

SCOTTISH BIRDS



THE JOURNAL OF THE
SCOTTISH ORNITHOLOGISTS' CLUB

Volume 6 No. 6

SUMMER 1971

Price 50p

Unique. By Zeiss



The Breast-Pocket Binocular

This is the smallest 8x20 prism binocular ever produced. Because of its entirely new design, based on unique folding centre bars, it can comfortably be carried in a waistcoat or breast-pocket. Price £42

Monocular with fountain pen clip also available £21.50

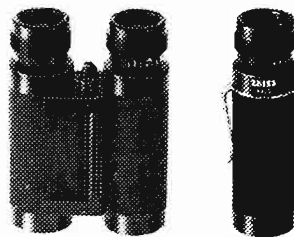
Latest Binocular Catalogue from Sole UK Zeiss Agents.

Degenhardt & Co Ltd,
Carl Zeiss House,
31/36 Foley Street,
London W1P 8AP.
01-636 8050 (15 lines)
Telex 24300

ZEISS



West
Germany





DORNOCH CASTLE HOTEL

A.A. ★ R.A.C. ★ R.S.A.C.

'Ashley Courtenay' & 'Signpost' Recommended

Retaining the romance of a Castle and the homely charm of a country house combined with the amenities of a modern hotel, our guests receive a warm welcome and a first-class service.

Conveniently situated for the Dornoch Firth, Tain Bay, Edderton Sands, Skibo Estuary and Loch Fleet as well as many interesting moorland, mountain and forestry areas, Dornoch has much to offer the observer of wild life.

Ornithological and other parties catered for. We offer 20% reduction mid April till 27th May and 18th Sept till mid Oct 1971. A 10% reduction is offered for June 1971 and organisers of parties of 12 or more are free.

Illustrated brochure on Hotel and tariff gladly sent on request to
Resident Proprietors, IRENE and STUART THOMSON
Telephone: Dornoch 216

LANDMARK

Europe's First Visitor Centre

OPEN ALL YEAR

ON A9 AT CARRBRIDGE



**Good selection of books on the history and natural history of
the Highlands and Islands — Catalogue available**

Evening Wild Life Films

**Exclusive tiles of osprey, crossbill, crested tit, goldcrest,
capercailzie and coal tit by John Busby**

Restaurant - Nature Trail - Exhibition - Film Programme



Telephone CARRBRIDGE 613

OBSERVE & CONSERVE
**BINOCULARS
 TELESCOPES**

SPECIAL DISCOUNT OFFER

OF UP TO 25%

POST/INSURED FREE

Retail price Our price

SWIFT AUDUBON Mk. II 8.5 x 44	£42.50	£31.00
SWIFT SARATOGA Mk. II 8 x 40	£28.50	£21.25
SWIFT CLASSIC 8 x 40	£26.50	£19.75
SWIFT NEWPORT Mk. II 10 x 50	£34.00	£25.40
SWIFT SUPER TECNAR 8 x 40	£18.00	£13.25
ZEISS JENA DEKAREM 10 x 50	£78.50	£63.00
CARL ZEISS 8 x 30B Dialyt	£89.46	£70.00
CARL ZEISS 10 x 40B Dialyt	£103.74	£81.00
LEITZ 8 x 40B Hard Case	£113.63	£85.33
LEITZ 10 x 40 Hard Case	£107.75	£81.00
ROSS STEPRUVA 9 x 35	£57.48	£45.00
Nickel Supra Telescope 15 x 60 x 60	£54.95	£43.25
Hertel & Reuss Televari 25 x 60 x 60	£53.95	£42.75

and the Birdwatcher's choice the superb HERON 8 x 40 just **£15.00** (leaflet available). As approved and used by the Nature Conservancy and Forestry Commission.

All complete with case. Fully guaranteed.

Always 36 models in stock from **£9 to £85**.

Available on 7 days approval—Remittance with order.

Also available most makes of Photographic Equipment at 25% to 33½% Discount. Also Practica/Exacta ranges less 33½% i.e. 'L', Super 'TL' and 'LCC' etc. Send for separate price list. Ask for our free brochure 'Your guide to Binocular/Telescope Ownership' and price list.

HERON OPTICAL COMPANY (Dept. SB),

15 Short Croft, Doddinghurst, Brentwood, Essex.

Tel. Navestock 3498

 Please despatch to me immediately
 for which I enclose £...../.....

Please send me your Free Brochure described above
 plus Binocular/Telescope/Photographic Price List.
 (Delete as appropriate)

Name

Address

.....(SB)



SCOTTISH BIRDS

THE JOURNAL OF THE SCOTTISH ORNITHOLOGISTS' CLUB
21 Regent Terrace, Edinburgh, EH7 5BT

CONTENTS OF VOLUME 6, NUMBER 6, SUMMER 1971

	Page
Editorial	293
Birds of Rhum in relation to a reafforestation programme. By Kenneth Williamson	296
Characteristics of Pheasant x Capercaillie hybrids. By Dr D. A. Boag, Dr A. Watson and N. Bousfield	313
The breeding season in a rural colony of Feral Pigeons. By Gordon Riddle	321
Short Notes	
Balearic Shearwaters in the Forth (M. E. Greenhalgh) ...	329
Cory's Shearwater in Orkney (Prof. M. F. M. Meiklejohn) ...	330
Little Egret in Wigtownshire (R. H. Miller, G. A. Willmet)	331
Little Bittern in South Fife (J. A. R. Grant, T. Wareham and J. Watkins)	331
Black Kite in Orkney (Prof. M. F. M. Meiklejohn)	331
Temminck's Stint in Stirlingshire (D. Fleming)	332
Wilson's Phalarope in Angus (G. M. Crighton, D. R. Barratt)	333
Brünnich's Guillemot in Argyllshire (R. K. Macgregor) ...	334
Yellow-billed Cuckoo in Caithness (Dr P. McMorran) ...	335
House Martins nesting at Golden Eagles' eyrie (J. L. F. Fergusson)	336
Rock Thrush at Fair Isle (R. H. Dennis)	336
Great Reed Warbler in Fife (D. W. Oliver)	337
Tawny Pipit in Shetland (J. H. Simpson)	338
Black-headed Bunting in Outer Hebrides (A. D. K. Ramsay)	338
Curlew Bunting in Wigtownshire (J. C. Sinclair)	339
White-throated Sparrow in Caithness (Dr P. McMorran) ...	339
Obituary—Dr James William Campbell	340
Reviews	
The Wetlands and Waterfowl of Iran. Reviewed by Dr D. Jenkins	341
Die Vogel des Bodenseegebietes. Edited by H. Jacoby, G. Knotzsch and S. Schuster. Reviewed by T. Delaney	342
A Field Guide to Australian Birds—Non-Passerines. By Peter Slater <i>et al.</i> Reviewed by T. Delaney	342
Letter	
Starling using sheep as a towel from R. J. Tulloch	343
The Scottish Ornithologists' Club	344

Edited by T. Delaney, 27 Trinity Crescent, Edinburgh, EH5 3EE

Assisted by D. G. Andrew

Business Editor Major A. D. Peirse-Duncombe, Scottish Ornithologists'
Club, 21 Regent Terrace, Edinburgh, EH7 5BT (tel. 031-556 6042)

The colourful world of Highland Birds

Golden eagle, osprey and snowy owls are probably the best known Highland birds. Others are equally exciting. Dotterel, ptarmigan and snow bunting nest on the high mountains; Scottish crossbills, crested tits and capercaillies are in the pine forests and divers and Slavonian grebes on hill lochs. The fells and marshes have greenshanks and wood-sandpipers and remote islands their whimbrels and skuas and red-necked phalaropes and forktailed petrels.

For over thirty years Desmond Nethersole-Thompson has lived and worked in the Highlands where his research has already led to monographs on three rare birds. In this intimate personal sketch he shares his love for Highland birds and their romantic homelands, while emphasising the many unsolved problems.

'Highland Birds' is generously illustrated by many magnificent colour and black-and-white photographs; some now published for the first time.

Price £1.25

'Highland Birds' is available from
booksellers or direct from:
Gordon Lyall, 'Highland Birds',
H.I.D.B., 6 Castle Wynd, Inverness.
(+10p post and packing)



SCOTTISH BIRDS

THE JOURNAL OF THE SCOTTISH ORNITHOLOGISTS' CLUB



Vol. 6 No. 6

Summer 1971

Edited by Tom Delaney, assisted by D. G. Andrew

Editorial

Scottish Bird Report. Normally our summer issue is devoted to the Scottish Bird Report. This year, however, largely owing to the postal strike, there was considerable delay in receiving the local reports, and it has not been possible, therefore, to work to the usual timetable. However, the compilation of the Report is now well under way, and we hope to have it complete in time for the autumn number.

Local recorders. Some time ago Prof. Meiklejohn indicated his wish to give up his local recordership. The area he covered stretches from south Ayrshire to Skye, and in considering the question of a successor it was felt that some reorganization of the area was desirable in order to produce more easily manageable units. It has therefore been decided to divide the area into two parts, each with its own local recorder. Ron Forrester, who did much of the work on the 1970 local report, is now responsible for the Clyde faunal area, including Arran and Bute but excluding Argyllshire, while M. J. P. Gregory takes on all of Argyllshire, the Inner Hebrides and Skye. Their addresses are given below. We wish to thank Prof. Meiklejohn for all his conscientious work as recorder for the area in the past. We trust his successors will receive the co-operation of observers in the areas as now constituted.

Observers should note the new addresses, also given below, of the local recorders for Inverness-shire and East Fife.

Argyllshire, Inner Hebrides and Skye.

M. J. P. Gregory, 4 High Bank Park, Lochgilphead, Argyllshire.

Dunbartonshire, West Stirlingshire, Renfrewshire, Lanarkshire, Ayrshire, Arran and Bute.

R. W. Forrester, 29 Crandleyhill Road, Prestwick, Ayrshire.

Inverness-shire (mainland more than 18 miles from Inverness).

Hon. D. N. Weir, Creag Dhu Lodge, by Newtonmore, Inverness-shire.

Fife (east of A90).

D. W. Oliver, East Cottage, Balass, Cupar, Fife.

Gull control on the Isle of May. The Isle of May hit the headlines in May when it was disclosed, prematurely as it now appears, that the Nature Conservancy was planning to reduce the gull population of the island (which is of course a National Nature Reserve). Some 15,000 pairs of Herring Gulls and 2,000 pairs of Lesser Black-backed Gulls breed there, having increased from a total of about 800 pairs in 1940, and the pressure of this large and increasing population is seriously affecting the ecology of the island: for example there is soil erosion in some parts; while in other areas the formerly dense sea pink and sea campion have been replaced by a growth of rank grasses; terns, formerly numerous, declined as the gulls prospered, and ceased breeding in 1960; some passerines have ceased to breed as the area colonized by the gulls has expanded, and breeding birds such as Eider and Oystercatcher are heavily preyed by the gulls.

These changes have been noted with concern by the Isle of May Joint Committee, who manage the reserve and are anxious to conserve the habitat and the diversity of its plant and animal communities. Indeed it had been clear to them for some years that the gull population would have to be limited if this aim were to be achieved. Attempts at control by egg-taking had proved unsuccessful, and it was considered that the only effective method would be to kill adult gulls at the colony. An operation was planned, therefore, with the object of reducing the number of gulls, in three annual stages, to about 1,000 pairs. The method intended was to lay poisoned bait near the nests before any eggs had hatched. The operation, which seems to have been well thought out and carefully prepared from a practical point of view, was to have been carried out by Nature Conservancy staff, the first stage being timed for the latter half of May this year. But the Press story (and perhaps the possibility of adverse publicity) seemed to give the Conservancy pause, and shortly afterwards it was announced that they would not authorize a start on the operation this year after all.

It is to be hoped that this false start will only postpone the plan and not prejudice it entirely. In the long run some delay is unlikely to matter very much, but it is a pity that time should be lost in implementing an effective gull-control policy on the island, for its necessity seems adequately demonstrated.

Loch Garten Ospreys robbed. The Ospreys at Loch Garten have caught the interest and imagination of thousands of visitors to the Highlands each year, and they have been an important factor in advancing public awareness of bird protection and conservation in Scotland and beyond. The taking of their eggs this year was a deplorable act and a disappointing, but

not, we hope, a significant set-back in the saga of their protection here.

The security operation at the site over the years has been a massive effort and has in the main proved a successful deterrent. Although it is not realistic, considering the difficulties of the site, to expect that security can be made absolute, nevertheless after this year's experience a review of the security methods used is obviously called for.

Don't fence it in. Birdwatchers visiting Aberlady Bay Nature Reserve, East Lothian, this summer will find a large new stretch on the east side of the Marl Loch fenced in and turned to grazing. This is the second enclosure in a process that started three or four years ago with an area between the footbridge and the Marl Loch. Apart from botanical changes, the most obvious effect is a whittling away of that fine sense of open space that was one of the main charms of the place.

Now we learn that yet another area is to be fenced off, inside the reserve and taking in the Yellow Mires north of the Marl Loch. This proposal has caused alarm among the natural-history bodies represented on the management committee, for it will mean considerable encroachment on the area of the reserve, the elimination of natural habitat, and the channelling of visitors towards the tern colony.

This development highlights a weakness in the arrangements under which the reserve was established and is managed, for the landowners retain their rights over the use of the land in the reserve, and are clearly not convinced that the damage to the reserve outweighs the value of the development. The agreements with the landowners may have been the best that could be obtained, but naturalists cannot be complacent about the status of a nature reserve where this kind of action is possible.

A strong expression of public opinion may have some effect on the issue; those who have an interest in Aberlady Bay and wish to express their concern should write to the East Lothian County Council, the local authority responsible for its administration.

Current literature. Recent material of Scottish interest includes:

The daily pattern of display in a wild population of Eider Duck.

M. L. Gorman, 1970. *Wildfowl* 21: 105-107. Ythan estuary study.

Territoriality in the Common Shelduck. C. M. Young, 1970. *Ibis* 1970: 330-335. Culterty study.

The moult migration of Yorkshire Canada Geese. A. F. G. Walker, 1970. *Wildfowl* 21: 99-104. Beaully Firth flock.

(See also p. 343).

The birds of Rhum in relation to a reafforestation programme

KENNETH WILLIAMSON

Introduction

The Island of Rhum is the largest of five forming the parish of the Small Isles, Inverness-shire. It covers 26,400 acres* and rises in the southeast to several mountain peaks over 2,500 feet in height. It is 15 miles due west of Mallaig on the Scottish mainland and seven miles south of the much larger island of Skye.

Rhum is roughly diamond-shaped (fig. 1), with the deserted settlements of Kilmory and Harris at river-mouths near the northern and southern points respectively. The only inhabited area (population about 40) is at the head of Loch Scresort. The climate is essentially oceanic, with over 100 inches of rain in most years, falling in the lee of the mountains.

Natural woodland and scrub of oak *Quercus petraea*, birch *Betula pubescens*, rowan *Sorbus aucuparia*, alder *Alnus glutinosa*, hazel *Corylus avellana* and holly *Ilex aquifolium* probably covered much of the lower ground centuries ago, but by the time the human population was evacuated in 1827-28, this had been reduced by cutting, muirburn and excessive grazing to a few small fragments in near-inaccessible gullies and on screes. A small plot around Kinloch Old Lodge at the head of Loch Scresort was planted with ash *Fraxinus excelsior*, beech *Fagus sylvatica*, sycamore *Acer pseudoplatanus* and wych-elm *Ulmus glabra* 130 years ago, and many of these trees still stand.

At the turn of the century the then owner Sir George Bulloch planted 80,000 trees about his newly built Castle and gardens, extending in a narrow belt along part of the south shore of the loch. Although this wood remained untended for many years towards the middle of the century, sustaining considerable damage from deer-browsing and windthrow, the head of Loch Scresort is today well wooded and many fine mature trees of a variety of broad-leaved and coniferous species exist (Wormell 1968).

Over the remainder of the island a degraded plant cover of purple moor grass *Molinia caerulea*, bent grasses *Agrostis* spp., deer sedge *Tricophorum caespitosus*, and in places a poor growth of heather *Calluna vulgaris* now dominate the once wooded areas.

When the island was purchased by the Nature Conservancy

*2.471 acres=1 hectare; 247.1 acres=1 km²

in 1957 and declared a National Nature Reserve, the aims of management included the diversification of the environment, the enrichment of the island's flora and fauna and the improvement of soils and biological productivity by means of a general reforestation programme. Some of the experimental tree plots, fenced and planted ten years ago, are now well grown; they have been described in some detail by Wormell (1969).

