FAIR ISLE
BIRD OBSERVATORY

SECOND ANNUAL REPORT
1950

Two Shillings and Sixpence

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FAIR ISLE BIRD OBSERVATORY TRUST

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Please detach and fill up this form and send it to The Manager, The Union Bank of Scotland, Ltd., 64 George Street, Edinburgh, 2.

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(Please use Block Letters.)

being in sympathy with the objects of THE FAIR ISLE BIRD OBSERVATORY TRUST apply for election as a FRIEND OF FAIR ISLE and enclose herewith the sum of £1, 1s. being my first year's subscription.

Cheques should be made payable to The Fair Isle Bird Observatory Trust and crossed Union Bank of Scotland, Ltd.

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(Please use Block Letters.)

.....

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Date.....

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Please place to the credit of The Fair Isle Bird Observatory Trust at The Union Bank of Scotland, Ltd., 64 George Street, Edinburgh, 2, on receipt of this Order and on the same date in each year the sum of

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This Order should be sent to the Manager, Union Bank of Scotland, Ltd., Edinburgh.

Note: Do not send this direct to your own Bank.

COVENANTS.

The Fair Isle Bird Observatory Trust has introduced a scheme for the payment of subscriptions under Covenant. This means that, if you pay Income Tax at the full rate and intend to remain a member of the Trust for seven years or more, you have an opportunity of increasing its funds without any additional cost to yourself.

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A certificate relating to the deduction has to be signed by the " covenanting " subscriber. This will be forwarded for completion each year when your subscription has been received.

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NOTE 1. The scheme applies only to Income Tax Payers, *i.e.*, those whose income is above the statutory limit of exemption and who pay Income Tax at the full rate.

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4. **The date of the first payment under the Covenant must be later than the date on which the Covenant is signed.**

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I, ...
(Name in Block Letters.)

of..... Do HEREBY COVENANT and agree that for the period of years, or until my death (whichever should be the shorter period) I shall pay yearly to the Fair Isle Bird Observatory Trust, per their Treasurer, for the time, a sum which, after deduction of Income Tax at the appropriate rate, will amount to per annum, the first of said payments to be made on the day of and so forth yearly on said day of during the subsistence of these presents, and I declare that said annual sum shall be held to represent payments to the General Funds of said Fair Isle Bird Observatory Trust for the year ending Fifth April following the date of payment thereof.

Signed by me at this day of .

Signature.....

BEFORE THESE WITNESSES :—

Signature.....

Address.....

Profession.....

Signature.....

Address.....

Profession.....

FAIR ISLE BIRD OBSERVATORY

ANNUAL REPORT

1950

FOREWORD.

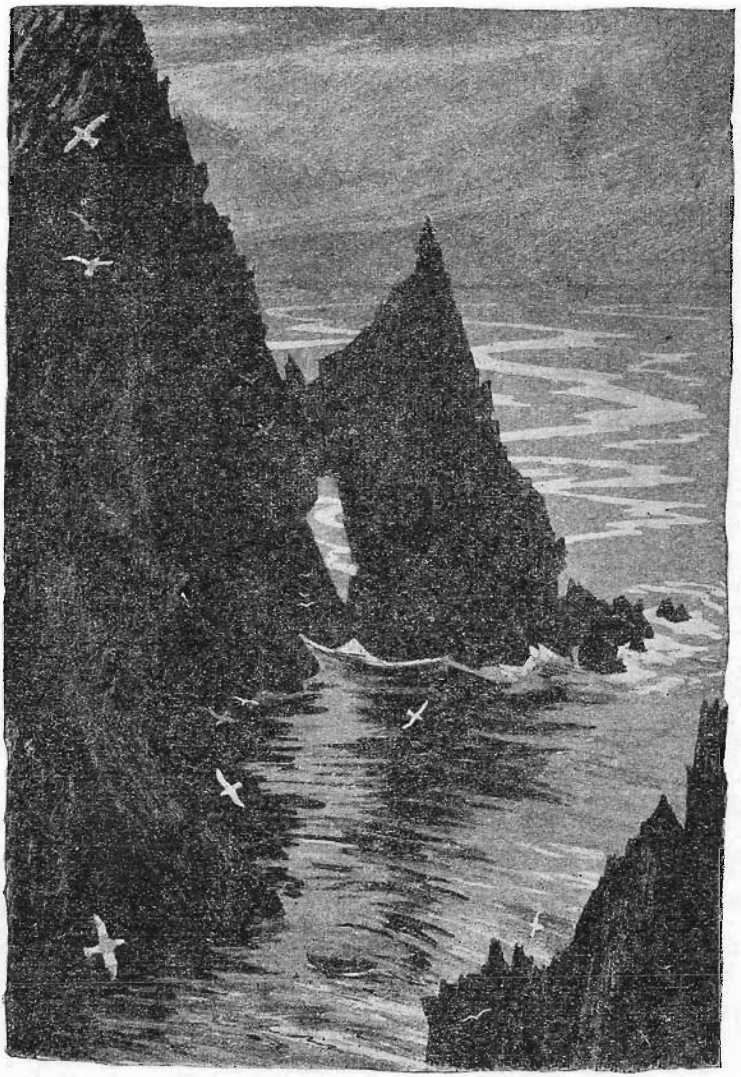
I MUST apologise for the late issue of this Annual Report due to a wide range of circumstances over which we have but little control—the illness of the Treasurer (now happily an episode of the past), the difficulties of the printing trade, and the indolence of the Chairman (both problems still awaiting permanent solution).

The work of the Trust falls naturally into two halves. The obvious and important half is the work done on and off Fair Isle by the Director, and under his leadership; some account of this work during the past year is contained in this Report. It is work worth doing and work well done. The less obvious half is the work done by the Trustees and the Executive Committee—planning, raising money, and seeing that it is wisely spent. Without this half the other half would stop. It is in this phase that all can help by continued support, by interesting fresh people, by bringing the Trust to the notice of the very many people who, we feel sure, would be anxious to help if they knew of this venture.

During the year we have lost by death Mr B. W. Tucker, the outstanding figure of British Ornithology of the last decade. Miss E. V. Baxter and Miss L. J. Rintoul, those twin pillars of strength of Scottish Ornithology, have felt compelled to retire as Trustees. These two ladies never occupy a position that they cannot justify by personal attention to affairs of a standard all too rare to-day. Since the inception of the scheme they have served on our Executive Committee, attending all meetings with unfailing regularity. We warmly thank them for their work and enthusiasm, and count, with assurance, on their support and influence for years to come.

Finally, I would ask you to study the Treasurer's Report with care. We have written off considerable sums to ensure that the financial picture is truly painted—not too rosy, albeit not too dark. With your continued support, support we feel justified in asking on account of the last two year's work, our future is assured. I ask you with confidence for that assurance.

ARTHUR B. DUNCAN,
Chairman.



FAIR ISLE—THE NORTH CLIFFS — *Roland Svensson.*

FAIR ISLE BIRD OBSERVATORY

Annual Report by the Director

1950

The Hostel.

The Fair Isle Bird Observatory was engaged in active field-work for 28 weeks in 1950, from 6th April to 31st October. The Warden, Pat Robertson, continued the work of trapping and bird-ringing during the rest of the year. The active season opened with the visit of a party of young and enthusiastic bird-watchers from Fettes College, Edinburgh; and later in the summer K. J. Witts, a student at the University College of North Wales, made a month's stay whilst studying the plant ecology of the island. Dr J. A. R. Miles, of the Department of Pathology, Cambridge University, made two visits in pursuance of his research on the incidence of Ornithosis viruses in British sea-birds, particularly the Fulmar. We were pleased to welcome once again no less than ten visitors who first came to the Bird Observatory in 1949, and the fact that the isle and conditions at the Hostel are proving so attractive to many is some consolation for the reduced number of visitors in 1950. A total of 102 people stayed at the Bird Observatory, but of these 20 per cent. were with us only one or two days, coming to the isle to fulfil business or professional engagements.

" The Bulletin."

During the spring we made the experiment of producing a " Fair Isle Bird Observatory Bulletin," our purpose being to circulate to the Bird Observatories, the Fair Isle Trustees and other interested parties in this country and abroad up-to-date news of the migration and of our work at Fair Isle. As one of the aims of the " Bulletin " was to help the various Bird Observatories to keep in touch with each other's affairs, they were invited to contribute similar news of events and activities from time to time.

Eight " Bulletins " were issued, Nos. 1-4 covering the spring migration, No. 5 the breeding season, and Nos. 6-8 the autumn migration. The first three were typewritten, but as the demand increased an easier means of reproduction had to be found, and the remaining issues were mimeographed. We are grateful to the Nature Conservancy for the invaluable assistance they rendered in this respect. Many visitors showed interest in the " Bulletins," and expressed a desire to have copies sent to them should a means be found of increasing the circulation. In view of this, and in the belief that Friends would like to be kept informed in this way of events at Fair

Isle, it is proposed to distribute a new series of " Bulletins " during 1951 and subsequent seasons on a wider scale. Friends of Fair Isle should already have received the first of these.

In addition to the migration news, the 1950 series contained notes on trapping methods and bird-ringing progress; recoveries of ringed birds; the development of the Arctic Skua study during the summer; field-notes on such rarities as the Red-headed Bunting, Eversmann's and Greenish Warblers; and occasional information on bird-weights and ectoparasites. The scope of the " Bulletins " was not restricted to Fair Isle, and among extraneous affairs dealt with were the passage of spring migrants through Egypt (Fayid Ornithological Club), an account of observations on Great Saltee Island during the spring and autumn migrations (R. F. Ruttledge and John Weaving), research into Ornithosis viruses in British sea-birds (Dr J. A. R. Miles), bird-movements in the south of Shetland (L. S. V. Venables), and the migration and chief ornithological events in the Faeroe Islands in 1949 (Niels Fr. Petersen).

Exchange of Observations.

We have established an exchange of notes of the occurrence of migrants and appropriate weather data, with Niels Fr. Petersen á Botni, the ornithologist at Nolsoy in the Faeroe Islands. Despite the remoteness of this potential observatory (for it is Petersen's intention to establish Bird Observatory methods of study on the island), 200 miles NW. of Fair Isle, there is often very close agreement between the bird-movements at both places. We have submitted a joint paper based on this comparison of observations to the Danish journal " Dansk Ornithologisk Forenings Tidsskrift." Close collaboration is also maintained with the Midlothian Ornithological Club, who are responsible for the observations carried out at the Isle of May, and with other stations through the British Trust for Ornithology Bird Observatories Committee.

The Library.

We are grateful to several Friends for gifts of books and periodicals, including Mrs T. Clemens, Misses Duthiot and Hesketh-Williams, Mr and Mrs R. K. B. Aldridge, Douglas Grant, David K. Wolfe-Murray, G. Theo Kay, James Archer, Sargent Wellman, Dr W. H. Bierman, Brian G. Lane, and Dr A. Vedel Tåning.

We are also grateful to a number of ornithologists, and also societies, museums and similar institutions abroad, who have sent us their publications in exchange for our own. Welcome material has come to us in this way from Africa, New Zealand, Italy, Yugo-Slavia, Denmark, Norway, Sweden, Finland, Iceland and the United States of America.

Acknowledgements.

Mention must be made of the debt we owe to the Perth Museum and Art Gallery, the Universitetets Zoologiske Museum in Copen-

hagen, and especially the Royal Scottish Museum for their assistance with the loan of specimens. The few skins we procured during the season were sent to the Royal Scottish Museum for incorporation in their collection, and in addition a number of " casualties " were passed to Miss Platt, who had them prepared as skeletons. These included a Whooper Swan, a Yellow-browed Warbler, a young Arctic Skua, an Eider Duck and a Heron, in addition to commoner species.

Lastly, I should like to record our gratitude to friends on Fair Isle, in the crofts and the Lighthouses, for their never-failing courtesy to our visitors and helpfulness to ourselves. As I wrote last year, not a little of the success of our observational work is due to their active help, and their willingness at all times to allow us access to their crops.

THE MIGRATION.

Spring Migration.

The spring migration of 1950 started slowly. Late in March the most exciting bird was a Black-bellied Dipper, and a few days later a widespread migration of Chaffinches took place. The weather in early April, with arctic conditions of north wind, sleet and snow, brought birds to match, and two of the world's most northerly breeding-species, the Snow and Lapland Buntings, were our most important visitors. There was, however, only a trickle of migration until the second week in May, and then, from 6-13th, it seemed as though the flood-gates had been opened! The wintry weather gave way to warm and sunny conditions, with light easterly winds, and we enjoyed such weather as seldom comes to Fair Isle even at midsummer.

Willow-warblers were innumerable on the 7th and 8th. There was a corner of the cliffs at the south where upwards of a dozen moved nimbly about the grey-green lichen on the precipitous rocks, sitting on their tails like tiny woodpeckers as they snapped up the insects which abounded in this warm retreat. There were others on the grassy cliff-tops, a lovely picture as they moved actively about with the first blue flush of the Vernal Squill making a perfect background. Redstarts flashed fiery colour from the forbidding crags of the west cliffs and from every few yards along the dry-stone dykes. Whinchats sat on the wire fences; Pied Flycatchers sought sheltered geos where the flies had been awakened to new life; and in the Burn of Gilly an early Sedge-warbler found sustenance along the stream. Lesser Whitethroats and Robins came through in smaller numbers, and their passage persisted for several days after the Willow-warblers and Redstarts had gone by. There were quaint, delightful Wrynecks, a few handsome Ortolan Buntings whose greenish heads were most difficult to spot among the first shoots of the spring corn, and Ring Ousels and a few Fieldfares enlivened the open heath.

Following the big rush the quantity of migrants fell away, but the quality increased. Each day was an adventure, and one had the

feeling that something new and exciting was lurking round every corner, hiding in every ditch, or hopping along every wall. There was an unusual movement of Black Redstarts; a handsome male in full plumage was trapped on the 11th, and the last seen was a female, in appropriate mourning, sitting on a tombstone in the tiny kirkyard! A magnificent Dotterel arrived on the 10th and an equally handsome Great Spotted Woodpecker came next day. A late Shore Lark was found on plough-land with two female Lapland Buntings, a Red-Spotted Bluethroat was lured into a trap,—and the fact that no less than 90 species were recorded in the week gives some indication of the quality of bird-watching at Fair Isle at this time.

