximum % error
Red-throated Diver	11	nests	0%
Eider	115	females	5%
	133	males	5%
Arctic Skua	306	territories	5%
Great Skua	3,000	territories	5%
Common Gull	11	nests	0%
Lesser Black-backed Gull	1	nests	0%
Herring Gull	23	nests	5%
Great Black-backed Gull	22	nests	5%
Arctic Tern	5,650	incubating birds	25%

Red-throated Diver

The number of nesting pairs has increased from none between 1900 and the late 1930s (Venables & Venables 1955) to a stable population of 10-11 pairs. A general increase has been recorded elsewhere (Parslow 1973). The population change on Foula appears to be typical for the Northern Isles, although the nesting density on Foula is now exceptionally high (Merrie 1978). Most suitable lochans on the island are now occupied and lack of further nesting sites may be limiting numbers.

Fulmar

Although Cramp *et al.* (1974) suggest that occupied sites may be counted any time between late May and early August, there is a considerable decline in numbers of occupied sites over this period as a result of egg loss or departure of immature prospecting birds (Venables & Venables 1955). Nearly all counts of Fulmars on Foula have been made in early July so are directly comparable. This is probably the optimal period for counts as by then most birds remaining at sites will be breeders. The increase of the British population was estimated to be 7% per annum up to 1969 (Cramp *et al.* 1974), and Harris (1976) recorded a significant increase in Fulmar numbers in Shetland between 1969 and 1974. Mudge (1979) found that the rate of increase had slowed in Caithness, averaging 3% per annum between 1969 and 1977. Counts on Foula, the first island outside St Kilda to be colonized, show clear evidence of the seasonal decline in numbers of occupied sites and the increase in numbers since 1878, but vary too much to allow meaningful rates of increase to be computed (table 3).

Most Fulmar sites on Foula are on cliffs (74%) but 1,380 sites were inland (3%), some in boulderfields (2%) and many on grass slopes (21%). Birds in these areas often have difficulty

Table 3. Number of Fulmar occupied sites on Foula

Year	Date	Occupied sites	Source
1878	-	12	Raeburn (1888)
1879	-	20	Garrioch (1879)
1890	23 June	60	Barrington (1890)
1938	July	10,000	Venables & Venables (1955)
1959	15 July	9,000	Jackson (1959)
1960	12 July	8,000	Jackson (1966)
	7 August	4,000	Jackson (1966)
1965	10 July	11,000	Fabritius (1969)
1968	15 March	60,000	J. Holbourn (pers. comm.)
	10 July	20,000	J. Holbourn (pers. comm.)
1969	15 July	10,500	Mawby (1970)
1974	15 July	15,000	Furness (1976)
1976	25 June	38,555	This census

becoming airborne on calm days and are likely to become trapped in buildings, against walls or in ditches. Use of these sites suggests that optimal cliff nesting areas may be fully occupied. A few birds have recently begun to establish sites on Kittiwake or Shag nests by evicting the owners and trampling the nest. In such cases the Fulmar often displaces all birds from within spitting range.

Manx Shearwater

Recorded nesting on Foula in 1774 (Low 1879). There are no counts of nesting burrows as the extent of the breeding area is hard to define and no doubt many burrows are under piles of boulders. It has been suggested that the population is between 35 and 100 pairs. Islanders claim that numbers declined during the 1940s as a result of Puffins occupying shearwater burrows (Jackson 1966).

Storm Petrel

Up to 200 a night can be attracted to nets by tape recorder, but most of these are probably wandering immatures. From the proportions of retraps and unringed birds that regurgitated food, Mainwood (pers. comm.) estimated that 20% of Storm Petrels caught at Murnatugs (coastal section 7) in 1974 were breeding birds. A modified capture-recapture estimate suggested that 500 pairs breed in this area. As it is one of the dozen or so Storm Petrel colonies on the island this fits the theory that Foula may hold somewhere between 1,000 and 10,000 pairs of Storm Petrels.

Leach's Petrel

Islanders claim they knew the breeding locations of this species on Foula as early as 1908, but none were caught by ringers until 1957. Up to 1973 a further 92 were caught, but some of these were no doubt wandering nonbreeders from other colonies: two were subsequently retrapped at the colony on North Rona. In 1974 an adult was removed from a burrow containing a hatching egg (Mainwood 1975) and a further seven occupied burrows were located. The population is clearly small, perhaps around 50 pairs (suggested from numbers of retrapped ringed adults).

Gannet

Three nests were completed in 1976, the first year in which breeding was attempted. In 1980 a total of 13 completed nests could be counted and the first chicks were fledged (Furness 1981a).

Shag

Counts of 1,100 and 1,573 pairs of Shags in 1965 and 1969 (Fabritius 1969, Mawby 1970) clearly overlooked many of the large boulderfield colonies, as did my estimate of 2,500 pairs in 1974 (Furness 1976). J. Holbourn counted 3,000 nests in 1968 which, compared to the 3,357 estimated present in 1976, suggests that the population has not altered much in recent years. The vast majority of nests were located in boulderfields (94%) with only 178 (5%) on broad ledges and 43 (1%) on tops of stacks.

Eider

Numbers of males and females show great changes from year to year, suggesting variation in recruitment or move-

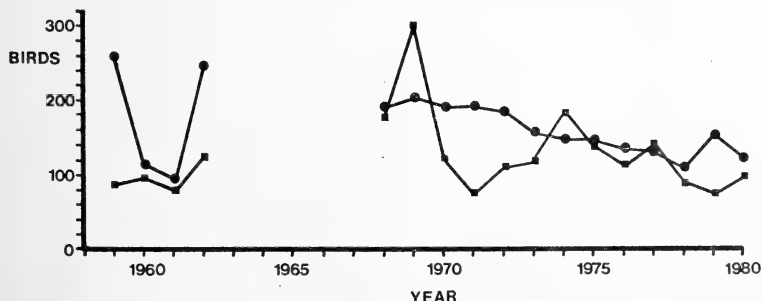


Fig. 2. Peak July counts of male and female adult Eiders on the sea and shore around Foula each year: circles = males, squares = females.

ments between different breeding sites or regular nonbreeding in Shetland (fig. 2). Reasons for this are unknown but it would appear that there has been a general decline in numbers at Foula since 1968, which may be a return to the lower population level recorded in the early 1960s.

Arctic Skua

Counts up to 1975 are given in Furness (1977b), where possible reasons for the growth of this colony were discussed. In 1976 the colony reached its highest number of occupied territories (306) and subsequently dropped to 261 territories in 1977, 253 in 1978, 271 in 1979 and 262 in 1980. In 1960 the colony occupied 3 km² giving a density of 57 territories/km², similar to that found in other British colonies (B. L. Furness 1980). In 1975 pressure from the expanding Great Skua colony had limited the Arctic Skuas to 1.8 km² and a density of 133/km², the highest recorded for an Arctic Skua population.

Great Skua

The population on Foula has been well documented since 1774. Details of counts up to 1976 are given in Furness (1977a). The colony increased at 7% per annum between 1900 and 1977, reaching a peak of 3,180 territories then declining slightly each year to 2,670 territories in 1980 (fig. 3). Although the

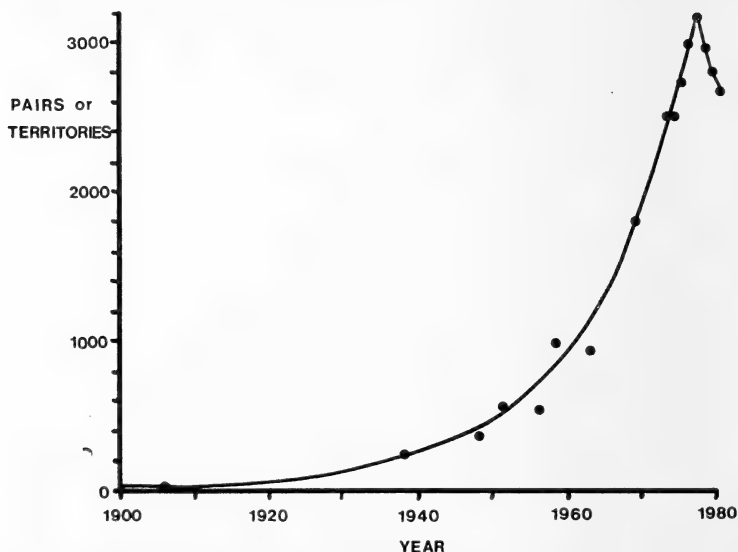


Fig. 3. Number of Great Skua territories 1900-1980.

national population continues to increase, the Foula colony is not the only one to have stopped increasing at present. Numbers have apparently remained stable on Noss, Fetlar, Bressay and Unst since 1974 (Furness 1977a, M. G. Richardson pers. comm.). The drop on Foula has taken place in most areas of the colony, but especially those most recently colonized where nesting density had become particularly high.

Common Gull

Not recorded nesting in 1890 and only one pair was found in 1948 (Barrington 1890, Pennie 1948) but since then numbers have increased to 10-12 pairs each year between 1975 and 1980.

Lesser Black-backed Gull

Recorded breeding in 1890 and 1948. Counts of nests have shown it to be the least numerous breeding gull: 9 pairs in 1969, 3 in 1973, 5 in 1974, 3 in 1975 and one pair nesting in 1976, 1977, 1978, 1979 and 1980.

Herring Gull

Also recorded nesting in 1890 and 1948. The highest number of nests (40) was recorded in 1960. Since then numbers have declined to 34 pairs in 1969, 25 in 1973 and 1974, 20 in 1977, 21 in 1978, 15 in 1979 and 5 in 1980. This is in contrast to the national pattern and may reflect inability to compete with the expanding Great Skua population at feeding sites such as fishing boats or sandeel *Ammodytes marinus* shoals, but there is little evidence to support this suggestion.

Great Black-backed Gull

Recorded nesting in 1890 and 1948. Numbers have been slowly increasing since the first count in 1960, when 15 pairs nested, but much more slowly than in many other parts of Shetland (Harris 1976). In the 20 years to 1980 numbers only increased to 35 pairs.

Kittiwake

Many colonies on Foula are not visible from the clifftops. Island based counts seriously underestimate numbers and for that reason counts for 1959, 1965 and 1969 have been ignored. Vetch (1822) recorded that Kittiwakes then nested in only one part of Foula. Now there are some 14 'breeding stations' (defined by Coulson 1963) so numbers appear to have increased as they have elsewhere (Cramp *et al.* 1974). Jackson (1966) estimated between 5,000 and 8,000 pairs in 1961 and J. Holbourn (pers. comm.) counted 5,429 nests in 1968, but one of the largest colonies was overlooked in 1974 (Harris 1976).

I recorded 5,570 occupied nests in 1976 so the colony appears to be much the same size as in 1961 and 1968. No complete count has been made since 1976 but from a single boat trip round the island in late June 1980 I got the impression that Kittiwake numbers were lower than in 1976 at most breeding stations. This may be supported by results of annual counts in early July at monitoring sites which show declines from 408 sites in 1973 to 347 in 1980 at Selchie Geo and 148 sites in 1975 to 109 in 1980 at Logat.

It is extremely unusual for Kittiwakes to nest on the ground, but on Foula several cliff colonies are less than 3 m off ground level and about 40 pairs nest on boulders at the foot of Nebbiefield, suggesting that better nesting sites higher up the cliffs (see Coulson 1963) are fully occupied.

Arctic Tern

Terns are well known for their habit of shifting colony location abruptly. On Foula Arctic Tern numbers have been recorded in many years. The population rose from 40-50 pairs in the first half of the century to between 200 and 300 pairs from 1956 to 1968. Then an irregular increase occurred to a peak of 6,000 pairs in 1975, subsequently decreasing irregularly (table 4).

Table 4. Numbers of pairs of Arctic Terns nesting on Foula

Year	Pairs	Year	Pairs	Year	Pairs	Year	Pairs
1906	50	1963	260	1972	1,100	1977	3,000
1948	40	1964	200	1973	748	1978	2,600
1956	250	1969	410	1974	1,800	1979	4,400
1960	200	1970	500	1975	6,000	1980	4,200
1961	300	1971	932	1976	5,650		

Sources: 1906—A. Holbourn (pers. comm.); 1948—Pennie (1948); 1956-71—Brathay; 1972-80—pers. obs.

The rapid increase began a year or two after the breakup of the vast colonies on Westray and Papa Westray in Orkney (Lloyd *et al.* 1975) and it seems probable that many of these birds moved to Shetland, where a number of colonies increased in size at this time (Robertson & Kinnear 1974, Marshall & Kinnear 1975, 1976). The decrease in numbers on Foula between 1976 and 1977 coincides with an increase on Papa Stour, the nearest Arctic Tern colony to Foula, from 1,000 pairs in 1974 (Harris 1976) to 3,000+ pairs in 1977 (Marshall, Okill & Sandison 1978). Movement of birds from Foula to Papa Stour is confirmed by a recovery of a dead Arctic Tern in August 1979 in the Papa Stour colony which had been ringed as a chick on Foula in 1968. Most Arctic Terns first nest as

four year olds (Coulson & Horobin 1976) so this bird should have been nesting in 1972, when the Papa Stour colony was rather small, but it is impossible to tell whether or not it nested on Foula before moving to Papa Stour.

In the last few years numbers of Arctic Terns in the main Orkney and Shetland colonies have fluctuated unpredictably, and breeding success has been very variable between colonies and between years. Unfortunately, we do not have data from earlier years to see whether this is typical or not. It seems likely that the differences are caused by local variations in the availability of food, particularly sandeels, but this has yet to be shown as the measurement of fish abundance on a local scale has not yet been possible.