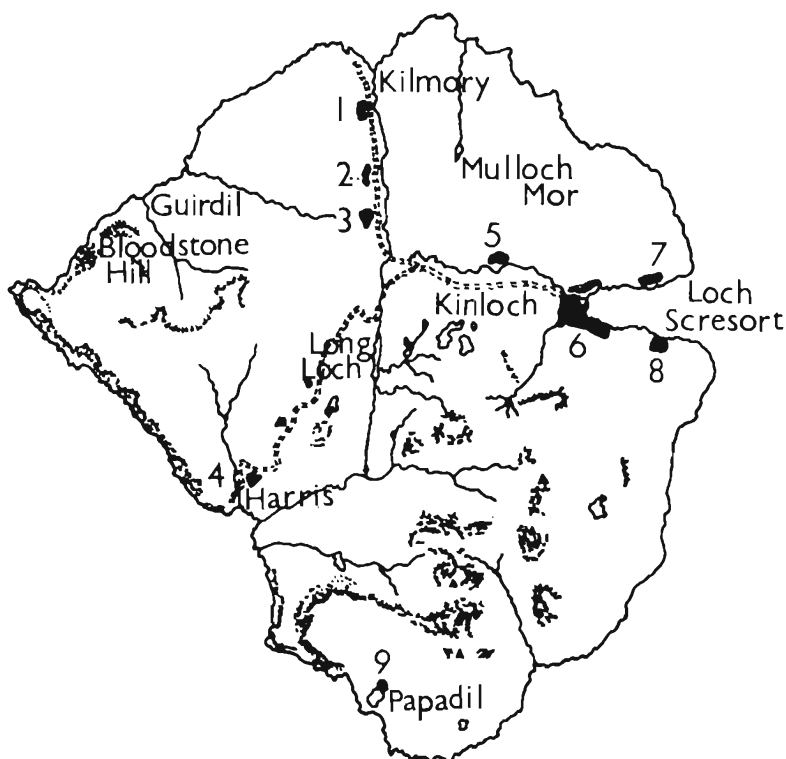


FIG. 1. Rhum, showing situation of the main plantations. 1 Kilmory North. 2 Kilmory South. 3 Kilmory Fank. 4 Harris. 5 Kinloch Glen. 6 Castle policies. 7 Northside Conifer Wood. 8 Southside Wood. 9 Papadil Lodge.

More recently some 1,450 acres of the moorland below Mullach Mor have been fenced and planted with Scots pine *Pinus sylvestris* and native broad-leaved species (Eggeling 1964). The aim of this paper is to consider the woodland bird fauna of the island and its prospects in relation to the reforestation programme.

The data and discussion are based on the results of breeding-bird censuses, using the mapping technique recommended by

Table 1. Bird community of policy woodland on Rhum, 1969

Dominance position	Percentage of passerine community	Species	Number of mapped territories	Approx. density, pairs per km ²	100 acres
1	19.2	Chaffinch <i>Fringilla coelebs</i>	46	184	74
2=	16.7	Robin <i>Erithacus rubecula</i>	40	160	65
2=	16.7	Willow Warbler <i>Phylloscopus trochilus</i>	40	160	65
3=	10.4	Wren <i>Troglodytes troglodytes</i>	25	100	40.5
3=	10.4	Blackbird <i>Turdus merula</i>	25	100	40.5
4	7.1	Song Thrush <i>T. philomelos</i>	17	68	27.6
5	6.2	Goldcrest <i>Regulus regulus</i>	15	60	24.3
6	5.4	Duncock <i>Prunella modularis</i>	13	52	21.1
7	—	Woodpigeon <i>Columba palumbus</i>	8	32	13
8	2.1	Coal Tit <i>Parus ater</i>	5	20	8.1
9=	—	Common Sandpiper <i>Tringa hypoleucos</i>	4	16	6.5
9=	—	Cuckoo <i>Cuculus canorus</i>	4	16	6.5
9=	—	Collared Dove <i>Streptopelia decaocto</i>	4	16	6.5
10=	—	Woodcock <i>Scolopax rusticola</i>	3	12	4.9
10=	1.3	Treecreeper <i>Certhia familiaris</i>	3	12	4.9
11=	0.8	Sedge Warbler <i>Acrocephalus schoenobaenus</i>	2	8	3.2
11=	0.8	Wood Warbler <i>Phylloscopus sibilatrix</i>	2	8	3.2
11=	0.8	Greenfinch <i>Chloris chloris</i>	2	8	3.2
12=	—	Sparrowhawk <i>Accipiter nisus</i>	1	4	1.6
12=	—	Long-eared Owl <i>Asio otus</i>	1	4	1.6
12=	0.4	Hooded Crow <i>Corvus c. cornix</i>	1	4	1.6
12=	0.4	Great Tit <i>Parus major</i>	1	4	1.6
12=	0.4	Long-tailed Tit <i>Aegithalos caudatus</i>	1	4	1.6
12=	0.4	Chiffchaff <i>Phylloscopus collybita</i>	1	4	1.6
12=	0.4	Spotted Flycatcher <i>Muscicapa striata</i>	1	4	1.6

Total territories (passerine totals in brackets) 265(240) 1060(960) 430(390)

Table 2. Passerine densities, pairs per km² (pairs per 100 acres) in some West Highland woods

	Scots Pine	Birch	Oak	Alder (grassland)	Alder (with gorse)	Mixed wood (Rhum)
Great Tit		30 (12)	103 (42)	33 (13)	16 (6)	4 (2)
Blue Tit		20 (8)	80 (33)	27 (11)	8 (3)	
Coal Tit	30 (12)	20 (8)	35 (14)			20 (8)
Long-tailed Tit		30 (12)	12 (5)		8 (3)	4 (2)
Treecreeper		20 (8)	35 (14)	16 (7)		12 (5)
Wren	50 (20)	162 (62)	80 (33)			100 (41)
Mistle Thrush		10 (4)				
Song Thrush		10 (4)	12 (5)		40 (16)	68 (28)
Redwing			12 (5)	11 (4)	16 (6)	
Blackbird			12 (5)			100 (41)
Whinchat	15 (6)			22 (9)	48 (19)	
Redstart	20 (8)	35 (14)	46 (19)	22 (9)		
Robin	10 (4)	35 (14)	92 (37)			160 (65)
Whitethroat		5 (2)			48 (19)	
Willow Warbler	10 (4)	425 (173)	264 (107)	119 (48)	127 (52)	160 (65)
Wood Warbler		10 (4)	103 (42)			8 (3)
Chiffchaff			12 (5)			4 (2)
Goldcrest	20 (8)					60 (24)
Spotted Flycatcher		30 (12)	23 (9)	11 (4)	16 (6)	4 (2)
Dunnock	10 (4)	10 (4)			16 (6)	52 (21)
Tree Pipit		37 (15)	35 (14)			
Greenfinch						8 (3)
Lesser Redpoll	20 (8)	42 (17)	23 (9)		56 (23)	
Bullfinch		10 (4)	12 (5)			
Chaffinch	25 (10)	170 (69)	345 (140)	125 (51)	79 (32)	184 (74)
Yellowhammer				38 (15)	48 (19)	

Note 1. Density figures are approximate and should be used for broad comparisons only. Data from Williamson (1969).

the International Bird Census Committee (1969), carried out by a British Trust for Ornithology expedition to Rhum in late May and early June 1969. This repeated in part an investigation initiated by Batten and Pomeroy (1969) in the previous year.

The Castle policies

The extensive planting of coniferous and broad-leaved trees around the Castle and along the inner part of the south shore of Loch Scresort early this century comprised many species. There is active regeneration of some of these within the area fenced to exclude deer, contributing to a shrub layer, while laurel *Cotoneaster simmonsii* and thickets of *Rhododendron ponticum* add to the understorey. The area immediately south of the Castle and the stream Allt Slugan a' Chuilich has *Acer* species in mixture with ash, wych-elm and horse chestnut *Aesculus hippocastanum*. Its close canopy gives heavy shade when the trees are in leaf, and there is a field layer of bluebells *Endymion non-scripta* and ferns lining the streamside. A few acres in the extreme west consist mainly of Scots pine with heather, bilberry *Vaccinium myrtillus*, and regenerating *Cotoneaster simmonsii*. North of this the pine is mixed with spruce *Picea abies* and birch, the latter forming in part a dense thicket of regeneration, and here and elsewhere there is an understorey of holly. Pine and birch again occur in mixture in a more open belt along the southern shore.

The woodland is relieved in places, especially around the Castle and estate houses, by lawns, flower-beds, outbuildings etc., and the roadway between the Schoolhouse and the bridge over the Kinloch River runs through it. An irregular strip of mixed planting, with many tall trees, borders the river-mouth and shore on the north side of the bridge, adjoining the farm. The main section covers some 54 acres, to which must be added an isolated two-acre stand of Scots pine on the moor some 300 yards to the south, and about five acres in all on the north side of Kinloch River, making a total area of some 61 acres.

Comparison with native woods

A feature of the bird community is the abundance of Chaffinch and Willow Warbler, the two species that dominate most Scottish semi-natural woodland types (Williamson 1969). Usually Chaffinch is dominant in Scots pine (though at low density) and also in oak (where density is high), while Willow Warbler holds the better place in birch woods and in birch mixed with pine. Wren, another important constituent of the semi-natural woods, is also prominent, while Goldcrest, Coal Tit and Treecreeper have some importance. Wood Warbler, a characteristic bird of the native oak-woods in the

West Highlands, appears to be present on Rhum in most years, usually favouring the horse-chestnut. Details of the species holding territories in 1969 are given in table 1. A comparison with the situation found in Wester Ross woods in 1968 (Williamson 1969) appears in table 2.

Comparison with Inverewe Garden

The birdlife differs from that of the native woods, however, in the abundance of Robin, Blackbird, Song Thrush and Dunnock, all of which are relatively scarce in Scots pine, birch, oak, alder and ash. In this the Rhum policies agree with the only other mature mixed planting in the West Highlands, Inverewe Garden at Poolewe, Wester Ross, which we have examined. Members of the B.T.O. Wester Ross expedition visited Inverewe Garden on 3rd and 6th June 1968 and found Robin dominant, with Chaffinch and Willow Warbler sub-dominant; but A. C. Aldridge, who made counts on 20th, 26th and 29th May 1969, found Chaffinch most numerous with Willow Warbler second, Blackbird third and Robin close behind. Spot counts and transects of this kind are subject to a wider margin of error than intensive census work by the mapping method, and the discrepancies between the two sets of data could result from varying population levels in the two years, or might reflect differences in conspicuousness due to the stage reached in the breeding cycle (this affecting song output), or both. The effect of these differences is perhaps best minimised by combining the data from all visits in a diagram (fig. 2), which is probably fairly representative of the community structure in Inverewe Garden and which can be compared with a similar diagram for the Kinloch Castle policies on Rhum (fig. 3). Such differences as are apparent between the two communities concern the less common species: it would seem, for example that Greenfinch is better placed at Inverewe, while Dunnock is commoner on Rhum.

Distribution and density

The varied ecotones around the Castle and the estate houses attracted the most birds. The almost pure stand of mature pine north of Allt Slugan a' Chuilich had the fewest: present were Wren, Robin, Willow Warbler, Goldcrest (two pairs) and Chaffinch. (Chaffinch and Robin were the only occupants of the isolated pine remnant outside the deer fence). Notable absentees from this area were Coal Tit, Treecreeper and *Turdus* spp. The Coal Tit pairs, although associated with conifers, preferred those areas with a liberal admixture of broad-leaved trees.

The pine with birch and holly understorey north of the pure stand did have the above species and supported a greater

variety and number of birds. The Woodpigeons were concentrated in this region, probably because it is closest to the cultivated fields where they feed. House Sparrow *Passer domesticus* and Swallow *Hirundo rustica* were found near the houses and farm-buildings. Twite *Acanthis flavirostris* and Pied Wagtail

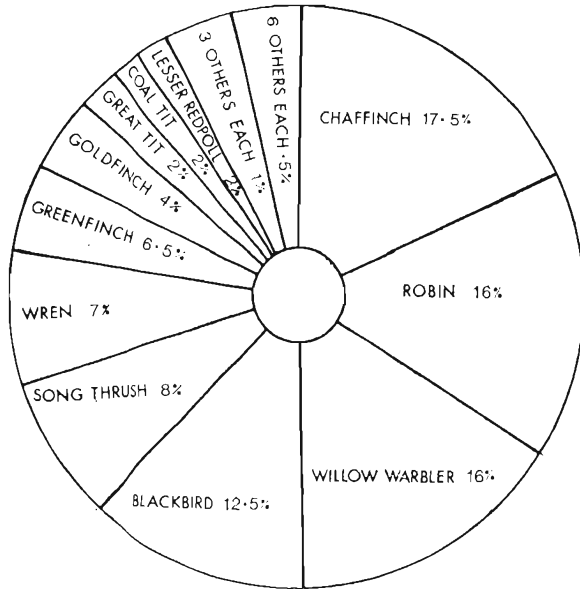


FIG. 2. Composition of bird population of Inverewe Garden, 1968-69.

Motacilla alba were more closely associated with the farmland and shore. These species therefore have been omitted from table 1, which embraces 265 pairs of 25 species, a density of approximately 450 pairs per 100 acres. It will be seen that the five commonest species comprise three-quarters of the bird community.

Irregular breeding

Some species which are of regular occurrence in the oak, birch and alder woods studied in Wester Ross do not appear to have bred on Rhum in 1968 or 1969; they include Blue Tit, Mistle Thrush, Tree Pipit, Siskin, and Lesser Redpoll. These and others have nested on Rhum at one time or another in the past, as shown in table 3, which is summarised from data contained in Bourne (1957), Williamson and Boyd (1963), Evans and Flower (1967), and Peter Wormell's personal observations, particularly in 1970.

The irregular appearance of most of these is probably explained as an 'island effect', birds striving first of all to fill suit-

able niches close to the mainland centres of dispersal and migration routes, and reaching Rhum only in seasons when there is intra-specific competition for mainland haunts and therefore pressure to expand. Such populations will usually be small and therefore unstable, especially as they may have

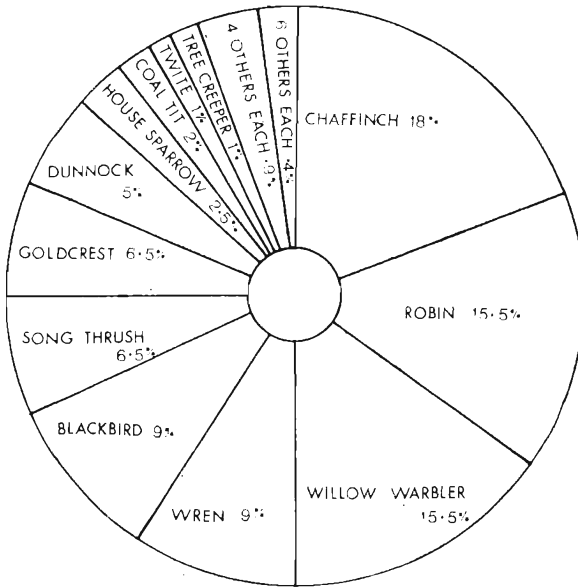


FIG. 3. Composition of bird population of policy woodland, Rhum, May 1969.

difficulty in overwintering. Moreover, such birds as do arrive are likely to be wandering males, part of the 'floating population' characteristic of the northern forest avifauna (Enemar and Sjöstrand 1970) and may remain unmated.

Rhum's comparative isolation, across a narrow water gap, must impose some check to successful colonisation, and probably explains why Tawny Owl *Strix aluco* and Great Spotted Woodpecker *Dendrocopos major* (for both of which apparently suitable conditions exist at Loch Scresort) have been reported only as rare vagrants, the former in 1963 and the latter in 1962. The instability of populations that can at times attain a relatively large size and that are common on the nearby mainland (e.g. Blue Tit, Starling, House Sparrow) is difficult to explain except on the grounds given above. Also, it is curious that the establishment of such species as Siskin and Lesser Redpoll, for which suitable habitat exists and which are currently enjoying range expansion in Britain, has been delayed on Rhum. Although Siskins bred in some numbers for the first time in 1970, Lesser Redpoll is still only an occasional breeder.