Late May brought a second wave of migrants, between the 19th and 25th, dominated by Whinchats, Spotted Flycatchers and hirundines. Swallows passed at the rate of fifty or more daily from the 23rd to 25th, and House-Martins were also numerous during that period, though not so plentiful as on 1st and 4th June, when there must have been quite a hundred on the isle each day. The odd Cuckoo shouted his name at the tormenting flocks of Starlings and Twites, and there were visits from a handsome drake Pintail and a Goosander, both rarities at Fair Isle.

" Delayed Passage."

An interesting feature of the spring passage was the unusual length of stay of some birds, examples of which have been included in the " Notes on Selected Species." Spring migration is often held to be an urgent movement, the birds hurrying onwards, eager to reach their breeding-grounds, and whilst this is no doubt true of many birds, there are exceptions. In " delayed passage " of this kind birds often show a decided preference for certain restricted areas where, presumably, they have discovered a congenial habitat. This was especially noticeable in the case of a Siskin, a Great Spotted Woodpecker and the two Red-Spotted Bluethroats which we trapped. One of these, released two miles from its chosen haunt, had returned by the following morning. One expects such behaviour from a breeding-bird with the strong pull of mate or nest to lure it home, but an instance of a migrant deliberately " homing " to a favoured habitat is, I believe, something novel, and surely postulates an acute topographical sense in the bird.

In the " First Annual Report, 1949," pp. 15-16, there was some discussion of the ability of certain species to adapt their feeding-habits successfully to the unusual types of habitat in this island refuge, so that they are able to make up the weight-loss which we now know is occasioned by a long overseas flight. There are two ways of accumulating evidence under this head; firstly, by observation of particular individuals (on the assumption that any bird which stays for a time does so because it has found a profitable environment), and secondly, by the recapture and re-weighing of ringed birds. Of

the two techniques, the former is the easier to conduct, but the latter is obviously the most valuable, since only the weight-records can show conclusively to what extent a bird has, or has not, been successful.

We are steadily collecting data on this problem, and an illuminating example arising out of 1950 observations is given below. I would emphasise, however, that this is a long-term study, and it may be some years before we have accumulated sufficient evidence to enable us to draw conclusions. It is especially difficult to get negative evidence bearing on this subject, for the very good reason that birds which do not find Fair Isle a happy hunting ground (such as the flycatchers) pass through quickly, and are thus not available for retrapping. Again, it is by no means easy to collect positive data of the right kind, for a number of birds are easy to trap once or twice, but very soon become wary enough to avoid recapture.

In the autumn a number of Chaffinches were caught and subsequently retrapped in seed-baited Potters at the North Haven, and most showed interesting gains during their stay. These data, whilst they derive from an artificial habitat specially provided for the birds, are nevertheless valid as showing the extent to which one class of migrant can put on weight if conditions are favourable. It is probable that equally favourable conditions exist in the stubbles, where the great majority of the finches congregate at this time. Data for two spring migrants are also included in the table :—

CHAFFINCH.—Increase in Weight.

Bird.		Initial Trapping.		Gain in gms. after *n* days.												
Ring No.	Sex.	Date.	Weight	1	2	3	4	5	6	7	8	9	10	11	12	13	14
F.0443	♂	23.iii.	20·2			2·5			3·4				3·9	6·6			
F.0460	♀	26.iii.	18·1	3·0													
L.1093	♀	13·x.	17·7		0·5						2·8		3·3	5·2	5·9		
L.1103	♂	15·x.	20·7					5·2				7·6			1·7		
L.1120	♀	13·x.	19·4														
L.1128	♂	22.x.	20·0	X	X	0·6											4·8
L.1129	♂	23.x.	20·6	1·6													
L.1130	♂	23.x.	21·0	2·0	2·7	3·4			2·1		5·9		3·9				
L.1131	♀	23.x.	19·2						1·2								5·3
L.1135	♂	24.x.	20·0					2·0		2·4				3·5			
L.1136	♂	24.x.	19·4				X	X				0·5					

X Retrapped but showing a slight loss.

The bird L.1128 had gained 7·25 g. after 22 days and 8 g. after 29 days. This is the biggest gain we have recorded but L.1103 showed the highest ultimate weight we had in this autumn, 28·3 g., and may have gone even higher, as there is a record of a male trapped at 28·85 g. in 1949. Bird L.1131 showed 6·7 g. gain after 23 days but was lower at subsequent retrappings, and had then apparently ceased to put on weight.

Autumn Migration.

The fall migration was just as busy as the spring, and in some ways even more exciting. There was a fairly steady flow of small

birds during the last fortnight of August, beginning on 19th after a day of SE. wind. One of the first visitors was the rare Aquatic Warbler—on a day of singularly appropriate weather !—and at the end of the month we had a splendid opportunity of studying another great rarity, Eversmann's Warbler, a bird whose normal migration spans the Eurasian continent from the north-west to the south-east corners, a distance of some 5,000 miles. Later, in mid-September, when a brief easterly spell broke the drear monotony of the westerly weather which had settled in earlier in the month, two eastern vagrants appeared together, a handsome Red-headed Bunting (whose home extends from Turkestan to the Altai), and a Greenish Warbler which we were fortunately able to trap. There was also a good selection of those rarities such as Scarlet Grosbeak, Red-breasted Flycatcher, Barred and Yellow-browed Warblers, which are regular autumn visitors to Fair Isle but are seldom seen elsewhere in the British Isles.

In 1949 the Blackcap was the most prominent *Sylvia* on autumn passage, but in 1950 it was the Garden Warbler's turn,—a rather remarkable fact, considering that we had only a single spring observation of the species. There were other curious anomalies, for the scarcity of Redstarts and Spotted Flycatchers in the fall was not at all what we expected, in view of their abundance in spring. The Willow-warbler was numerically the most prominent species at both seasons, and Pied Flycatcher, Whinchat and Wryneck were also well represented, particularly in the late August passage.

October continued the run of westerly gales and rain, and apart from a few unexpected visitors from the British area,—Song-thrush, Robin, Stonechat,—there was little of interest until the wind veered to NE. on 20th. The first big " rush " of winter visitors, mainly Redwings, took place next day : arrivals continued, and a few days behind them came the Blackbirds, Robins and Woodcocks. The last ten days of the active season, from the point of view of trapping and laboratory work, was the busiest period of the year, and left little time for bird-watching among the stubbles and the remaining crops. Nevertheless, a few rare and interesting species came to notice, and among them a Great Grey Shrike, Woodlark, Shore-Lark, and Bullfinch are worthy of note.

The high cost of producing a report precludes a detailed account of the spring and autumn migrations, and in the following list we have had to be selective. These " Notes on Selected Species," therefore, deal only with such birds as are interesting because of their rarity in Britain, or which have a bearing on special problems we are studying at Fair Isle. In order that students may have access to the Fair Isle records, a full MSS. account of the year's observations has been prepared, and copies are available on loan at the Trust Headquarters, 17 India Street, Edinburgh, and at the library of the Edward Grey Institute of Field Ornithology, 91 Banbury Road, Oxford.

NOTES ON SELECTED SPECIES.

Rosy Pastor, *Pastor roseus* L.

An immature bird was in the neighbourhood of the Bird Observatory from 22-30th August (9 days). See *British Birds*, 44, p. 118.

Golden Oriole, *Oriolus oriolus* L.

One was seen on 22-23rd May,—the fourth spring record for Fair Isle and first since May 1913.

Siskin, *Carduelis spinus* (L.).

A female remained in and about the tiny burial-ground at the south of the isle, feeding in a patch of seeding dandelions, from 12-23rd May (12 days). A female Linnet, *Carduelis cannabina* (L.), was at the same place, apparently for the same purpose, from 18-23rd May (6 days). Our only spring Siskin in 1949, a male, haunted the Gully for 8 days from 1st May.

Two of three females were trapped in the Gully on 26th September, and an adult male was caught in Vaadal on 14th October. These dates coincide with the arrival of the only autumn Siskins recorded on the Isle of May, and it is noteworthy that just prior to the September arrival there had been a conspicuous movement of this species at Utsira, south Norway.

Bullfinch, *Pyrrhula pyrrhula* (L.).

Bullfinches were reported on 7th and 9th April, and in autumn James A. Stout saw a male of the northern race, *P. p. pyrrhula* (L.). on Ward Hill on 26th October. Pat Robertson trapped a female of this race in the Gully on 4th November (wing 92 mm., bill 12 mm., tarsus 20 mm., weight 27 g.).

Scarlet Grosbeak, *Carpodacus erythrinus* (Pallas).

Two arrived on 31st August and one of these, a 1st-winter bird, was trapped on 2nd September. There was another on 21st September.

Red-headed Bunting, *Emberiza bruniceps* Brandt.

An adult male, first recognised on 19th September, stayed until 22nd: a detailed note on its plumage and field-characters was obtained and is published in *British Birds*, 44, pp. 118-9

Previously, G. Theo Kay had shown me a live male of this species which had been caught in a baited bird-cage in a Lerwick (Shetland) garden on 6th June. This specimen had a much-battered tail, which, taken with the curious circumstances attending its capture (for it entered the cage several times before being finally caught), made us suspect that it was an "escape," perhaps from a passing vessel.

However, there can be no certainty of this, and it later transpired that the tail had been damaged when the bird was caught. The status of this example, which subsequently died,—and the skin of which is now in the collection of Sam Bruce of Lerwick,—must be regarded as uncertain, but the appearance of an apparently wild and rather shy bird of the same species at Fair Isle suggests that the Lerwick example may have reached Shetland unaided. The coincidence of the double occurrence is the more remarkable when one considers that the only previous British-taken example of this east Siberian species was at North Ronaldshay, Orkney, on 19th June 1931 (*British Birds*, 25, p. 66).

Ortolan Bunting, *Emberiza hortulana* L.

One, or perhaps two males, were in the sprouting corn from 8-12th May. Another was seen on 18th, and there was also a female on 12th. There was a young bird on corn-stooks at the Haa on 29th August and one was seen on 12th September.

Little Bunting, *Emberiza pusilla* Pallas.

A male was observed on 18-19th May. There are previous spring records for 1907-09 and 1936.

Lapland Bunting, *Calcarius lapponicus* (L.).

W. Eagle Clarke (" Studies in Bird Migration," 2, p. 117, 1912) recorded five birds between 25th March and 2nd May. There does not appear to have been a spring movement of any dimension since, until 1950. Adult males were recorded on 5th April, daily between 18-29th (once three birds), and again on 5th and 18th May. One of these haunted a manure-heap at one of the crofts from 18-22nd April: the later birds were seen on newly-sown fields. There were two females in company with a Shore-lark on 12-13th May, one on 17th and two next day. Their unusual strength may not be unconnected with the fact that the previous autumn migration was the best for many years (" First Annual Report, 1949," p. 10).

In autumn a single bird was heard on the Byerwil moor from 1st September. There were six on Vaasetter on 11th, a few on most days during the rest of the month, and five on 26th. Three stayed in the stubbles for some days following 20th October. The bill-colour, a deep vinous in all autumn examples (see *British Birds*, 43, p. 48), is subject to seasonal change, being yellow in the spring birds with a little black at the tip of the upper mandible.

Woodlark, *Lullula arborea* (L.).

A very confiding bird spent the three days, 29-31st October on the moor at Duttfield, and on the last morning was self-caught in the Gully Trap.

Shore Lark, *Eremophila alpestris* (L.).

A male on newly-sown land on 13th May was the latest by a week of the four spring records for Fair Isle. A bird was seen at Duttfield on 27th October.

Great Grey Shrike, *Lanius excubitor* L.

A fine bird with single speculum was at Vaadal and later in the Gully on 26th October.

Waxwing, *Bombycilla garrulus* (L.).

Five were seen on Ward Hill 10th November 1949, and there were six (perhaps the same flock) on 12th. James A. Stout reported a flock of 20 or so at the same period. Pat Robertson also saw birds later in the month, two on 21st and two on 25th.

It is interesting to note that this Waxwing "invasion" was experienced in the Faeroe Islands, 200 miles to the NW. Niels Peterson á Botni received specimens from several islands in the archipelago, and had birds at Nolsoy from 7-12th November. The peak of the invasion seems to have been 10-11th as at Fair Isle, extreme dates being 1st and 21st.

Red-breasted Flycatcher, *Muscicapa parva* Bechstein.

There was a bird in the South Harbour area, feeding on flies along the shore, on 25th-26th August. 1st-winter males were trapped on 21st September and 13th October.

Chiffchaff, *Phylloscopus collybita* (L.).

A Chiffchaff, in plumage similar to the Siberian race *Ph. c. tristis* Blyth, was watched on the Duttfield cliff on 23rd October. It had a very greyish-brown mantle which showed a sharp contrast with the warmer brown head in the strong sunlight, a whitish superciliary stripe and eye-ring, blackish legs, and no yellow beneath.

Greenish Warbler, *Phylloscopus trochiloides* Sundevall.

An account of the field-characters of a 1st-winter Greenish Warbler captured in the Yeoman Net on 19th September is given in *British Birds*, 44, pp. 120-1.

This is the second record of the species at Fair Isle and the fifth in Britain. For observations on the bird of 2nd June 1949, and on Sam Bruce's Whalsay specimen, see *The Scottish Naturalist*, 62, pp. 18-20; also "First Annual Report, 1949," p. 13 and plate 13. There have been four records of this bird, which belonged to the race *Ph. t. viridanus* Blyth, in Britain since 1945, a fact which suggests that the westwards extension of its range noted by C. B. Ticehurst ("The Genus Phylloscopus," p. 138, 1936) is still proceeding. As with the spring bird of 1949, racial determination is based on the

position of the tip of the 2nd primary (between 7th and 8th) combined with the possession of a single wing-bar.

Eversmann's Warbler, *Phylloscopus borealis* (Blasius).

Two birds were together in the walled cabbage-garden at Upper Leogh on 30th August: a full description of their field-characters, plumage and habits is given in *British Birds*, 44, pp. 121-2. This is the eighth record for the species at Fair Isle. Judging from the faded remiges and worn wing-bars, both birds were adults.

