

THE THIRD ANNUAL REPORT
OF THE
SEVERN
WILDFOWL
TRUST
1949-1950



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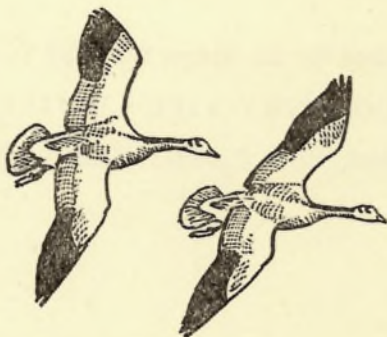
THE SEVERN WILDFOWL TRUST

THE NEW GROUNDS . SLIMBRIDGE . GLOUCESTERSHIRE

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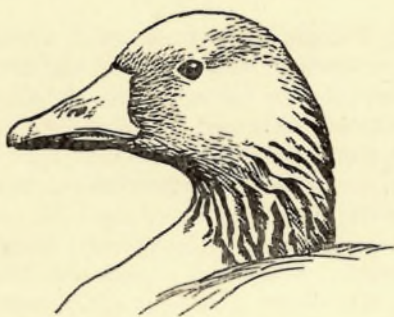
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REPORT

IN ITS third year of work the Trust has laid emphasis on the scientific research which is one of its principal objects. Members will recall that it was established in order 'to promote the study of wildfowl' and also 'to establish and maintain a wildfowl research observatory'. It is satisfactory, therefore, to record that the New Grounds are now included in the Bird Observatories Scheme of the British Trust for Ornithology. The promotion of the study of wildfowl has not only scientific and educational significance, but also a particular application to the decline in the world-stocks of many species of ducks, geese and swans. Although this downward trend is recognised by many, it is very difficult, especially in Europe, to determine the rate of decline and to supply data which make the trend apparent. Much attention has therefore been given to the extension of the ringing effort and to the development of quantitative techniques for the measurement of wildfowl production. This work requires the support of all who are concerned with the continued survival of the birds; it is in the interests of the wildfowler no less than of the ornithologist and bird lover.

Another important project during the past year was the active part taken by the Trust in the attempt to save the Hawaiian Goose (*Branta sandvicensis*) from imminent extinction.

The Council presents a full report of these activities in the pages which follow. The first part deals with the ornithological results, which occupy the period from April 1949 to April 1950. April is the most convenient break in the Trust's year because by then the wild geese have left the estuary, the wild ducks have left the decoy and the breeding season of the waterfowl in the collection has scarcely begun.

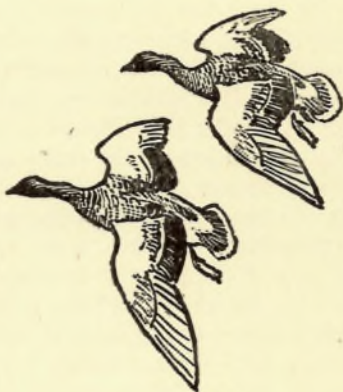
Administrative and financial arrangements follow the ornithological data, and the Minutes of the Annual General Meeting appear on page 70. After the section of photographs, there is a coloured key to the swans and geese of the British Isles. It is hoped to complete the series of plates of the British wildfowl in subsequent reports.

WILD GEESE

GEESE were present on the estuary from 25th September to 15th March. Seven kinds were seen during the period: Pink-footed (*Anser brachyrhynchus*), Bean (*A. f. fabalis*), White-fronted (*A. a. albifrons*), Greenland White-fronted

(*A. a. flavirostris*), Lesser White-fronted (*A. erythropus*), Greylag (*A. a. anser*), Barnacle (*B. leucopsis*).

The earliest arrival was a single White-front which appeared on 25th September. For nearly a week, however, it was alone and the first Pink-feet, a flock of 31, arrived on 1st October. On the following day 18 White-fronts joined them, and subsequently the numbers increased to about 700 in the normal manner. But the main influx was more than two weeks later than usual and took place during the first week in January. As usual the flocks consisted mainly of White-fronts. The Pink-feet never numbered more than 62 and left, as they have previously done, during the last week of November. Although they arrived late the main flocks of White-fronts reached a peak on 29th January, when the estimated number was 3,500. There were over 2,000 geese on the estuary from 22nd January until the last week of February. The main departure took place on 4th-5th March and odd birds only were left by 7th March.