Table 3. Irregular breeding of some woodland passerines on Rhum

	Recorded as :		
	having bred	singing or seen	absent
Great Tit <i>Parus major</i>	1955 (family)	1969	1968
Blue Tit <i>Parus caeruleus</i>	1934 (6-10 families) 1950s (numerous) 1959-60 (5 pairs) 1970 (2 pairs)	1961 (several) 1969	1962-63 1968
Coal Tit <i>Parus ater</i>	1950, 1961-62 and from 1965 (2-3 pairs) 1970 (2 pairs)	1960	1950s 1963-64
Long-tailed Tit <i>Aegithalos caudatus</i>	1969	1934, 1948	1968, 1970
Treecreeper <i>Certhia familiaris</i>	1938-61, 1964, 1968-69 (3 pairs), 1970	regularly	1962-63
Mistle Thrush <i>Turdus viscivorus</i>	1934 and in recent years (up to 3 pairs), 1970 (one pair)	1961	1968-69
Redstart <i>Phoenicurus phoenicurus</i>	1961	1962-66 (♂♂) 1968-70 (♂♂)	
Grasshopper Warbler <i>Locustella naevia</i>		June 1966 (2 areas) 1969 and 1970	
Sedge Warbler <i>Acrocephalus schoenobaenus</i>	1958, 1966	1960-62, 1964-65, 1969	1968, 1970
Blackcap <i>Sylvia atricapilla</i>		1958, 1960, 1969-70	1968
Garden Warbler <i>Sylvia borin</i>		1969 and 1970	
Whitethroat <i>Sylvia communis</i>	1950, 1958, 1959 (2 pairs) 1967 (4 pairs)	1961, 1968, 1969	1970
Chiffchaff <i>Phylloscopus collybita</i>	1959	1961 (2), 1969	1968
Wood Warbler <i>Phylloscopus sibilatrix</i>	1961-62, since then "probably one pair annually", 1969 (2 pairs)	most years	1968, 1970
Tree Pipit <i>Anthus trivialis</i>		1958, 1961 (2)	1968-70
Grey Wagtail <i>Motacilla cinerea</i>	1934, 1957-59, 1966, 1970	1967-69	1960-61
Starling <i>Sturnus vulgaris</i>	1934, 1940s, 1961-62 (3 pairs), 1964-66 (1 pair)		1950s, 1968-70
Greenfinch <i>Chloris chloris</i>	1960, 1963, 1969	1958, 1961	
Siskin <i>Carduelis spinus</i>	1964, 1966 1970 (6 pairs)	1965, 1969	1968
Lesser Redpoll <i>Carduelis flammea</i>	1934, 1962 (several), 1965-66 (several), 1970	1969	1968
Bullfinch <i>Pyrrhula pyrrhula</i>		Pair seen 1964 and 1970	
House Sparrow <i>Passer domesticus</i>	1934, from 1958 after wintering		1950-57

A comparison of the data in table 3 with the dominance positions shown in table 1 suggests that no small bird that forms less than 5% of the total passerine community can be said to be firmly established as a regular breeding species. The situation with the parids is particularly fascinating. In 1969 the only breeding species was Coal Tit, and this apparently has not always been present, while Blue Tit, which was "numerous" in the 1950s when Coal Tit was absent, seems to have declined and disappeared in the early 1960s (table 3). It was present again in 1970, however, with two pairs nesting as well as two or three pairs of Coal Tits. Lack (1969) has made the interesting point (giving an illustration from the Canaries where of these two species only Blue Tit occurs, inhabiting both pine and broad-leaved woods) that in the restricted ecological conditions found on islands, one generalised species is liable to displace two specialists. Despite the proximity of Rhum to the mainland of Scotland it may be that there is serious competition among the tits, with the odds on colonisation by either Blue Tit or Coal Tit to the exclusion of Great Tit and the other. The future development of the young tree plots with their mixture of broad-leaved trees and quickly growing conifers should favour Coal Tit, since it seems to be adapting well to a broadly based niche of mixed coniferous and deciduous trees, and may be better equipped than Blue Tit to overwinter successfully in so restricted an area. It is noteworthy that, although a pair was present in the mainly deciduous Southside Wood, Coal Tit was absent from the Northside spruce and larch (see next section); nor was it present in the nearly pure stand of pine in the western corner of the Castle policies.

During the census work in 1969 one or at the most two song or sight records were obtained for the following species, and in all cases they are considered to have been late migrants or part of the floating population without established territories: Turtle Dove *Streptopelia turtur*, Blue Tit, Blackcap *Sylvia atricapilla* (male), Whitethroat *Sylvia communis* (male), Pied Flycatcher *Ficedula hypoleuca* (male), White Wagtail *Motacilla alba alba* (male), Grey Wagtail *Motacilla cinerea* (female), Siskin and Lesser Redpoll.

Note 1. The 1968 data are from six surveys by Batten and Pomeroy. The 1970 additions and some earlier data were supplied by Wormell.

Note 2. Birds of prey. Buzzard *Buteo buteo* bred in 1950 (two families) and 1955 and was present at Papadil in 1934: the rabbit *Oryctolagus cuniculus* its staple food does not occur on Rhum. Sparrowhawk *Accipiter nisus* bred in 1959 and possibly 1962, since when one or two have been seen regularly. Kestrel *Falco tinnunculus* bred in 1955 (two pairs) and 1959 (at least four pairs), and Evans and Flower (1967) say "perhaps one pair since", but at present at least two pairs breed regularly (P. Wormell, pers. comm.). Peregrine *Falco peregrinus* and Merlin *Falco columbarius*, which probably breed regularly, were both seen in 1969. Golden Eagle *Aquila chrysaetos* was encountered daily.

Isolated woods

Northside Wood

The wood on the northeast shore of Loch Scresort is predominantly Norway spruce with some European larch *Larix decidua* and Scots pine in places; broad-leaved trees are few and comprise some birches in the northeast and some alders beside the outfall of the stream that flows through the western end. The wood is in four major sections with much open grassland between, where seedlings of pine, alder, birch, etc. have been planted in recent years. The area was affected by a severe moorland fire in late March 1969, the pine seedlings on open ground and some mature spruces on the moor fringe being killed. The broad-leaved seedlings, cut after the fire, appear to be coppicing well (Wormell 1970).

The trees cover roughly 12 acres, and there must be at least as much open ground. Five pairs of Herons *Ardea cinerea* nested in this wood in 1960 and two pairs in 1963 and 1964 (Evans and Flower 1967). The bird community (table 4) is typical of a closed-canopy coniferous wood, although Coal Tit is lacking. Short-eared Owl and Meadow Pipit were dependent

Table 4. Bird communities in isolated mature woods

	Northside Wood		Southside Wood	
	No. of territories (passerines)	Dominance%	No. of territories (passerines)	Dominance%
Woodcock	1			
Common Sandpiper	1		1	
Woodpigeon	2			
Short-eared Owl	1*			
Hooded Crow	2	14		
Coal Tit			1	6
Wren	3	21	2	13
Redstart			1*	6
Robin	1	7	2	13
Willow Warbler			5	32
Goldcrest	2	14	1	6
Meadow Pipit	1	7		
Chaffinch	5	36	4	26
Total species		10		8
Total territories		19		17

*probably non-breeding

Dominance figures rounded off to nearest whole number

on the open areas, and Common Sandpipers were probably nesting near the alder-grown mouth of the stream. Visiting birds were Song Thrush, Willow Warbler and Twite. Siskins nested in this wood in 1970 (P. Wormell, pers. comm.).

Southside Wood

The Southside Wood is a very mixed stand with sycamore and larch the dominant trees, the latter being most numerous towards the shore. There are some birches and rowans, especially on the fringe, and some alders along a stream flowing through the western part. The occasional sweet chestnut *Castanea sativa*, ash, horse chestnut, Swedish whitebeam *Sorbus intermedia*, hawthorn *Crataegus monogyna*, Douglas fir *Pseudotsuga menziesii* and pine are found. There are small rhododendron thickets close to the shore and at the southwestern edge, and also small open areas with a moorland field layer. Close to a stream near the eastern edge there are the remains of old buildings. The area is approximately ten acres.

A more varied bird life might have been expected, in view of the diversity found in the Castle policies. However, unlike the policy woodland, the area is grazed by deer so that the development of secondary growth and rich herb layer is prevented. There were no thrushes, and Dunnock and Treecreeper were absent. Not surprisingly in such a well mixed habitat, Willow Warbler and Chaffinch shared dominance (table 4). The territory of one of the two pairs of Wrens extended beyond the wood into a rocky gully with aspens *Populus tremulus*. The Redstart (only a male was seen) was the only one recorded on Rhum in 1969, and its territory included the old buildings where Bruce Campbell and the writer found a nest with five eggs in 1961 (Williamson and Boyd 1963). Sparrowhawk (perhaps from the main wood), Collared Dove, Cuckoo and Spotted Flycatcher were recorded as visitors. Siskins nested in 1970 (P. Wormell, pers. comm.).

Papadil Lodge

Papadil was visited twice by J. Cook, in company with W. Edwards on 28th May and P. Willson on 3rd June. Owing to its remoteness, these visits were of brief duration, and only a cursory examination of the old wood and adjacent tree plot was possible. Willow Warbler and Chaffinch were in song on both dates, and other passerines present were Wren, Blackbird, Spotted Flycatcher (a pair) and Dunnock. A Long-eared Owl and a Collared Dove were found in rhododendrons in front of the Lodge.

Experimental tree-plots

One-year-old plots

In 1968 Batten and Pomeroy (1969) censused 85 acres of moorland that had been ploughed and recently planted with tree seedlings; and they also censused, for comparison, 196 acres of unplanted wet moorland on the same hill. These censuses were repeated by the expedition in 1969 after a disastrous spring fire which destroyed the ground vegetation and killed many of the tree seedlings (Batten 1970).

The total number of mapped territories on the two plots was 40 in 1968 and 46 in 1969, so, clearly, the carrying capacity of the ground was not adversely affected by the fire. The difference in the number of Meadow Pipits present is not statistically significant. The fact that more Red Grouse were recorded in late spring 1969 could have been due to their greater conspicuousness, a short and still somewhat sparse flush of *Molinia* being the only cover at that time.

Clearly the burning was of less importance to the environment than the ploughing in preparation for planting out the seedlings. Batten and Pomeroy have shown that this treatment more than doubles the population of Meadow Pipits and greatly improves the conditions for Skylark, Red Grouse and Snipe (table 5).

Table 5. Relative densities of species on planted and unplanted moorland

	One-year-old moorland plantation				Unplanted wet moorland			
	85 acres (34.4 hectares)		1969		196 acres (79.4 hectares)		1969	
	1968		1969		1968		1969	
	Pairs per 100 acres hectares		Pairs per 100 acres hectares		Pairs per 100 acres hectares		Pairs per 100 acres hectares	
Red-throated Diver <i>Gavia stellata</i>	0	0	0	0	0	0	0.5	1.2
Red Grouse <i>Lagopus scoticus</i>	2.4	5.9	3.6	8.9	0	0	1.5	3.7
Snipe <i>Gallinago gallinago</i>	2.4	5.9	2.4	5.0	0	0	1.5	3.7
Skylark <i>Alauda arvensis</i>	3.6	8.9	3.6	8.9	0	0	0.5	1.2
Wheatear <i>Oenanthe oenanthe</i>	0	0	0	0	0	0	0.5	1.2
Stonechat <i>Saxicola torquata</i>	1.2	3.0	0	0	0	0	0	0
Meadow Pipit <i>Anthus pratensis</i>	21.2	52.4	20.0	49.4	7.1	17.5	8.7	21.5
Totals	30.8	76.1	29.6	71.1	7.1	17.5	12.3	28.8

To provide a further check, a census was carried out in 1969 on a moorland area in a part of the island untouched by the fire, close to the central lochs; this suggested a Meadow Pipit density of 4-5 pairs per 100 acres, or half that of the ploughed moorland. The total bird density on the moor surrounding the lochs was 7.4 pairs per 100 acres compared with 31 pairs per 100 acres on the newly planted moorland, confirming the greater attraction and holding capacity of this initial stage of the new plantations.

Ten-year-old plots

Planting inside fenced plots was begun in 1959: the trees used consisted of a variety of native hardwoods and Scots pine, often sheltered by a windbreak of gorse *Ulex europaeus* and broom *Sarothamnus scoparius*. They were usually sited where some natural woody growth had escaped the ravages of sheep

and red deer, in steep-sided gullies carrying streams. The greater part of the plot at Kilmory South was left to regenerate naturally from existing scrub. Full details have been given by Wormell (1968).

The five larger plots were examined in 1968 and again in 1969 (table 6). The surveys in 1968 were made by Batten and Pomeroy (1969), the plots at Ard Nev, Ard Mheall and Primrose Burn being omitted. The B.T.O. expedition in 1969 found that Primrose Burn and Kinloch Glen had been so ravaged by the fire of late March that no birds were present. Much of the earth was still bare, the pine seedlings were dead, and the only growth consisted of a sparse flush of *Molinia* and new shoots from coppiced hardwood seedlings. The cover was entirely inadequate for ground-nesting birds. Ard Nev (800 feet) and Ard Mheall (600 feet) were too high and exposed to be attractive to birdlife, and the sum total was one pair of Meadow Pipits (with a nest and four eggs) in the former.

It is clear that, although the larger tree plots contain few whole territories, they serve as loci for a number which range over a part of the neighbouring moor. They enrich the environment in three ways, each corresponding to a stage in their development and colonisation. First, they lead to a concentration of the moorland species, as shown by Batten and Pomeroy (1969), particularly affecting Meadow Pipit, but also Red Grouse, Common Snipe and Short-eared Owl (and possibly Corncrake *Crex crex* in Kinloch Glen plantation in 1968). After a few years the emergent cover attracts scrub and woodland-edge species such as Wren, Stonechat, Whinchat, White-throat and Sedge Warbler. Finally the trees become large enough to interest the forest species such as Song Thrush, Willow Warbler, Spotted Flycatcher and Chaffinch. These are probably entirely dependent on the plots for their food and nesting sites. The five plantations whose birds are summarised in table 6 are presently at the interesting stage of catering for all three groups. With increasing age of the trees, the third group will colonise at the expense of the first, but their expansion will be limited by the small size (average seven acres) of the plots.

It is fortunate that the census study was spread over two years; had the work been confined to the 1969 season, a false impression of the part played by these plots in the moorland ecology might have resulted, since the bird fauna associated with them was poorer in numbers (though not in species) than in the previous year. Red Grouse and Common Snipe, though present in 1968, were not established in 1969; but two woodland species, Spotted Flycatcher and Chaffinch, had moved in. A Short-eared Owl was seen on single occasions at Harris and Kilmory South in 1968, and in the following year was firmly

Table 6. Territories based on five tree plots in 1968-69

	Harris		Kinloch Glen		Kilmory Fank		Kilmory South		Kilmory North		Totals	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Red Grouse	1				1						2	
Snipe	1										1	
Cuckoo					1	1	1		1		3	1
Short-eared Owl		1				1						2
Hooded Crow								1				1
Wren			1		1	2	3	1	3		8	3
Song Thrush	1	1									1	1
Stonechat	1	1	1		1	2	2	2	2	2	7	7
Whinchat	4	1	2		2		1		2	1	11	2
Sedge Warbler	1										1	
Whitethroat			1		1				1	1	3	1
Willow Warbler	1	1			1	1					2	2
Spotted Flycatcher						1						1
Meadow Pipit	5	2	5		4	4	4	2	3	4	21	12
Chaffinch						1						1
Total species	7	6	5		8	8	5	4	6	4	11	12
Total territories	14	7	10		12	13	11	6	12	8	59	34
Area (acres) (from Wormell 1967)		4.2		6.7		8.8		5.7		9.7		35.1

established in the Harris (where a young bird was found) and Kilmory Fank plantations. Sufficient castings were collected at these two haunts to enable D. E. Glue to show that their main food comprised small mammals—with 63% of the prey-weight brown rat *Rattus norvegicus*, 21% wood mouse *Apodemus sylvaticus* and 12% pigmy shrew *Sorex minutus*.

More Meadow Pipits were associated with the tree plots in 1968 than in 1969, but, omitting Kinloch Glen which was rendered quite unsuitable for them in the latter year, the discrepancy is probably not outside the normal fluctuation in this species, and the decline was matched by a similar decrease discovered in a repeat census of the farmland. More serious (and again reflected in the farm census) was the decline in the Whinchat population between the two seasons. The tree plots are clearly important to this species—though this might not have been apparent from the 1969 census alone—and the 1968 concentration at Harris is remarkable. As Batten (1971) has indicated, some disaster appears to have overtaken Whitethroat (and perhaps other species wintering in Africa) in 1968-69. It is noteworthy that Stonechat, a short-distance migrant, showed no variation between the two years. The fall in the Wren population in the tree plots is substantial and unexplained.