Yellow-browed Warbler, *Phylloscopus inornatus* (Blyth).

The first was trapped in the Yeoman Net at Quoy on 21st September. There were three on the island on 24th, one being trapped in the Gully, where it remained until 1st October (8 days). One found at Upper Leogh on 26th was still there on 1st October (6 days), and an additional bird was seen on 6th October. An observation on the call note is given in *British Birds*, 44, p. 122.

Grasshopper Warbler, *Locustella naevia* (Boddaert).

One, haunting a ditch near the Chapel, was reported by James A. Stout on 2nd May, and it was our first capture in the portable Yeoman Trap (plate). It was the eighth record for Fair Isle, the third on spring migration.

A 1st-winter bird, judging by the strong yellowish tinge beneath, was in the Burn of Gilly on 1st September; and on 19th the Yeoman Net was again in action capturing an adult in a turnip rigg at the Auld Haa.

Reed Warbler, *Acrocephalus scirpaceus* (Hermann).

An adult was captured in the Yeoman Net in the Burn of Gilly, where it had been found the previous day, on 19th September. This bird, and the three recorded in 1949 (*British Birds*, 43, p. 51) are the only autumn records since 1908-09. It may be becoming more regular, as it has established itself as a breeding-bird in Norway in recent years.

Marsh Warbler, *Acrocephalus palustris* (Bechstein).

T. Yeoman trapped one in the Gully on 10-11th June, the fourth spring record for Fair Isle and Scotland, the last being in 1929. Previous dated occurrences were at the same period, 7-8th June, 1913-14. In autumn the third bird at this season for Fair Isle and Scotland was captured on 21st September.

The notch on the 2nd primary fell between the tips of 7th and 8th primaries in the first bird, and just short of the 7th in the later example. This bird was compared with skins of Reed and Marsh Warblers and was well-matched by a November specimen of *A.*

palustris from British East Africa. The spring bird had the front of the tarsus reddish-brown rather than brownish-flesh, which is the colour given in "The Handbook of British Birds," 2, p. 52, and with which the autumn example agreed.

Aquatic Warbler, *Acrocephalus paludicola* (Vieillot).

One was found haunting long grass beside a rainwater pool on the evening of 20th August, the fourth Scottish record and third at Fair Isle. It is described in *British Birds*, 44, p. 122.

Barred Warbler, *Sylvia nisoria* (Bechstein).

The first was seen on 23rd August, when it flew out of the skua-watching hide on the Byerwil moor. The next evening a bird appeared at the North Haven, and remained on the shore and about the Bird Observatory, haunting the patches of seeding thistles, until 31st (8 days). Another was seen from 25-27th in the crops. Single birds were also seen on 3rd and 21st September, and 1st October. All were 1st-winter examples.

The North Haven bird, when examined in the laboratory, was found to have only ten rectrices instead of the usual twelve. This bird was caught by the Yeoman technique and was subsequently retrapped three times, showing a slight but steady gain from 21·7 g. on 23rd to 22·15 g. on 27th and 23·5 g. on the afternoon of the 30th.

Song Thrush, *Turdus ericetorum* Turton.

A bird trapped early on 3rd October, after a NW. gale, was compared with skins of British, Continental and Hebridean Song-thrushes and most nearly matched *T. m. hebridensis* Clarke in mantle plumage, but was more like the British race below. Its weight, 77·2 g., was abnormally high for an overseas migrant arriving under these conditions, and there can be little doubt that it originated in Scotland. All others trapped during the season were *T. e. philomelus* Brehm, the Continental race.

Stonechat, *Saxicola torquata* (L.).

Ian Walker, of the South Lighthouse, when on Ward Hill on 30th September, saw a Stonechat which he described as very reddish beneath. What was almost certainly the same bird was trapped at the Haa next day. It was a female, and comparison with skins available in the laboratory showed that it was quite distinct from the Continental race, *S. t. rubicola* (L.), and had darker brown fringes to the mantle feathers and more richly reddish underparts than comparable British material, *S. t. hibernans* Hartert, from Yorkshire localities. No skins of the Hebridean race *S. t. theresae* Meinertzhagen, were available, but there can be little doubt that the bird's affinities were with this form.

Black Redstart, *Phoenicurus ochrurus* (L.).

A survey of past records indicates that there has been no previous spring passage comparable with that of 1950. This was initiated by a female on 4th May, and continued with an immature male and female on 7-8th and different birds on 9th, 10th and 12th. The bird of the 10th, trapped at the Haa, was a handsome male in full breeding plumage. With the later wave of migration was an immature male, 20-22nd May. The only autumn bird, a female, was " flycatching " near the Gully on 31st October.

Bluethroat, *Luscinia svecica* (L.).

A 1st-summer male Red-spotted Bluethroat, caught in the Yeoman Trap on 11th May, stayed near the Bird Observatory until 18th (8 days), frequenting the low cliffs, dry ditches and a nearby rubbish-tip at South Haven. An adult male taken on the Hestigeo Burn on 24th May stayed until 27th (4 days). Others were seen on 14th and 18th May. A 1st-winter male was caught in the Ward Hill trap on 21st September.

The adult male was caught in the late evening by the method shown in photo (p. 18), and was removed two miles, in a bag, to the Bird Observatory for examination. It was released there after dusk had fallen. By 1030 hrs. next morning it had returned to the Hestigeo Burn, where it remained during the next three days. This " homing " phenomenon in a migrant bird suggests that a congenial haunt, once discovered, is not lightly relinquished, and exerts a powerful influence on the bird.

Robin, *Erithacus rubecula* (L.).

A British Robin, *E. r. melophilus* Hartert, was trapped on 17th April, its identity being established by comparison with spring specimens in the collection kept in the laboratory. This was the first time that the race had been recorded at Fair Isle. All other trapped birds, spring and autumn, were *E. r. rubecula* (L.), with one exception. This was the first of the autumn captures, on 6th October, after a strong SW. wind. No fresh autumn material was available for comparison, but the strongly reddish breast (very striking in the field) and greenish-olive mantle suggested closer affinity with the British than the Continental form.

Dipper, *Cinclus cinclus* (L.).

Pat Robertson had very close views of a Black-bellied Dipper, *C. c. cinclus* (L.), showing no reddish-brown on the underparts, in the Gully on 19-20th March. The wind had backed from a SW.

gale through SE. to NE. at force 5 on 18-19th. This is the second record for Fair Isle and apparently the fourth only for Scotland (all from Shetland).

Great Spotted Woodpecker, *Dendrocopus major* (L.).

The last bird of the autumn 1949 invasion (*see* " First Annual Report, 1949," pp. 11, 15) remained until 4th January.

An adult male stayed on the island from 11-30th May (20 days), spending nearly the whole time in a restricted area of pasture north of Hyukni Geo, and feeding almost exclusively on the ground, but taking to the fencing-posts if alarmed. The only previous spring record for Fair Isle is for 6-11th May 1936. In both cases there had been an " invasion " of birds of the northern race, *D. m. major* (L.), in the previous autumn.

Wryneck, *Jynx torquilla* L.

The Wryneck was a conspicuous member of the early wave of spring passage, and a number of examples also passed through in late August. One, presumed to have been the same bird, was noted daily among rocky outcrops in a certain field from 26-29th May, and was seen at a little distance from this site on 30th (6 days). The interest of this observation is that the Wryneck is thought to be one of the species that are unable to adapt themselves successfully to the limited range of habitats available at Fair Isle, where, as Eagle Clarke pointed out (*Annals Scot. Nat. Hist.*, 1906, p. 20), they sometimes suffer considerable mortality.

Gadwall, *Anas strepera* L.

A pair was present on the island on 3-4th May and the drake remained during the next two days, feeding mostly along the wet ditches below Vaasetter. This is the fourth record for Fair Isle, the third for the spring migration.

Goosander, *Mergus merganser* L.

A fine drake, swimming off the South Harbour on 11-12th April, was found dead, and the skin preserved, on the 13th. A drake in what appeared to be eclipse plumage (showing white, not ash-grey, wing-coverts) was in the North Haven from 6-10th June. The species is comparatively rare in Shetland waters.

Dotterel, *Charadrius morinellus* L.

A handsome bird was present on heath in the village area on 10-11th May. This is the first spring record, and the third only for the species at Fair Isle.

Iceland Gull, *Larus glaucoides* Meyer.

Up to three are said to have been present throughout February and March, and two in 1st-winter plumage visited the South Haven daily until they departed, one on 24th April, the other as late as 31st May. A note on these birds has been submitted to *The Scottish Naturalist.*

TRAPPING AND BIRD-RINGING.

We ringed a total of 2,390 birds of 78 different species: this figure includes 23 birds of 5 species not obtained at Fair Isle, which I ringed when on a short holiday in Unst. For Fair Isle we have, therefore, 2,367 birds of 73 species, representing an increase of 862 birds and 10 species over 1949. The individual totals, for Fair Isle only, are shown in the summary on pp. 19-20.

Four traps were working throughout the year and the total captures, including " retraps," were: Gully, 837 birds; Observatory, 660 birds; Haa, 201 birds; and Dyke, 129 birds. The Dyke Trap showed a 60 per cent. increase in efficiency on last year, a fact which must be attributed to structural modifications made at the end of last season. The Gully Trap, also extended and improved in 1949, showed an increased catch of some 300 birds.

Three new traps were made and one, below the Ward Hill, was temporarily rebuilt. One of these was a small affair on the North Haven shore. It was in operation only during the period when juvenile Wheatears and other small birds were much in evidence on the beach, and caught 71 birds in 5 weeks. It ceased to be profitable after the local Wheatear exodus in late August.

A new trap at the Mills was built in June to close off the outlet from the Gully above the waterfall. Although its catch fell short of expectations the very existence of a trap here deflects birds from this outlet and turns them into the Gully Trap immediately to the east.

Another new trap was made in Vaadal by spanning this small natural gully, which carries the upper reach of the Gilsetter Burn, with 30 ft. lengths of hot-water piping (jettisoned during the reconditioning of the North Haven camp) supporting a wire-netting roof. A small wooden funnel was built at the far end, and, thanks largely to the willing help of a number of visitors, we now have what I am sure will prove to be a most effective trap, achieved at little cost. Vaadal Trap was in operation only six weeks, during much of which migration was at a standstill owing to rough westerly weather, and its catch of 55 birds included 3 Snipe, 2 Water Rails, a Merlin and a number of Redwings and Blackbirds.

As a result of the winter gales, the funnel section of the trap at the foot of Ward Hill was the only part left standing when the

Observatory re-opened. Such reconstruction as was undertaken was of a purely temporary nature, for, as we anticipated, the trap was again rendered useless by severe gales in September. Its captures during the year included a Cuckoo, an Owl, a Bluethroat, and other interesting species.

Two new traps are contemplated for 1951. The first of these is a " double-dyke " at the corner of two stone walls which meet at right-angles at Duttfield. This is a great place for Wheatears coming down off the Eas Brecks moor and for Twites when the post-nuptial flocking begins; and the fact that it is situated on the direct route to and from the Gully trapping-area will ensure maximum operation. An anonymous Friend has sent a most welcome contribution towards the cost of this trap.

The other will be similar to the one at Vaadal; we propose to use derelict hot-water pipes to support a roof over the head of a short but steep gully on the south side of Funniequoy shore. This is a popular resting-place of flocks of newly-arrived Redwings and Blackbirds in October, and attracts a varied assortment of migrants—including Water Rails—during the season.

We hope to raise our total of Wheatears and Redwings considerably by means of these new traps. These are the species which promise to be most profitable for a study of individual and racial variation, provided the numbers examined are large enough to permit of statistical analysis of the data obtained. Other techniques which brought useful returns in 1950 were as follows :—

Potter Traps.—These accounted for 282 birds, mainly Starlings. Baited with corn in spring they caught a number of Skylarks, and in October we got interesting data on weight-increase in Chaffinches by baiting the traps with turnip seed (p. 7).

Fleyg.—Dr J. A. R. Miles used this Faeroese bird-fowling net to good advantage when acquiring adult Fulmars for serological tests. It was also used to catch Knot and Sanderling by torchlight on the North Haven shore one misty night.

Clap-net.—One was worked from a hide at the skuas' bathing-pool on Byerwil during the late summer, 12 adult Arctic Skuas and one Great Skua being caught and colour-ringed.

Yeoman Net.—The excellent net made for us by T. Yeoman last winter makes an extremely mobile trap for use over the island's ditches in spring, and in the root-crops in autumn (photo p. 18). " Flying squads " of observers rushed it into position, with marked success, at odd times during the season, and its captures include two Bluethroats, a Robin, two Grasshopper Warblers, one each of Reed, Sedge and Yellow-browed Warblers, and the fifth Greenish Warbler for Britain. The same technique, but with a different net, was used in trapping a Barred Warbler on the North Haven shore.

Lighthouse.—Three good " Lighthouse nights " in late August,

THE "YEOMAN" NET

when the local Wheatears were moving out, resulted in the capture of 70 birds, mostly Wheatears, but also a few Pied Flycatchers, one of which had been ringed on the island the previous day.

Nine birds of prey were captured when themselves driving small birds into the traps,—5 Merlins, 3 Sparrowhawks and a Kestrel.

Recoveries.—A few interesting recoveries were reported during the year. A Starling taken in a Potter Trap on 24th October 1948, was found dead at Tromsö in north Norway, on 20th March 1950. A male Blackbird, which passed through Fair Isle at the end of October 1949, was recovered in June at Haarby, Fyen, in Denmark. A Skylark, taken in a corn-baited Potter in March was caught—and released—by a keeper at the Bell Rock Lighthouse, Angus, on the night of 10-11th October.

Two Meadow Pipits were reported from abroad: one, a migrant ringed on 1st October 1949, was at Wilskerke, near Ostende, Belgium, on 30th December 1950; and the other, taken in the Dyke Trap on 9th September, was killed by a boy near Bilbao, north Spain, on 8th October. A young Arctic Skua ringed in July 1949 was found dead in November at La Panne, West Flanders.

SUMMARY OF BIRD-RINGING.