In 1972 a small number of terns nested on rocky coast while over 90% nested on dry heath areas of short vegetation and small stones. In 1976 83% were nesting on dry heath areas, 8% on rocky coast, but about 500 pairs (9%) had moved into a hay field in an area formerly cultivated but now abandoned and ungrazed in summer. By 1980 most of the colonies on dry heath had been deserted but numbers in the hayfield had increased. Now 60% nest in the hayfield, 5% on rocky coast and 35% on dry heath. Disadvantages of the dry heath areas, which are more typical Arctic Tern nesting habitat, appear to be predation of chicks by sheep (presumably resulting from a mineral deficiency in the grazing) which has affected up to 10% of chicks in this area in some years, and human disturbance which causes chicks to run through the colony, combined with large numbers of Arctic Skuas nesting between the terns in this area.

Guillemot

Ignoring the counts of 6,500 birds in 1965 and 1,765 birds in 1969, which are clearly far too low, there are three recent counts: 30,000 birds in 1968 (J. Holbourn pers. comm.), 37,000 in 1974 (Harris 1976) and 60,021 in 1976. Guillemots have increased during the last decade and new ledges are occupied each year, but these three counts are probably not very accurate and cannot be taken to show a doubling of the population in eight years. In 1980 new colonies were found in six areas of boulderfield where none had been present in 1976 but one cave which contained 350 birds in 1976 held only 20 in 1980. Nevertheless this suggests that the increase is continuing.

In 1976 most birds were in caves (35%) with slightly fewer on cliff ledges (33%), a very few (2%) on large rock shelves, but a large number (30%) in boulderfields. Again there appears to be a shortage of optimal nesting sites as Guillemots are

very awkward in boulderfields and have considerable difficulty reaching the sea, particularly if disturbed and in a hurry.

Razorbill

Counts of Razorbill numbers on Foula are very inaccurate. No trend can be detected from the various estimates (table 5)

Table 5. Numbers of Razorbills counted on Foula

Year	Individuals	Source
1965	4,500	Fabritius (1969)
1968	3,000	J. Holbourn (pers. comm.)
1974	1,720	Harris (1976)
1974	5,000	Furness (1976)
1976	10,373	This census

and it is probably best to estimate the population size as likely to be between 5,000 and 15,000 birds. Only 198 (2%) of those counted in 1976 were on ledges; 1,268 (12%) were in cliff fissures, with the majority (86%) in boulderfields. A more detailed census of this species is required as the colony is certainly one of the largest in Britain.

Black Guillemot

Most Black Guillemots on Foula nest on Hiora Wick. This colony has been studied in a number of years and all nests located. In some years nests were marked at all colonies on the island. In addition, counts of all individuals visible on sea or shore have been made. The value of counts of individuals is doubtful owing to the large and unexplained differences found from day to day (from 21 to 151 individuals in July 1979).

Numbers probably did not vary much from 1962 when 90 nests were found to 1976 when 117 nests were found, but dropped rapidly in 1977 and further in 1978 and 1979. Only 28 nests were found in 1980. Oiling cannot be blamed for this change as the major oiling incidents in Shetland did not begin until December 1978, by which time the Foula population had already fallen considerably, and no ringed birds from Foula (and many are ringed) were found among the 727 found oiled between January and May 1979 (Heubeck & Richardson 1980). Presumably most Foula Black Guillemots were not around mainland Shetland at this time.

Puffin

J. Holbourn estimated that 50,000 pairs of Puffins nest on Foula, while Brathay recorded the population as order 5 (10,000-99,999 pairs). In 1976 the total number of burrows was estimated at 70,171 but with a wide margin of error.

Puffins have undoubtedly increased in some boulderfields in recent years but the population may not necessarily be increasing. Many grassy slopes occupied by Puffins now have large numbers of Fulmars nesting on the surface and their influence on Puffins is uncertain. During the winter 1978/9 a rock fall on the Kame destroyed half the grass slope on the Little Kame, half way down the main cliff. An estimated 5,000 burrows will have been destroyed and soil depth is now insufficient for Puffins to resume nesting at present. Presumably these displaced birds will have moved into other areas. In 1976 most Puffins were nesting in grassy slopes (61%) with 26% in boulderfields and 13% in cliff fissures.

Discussion

Only three colonies in the British Isles contain more than 16 breeding species of seabird (not counting Red-throated Diver or seaduck). Of these, Westray (19 species) and Fetlar (18) have a wide variety of inshore birds (terns, gulls and Cormorant). Foula (18) is unusual in combining populations of oceanic species (petrels, shearwaters) and inshore ones (Arctic Tern, Common Gull, Arctic Skua).

An important feature of Foula that makes it highly suitable for large populations of Arctic Terns is the presence of tide races around South Ness and Strem Ness, very close to the main colonies. Most feeding is done in these tide races during maximum flow when presumably the disturbed water makes



ARCTIC TERNS

Keith Brockie

sandeels more readily available. Possibly even more valuable is the Shaalds reef, a few miles east of Foula. Here there is very shallow water and a strong tide race, but maximum flow occurs during high and low water at Foula owing to some anomaly of local currents. This means that terns can feed in their preferred disturbed water conditions at all times by making alternate use of coastal and reef races. Shags, auks and to a lesser extent Kittiwakes also use them and the high concentrations of feeding birds provide for kleptoparasitism by Arctic Skuas.

Table 6. Seabird populations on Foula which represent more than 2% of the Shetland population compared with those on St Kilda and the largest colony of each species in the British Isles

For population units see text.

	Foula population as % of		St Kilda	Largest colony in
	Foula 1976	Shetland population	1973-7	British Isles 1969-79
Fulmar	38,555	26%	44,000	44,000 - St Kilda
Manx Shearwater	ord 2-3	50%?	ord 3-4	120,000 - Rhum
Storm Petrel	ord 4	40%?	ord 4-5	20,000 - Inishtearaght
Leach's Petrel	ord 2	80%?	ord 4	ord 4 - St Kilda
Shag	3,357	31%	300	3,360 - Foula
Arctic Skua	306	20%	0	326 - Yell
Great Skua	3,000	54%	24	3,000 - Foula
Kittiwake	5,570	12%	6,000	53,000 - Westray
Arctic Tern	5,650	47%	0	8,500 - Papa Westray
Guillemot	60,021	40%	22,000	71,000 - Westray
Razorbill	10,373	53%	2,500	20,000+ - Horn Head
Black Guillemot	117	3%	10	342 - Auskerry
Puffin	70,171	28%	320,000	320,000 - St Kilda

Note Data from this census, Berry & Johnston (1980), Cramp *et al.* (1974), Goodier (1974, 1975), Harris & Murray (1978), Lea (no date), Sharrock (1976), Wormell (1976); ord 1 = 1-9, ord 2 = 10-99, ord 3 = 100-999, etc.

The Foula seabird populations are set in context in table 6. The Foula populations of Shags and Great Skuas are the largest discrete colonies in the British Isles. The numbers of Fulmars, Arctic Skuas and Guillemots are only slightly below those of the largest colonies of these species, while the Arctic Tern, Razorbill and Puffin colonies probably rank as third largest in the British Isles. Although small, the Leach's Petrel colony is one of only five in the British Isles, and the Kittiwake and Black Guillemot colonies are large by Shetland standards.

Lack of data makes it impossible to detect changes in population sizes of Manx Shearwaters, small petrels, Razorbills or Puffins. The Shag and Eider populations appear to be remaining at about the same level, although Eider numbers may

be declining slowly. Herring Gull and Lesser Black-backed Gull numbers have declined slowly and consistently and Black Guillemot numbers declined suddenly in 1977. But most species have been or are increasing. Red-throated Divers, Great Skuas, Arctic Skuas, Kittiwakes and Arctic Terns increased considerably but now appear to have reached an equilibrium or decreased slightly in the last few years. Fulmars, Common Gulls, Great Black-backed Gulls and Guillemots all seem to be increasing, while the Gannet has begun to colonize the island. Several species seem to have fully occupied their preferred nesting habitats and have to overspill into sites which appear to be suboptimal. It would make an interesting study to compare the performance of birds in these different habitats, but no such work has been done.

Red-throated Divers and both skua species nest at exceptionally high densities on Foula, while many of the colonies of the 'cliff nesting' species are readily accessible. Access to Foula is difficult and there is little accommodation on the island for visitors. It seems likely that lack of human interference on the island has been an important factor in allowing the seabirds to nest in areas that would not be occupied in other parts of Britain. The protective attitude of the island community has allowed skuas to nest beside peat banks, terns to nest in crofts and Fulmars to nest in gardens and on buildings.

As with the rest of Shetland, Foula seabirds are threatened by possibilities of oil pollution and changing fisheries. There is no evidence that the Great Skua population has influenced the numbers of any of the other species on the island. On Foula the Great Skuas feed largely by fishing on sandeels and scavenging discard whitefish from trawlers (Furness & Hislop in press). There remains a possibility that if these sources of food become unavailable the Great Skuas would turn to predation on seabirds. They could then have a great impact on all species (Furness 1981b). It would seem sensible to monitor Great Skua diets and seabird numbers on Foula in view of the various threats of oil, whitefish and sandeel fishing and increasing human access to the island.

Acknowledgments

I would particularly like to thank the Holbourn family for permission to work on Foula and for their advice, encouragement and help. I am grateful to Brathay Exploration Group for use of facilities on Foula, assistance with the seabird censuses and access to their accumulated data. Thanks to the many friends who have helped on Foula over the years. I am pleased to acknowledge the support of the Universities of Durham, Aberdeen and Glasgow, the Natural Environment Research Council, the Seabird Group, the SOC and the Nature Conservancy Council. Finally, I thank Dr J. C. Coulson and Professor G. M. Dunnet

for much advice on the censusing of seabirds and interest in the work on Foula.

Summary

A census of Foula seabird populations in 1976 showed that the colonies of Shags and Great Skuas are the largest in the British Isles. Fulmar, Arctic Skua and Guillemot colonies rank second largest; Arctic Tern, Razorbill and Puffin probably third largest. Foula is one of the most diverse seabird communities in the British Isles, with Red-throated Diver, Eider and 18 species of seabird, including one of Britain's five known Leach's Petrel colonies. Numbers of breeding gulls are small; Herring Gull and Lesser Black-backed Gull populations are declining. Gannets recently colonized and Red-throated Diver, Fulmar, Great Skua, Arctic Skua, Common Gull, Great Black-backed Gull, Kittiwake, Arctic Tern and Guillemot numbers have increased during this century although several increases have now stopped, in some cases perhaps due to lack of further suitable nesting habitat. Threats of oil, whitefish and sandeel fisheries and increasing human access are discussed.

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RAZORBILLS

M. G. Richardson

Winter colony attendance by auks and the danger of oil pollution

W. R. P. BOURNE

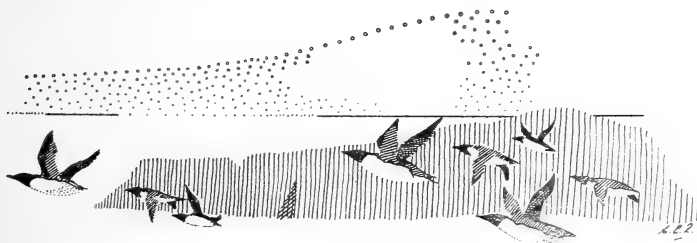
It may be useful to make some additional points in connection with the 'Earlier colony attendance by Guillemots and Razorbills' discussed by Taylor & Reid (1981). Attention first appears to have been directed to this by H. G. Alexander (1965) who reported in an introductory article for the first *Seabird Bulletin* which suggested topics for research that Guillemots in breeding plumage return to their colonies in Dorset by the first half of November, although birds continue to be seen at sea in winter plumage much longer. The following year Bill Phillips (*Seabird Bull.* 2: 65) also noticed that while many dark backed northern birds washed up in Sussex on 1st February were still in winter plumage, three paler backed southern birds were already in breeding dress.

The subject was then taken up by George Waterston in a radio programme, which elicited the records of birds seen on the Farnes (Northumberland) in November up to that date from Grace Hickling, while George had also seen them on St Abbs Head (Berwickshire) and Alastair Munro had seen them on Handa (Sutherland) in December. These observations are summarized at the end of a note by Waters (1967) reporting that during the 1961/2 winter neither Guillemots nor Razorbills were noticed ashore on St Kilda between early August and late March, nor Puffins between late August and mid April. Thus it appeared that while adult Guillemots in breeding dress were sometimes coming ashore at the more sheltered southern and eastern colonies as soon as they had completed the autumn moult, the birds might be leaving the most exposed northwesterly colony in the winter.

During a series of cruises around the Hebrides at all seasons in 1970-75 I was able to clarify the situation further (Bourne & Harris 1979). Before the start of the breeding season the attendance of the birds at the colonies is very erratic. The larger auks leave the open sea to move inshore and north to moult at the end of the breeding season in August, and do not reappear until about November, when numbers were seen moving south into the area around Cape Wrath (Sutherland), by which time they were starting to resume their breeding plumage. Thereafter they were regularly seen visiting the colonies on fine mornings, for example those on the Shiants in January 1972, and then dispersing to feed in the centre of the Minch later in the day. Their appearance was however

greatly influenced by the weather, and they were liable to remain sheltering in the lee of the land if it deteriorated, as for example when large flocks built up off the sea-lochs along the east side of Lewis during a series of westerly gales in February 1971. The occurrence of southward movements past Islay towards the Irish Sea under such conditions (Verrall & Bourne in press) suggests that some may leave the area entirely, though they soon reappear if the weather improves (compare maps in Bourne 1972a and Bourne & Harris 1979).