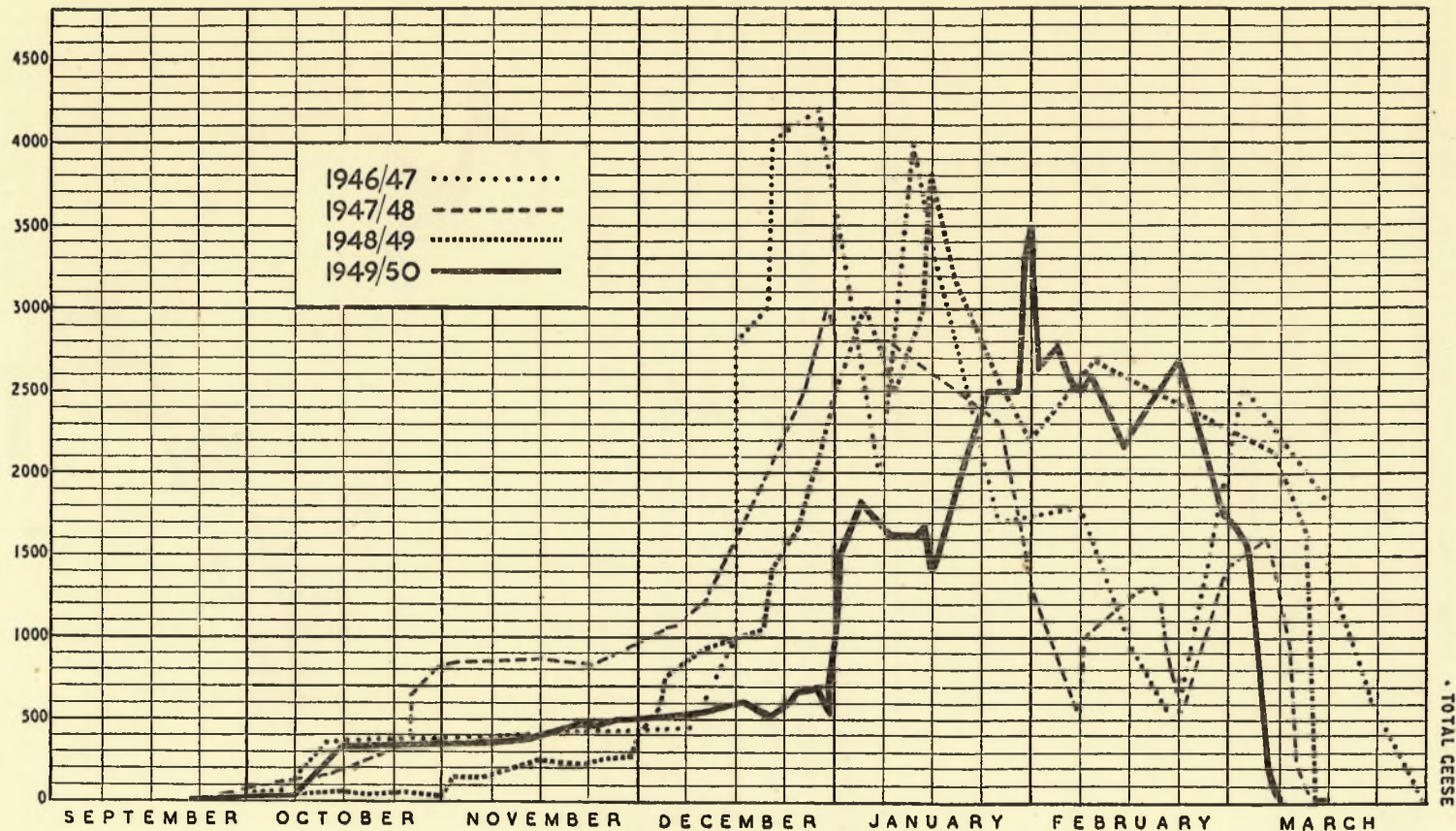
PINK-FOOTED GOOSE (*A. brachyrhynchus*)

TABLE I
COUNTS OF PINK-FOOTED GEESE

Date	Number	Date	Number	Date	Number
October 1st	31	October 17th	60	December 2nd	22
" 2nd	24	" 30th	60	" 3rd	22
" 4th	30			" 10th	7
" 6th		November 5th	56	" 12th	7
" a.m.	44	" 16th	61	" 14th	7
" p.m.	52	" 17th	55	" 15th	7
" 7th	52	" 22nd	24	" 16th	7
" 8th	52	" 23rd	18	" 17th	7
" 9th	52	" 25th	29	" 18th	7
" 13th	52	" 28th	27	" 19th	7
" 14th	52	" 29th	28	" 21st	7
" 15th	58	" 30th	28	" 23rd	7
" 16th	62				

One present 3rd February to 2nd March.

TOTAL NUMBER OF WILD GEESE ON THE NEW GROUNDS 1946-50



GRAPH I—TOTAL NUMBERS OF GEESE (COMPARED WITH PREVIOUS SEASONS)

The following Table of maximum numbers of Pink-feet, although incomplete, demonstrates the remarkable decrease in numbers of this species on the New Grounds during the last 12 years :

TABLE II
MAXIMUM NUMBERS OF PINK-FOOTED GEESE SINCE 1933

1933	1250	1944	105
1934	1250	1945	80
1935	550	1946	97
1937	1050	1947	120
1938	650	1948	58
1941	55	1949	62
1943	110		

BEAN-GOOSE (*A. f. fabalis*)

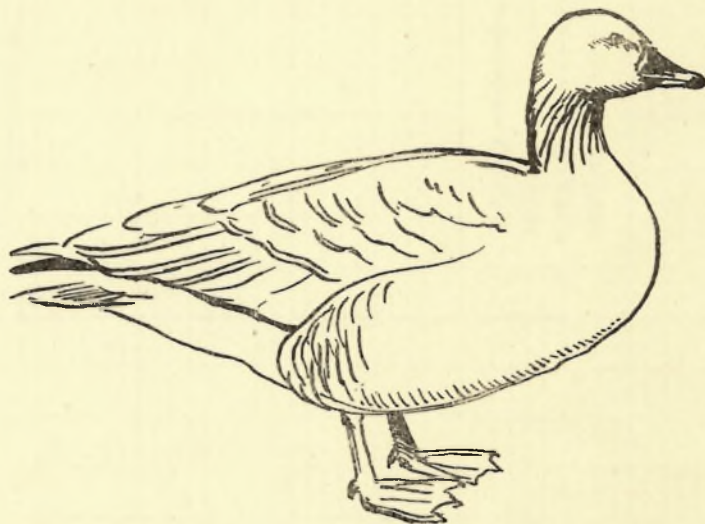
Two Bean Geese visited the Dumbles during the season, as follows:—

One; adult seen 7th February (H. J. B.), 17th February (H. J. B.).