SPECIES	1949	1950			GRAND TOTAL
		TRAPPED	NESTLINGS	TOTAL	
1. Starling	195	341	63	404	687
2. Siskin	—	3	—	3	3
3. Twite	111	190	—	190	311
4. Redpoll	—	—	—	—	2
5. Scarlet Grosbeak	—	1	—	1	1
6. Chaffinch	15	56	—	56	76
7. Brambling	3	—	—	—	4
8. Yellow-Hammer	1	—	—	—	1
9. Reed Bunting	4	—	—	—	4
10. Lapland Bunting	1	—	—	—	1
11. Snow Bunting	—	6	—	6	10
12. House Sparrow	162	118	—	118	284
13. Skylark	12	30	14	44	57
14. Tree Pipit	9	4	—	4	13
15. Meadow Pipit	117	112	12	124	253
16. Rock Pipit	134	155	15	170	310
17. Grey Wagtail	—	1	2	3	3
18. White Wagtail	27	13	—	13	41
19. Great Grey Shrike	—	—	—	—	1
20. Red-Backed Shrike	—	1	—	1	3
21. Spotted Flycatcher	5	1	—	1	7
22. Pied Flycatcher	10	34	—	34	44
23. Red-Breasted Flycatcher	2	2	—	2	4
24. Goldcrest	28	1	—	1	33
25. Chiffchaff	1	—	—	—	1
26. Willow-Warbler	6	53	—	53	59
27. Greenish Warbler	1	1	—	1	2
28. Yellow-Browed Warbler	—	2	—	2	2
29. Grasshopper Warbler	—	2	—	2	2
30. Reed Warbler	1	1	—	1	2
31. Marsh Warbler	—	2	—	2	2
32. Sedge Warbler	10	3	—	3	13
33. Barred Warbler	—	1	—	1	2
34. Garden Warbler	5	46	—	46	53
35. Blackcap	17	14	—	14	32
36. Common Whitethroat	5	5	—	5	10
37. Lesser Whitethroat	5	11	—	11	17
38. Fieldfare	5	2	—	2	7
39. Song Thrush	11	7	—	7	23
40. Redwing	55	93	—	93	163
41. Blackbird	135	313	4	317	477
42. Wheatear	177	280	40	320	536
43. Whinchat	2	14	—	14	17
44. Stonechat	—	1	—	1	1
45. Common Redstart	7	15	—	15	25
46. Black Redstart	1	2	—	2	4
47. Nightingale	1	—	—	—	1
48. Bluethroat	1	3	—	3	4
49. Robin	21	56	—	56	86
50. Hedge-Sparrow	3	—	—	—	3
51. Wren	23	34	—	34	69
52. Swallow	2	1	—	1	3
53. Cuckoo	—	1	—	1	1
54. Wryneck	—	1	—	1	1

PRICES	1949	1950			Grand Total
		Trapped	Nestlings	Total	
55. Long-eared Owl	—	1	—	1	2
56. Merlin	1	5	—	5	7
57. Kestrel	—	1	—	1	1
58. Sparrow-Hawk	2	3	—	3	5
59. Teal	—	1	—	1	1
60. Eider	—	3	—	3	3
61. Heron	—	2	—	2	2
62. Shag	19	3	11	14	33
63. Gannet	1	—	—	—	1
64. Storm Petrel	1	—	—	—	2
65. Fulmar	26	9	4	13	40
66. Snipe	—	3	—	3	3
67. Woodcock	2	3	—	3	7
68. Knot	2	1	—	1	3
69. Sanderling	1	1	—	1	2
70. Dunlin	1	—	—	—	1
71. Common Sandpiper	1	—	—	—	1
72. Lapwing	—	—	3	3	3
73. Oyster-Catcher	21	—	9	9	45
74. Herring-Gull	16	20	6	26	42
75. Lesser Blackback	10	—	7	7	17
76. Greater Blackback	1	1	1	2	3
77. Kittiwake	2	—	—	—	2
78. Great Skua	4	1	8	9	17
79. Arctic Skua	12	12	24	36	52
80. Guillemot	—	3	—	3	3
81. Razorbill	—	4	—	4	4
82. Black Guillemot	—	7	1	8	8
83. Puffin	39	7	—	7	46
84. Little Auk	—	1	—	1	1
85. Corncrake	1	1	—	1	2
86. Spotted Crake	1	—	—	—	1
87. Water Rail	9	15	—	15	25
88. Moorhen	1	2	—	2	4
Totals	1,505	2,143	224	2,367	4,160

REPORT ON BIRD ECTOPARASITES.

Contributed by R. EDWARDS, B.Sc.

During the 1950 season 92 flatflies, *Ornithomyia fringillina* Curtis (=*lagopodis* Sharp), were collected at Fair Isle Bird Observatory. They were taken from 10 different host-species, the first on 6th June from a Garden Warbler, the last on 21st October from a Merlin. The first flatfly seen escaped from a Red-spotted Bluethroat on 24th May. The Wheatear was the species most abundantly infested (see p. 40) followed by Rock and Meadow Pipits. No conclusions as to host preference, degree of infestation, etc., can be drawn until a standard procedure of bird examination is employed. The Director is hoping to evolve such a procedure and put it into effect next season.

Many of the flatflies were themselves parasitized by mites of the genus *Microlichus* (*see* "First Annual Report, 1949," p. 23). Undoubtedly the most interesting specimens were three flies taken from Starlings, which were found to have bird-lice (*Mallophaga*) attached to their abdomens, in addition to being infested with mites. The most heavily affected fly had 4 lice and no fewer than 100 mites clustered together on its abdomen. This unusual association of fly and lice is thought to be an example of the phenomenon of phoresy, the exploitation of one animal by another as a vehicle of transportation.

Of the 92 flies forwarded, 18 from known hosts were found to be infested with mites, as follows:—

Wheatear, *Oenanthe oenanthe* (L.). Seven out of 28 flies affected with mites.

Rock Pipit, *Anthus spinoletta* (L.). Five out of 10 flies affected with mites.

House Sparrow, *Passer domesticus* (L.). Four birds had flies, and one of these was infested with mites.

Starling, *Sturnus vulgaris* L. Six birds were infested with flies; five flies were associated with *Microlichus*, and, in addition, three of these flies had lice (*Mallophaga*) attached to the abdomen.

Some of these mites were *Microlichus uncus* Vitz., attached to the flies' wings and surrounded by masses of eggs (plate 00); others were *M. avus* Tr., attached to the abdomen. The latter is normally a skin parasite of birds, and its association with *Ornithomyia* may be another instance of phoresy.

My investigation into the habits of these mites continues, and I hope to be able to give a further report at the end of next season.

THE BREEDING BIRDS.

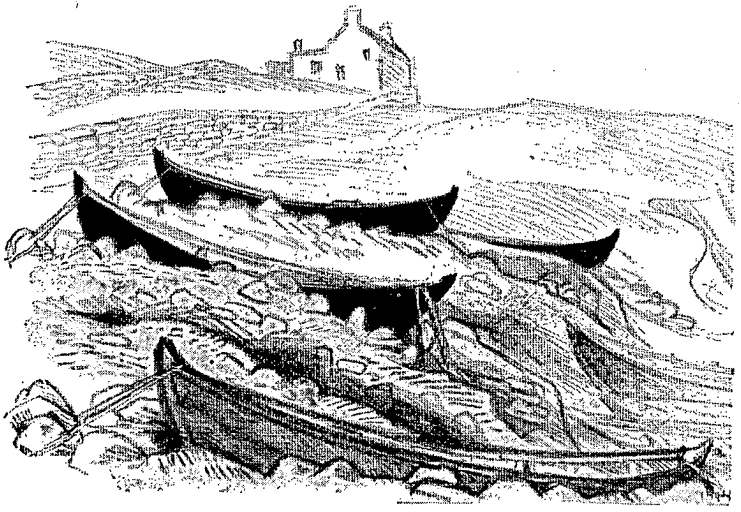
The Arctic Skua, *Stercorarius parasiticus* (L.).

During the twelve weeks of the summer, between the two migration periods, the Observatory's activities are focussed on the breeding-birds. At Fair Isle we are fortunate in having one species, the Arctic Skua, whose breeding-biology and behaviour present interesting problems which make it an eminently suitable subject for long-term research. The adjective " long-term " must be emphasised,—for what we are aiming to do is not so much to study a bird-species in the general sense, as to record over a period the history, economy and vicissitudes of a community of known individuals within a species.

There are a number of reasons why the Arctic Skuas have been selected for special attention. One is that the species is polymorphic, there being two broad extremes of plumage-type, irrespective of age and sex. There is a type which is almost entirely dark brown, the so-called " dark phase " bird; and there is also a type that has the underparts, cheeks and nuchal band white, the so-called " pale phase." Between these two extremes are many individuals which, although they appear to be " dark phase " in the field, reveal themselves as intermediates when critically examined in the hand. They are more slatey-brown than the darkest individuals, have a good deal of white on the belly-feathers, though this is concealed by brownish tips, and an ill-defined pale collar and cheeks. These intermediates, which are in the majority at Fair Isle and in Shetland generally, have always been reckoned as " dark phase " in previous studies of this species, as this is the only practical course to adopt when there is no recourse to minute examination of individual plumages.

The genetics of the situation are not fully understood. H. N. Southern, who discussed the problem in much detail in *Ibis* (1943) 83; pp. 443-85, suggested that the dark phase may be a mutant which has spread throughout the population northwards and along the continental edges from an oceanic dispersal area, since the available records show clearly that dark birds become progressively scarcer as one goes northwards and eastwards towards Arctic Siberia, or, in the other hemisphere, westwards across Arctic Canada. Whilst some of the evidence suggests unifactorial control, other observations—particularly those of Selous and others on the rather wide intergradation to be found between the extreme types—do not seem to support it, and, as Southern points out, more quantitative observations on this kind of variation are required before the genetical control can be properly understood.

At Fair Isle we have an opportunity to collect quantitative data, bearing on this aspect of the problem, by colour-marking birds so that they are individually recognisable, and at the same time keeping a record of their morphological characters from year to year. In the 1950 season all the young birds reared on the island were colour-ringed according to a code which will identify them with their parentage



FISHING BOATS AT SOUTH HARBOUR — *Roland Svensson.*

and year of birth, should they return to the island in future years. There are good grounds for hoping that some of them, at any rate, will do this. Each summer there are a number of non-breeders (some in immature plumage) about the island, and among these birds in 1950 we recognised one of the youngsters of the previous year.

In addition to colour-ringing each season's young, we have now devised a technique of trapping and colour-ringing the adults,— breeders and non-breeders alike. We have found that it is possible to catch them in a clap-net set at the edge of their favourite bathing-pool at Byerwil, and worked from a " hide " thirty yards away. So far a dozen birds have been caught, but the net was only in operation during August, and in a full season the method ought to be very productive. It should afford opportunities for closely examining this question of intermediacy, and also, possibly, for determining the plumage sequence of some of the young as they develop towards maturity. This sequence is important. Collet, the Norwegian ornithologist, believed that the young in their first plumage could be assigned to one or other of the extreme phases, and although we have observed that a mixed mating will sometimes produce a juvenile that is white-bellied, except for narrow brown fringes to the feathers, nothing is known as yet about the changes which occur at subsequent moults.

According to Eagle Clark, the Arctic Skua was not uncommon at Fair Isle at the end of last century, but was apparently reduced to one pair in 1905 and ceased to breed afterwards. Recolonisation

took place with 4 pairs in 1926, and in 1935 (and again in 1944) 12 pairs were recorded. There were about 15 pairs in 1948 and the nests or young of 20 pairs were found in 1949. So far as could be ascertained from an exhaustive search there were no survivors of the young hatched in 1948, owing probably to the cold, wet conditions at and immediately after the hatching period, but in the following season the birds did better and 13 youngsters are known to have left the island, most of them bearing our colour-rings.

The colony increased to 22 pairs in the present season. Three new sites were taken up, but in each case the newcomers were unsuccessful. One site on the outskirts of the colony, first established in 1949, was not re-occupied in 1950, although a pair was present there during May. With a single exception the 19 well-established pairs reared one or two young each, and 23 of the 25 fledglings survived to leave the island.

The unsuccessful pair was a mixed mating, which nested rather late on their usual site above the Brae of Restingsgeo, hatching two chicks during the first week of July. One chick died soon after hatching, and the other was still "grounded" after 40 days. An examination revealed that it had sustained an injury to the right wing (perhaps caused by a sheep) which would prevent it ever taking flight. This was a serious blow to our hopes, for the youngster showed more pronounced pale phase characteristics than any we had seen, the underparts being completely white except for narrow brown terminal bars, and the upper parts strongly barred with buffish-brown, with the head and neck entirely light brown. In the hope that it might be possible to follow up the plumage sequence in captivity, the bird was sent off in *The Good Shepherd* on 16th August, and went south by air to Turnhouse the same day, arriving that evening at the Royal Scottish Zoological Park. Unfortunately, it survived only a short time, and was then sent to the Royal Scottish Museum, where its skeleton is preserved.

Two of the new pairs were mixed matings, a fact which led to an increase in the percentage of pale phase birds in the breeding stock in 1950 as compared with the previous year. We estimated 15 per cent. pale phase birds in 1948; there were 10 per cent. in 1949, and 13·4 per cent. in 1950. Both pairs laid single eggs only—the normal clutch is two—at stations well outside the main colony; in one case the chick died a few hours after hatching, and in the other some predator removed the egg, which was a small and rather misshapen one, suggesting a first laying. The third new pair, a dark mating, also lost their clutch of two eggs to a predator, and did not lay again.

The Homisdale Hillside pair lost their first clutch of two beautiful pale greenish-olive eggs at the end of May, and had replaced them with two considerably darker eggs on the same site by 9th June. One egg sustained damage in the nest, and the other produced a

chick which turned out to be the darkest juvenile we have yet seen, the entire plumage being blackish-brown unrelieved by any of the usual paler bars. A casual observer would not have believed it possible that this—one is tempted to say, melanic—youngster, and the remarkably pale youngster above the Brae of Restingsgeo, could have belonged to the same species. This was the last of the season's young to fly, on 6th August.