Until recently I had only seen auks in summer plumage ashore around the north of Scotland. In 1978 there were 40 in winter plumage at the Bullers of Buchan (Aberdeenshire) on 13th October, 75 on the 18th, and 100 on 7th November, by which time a third were in summer plumage, in an area where their presence is erratic later but there are hundreds in the spring. Most have been seen in the morning though I once saw thousands at Fowlsheugh (Kincardineshire) on Christmas afternoon. They were settled in a compact group in the centre of the colony instead of dispersed around the ledges as in summer, and it seems questionable whether they were all local birds, or included winter visitors from elsewhere which also made for the nearest cliff on fine days. This would explain the occurrence of larger numbers in winter than in summer at some colonies, including those on Anglesey (Gwynedd) as well as the Isle of May, since these are sheltered areas which tend to attract many birds in the winter (Bourne 1972b). There is a need for more investigation of this phenomenon, perhaps by marking the birds, though it would need to be done cautiously since they are very shy at this season and there is a risk that potential breeders might be scared away from the area.



GUILLEMOTS *M. G. Richardson*

It is notable that the solitary past record of Guillemots ashore at Bempton (Humberside) in November 1870 quoted by Taylor & Reid (1981) occurred at a time when there was a flush of small fish offshore and the birds were building up

from the low population level that led to the passage of the Seabird Protection Act the year before to a maximum when over 100,000 eggs were said to be taken in a year at the end of the century. Most of the observers who first noticed their appearance in autumn in the 1960s thought that they were being overlooked, although Alastair Munro was told that they had not been seen on Handa before mid January in living memory. Possibly they are again profiting from the recent increase of small fish following over-fishing for the larger ones (see also Sherman *et al.* 1981) but they may also be benefiting from the recent series of mild winters, when a reduction of the number of dead birds found on beaches suggests that they have been doing unusually well and are likely to have stayed in home waters longer where they have had more free time to spend at the colonies.

It should be emphasized that this results in a real risk to the birds from oil pollution. Early in 1977 the authorities refused to take action when oil was reported near Flamborough Head (Humberside) because the official map failed to indicate any concentration of birds there at that season. By the time it was demonstrated that they were already present offshore and visiting the cliffs in the mornings one of the most serious birdkills of recent years had taken place, resulting in a measurable reduction in the largest colony of Guillemots in England (Bourne 1977, RSPB 1979). In view of this it was alarming to see recently that the British National Oil Corporation's *Oil Pollution Manual for the Moray Firth* still reported that the birds only begin to return in January to the largest colony on the mainland of Britain along the east coast of Caithness, where hundreds of thousands of birds breed within a few miles of the Beatrice oilfield. The plans for the control of pollution in this area, which is packed with birds throughout the year (Mudge 1979, Mudge & Allen 1980) do not seem satisfactory.

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Birdwatching in Galloway

DONALD WATSON

(Plate 31)

(Concluded from 11: 193)

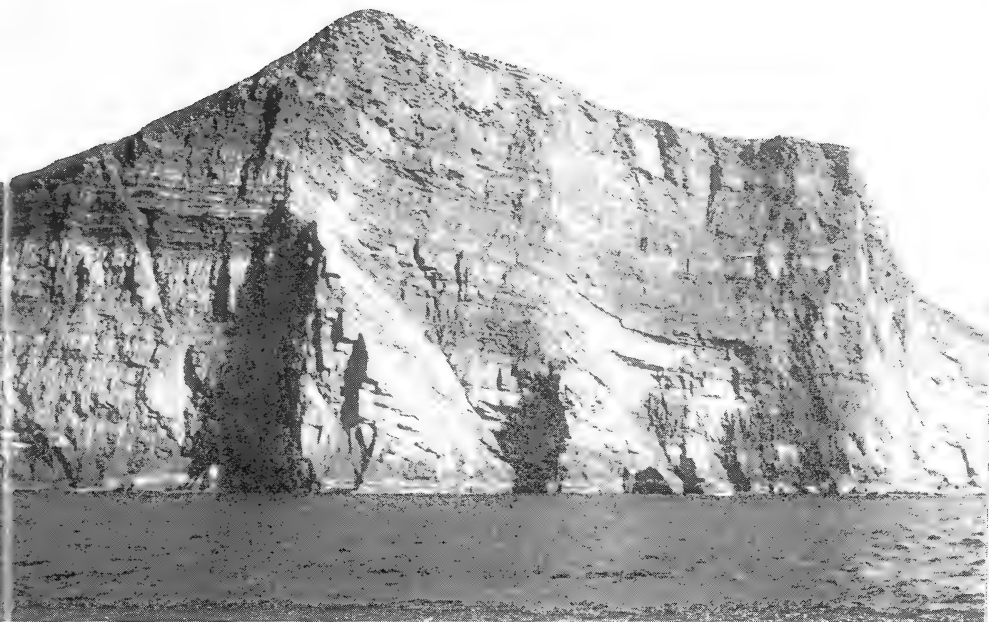
For most visitors Galloway begins when they cross the River Nith at Dumfries. The heathery massif of Criffel is skirted by rich farmland, with some magnificent old mixed woodland around New Abbey. An area of some 155 ha of peat bog and Scots Pine, next to Kirkconnell merse, is a National Nature Reserve. So this coastal strip, with its vast mud and sand flats, has a splendid variety of habitats. Wild-fowl and waders move freely between the Dumfriesshire side and the Stewartry at least as far as Southwick. Thus, over 1,000 Pintail may be found on the shore near Carsethorn and often cross the estuary to feed near Caerlaverock, while as many as 100 Black-tailed Godwits are seen below Glencaple in April and more usually at Carsethorn in autumn. Whooper and Bewick's Swans move between Caerlaverock and Islesteps on the Stewartry side. From late November flocks of Pink-footed and Barnacle Geese feed increasingly on fields near Southernness. Stray Brent, Snow and Bean Goose may be found among them. After the shooting season Kirkconnell merse presents a fine spectacle of massed Pinkfeet and brilliant pairs of Shelduck.

Carsethorn can offer a teeming prospect of shorebirds, though the sheer number of Oystercatchers and Redshank—the latter mostly Icelandic birds—is the most striking feature. Scaup are fewer than formerly but can still be seen in hundreds off the mussel beds, often so close that the splendour of the drakes' glossy dark green heads is apparent. Seaward of the holiday village at Southernness (originally Salternes from salt-working) stands Galloway's oldest lighthouse. Purple Sandpipers feed on the rocks below while waders roosting in nearby Gillfoot Bay have included well over 2,000 Bar-tailed Godwits and almost 100 Grey Plover. Sand dunes

backing the long sweep of Mersehead sands are the haunt of Stonechats and wintering Short-eared Owls and a few Little Terns may still nest. In recent years at Southernness Surf Scoter, Black Redstart and Lapland Bunting have occurred, while Dotterel have been known to alight on the golf course in spring. West of Southwick the coastline becomes steep and wooded at the Heughs of Colvend, overlooking the Southwick burn snaking through the merse. The clifftop path from Port o' Warren passes near a fine colony of Cormorants. There are also Fulmars and a small group of Razorbills. Twites probably breed on the Gorse covered slopes, where Linnets abound.

The much indented coastline between Rockcliffe and the Dee is often neglected by birdwatchers, though only the tank range west of Abbey Burnfoot is inaccessible. Common Terns breed on Rough Island, warded by the National Trust for Scotland. As many as ten Greenshank stay all winter at Kippford. There is an almost Mediterranean atmosphere about the hilly peninsular of Almorness with its thorny thickets down to the rocky shore and the green slopes of Heston Island beckoning beyond. In the 1950s there was a fine tern colony, including 75 pairs of Sandwich Terns, on the high part of the island, now thick with Herring Gulls. Auchencairn and Orchardton bays are good feeding grounds for waders and duck, especially Shelduck, some of which nest far inland. Sea-birds nesting at Balcary Point include Guillemots, Razorbills, Black Guillemots, Kittiwakes and Fulmars. The path from Balcary Bay climbs through lush woodland where early Chiffchaffs sing. Cormorant colonies fluctuate between Balcary and Orroland, further west. Behind the cliffs, the high farmland attracts up to 1,500 Pinkfeet in midwinter, while Heart Moss with its bog and willow scrub has an upland character with many nesting Curlew.

The Dee is the most varied of the smaller estuaries. Its tributary the Tarff has steep banks and trailing branches where Kingfishers perch unobtrusively. From Cumstoun Bridge Dippers and Grey Wagtails can be watched at close range, while just downstream the mudbanks attract Greenshanks, Spotted Redshanks and occasional Green Sandpipers. Further down the estuary the variety of waders is usually limited, but Dunlin and Knot are numerous in winter and sometimes thousands of Golden Plover mingle with Lapwings. There are also some hundreds of Wigeon and in summer the estuary is a gathering ground for Shelduck broods. Before the lighthouse on Little Ross Island became automatic many migrants were recorded (and often killed at the light). These included Yellow-browed Warbler, Siberian Chiffchaff and Grey Phalarope. Rats and large gulls have eliminated former colonies of Common and Sandwich Terns. Flowering plants, impressive rock



PLATES 28-30. Seabirds of Foula (p.237).

PLATE 28 (a) The immense cliffs of Foula, rising to 367m at the **Kame**.

S. R. D. da Prato

(b) Arctic Skua on nest.

R. T. Smith

Foula has the second largest colony of Arctic Skuas in the British Isles, and, owing to pressure from the expanding Great Skua colony, the highest density known.





PLATE 29. Seabirds of Foula.

R. W. Furness

(a) Foula is the largest colony of Shags in the British Isles.

(b) Black Guillemot with Butterfish *Pholis gunnellus*.

(c) Foula is the largest and oldest Fulmar colony in the British Isles after St Kilda.





PLATE 30. Guillemots are increasing on Foula which probably has the second biggest colony in the British Isles.

(a) Many Guillemots nest among boulders on Foula.

M. P. Harris

(b) Guillemot settling on egg.

D. A. Smith



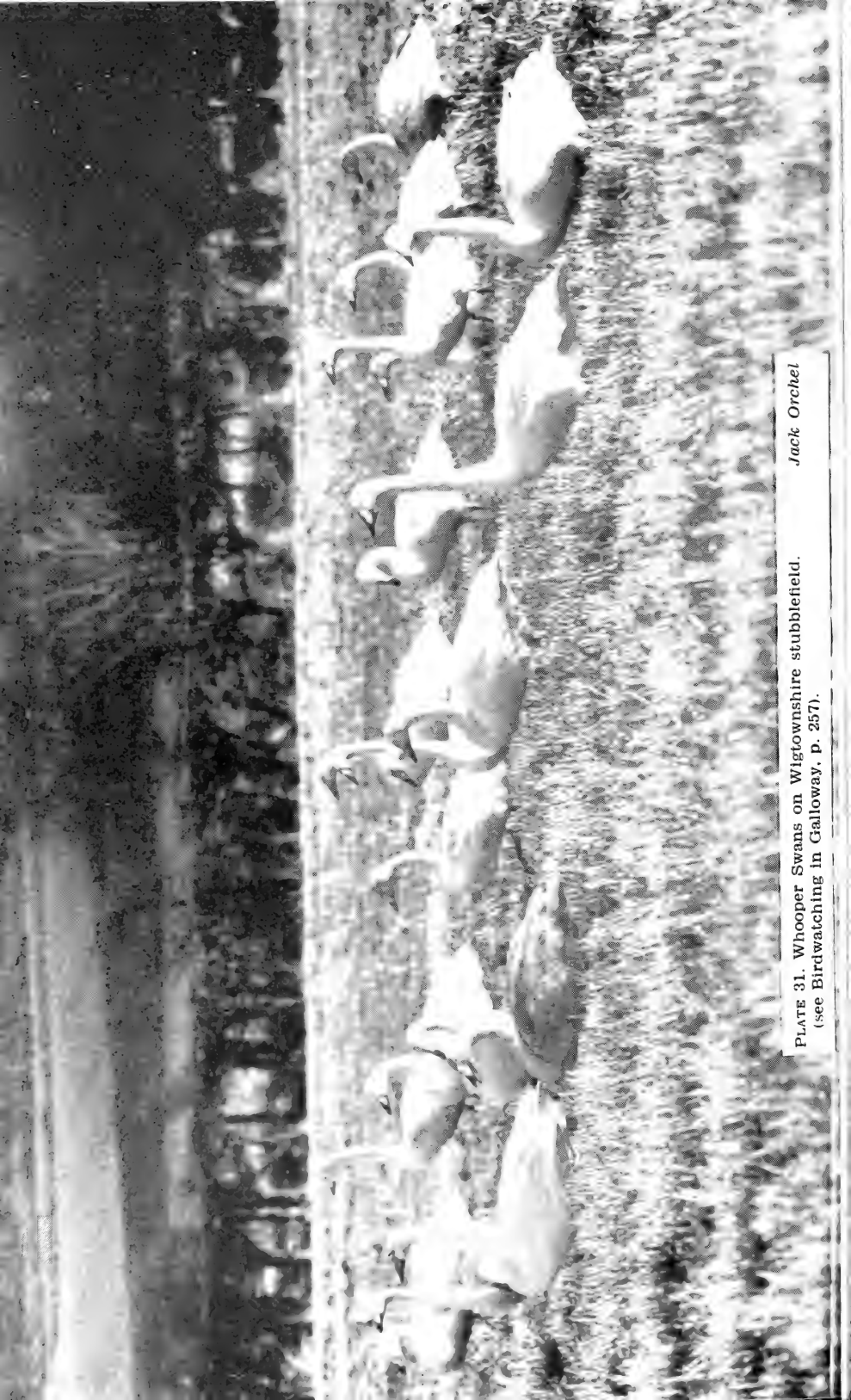


PLATE 31. Whooper Swans on Wigtownshire stubblefield.
(see Birdwatching in Galloway, p. 257).

Jack Orchel

formations and nesting seabirds combine to make Meikle Ross a memorable headland. Most of the cliff birds are of similar species to those at Balcary, but Shags are well established at the Ross.