Second; possibly second winter seen 8th February (H. J. B.), 10th February (P. S.), 24th February (H. J. B.), 28th February (H. J. B.).

Single bird (identity not established) seen 23rd February (H. J. B.), 1st March (H. J. B.).

Two seen at the same time 26th February (K. Shackleton).



Bean Goose

WHITE-FRONTED GOOSE (*A. a. albifrons*)TABLE III
COUNTS OF WHITE-FRONTED GEESE

Date	Time	Total	Accuracy	Date	Time	Total	Accuracy
1949				1950			
Sept. 25th	—	1	—	Jan. 1st	Morning	1020	± 20
Oct. 2nd	—	18	—	2nd	Morning	1347	± 50
4th	—	18	—		Morning	1317	—
6th	—	20	—	3rd	Morning	1408	± 50
7th	—	20	—		Late		
8th	—	34	—		morning	1464	—
9th	Morning	72	± 1		? Afternoon	1545	—
	Afternoon	78	± 1	4th	Morning	1730	± 50
13th	—	323	—	5th	Morning	1526	—
14th	—	357	—		Late		
15th	—	360	—		afternoon	1820	± 40
16th	—	360	—	7th	Early		
17th	—	354	—		morning	1790	± 30
30th	—	361	± 5		Late		
Nov. 5th	—	371	—		morning	1555	± 40
13th	—	400	—	9th	Morning	1656	± 50
17th	—	455	± 5	13th	Afternoon	1609	± 50
22nd	Afternoon	462	—	14th	Morning	1680	± 100
23rd	Morning	485	—	15th	Morning	1470	± 10
24th	Morning	452	—	16th	Morning	1530	± 50
25th	Morning	476	—	17th	Morning	1520	± 50
26th	—	475	—	18th	Morning	1590	± 20
27th	Morning	531	—	20th	Early		
28th	Morning	497	—		afternoon	1693	± 75
30th	Morning	535	± 15		Late		
Dec. 2nd	Afternoon	545	± 50		afternoon	1978	± 50
3rd	Morning	518	± 10	22nd	Morning	2430	± 100
5th	Morning	510	± 30	23rd	Morning	2500	± 200
7th	Morning	556	± 30	27th	Afternoon	c.2500	± 300
9th	Morning	535	± 10	28th	Afternoon	c.2800	—
12th	—	607	—	29th	Morning	c.3500	± 500
13th	Morning	598	± 10	30th	Mid-		
14th	Morning	623	—		afternoon	2630	± 50
16th	Morning	676	± 20	Feb. 2nd	Morning	2776	± 50
17th	Morning	642	± 20	7th	Morning	2470	± 300
18th	Morning	638	± 10	9th	Morning	2640	± 100
19th	Morning	662	± 10	13th	Morning	2150	± 100
20th	Morning	570	± 20	14th	Afternoon	2260	± 50
21st	Morning	564	± 10	17th	Morning	2470	± 50
23rd	Morning	540	± 10	21st	Morning	2700	± 40
	Afternoon	630	—	28th	Morning	1726	± 50
24th	Morning	610	± 10	Mar. 1st	Morning	1712	± 20
	Afternoon	680	—	2nd	Morning	1890	± 100
26th	—	712	—	3rd	Morning	1616	± 50
28th	Morning	660	± 20	4th	Morning	1543	± 30
29th	Morning	673	± 10	5th	Morning	212	± 2
30th	Morning	555	—	6th	Morning	77	± 1
31st	Morning	370	± 30	8th	Morning	1	—
	Afternoon	780	—	9th	Morning	1	—
				12th	Morning	4	—
				15th	Morning	4	—

The Proportion of Immature Birds

Observations have again been made of the numbers of young birds present in the flock, and the size of family parties ; these have tended to diminish confidence in the results previously obtained. It has been established that estimates of the proportion of immatures in the flock as a whole, which are based on counts of sample portions only, may be subject to error so large as to render such estimates useless for purposes of comparison. There is a tendency for families to aggregate, so that the distribution of young birds within the flock is far from random. If it is possible to examine the whole flock this source of error is, of course, eliminated, but this has not been found practicable when the total number of geese exceeds a thousand or so. A method of sampling which will increase the accuracy of estimates is being sought.

The data on family size are tabulated below. The absence of significant differences between the means for each month would seem to indicate that the families arriving at the New Grounds after Christmas were little, if at all, different in size from the earlier arrivals. No counts were made in November. The 'family' is here equivalent to the number of young in each party, excluding the adults. In compiling these data parties with three or more attendant adults were omitted.