The five Eas Brecks pairs, nesting at their usual sites round the fringe of a Great Skua territory, again showed a marked tendency to " migrate " outwards from their arch-enemy's ground as soon as their chicks were hatched. The North pair, a mixed mating, took their chicks a distance of over 200 yards, across a road, to a neighbouring moorland which had been the fledging-ground of their one youngster in 1949. In that year this pair had the bad luck to lose their offspring, a pale-bellied bird, three weeks after fledging; and again in 1950 they lost one of their young at the same age,—we suspect through the agency of a Bonxie. This was the darker of the two young. The junior chick, which survived, exhibited pale phase characteristics, having white underparts masked by rufous tips and fringes. These two youngsters, hatched 12 hours apart, remained very close in development, and took their first flights on 5th July.

In contrast, the two chicks of the Vatstrass pair fledged ten days apart, and the period might well have been longer had we not interfered. The younger chick's backwardness seemed to be due to a slight leg injury which caused it to walk with a limp, but the nature of the injury could not be ascertained from a superficial examination. The average fledging period is about 32-34 days, so when this chick had been on the ground for 39 days we decided to give it " flying lessons." These consisted merely of tossing it into the wind a few times a day from a hillside overlooking the nesting-ground ! On the fortieth day the youngster once got under way itself, and the next day was flying as to the manner born.

In 1949 the Burn of Furse North pair, of which the female is of the extreme dark type, but has white eye-spots and patches on the chin, belly and lesser wing-coverts, hatched two chicks. One, which soon died, was normal, and the other, which survived, had exactly the same distribution of white markings as the female parent in both the down and juvenile plumages. In 1950 they again hatched two young, one normal and one with the albinistic marks, but unfortunately only the former was reared. One of the Brae of Restingsgeo females is so like this Burn of Furse individual, lacking only the spots beneath the eyes, that we cannot avoid feeling they must be related ! There was a downy chick with white belly-patch, chin and wing-stumps on the Brae in 1948, and although a normal dark youngster flew from the site in 1949, in the present season a partial albino chick with the same characteristics as the female parent was safely reared from the single egg.

The remaining mixed matings, which nest annually one on each side of the island's derelict airstrip, successfully reared one of their two youngsters, but neither of these birds held out much promise of developing into white-bellied adults. A very dark chick was reared by dark parents on the north-west side of the Eas Brecks moorland, and a similar mating on the moor above the Brae of Restingsgeo fledged two dark-plumaged young. One of these, during an examination when about three weeks old, disgorged a complete Wheatear,—complete, that is, except for the contour feathers, which had been plucked. A sheep trod on the nest of the Vaasetter pair, despite the valiant attempts of the adults to drive it away, on the day the eggs were hatching; and, although one chick was killed outright, the other lived to fly in the record time of 29 days. It was interesting to note that a parent of this bird, when on guard, usually stood on top of a drystone dyke in lieu of the usual mound,—the only occasions on which we have seen a skua perching off the ground.

On two occasions flat-flies, *Ornithomyia fringillina*, were collected from young Arctic Skuas, and a third was seen but not captured. The occurrence of these ectoparasites on the skuas may be accidental, the flies transferring from smaller birds taken as prey. It is also possible that a number of *Ornithomyia* are free-flying at this time, their peak-period of abundance, in search of hosts. The only other parasites collected were biting-lice, *Saemundssonia cephalus*, which last year were taken from the heads of day-old nestlings. The melanic Homisdale Hillside youngster, at one visit in the third week, was found to have a mass of blow-fly eggs on his mantle feathers,—testimony, perhaps, of the inactivity of skua chicks, which lie motionless for long periods in a "couch" among the clumps of juniper and heather.

It was not until the young were on the wing that consideration was given to trapping the adult birds at the Byerwil bathing-pool, and although the primary reason for this has been given, the colour-ringing of adults also seemed an essential preparation for the study of the skuas' social behaviour which we contemplate undertaking in future seasons. Social meeting, pursuit-flights and "visiting" go on constantly throughout the season, much of the activity being initiated by non-breeding birds, although the nesting-birds join in, sometimes leaving their growing young unguarded whilst they do so. So many birds are involved in these meetings that any means of individual recognition will greatly facilitate the study of their activities. Later, the young themselves chase each other about the moor, and unoccupied non-breeders join with them in this play. The Byerwil pool too, is a social centre. The skuas are very fond of bathing, and their actions follow a highly ritualised pattern, at which the juveniles just on the wing are as adept and picturesque as the adults. Very often, at this period, whole families come to the pool for a half-hour's ablution and relaxation, and it is fortunate for us that interference does not seem to deflect them from their purpose.

The 12 adults caught included 4 pale phase birds none of which, so far as we could discover, were actually breeding individuals: each bird was weighed and measured, weights varying from 354-475 gms., with one exceptionally heavy bird at 588 gms. Two interesting events occurred on the last day, when an old stuffed specimen of a young Arctic Skua was being used as a lure. It was responsible for the capture of a 1450 gm. Bonxie which saw in it the prospect of an easy meal; also of the dark phase male Arctic Skua whose territory lies next to this pool, and which persistently stooped at the dummy as though trying to drive it away. It may or may not be significant that the single youngster reared on this territory had vanished from home a day or two before.

The Great Skua, *Stercorarius skua* (Brunnich).

The Bonxie or Great Skua is phylogenetically closely allied to the Arctic Skua,—so closely, indeed, that most authorities put the two species in the same genus. It is therefore necessary that the Bonxies should receive attention, for not only are there interesting similarities, —and equally interesting differences,—in the behaviour and biology of the two species, but they are potential competitors for living-space. There may, therefore, be aspects of the study of the life-history of each which will help towards an understanding of the conditions which enable closely allied species to co-exist in the same area.

At Fair Isle these larger skuas nest solitarily, and as they prefer moister ground than the Arctic Skuas, and are as yet few in number, they are not seriously competing for nesting-sites. The exception is the well-established pair in the middle of Eas Brecks, which again succeeded (for the third year) in rearing two young, and as usual caused their Arctic Skua neighbours to retreat after their own young had hatched. The young Bonxies roam much more freely than the chicks of the smaller birds, and spend less time in cover,—as though they fully appreciate the fact that their natural enemies are few and far between. Other Bonxie pairs which have tried to nest within the Arctic skuary in recent years have not been successful, and a pair which laid in Homisdale in 1949 were so harried that the eggs were chilled, and the pair did not attempt to repeat the experiment in 1950. There were four pairs in 1949, and these increased to six in 1950.

Two pairs occupied the Vaasetter moor, one losing its clutch (apparently to Ravens) and the second successfully rearing two young near a site where a single chick was raised last year. A pair which has nested annually at the Wester Lother reared two young, and there were single chicks at two new sites on wet ground on the north and south sides of Ward Hill. Two additional pairs sat about, during May, on Byerwil and the moor above Hoill Lee, and although the

latter reached the stage of half-heartedly attacking intruders, neither pair nested.

The Grey Wagtail, *Motacilla cinerea* Tunstall.

In early June we were delighted to find a pair of Grey Wagtails haunting the lower reach of the Gilsetter Burn below the Gully Trap: the male was often singing, and the pair was watched prospecting a nesting-site. They eventually chose a hole in the precipitous bank immediately below the approach to the trap, some 15 feet above the stream. Five eggs were laid but only two young were reared: what happened to the others is not known, as the birds were left strictly alone when nesting had begun. The two young flew on 8th July and remained in the Gilsetter ravine until late in September.

This is the first breeding-record for the species in Shetland, although the bird is not uncommon in Orkney. Probably a northwards expansion of the range took place in 1950, as Grey Wagtails (formerly scarce migrants only in Fair Isle and Shetland) were reported from several places in the spring and early summer as far north as Loch Watlee in Unst.

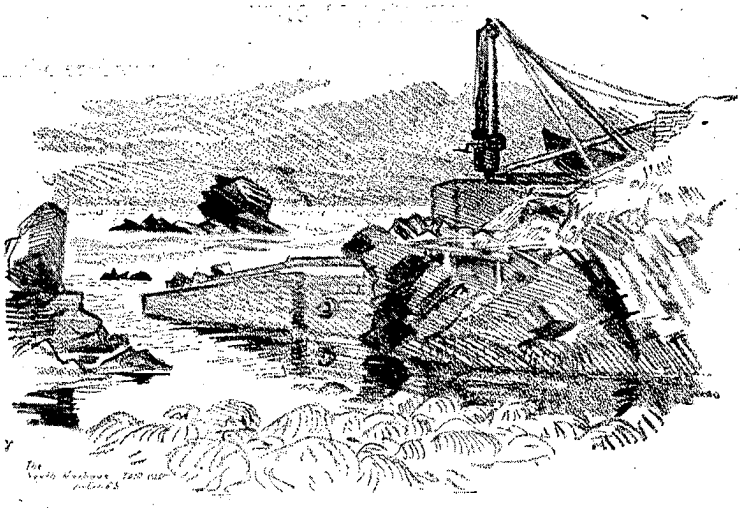
The Lapwing, *Vanellus vanellus* (L.).

Two pairs of Lapwings nested on the lower reach of the Vaasetter moor, and although they were much disturbed by potential predators —gulls, ravens, hooded crows and skuas—one pair succeeded in fledging two youngsters out of three hatched on the morning of 1st June. The second pair lost their clutch soon after incubation had commenced and did not nest again, though they remained on the moor.

The Lapwing is a sporadic breeding-species at Fair Isle and this was the first nesting for several years.

The Fulmar, *Fulmarus glacialis* L.

There were very many more Fulmars at the cliffs in early and mid-April than eventually nested. They went to sea during a gale in the third week of the month and for a few days the cliffs were almost bare; this behaviour, Pat Robertson reports, is quite usual early in the year, a strong wind clearing the cliffs for four or five days. Such absences took place between 13-16th January, 31st January, 5th February (whilst a SSE. gale was raging), 1-6th March (during a SW. gale) and 1-3rd April (NW. gale on 2nd). The first eggs



SOUTH HARBOUR — *Roland Svensson.*

were seen on 20th and 22nd May, later than in 1949, when Pat Robertson found two eggs on 15th May. When the young began to leave their ledges a small number, as usually happens, were driven inshore and "stranded" on the heath,—and in one case, on the roof of the Gully Trap. These "strandings" occurred between 24-30th August, but some young were still on their ledges at the end of the first week in September.

Eight young birds "stranded" during their first flights weighed from 708 g. to 1062 g., with a mean of 850 g. Two fledglings taken from their ledges by Dr J. A. R. Miles for serological tests on 1st September were 906 g. and 934 g., and two obtained at Buness on the following evening were 991 g. and 1190 g. According to James Fisher, the last is the highest weight recorded for a Fulmar. These birds, after the tests, were put on ledges close to the Bird Observatory, where they remained for 4 and 4½ days, the heaviest bird being the first to leave.

A dark phase or "blue" Fulmar was observed by M. J. Wotton on 22nd September, on the coast near Sheep Craig, and a description of it was given in our *Bulletin* No. 1, 1951.

In mid and late September, after departure from the cliffs, small "rafts" of Fulmars floated on the water outside Duttfield on calm days, and a great deal of courtship activity was observed. The cliffs were deserted at this period, but birds began to occupy the ledges again from 31st October.

FIELD TAXONOMY.

Hitherto, purely taxonomic studies have been the province of the Museum worker, whose materials are the preserved specimens of birds and other animals in his care. Under the old concept of systematics, in which the species was regarded as the most important unit, and the main aim of the taxonomist was the correct classification of animal forms, dead material was a satisfactory medium with which to work. In recent years, however, a change has occurred in the outlook of workers in the best-known taxonomic groups—including birds—and the study of systematics has lost much of its old rigidity. It is now dominated by a new and more vigorous view which regards populations, geographical and ecological, as the fundamental starting-point for a proper understanding of the evolution of the subspecies, species and higher categories. The discoveries of geneticists, as well as the rapid growth of our knowledge of bird-distribution during the present century, have been largely responsible for bringing about this change in outlook. The history and significance of these developments are admirably discussed by Ernst Mayr in his book " Systematics and the Origin of Species."

Modern knowledge of the wide extent of variation within animal-species, and its dependence upon genetic arrangements and mutations, has brought out the serious limitations of museum taxonomic studies made on the basis of dead material from widely scattered parts of the species range. On the other hand, it has revealed the potentialities of Bird Observatory work in opening up a new kind of taxonomy, which we might perhaps call " field-taxonomy," based on a critical examination of the large amount of living material taken in the traps during the course of the year. This material, as a glance at our Ringing Summary will show, includes long " series " of certain species,—much larger series than most museums are able to accumulate, —and it would be a waste of scientific opportunity if we did not apply to the study of these birds as many of the known techniques of examination as we can. So the laboratory routine at Fair Isle embraces ageing, sexing and subspecific identification where possible; accurate weighing and measuring of wing, bill, tarsus and wing-formula; recording of plumage details and colours of soft parts; examination of condition with regard to moult, infestation by ectoparasites and so on. The data obtained for each individual are noted under a card index system, and this method of record-keeping facilitates analysis of the data when the season is at an end.

It was in the hope of increasing our resources in this respect that a Lovibond-Schofield Tintometer, which will match and measure the colours of a bird's plumage to " the least discernible difference," was added to the laboratory equipment at Fair Isle. The museum worker can refer to his specimens whenever he likes, but the Bird Observatory worker must make the most of the few minutes during which the

specimen is in his hand, and it is an advantage if he is able, during that period, to make an accurate and permanent evaluation of the more important plumage features. The provision of this useful but costly instrument was made possible by a grant from Nature Conservancy. It is too early yet to assess the value of this new technique in field-taxonomy, although the importance of such an instrument in the study of infraspecific variation is self-evident. It will take one or two seasons of experimental enquiry before we are able to apply the colorimeter with force to the problems we see emerging from our studies.

The established school has been of invaluable help to us in this task of developing field-taxonomy, for among the essential tools of this study are bird-skins representing the known geographical forms, or subspecies, of the birds we handle at Fair Isle. Comparison of the living bird with museum material often enables us to decide to which geographical race our example belongs, and it should not be necessary to emphasise the importance of such information to our migration records. Any attribute of a bird which will provide a clue as to its area of origin is of considerable importance, and that is one reason why taxonomic matters take up some space in this report. Last year we had a small general collection on loan from the Perth Museum, and this facility was continued in 1950. In addition, a more specialised collection was put at our disposal by Dr A. C. Stephen of the Royal Scottish Museum, and this enabled us to approach the problem of racial affinities more critically than was possible in 1949. Dr Finn Salomonsen of the Universitetets Zoologiske Museum, Copenhagen, has also shown a sympathetic understanding of our difficulties and problems, and has come to our help on a number of occasions with the loan of important specimens.