Much of the coastline between Kirkcudbright and Creetown is rocky, but sandy shores are populous in summer. In several places dense hardwood descends to the shore. Off Muncraig cliffs Common Scoter display in spring, while at Carsluith moulting scoter flocks in summer have numbered thousands. Spring is the best season to see divers, especially Red-throated, off this stretch of coast. Despite holiday huts and caravan parks, thickets of Blackthorn, Gorse and Hawthorn can be alive with Yellowhammers, Linnets, Whitethroats, Goldfinches and Stonechats. Yellow Wagtails are sometimes passage visitors to this coastline and it would be no great surprise to find them breeding again as they did quite widely long ago. Shore nesting birds have suffered from the human invasion but Common Terns still breed in Fleet Bay. On the Isles of Fleet gull colonies have recently included 100 pairs of Great Black-backs and over 200 pairs of Common Gulls. A small flock of moulting Canada Geese has been here in summer.

Where the Cree estuary broadens into Wigtown Bay the spaciousness of the Nith is repeated, but here the backcloth is Cairnsmore of Fleet, higher and more enticing than Criffel. The birds, too, bring echoes of the Nith, with more than 100 Whooper Swans, often joined by a few Bewick's, at Moss of Cree and over 2,000 Pinkfeet on Wigtown or Cree merse late in winter. There are substantial numbers of Wigeon and Pintail at times, but there have never been high counts of Grey Plover or Black-tailed Godwits. A move to control the greatly increased shooting in Wigtown Bay has been launched with the co-operation of local naturalists and wildfowlers.

In hard winters the coastal fields at Moss of Cree are an important refuge for birds fleeing snow covered areas. Even in mild winter conditions there are flocks of Lapwing, Golden Plover, Curlew, Fieldfares, Redwings, Skylarks and mixed finches on these fields. Twites and the occasional hard weather flock of Snow Buntings range on to the merse to feed. Peregrine, Merlin, Sparrowhawk and Hen Harrier all hunt the winter concentrations of birds.

If the vastness of Wigtown Bay can be intimidating, a good variety of waders, including Bar-tailed Godwits, can often be seen from the comfort of a car at Garlieston. Southward stretches Rigg Bay with its fringe of hardwood harbouring tits, Treecreepers, and in summer many warblers and finches. The bay is one of several places where Greenshanks winter and it can produce surprises like a flock of over 100 Snipe

resting on the seaweed among large numbers of Teal, with a few Pintail, in October 1980. Offshore Red-breasted Mergansers and Common Scoters are usual and Velvet Scoter and Brent Goose have been seen. At Slidery Point seabirds, including Black Guillemots, nest on a beautiful hidden cliff. Beyond Isle of Whithorn, cliff nesting birds are found again at Burrow Head. At Kildale big fields stretching to the high cliff edge once attracted a vagrant Little Bustard. West of Port William the density of breeding Stonechats above the pebble beach is the highest in Galloway.



STONECHATS
Donald Watson

Fields around Dunragit are visited by large flocks of Greylag Geese but the Greenland White-front flock more often feeds on rushy pastures beside West Freugh. Conifer plantations, tall Heather and willow scrub back the dunes at Torrs Warren where prohibition of public access has benefited many birds. On the way to the Mull of Galloway the east facing shore has long strands of sand and shingle particularly good for Ringed Plover, with a sprinkling of Arctic, Common and sometimes a few Little Terns nesting. In autumn waders at Sandhead, Drummore and Maryport Bays may include Grey Plover, Whimbrel, Sanderling, Curlew Sandpiper, Little Stint and Ruff. The latter have lately overwintered, chiefly inland. Off Dyemill, as many as 31 Great Northern Divers have been counted in December (Bert Dickson tells me that they not uncommonly land by mistake on the airfield runway at West Freugh). A short diversion from the coast road to visit the secluded Logan Gardens (open April-September) must be recommended.

Southward as far as the contrasting little bays of East and West Tarbet the route to the Mull of Galloway traverses an undulating landscape of cattle pasture and arable fields where Corn Buntings sing from telegraph wires. The road to the lighthouse climbs above magnificent cliffs on which many seabirds breed. In spring and early summer the headland is unsurpassed for colour, as the flowering of Thrift, Sea Campion, stonecrop and Thyme succeed the blue carpet of Spring Squill. This is the most important site in Galloway for Shags, Guillemots, Razorbills and Kittiwakes; there are also Fulmars, Cormorants and many Jackdaws and Rock/Feral Doves. Most of

these species have increased in recent decades. Puffins are an enigma here; a maximum count of 26 in July 1979 included four juveniles, but nest sites have not been seen. There is historical interest in J. B. Hough's visit in June 1912. He said that the whole colony of seabirds amounted to only 80-100 birds. These were mostly Razorbills and Guillemots, with a few Puffins and Black Guillemots, but no Kittiwakes, Cormorants, Shags or Fulmars! He saw a pair of Peregrines with two young exactly where they are still sometimes seen. Of all the seabirds Black Guillemots have perhaps kept the most stable population. Choughs are now only rare visitors. I have been told that they still bred below Cardrain well into the 1930s. Twites, Stonechats and Linnets nest on the Gorse and Bracken clad slopes.

Ever since John Bain recorded the first Red-breasted Flycatcher on the Scottish mainland at the lighthouse in 1922 the Mull has seemed a promising site for migration studies. Only rarely, however, have substantial numbers of warblers, flycatchers or Redstarts been seen by day, though passage of thrushes, larks, pipits, wagtails and Goldcrests can be impressive in September-October. Unusual sightings include Water Pipit in May, Cirl Bunting in August, Nightjar in October and Shorelark in November. The best cover for migrants is in the sheltered bushes of Auchie Glen, where Little and Long-eared Owls have occurred.

Some 9½ km east of the Mull the pinnacle of the Big Scare rock can be seen in Luce Bay. On a clear day its attendant cloud of Gannets can be made out. The colony now numbers well over 500 pairs, having increased steadily since its inception in 1939. Surprisingly this tiny barren rock retains large numbers of other nesting seabirds.

The long western coast from the Mull north to Corsewall Point invites exploration on foot. Kittiwakes nest at Port Mona, Fulmars in many places and Black Guillemots in the harbour wall at Portpatrick. The decline of the upland Ravens is to some extent reflected on coastal cliffs here. North of Killylantrangan Bay many Eider broods gather and terns breed. Corsewall Point has proved the best viewpoint for passing seabirds, which have included hundreds of Manx Shearwaters, with Sooty Shearwaters, Leach's Petrels and Sabine's Gull in September.

Finally, Loch Ryan attracts a great variety of sea and shore birds. It is unique in Galloway in having regular, but small, wintering populations of Black-necked and Slavonian Grebes (Red-necked are scarcer). Both Great Crested Grebes and Red-breasted Mergansers have exceeded 200. It is an important moulting and wintering area for Eider flocks which have in-

cluded a drake King Eider for five successive winters. Wig Bay is usually the best place to see the small grebes and the greatest variety of seaduck but large flocks of Wigeon, Scaup and waders feed remarkably close to the A77 road east of Stranraer. In October there is a good chance of a small flock of Brent Geese, comparative rarities on the Solway. Loch Ryan has so far escaped major industrial development. It is only too obvious that its rich birdlife, concentrated in such a small enclosed area, is highly vulnerable.

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SHORT-EARED OWLS
Donald Watson

Short Notes

Sparrowhawks and heavy prey

On 12th March 1981 a Sparrowhawk caught a domestic pigeon beside our house near Newtonmore (Inverness-shire) and carried the living but inactive pigeon with difficulty for c.3m over a level surface and then c.25m down a 30° slope to the foot of a 1.5m wall. When approached the hawk failed to carry the pigeon over the wall. The pigeon was killed and put in a balchattri trap and the hawk was caught eleven minutes later. It was a very large first year female, weight 340gm, crop part full, condition fair to good (assessed by feeling the breast), wing 238mm. The pigeon, which it seemed unable to carry upward or in level flight in still air, weighed 410gm.

Woodpigeons weigh c.500gm and are a major prey species of Sparrowhawks, which are usually assumed, in calculating food consumption, to carry them whole to the nest area (Newton 1973 *Brit. Birds* 66: 271-8 *et seq.*). This seems not to be well documented by observation. DNW has seen a female Sparrowhawk carry a young Capercaillie, which weighed

c.350gm, for over 1km to the nest but the vertical drop over this distance was more than 150m. Male Scottish Highland Peregrines, weighing c.730gm, seem rarely to carry prey weighing over 500 gm for more than 2km to the nest (Weir 1977 in Lindberg (ed.) *Rept. Peregrine Conf.* . . . Grimso Wildl. Res. Stn., Sweden) and prey weighing more than the Peregrine may be dismembered before being carried (Weir unpub.). The question is, how often do female Sparrowhawks dismember Woodpigeons before carrying to the nest? The implications are evident for (a) accuracy of food consumption studies, and (b) the proportion of the female Sparrowhawk's extensive home range from which Woodpigeons can be carried to the nest.

DOUGLAS N. and PENNY WEIR

The above note raises the issue of how much a female Sparrowhawk can carry and thus the availability of heavy prey for feeding young. Although hen Sparrowhawks frequently kill Woodpigeons it is obvious that they cannot carry even severely emaciated ones for any distance. On 11th March 1981 near Kirkton (Dumfriesshire) I watched a first year female Sparrowhawk attempting to carry a Woodpigeon from the centre of a field of winter wheat. She managed to drag it about 5m before abandoning the attempt and fed from the carcass *in situ*. After her meal she perched on it for c.20 minutes then fed again before flying off to perch in a nearby plantation. The carcass was subsequently scavenged by crows and disappeared overnight, presumably removed by a Fox or cat. Had this situation arisen in summer, none of this pigeon would have been available to nestling Sparrowhawks as they are never, to my knowledge, fed by regurgitation, only directly from items brought to the nest. However, Woodpigeons are fed to the young, as has been shown by observation from hides (Newton 1978 *J. Zool., Lond.* 184: 465-487) and these observations suggest that most, if not all, Woodpigeon carcasses are partially eaten before they are brought to the nest.

The greater the distance from the nest site a pigeon is killed, the greater the chance that the carcass will be scavenged before the Sparrowhawk has eaten and digested enough to enable her to carry it to the nest. Judging from the scattering of feathers dislodged during the kill and the plucked feathers close by where the kill had been dressed, many Woodpigeons fed to the young are killed quite close to the nest, and under these circumstances little, if any, will be lost to scavengers. However, when their young are large, female Sparrowhawks often hunt up to 4km from the nest and 8km has been recorded (Marquiss & Newton in prep.). At these distances large, heavy prey are inappropriate to the needs of parent Sparrow-

hawks and this raises the question as to whether such birds prefer smaller prey when they are outside the immediate nest vicinity.

MICK MARQUISS

Mediterranean Gull holding territory

On 12th April 1980 an adult Mediterranean Gull was found in a Scottish colony of Black-headed Gulls a few days after its disappearance from a nearby roost. The colony site is an island on a small hill loch where Black-headed Gulls breed amongst the rank Reed-grass *Phalaris arundinacea* which covers the whole island bar a few stunted Willows *Salix*.

The Mediterranean Gull had obtained a small territory near the edge of the colony, which indicated, along with its advertising calls occasionally distinguishable amidst the colony rabble, that it was a male. For the first few weeks of its stay it was harried frequently in the air by small parties of resident gulls; first summer birds were especially persistent in their attacks. Over the following weeks this intolerance abated and by mid May the alien was largely ignored. This increased suspicions that it might try to breed with a Black-headed Gull as has occurred elsewhere. At no time, however, was it seen to associate with any particular individual, except on 5th May when it mounted an apparently off-duty bird on the water. This had not been preceded by any obvious display and the Mediterranean Gull was driven off aggressively almost at once.

Observations throughout the period were unfortunately irregular and the possibility that hybrid eggs were laid as the result of such an opportunistic encounter cannot be discounted. The colony is plundered relentlessly throughout the summer by locals and any such eggs would almost certainly have been taken. The bird left the area unexpectedly around 30th May, having been present for about 50 days. It was not seen in 1981.

This is the first instance of a Mediterranean Gull holding territory in Scotland and follows a rise in the number of Scottish records from three before 1975 to the recent level of 3-4 annually. The main population of the species breeds in southeast Europe, wintering along Mediterranean coasts. Since 1950 small but increasing numbers have bred erratically in central Europe and on the southern slopes of the Baltic and North Seas, hybridizing frequently with Common and Black-headed Gulls. Pure pairs have nested five times in the UK between 1968 and 1979 and hybridization with female Black-headed Gulls has also occurred.

Given this steady range expansion the occurrence of a lone male summering in Scotland is perhaps not surprising, but it seems significant that the colony concerned constituted a marked habitat difference from the saltmarsh and other low lying coastal environments where western European and Baltic colonists breed, being sited over 20km inland at an altitude of over 200m on a predominantly oligotrophic loch.

JOHN J. SWEENEY

Treecreeper with only one foot

While mistnetting at a pool in a pinewood near Banchory (Kincardineshire) on 16th April 1981 I caught a Treecreeper with the lower part of the left tarso-metatarsus and the whole left foot missing, apart from one claw hanging from a dried-up tendon. The bird was otherwise apparently healthy and weighed 9gm. A second Treecreeper, trapped at the same time and suspected of being its mate, weighed 8gm. Upon release (unringed) the injured bird flew to the nearest pine tree and proceeded to climb up the trunk. Apart from a very slightly jerkier movement and somewhat crab-like ascent (at about 15° from the vertical) the bird appeared to be able to move and forage quite satisfactorily. As the wound was an old one, the bird had clearly been able to cope with the previous winter conditions despite its injury and the special demands of a Treecreeper's way of life.