Examination of table 6 shows that Kilmory Fank, with 12-13 mapped territories shared among eight species in each year, is the most successful plantation: it has the most varied topography, and one of its two stream-bearing gullies has well grown birch trees. Harris, judging especially from the 1968 figures, has a good potential. The poorest results are shown by the long narrow plantations near Kilmory, especially the southern one which was left largely to regenerate from existing scrub.

Summary and conclusions

It is fortunate that the reforestation programme on Rhum is supported by a mature mixed artificial woodland rather than a more homogeneous one of native type, since the more varied canopy and secondary vegetation and the wide variety of edge habitats have encouraged strong colonisation by several species (e.g. Robin, Blackbird, Song Thrush, Dun-nock) which are relatively scarce in the semi-natural-woodland communities studied in northwest Scotland.

If we accept as an arbitrary threshold for the successful colonisation of a species a level of around 5% of the total passerine community, then eight woodland birds seem to be sufficiently well established to provide an overspill for the new woodland niches as these become available with the growth of the moorland tree plots. In addition to the birds mentioned above there are Chaffinch, Willow Warbler, Wren and Goldcrest. The policy woodland would appear to be of the best kind to serve the purpose of a production and dispersal centre from which the developing forest is populated.

In the first stage of establishing woodland on a denuded island, ploughing in preparation for planting out tree seedlings concentrates more moorland birds in the treated area, doubling the Meadow Pipit popula-

tion. This is possibly due to the increased surface area and exposure of soil organisms, and improved drainage leading to greater biological activity. There may also be a shelter factor. This process is carried into the early growth stage of the young tree plots, which can support a high density relative to their small area, since they serve as loci for territories radiating outwards onto the surrounding moor.

After a few years the second-stage colonists, among which Wren, Stonechat and Whinchat are prominent, take advantage of the scrub. Some of these also (particularly the chats) use part of the adjacent moorland as a feeding area. After about a decade the first woodland colonists appear (Chaffinch, Willow Warbler, Song Thrush), probably as overspill from the mature mixed artificial woodland at Loch Scresort. These are much more dependent on the trees for food and nesting sites. Colonisation by these species is likely to be restricted by the small size of the plots, so that eventually the total population (and probably also the diversity) will be less than now.

These plots were originally intended as pilot experimental areas to determine whether coniferous and broad-leaved trees could be established. They have served this purpose, and they should perhaps now be extended at intervals of 12-15 years with a view to creating larger and more viable habitats for the ultimate woodland colonists. At the same time this would ensure for a longer period the availability of suitable ecological conditions for the concentration of first- and later second-stage colonists, so achieving the optimum enrichment of the new environment that is one of the stated aims of the planting.

Acknowledgments

Acknowledgments are due to Mr and Mrs A. B. Bailey, L. A. Batten, assistant leader of the expedition, J. G. Cook, Mrs Susan Cowdy, Marion Dadds, T. W. Edwards, P. J. Hoy, Mrs M. K. Macduff-Duncan, Mrs B. J. Poloneicka, Dr G. H. Spray, Dr and Mrs R. K. Stanford, Mrs M. Tugendhat, W. H. Wild, Mr and Mrs P. Willson, all of whom took part in the census work. The expedition's gratitude is due to Peter Wormell, the Reserve Warden, and his deputy George McNaughton and other members of the Nature Conservancy staff on Rhum for their help. My personal thanks are also due to Peter Wormell for valuable comments and suggestions on a first draft of this paper and for his revision of table 3 to include 1970 data.

The expedition was supported by a grant from the Nature Conservancy (Scotland).

References

- BATTEN, L. A. 1970. Effects of fire on moorland birdlife on the Isle of Rhum. *Scot. Birds* 6: 191-194.
- BATTEN, L. A. 1971. Bird population changes on farmland and in woodland for the years 1968-69. *Bird Study* 18: 1-8.
- BATTEN, L. A. and POWEROY, D. E. 1969. Effects of reafforestation on the birds of Rhum, Scotland. *Bird Study* 16: 13-16.
- BOURNE, W. R. P. 1957. The birds of the island of Rhum. *Scot. Nat.* 69: 21-31.
- EGGELING, W. J. 1964. A nature reserve management plan for the island of Rhum, Inner Hebrides. *J. Appl. Ecol.* 1: 405-419.
- ENEMAR, A. and SJOSTRAND, B. 1970. Bird species densities derived from study area investigations and line transects. *Bull. Ecol. Research Committee* No. 9: 35-37, Lund.

- EVANS, P. R. and FLOWER, W. U. 1967. The birds of the Small Isles. *Scot. Birds* 4: 404-445.
- INTERNATIONAL BIRD CENSUS COMMITTEE 1969. Recommendations for an international standard for a mapping method in bird census work. *Bird Study* 16: 249-255.
- LACK, D. 1969. The numbers of bird species on islands. *Bird Study* 16: 193-209.
- WILLIAMSON, K. 1969. Bird communities in woodland habitats in Wester Ross, Scotland. *Q. J. Forestry* 65: 305-328.
- WILLIAMSON, K. and BOYD, J. M. 1963. *A Mosaic of Islands*. Edinburgh.
- WORMELL, P. 1968. Establishing woodland on the Isle of Rhum. *Scot. For.* 22: 207-220.
- WORMELL, P. 1970. The recovery of plantations after fire on the Island of Rhum. *Scot. For.* 24: 93-100.

Characteristics of Pheasant x Capercaillie Hybrids

D. A. BOAG, A. WATSON and N. BOUSFIELD

Introduction

Five Pheasant x Capercaillie hybrids are recorded in the literature (Lumsden 1891, Sim 1896, Clarke 1889, Wynne-Edwards 1950 and Gray (1958): all five were males and all collected in Scotland (table 1).

Clarke recognised two morphologically distinct types among the four specimens taken in the 1800s: a Pheasant-like form, with weaker beak and longer rectrices, and a Capercaillie-like form, with strong, hooked beak and shorter rectrices. Both forms had scaled toes and distal tarsi, and vermilion bare skin surrounding the eye, as in Pheasant. They also had partially feathered proximal tarsi, and the hallux on the same plane as the other toes, as in Capercaillie. Their plumage coloration was predominantly like Capercaillie. The 1950 specimen from Rothiemay (bird 5 in table 1) resembles the Pheasant-like form of Clarke.

These five were described from preserved specimens. Few measurements were given, and the characteristics of the viscera and fleshy parts were not mentioned. Thus it is impossible to know whether there was any physiological basis for separation of Clarke's two forms or if they merely represented the two extremes in the distributions of the anatomical characteristics chosen. (Anatomical differences in the hybrids could depend on which species was the male and which the female parent in each case.)

Description of two new hybrids and comparison with others

In October 1970 two more hybrids (birds 6 and 7 in table 1) were shot in Kincardineshire by James Ogilvie, a ranger with the Forestry Commission, and we were able to examine them in the flesh (plate 24a). They had been feeding in a forest at

about 270m altitude, where the dominant tree species were Japanese larch, lodgepole pine and mountain pine. The ground vegetation was mainly ling and wavy hairgrass.

Both specimens are males: they are thought to be siblings because they were very near one another when shot and they are both in a similar late stage of post-juvenile moult. On dissection their age was confirmed by the presence of large (19 and 27 mm long) bursae of Fabricius. Remnants of juvenile

Table 1. Pheasant x Capercaillie hybrids recorded in Scotland

Specimen	Location	Date killed	Sex	Age
1	Arden Estate, Loch Lomond Dunbartonshire	8th Nov. 1890	♂	—
2	Rothiemurchus, Aviemore, Inverness-shire	10th Nov. 1890	♂	—
3	Monymusk, Aberdeenshire	Late in 1895	♂	Juvenile
4	Stronchullin, Blairmore, Argyllshire	Mid Sept. 1897	♂	Adult
5	Rothiemay, Banffshire	18th Nov. 1950	♂	Juvenile
6 ^a	The Black Hill, Drumtochty, Kincardineshire	13th Oct. 1970	♂	Juvenile
7 ^b	The Black Hill, Drumtochty, Kincardineshire	13th Oct. 1970	♂	Juvenile

^aIn museum (No. (A773) 1970-1-38) of Dept. of Zoology, University of Aberdeen, Scotland.

^bIn museum of Dept. of Zoology, University of Alberta, Canada.

Table 2. Physical characteristics of Pheasant x Capercaillie hybrids

	Specimen number (from table 1)				
	2	4	5	6	7
Weight (g)	—	—	—	1413	1285
Lengths (cm)					
Total	83.8	84.8	87.0	64.0	62.0
Tail	—	—	33.5	19.0	17.4
Wing	—	32.7	33.0	27.0	25.8
Tarsus	—	—	9.0	8.5	8.3
Longest toe	—	—	6.6	6.2	6.0
Culmen	—	3.7	4.3	3.7	3.4
No. of rectrices	—	—	19	18	18
Beak form	—	Tetraonine	Phasianine	Phasianine	Phasianine

plumage on the heads and upper necks of both specimens resemble the juvenile plumage of Pheasant, except that the feathers of the crown, back of the neck and a strip immediately below the bare eye patch are heavily barred and tipped with black. The first adult plumage, which is still growing over much of their bodies, resembles most closely that of the Stronchullin hybrid (bird 4 in table 1) described by Clarke.

The immaturity of the Drumtochty birds is reflected in their short total length and tail length (table 2); only the two outside rectrices on either side had completed their growth.

The birds are apparently smaller than the previous ones that have been measured; for example, wing lengths, based on their primary 7 which is fully grown, are considerably smaller (table 2). The beak form is very Pheasant-like and contrasts with the heavier, somewhat hooked Capercaillie-like beaks of the Loch Lomond and Stronchullin hybrids (birds 1 and 4 in table 1) described by Clarke, and seen in the Monymusk specimen illustrated in Sim (1903). Like the other hybrids recorded

Table 3. Physical characteristics of two adult male Pheasants, the two Drumtochty hybrids and one juvenile male Capercaillie, all from Kincardineshire

	Pheasants		Hybrids	Capercaillie
	Absolute value*	Relative Index	Relative Index†	Relative Index
Lengths (cm)				
Beak-pygostyle	42.1	1	1.08	1.26
Wing	25.1	1	1.14	1.37
Tarsus	8.5	1	0.99	0.95
Longest toe	5.6	1	1.09	1.25
Culmen	3.4	1	1.00	1.21
Small intestine	121.0	1	1.05	1.17
Large intestine	11.4	1	1.01	1.39
Longest caecum	29.0	1	1.26	2.03
Weights (g)				
Total body	1556.5	1	0.84	0.93
Empty gizzard	35.3	1	0.67	1.76
Liver	18.0	1	1.56	2.06
Heart	6.5	1	1.46	1.54

*Mean values for two birds

†Mean values for the two specimens.

the Drumtochty birds have Pheasant-like tarsi, which lack feathers, except for the upper 2 cm of the anterior border. The feet bear scales only and show no evidence of the lateral cornified pectinations that are characteristic of the toes of Capercaillie from autumn to late spring. The hallux is not raised, as in Pheasant, however, but is on the same plane as the other toes, as in grouse. The tarso-metatarsal spur of Pheasant is vestigial in these hybrids, being represented only by a slightly enlarged convex scale.

The extent to which the Drumtochty birds resemble their Pheasant parent beyond this superficial similarity was investigated by comparing their measurements and weights with those of freshly obtained Pheasant and Capercaillie specimens (table 3). In all features measured the hybrids are intermediate between the parent species, but their measurements are much closer to those of Pheasant. This is particularly evident in their smaller beaks, caeca, and gizzards. The smaller gizzard in the hybrids may be partly due to their immaturity as well as to a

diet of relatively soft foods; their crops contained mostly soft-bodied insects (table 4). The only characteristics in which the hybrids resembled Capercaillie more closely than Pheasant were total weight and heart size. This may be because the hybrids were similar in age to the Capercaillie and younger than the Pheasants used for comparison.

Two additional features were noted in which the hybrids resembled Pheasant more closely than Capercaillie. The *pectoralis major* muscles were pale like those of Pheasant, not

Table 4. Crop contents of the Drumtochty hybrids

Food item	Specimen number (from table 1)	
	6	7
	Quantity	
Larch sawfly larvae	741	332
Heteroptera	—	4
Lepidopterous larvae	1	1
Carabid beetle	1	—
Spider	1	—
Onycophoran	—	2
Needles of larch	87	5
Fruit of chickweed	—	8

dark as in Capercaillie. Also the post-juvenile moult of the primaries had proceeded through the distal-most two. This is similar to the moult in pheasants, but in tetraonids the outer two juvenile primaries are retained until the bird's second autumn (Petrides 1942).

Thus it appears that the Drumtochty specimens, which outwardly resemble Clarke's Pheasant-like form, are also closer anatomically and physiologically to their Pheasant parent than to their Capercaillie parent. It remains to be determined whether the Capercaillie-like form resembles its Capercaillie parent more closely in these respects.

Acknowledgment

We are grateful to Dr D. Jenkins for his comments on the manuscript.

Summary

Two Pheasant x Capercaillie hybrids from Kincardineshire are described and compared with the five previously described specimens. The Kincardineshire hybrids are outwardly Pheasant-like, in contrast to some of the previously described individuals, which are recorded as beng Capercaillie-like. The similarity to the Pheasant parent involves both anatomical and physiological characteristics, as shown by comparative skeletal and visceral measurements of the hybrids and examples of their parent species.

References

- CLARKE, W. E. 1898. On hybrids between the Capercaillie and the Pheasant. *Ann. Scot. Nat. Hist.* 25: 17-21.



PLATES 21-23. These photographs, all taken in Dumfriesshire, are the work of Robert T. Smith. *Above* Barn Owl with prey, June 1969. *Over* Blackcock at a lek, April 1971 (plate 22a and b). Female Sparrowhawk at nest, June 1962 (plate 25a), Goldcrest at nest, Ae Forest, May 1968 (plate 23b).





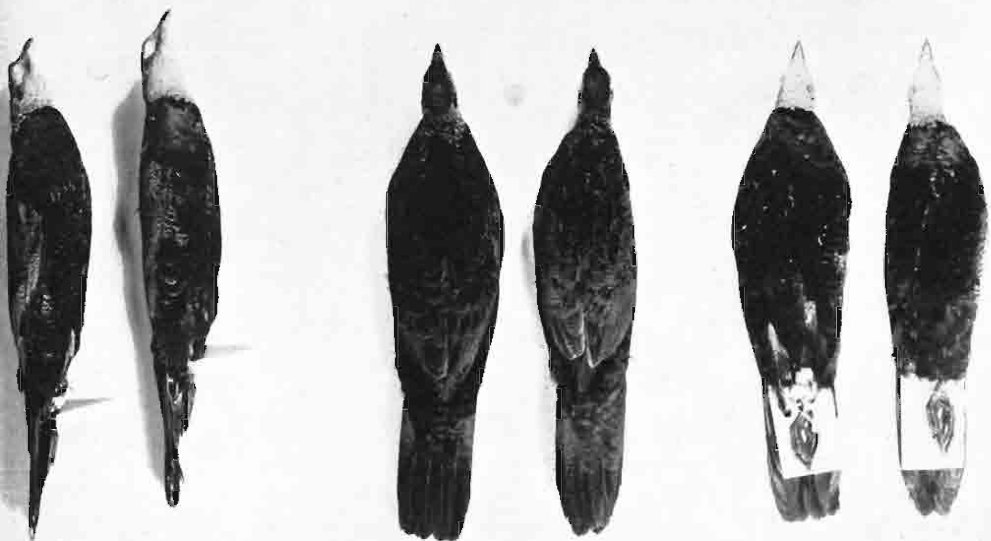


PLATE 24a, Pheasant x Capercaille hybrids shot near Drumochty, Kincardineshire, showing lateral, dorsal and ventral views of both birds.

Photograph D. A. Boag

PLATE 24b, Starlings huddle together on sheep's back during snow.

Photograph R. J. Tulloch

- GRAY, A. P. 1958. *Bird Hybrids* Technical Communication No. 13. Commonwealth Agric. Bureau.
- LUMSDEN, J. 1891. Hybrid between Pheasant and Capercaillie. *Scot. Nat.* 31: 38-39.
- PETRIDES, G. A. 1942. Age determination in American gallinaceous game birds. *Trans. N. Am. Wildl. Conf.* 7: 308-328.
- SIM, G. 1903. *Vertebrate Fauna of Dee*, Aberdeen.
- SIM, G. 1896. Hybrid between Capercaillie and Pheasant. *Ann. Scot. Nat. Hist.* 17: 38-39.
- WYNNE-EDWARDS, V. C. 1950. Pheasant x Capercaillie hybrid. *Scot. Nat.* 62: 186-187.