It must be emphasised—as previously in regard to the skuas—that we view our research as a long term one that will take a number of years to develop. We do not look for sensational discoveries, but hope in course of time to accumulate a sufficiently large amount of data on the morphological attributes of various birds as will permit of statistical analysis, and, perhaps, prove to be of some value to students of variation and evolution. The work done up to the present has been largely exploratory, as the initial work in any new discipline must be. Its chief value is that it helps to point the way more clearly towards future development. One of the lessons learned in this first season is not to spread the net too wide,—it looks as though critical field-taxonomic studies, for the present at any rate, would be best confined to one or two species. Analysis of the 1950 results suggests that it would be most profitable to concentrate on Redwings and Wheatears, partly because we are able to trap them in sufficiently large numbers, and partly because they are very variable species. In the case of the Wheatear, there is a local resident population during the summer months, whilst in the autumn migrants come to us from two major sources,—the Scandinavian peninsula, and the Faeroes-

Iceland-Greenland region. Greenland birds are regarded as a distinct geographical race, *Oenanthe oe. leucorhoa*, whilst the intermediate populations of South Iceland and the Faeroe Islands have also been named, *Oenanthe oe. schiøleri*. There is, therefore, abundant material at Fair Isle for a consideration of the variation within this widely distributed species, and the account which follows gives an indication of how this question is being tackled.

The Redwing is only a migrant at Fair Isle, the great majority being Continental birds of the nominate race. There is also, however, a small passage in both spring and autumn of the Iceland race, *Turdus musicus coburni*. We take by far the largest number of our Redwings in the early drives of the Gully Trap when they come up from the cliffs on the morning of their arrival. As they are gregarious migrants, we often have the chance of catching a number of individuals in a single drive. If we can increase the numbers caught in this area (as we hope to do by making a new trap at the head of a subsidiary gully east of the main one) we should obtain each morning for laboratory examination a fair sample of the population originating in some restricted area of the bird's range. That we cannot at present pin down the area of origin of these samples is unfortunate, but perhaps not of much consequence. The main point is that we are able to compare representatives of one population with those of another, in the hope of learning something about the extent of morphological variation between different "stocks" arriving on different days; and perhaps we shall be able to correlate our findings eventually with the wider question of variation between the geographical races. Every small population is believed to be genetically distinct from the next, and we should expect to find evidence of this in a critical assessment and comparison of morphological attributes. Further the development of those taxonomic features which distinguish one good geographical race from another are frequently adumbrated in the type and extent of individual and small group variation. It is perhaps not impossible to test these hypotheses, in the case of birds, by amassing quantitative data from field-taxonomic studies of the kind we envisage at Fair Isle.

Another promising line of enquiry to be followed up is the variation in mean weight of samples taken on different days. It will be obvious from the account of the 1950 autumn migration of the Redwing (as well as from the observations on the Water Rail given in *Bulletin* No. 1, 1951) that the prevailing weather conditions during the overseas migratory flight have a considerable influence on a bird's arrival-weight. A study of this will entail a much more comprehensive study of meteorological conditions over a wide area than has been undertaken up to now, and it is a serious drawback that this can only be done in retrospect, owing to the isolation of Fair Isle. There is also a difference in mean weight between Iceland and Scandinavian birds and this needs further critical examination.

In concluding this section, which introduces the special studies we have attempted on Redwing and Wheatear, I would like to express the Trust's gratitude to those visitors who have concerned themselves with our problems, and particularly to Alec Butterfield for his statistical work, Ron Edwards for his research on the ectoparasites, and also Dr F. A. Turk, Eugene O'Mahony and R. L. Coe for their kindness in identifying materials submitted to them from time to time.

SPECIAL STUDIES.

Redwing, *Turdus musicus* L.

Taxonomic Notes.

The two races were segregated by comparing the trapped birds with autumn skins of typical examples of *Turdus m. musicus* L. and *Turdus m. coburni* Sharpe, in the study collection on loan to us from the Royal Scottish Museum. " The Handbook of British Birds," 2, p. 125, gives as the characters of the Iceland subspecies darker upper-parts, thicker and more prominent black streaks on the throat, more extensive olive-brown wash on sides of breast and flanks (with the breast-markings often confluent), and a deeper red hue under the wing. Nothing is said of the strong buffish suffusion on head and breast, usually extending as a pale wash over the belly, and the heavily-marked and buff-washed under tail-coverts which, in our experience, provide the best criteria for assigning birds to this race. Colorimeter examination suggests that whilst the mantle in some cases is darker than in most *musicus*, this is a variable character in all Redwings and is not to be relied upon as a means of separating the races. Nor is the wing-measurement a critical character, although it may help: the wing is normally longer in the Iceland birds, but a good many Scandinavian wings fall within the same range. The wing-length of the two races, as shown by the autumn 1950 observations, is—

T. m. musicus,—(108·5) 110-122 (124) mm.

T. m. coburni,—117·5-124 mm.

Birds were not separated as being definitely *coburni* unless they showed an unusual amount of buffish suffusion on head and breast, combined with heavily-marked under tail-coverts and comparatively long wing. A small number, which did not satisfy these requirements, but which showed long wings and high weight, were not assigned to either race.

Autumn Migration.

Movement at the end of September was very slight. The first was recorded on 22nd, and the most were six on 27th. The first notable movement was of 80 or so birds on 5th October. The wind had been SE. until late on the 4th, but shifted to SW., where it

remained for several days. Nevertheless, arrivals continued, those taken in the traps being *T. m. musicus*, all of low weight.

The first bird to show the characteristic clouded breast-markings and buffish suffusion of *coburni* was trapped on 11th October: this and another (which was not critically examined, but may well have belonged to the same population) weighed 70 g. and had wings of 120-121 mm. The overnight wind had been NNW. at force 5.

A small influx of 50 or so occurred on 13th with the wind SSE. That night there was a SW. wind at force 4, but despite these apparently adverse conditions there were over a thousand birds on the isle on 14th. Only *musicus* were trapped, at a generally low mean weight. Three out of the same small flock were caught in the Dyke Trap, where they took refuge from a passing Merlin, and the distribution of weights of these three birds, and of the remaining birds trapped on this day, suggests that arrivals took place from at least two different sources (*i.e.*, the Continent and Shetland).

This SW. wind prevailed for several days and Redwings decreased in numbers: birds were obviously "moving out," and the few new arrivals were all of low weight, suggesting a long struggle to make a landfall against adverse weather conditions. A new stock of *musicus* with heavily-marked under tail-coverts was in the Gully early on 15th: four of them showed a mean weight of 59·8 g., whilst the next morning three *musicus* were still lower at 54·5 g. Two heavy birds trapped on 15th almost certainly belonged to an earlier stock, as they had the under tail-coverts lightly marked. One of them was a long-winged bird, 122 mm., and this, in conjunction with its high weight of 73·5 g., suggests *coburni*. The colour-quality of the mantle plumage was different from other birds examined on this day, but there was nothing in the plumage of the under-parts to indicate Icelandic origin.

Two definite *coburni* and another puzzling "indeterminate" came to hand early on 17th, when a westerly gale was raging. One of the Iceland birds was unusually light for that race at 63·8 g., whilst the other, captured from the same small flock, was 70 g. Only *coburni*, five in all, were taken on 18th, and again these arrived on a NW. wind. Their wings ranged from 117·5-124 mm. and their weights from 71-73·8 g. with one heavier bird at 80·25 g.

The wind again backed to SW. and rose to force 6; nevertheless, a number of Redwings came in overnight on 18-19th, and in view of the conditions, the high mean weight of the five birds trapped—69·4 g.—is surprising. It strongly suggests a journey from no further afield than Shetland of a group of migrants that had been there for some days. All had lightly-marked under tail-coverts and the mantle colorimeter readings fell fairly near each other when graphed. Two of them were infested with ticks, and all had the pale flesh-coloured legs usual with *musicus*. There was remarkable variation in wing-length among these birds, from 108·5 and 112 mm. to 119-121 mm.; the first, which was carefully checked, is well below the minimum

for the species given in " The Handbook of British Birds," 2, p. 124. The theory that the movement originated in Shetland is strongly supported by the fact that when *The Good Shepherd*, the island mail-boat, returned from Grutness during the night she had small birds with her all the way across Sumburgh Roost, and Redwings were among those heard passing by.

The next " rush " took place on the night of 20-21st, with the wind veering from NW. to SE. and falling in strength. A small sample—17 birds—of the thousand or so on the island showed a mean weight of 69·5., comparable with that of the presumed Shetland birds of the 19th. There was a great deal of bird-migration on this particular night, embracing Blackbirds (of which those trapped also showed a high mean weight), Skylarks and the first influx of Woodcocks; so it is practically certain that the Redwings were from the same source and had, in fact, made the long sea-crossing from the Continent. Their high mean weight may well be due to the fact that the light easterly wind would assist rather than hinder their passage.

This SE. wind continued, at force 3, and over 5,000 Redwings had arrived by the morning of 22nd. Only six *musicus* were trapped, and again their mean weight was high at 68·8 g. The wind then veered to SW., and went into the north overnight, and an excellent *coburni* at 88·2 g. was the only bird trapped on 23rd (unlikely to have been a new arrival at this high weight), apart from an Iceland Redwing which we had first ringed on 17th.

A statistical analysis of the weights, made by Alec Butterfield, shows that there is a probable relationship between the means of arrival-weights and prevalent wind-direction,—*i.e.*, birds arriving under south and west wind conditions weigh less than those assisted by north and east winds. The picture is a little confused by the existence of at least three categories,—*i.e.*, new arrivals from overseas, birds arriving ex Shetland, and birds which have already been at Fair Isle during several days. There are difficulties in segregating these categories, but we hope that a means of overcoming them will be found. The data are at present too small to give conclusive results, but the analysis has been of value in suggesting lines of enquiry to be taken in future years.

Ectoparasites.

Six ticks collected from the gape of a 1st-winter *musicus* on 6th October 1949, were kindly determined by Dr F. A. Turk as *Ixodes turdi* var. *brunneus* (Koch); and a nymph removed from the eye-rim of a *musicus* on 25th April was pronounced to be the typical form of the same species. The only tick so far found on a *coburni* was collected from the gape of the heavy bird of 25th April, but it has not yet been

determined. Tick infestation in autumn 1950 was observed in 10 per cent. of the birds examined, all *musicus*, as follows :—

REDWING.—Tick Infection.

Age.	Date	Total No.	Right Side.		Left Side.	
			No.	Position.	No.	Position.
Adult	Sept. 26	5	3	Eye-rim	2	Eye-rim
,,	Oct. 10	5	4	Gape	1	Above eye
?	,, 15	1	1	Upper gape		
Adult	,, 19	4	1	Eye-rim	3	Gape
,,	,, 19	1	1	Gape		
,,	,, 21	1			1	Gape
1st w.	,, 21	2	2	Eye-rim and under rictal bristles		
,,	,, 22	1	1	Gape		

Four affected birds were found in 1949, two with 6 ticks, one with 4, and the other with a single example, all in the region of the gape and eye.

WEIGHT RECORDS.

The spring birds, as one would expect, are very near their top weight on arrival at Fair Isle, and re-trapped examples show but little gain, or even a loss. The following are April records 1950 :—

REDWING.—Changes in Weight.

Ring No.	Race.	Initial Trapping.		Retrapping.	
		Date/Time.	Weight.	Date/Time.	Weight.
SP 684	Coburni	10/1530	71·2	11/0630	73·13
SP 687	Coburni	13/0715	83·9	16/0600	84·75
SP 691	Musicus	24/0715	77·6	25/0730	72·37
SP 693	Coburni	25/1600	91·67	28/1100	88·34

The last of these was the heaviest Redwing during 1950, but was surpassed by a 1st-summer *coburni* of 99 g. on 22nd April 1949. So far there has been insufficient segregation of the races among the few spring migrants to determine definitely whether a difference in weight exists. The average of 16 spring birds in 1949-50 is 80·82 g., which considerably exceeds the autumn average.

Of the birds weighed during October, 60 *T. m. musicus* gave an average of 64 g., and 10 *T. m. coburni* 73·5 g. This difference is statistically significant. The heaviest autumn Redwing in 1950 was the *coburni* trapped at 88·2 g. on 23rd October : it provides a remarkable contrast with the 42·4 g. recorded by Pat Robertson for a tired migrant *musicus* on 6th November, the lightest Redwing we have had.

A *coburni* ringed on 17th October at 70 g. and retrapped on 23rd had put on 9·7 g. during the week.

Wheatear, *Oenanthe oenanthe* (L.).

SPRING MIGRATION.

James A. Stout saw the first on 4th April,—a day on which the wind went into the SE. after 13 days of westerly weather. None was seen on the following day, but four birds were noted on 6th, two next day, a solitary male on 8th, then from six to nine daily until 14th, when 15 males were counted. There were substantial increases each day from 15-17th and again on 21st. The first females were single birds on 13th and 15th and four on 16th: thus they were 9 days behind the first males. There were further increases on 28-29th and on 2nd and 4th May, a few Greater Wheatears being seen on the last two days and about 20 of both sexes following them on 5th May. There was no further marked movement of the larger birds until the end of the month, when a few females were trapped between 26-31st. The first *Oe. oe. leucorhoa* in 1949 was an unusually early male (wing 104 mm.) on 14th April.

AUTUMN MIGRATION.

It is very difficult, in the case of species that have a large breeding as well as migrant population, to determine when migratory movements begin and cease. All that can be said in the case of the Wheatear is that we had no evidence of outward movement until the night of 22-23rd August, when, from an early hour, Wheatears were at the lantern of the South Lighthouse in large numbers. Among 51 captured, there was not a single adult. On the following night, again from an early hour, Wheatears were at the lantern, but in reduced strength, only ten (including an adult male) being caught. Four birds were taken at the North Lighthouse on the next night, 24-25th.