TABLE IV
FAMILY SIZE IN WHITE-FRONTED GEESE

Period	No. of Families	Size of Family							Mean Size	σ_m (= standard error of the mean)
		1	2	3	4	5	6	7		
October ..	7	0	2	3	1	0	1	0	3.29	0.46
December ..	45	4	9	16	5	8	3	0	3.29	0.21
January ..	60	5	14	19	12	10	0	0	3.30	0.15
February ..	33	3	9	6	8	5	1	1	3.09	0.26
Whole season..	145	12	34	44	26	23	5	1	3.25	0.11

Dominance Relationships

The Resident Biologist, Mr. H. J. Boyd, contributes the following note on one of the special studies he has been undertaking during the past winter:

As a first step in an examination of the social structure of the flocks of wild geese, a study of dominance relationships has been begun. This aspect of social behaviour was selected for two reasons : first that the subject has already received a good deal of attention, and secondly that it permits of quantitative, or quasi-quantitative treatment. The latter reason is important because the use of numerical data capable of statistical evaluation minimises the need for intuitive skills in the observer.

The existence of dominance relations (i.e., super- and sub-ordination) between individuals in flocks of domesticated birds, especially poultry, has long been appreciated, and during the last 30 years a number of detailed investigations



into their nature have been made. The great majority of such studies have been made on birds in captivity, and the exceptions have related mainly to passerines and game birds. No extensive study appears to have been made with large flocks of wholly wild birds. Hence the desirability of an attempt to study dominance in the geese on the Dumbles. It is necessary to write of 'an attempt' because there are considerable practical difficulties in observing groups of hundreds or thousands of birds. All studies of dominance have depended on the ability of the observer to distinguish between the individuals in the group (usually by means of colour-ringings). The colour-marking of the whole of the wintering flock of White-fronts is an unlikely eventuality, and even if it were achieved it would be impossible to study the relationships of all the birds with each other. It is necessary, therefore, to resort to some kind of sampling, and in the work carried out last winter the procedure followed was to pick out readily identifiable birds (such as, for example, those with unusual breast-markings or other peculiarities of plumage) and follow them for as long as possible, noting the nature and frequency of their contacts with neighbouring birds and the results of their conflicts.

The accumulation of such records for individuals, *qua* individuals, is unlikely to produce much of value, but note was taken of the family status (i.e., whether adult or juvenile, paired or single, size of family if paired) of all the birds studied and it became apparent that this was important in determining the attitude of the individual to its neighbours, and their attitude to it. The detailed working out of relationships on these lines will require the accumulation of a large number of observations. The limited information so far available indicates that birds initiating conflicts are almost always successful and that adults with families take the initiative more than those without young, and much more than do single birds.

It might seem that dominance should be regarded as something tending to break up a group rather than keep it together, but there are arguments suggesting that it has survival value. In any event there must be other cohesive factors, especially those which hold together the family as a unit. Such possibilities as the use of signal movements and calls have still to be fully investigated, and it is here that the geese in the collection should be of use for experimental checking of observations on the wild birds.

Marked and Distinguishable Geese

The White-front gander with the unusual head-markings known as 'White-eyebrows' appeared for the third consecutive season on 10th January (N. G.

Blurton Jones) and remained at least until 22nd February. This time, it was unpaired whereas throughout the previous season it was paired.

Rings were seen on White-fronts indicating that four ringed birds were present during the winter. These are probably some of the 15 ringed on the original rocket-net occasion on 18th February, 1948. They were as follows:

- (a) Adult (probably ♀) with mate and three young: metal ring right leg, seen 18th January, 22nd February.
- (b) Adult (no note of family): metal ring right leg. (1204--) seen 7th February.
- (c) Adult (? sex) with mate and four young: metal ring right leg, seen 8th February.
- (d) Adult, perhaps paired but without young: metal ring *left* leg, seen 22nd February.

During the season 1947-48 all birds were supposedly ringed on the right leg. Bird (d) is therefore either one ringed elsewhere (we have no information that White-fronted geese of this subspecies have been ringed elsewhere) or was ringed on the left leg in error—a possibility in view of the general haste which follows a catch with the rocket-net.

Rocket-nets

On 27th February the nets were thrown over 71 Geese. They were ringed and marked with red dye (Rodamine) on the tail coverts (upper, lower and sides). The rings were standard B.T.O. No. 5 clip type, dyed red and anodized. They were put on the right legs of the geese. Two of the 71 which seemed to have been slightly damaged by the nets were brought into the pens. The remainder were released immediately.

The geese flew in over the Dumbles again before the last birds had been extricated from the net, and on the following day the main flock was feeding about 300 yards from the scene of operations.

Ringed and dyed birds were seen frequently during the remaining week before the departure of the geese on the northward migration. The red dye appeared to have washed out considerably on some of them. Further experiments on a more lasting dye are in progress.

Migration Routes

The following notes have been received concerning the movements of geese in March 1950 which may have been on their way from the New Grounds.

4th March. 5.15-5.30 p.m. Stroud, Glos.

'Two V's flying north.' Reported by H. Bassett.

4th March. 6 p.m. Burford, Oxon.

'Several hundreds, travelling in an easterly direction, at a not very great height. They were formed in about six skeins'. Reported by P. Thomas.

8th March. Early afternoon. Codsall (west of Wolverhampton).