ALAN G. KNOX

Obituary

WILLIAM BROTHERSTON, BL, SSC, NP

With the passing of Willie Brotherston on 18th July 1981 the club has lost one of its staunchest supporters. Save for the war years when he was in Persia, he practised in Edinburgh as a solicitor from 1935 until his retirement earlier this year. His unexpected death while out birdwatching in the Moorfoot Hills came as a shock to his many friends who would have wished him a few more years in the field.

Willie was a man whose first consideration was for other people and this applied to both his business dealings and his leisure activities. For the many years that he was associated with the Castle Trades Hotel in the Grassmarket he was always concerned for the well-being of the lodgers there. He also had a great concern for wildlife and the countryside.

Being a sole practitioner in his latter years he had little time for travel and holidays, but any free time he had would be put to maximum use. In the summer he and his wife, Helena, would stay in their cottage by the Heriot Water in the Moorfoot Hills, and it was in south Midlothian that he was able to do most of his birdwatching. Consequently he had considerable knowledge of the traditions and dialect of the upland agricultural community of the area. For most of his life he photographed from a hide and his pictures from the early 1930s are classics. In recent years he took a number of fine photographs of nesting moorland birds in the Moorfoots and a selection was depicted in the winter 1979 issue of *Scottish Birds* (10: pl. 29-31).

It would be safe to say that the species to which Willie devoted most of his attention was the Pink-footed Goose. Virtually every weekend from September to April, weather permitting, he would be out watching the geese at their haunts in the Lothians. He organized goose counts to cover all the known roosting sites in southeast Scotland, and with great tact and charm would persuade the most unsuspecting volunteer out into the field to do his or her stint. His work on Pink-footed and Greylag Geese has greatly contributed to our knowledge of their migration and wintering habits in southern Scotland. He published a masterly paper on this subject in the *Wildfowl Trust 15th Annual Report 1962-3* (1964, pp. 57-70). Though a non-shooter, Willie did valuable work as Scottish solicitor for the Wildfowlers' Association of Great Britain and Ireland, and in recognition of this was recently made a vice-president of the association.

In addition he was closely involved in the formative years of the Scottish Wildlife Trust, first as secretary of the Lothians branch and then as branch chairman from 1968 to 1972. During these years he did a great deal of work for the trust and was active behind the scenes, particularly in the creation of the reserves at Bawsinch (Duddingston) and Red Moss (Balerno). He was responsible for getting the detailed survey of the land use and habitat of the Lothians under way. As a regular attender at the monthly Wednesday evening discussion meetings of the SOC at Regent Terrace Willie was always ready to give advice and help, and would often take the initiative in introducing new ideas. He was a member of council from 1965 to 1970, and in 1979 his many years of work for the club were recognized when he was made an honorary member.

We extend our sympathy to his wife, Helena, and share with her the loss of a remarkable man.

J. H. BALLANTYNE

Reviews

Waders (New Naturalist 65) by W. G. Hale; Collins, London, 1980; 320 pages; 24 plain photo plates; many drawings; 73 diagrams & maps 22 x 15 cm; £9.50.

The author describes his book as a general and personal view of wading birds. Certainly the personal interest comes through in the emphasis on taxonomy and variation, especially in the Redshank, and on studies of the Ribble. As to the 'general', the chapters each cover an aspect of wader biology rather than a species or genus. This approach has allowed the author to incorporate wader studies from outwith Britain, notably from North America, although 255 references seem rather few. It is good to see so many photographs showing behaviour away from the nest.

As to content I found this difficult to evaluate. The book covers a great deal of ground but there is a lack of balance. The author is not afraid to tackle wide ranging subjects such as variation in relation to evolution, the effects of glaciation, carrying capacities of estuaries, and energy flows, but I wonder whether the general reader will appreciate how many assumptions have to be made in these areas. Not all ringers will agree that it is safe to assume a linear progression in the rate of moult for many waders. Wader roosts are given a whole chapter which may overemphasize their importance especially since it is claimed that the quality of roost sites can be 'an over-riding factor of more importance than the availability of food'.

The emphasis on roosts also appears in the references to wader counts and can give a misleading picture of which parts of an estuary are most important. The assumption that outwith the breeding season most waders are concentrated on a few estuaries in northwest Europe and that other types of coast and most of Africa hold relatively few is debateable. It has been known for some time that many of Scotland's open coasts hold important wader populations yet the index only gives four references to Purple Sandpiper (British wintering population at least 14,500)—the same number as Greater and Lesser Yellowlegs and less than pratincole, stilt, and four other American species.

Other work of Scottish interest on the feeding distribution and movements of wintering waders on the Forth and Clyde estuaries or breeding season censuses in the uplands does not feature. This is at least partly due to the timing of the book which really stops around 1977 and is in danger of being overtaken by events. Despite these criticisms the book is worth buying but I wonder whether the New Naturalist editors can realistically expect one author to cope with as wide ranging a book as this. Wader studies are a good example of co-operation in ornithology and a chance for fruitful joint authorship has sadly been lost here.

S. R. D. DA PRATO

Birds of Prey of the World by F. Weick & L. H. Brown; Hamburg, Verlag Paul Parey, 1980, published in UK by Collins; 159 pages; 40 colour plates; 164 drawings; 29 x 21 cm; £15.

Inspired by Peter Scott's *Coloured Key to the Wildfowl of the World*, this book should be in the library of anyone interested in the order Falconiformes. Every species and distinctive race is illustrated, no less than 1,144 specimens. For comparison all are painted in the one position, and males, females, and some immatures and unusual colour phases are shown. The text, a model of brevity giving measurements, field characters and distribution, is opposite the relevant illustration. There is an

introductory section containing identification keys, a review of the genera, and a bibliography.

The text appears in both English and German, and not all the supplementary remarks on the colour plates are reproduced in both languages. This is not as confusing as might first appear and one soon gets used to looking at the correct part of a page for the relevant information, or learns, for example, that 'hell' is the German for 'pale'! Even so, this practice of reducing costs by producing a multilanguage edition is of questionable value since many readers will object to having to pay for the other language text they have no need for.

The value of this book must lie in the quality of the illustrations. At first glance these give the impression of being overcrowded and perhaps a little sketchy, yet no important detail appears to have been missed, they are drawn to scale, and the colours are accurate albeit a trifle heavy. The line drawings are particularly neat. This book is essentially an identification aid and, although not a field guide, is well worth the sacrifice of a little of your baggage allowance if birdwatching abroad. It is just a great pity that illustrations of flight patterns were deliberately omitted, even if these are amply covered in other publications.

IAN H. J. LYSTER

The books reviewed above are available from the SOC Bird Bookshop

Also received

Nature Guide to Scotland by G. Fry; Usborne, London, 1981; 128 pages; many colour illustrations & photos; maps; 19 x 13 cm; £3.99 (hardback), £2.50 (softback).

Sandgrouse (Annual journal of The Ornithological Society of the Middle East); plain photos; drawings; diagrams; maps; 21 x 15 cm; each £5 (softback); **No. 1** 1980; 81 pages; **No. 2** 1981; 110 pages; from The Secretary, OSME, c/o The Lodge, Sandy, Beds., SG19 2DL.

The Wild Flower Key by F. Rose; Warne, London, 1981; 480 pages; c.1000 colour illustrations; drawings; map; 19 x 13 cm; £8.95 (hardback), £5.95 (softback).

Usborne Guide to Birds of Britain and Europe by Rob Hume; Usborne, London, 1981; 128 pages; many colour illustrations and drawings; 20 x 13 cm; £3.99 (hardback).

A Field Guide to the Bird Songs of Britain and Europe supplementary record 15 N° RFLP 5015 by S. Palmer and J. Boswall; Sveriges Riksradio, Stockholm, 1980; distributed by Conifer Records, Horton Road, West Drayton, Middlesex, UB7 8NP.

Voices of the Loon by W. Barklow; NAS-1001; National Audubon Society & North American Loon Fund. Long-playing record of Great Northern Diver repertoire; \$9 + \$2.50 postage from NALF, Main Street, Humiston Building, Meredith, New Hampshire 03253, USA.

Current literature Articles and reports on the status and distribution of birds in Scotland are listed here. Strictly biological studies such as ecology or behaviour are excluded and so are references from the widely read journals **British Birds**, **Bird Study**, **Ringing and Migration** and **Ibis**. Most items listed and many others are available for reference in the club library and we are grateful to the contributors. The library welcomes copies of work on any ornithological subject.

Edinburgh Ringing Group: Eight 1980. 60p (85p by post) from J. H. Ballantyne, 6 Mansfield Place, Edinburgh, EH3 6NB.

Caerlaverock Bird Report No. 2 - 1980. M. Wright (comp.) 1981. Nature Con-

- servancy Council, South West (Scotland) Region, The Castle, Loch Lomond Park, Balloch, Dunbartonshire, G83 8LX.
- The spring migration of Turnstones through Britain in 1979. P. N. Ferns 1981. *Wader Study Group Bulletin* 31: 36-40.
- A Guide to Birds and Birdwatching on the Uists*. Royal Artillery Range Natural History Society 1981. Royal Artillery Range Hebrides, Benbecula PA88 5LN.
- St Abbs Head Seabird Sample Counts, 3rd Year Results* - 1980. R. Weatherhead, C. O. Badenoch 1981. Nature Conservancy Council, South East Scotland Region, 12 Hope Terrace, Edinburgh, EH9 2AS.
- Fair Isle Bird Observatory Report for 1980*. Ed. J. Arnott 1981. £1.15 from FIBOT, 21 Regent Terrace, Edinburgh.
- Orkney Bird Report 1978-9*. Ed. D. Lea 1981. £1 from D. Lea, 6 Old Scapa Road, Kirkwall.
- Review of Sanda Storm Petrel movements. E. J. Maguire. *Copeland Bird Observatory Report for 1980*: 19-20.
- Hebridean Naturalist* No 5. J. A. Crummy (ed.) 1981. Includes 'Red-throated Divers... on Rhum' and 'A Bird census in Lews Castle woodlands'. £2 plus order charge from SOC Bird Bookshop or from editor (17 Tolsta Chaulais, Isle of Lewis).
- Ayrshire Bird Report 1980*. A. Hogg (ed.) 1981. £1 plus order charge from SOC Bird Bookshop or from editor.
- Perthshire Bird Report '80*. E. D. Cameron 1981. Perth Museum and Art Gallery, George Street, Perth. 80p post free.
- Angus and south Kincardine 1979 and 1980 bird report. N. K. Atkinson (1981). *Angus Wildlife Review 1979/80*. (50p). Museum and Art Gallery, Panmure Place, Montrose.

Notices

British Birds is again offering reduced subscriptions to SOC members. You can get it for only £13.50 instead of £18. Send the enclosed leaflet to Mrs E. Sharrock, British Birds (Circulation), Fountains, Park Lane, Blunham, Bedford, MK44 3NJ.

Suggestions for Speakers and Standards for Slides is the title of a useful illustrated pamphlet available for 40p from the Institute of Biology, 41 Queen's Gate, London, SW7 5HU.

Colour ringed Fulmars Fulmars will be colour ringed over the next few years at colonies on the Firths of Clyde and Forth. Sightings at or away from these areas will be very welcome, particularly over the winter months. Observations at Fulmar colonies should record whether birds are in flight or on land. B. Zonfrillo, 28 Brodie Road, Glasgow G21 3SB.

Whooper Swans ringed at Lake Myvatn (Iceland) in 1980 are carrying blue neck collars engraved with individual codes. Please send records to M. A. Brazil, Dept. Psychology, University of Stirling, FK9 4LA.

BTO/IWC Winter Atlas Project This autumn the British Trust for Ornithology and Irish Wildbird Conservancy launched a major project—the Winter Atlas. Fieldwork will start in mid November and continue until the end of February in each of the next three winters 1981/82 to 1983/84. The object is to produce, for each species, a map of its distribution in Britain and Ireland during the winter. The unit of distribution is the 10-km square of the respective National Grids, and observers are asked to record not only the presence of species in a square but also to provide counts. These will enable the maps to show, in addition to the whole distribution, where each species is commoner and where it is scarcer. For most species, especially the landbirds, detailed information on winter distribution is simply not available at present. Therefore the

map will become an essential reference for everyone wanting information on birds in winter, just as **The Atlas of Breeding Birds in Britain and Ireland** now is for breeding season studies. There is already information on the main concentrations of some of the waterbirds, yet even for these species we do not know the complete distributions, knowledge which is necessary for properly evaluating more detailed work, whether for conservation, scientific or other purposes. The results of ALL your birdwatching during the Atlas period—in this winter 14 November 1981 to 28 February 1982 inclusive—can be incorporated, although special timed visits of at least one hour will be especially valuable. Full details of how you can take part will be available from your local Regional Organiser. The list appears after p. 280. (Dr Peter Lack, BTO.)

The Scottish Ornithologists' Club

REPORT OF COUNCIL

For Year to 30 June 1981

Membership On 30 June 1981 the club had 2914 members, a net increase of 182. This encouraging increase was also reflected in the number of new members; 407 joined during the year, 75 more than last year, of whom 63 were juniors and 15 children nominated for family membership. 4 existing members took out life membership and 1 member was made an honorary member. 356 paid the reduced rate for pensioners. In the table family members are counted as two people; nominated children pay no subscription.

Year to 30 June	1976	1977	1978	1979	1980	1981
Honorary	4	4	1	1	5	6
Life	29	29	49	51	58	62
Ordinary	2406	2536	2572	2357	2387	2555
Junior	299	282	271	211	208	211
Nominated children	80	98	87	82	74	80
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	2818	2946	2980	2702	2732	2914
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	+302	+128	+34	-278	+30	+182

Covenants The revenue from covenanted subscriptions continues to increase and provides a substantial sum in the club's annual income. The number of covenants rose from 756 to 776 covering 938 members and council records its gratitude to those members for their help.

Deaths Council records with deep regret the death during the year of Leslie Brown; Major the Honourable Henry Douglas-Home; and Dr George Waterston, founder, first honorary secretary, President and Honorary President of the Club. Obituaries have appeared in *Scottish Birds*.