I feel confident that the great majority of these birds belonged to the local and Shetland populations, a view which is founded on (*a*) their early appearance at the lantern, (*b*) the barometric pressure at the time, (*c*) their comparatively high mean weight (*see* Alec Butterfield's remarks below), and (*d*) the fact that our Shore Trap, which had caught 30 birds since 5th August, caught only one after 21st. In other words, the local juveniles, which had haunted the shore in fair numbers for feeding purposes since their first appearance, had apparently departed.

Most authorities on migration have expressed the view that anticyclonic conditions provide the main stimulus to departure,—fine, settled weather and high barometric pressure (for a full discussion see W. Eagle Clarke, "Studies in Bird Migration," 1, Chapter VIII: A. Landsborough Thomson, "Problems in Bird Migration," Chapter VI). It is perhaps significant that such conditions obtained at Fair Isle immediately prior to the mass-movement

of 22-23rd August. The weather was fine and rather warm, with day temperatures 54-56 and night temperatures 52-54, easterly and SE. winds at moderate strength prevailing. On 16th the barometer stood at 29 inches, on 19th at 29·15, on 20th at 29·40, on 21st at 29·50, and on 22nd it reached its highest point at 29·65, falling to 29·50 next day.

There appeared to be new influxes of migrants on 28th August and 1st September, with gradual decreases afterwards until we had only 20 in the Schedule for 22-23rd September. After 27th only two or three came to notice daily until 3-5th October, when there was a very slight increase. Afterwards, Wheatears were decidedly scarce and the last were seen on 17th and 24th October.

Taxonomic Notes.

The preponderance of 1st-winter birds among the Wheatears trapped in autumn was astonishing. Until 7th September only four adult males were taken in a total of 216 birds since the beginning of August. From 7-11th September however, seven birds trapped included five adult females and a single male, and two males were got on 16th. In all, from the time the first juveniles got on the wing at the beginning of July, less than 7 per cent. of the 250 birds trapped were adults. Those birds were regarded as adults which had the inside of the mouth entirely black, not black and yellow combined.

No means was found of distinguishing *Oenanthe oe. leucorhoa* (Gmelin), the Greenland or (better) Greater Wheatear, among 1st-winter birds and autumn females: colorimeter examination, which had been a most useful aid in spring (when the plumage differences are fairly pronounced) was of no assistance later in the season.

July wing-lengths range from (90) 92-100, mostly 92-94 mm., whereas up to mid-August the majority show 94-95 mm. This slight increase is almost certainly due to the fact that the July juvenile wings have not completed growth in many cases. From 16-23rd August the majority were 95 mm., but there was an increasing number of larger birds with wings 96-98 mm. During the big movement of 23-24th August the majority were 94-96 mm., but there was also a distinct "tail" of birds with wings 99-100 mm. within the range given for *Oe. oe. schioleri* Salomonsen, described from south Iceland and the Faeroe Islands. There was a strongly marked increase in long-winged birds, no doubt due to a more marked passage of *Oe. oe. leucorhoa* in September, the peak shifting from 95 to 99 mm.

Moult.

A 1st-summer male on 6th June had new innermost secondaries in the right wing,—probably a case of irregular moult.

The first evidence of post-nuptial moult was found in a female of 9th July: the 1st-5th primaries were old, and the inner ones

emerging from their sheaths; the innermost secondaries were growing, the seven outer ones and the major coverts being old. The bird was without a tail, the complete set of new feathers being still ensheathed. Body moult was proceeding on all tracts and new feathers were covering the brood-patch.

A male on 6th July was in very soiled plumage, but showed no sign of moult. Two males in heavy moult were captured on 27th July and 3rd August. The first had the 1st-7th primaries old and the remainder and their coverts barely protruding from their sheaths. One old major covert remained in the right wing, but all had been shed from the left and the new feathers were just protruding. New lesser coverts were appearing at the carpalia. No secondaries had been shed, and the tail moult had not begun. The old body-plumage was extremely soiled, and new feathers were growing on all tracts, but especially on the mantle and sides of breast. In the second example the 1st primary was old, the 2nd in sheath, 3rd growing, and 4th-10th new; all the secondaries had been cast, apparently together, and the long innermost feathers in each wing were new.

Other males trapped on 23-25th August had finished, but one as late as 16th September was still in body moult. A female on 11th September was completing the head and wing moult, having the old 1st primary unshed in the right wing, but the new one growing. The corresponding feather in the left wing was new, also the bastard-wing, this being absent from the right.

A juvenile, undergoing considerable body moult, was trapped on 17th July. A bird which flew from a nest at North Haven about 6th July had not begun to moult by 21st (on which date the primaries were not yet fully extended), but it was in heavy body moult a month later. This moult appears to be confined to all body tracts and lesser and median wing-coverts: the succession is mantle, underparts, and finally head, with lesser coverts preceding the medians. In some early youngsters this moult is apparently complete by 1st August, and the last example still showing change was trapped on 24th August. The change is a rapid one: a juvenile showing practically no moult on 3rd August had finished when retrapped on 22nd. One bird on 30th July was getting a replacement of the inner major coverts, which appears to be unusual. Two showed irregular tail-moult: one on 2nd August was in full 1st-winter dress except that it was growing the two outermost rectrices on the right-hand side, and another on 13th August had only half-finished the change to 1st-winter and was also getting a replacement of these tail-feathers.

Wing-formula.

During August-September the wing-formula of 159 birds was examined, the measurements being taken (with dividers) to 0·5 mm. Only two birds had an identical wing-formula. If we allow for a possible error of 0·5 mm. in measuring, then there is one group of

three birds whose formula is practically the same, and whose wing-length was taken as 94-94·5 mm., and there are four other pairs differing by 0·5 mm. in the measurement of one feather, but with differing wing-lengths. There does not appear to be any correlation with wing-length, except that the long-winged birds (99 mm. and over) tend to have a shorter 1st primary.

The 3rd primary is the longest feather in 86 per cent., and the 3rd/4th are equal and longest in 10 per cent. Four birds had the 2nd/3rd equal and longest, and two had the 4th longest. The variation, which is considerable, is expressed in the following Table as a percentage (to the nearest whole number) of the total examined :—

WHEATEAR.—Wing Formula.

Primary.	% shorter than wing-point by *n* mm.																
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1st *	2	2	10	15	24	25	12	7	3								
2nd	3	8	31	41	13	2	2										
3rd	98	1	1														
4th	9	33	46	9	2	1											
5th					1	5	33	33	25	2	1						
6th												9	31	36	14	6	3

* measured as *n* mm. shorter than the primary coverts.

ECTOPARASITES.

A tick was collected from the eye-rim of a female *Oe. oe. leucorhoa* (wing 102 mm.) on 28th May, but it has not yet been specifically determined.

A few specimens of the flea *Dasypsyllus gallinulae* (Dale), kindly determined by Eugene O'Mahony, were collected from Wheatears in August-September. There are apparently few records of this flea from the Wheater, which is the principal host of *Ceratophyllus borealis* Rothschild.

Flat-flies, *Ornithomyia fringillina* Curtis, were either collected or escaped from 31 Wheatears, 28 of which were juveniles. One bird had five flies, another four, a third three, whilst four had two flies each. It is not worth while expressing the degree or the frequency of infestation in any more exact fashion than this, as the technique of search requires to be greatly improved before results of value for statistical purposes can be obtained.

The first affected bird was an adult female taken from a nest of six eggs on 17th June. One of her brood, which were ringed as nestlings, was retrapped on 16th August and a fly was removed from

it. The puparia, at first bright red or orange in colour, but turning black after a few hours, were found attached to flies on 3rd August (from an adult male), 21st and 24th.

STATISTICAL ANALYSIS OF WHEATEAR WEIGHTS, 1949-50.

Contributed by ALEC BUTTERFIELD.

Owing to the large number of factors which affect the weight of an individual bird, the number of records needed to give a satisfactory analysis of the variations which are noted is very large. Although some 400 records of the weights of Wheatears are available these only allow the sketchiest analysis to be made. The main purpose of the analysis which forms the basis of this note was to test the method of recording and to give a line on possibilities for future investigations. No attempt has been made to establish any theories.

It is perhaps as well to explain the meaning attached to the word "significant," which is used freely in this note. If two small samples are taken from the same population the chances are that their mean weights would differ. By calculating the variances of the two samples, and thence the variance of the difference between their means, it is possible to discover from tables the percentage of cases in which the difference noted would arise simply from the chances of random sampling. Where this percentage is above 20 per cent. the difference is described as non-significant, *i.e.*, it is most probably due to the chances of random sampling, and might be expected to disappear if sufficiently large samples were taken. It is of course always possible that the larger samples might confirm the difference: in this case the percentage would drop, owing to the drop in variance. If the percentage is below 20 per cent. it becomes a safe assumption that the two samples considered are not drawn from the same population, and the difference is then "significant." When the percentage has fallen to below 1 per cent. it is almost certain that the samples are drawn from different populations and that the difference really exists, and it may then be termed "highly significant."

The records available were divided by time of year, age, sex and subspecies into 14 different categories. Some of these categories contain only very few records; even so, certain records have been rejected because they did not fit in well with the remainder of their group. This rejection was not capricious, but was only done after variance calculations had been made. A note has been made in each case as to the records rejected. An earlier analysis had shown that spring migrants for the two years did not show any difference, so the two years have been taken together.

	Group.	No. of Birds.	Mean Weight in Gms.	Variance of Mean.
1.	Spring migrants *oenanthe* ♂	17	24·52	0·2131
2.	,, ,, ,, ♀	6	23·75	0·5713
3.	,, ,, *leucorhoa* ♂	10	27·93	3·3176
4.	,, ,, ,, ♀	4	30·97	1·1019
5.	Breeding-birds *oenanthe* ♂	10	24·46	0·2820
6.	,, ,, ,, ♀	2	28·20	0·2500
7.	Autumn migrants 1949 ♂	5	25·57	0·8675
8.	,, ,, 1950 ♂	5	28·52	0·2295
9.	,, ,, 1950 ♀	5	26·04	0·5305
10.	,, ,, juveniles prior to 28 Aug. 1949	66	24·61	0·0642
11.	,, ,, juveniles prior to 22 Aug. 1950	105	24·92	0·0345
12.	,, ,, juveniles after 28 Aug. 1949	57	27·51	0·2079
13.	,, ,, juveniles after 25 Aug. 1950	44	26·33	0·1168
14.	,, ,, juveniles mainly from Lighthouse, 22/24 Aug.	70	27·40	0·0740

1. Spring migrants, *oenanthe* ♂. These were taken from 17th April to 19th May 1949, and 16th April to 23rd May in 1950; wing-length 90-98 mm., mostly 95 mm. The spring migrant *leucorhoa* were separated from this group partly on wing-length and partly on plumage. No definite *leucorhoa* were found with a wing below 98 mm., and no definite *oenanthe* with a wing exceeding that length.

2. Spring migrants, *oenanthe* ♀. These are taken over the same period as the ♂♂ and have wing-length (90) 92-95 mm. This group does not differ in a significant way from the first. The chance of the difference being due to random sampling is 40 %.

3. Spring migrants, *leucorhoa* ♂. The first bird trapped in the 1949 season was an unusually early ♂ *leucorhoa* on 14th April (wing 104 mm., not weighed). Others were trapped from 27th April to 13th May, but in 1950 no *leucorhoa* were taken until a single ♂ (wing 104 mm., worn) was got on 26th May. This is a very heterogenous group, as shown by its large variance: however, the difference in mean weight between this and the corresponding *oenanthe* group is significant.

4. Spring migrants, *leucorhoa* ♀. The birds were trapped between 27-31st May, wing-length 98-102 mm. A small but fairly homogenous group, differing significantly from the *leucorhoa* ♂ group and highly significantly from the corresponding *oenanthe* group.

5. Breeding-birds, ♂. One bird at 27·9 g. is omitted. These are taken from 6th June, and are virtually the same weight as the spring migrant *oenanthe* ♂. they have the wing-length 92-95 mm.

Two birds in this class had been trapped previously in the spring migrant *oenanthe* ♂ class :

1st summer ♂, 10th May, 22·6 g.; evening of 8th June, 26·35 g.

Adult ♂, 5th May, 19·8 g.; early on 1st July, 21·69 g. (Our lowest recorded weight for an adult Wheatear.)

6. *Breeding-birds*, ♀. These are taken over the same period as the breeding ♂ ♂ : they differ in a highly significant way from this class and from spring migrant *oenanthe* ♀. The higher weight is probably due to physiological changes consequent upon incubation.

A ♀ weighing 27·1 g. on the evening of 18th June, had the temperature of the brood-patch 30° C. : it had been taken previously at 24·34 g. on 12th May in the spring migrant, *oenanthe* ♀ class.

7. Autumn migrants, 1949, ♂. These were caught between 9-19th September and on 3rd October. There is no significant difference between them and spring migrant *oenanthe* ♂ or breeding ♂.

8. Autumn migrants, 1950, ♂. There were three from 23-25th August and others on 1st, 8th and 16th September. One, with wing 103 mm. and weight 33·65 g. (a probable *leucorhoa*) is omitted. These birds are significantly heavier than any other *oenanthe* ♂ class, a surprising fact in view of the close resemblance of the spring migrant ♂ ♂ of the two years. It is perhaps worthy of note that they were taken earlier in the autumn than the 1949 group, which also showed a tendency to decrease in weight as the season advanced.

9. Autumn migrants, ♀. Discrimination between 1st-winter birds and adult ♀ ♀, on the colour of the gape, was not made until 1950, in which year five were captured, between 7-11th September. There is a significant difference from spring migrant *oenanthe* ♀ and from autumn migrant ♂ ; also a highly significant difference from breeding ♀ ♀.

10-14. Juvenile groups. There is little significant difference between the two groups captured early in the two autumns. There is a significant difference between those captured later in the two years : in this case the 1949 birds are heavier than those of 1950 (contrast autumn migrant ♂).

The Lighthouse birds require special comment. They were held approximately 12 hours before being weighed, so their mean weight should probably be higher than that shown in the table. The data obtained from eight birds which were roosted in the laboratory at various times is conflicting, but it seems reasonable to add 2 g. to the mean weight of the Lighthouse birds, giving a value of about 29·5 g. for this group.