'Hundreds, flying from west to east'. Reported by the Birmingham and West Midland Bird Club.

8th March. 3.15 p.m. Sutton Coldfield.

'150-200 birds, flying east'. Reported by the Birmingham and West Midland Bird Club.

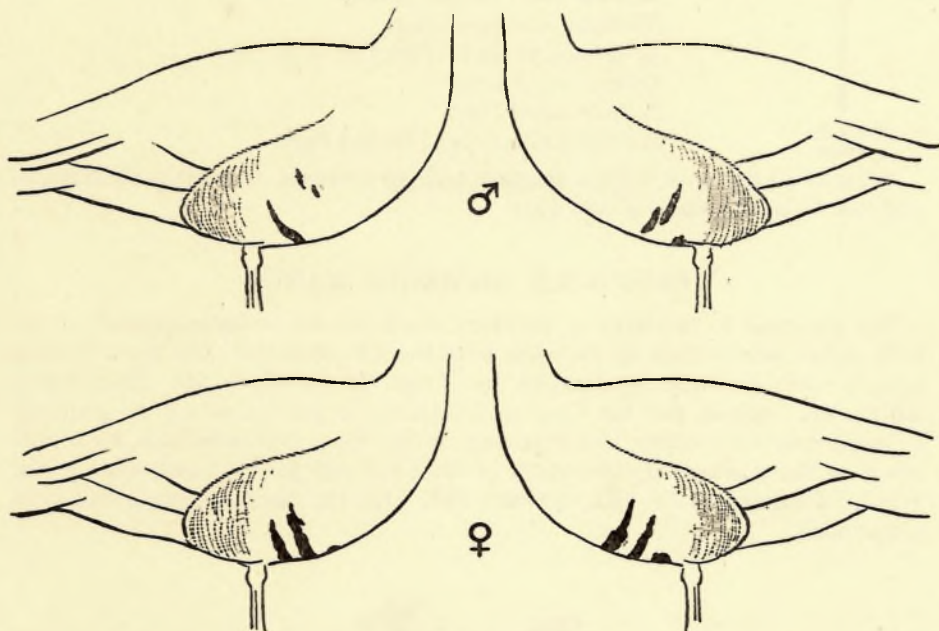
There is some possibility that flocks of White-fronts in Cheshire and Lancashire may have been augmented from the Severn during the first week of March.

GREENLAND WHITE-FRONTED GOOSE (*A. a. flavirostris*)

A family party of two adults and three young was first noticed on 9th November, and remained throughout the winter. The birds were last seen on 3rd March (possibly 5th March). One of the young birds had a malformed bill, with lower mandible projecting beyond the upper. The arrival of this party coincided with the arrival of a similar family party—also of five—which spent the winter on Bellfields Reservoir, Staffordshire.

LESSER WHITE-FRONTED GOOSE (*A. erythropus*)

An adult pair was first seen 6th January and remained until 1st March. Their breast-markings are figured below. This is the first time that two of these birds have ever been recorded in company in this country.



An immature (the first immature recorded since the original bird was shot in 1881 in Northumberland), was seen on the following dates: 15th January (R. S. R. Fitter, J. Fisher, J. S. Huxley), 22nd January to 12th February (H. H. D., P. S., P. T. P., H. J. B.), 1st March (E. Overend, P. Glasier).

These three birds are the tenth, eleventh and twelfth authentic records for the species in this country.

GREYLAG GOOSE (*A. a. anser*)

A single bird, probably immature, was present from 3rd January till 1st March. Two were reported seen at once in widely separated parts of the flock on 1st March, and thereafter one was present, possibly the new one, until 15th March.

BARNACLE GOOSE (*Branta leucopsis*)

One; adult present from 5th November till 27th February.

CANADA GOOSE (*B. c. canadensis*)

Five in pens from 27th March to 13th April,

VEGETATION OF THE DUMBLES



*Puccinellia
maritima*

A preliminary study of the botany of the principal feeding ground of the geese has been made by Mrs. M. L. Davis and Mr. I. W. Evans. The following species of *Gramineæ* were recorded on the Dumbles and the strip of vegetation now in process of formation on the mud bank (scientific names from British Ecological Society's "Check List of British Vascular Plants").

Phleum pratense Linn.

Agrostis tenuis Sibth.

Holcus lanatus Linn.

Spartina townsendii Groves.

Lepturus incurvus (L.) Druce.

Hordeum nodosum Linn.

Agropyron pungens (Pers.) R. & S.

Festuca ovina Linn.

Festuca rubra Linn.

Puccinellia maritima (Huds.) Parl.

A list of all plants is being compiled with an estimate of relative abundance, and will be published at a later date.

PROPOSED BOMBING RANGE

The proposal to establish a bombing range on the roosting ground of the wild geese, with a part of its circle covering the Dumbles—the main feeding ground—was strongly opposed by the Trust. In its efforts the Trust found widespread support and the Council is anxious to put on record its gratitude to those who took action in Parliament, in the Press and elsewhere. As a final result of these efforts the Secretary of State for Air gave an assurance in the House of Commons on 19th October, 1949, that the whole proposal had been abandoned.