George Waterston Memorial Fund While a full account of George Waterston's life is given in his obituary, council considered there should also be a more lasting and positive memorial to him. Two suggestions were agreed: firstly that the SOC reference library be named the Waterston Library, and secondly that a George Waterston Memorial Fund be established. By 30 June 1981 over £3000 had been donated, and further sums have since been received; we are very grateful to the RSPB for publicising the Memorial Fund and to its members for their contributions. A decision has still to be made regarding the use to which the Fund will be put, but consideration is being given to three suggestions: first there

should be a periodic George Waterston Memorial Lecture, at intervals yet to be decided but possibly not more frequently than every three years; second, support should be given to the Waterston Library; and third, support should be given to projects dear to George's heart. Members will be advised when a firm decision has been reached, but in the meantime the Fund remains open and donations will be welcomed.

Finance Several factors account for the small deficit. The cost of printing the annual bird report, and the cost of travel to meetings and conferences were higher than expected, as was the cost of reprinting back numbers of the journal, though this last was offset by increased sales, which have already shown good results. Bookshop sales rose by 15% and showed an increase in overall surplus, although total sales did not reach the estimated figure. In anticipation of a further deficit next year, and in line with the forecast made by the retiring Treasurer at the last AGM, council has recommended an increase in subscription rates from July 1982. To have been able to hold rates for four years is a measure of the importance of the bookshop to the club's finances.

Branches The increase in total membership is reflected in a noticeable increase in the number attending meetings and excursions. A full programme of lectures was given at all thirteen branches, several of which arranged additional meetings to cater for the varying needs of their members.

Annual conference The 33rd annual conference and 44th annual general meeting of the club were once again held at the Marine Hotel, North Berwick. Over 300 members and guests attended another enjoyable weekend, and filled the hotel to capacity. An account appeared in *Scottish Birds* 11: 170.

Scottish Birds Four issues with 164 pages of text and plates were published on schedule during the year. Council thanks all who contributed to the journal, and in particular those who have acted as referees for papers submitted to the editor.

Scottish Bird Report The 1979 report was sent to members with the winter 1980 journal, and council acknowledges most gratefully the work of the editor, compilers and local recorders in producing it. Escalating costs forced council to take the decision that in future the report should be available only to members prepared to purchase a copy. This decision was not universally welcomed, but the relatively small number of copies ordered indicates the wisdom of council's decision to save on printing costs.

Birds in Scotland During the year arrangements were made for the club to support the production of a book on the status and distribution of Scottish birds, to provide an up-dated successor to Baxter and Rintoul's *The Birds of Scotland*. The book is being written by Valerie Thom and publication, by T & A D Poyser Ltd., is planned for 1985. Generous financial assistance towards this project has been received from the Baxter Trust, the Rintoul Trust, J. D. Hutchison's 1970 Charitable Trust (£200), the Late Lord Rootes Charity Trust (£200), BP Petroleum Development Limited (£1000), and Shell UK Limited (£1000). The club is greatly indebted to these organisations and especially to the Trustees of the Baxter and Rintoul Trusts who so generously transferred the entire monies held by these trusts to the SOC for this purpose. The sums received (including £6477 from the Baxter and Rintoul Trusts received shortly after the end of the financial year) have been lodged in a special account where they will accumulate interest until required. On publication of the book one third of the royalties due will be payable to the SOC.

Research and fieldwork Club members again helped other ornithological bodies with surveys, including the BTO's national Nightjar survey, the RSPB's beached bird survey, the Wildfowl Trust's goose and wildfowl

counts, and the BTO common bird census. It is expected that the pilot studies carried out in preparation for the BTO Winter Atlas, and the summer Wader Breeding Survey, will demonstrate the value of carrying out full surveys in the coming years.

Conservation The major public enquiry into the proposed development of ski-ing facilities in the Cairngorms started in May, but after two weeks was postponed until September. The outcome of this important enquiry will have a major effect on the future of wildlife in this most sensitive area. A decision has still to be made on the exact route to be taken by power lines from the Torness power station in East Lothian.

Endowment Fund 10 applications were received and council endorsed the recommendations of the research committee to award seven grants totalling £795. The following grants were made: £30 to Bruce Lynch towards costs of his Common Sandpiper study in Glen Clova; £75 to Graham Rebecca to study Merlin in the Grampian area; £40 to Steve Buckland for maps for a survey of sites of ornithological interest in NE Scotland being undertaken by the Aberdeen University Bird Club; £50 to Alistair Duncan towards costs of the Grampian Region Schools expedition to St Kilda and Rhum; £100 to Mike Nicholl and Keith Brockie for their studies of nestling Heron in Fife and Tayside; £250 to the Tay Ringing Group expedition to Iceland to study Redshank; and £250 to the Grampian and Tay Ringing Groups' joint expedition to Norway to study Purple Sandpipers, which will complement their winter studies of this species in Scotland. It is a condition of any grant that a short report about the project must be submitted within three months of its completion; if a grant has been awarded in support of a continuing project, those concerned are encouraged to submit an article about their work to *Scottish Birds*.

Legacy Miss Agnes Gunn, sister of Mr Peter Gunn, an honorary member who died in 1978, herself died in 1980 and the club received a one sixth share of the residue of their estate. Peter Gunn bequeathed all his ornithological books to the club and in addition he left a large sum of money for the Endowment fund. So far £2500 had been received; the balance would follow when the estate was finally wound up. The club, and in particular those who benefit through grants from the Endowment fund, have cause to be extremely grateful to Peter Gunn for remembering the SOC so generously.

Waterston Library Following the bequests by Peter Gunn and others, a number of duplicate copies of books were sold and the proceeds placed in a library fund. In addition to the purchase of new books, and of journals required to complete runs, an increased programme of binding was undertaken during the year. Greater use is being made of the library and the Council continues its policy of purchasing new reference books with an allocation from general funds.

Bookshop Sales reached £90,000, the volume of work handled again increased and mail order business continued to expand. The club has a world-wide reputation for the service its bookshop gives and great credit is due to the staff for the personal attention and help they give to customers.

Council acknowledges gratefully invitations to take books to the BTO annual conference at Swanwick; the Scottish Ringers' conference organised by the Tay Ringing Group in Dundee; and the British Ornithologists' Union's 1981 annual conference, held in Glasgow.

Scottish Centre The Scottish Centre for Ornithology and Bird Protection continues to be a focal point for visiting birdwatchers from home and abroad; postal enquiries too are received in large numbers. Meetings of the SOC council and its committees took place in the building as well as branch and informal group meetings. The Fair Isle Bird Observatory

Trust, Scottish Advisory Committee of the RSPB, and Isle of May Bird Observatory and Field Station Committee all held meetings in the Centre during the year.

Ever since the RSPB Scottish Office moved out of 21 Regent Terrace in 1968, two rooms in the basement have been leased to charitable organisations to help reduce the running costs of the building. However increasing bookshop sales, with a consequent expansion in SOC staff and need for more storage space for stock, meant that extra space was required. At the end of June 1981 these two rooms were therefore taken over for the Club's own use.

Club representation Council records its appreciation to three members for their continued service to the club. Bede Pounder is a member of the Duck Working Group of the International Wildfowl Research Bureau, while Frank Hamilton and Dr Derek Langslow serve on the British Section of the International Council for Bird Preservation.

Secretarial staff To help with the growing volume of secretarial and clerical work associated with the bookshop, two new staff members were welcomed during the year. In August 1980 Miss Helena Barul joined the full time staff; she is responsible for general typing and also assists with other work in the bookshop. Alasdair MacKay, a club member from Edinburgh, joined the part time staff in January 1981 and is responsible for clerical work concerning accounts.

Acknowledgments As the club grows numerically and in number of branches, more members become involved in its organisation. Council is aware of the time and trouble taken by these members to help others to enjoy their birdwatching, and records its appreciation to them all. Others, such as the compilers of the annual bird report, local recorders, and those who serve on branch and club committees and whose presence may not be so obvious, contribute to the strength and growth of the SOC and Council acknowledges their work with gratitude. Finally, the smooth-running of the SOC's affairs is in no small measure due to the efficiency and enthusiasm of the staff; Council records its sincere appreciation of the loyal way in which they serve the SOC.

For the Council,

VALERIE M. THOM, President.

Revenue account for the year ended 30 June 1981

INCOME	30/6/81	30/6/80
Subscriptions received for year	£12075	£11412
Income tax received on covenanted subscriptions	1730	1717
Dividends and interest received (gross)	942	1254
Surplus on bookshop (sales £90886)	22184	18582
Sale of "Scottish Birds"	1054	698
Sundry sales less sundry purchases	77	45
Donations	127	110
Raffle	595	—
V.A.T. recovered	89	—
Conference	—	126
	<u>£38873</u>	<u>£33944</u>

EXPENDITURE

Branch expenses including lectures	... ..	£1699	£1457
Travel expenses of council members and delegates to conferences	... ..	1026	673
Secretarial and editorial expenses	... ..	23750	19317
Office expenses	... ..	2598	2188
Scottish Centre for Ornithology and Bird Protection: Club's share of running expenses		2273	1828
Cost of books purchased by library, and binding	... ..	506	335
Cost of publishing "Scottish Birds" (less advertising revenue £1284)	... ..	4901	4597
Cost of publishing 1979 Scottish Bird Report (1)		1256	—
Expenses in production of 1979 SBR	£100		
Less contribution from "Scottish Birds" Appeal Fund		100	
		<u>801</u>	<u>—</u>
Cost of reprinting back numbers of "Scottish Birds"		801	—
Conference	... ..	134	71
Subscriptions paid	... ..	94	142
V.A.T. not reclaimable	... ..	69	
		<u>£39108</u>	<u>£30608</u>
Excess of Expenditure over Income	... ..	(235)	3336
		<u>£38873</u>	<u>£33944</u>

Note (1) The cost of publishing the 1978 SBR (£959) was added to the cost of publishing "Scottish Birds" for the year, from which was deducted both the advertising revenue and the 1979 raffle income (£1306 and £555 respectively).

Balance Sheet as at 30 June 1981

	30/6/81	30/6/80
GENERAL FUNDS OF THE CLUB		
Accumulated surplus from previous year	... .. £11342	£8006
Subtract deficit for year	... .. (235)	3336
	<u>11107</u>	<u>11342</u>
Life membership fund	... .. 4363	4013
"Scottish Birds" Appeal fund	... .. 1415	1515
Library fund	... .. 699	—
George Waterston Memorial fund	... .. 3077	—
	<u>£20661</u>	<u>£16870</u>

REPRESENTED BY

Cash in hand and at bank	...	...	...	£798	£1077
Cash in Dunfermline Building Society	...	...	...	6640	2628
Bookshop stock	...	...	...	18294	16050
Tie, badge, car sticker and notelet stock	...	...	...	683	486
Debts due to club	...	...	...	4560	4385
Due from Endowment fund	...	...	...	56	—
Investments at cost as below	...	...	...	2506	2506
				<u>33537</u>	<u>27132</u>
Less					
Subscriptions paid in advance	...	...	£25		46
Debts due by club	...	...	12851		10090
Due to Endowment fund	...	...	—		126
				<u>12876</u>	
Total net assets	...	...	...	<u>£20661</u>	<u>£16870</u>

Investments as at 30 June 1981

	Market value	At cost	At cost
Safeguard Industrial Investments Ltd.—			
875 Ord. shares of 25p each	£936	£508	£508
£2100—10% Treasury Stock 1983	1963	1997	1997
	<u>£2899</u>	<u>£2506</u>	<u>£2506</u>

Endowment Fund

(The free income of which is available for the advancement of ornithology)

Revenue account for the year ended 30 June 1981

INCOME	30/6/81	30/6/80
Interest and dividends received (gross)	£1010	£917
EXPENDITURE		
Grants as detailed in Report of Council	795	735
Excess of income for year	<u>£215</u>	<u>£182</u>

Balance Sheet as at 30 June 1981

Endowment Fund as at 30 June 1980	...	...	£3561	£3556
Add Donations	...	...	2500	5
			<u>6061</u>	<u>3561</u>
Accumulated revenue as at 30 June 1980	...	...	2243	2061
Excess of income for year	...	...	216	182
Grants refunded	...	...	240	—
Gain on redeemed stock	...	...	81	—
General No. 2 account: donations and interest	...	...	2556	—
			<u>11397</u>	<u>5804</u>
Less Decrease in cost value of investments	...	...	88	—
			<u>£11309</u>	<u>£5804</u>
Made up of:				
Investments at cost as below	...	...	£3063	£3151
Dunfermline Building Society:				
Capital account	...	...	2906	407
General No. 1 account	...	...	2940	2461
General No. 2 account	...	...	2556	—
Due by Club's general funds	...	...	—	125
			<u>11465</u>	<u>6144</u>
Less Grant allocated but not yet paid	...	£100	156	340
Due to Club's general funds	...	56	—	—
			<u>£11309</u>	<u>£5804</u>

Investments as at 30 June 1981

	Market value	At cost	At cost
£1220—9¼% Treasury Stock 1983	£1147	£1140	£1140
£352—British Printing Corporation 7½% Non Cumulative Preference shares £1	95	353	441
500 St Andrew Trust Ordinary 25p	800	570	570
1952 M & G Equity Investment for Charities	3328	1000	1000
	<u>£5370</u>	<u>£3063</u>	<u>£3151</u>

EDINBURGH, 14th September, 1981.—I have audited the foregoing revenue accounts for the year to 30 June 1981, and the balance sheets as at that date. I have accepted as correct subscriptions and other receipts shown as received in the books and the value placed on the bookshop stock. I certify that in my opinion the foregoing accounts are correctly stated and sufficiently vouched.