As these birds seem almost certain to be of local origin, it is possible to hazard an explanation of the high weight of the late 1949 group : *i.e.*, that it consists of a mixture of local birds and migrants, whereas in 1950 these categories were more or less segregated.

WHEATEAR.—Overnight Loss in Weight.

CLASS.	Date.	Roosting Weight.	Morning Weight.	Hrs.	Loss in Gm.
Juv.—1st w.	August 1	27·4	25·75	9	1·65
1st winter	,, 4	24·1	22·16	11	1·94
,,	,, 4	24·8	22·57	11	2·23
Juvenile	,, 6	24·39	21·99	11	2·4
1st winter	,, 8	24·4	22·73	9	1·67
,,	,, 8	25·35	23·33	9	2·03
,,	,, 23	26·1	24·6	11	1·5
,,	,, 23	25-52	42·2	11	1·32

There is a suggestion in the mean weights that juveniles gain in weight as the season progresses. One ringed as a half-grown nestling of a 6-brood on 2nd July was retrapped on 21st July with the primaries still not fully developed, weight 21·13 g., and again on 21st August with wing 95 mm. and weight 26·18 g. Another nestling of the same brood was trapped on 16th August with wing 96 mm. and weight 26·61 g. A nestling marked in a nearby nest on 1st July showed wing 93 mm. and weight 23·56 on 15th August. A fourth nestling ringed on 19th June was retaken on 19th July with wing 95 mm. and weight only 19·9 g.—compare the first retrap weight of the first-mentioned bird above.

TREASURER'S REPORT

I would like to preface these remarks by apologising to all who support the Fair Isle Trust for my inconveniently timed illness which has resulted, as the Chairman points out, in this Annual Report being published later than we would have wished.

The year has been satisfactory, and although we show a small deficit in the Revenue Account, that is only because your Trustees thought it prudent to write down the value of assets such as traps, furniture, scientific equipment, etc., to a figure which would be easily realisable in the event of the Trust having, through unforseen and, it is hoped, unlikely circumstances, to be wound up.

The very generous donation of £1,000 from the Nature Conservancy has enabled the Trust to purchase essential scientific equipment and to build additional traps which will help enormously during the present season and which, without this donation, could only have been built one by one over a period of years.

So far we have done well, but I will not attempt to disguise the fact that without the help of the Pilgrim Trust, the Nature Conservancy and one or two large private contributors we could not have achieved the things that we have. Anyone looking at the Revenue Account can see that our probable revenue for this present year, assuming the absence of a grant, will be in the neighbourhood of £1,600. Our expenditure, even allowing for the continuance of the private contributions to salaries, for no further writing down of assets and for a considerable reduction in the item for supplies, furniture, etc., will be at least £1,800, unless we can avoid the loss on the Hostel.

We have, therefore, no cause for complacency, even though so far we have shown good results. The important thing is to go on showing them. The Hostel is essential to the working of the Observatory. Fair Isle is an isolated spot, difficult of access, and if the guests on whom we rely for help are to make the trip it is only right that we should try to make them comfortable. I think that we do. But the Hostel can only pay its way, in the face of freight, feeding and staffing difficulties inevitable on a small isolated island if it is reasonably full every week. We are trying, in the light of each year's experience to minimise the loss, without detracting from the comfortable welcome.

The other large item in the accounts is printing and stationery. This is difficult to reduce. The annual report alone accounts for the greater half. In addition we are now issuing a series of *Bulletins* which will keep subscribers up to date throughout the year. They will be available to anyone who becomes a Friend of Fair Isle. They involve, however, additional expense, and we propose therefore only

to send the *Bulletins* to those Friends who apply on the postcard supplied with this Report. The *Bulletins* are bound to be to some extent technical, and we do not wish to incur unnecessary expense sending them to supporters who are not interested. We are, however, delighted to send them to anyone who asks, since we feel that they will not only be interesting in themselves but will help us to keep in touch with our many Friends. Moreover it is hoped that they will encourage others to join the Trust and so swell our revenue.

This year seems to me a critical year in our adventure. The initial expenses are behind us and it is now a question of whether or not annual revenue will meet annual expenditure. There are many ways in which you yourself can help. Continue your membership; sign a covenant form if you can; encourage others to join or to give a donation; come to Fair Isle yourself, if you possibly can. You will never regret having done so.

And whether or not you can do any or all of these things, leave the Fair Isle Bird Observatory Trust a legacy in your Will, so that other bird lovers, in years to come, will have no reason to bewail the loss of a permanent migration record, scientifically kept over the years.

It is a long term record that we want—and it is you that can give it to us.

FAIR ISLE BIRD OBSERVATORY TRUST

REVENUE ACCOUNT

Year to 31st December 1950

RECEIPTS.		EXPENDITURE.	
Subscriptions under Covenants and from Friends of Fair Isle	£716 2 0	Salary, Wages and National Insurance	£1,235 5 7
Donations for Year	198 15 6	*Less:* Private Contribution	500 0 0
Proceeds of Sales of Booklets, etc.	55 5 1		£735 5 7
Proceeds of Lectures, etc.	162 3 10	Printing, Postages and Stationery	479 18 2
Use of Room	10 0 0	Supplies, Furniture, Furnishings, etc.	316 6 0
Income Tax Recovered	325 16 7	Insurance Premiums	99 14 3
Grant from The Nature Conservancy	1,000 0 0	Lantern Slides, etc.	26 12 10
Miscellaneous Receipt	117 16 0	Payments in respect of 17 India Street	123 9 5
Deficit for Year	50 12 0	Loss in respect of Hostel	255 8 9
		Administration and Petty Cash	99 16 0
		Buildings, Traps, etc., sum written off	100 0 0
		Furniture and Furnishings, sum written off	400 0 0
	£2,636 11 0		£2,636 11 0

BALANCE SHEET

As at 31st December 1950

LIABILITIES.			ASSETS.		
Sums Advanced		£1,968 15 0	Buildings, Traps, etc.		£3,026 17 6
Note: These Advances are repayable only in the event of Funds being available.			*Less:* Amounts written off		2,676 17 6
					£350 0 0
Messrs J. & F. Anderson, W.S., for sums advanced by them		171 17 9	Furniture, Furnishings, etc., at Fair Isle	£1,628 11 10	
Sundry Creditors :—			*Less:* Amounts written off	1,028 11 10	600 0 0
Hostel	£25 10 0		Furniture, Furnishings, etc., at 17 India Street	£712 4 11	
Price of Huts	5 0 0		*Less:* Amounts written off	242 4 11	470 0 0
		30 10 0	Scientific Equipment, etc.	£266 2 11	
			Less: Amounts written off	70 2 11	196 0 0
			Consumable Stores :—		
			Food Stuffs	£131 0 0	
			Livestock (cost)	38 0 0	169 0 0
			Sundry Debtors		9 19 10
			Cash in Bank and on hand :—		
			Bank (Treasurer's Account)	£33 1 7	
			Cash (Hostel) £49 0 6		
			Less: Bank (Hostel) 32 11 2	16 9 4	49 10 11
			Deficit on Revenue Account brought forward from previous Year	£276 0 0	
			Add: Deficit for Year	50 12 0	326 12 0
		£2,171 2 9			£2,171 2 9

EDINBURGH, 30*th July*, 1951. *Examined and found correct.*

LINDSAY, JAMIESON & HALDANE, C.A.

GEORGE WATERSTON & SONS LTD., *Printers*, EDINBURGH.

FAIR ISLE BIRD OBSERVATORY

The Work of the Observatory.—The purpose of the Bird Observatory is to provide facilities for visitors to carry out scientific research on the island, not only in the sphere of ornithology, but in every aspect of Natural History. Work will be mainly concentrated however on ornithology under the supervision of the Director. The Observatory will be open from 5th April 1951.

The Hostel.—The Hostel has accommodation for ten observers. It is sited at the North Haven, the main landing-place, and consists of a group of well-constructed timber buildings formerly occupied by the Royal Navy.

Terms.—Full board, including service, is SIX GUINEAS PER HEAD PER WEEK. Reduced terms are available for parties of students from schools and universities. These terms include use of bicycles, bird-rings, and other Bird Observatory equipment, but do not include hire of motor transport or small boats whilst staying on the island.

Catering.—Breakfast is served at 9 a.m., lunch at 1 p.m., and supper at 6.30 p.m. Facilities for early morning and late evening refreshments are provided in the hostel sitting-room.

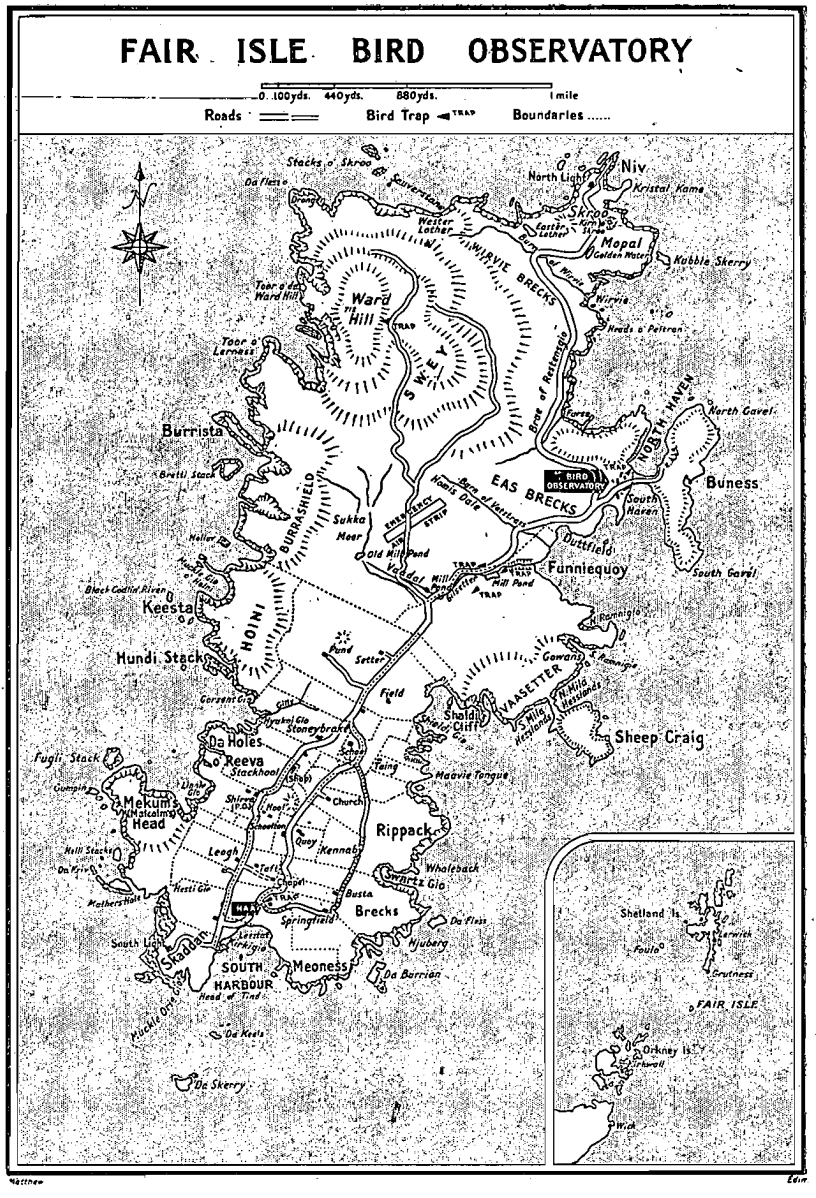
Applications.—Priority in bookings will be given to " Friends of Fair Isle," and to *bona fide* naturalists prepared to take part in the scientific investigations of the station under the leadership of the Director, and to help with such other duties as may be necessary from time to time in connection with the station or hostel. Anyone else wishing to visit the island will be made welcome, provided room is available. Those who are not keen ornithologists are asked to book for the summer months—June, July, and August—so that more accommodation will be available in the Spring and Autumn for students of bird migration. Application should be made as follows :—

(1) **If made between 1st April and 31st October.**
To the Director, Fair Isle Bird Observatory, by Lerwick, Shetland. Telegraphic address: " Migrant, Fairisle." Telephone: Fair Isle 8.

(2) **If made between 1st November and 31st March.**
To the Director, Fair Isle Bird Observatory Trust, 17 India Street, Edinburgh. Telephone: Edinburgh CENtral 4532.

Prospectus.—Giving details of transport to and from Fair Isle, and other information, will be sent on application.

Scientific Publications.—Subscribers can obtain reprints of the Scientific Publications of the Observatory free on application to the Secretary.


FAIR ISLE BIRD OBSERVATORY
0 100yds. 440yds. 880yds. 1 mile
Roads
Bird Trap TRAP
Boundaries
Niv
North Light
Kristal Kama
Skroo
Mopal
Golden Metal
Kubble Skerry
Wirrie
Heads o' Petteron
Ward Hill
TRAP
Toor o' dee Hard Hill
Toor o' Larness
Stacks o' Skroo
Da Flees o'
Sutherland
Wester Lother
Easter Lother
WIRVIE BRECKS
Burn of Reterengie
Burrista
Brettil Stack
BURRASHIELD
Sukka Moor
EAS BRECKS
Burn of Houlland
Old Hill Pond
Vaadal
Will Gingerbite
Hill Pond
BIRD OBSERVATORY
NORTH HAVEN
North Gavel
Buness
South Naven
Outfield
Funniequoy
South Gavel
Keesta
Black Coastal Rivlet
HOINI
Hundi Stack
Pund
Setter
Field
Gowans
Hamnigio
VAASETTER
Shaldi Cliff
Sheep Craig
Da Holes
Reeva
Stackhoof
Fugli Stack
Mekum
Head
Maovie Tongue
Church
Rippack
Whaleback
Swarta Glo
Brecks
Springfield
Da Flaas
Hjuberg
Da Barrien
Meoness
SOUTH HARBOUR
Head of Tind
Skadan
South Light
Da Skerry
Da Kwes
Shetland Is.
Fetlar
Lerwick
Foula
Grutness
FAIR ISLE
Orkney Is.
Stromness
Wick