Dr Boag and Dr Watson, Nature Conservancy, Blackhall, Banchory, Kincardineshire.

Mr Bousfield, Glen Farquhar Lodge, Auchenblae, Kincardineshire.

The breeding season in a rural colony of Feral Pigeons

GORDON RIDDLE

Introduction

A colony of about 100 Feral Pigeons breed in Blunty's Mill at Kirk Yetholm, Roxburghshire. The building was previously a woollen mill and is now converted to boarding kennels.

The birds in the Mill follow a pattern of breeding that I have called rounds. A certain number of birds start their breeding cycle at about the same time (e.g. between 4th and 11th May 1969 nine pairs began to breed) and as a result most of these pairs have eggs and rear young at the same time, and all the successfully reared young leave the nest at about the same time.

Table. 1. Nest progress in round 1, 1960

Nest	Apr 27	May 4	May 11	May 18	May 25	May 31	June 8	No. of young
A13		2e	2e	2y	1y id	1y	f	1
A14	2e	2y nh	2y	2y	2y	f	f	2
A15		1e	2e	2e	2y	2y	f	2
A16		2e	2e	2y	2y	2y	d	0
A17a		2e	2e	2y nh	2y	2y	f	2
A17b		2e	2e	2e	2e	dis		0
A9				1e	2e	2e	dis	0
B1			2e	2e	2e	dis		0
B8				2e	2e	dis		0
C7			2e	2e	2e	dis		0
C8		3e	3e	1y 2e	d			0

Key f - young had left nest; nh - newly hatched; e - eggs; y - young; d - dead; dis - dead in shell

Type of construction of each nest was also recorded (see section on nesting).

However, the rounds do not all follow one after another; some begin before the preceding one has ended. This produces an almost continual period of nesting from the beginning to the end of the season.

The progress of each nest in the colony was recorded once weekly between 4th May 1969 and 15th November 1970, and

general notes on the behaviour of the birds during the breeding seasons were also made. Tabulation of breeding results was made in rounds, and table 1 is a typical record.

Description of study area

A riverside thick with whin and gorse, grass fields supplying a dairy herd, and a scattering of deciduous trees form the setting of the Mill. The area, with its ample patches of bare or short-cropped ground is an ideal environment for the colony of Feral Pigeons, with good feeding, drinking, bathing, roosting and breeding facilities. There is little interference, even though the Mill is inhabited.

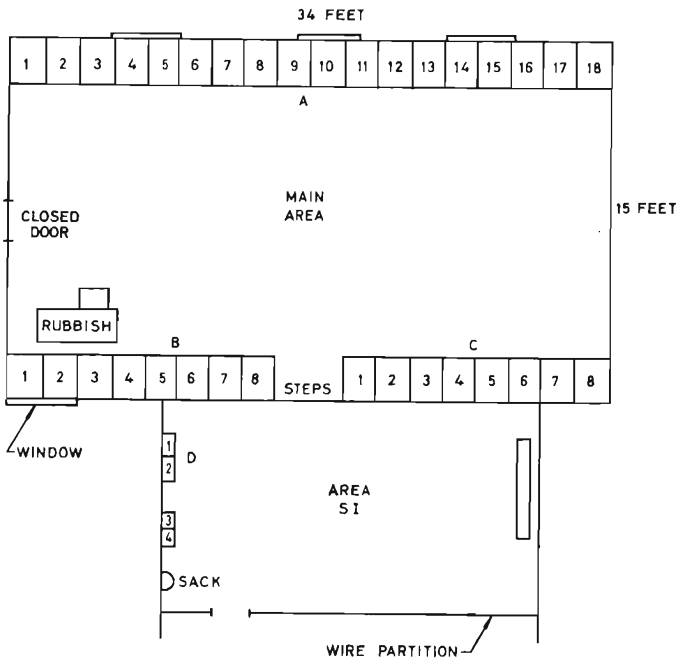


FIG. 1. Nest sites in main area and area S1. A, B and C are cubicles on ledges 6 feet from the floor.

Previously used for poultry, the building has been used by the Feral Pigeons only in the last nine years. The breeding area is on the second floor, separated from the rest of the Mill by a door. Wire partitions divide the area into five sections; birds nest in all of these, though the largest one has by far the most nests, nest sites and roosting points (fig. 1).

Manure, both hen and pigeon, is very deep in the main section, and all the others have a liberal covering and a fair amount of rubbish. Light enters through four large windows;

in the smaller sections skylights let in the light and often, when panes are broken, the birds as well. There is an ample variety of nest sites, those most commonly used being the 34 cubicles in the main area formed by the rafters running down to the ledge on top of the outside wall; only six of the 34 were not used at one time or another in 1970. Rafters and ledges are used for roosting. The main entrance to the area is a small hole at the junction of the roof and the chimney stack, where some slates have been dislodged and through which only one bird can enter or leave at a time.

Courtship and nesting

Courtship is quite complicated in the Feral Pigeon, and comprehensive accounts are given by Thompson (1923) and Whitman (1919). My observations at the Mill bear out their findings, and only a brief summary is given here. Courtship begins with the male taking the initiative: he picks up scraps of nesting material, selects a nest site and calls for a female. When an interested hen arrives, pecking, billing and mutual preening take place. Bowing and cooing follow, with the male raising and spreading his tail and strutting round the female. She droops her wings and by adopting a continual submissive pose and ducking down indicates her readiness to mate. After mating nesting begins.

The nest site is usually in a dark place, draught-proof and enclosed on three sides; for example a hole in a wall or a ledge cubicle. The birds are very adaptable in choosing sites. Nest sites used included: holes in walls; a sack in the rafters; a thick rafter; ledge cubicles; a barrel; boxes; the floor; chicken frames; steps; shelves. Most sites were easily found since the adults do not remove droppings from the nest, and these build up and around it, and eggshells, feathers and nest materials are littered below. For the birds nesting in the Mill, nest sanitation would appear to have little survival value, as the breeding areas are shut off from most predators, and so the nests do not have to be carefully hidden.

The birds tended to collect nest materials from what was available at the time. Often during a round one particular material would be predominant. For example, if a field had been turned over by the plough, and plenty of wrack was available, it would be used by most of the colony. Straw was collected from a nearby shed, twigs from below trees, and feathers were in good supply at all times in the Mill. Oddly enough there was a change of materials in the two years. In 1969 the main materials used were wrack, straw, twigs and feathers, as follows: in round 1 sticks; in round 2 sticks and feathers; and in rounds 3, 4, 5 and 6 all four materials. In 1970, however, in every round, only straw and feathers were used. Wrack was not as abundant that year, but twigs were.

Six types of nest were distinguished : bare ledge with no nest material; bare ledge with small amount of material; well built platform of sticks or straw; base of droppings; base plus nest materials; base plus platform.

The most common type was base plus nest materials. This had the shape of a bowl, owing to the accretion round the nest of the droppings of previous squabs. Over a long period the droppings had hardened, creating a strong concrete-like structure. Nest materials were usually placed inside the bowl, which was 7-8 inches in diameter, with sides 2 inches high. These nests were used over and over again. A few pairs did not use nest materials, and eggs were laid either on the bare ledge or in a bowl, but this was exceptional. The well built, strong platform of Wood Pigeon type was infrequent; the few seen were built from sticks or wrack.

The female lays two eggs 48 hours apart. If one egg is lost she does not lay another to replace it. In a few nests three eggs were found, though only in two cases did three young hatch. One pair did rear the three, but in the other, one squab hatched a few days later than the others and was squashed soon after. All the other pairs with three eggs hatched and reared two. Three of the nests that had three eggs were next to each other in time and position. Nests X5, X7 and X8 (in one of the smaller sections) all had three eggs between 17th June and 8th August 1970, and seven young were reared from them. Complete clutches of only one egg were rare, only 16 out of 236. The fertility rate of the birds in the Mill is high : in 1969 only two out of the 186 eggs showed no signs of embryo development.

Incubation lasts 17 days and is carried out by both parents. When the young hatch, the eggshells are not always discarded from the nest; if they remain they are soon crushed. During the first five days the squabs are fed on pigeon milk secreted from the lining of both the adults' crops. After this period they are fed on food regurgitated by the adult, the squabs putting their heads right into the parent's gullet. A comprehensive account is given by Murton (1965).

On hatching, the young birds have a layer of yellowish orange down, which soon darkens as the quills appear. Gradually the feathers develop until after two weeks the squabs are well covered, and after three and a half weeks they are strong enough to leave the nest. At this stage the juveniles often perch on or near the nest, calling for food when the parent enters. Even after they are able to fly they often roost on the nest until the parents begin a new round. To leave the Mill, the young birds have to be strong enough to fly up and cling to the bricks before escaping to the outside world through the hole. They spend a short period inside the Mill before attempting this and so have an opportunity to strengthen their wings, flying from the floor to the ledges and rafters. Thus the

young are protected from the hazards of the outside world at a most vulnerable stage in their development. Hunger forces them out, since no food is available in the Mill when the parents stop feeding them.

Nest failure

Nest failure can be attributed to a number of causes. Predation inside the Mill is due mainly to rats. One attack on 9th May 1970 resulted in the birds deserting the Mill for three weeks. Only two nests out of 15 survived the slaughter, eggs and squabs being taken and nests destroyed.

Adults sometimes came to grief in the panic that ensued when anyone entered the breeding areas, since the exit hole allows only one bird to depart at a time.

Away from the breeding colony, the birds may be subject to predation by cats, a healthy population of which breed in the area, but man is probably the most dangerous predator. Pigeons are shot for food and for sport, and bodies are frequently found both inside and outside the Mill. Out of 55 dead adults found, 42 had been shot. Young birds in the nest died of starvation when the parents disappeared. A negligible number of young died due to accidents, such as falls, and draughts.

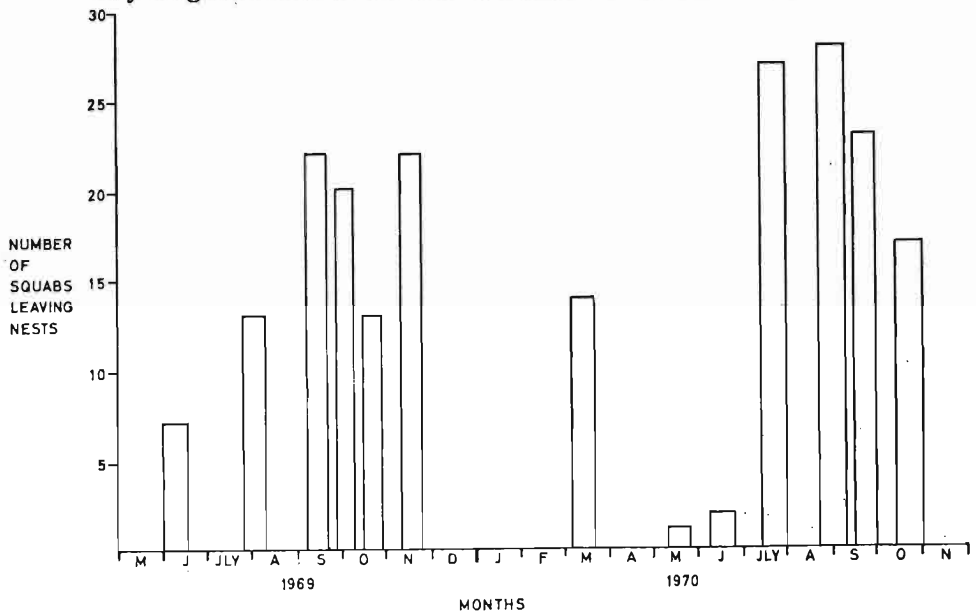


FIG. 2. Number of young reared.

Seasonal and climatic factors

The weather is an important factor in the breeding cycle at the Mill. Late frosts can cause chilled eggs and desertion. The

average temperature during the four non-breeding months, November to February, during the study was 40°F, with much colder periods. Only a few young survived during breeding rounds when temperatures were around this level, and when there was frost and snow. For example, in 1969 during round 7 (2nd-30th November) the average temperature was 40°F, and no birds left the nests. In 1970 during round 2 (15th March-12th April) the average temperature was 42.6°F, and again no birds left the nests. Feeding is also affected if there is a hard frost or snow on the ground.

Day length is also an important factor, and the period mentioned when breeding success was hardly ever recorded was, of course, the period of shortest days. The most successful rounds were between July and October, when the birds have longer periods of daylight in which to feed and collect food for their young (fig. 2). The nesting grounds at this time of the year, when food supplies are good and the temperatures are much higher, were most successful: in 1969 during round 3 (3rd August-4th September) the average temperature was 64°F, and 22 young were reared; in round 4 (24th August-5th October) the average temperature was 60°F, and 20 young were reared; in 1970 during round 5 (7th June-26th July) the average temperature was 61°F, and 27 young were reared; in round 6 (12 July-5th September) the average temperature was 60.5°F, and 29 young were reared.

Territorial behaviour

Gompertz (1957) stated "Many Feral Pigeons hold quite an extensive territory round the nest site, and I think that if there are alternative sites available the spacing out of nesting is much more considerable than sometimes supposed."

This was not the case at the Mill. Although in the main area 34 sites were available on the ledges, birds persisted in nesting close together or in groups when they could have spaced themselves out. Indeed, successful breeding results were obtained from pairs nesting very close to each other, e.g., A13-A18 in rounds 3 and 6 in 1969, and A3-A9 in round 6 in both 1969 and 1970.

Very little territory other than the immediate vicinity of the nest was held by pairs. However, nests were often out of sight of each other in the partitions formed by the rafters running onto the ledge. Nevertheless, some ledge cubicles contained two nests, and sometimes both were used at the same time, but only one pair usually succeeded in rearing squabs. Owing to the abundance of nest sites, competition for them is not fierce. In summer, food and nest materials are abundant round the Mill, and so there is little competition here either. In winter, however, competition for food is severe,

Table 2. Summary of data collected 1969-70

Round	1969							1970										
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9		
	May 4 - June 8	June 22 - Aug 3	Aug 3 - Sept 14	Aug 24 - Oct 5	Sept 14 - Oct 26	Oct 5 - Nov 16	Nov 2 - Nov 30	Feb 15 - March 22	March 15 - May 3	April 5 - May 24	April 19 - June 14	June 7 - Aug 1	July 12 - Sept 5	Aug 8 - Sept 27	Sept 5 - Oct 25	Sept 27 - Nov 15		
Total								1969 Totals								1970 Totals		
236 Attempts to nest	15	15	17	13	12	19	5	96	13	18	8	16	18	20	17	20	10	140
453 Eggs laid	31	29	33	27	21	35	10	186	26	33	14	28	35	39	34	38	20	267
16 Nests with 1 egg	0	1	2	1	2	2	0	8	0	1	0	1	2	1	2	0	0	8
210 Nests with 2 eggs	14	14	13	10	13	15	5	84	13	17	7	14	15	17	15	18	10	126
10 Nests with 3 eggs	1	0	1	2	0	1	0	5	0	0	1	2	1	1	0	0	0	5
295 Hatched	11	17	28	20	16	28	4	124	17	11	7	6	29	31	28	28	14	171
113 Reared none	11	6	5	3	4	6	5	40	5	18	7	15	3	6	9	7	7	73
33 Reared 1	1	5	2	0	3	4	0	15	2	0	1	0	5	0	5	2	2	18
99 Reared 2	3	4	10	10	5	9	0	41	6	0	0	12	12	10	6	1	0	48
1 Reared 3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
214 Young left nest	7	13	22	20	13	22	0	97	14	0	1	2	27	23	17	4	4	117
9 Eggs infertile	0	0	0	1	1	0	0	2	0	6	0	0	0	1	0	0	0	7
74 Dead in shell	20	12	0	4	5	6	6	53	2	4	2	1	0	3	2	1	6	21
70 Died in nest	2	4	4	0	2	2	4	18	3	11	6	4	2	5	11	8	6	52
55 Adults died									5	18	0	1	0	3	11	3	6	55
16 Immatures died									0	2	2	0	0	3	0	9	16	16

Population

The colony increased slightly but noticeably during the months of observation, but the population level and rate of expansion, however, were difficult to calculate; although it was easy to record new arrivals to the colony, i.e. squabs, it was impossible to estimate the number of birds that died away from the Mill. Some 55 bodies of adults were found in 1970 in and around the Mill, and the total number that had been killed or died was certainly greater.