(Signed) ROBERT CAVEN,
Chartered Accountant.

COUNCIL AND OFFICIALS OF THE CLUB FOR SESSION 45

Hon. Presidents Sir Charles G. Connell WS, LL D, FRSE; Sir Arthur B. Duncan; W. J. Eggeling, CBE, B Sc, FRSE; Professor V. C. Wynne-Edwards CBE LL D, MA, D Sc, D Univ, FRS, FRSC, FRSE, F I Biol.

President Dr Ivan T. Draper.

Vice-President John M. S. Arnott.

Law Agent D. G. Andrew WS.

Council (elected at AGM) R. A. Broad, Dr D. M. Bryant, D. L. Clugston, Mrs H. Halliday, R. H. Hogg, T. Irving, Dr D. R. Langslow, M. B. Ross, B. J. Stewart, Dr I. R. Taylor. **Young members** (elected by Council) L. Steele, A. Williams.

Branch Representatives (elected by their Branch) B. J. Stewart (Aberdeen); R. H. Hogg (Ayr); M. B. Ross (Borders); R. T. Smith (Dumfries); Dr K. M. Watson (Dundee); P. R. G. Marriott (Edinburgh); Dr J. T. Knowler (Glasgow); R. H. Dennis (Inverness); Mrs H. Halliday (New Galloway); P. K. Kinnear (St Andrews); H. Robb (Stirling).

STAFF

Secretary, Treasurer and Business Editor Major A. D. Peirse-Duncombe.

Editor and Bookshop Manager D. J. Bates.

Membership Secretary Mrs R. D. Smillie.

Hon. Treasurer and Librarian W. G. Harper.

Bookshop and Clerical Mrs H. L. Harper, Mrs D. J. Ridley, Miss H. Barul, A. G. MacKay.

BRANCH OFFICE BEARERS

Aberdeen Chairman, S. M. D. Alexander; Vice-Chairman, L. Steele; Secretary, A. Duncan; Committee, D. J. Bain, S. T. Buckland, J. A. England, Miss M. C. Hartnoll.

Ayr Chairman, R. H. Hogg; Vice-Chairman, D. A. Smith; Secretary, B. C. Forrester; Committee, J. Burton, Dr R. Hissett, Mrs E. M. Hissett.

Borders Chairman and Secretary, M. B. Ross; Vice-Chairman, A. J. Smith; Committee, A. Buckham, T. D. Dobson, R. D. Murray, Mrs E. Ross.

Dumfries Chairman, Dr N. E. Armstrong; Vice-Chairman, Dr E. C. Fellowes; Secretary, J. W. Barclay; Committee, W. Austin, Miss A. MacDonald, R. T. Smith, R. M. Wright.

Dundee Chairman, B. M. Lynch; Vice-Chairman, B. Pounder; Secretary, Dr K. M. Watson; Committee, R. M. Corbett, Mrs J. A. R. Grant, Miss S. Laing, D. B. Thomson.

Edinburgh Chairman, P. W. G. Marriott; Vice-Chairman, W. G. Prest; Secretary, Miss J. A. Wilcox; Committee, Miss P. D. Anderson, G. F. Bell, Mrs L. M. Brown, Mrs E. Ferro.

Glasgow Chairman, Dr J. T. Knowler; Vice-Chairman, Dr I. T. Draper; Secretary, S. N. Denney; Committee, D. Carnduff, H. Galbraith, C. E. Palmar, W. S. Taylor.

Inverness Chairman, R. H. Dennis; Vice-Chairman, R. L. Swann; Secretary, Mrs S. E. A. Moore; Committee, R. A. Broad, J. Carruthers, D. B. McGinn.

New Galloway Chairman, Mrs H. S. C. Halliday; Vice-Chairman, Miss J. E. Howie; Secretary, Dr G. A. Fleming; Committee, Admiral Sir Nigel Henderson, R. K. Peace, R. E. S. Wass, Mrs J. Yeo.

St Andrews Chairman, P. K. Kinnear; Vice-Chairman, Dr R. W. Byrne;

Secretary, Miss D. E. Rowling; Committee, K. Brockie, Mrs W. E. Mattingley, Lt Cdr E. F. B. Spragge, D. R. Stuart.

Stirling Chairman, H. Robb; Vice-Chairman, C. E. Barth; Secretary, A. B. Mitchell; Committee, W. R. Brackenridge, J. Gearing, R. L. Gooch, Miss M. H. Knox.

Thurso Chairman, Mrs P. M. Collett; Secretary, S. Laybourne.

Wigtown Chairman, Dr P. G. Hopkins; Secretary, G. Sheppard; Committee, J. H. Hollands, D. L. Irving, D. J. Mould, D. J. Rennie, G. Shaw.

COMMITTEES

Management Dr I. T. Draper (Chairman), D. G. Andrew, J. M. S. Arnott, D. L. Clugston.

Library D. L. Clugston (Chairman), Ritchie Seath (Hon. Librarian), Dr J. J. D. Greenwood, P. W. G. Marriott, Dr I. D. Pennie, Mrs M. I. Waterston.

Editorial Miss V. M. Thom (Chairman), J. M. S. Arnott, R. H. Dennis, Dr R. W. Furness, F. D. Hamilton, S. R. D. da Prato.

Research Dr I. R. Taylor (Chairman), A. W. Colling, R. H. Dennis, Dr J. J. D. Greenwood, Dr D. R. Langslow.

CLUB REPRESENTATION

British Section, International Council for Bird Preservation : F. D. Hamilton, Dr D. R. Langslow.

International Wildfowl Research Bureau, Duck Working Group : B. Pounder.

HONORARY MEMBERS

Dr John Berry, Maxwell Hamilton, Dr Ian Pennie, Mrs Irene Waterston, Donald Watson.

NOTICES

DUMFRIES WEEKEND

Normal arrangements had been made to be at the County Hotel from 26-28 February 1982 but we have been told that the hotel is to close at the end of January. We are trying to make alternative arrangements and anyone who is interested is asked to contact the club secretary, either by post or telephone, after 17 January 1982 for further information.

STIRLING BRANCH SECRETARY

Please note that Mr A. B. Mitchell has moved. His new address is : The Barony, Airth, Stirlingshire FK2 8LS (tel. 034 483 331).

PROPOSAL TO FORM A NEW BRANCH

A proposal to form a new branch in the Kirkcaldy/Glenrothes area has been made by Mr Alan Carpenter, 9 Glenbervie Road, Kirkcaldy, Fife (tel. Kirkcaldy 69236). Initially it is hoped to hold some indoor meetings in the New Year followed by summer excursions. If the response is favourable an application will be made to the SOC Council to form a Kirkcaldy Branch of the club in time for a full series of lectures to be included in the 1982/83 winter lecture syllabus. Anyone who is interested should contact Mr Alan Carpenter for further information.

ARGYLL WEEKEND

The Stirling branch intend to repeat their annual visit to Argyll based at a country cottage near Ford. It will take place over the weekend 6-7 March 1982. Accommodation is limited and the charge will depend on the number attending. Anyone interested should contact the branch secretary, Sandy Mitchell, The Barony, Airth, Stirlingshire FK2 8LS (tel 034 483 331).

LOCAL RECORDER

Please note the following new Recorder to whom records for the 1981 *Scottish Bird Report* should be sent :

Aberdeen, North Kincardineshire Dr M. V. Bell, Institute of Marine Biochemistry, St Fittick's Road, Aberdeen.

Current Notes

These include unchecked reports and are not intended as a permanent record, nor will they be indexed. Please send reports to the editor via local recorders at the end of March, June, September and December.

The period July to September is covered here. During the summer the Hebrides attracted **Franklin's**, **Ring-billed** and **Ross's Gulls**. The first signs that migration had reversed direction came when summer plumaged arctic waders began to reappear. The more unusual waders were rather scarce with unexceptional numbers of **Little Stints** and low numbers of **Curlew Sandpipers**. There was a smattering of **Pectoral Sandpipers** in the Northern Isles. A **White-rumped Sandpiper**, a **Lesser Golden Plover**, 3 **Wilson's Phalaropes** and a **Great Snipe** were the best of the bunch. Sea passage was disappointing with low numbers of **Sooty Shearwaters**, though a few **Sabine's Gulls** and big shearwaters kept several observers happy. But then things started to happen. Aberlady made up for its recent dearth of goodies with a **Citrine Wagtail**, eating into Fair Isle's near monopoly. Not to be outdone, Out Skerries turned up **Black-eared Wheatear**, **Bonelli's** and **Booted Warblers** and together with the rest of Shetland at least 7 **Arctic Warblers**. It was during a series of massive falls in that area that Fair Isle put its stamp of authority on the autumn with **Red-flanked Bluetail**, **Roller** and two of Dr Pallas's best, his **grass-hopper warbler** and his **reed bunting**, the latter only the 2nd ever to reach Britain. The 1st was (guess where) Fair Isle too.

Cory's Shearwater Peterhead (Aber) Aug. **Great Shearwater** Peterhead Aug. Sep. **Manx Shearwater** Balearic *mauretanicus* Peterhead Aug. **Leach's Petrel** Fair Isle 20 Jul, 4 Troon (Ayr) 20 Sep. **Bean Goose** 3 Out Skerries (Shet) 30 Sep. **Pink-footed Goose** 21 Gladhouse (Midl) 8 Sep. **Brent Goose** 80 Barra (O. Heb) 15-19 Sep, 5 Aberlady (E. Loth) 20 Sep. **Ruddy Shelduck** L. Strathbeg (Aber) 4 Jul. **Honey Buzzard** Mid Yell (Shet) 9 Jul, Fair Isle 9-19 Jul, 11 Sep, 19 Sep, Barns Ness (E. Loth) 13 Sep, St Abbs (Ber) 21 Sep, St Ola (Ork) 22 Sep, Musselburgh (Midl) 28 Sep. **Marsh Harrier** Holm (Ork) 17-19 Sep, L. Kinnordy (Ang) Sep. **Osprey** Fair Isle 11 Sep, 19 Sep, Lewis (O. Heb) 27 Sep. **Hobby** St Andrews (Fife) 23 Aug, Aberlady 6 Sep, 10 Sep. **Quail** bred Fair Isle, Coltingham (Ber) Jul, Black Isle (Ross) Jul. **Dotterel** juv Barassie (Ayr) 23 Aug, Fair Isle 25 Sep, **Lesser Golden Plover** Aberlady 16-19 Sep. **Grey Plover** 352 Aberlady 27 Sep. **Little Stint** 13 Musselburgh 17 Sep. **White-rumped Sandpiper** Virkie (Shet) 25-30 Aug. **Pectoral Sandpiper** Tankerness (Ork) 26 Aug-2 Sep, Virkie 26 Aug, 3 L. Hillwell (Shet) 1 Sep, Lewis 1 Sep. **Curlew Sandpiper** 4 Barassie 10 Sep, 6 Musselburgh Sep. **Jack Snipe** Fair Isle 9 Aug, Aberlady 22 Aug. **Great Snipe** Fair Isle 22 Sep.

Wilson's Phalarope Birsay (Ork) 3 Sep, 2 L Kinnordy Sep.
Long-tailed Skua Fetlar (Shet) 16 Jul, 19 Jul, Barns Ness 27 Sep.
Mediterranean Gull Aberdeen Jul, Doonfoot (Ayr) Aug. **Franklin's Gull** Canna (I. Heb) 16 Jul died. **Little Gull** Stenness (Ork) 29 Aug, Out Skerries 7 Sep, 4 Stranraer (Wig) 13 Sep. **Sabine's Gull** Doonfoot Aug, Ayr 28 Sep. **Ring-billed Gull** Lochboisdale (O. Heb) 13 Aug. **Ross's Gull** St Kilda (O. Heb) Jul. **Black Tern** 11 Aberlady 16 Aug, 2 Balgray (Renf) 19 Sep, Out Skerries Sep.

Turtle Dove Levenwick (Shet) 5 Jul, Fetlar 7 Sep. **Swift** 160 Fair Isle 9 Jul. **Roller** Fair Isle 22 Sep. **Hoopoe** Harray (Ork) 28-29 Sep. **Wryneck** 2 Fetlar 30 Aug, 6 Fair Isle 11 Sep, Largs (Ayr) killed by cat 19 Sep. **Short-toed Lark** Fair Isle 19 Sep. **Richard's Pipit** Deerness (Ork) 12 Sep, Fair Isle 16 Sep, 21 Sep. **Yellow Wagtail** nested unsuccessfully Fair Isle. **Citrine Wagtail** Orkney Sep, Aberlady 14-16 Sep. **Bluethroat** S. Uist (O. Heb) 12 Sep, 3 Fair Isle 12 Sep. **Red-flanked Bluetail** 2 Fair Isle 9-30 Sep. **Black-eared Wheatear** Out Skerries Sep. **Pallas's Grasshopper Warbler** Fair Isle 21 Sep (4th Scottish record—all Fair Isle). **Booted Warbler** Out Skerries Sep. **Melodious Warbler** Sumburgh (Shet) 10 Sep. **Marsh Warbler** Fair Isle 11 Jul. **Barred Warbler** 8 Isle of May Aug-Sep, 5 Shetland 21 Aug-8 Sep, 3 Fair Isle 23 Aug, 4 on 2 Sep, Deerness 6 Sep, Kirkwall (Ork) 6 Sep. **Garden Warbler** 200 Fair Isle 11 Sep, 400 on 21 Sep. **Blackcap** 1,000 Fair Isle 21 Sep. **Greenish Warbler** Holm 26-27 Sep, Fair Isle 16 Sep. **Arctic Warbler** Fair Isle 22 Aug, Holm 15 Sep, 7 Shetland Sep. **Yellow-browed Warbler** 5 Shetland Sep, Dunure (Ayr) 12 Sep, 2 Fair Isle 16 Sep, St Ola 18 Sep. **Bonelli's Warbler** Out Skerries Sep. **Wood Warbler** Strand (Shet) 23 Aug, Whalsay (Shet) 26 Aug, St Abbs 2 Shet, St Ola 14 Sep. **Red-breasted Flycatcher** 2 Fair Isle 15 Sep. **Red-backed Shrike** 6 Fair Isle 11 Sep, 3 Copinsay (Ork) 13 Sep. **Scarlet Rosefinch** Out Skerries 8 Aug, 21-22 Aug, 2 Fetlar 21 Aug, 4 late Aug, one 2 Sep, Strand (Shet) 23 Aug, Sumburgh 23-25 Aug, Deerness 11 Sep, 2 Fair Isle 2 Sep, one 9 Sep, two 11 Sep, S. Ronaldsay (Ork) 13 Sep. **Lapland Bunting** Papa Westray (Ork) 30 Sep. **Ortolan Bunting** Fair Isle 11 Sep, 21 Sep, 2 Out Skerries Sep, Whalsay Sep. **Yellow-breasted Bunting** 2 Fair Isle 22-23 Sep, Tiree (I. Heb) 5 Sep, 2 Out Skerries Sep. **Pallas's Reed Bunting** Fair Isle 17 Sep.