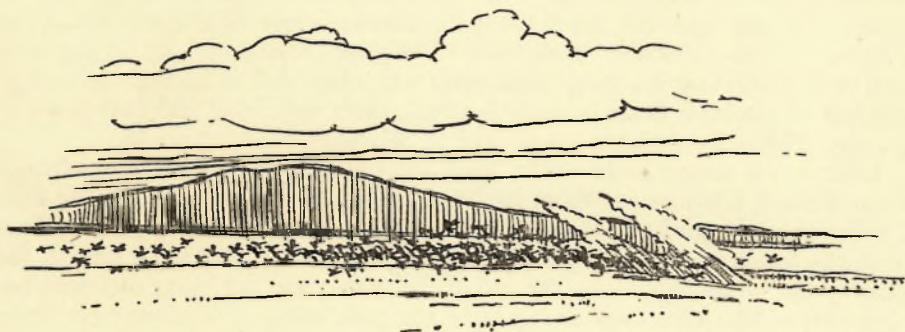


DISTURBANCE BY AIRCRAFT

Although the threat to open a bombing range on the estuary has happily been averted, the disturbance of the geese by aircraft was nevertheless very great. For some reason wild geese, and particularly White-fronted Geese¹ do not become used to aeroplanes. They take wing at once in great alarm at the approach of any aircraft which is heading towards them at a height of less than 5,000 feet and within a mile. This is particularly noticeable in the early part of the season when the flock is not very large. The geese appear to develop a kind of neurosis and fly out to the mudflats where they fancy themselves more secure. So serious did this disturbance become during November and December that the geese

¹ Barnacle Geese behave in the same manner.

were kept continuously off their feeding grounds by day and became largely nocturnal. An approach was made to the Air Ministry and to the Ministries of Civil Aviation and Supply in order to try to reduce the disturbance, and the situation was slightly improved. It has been observed for several seasons that the geese are less easily disturbed when the flocks are large. They seem to take confidence from their numbers. Thus the aircraft, although hardly less numerous after the arrival of the main flocks in mid-January, constituted a much reduced disturbance and the geese returned to daylight feeding on the Dumbles. Even then, however, they normally rose at the approach of aircraft. This is usually disastrous for the watchers, because the geese settle further from the sea wall and the observation huts. By the time that they have fed in towards the bank the next aircraft has raised them again, so that in the average day of good flying weather serious observation of the geese has become almost impracticable. It is greatly to be hoped that, with the co-operation of the Ministries concerned, it will be possible to keep the area more free from low-flying aircraft during next winter. In view of the unique opportunities offered by the Trust in the scientific and educational field if this disturbance can be averted, it would seem that the effort is fully justified.



Rocket Nets. Scotland, Spring 1950

MARKING OPERATIONS AWAY FROM THE NEW GROUNDS

Between 21st and 28th March a team from the Trust consisting of the Director, H. J. Boyd, Lord G. Percy, R. J. F. Taylor and Miss P. Talbot Ponsonby, ringed 36 geese on the Solway Firth by means of the rocket-nets. Four small catches were made: 7 Pink-feet, 3 Greylags, 25 Greylags, 1 Greylag. The birds were ringed with red anodized rings on the right leg, and a number of them had the tail coverts dyed purple with gentian violet. With the co-operation of the International Wildfowl Research Institute, ornithologists throughout Europe, were informed of these catches and of the White-fronts marked on the New Grounds in order to make the best use of even this small sample.

Although the catch in Scotland was disappointingly small, owing to a number of material failures and mishaps, so much was learnt and so much improvement in the equipment was planned that much larger catches are confidently expected next season.



WILD DUCKS

THE DECOY

The Lead

THE 'lead' in the duck decoy this season was considerably better than last. During September there were at times as many as 400 wild ducks on the pool, which, it will be remembered, is no more than three-quarters of an acre in extent and less than 100 yards from the Headquarters buildings. During the evening of 25th September there were 72 Wigeon (*Anas penelope*) on the pool and on the following morning (when there was a big tide), in addition to a large number of Mallards (*Anas p. platyrhynchos*), there were over 100 Teal (*Anas c. crecca*), 32 Pintails (*Anas a. acuta*) and 11 Shovelers (*Anas clypeata*).

Later in the season however the 'lead' was not well maintained. Disturbance from farming activities and from the Trust's many visitors who, in the Big Pen, are less than 50 yards from the pond, caused a sharp decline in the numbers of ducks regularly using the pool. Nevertheless about 25 Teal were present for most of the winter and during the end of November and beginning of December a number of Shovelers came in regularly, the peak being on 4th December when 53 were present. A number of Pintails were present throughout the winter (up to 40 on 5th February) but these spent more time in the Rushy Pen than in the decoy. The comparatively small numbers of Wigeon during the later part of the season were a great disappointment especially after the good flocks of September.

Other species recorded were Garganey (*Anas querquedula*), Gadwall (*Anas s. strepera*), Pochard (*Aythya ferina*) and Tufted Duck (*Aythya fuligula*).

The Catch

In spite of the failure of the 'lead' in the latter half of the season, the total catch of 609 ducks was a very considerable improvement on last season. Of these, 524 were ringed, the remainder being birds already ringed which were recaptured. The details are shown in Table V.