In 1970, of 171 young hatched, about a third failed to survive the nesting stage: 117 young birds left the nest, but a large proportion of these died before attaining breeding status. The number of nest sites used suggests that, although there is a surplus at the end of the breeding season owing to the accumulation of juvenile birds, the effective breeding population is expanding only slowly: despite the number of nest sites available, the totals used in 1969 and 1970 were 46 and 50 respectively. Most sites were used in both years, and some new sites were adopted in 1970, but the number of nesting pairs seems stable.

Two observations give an indication of the size of the population: on one occasion 80 birds were counted sunning themselves on the roof of the building while at least ten adults were inside; secondly, on the date when most pairs were breeding, 5th September 1970, 32 nests had either eggs or squabs in them. (In both years a high number of young left the nest in September: e.g. 39 in September 1970).

The data for the two years are summarized in table 2.

Discussion

The Feral Pigeons in the Mill are a true colony, being an aggregate of animals feeding together, and breeding close together in the confines of the building. Fitter (1949), discussing London Feral Pigeons, also noted the colonial preference of the bird in the urban environment.

The way the Mill was colonised was similar to the method described by Gompertz (1957) who recorded how some Feral Pigeons took over an attic after a window pane had been broken. A few pairs in the Kirk Yetholm area took the opportunity, when the poultry were removed, to enter the Mill and begin nesting. In nine years they have successfully built up a thriving colony of over 100 birds despite predation by rats and man.

The Feral Pigeon has forsaken the sea caves and cliff faces of its ancestor the Rock Dove, but the walls of the Mill, its ledges and rafters correspond to the conditions in which the Rock Dove thrives. The Feral Pigeon has adapted well to

rural life, though the Yetholm colony still depends on man (as do its urban counterparts) for food and a place to breed: the crops in summer and winter provide food, and the Mill provides shelter, roosting places and nest sites. Competition with Wood Pigeon, which is adapted to living in rural areas, is thus confined to feeding only.

Summary

A colony of Feral Pigeons inhabits a Mill in rural surroundings in Roxburghshire. Breeding activity in the colony was studied over a period of two seasons. Data are given based on the pattern of breeding rounds. Observations on behaviour confirm those of previous workers except that the birds in the present study did not appear to hold much territory around the nest site.

References

- FITTER, R. S. R. 1949. *London Birds*, London.
GOMPERTZ, T. 1957. Some Observations on the Feral Pigeon, *Bird Study* 4: 2-13.
THOMPSON, J. A. 1923. *Biology of Birds*, London.
WHITMAN, C. O. 1919. *The Behaviour of Pigeons*, Washington.
MURTON, R. K. 1965. *The Wood Pigeon*, London.
Weather figures are from the Hill Farm Research Organisation at Sourhope, Roxburghshire.

Acknowledgments

I would like to thank Jack Robb, Andrew Currie, Michael Wilson and Rosemary Robb for all the help they gave me during the two years of observation and in the preparation of this paper.

Short Notes

Balearic Shearwaters in the Forth

On 18th August 1969 at Fife Ness P. A. Lassey, Dr P. H. Smith and I were carrying out a sea watch. Fair numbers of Manx Shearwaters had been seen during the day. At 1700 hrs BST, looking due east, we picked up a different-plumaged bird at a range of probably quarter to half a mile as it approached flying south. We watched it as it flew past and until it disappeared out of sight. Visibility was moderate to good, and we had excellent views of the bird. It was the same size as a Manx Shearwater, with the same characteristic shearing flight as that species, on stiff, sickle-shaped, pointed wings.

The next day at 1725 hrs and in perfect visibility we again had excellent views of a shearwater of the same description

flying north, followed three minutes later by two more. The plumage notes below apply equally to all four birds:

Description Upperparts brown or grey-brown, shading to a paler dirty brownish-white below, not contrasting with white underparts as in Manx Shearwater; axillaries paler, not clear white as in Manx Shearwater, nor with pale longitudinal line of Sooty Shearwater; bill fine and dark, not yellow and relatively large like that of Cory's Shearwater.

This plumage can only be that of the Balearic Shearwater, the west-Mediterranean race of the Manx species. We have had previous experience of this race, both in Britain and in the Mediterranean.

During the period when these birds were seen, good numbers of the scarcer southern shearwaters were obviously present in the North Sea, for on 23rd August a sudden northerly gale produced many Sooty Shearwaters along the northeast coast of England. At Holy Island that day we saw 38 Sooty Shearwaters and another Balearic Shearwater, while on 26th August at Hartlepoons (where 25 Sooty Shearwaters had appeared on the 23rd) we saw a Great Shearwater.

M. E. GREENHALGH.

(The only previous record of a Balearic Shearwater in Scotland is of one shot in the Forth on 19th August 1874 (*Scot. Nat.* 1916: 249), though there is also a report of one seen 65 miles west of South Uist on 10th September 1966 (*Ibis* 110: 3).—Ed.)

Cory's Shearwater in Orkney

On 24th September 1970 between Scrabster (Caithness) and Stromness (Orkney) I saw a Cory's Shearwater. There was an easterly wind, which had been blowing for days, and under the western lee of Hoy were many hundreds of Fulmars, resting on the water. Among these I saw three Sooty Shearwaters, one of which was close enough to show the pale wing-linings clearly. About 200 yards off, a very big shearwater got up with several Fulmars, one of which chivvied it in flight. It was a whole size bigger than the Fulmars and plain brown above, without a pale patch on the neck or above the tail. The apparent brown colour of the back was not due to a trick of the light, which sometimes makes Fulmars seem brown, as the Fulmars with the Cory's were obviously grey. Its wing-flapping was much slower than that of the Fulmars.

M. F. M. MEIKLEJOHN.

(Apart from a notable passage of 88 Cory's Shearwaters at Fair Isle in September 1965 (*Scot. Birds* 4: 218) there is only a handful of Scottish records of the species, and this seems to be the first for Orkney.—Ed.)

Little Egret in Wigtownshire

On 19th April 1976 GAW saw a Little Egret at a pond on Catyans farm on the northern outskirts of Whithorn. On 30th April on the Kilfillan Burn, Manse Bridge, Garlieston, about four miles from Catyans, RHM and GAW saw the bird again and it was seen there on several occasions up to 6th May.

GAW saw the bird catch a frog and an eel. Each time it made a catch it would rise slightly out of the water, flapping its wings.

R. H. MILLER, G. A. WILLMETT.

(This record fits in with the previously published series for the period October 1969 to July 1970 (*Scot. Birds* 6: 196-197). It is not the first record for Wigtownshire; one was found dead under wires at Mochrum on 23rd April 1968 (*Scot. Birds* 5: 311).—Ed.)

Little Bittern in South Fife

On 10th June 1970 TW and JW saw a Little Bittern in a gully beside Gillingshill Reservoir. It stood motionless for about a quarter of an hour then moved its head very slowly to one side then the other. It walked slowly to the water's edge and stretched its neck to feed or drink. When a small bird flew over, the bittern stretched up towards it.

Later in the day, at the same spot, JARG watched the bird for an hour at close range. It stood among dock leaves by the muddy edge of the stream: it moved very little, and was not disturbed by a low-flying aircraft or by the noise of blasting from a nearby quarry. Its hunched attitude was Heron-like, but on one occasion, and for no apparent reason, the bird suddenly stretched to its full height, its bill pointing to the sky.

Description Crown and nape soft blue-grey or blue-black; back black; wing-patch warm buff with faint dark markings; face and all underparts warm pinky buff, striated; bill blood-red at base, straw-coloured towards tip, with dark grey ridge along top of upper mandible; iris yellow, and there seemed to be a yellow eye-ring; legs yellowish green.

The bird was not seen again.

J. A. R. GRANT, T. WAREHAM, J. WATKINS.

(This is the first record for South Fife.—Ed.)

Black Kite in Orkney

On North Ronaldsay on the morning of 28th September 1970 I saw a large brown raptor fly up from marshy ground near Lindy croft. At first I thought it was a Marsh Harrier, but it was too small, and when it alighted on a cattle trough on the top

of a wall I saw that it was a Black Kite, only a little bigger than the pair of Hoodies that were diving at it. It was chocolate-brown in general colouration, but paler below, with the head, especially below the eye, palest of all. It showed typical kite stance, rather horizontal, not upright like a Buzzard. Its long wings, reaching the end of its tail, gave it an elongated look. Its head was small and its beak rather short, with a long hook at the tip. It flew off to a barley-stook, and I saw the plain brown tail with a shallow fork.

For comparison I was lucky enough to see a Buzzard the following day and was able to note these contrasting points: steadier, not so wobbly flight; larger, rounder head; pale under wing-coverts with dark spot; and, of course, square, barred tail. To judge from the plate in Coward's *Birds of the British Isles and Their Eggs* (Vol. 3), the Black Kite also has barring on the tail, but this must be very inconspicuous.

The winds had been easterly for some days, with fog, but the morning of the 28th was clear, so that the birds could see the island and land on it. On the same day I saw a Richard's Pipit and a Great Grey Shrike.

M. F. M. MEIKLEJOHN.

(This seems to be the first autumn record for Scotland (there are three spring ones) and, taken together with reports from the Northern Isles in 1966 and 1968 (*Scot. Birds* 4: 295; 6: 38), tends to suggest more regular occurrence than previously recorded.—ED.)

Temminck's Stint in Stirlingshire

On 15th July 1970, while scanning through a flock of waders in flight over one of the ponds at Skinflats, I noticed a very small wader suddenly break away from the main group and rise above them before landing on the mud at the edge of the pond. Approaching to within 20 yards I had a good view of the bird and was able to identify it as a Temminck's Stint in full summer plumage. I saw the bird again on 16th July along with I. Taylor. He was immediately struck by the unusual call note, which the bird never failed to utter both when taking off and in flight. He was able to determine the leg colour as brownish-green and thought the bird looked rather short-tailed in flight. When flushed it would fly up quickly, swerving wildly, and after circling once or twice it would suddenly plunge downwards and land on the muddy perimeter of one of the ponds. On the few occasions when it could be directly compared with Dunlin, the difference in size was immediately obvious, and the bill appeared relatively shorter. In its feeding activities the stint was much less vigorous than the Dun-

lin. Usually it would stand still and either make very shallow probes in the mud around it or pick from the surface of the mud then walk a pace or two and repeat the action.

Description Head and upperparts dark brown, with some of the mantle feathers having black centres, giving a very noticeable mottled look; upper breast greyish and rest of the underparts white, giving the bird, when head-on, an appearance rather like a small Common Sandpiper; in flight a faint white wing-stripe showed; the tail had a black centre and white outer feathers; bill short, straight and black; call note a very distinctive rapid twittering.

The bird was also seen by M. Hutcheson on 17th July and was last seen by me on 19th.

DAVID FLEMING.

(The date is exceptionally early for an autumn migrant and calls to mind that the species attempted to breed in East Inverness-shire in 1934-36 and 1956. This is the first record for East Stirlingshire.—Ed.)

Wilson's Phalarope in Angus

On 19th September 1970 Ian Simpson found a phalarope at Forfar Loch. On 21st September, with a party of bird-watchers, we located the bird and watched it at ranges down to 50 yards. At first it stood at the muddy edge of the loch, preening with very fast bill movements. It was noticeably bigger than a Dunlin, and considerably smaller than a Ruff, both standing nearby.

The bird spent most of the time swimming jerkily around in shallow water at the edge of the loch, feeding from the surface with quick darting movements. The following description is taken from notes made at the time:

Forehead and crown grey; eyestripe broad, darker grey, extending from just forward of the eye, through it and down the neck; nape, back and closed wings grey, primaries darker; some white edging on primaries, secondaries and wing-coverts; no wing-bar; rump white; throat, breast, underparts and flanks pure white; legs and feet yellow; bill longer than head, very thin, straight, black.

On consulting reference books we identified the bird as a Wilson's Phalarope, and the record has been accepted by the Rarities Committee.

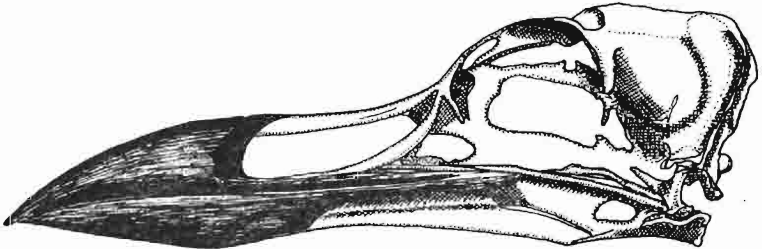
G. M. CRIGHTON, D. R. BARRATT.

(This is the fourth Scottish record and the first for Tay and Angus. The first was in Fife from 11th September to 5th October 1954 (*Scot. Nat.* 1954: 188), and there have been a score of British records since then. The other Scottish ones were in Dunbartonshire from 30th August to 1st September 1962 (*Scot. Birds* 2: 366) and in Fife from 19th to 25th October 1963 (*Scot. Birds* 3: 82).—Ed.)

Brünnich's Guillemot in Argyllshire

On 11th October 1969, after a long spell of strong westerly gales, there were many dead Guillemots on the saltings at the head of Loch Caolisport; among them I found a Brünnich's Guillemot in a fairly decomposed state. I detached the head, a wing and a leg and later showed them to I. H. J. Lyster at the Royal Scottish Museum. The following description was made from my own notes and from observations made by IHJL; measurements were wing 185mm (down on primaries suggests these feathers had not fully grown in); bill 36.5mm; maximum bill depth 14mm; bill depth at nostril 13.25mm; length from angle on lower mandible to tip 21mm; tarsus 35mm; tail (an isolated central tail-feather measured from start of down to tip) 53.5mm.

Description Crown and sides of head black, extending well below and behind the eye (unlike winter plumage of common Guillemot); lower cheeks white; between the black on the head and the white of the lower cheeks some feathers showed black at the tips thus producing a gradual merging of the two colours; all upperparts including wings



and tail very black with some tinges of grey; area of white on trailing edge of secondaries much greater than in common Guillemot; upper side of primary shafts very dark brownish black; all underparts pure white except a little black feathering at the chin, and some darkish underwing marks; flanks showed no dark streaks; bill black, pale grey at tip and with a small indistinct dull-yellow streak on side of upper mandible (no white line); legs very dark greyish black with faint dull-yellow tinge on some joints.

The skull was later compared with several common Guillemots' skulls, and a number of structural differences in the posterior parts were noted, the most noticeable concerning the cleft that runs down each side of the hind-brain area in both species. In the Brünnich's Guillemot this cleft was at least twice as wide as the corresponding clefts in all the common Guillemots examined. Unfortunately no other skulls of Brünnich's Guillemot were available to confirm whether the cleft width in this species is consistent.

R. K. MACGREGOR.

(The record has been accepted by the Rarities Committee. It is the first for the Argyll faunal area and North Argyll and is the third Scottish record. We asked Dr W. R. P. Bourne to look at the material, and he comments: "I have compared the skull and wing collected by RKM with the large series of comparative material in the British Museum (Natural History). The pattern of muscle attachments to the hind part of the skull appears to vary individually in guillemots, and this is reflected in the markings on the skull, and it does not seem certain that the one in question can be identified conclusively by these features. The wing, like others collected from common Guillemots during the 1969 birdkill (Stewart *Scot. Birds* 6: 142-149), is in moult, with the primaries nearly grown but still in sheath, and the under wing-coverts still growing, so that the downy bases to the primaries are exposed. It is very black above, with dark primary shafts (which distinguishes it from the wing of a common Guillemot), and dark central parts to some longer under wing-coverts (which distinguishes it from the wing of a Razorbill), and together with the description of the head markings these characters indicate that it must be Brünnich's Guillemot"—ED.)

Yellow-billed Cuckoo in Caithness

On 9th November 1970 an exhausted bird was picked up three miles west of Thurso. It died during the night. I saw the bird next day and identified it as a Yellow-billed Cuckoo. The bird was emaciated and had obviously died of exhaustion and starvation. The body was sent to the Royal Scottish Museum, and the following description is taken from notes made by I. H. J. Lyster:

Head, nape, back and upper tail-coverts mid brown, with a slight gloss; forehead, lores and above eye grey-brown; cheeks, lower ear-coverts and all underparts buff-white, becoming greyer at the sides; under tail-coverts white; wing mid brown, with middle and basal part of the primaries red-brown, and feathers 4—9 almost wholly red-brown; outer webs of secondaries, primary coverts and some other coverts tinged red-brown; inner secondaries mid brown; under wing-coverts cream; outer ends of primaries (underside) dark brown, basal parts light brown to red-brown; secondaries (underside) dark brown, tinged red-brown and cream at bases; the two central pairs of tail feathers mid brown; the three outer pairs much darker brown, with white tips, that of the outermost pair extending halfway along the outer web; upper mandible and tip of lower one dark horn; basal cutting edge of upper mandible and remainder of lower one yellow; legs and feet slate-blue; iris dark brown; eyelids yellow.