Late News **Black Duck** Inverness 11 Oct, **Isabelline Shrike** Fair Isle early Oct. **Olive-backed Pipit** Fair Isle Oct.

PETE ELLIS



SCARLET ROSEFINCH
 W. R. Brackenridge

Winter Atlas

LIST OF SCOTTISH REGIONAL ORGANISERS

- Shetland (except Fair Isle)** Dr B. Marshall, Symbister, Whalsay.
Fair Isle N. J. Riddiford, Bird Observatory, Fair Isle, Shetland.
Orkney C. J. Booth, Ronas, 34 High Street, Kirkwall.
Outer Hebrides Dr N. E. Buxton, 42 Aird Tong, Isle of Lewis.
Caithness Mrs P. M. Collett, Sandyquoy, Scrabster, by Thurso KW14 7UH.
Sutherland D. Macdonald, Elmbank, Dornoch IV25 3SN, and Miss S. H. Read, An Sithean, Bonar Bridge.
Ross-shire (mainland) C. G. Headlam, Dallachie, Fearn IV20 1TN.
Inverness-shire (mainland) R. A. Broad, 5 Birch Place, Culloden IV1 2LB.
Nairnshire, Morayshire B. Etheridge, Hillview, Rafford, Forres, Moray IV36 0RU.
Banffshire M. J. H. Cook, Rowanbrae, Clochan, Buckie.
Aberdeenshire, Kincardineshire S. T. Buckland, Dept. of Statistics, King's Buildings, Old Aberdeen AB9 2UB.
Angus N. K. Atkinson, Tadorna, 18 Cairnwell Crescent, Montrose.
Perthshire E. D. Cameron, Strathclyde, 14 Union Street, Scone PA2 6RZ.
Isle of May B. Zonfrillo, 28 Brodie Road, Glasgow G21 3SB.
Fife (except Isle of May), Kinross-shire Mrs W. Mattingley, 49 Elizabeth Street, Tayport, Fife.
Stirlingshire, Clackmannanshire W. R. Brackenridge, 7 Ochilview, Ashfield, Dunblane, Perthshire FK15 0JW.
Lothians A. W. & L. Brown, 7 Trelawney Terrace, Penicuik, Midlothian EH26 0NB.
Berwickshire, Peebleshire, Roxburghshire, Selkirkshire R. J. Robertson, 123 Howden Road, Jedburgh, Roxburghshire TD8 6JT.
Skye, Rhum, Eigg, Muck, Canna A. Currie, Glaiseilean, Harrapool, Broadford, Isle of Skye IV49 9AQ.
Argyllshire R. F. Coomber, Staffa Cottages, Tobermory, Isle of Mull.
Dunbartonshire, Lanarkshire, Renfrewshire, West Stirlingshire I. P. Gibson, The Glen, Howwood, Renfrewshire.
Ayrshire A. G. Stewart, Branahuie, 31 St Andrews Drive, Prestwick KA9 2DY.
Buteshire (inc. Arran & Cumbraes) Dr J. A. Gibson, Foremount House, Kilbarchan, Renfrewshire.
Wigtownshire G. Sheppard, The Roddens, Leswalt, Stranraer.
Kirkcudbrightshire Mrs H. S. C. Halliday, Dalveen, New Galloway, by Castle Douglas DG7 3RS.
Dumfriesshire R. M. Wright, Tadorna, Hollands Farm Road, Caerlaverock.

THE SCOTTISH ORNITHOLOGISTS' CLUB

THE Scottish Ornithologists' Club was formed in 1936 and membership is open to all interested in Scottish Ornithology. Meetings are held during the winter months in Aberdeen, Ayr, the Borders, Dumfries, Dundee, Edinburgh, Glasgow, Inverness, New Galloway, St Andrews, Stirling, Thurso and the Wigtown District at which lectures by prominent ornithologists are given and films exhibited. Expeditions are organised in the summer to places of ornithological interest.

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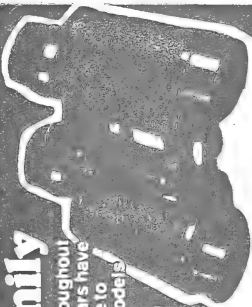
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Vol. 11 INDEX

1980-1981

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1980 - 1981

and

SCOTTISH BIRD REPORTS 1979-1980

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- NIGHTHAWK, COMMON, Orkney, 85.
- NIGHTINGALE, Isle of May, 76.
- , THRUSH, Isle of May, 76.
- OSPREY, Isle of May, 75.
- OUZEL, RING, Isle of May, 73, 214, 216, 218-9.
- OWL, LONG-EARED, Isle of May, 77, 215; rings from pellets, 166-7.
- , SHORT-EARED, oiled in Shetland, 107; Isle of May, 214-5.
- , SNOWY, food in Outer Hebrides, 56-57.
- , TAWNY, nesting in abandoned car, 196.
- OYSTERCATCHER, starving in Deeside after snowstorm, 55-56; Isle of May, 76, 217; disabled young attacked by Great Skua,







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I enclose cheque/P.O. £..... for binding in

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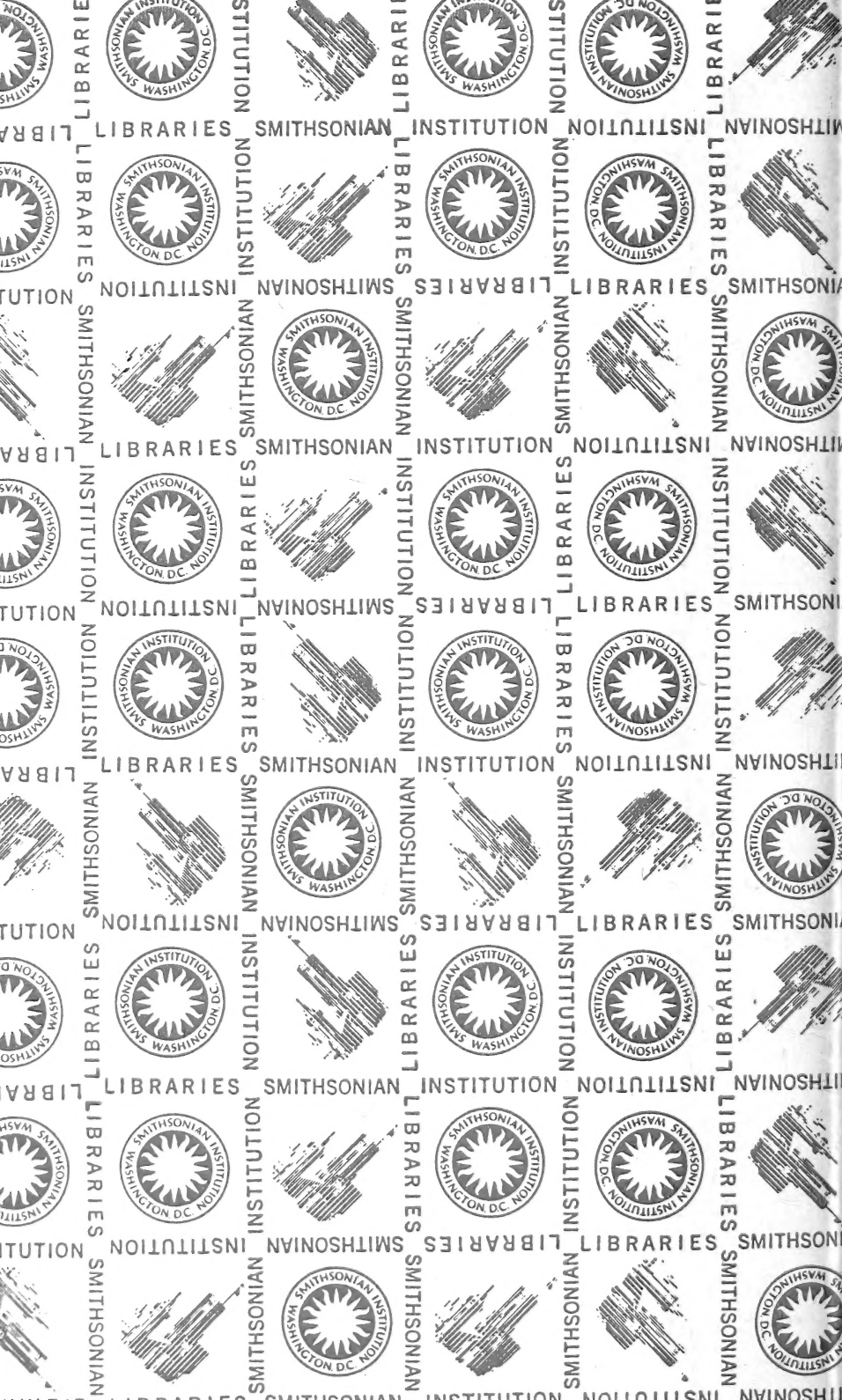
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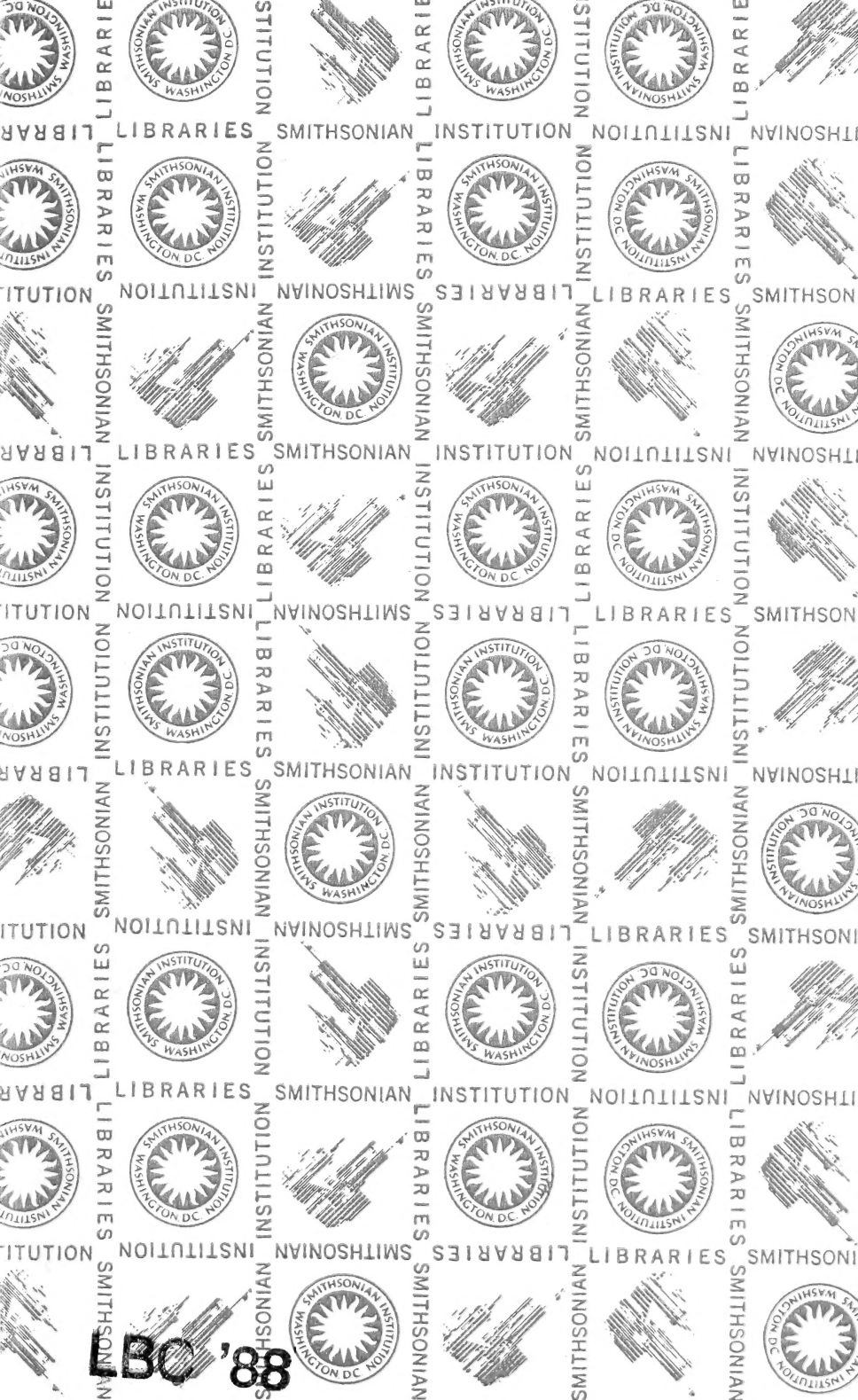
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