The best individual catch was on 13th September when 55 birds (49 Mallards, 6 Teal) were taken at one run in the North Pipe. On 24th September the journal reads as follows: 'A red-letter day in the Decoy, and a Saturday to boot, with a fairly large attendance in the pens. In the morning we took 24 birds, including 2 Shovelers and 2 Wigeon which were banked in the North Pipe, and then worked the dog in the House Pipe and caught 31 more—55 for the morning.

In the afternoon we tried a new technique. The wind having changed after a shower, we took a spare tunnel net to the West Pipe and caught the birds banked in it (20), then, without ringing the first lot, we quickly put on the second net and dogged, getting a further 15. Next we went round to the South Pipe and dogged again, getting 13. This brought the days total to 103, of which 10 were recaptures, one in the afternoon a recapture from the morning'.

Apart from ducks, 6 Herons (*Ardea cinerea*), 1 Common Sandpiper (*Actitis hypoleucos*), 2 Water-rails (*Rallus aquaticus*) and a number of Moorhens (*Gallinula chloropus*) and Blackbirds (*Turdus merula*) were captured and ringed.

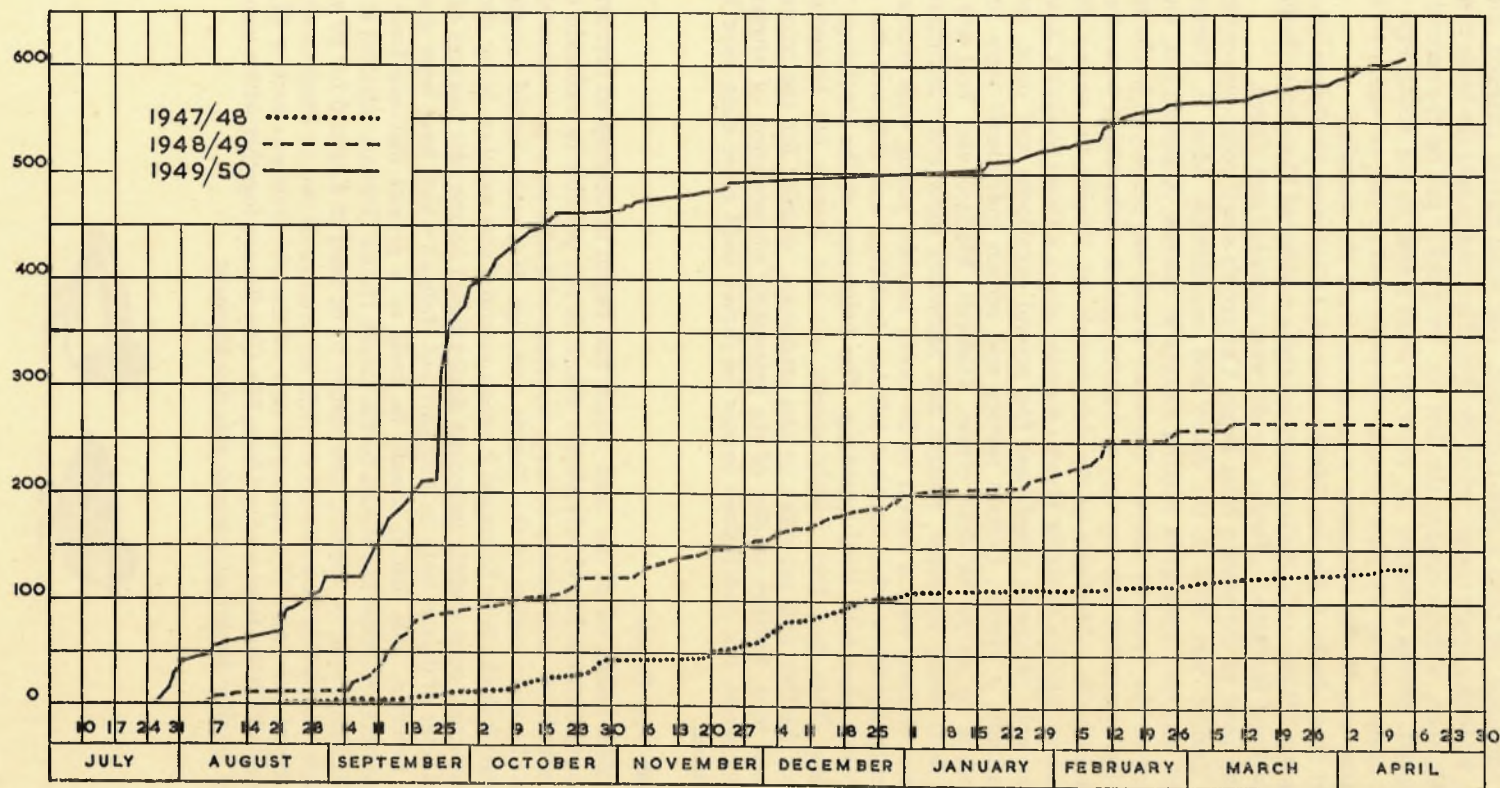
During most of the season Miss Peggy Cameron's small collie-type mongrel puppy 'Laddie' was used in the decoy and occasionally Miss E. Overend's 'Blondel' was instrumental in making successful catches. A stuffed fox, kindly presented to the Trust by Messrs. Rowland Ward, was employed in the latter part of the season but was not very successful against ducks which were already familiar with the subterfuges of the decoyman's art. During the season ducks were seen to follow a Sparrow Hawk (*Accipiter nisus*), a Grass Snake (*N. natrix*), a Water Vole (*Microtus amphibius*) (on several occasions) and once, rather half-heartedly, a Heron. Certain species and certain individuals seem to be more prone to attraction than others. Gadwall, Mallard and Teal are the species most easily attracted. Pintails and Shovelers show some indifference. A female Mallard with a brood of 24 newly hatched young ones (some no doubt collected from other females) left her ducklings and followed the dog far into the pipe with loud quacking. The behaviour of the ducklings was interesting. They had been widely spread out and feeding but immediately clustered together and sat more or less stationary, waiting for the return of the parent bird. Further studies of the interesting phenomenon of attraction are being made, but conclusions cannot be drawn until more data have been accumulated.