Sex female; weight 36.5g; wing 147mm; tarsus 26mm; bill 24mm.

P. McMORRAN.

(Among four other specimens of this species in the Royal Scottish Museum there is one, details of which have not pre-

viously been published. The bird, a male, was found in the last stages of exhaustion at Bryameadow Farm, Sandwick, Orkney, on 12th October 1956. It was identified by E. Balfour.—Ed.)

House Martins nesting at Golden Eagles' eyrie

On 5th July 1970 in the Eastern Highlands I was shown a House Martins' nest built beside a Golden Eagles' eyrie. The eyrie, situated beneath an overhang, was occupied by a well grown eaglet. The adult martins were active at their nest, which was a few feet above the eyrie and within the overhang. When I revisited the site on 11th July the eaglet and the martins were still there.

J. L. F. FERGUSSON.

Rock Thrush at Fair Isle

At 6.50 a.m. on 30th June 1970 Dr Brian Marshall found a male Rock Thrush in the Single Dyke trap on Fair Isle. I examined it at the Bird Observatory, where it was ringed and photographed. A detailed description was taken and the bird was released. It flew with an unusual slow undulating flight and gave a soft, chuckling call, slightly reminiscent of a Mistle Thrush; I think this was part of its song flight. It perched for a few seconds on a shed about 100 yards away but was disturbed and flew up to a rocky hillside. We watched it there on the ground for about five minutes before it disappeared over the hill, not to be seen again.

Description Whole of head, nape, sides of neck, chin and throat blue-grey with some feathers very blue, lores darker, nape greyer; upper back grey-black, shading into white on back and upper rump; lower rump feathers dull black with base and tips white; upper tail-coverts a mixture, some like rump, the rest chestnut with darkish tips; all underparts orange; feathers on belly and flanks tipped white; a few feathers on under tail-coverts also with subterminal brown mark. Primaries and secondaries dark brown, with slight grey edging on outer webs of inner primaries and whitish tips on four outer secondaries; lesser coverts worn, dark brown, edged buff; median coverts a mixture of old and new feathers, old ones like lesser coverts, new ones blackish with white tips; greater coverts old and like secondaries except for three inner ones, which were new and blackish with white tips; primary coverts grey-brown with grey-white tips and outer webs; bastard wing similar; axillaries orange; under wing-coverts orange-buff, with dark marks; tail centre pair brown with orange-buff base, the rest orange with buff marks at tip of outer webs, outermost with distal half of web brown; bill black; gape yellow; inside mouth yellow; iris dark brown; legs and feet brownish horn with dull yellow soles. Wing 122mm; bill 27mm; tarsus 27mm; tail 61mm. The 3rd and 4th primaries were emarginated on the outer webs; the first primary was 10mm shorter than the primary coverts; the 3rd was longest, the 2nd and 4th 2mm shorter, the 5th 9mm shorter and the rest progressively shorter.

We decided the bird was a first-year male. It was also seen by I. S. Robertson, J. Driver, G. J. Barnes and others. The two previous reports for Fair Isle were 8th November 1931 and 16th October 1936.

ROY H. DENNIS.

Great Reed Warbler in Fife

On 17th June 1970, at about 8 p.m. D. Thomson and I found a Great Reed Warbler at Kilconquhar Loch. It first attracted attention by its very loud often repeated song, which I transcribed as *kara kara kreek kreek gurk gurk gurk*. Every stanza ended with the *gurk gurk gurk*, no matter what calls had gone before. The notes were harsh, and some were almost crake-like. The bird sang from a perch out of sight and over the water among the *phragmites* that surround the loch. It would not be flushed above reed height nor would it move to drier habitat; when disturbed it would seem to disappear but would start singing again about five minutes later.

After we had listened to the song for half an hour, the bird appeared for a few seconds at the top of a small willow tree. This was just long enough for me to see that it was a reed warbler approaching the size of a small Redwing, that its head was much longer than that of the ever present Sedge Warblers and that it was brown on the back and lighter below. It dived for cover and resumed singing. Although we watched for 30 minutes more, we obtained only glimpses of the bird, but it never stopped singing.

An attempt was made to mist-net the bird, but without success. At 10 p.m., with dusk creeping in, almost all the other birds had stopped singing, but the Great Reed Warbler continued: the strength and depth of the song were remarkable. The song sounded exactly as the *Field Guide* transcribes it. It is rare that bird sounds are so easy to interpret.

The bird was not seen or heard again, although the site was revisited many times. I suspect the bird had overshoot its breeding range and had set up a territory at Kilconquhar Loch, which, with its extensive bed of *phragmites* resembles the Great Reed Warbler's usual breeding habitat. Similarly in 1961 a Woodchat Shrike inhabited this area in late spring during a like period of prevailing high pressure.

D. W. OLIVER.

(There are three previous Scottish records, all in June: Shetland 1958 (*Scot. Birds* 1: 254), Fair Isle and East Inverness 1964. (*Scot. Birds* 4: 291).—Ed.)

Tawny Pipit in Shetland

On 10th and 11th June 1970 a Tawny Pipit was present on Whalsay. I watched it for about an hour each day in bright conditions at distances down to 20 yards. It was feeding in cabbage patches and short-cropped grass. When disturbed, it flew from place to place, sometimes perching on fences and stone walls; it was not very wild. The most noticeable features were its very pale sandy colouration, its long-legged erect stance and its Fieldfare-like habit of running fast and stopping suddenly to stand very erect. It frequently moved its tail up and down like a wagtail, its flight was undulating and, although no other birds were near for direct comparison, it appeared to be larger than a Meadow Pipit, and to have longer legs.

Description Forehead and crown sandy brown, lightly streaked brown-black; lores and ear-coverts light brown; eyestripe cream, distinct, extending from base of bill well beyond eye; nape, mantle, scapulars and upper tail-coverts sandy brown with faint brown-black streaking; rump unstreaked sandy brown; chin and throat whitish, with brown streaks on upper breast; flanks buffish; belly and under tail-coverts whitish; tail brown, centre feathers showing buffish edging, with outer pair whitish; wings brown; secondaries and greater and median coverts edged and tipped buff; lesser coverts brownish, edged buff; legs and feet yellowish flesh; bill brown.

JOHN H. SIMPSON.

(This is the first record for Shetland other than Fair Isle.—Ed.)

Black-headed Bunting in Outer Hebrides

On 6th July 1970 at Boreray, Sound of Harris, I saw a male Black-headed Bunting feeding among straw at the old school. In general appearance it was a large yellow bunting with dark head and rufous brown back. It was rather wary.

Later that day the bird was seen by others and was caught, ringed and photographed. Its plumage, particularly of the wings and body, was in very good condition, though the tail was very slightly abraded. A full description was made and submitted to the *British Birds* Rarities Committee.

The bird was last seen on the morning of 8th July.

A. D. K. RAMSAY.

(There is no previous record for the Outer Hebrides, but with substantial numbers of Black-headed Buntings in captivity the origin of any seen must be suspect. The bird is a summer visitor to southeast Europe.—Ed.)

Cirl Bunting in Wigtownshire

On 17th August 1969 at Mull of Galloway, a male Cirl Bunting was seen perched on top of a gorse bush. It was watched for two or three minutes at ranges down to ten yards. The head pattern showed a black throat and a yellow face with a black line through the eye. The underparts were pale, with an olive-green breast-band, and slight streaking on the flanks. No call note was heard.

J. C. SINCLAIR.

(This is the first record for Solway. A pair of this species was recorded at Eglinton, Ayrshire, 8th May 1928 (*Birds of Scotland*), and a pair are reported to have bred in Cumberland in 1955.—ED.)

White-throated Sparrow in Caithness

In early May 1970 a White-throated Sparrow turned up in PJR's garden near Thurso. DS and PM visited the place in June and saw and heard the bird. It was the size of a large sparrow, with a longish tail. It drew attention to itself by its call, which it uttered continuously from a conspicuous perch on a tree or sometimes from a telegraph pole. We had excellent views of it at close quarters; once it came within a few yards to eat a large green caterpillar. The plumage seemed abraded and we think the bird may have been an escape. Extensive enquiries were made locally, but no one seemed to have lost such a bird.

Description Crown striped white and black; back and tail brown; wings warm chestnut-brown, with two faint white wing-bars; eye-stripe bright yellow in front of eye, white behind eye; chin and breast showed an inverted triangle of white outlined in grey; breast greyish, with yellowish tinge on belly; bill and legs horn; eye dark.

The bird raised its head and quivered its tail while delivering its call, usually two long, high-pitched whistles followed by three rather quavering notes; sometimes two notes only were sung and occasionally four.

The bird was present for about four months. It preferred a territory between hedgerows bordering the main road and PJR's garden.

P. McMORRAN, P. J. RODGER, D. M. STARK.

(Previous Scottish records are of a male shot in the Outer Hebrides on 18th May 1909 (*Brit. Birds* 53: 97) and, possibly more likely escapes, a female shot in Aberdeenshire on 17th August 1867 (*Brit. Birds* 48: 189) and one trapped at Fair Isle on 13th May 1966 (*Fair Isle Bird Obs. Bull.* 5: 193).—ED.)

Obituary

DR JAMES WILLIAM CAMPBELL

Dr Jimmie Campbell, who died on 2nd January 1971, was an authority on the food of wildfowl and on the birds of the Outer Hebrides; he was co-editor of the *Scottish Naturalist* for eight years and became a Vice-President of the SOC.

He was born in Streatham, London, on 19th May 1906, and went to school at Charterhouse. Later his family moved to Essex; from there he went to King's College, Cambridge, (B.A. 1928) and later to St Bartholomew's Hospital Medical School (M.B., B.Chir. 1933). Financial independence relieved him of the need to practise medicine, though he did so throughout the war from 1939 to 1945 in the RAMC; he attained the rank of Major and was awarded the M.B.E. (Military Division).

From his childhood he spent holidays in Scotland, at first near Aberfeldy and later in North Uist, where in the 1930s his family rented Newton Lodge. His lifelong devotion to natural history and his keenness on rough-shooting and wildfowling (for preference away on his own) developed early. When professional training later taught him to make scientific use of the bird in the hand, he turned his attention also to stomach contents and food and to racial differences in measurements and plumage. He sought advice and confirmation of his identifications of subspecies and of the food organisms the birds contained at the British Museum (Natural History), and this brought him to the attention of various specialists there, including Mr (afterwards Sir Norman) Kinnear in the Bird Room. Similarly he established early links with Harry Witherby, and most of his notes and articles before the war were published in *British Birds*. It was at that period that he amassed a rather large and representative collection of stuffed birds.

I met him soon after I came to Aberdeen in 1946. He was then an experienced and critical observer, widely known among British ornithologists. His first substantial publication had summarised his observations, extending over a dozen years, of the Rooks at an Essex rookery (*Brit. Birds* 29: 306-9); in it he had added much to the then recent studies of G. K. Yeates and of J. P. Burkitt, and his paper is quoted in *The Handbook*. Another of his sustained interests was in Herons and heronries; his longest published paper was on the breeding of the Heron in the Outer Hebrides (*Scot. Nat.* 61: 73-100). For many years he also kept up his analyses of the diet of wildfowl and to a lesser extent shore-birds, receiving material from correspondents and at length producing a valuable study of the food of Wigeon and Brent Goose (*Brit. Birds* 39: 194-200 and 226-32). He prepared

a detailed report on wildfowl habitat and distribution in the Outer Hebrides for use by George Atkinson-Willes in the Nature Conservancy monograph *Wildfowl in Great Britain* (1963).

In 1947 he came to stay permanently in Perthshire (apart from one short break when he went to Scatwell in Easter Ross); he lived first at Strathtay and afterwards near Bridge of Cally. He was soon enlisted to help edit the revived *Scottish Naturalist*, and it was between 1948 and 1955 that I saw him most often, usually combining a night at their house at Strathtay with meetings I used regularly to attend at that time at Pitlochry. I soon came to look forward to these visits with keen anticipation, and especially to getting out with him in the oak-woods at Strathtay and on the nearby hills. On one special occasion I joined him for a week-end in the Isle of Lewis, camping in his Land-Rover and tramping the hills, hopefully searching for breeding skuas or perchance Great Northern Divers. He had a good general knowledge of natural history and missed very little that could be seen or heard. I enjoyed too the evenings at his home, with his young family, and among his fine library of books; he was an excellent host, and when it came to our mutual business an excellent editor too, with the essential capacity for taking trouble and getting things right. For more than 20 years before he died he had been working to fill an outstanding gap in the Scottish faunal series by writing a book on the birds of the Outer Hebrides, and it is strongly to be urged that other hands should strive to complete and publish it.

He served for nine years on the SOC Council, and was a Vice-President in 1954-55. He was one of the group that started the Perth Branch in 1948, and for long was a member of the Scottish Birds Records Committee, becoming its chairman in 1960-62. He was a man with great gifts of friendship and will be remembered with affection especially among his own generation of SOC members as long as we live. He is survived by his wife Betty, their three sons, and his sister, Miss M. S. Campbell.

V. C. WYNNE-EDWARDS.

Reviews

The Wetlands and Waterfowl of Iran. Game and Fish Department of Iran, 1971. Pp. 43, 20½ x 13 cm. \$1.

Iran is a big country, largely arid, but with an interesting variety of wetlands. These include lakes and rivers, many flooded rice-paddies, coastal lagoons, bays in the Caspian Sea, salt lakes (one very large) and extensive seasonal freshwater and brackish marshes. This booklet describes the work of the Iranian Game Department on conserving wetlands,

lists the most important of these, gives the status of several of the more interesting species of waterfowl and includes a short account of the Department's ringing programme. Some 1,065,860 hectares of land containing important waterfowl habitat are already under protection, and over 140 species of waterfowl have been recorded, including 63 breeders, but numbers are rapidly decreasing owing to drainage and disturbance, and the development of the conservation programme is to be welcomed. Recent reports include Marbled Teal breeding at Fars, up to 93 White-headed Ducks at Fars and 64 in the Bay of Gorgon (Caspian Sea), disappearance of wintering Bean Geese, and diminished numbers of Lesser White-fronted Geese (which presumably now mostly winter further east). Red-breasted Geese are now rare.

DAVID JENKINS.

Die Vogel des Bodenseegebietes. Edited by H. Jacoby, G. Knotzsch & S. Schuster. German. Zurich, ALA/Schweizerische Gesellschaft für Vogelkunde und Vogelschutz, 1970. Pp. 260; 16 plates (25 photographs); 27 figures. 21½ x 15½ cm. Paperback. Fr. 18.50 from Frau Käthi Niquille, Kernstrasse 27, 8406 Winterthur, Switzerland.

Situated on the borders of Switzerland, Germany and Austria, the Bodensee (Lake Constance) is a wetland habitat of considerable ornithological interest, especially as an important breeding and wintering area for wildfowl and marsh birds. This volume is the result of 12 years work by a group of field ornithologists from all three countries.

A general section first sets the scene with short chapters on the geography and topography of the district, its plants and animals and the influence of climate and water conditions on the birds. There are chapters also on migration, conservation etc. The status of the breeding and wintering birds is discussed, and changes over the last 50 years are highlighted: it is interesting to learn for example that the White Stork, Hazel Hen, Black Grouse, Redshank, Crested Lark and Lesser Grey Shrike have disappeared as breeding birds in that time, while Purple Heron, Mute Swan, Red-crested Pochard, common Pochard, Tufted Duck, Black-tailed Godwit, Common Gull, Collared Dove, Fieldfare and Raven have been gained.

The main text (191 pages) deals with 313 species, of which 130 are regular breeders. Many receive very full treatment under headings such as status, seasonal fluctuations, migration, breeding data etc. and there are many references, tables and figures.

TOM DELANEY.

A Field Guide to Australian Birds—Non-passerines. By Peter Slater *et al.* Edinburgh, Oliver and Boyd, 1971. Pp 428+32; 64 plates (43 in colour. 19 x 13½ cm. £3.

Some 400 species are illustrated and described in this well produced, well designed volume (a second one, in preparation, will cover the passerines). All the plates are grouped together at the front of the book, which makes them easy to sort through, and there is a handy 8-page "visual index" designed to help the observer find the plate he needs. The illustrations are strongly drawn, clear and attractive. In general they effectively show field identification features, but among the smaller waders, Mr Slater has not always captured the jizz of his subjects.

Distribution maps are given for all the species, though only approximate accuracy is claimed for them in view of the present state of knowledge of bird distribution in Australia.

TOM DELANEY.

Also received: Pheasants, including their care in the aviary. By H. A. Gerrits. Second edition, revised by Philp Wayre. London Blandford Press, 1971. Pp. 144, 6 colour plates, 30 photographs and 17 line drawings. 23 x 16 cm. £2.

Letter

Sir,

Starling using sheep as a towel

That Starlings perch on the backs of sheep is well known, and I have often seen them do so. Usually the reason appears to be purely one of convenience, and I have seen a Starling singing from such a perch. When sheep are being hand fed during snow, Starlings frequently congregate to share the food and during heavy snow showers often huddle together on a sheep's back for shelter and, probably, warmth (see plate 24). Recently I was intrigued to see a Starling use a sheep for another purpose.

It was getting dusky, and Starlings were gathering into pre-roosting parties. A dozen or so were on the clothes-line and fence at the front of our house. Though the day had been dry, some of them were bedraggled and had obviously been bathing. Several sheep were grazing nearby, and one bird flew down onto the back of a sheep and proceeded to rub itself in the wool, sometimes going through wing-fluttering, bathing motions and sometimes burrowing into the wool so that little more than its head was showing, and all the time preening vigorously. The sheep got a bit fidgety, and finally shook off the Starling, which immediately flew to the next animal and continued the same performance. This one ignored the burrowing and fluttering, and the Starling finally flew back to its fellows, landing on the highest vantage point with a superior air—and looking much drier.

BOBBY TULLOCH.

Current literature (continued).

Population control in Red Grouse and Rock Ptarmigan in Scotland. D. Jenkins & A. Watson, 1967. In Proceedings of 8th International Congress on Game Biology, Helsinki, 1967. *Finnish Game Research* 30: 121-141.

Practical results of research for management of Red Grouse. D. Jenkins, A. Watson & G. R. Miller, 1970. *Biological Conservation* 2: 266-272.

Inter-specific competition in Stonechat and Whinchat. J. S. Phillips, 1970. *Bird Study* 17: 320-324. Ayrshire/Renfrewshire study.

Loch Leven, Kinross. C. R. G. Campbell, 1970. *Wildfowl* 21: 147 (148). Current report for 1969.

THE SCOTTISH ORNITHOLOGISTS' CLUB

ANNUAL CONFERENCE

The 24th Annual Conference and 34th Annual General Meeting will be held in the Hotel Dunblane Hydro, Perthshire, on 29th-31st October 1971. Bookings should be made direct with the hotels. The full programme will be given in the next issue of *Scottish Birds*. The registration fee will be 75p, and the Annual Dinner (with wine or soft drinks) £1.90.

Hotels in Dunblane

Hotel Dunblane Hydro (tel. 0786 82 2551). Special Conference charge £7.10, inclusive of 10% service charge, bed and all meals (except tea on Saturday afternoon and the Annual Dinner) from Friday dinner to Sunday lunch, and after-meal coffee. For less than a full day, bed and breakfast is £2.50, lunch £0.70 and dinner £1.10, all with additional 10% service charge. Rooms with private bathroom have a supplementary charge of 50p per person per day (double room) and 75p per person per day (single room).

Ardleighton Hotel (near Hotel Dunblane Hydro gates) (tel. 2273). Bed and Breakfast from £1.50-£1.75.

Schiehallion Hotel, Doune Road (tel. 3141). Bed and Breakfast maximum £1.25.

Stirling Arms Hotel (tel. 2156). Bed and Breakfast from £1.63-£1.75.

Hotels in Bridge of Allan

Allan Water Hotel (tel. 2293). Bed and Breakfast from £2.63-£3.38.

Old Manor Hotel, Henderson Road (tel. 2169). B & B from £2.13-£2.75.

Queen's Hotel, Henderson Road (tel. 3268). B & B from £2.10-£2.40.

Royal Hotel (tel. 2284). Bed and Breakfast from £2.75.

Strathallan Hotel, Henderson Road (tel. 3293). B & B from £1.25-£1.75

Prices, except for the Conference Hotel, are provisional and should be confirmed when booking.

BRANCH MEETINGS 1971/72

Will Members please note that the dates of the first Meetings of Branches next winter will be as follows :

September	23rd Dundee and Stirling
	28th Edinburgh and Inverness
	29th Ayr, Dumfries and St Andrews
October	4th Aberdeen and Glasgow

Dundee Meetings will take place in Dundee University, Perth Road, Dundee at 7.30 p.m.

Glasgow Meetings will start at 7.15 p.m.—15 minutes earlier than in previous years.

Bird Books



THE BIRD BOOKSHOP

21 REGENT TERRACE, EDINBURGH, EH7 5BT

Some new books in stock:

The Birds of Britain and Europe. *Heinzel, Fitter & Parslow*. About £1.25. (A new Field Guide which includes birds of Asia Minor, the Middle East, North Africa and the Atlantic Islands). June.

Highland Birds. *D. Nethersole Thompson*. £1.25.

Birds of Prey in the Field. *Roger Harkness & Colin Murdoch*. £2.25.

The World of Birds. *Malcolm Ellis*. £1.50.

A Naturalist on Speyside. *Henry Tegner*. £1.75.

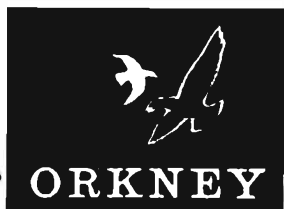
Status and Distribution of Birds in Great Britain and Ireland. *B.O.U.* £2.50. August.

Evolution Illustrated by Waterfowl. *David Lack*. £0.60. August.

All Books sent Post Free — Terms: Strictly Cash with order

WHEREVER YOU GO

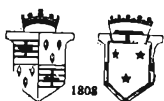
in Orkney, a bird will probably be watching you. The total number of recorded species is around 280, 109 have bred this century—some 85 regularly. All in some of the finest and least known Islands of Britain. Spoil yourself this year—come and be watched.



for transport and accommodation
information write to
The Tourist Officer

ISLANDS

Information Office, 93, Kirkwall
(Tel. Kirkwall 2856)



**SUTHERLAND
ARMS HOTEL**

**GOLSPIE
SUTHERLAND
SCOTLAND**

Telephone : Golspie 216

Situated on the main North Road near the sea, Golspie offers invigorating open air holidays to all.

In addition to its unique golf course, it has fine loch fishings, sea bathing, tennis, bowls, hill climbing, unrivalled scenery, including inexhaustible subjects for the field sketcher and artist and is an ornithologist's paradise. It is, indeed, impossible to find elsewhere so many natural amenities in so small a compass.

The astonishing diversity of bird life in the vicinity has been well known to ornithologists for many years, but it is still possible to make surprising discoveries in Sutherland.

The Hotel is fully modern, but retains its old world charm of other days, and enjoys a wide renown for its comfort and fine cuisine.

Fully descriptive brochures, including birdwatching, will gladly be forwarded on request. Central Heating.

Proprietor, Mrs F. HEXLEY
Garage & Lock-ups available

A.A. R.A.C. R.S.A.C.

ARGYLL

Forestry Commission

**Tighnabruaich
Wild Life Centre**

Opened 28/5/71

WATERFOWL ROEDEER

**Bookable Observation
&
Photographic Hides**

Apply to Head Forester,
**Tighnabruaich Forest
Hafton, Tighnabruaich (284)
Argyll**

COLOUR SLIDES

We are now able to supply slides of most British Birds from our own collection, and from that of the R.S.P.B. Send for our list covering these and birds of Africa—many fine studies and close-ups.

FOR HIRE

We have arranged to hire out slides of the R.S.P.B. These are in sets of 25 at 37½p per night's hire. Birds are grouped according to their natural habitats.

W. COWEN, Keswick

KINDROGAN FIELD CENTRE

The Scottish Field Studies Association

Kindrogan provides accommodation, lecture rooms, laboratories and a library. Situated in Strathardle, 16 miles north of Blairgowrie and 9 miles north-east of Pitlochry, it affords excellent opportunities for all aspects of Field Studies in the Scottish Highlands.

The standard weekly charge is £15. Members of local Natural History groups or Scientific Societies may be eligible for bursaries valued at £3 made available by the Carnegie United Kingdom Trust.

The programme for 1971 includes courses for adults in a variety of subjects including :—

Birds
Mountain Flowers
Field Botany
Soils and Land-use
Moorland Ecology
Rocks and Minerals
Conservation
Wild Flowers
Insects

Surveying and Map-making
Mammals
Natural History Photography
Painting
Natural History of the Highlands
Nature into Art
Archaeology
Highland Landscape
Industrial Archaeology
Bryophytes

All applications, enquiries and requests for programmes should be addressed to the Warden, Kindrogan Field Centre, Enochdhu, Blairgowrie, Perthshire.

ISLAY

'The Bird-Watchers' Paradise'

Islay hospitality and the unique opportunity to study an astonishing variety of birds in Winter and Spring combine to provide a perfect early holiday.

The island is the principal wintering resort, possibly in the world, of the Barnacle Goose. It is also the last Scottish stronghold of the Chough. These are only two of the hundred different species that may be seen on Islay's varied habitat during a Winter or Spring holiday.

For Ornithological Leaflet
write to :

Mid Argyll, Kintyre and
Islay Tourist Organisation,
Campbeltown, Argyll



THE SWAN AT KINGHOLM

This small riverside hotel is situated two miles from Dumfries and three miles from the Caerlaverock Nature Reserve, now further areas of the Solway meres are being set aside for research of the habits of the geese and waders.

The hotel has seven letting bedrooms, residents lounge, etc. Please write to Mrs C. M. Armstrong for tariff.

Telephone 3756



Tweeddale Court
14 High Street
Edinburgh EH1 1YL

Oliver & Boyd

Just published

A FIELD GUIDE TO AUSTRALIAN BIRDS

Non-Passerines

Edited by Peter Slater

Prepared by Australia's leading bird specialists and ideal for use in the field, this guide, the first of two, is designed to enable the observer, whether a beginner or a serious student, to identify any bird seen on the Australian mainland, Tasmania, and the dependent islands Lord Howe, Norfolk, Christmas, Cocos-Keeling, Macquarie, and Heard.

Packed with all the information needed for positive identification of every non-passerine bird to be found in Australia, it contains 43 full colour and 21 black and white plates, all from paintings by Peter Slater, showing many plumages, forms and phases *never before illustrated*.

460 pages £3.00

Other titles of interest

BIRDS OF NORTH AFRICA

From the Canary Islands to the Red Sea

R. D. Etchécopar and F. Hüe

632 pages illustrated £8.50

BIRDS OF NATAL AND ZULULAND

P. A. Clancey

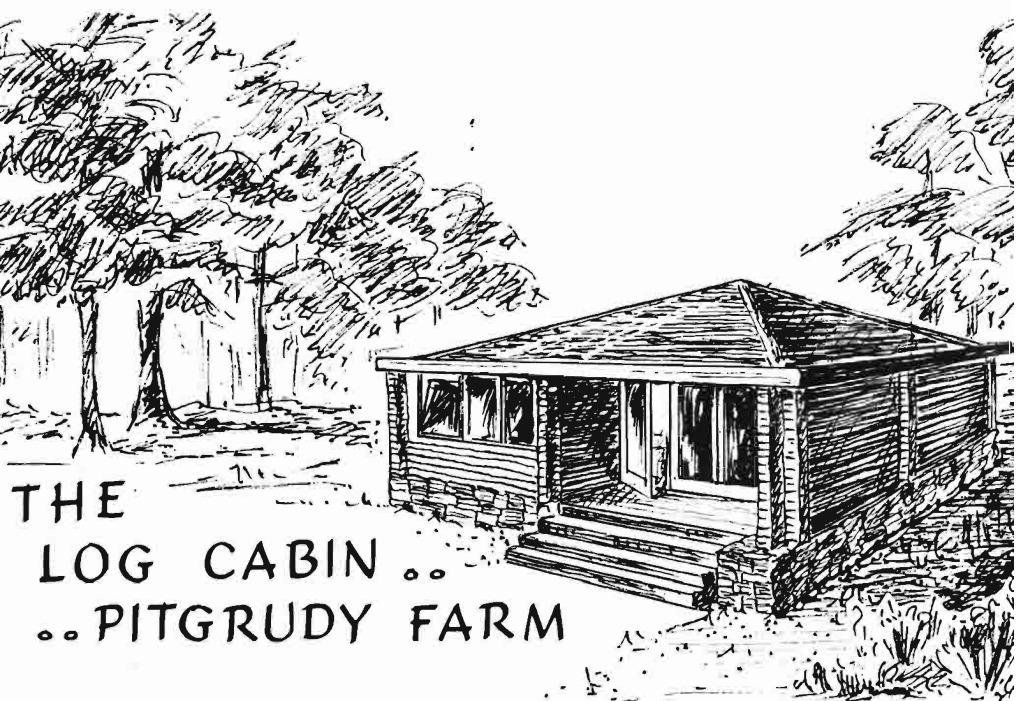
548 pages illustrated £5.00

BIRDS OF CYPRUS

D. A. Bannerman and W. Mary Bannerman

424 pages illustrated £5.25

For a full list of our ornithological titles please write to the above address



THE LOG CABIN PITGRUDY FARM

Self catering chalet and cottage available near Dornoch. Ideal area for study of birds of Farm, Hill and Estuary.

For details apply to: Mr M. M. Grant, Pitgrudy Farm, Dornoch, Sutherland.
Tel. Dornoch 291.

We offer you **TWO VIEWS OF SHETLAND**

**From The Lerwick Hotel in "the capital" on the main island.
And the Springfield Hotel on Unst overlooking the Baltasound.**

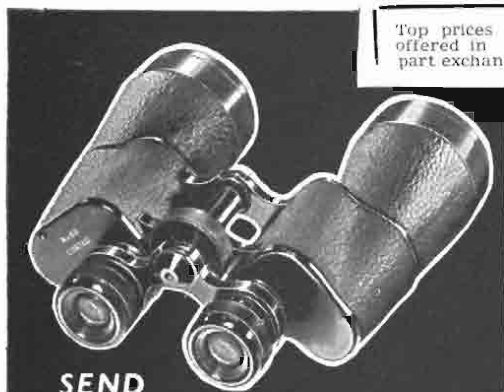
Bedrooms with private bathrooms, Central heating throughout. Double glazing. Bars. Comfortable lounges. Television. And the best cuisines North of latitude 60°. So come and have a double-based birdwatching holiday. You never know your luck—you might see a Snowy Owl or a Red-necked Phalarope, a Fieldfare or a Whimbrel. There are several very rare species of bird on Shetland, and—of course—colonies of seabirds. You could see Great Skuas and Arctic Skuas, or even—very occasionally—Great Northern Divers. Make a double booking if you like. Just write for full details of accommodation etc. to:

SHETLAND HOTELS (LERWICK) Ltd.,
Scalloway Road, Lerwick.
Tel. Lerwick 1166/7.

Perfect Alignment and the Ornithologist

The correct alignment of your binocular is of paramount importance and you can be sure that any binocular purchased from us has undergone stringent tests in our own workshops.

'Alignment' and a hundred-and-one other points of interest to the binocular user are discussed in our new booklet 'Tell Me Mr Frank', a copy (together with our illustrated catalogue) will be sent post free to readers of 'Scottish Birds'.



Top prices
offered in
part exchange

**SEND
FOR NEW
ILLUSTRATED CATALOGUE
CHARLES FRANK LTD.**

145 QUEEN STREET : GLASGOW



We stock all the better makes of binoculars, but the ornithologist who insists on a good quality instrument at a reasonable cost will do well to consider either the 8 x 30 or 10 x 50 Frank/Nipole binocular.

The 8 x 30 is a compact instrument (recommended by the Game Conservancy) 4½" high and weighing only 18 ounces.

Price with hide case **£12.50.**

The dedicated ornithologist may prefer the greater magnification of the 10 x 50 model and will not be deterred by its somewhat greater bulk and weight (7" high and weighing 36 ounces).

Price with hide case **£16.50.**

All Frank Nipole binoculars are unconditionally guaranteed for a period of 7 years and our free approval facilities enable you to test out any glass without obligation to purchase.

TEL. 041-221 6666