Proposed New Decoy

The rapid falling off of the 'lead' which had begun to develop so favourably in the early autumn has clearly shown that it is not possible to maintain conditions which are satisfactory to large numbers of ducks on a pool situated so close to the main centre of the Trust's activities. If a really useful sample of the estuary's ducks is to be ringed it seems essential that another decoy should be constructed, on a slightly improved design based on the best features of the large number of decoys both in England and Holland which have been studied by the Director, and that it should be built at a greater distance from the Headquarters. An ideal site would be the Goose House Ground, adjacent to the sea wall. This would be the first new decoy to be built in England for 80 years and might reasonably be expected to yield an average of two to three thousand ducks ringed per year. The estimated cost of the construction work is £1,500 and already £500 has been received from Mr. Guy Benson together with a number of other smaller donations towards this development.



PROGRESS OF TOTAL CATCH IN DECOY 1947-50



GRAPH II



TABLE V
CATCH AND RINGING FIGURES

Seasons	..	..	..	1946-7	1947-8	1948-9	1949-50	Total
Mallard	{	Ringed	..	3	64	102	410	579
		Recaptures	..	—	6	19	71	96
		Total Catch	..	3	70	121	481	675
		Recoveries	..	1	8	11	20	40
Teal	{	Ringed	..	2	24	24	56	106
		Recaptures	..	—	—	7	2	9
		Total Catch	..	2	25	31	58	116
		Recoveries	..	—	5	1	4	10
Wigeon	{	Ringed	..	—	19	52	19	90
		Recaptures	..	—	—	20	2	22
		Total Catch	..	—	21	72	21	114
		Recoveries	..	—	4	7	3	14
Pintail	{	Ringed	..	—	2	13	17	32
		Recaptures	..	—	1	4	5	10
		Total Catch	..	—	3	17	22	42
		Recoveries	..	—	—	1	—	1
Shoveler	{	Ringed	..	—	9	26	23	58
		Recaptures	..	—	—	—	3	3
		Total Catch	..	—	9	26	26	61
		Recoveries	..	—	5	5	2	12
Garganey	{	Ringed	..	1	2	1	1	5
		Recaptures	..	—	—	—	—	—
		Total Catch	..	1	5	2	1	9
		Recoveries	..	—	—	—	—	—
Total	{	Ringed	..	6	120	218	526	870
		Recaptures	..	—	7	50	83	140
		Total Catch	..	6	133	269	609	1017
		Recoveries	..	1	22	25	29	77

TABLE VI
METHODS OF CAPTURE IN DECOY

Season	Without Dog				With Dog				Total		
	No. of Ducks	No. of Catches	Average No. of Ducks per Catch	Per cent. of Total Catch	No. of Ducks	No. of Catches	Average No. of Ducks per Catch	Per cent. of Total Catch	No. of Ducks	No. of Catches	Average No. of Ducks per Catch
1946-47 ..	6	3	2.00	100	—	—	—	—	6	3	2.00
1947-48 ..	84	47	1.79	63.2	49	14	3.50	36.8	133	61	2.18
1948-49 ..	190	98	1.94	70.6	79	19	4.37	29.4	269	117	2.29
1949-50 ..	432	101	4.27	70.8	177	30	5.90	29.2	609	131	4.66
Grand Total	712	249	2.86	69.9	305	63	4.84	30.1	1017	312	3.26

STATUS OF DUCKS

No very great quantities of ducks have been present at any time during the winter in the neighbourhood of the New Grounds. The largest counts of Mallards were between 1,300 and 1,400, and up to about 2,000 Wigeon were estimated. Accurate counting of ducks is very difficult, since a good view of the roosting grounds by the river channel cannot be obtained without disturbing the wild geese. It is intended to construct a special hut at the end of Middle-point Breakwater, with covered access, in order to command a view of the channels and sandbanks, but the Trust's resources may not permit this development in the immediate future.

Counts were made as frequently as possible and in particular on the dates called for by the Wildfowl Count Group of the Wildfowl Inquiry Committee.

The numbers of Shelducks increased as usual during February, the highest count being 184. Special observations will be made during July following the recent discoveries made by R. A. H. Coombes,¹ J. Hoogerheide and W. K. Kraak² which indicate that Shelducks from this country migrate eastwards in late summer apparently in order to moult in the Heligoland Bight, returning by easy stages during the following winter.

SHELDUCK (*Tadorna tadorna*)

Only small numbers bred on the estuary. Numbers remained low until late January. Thereafter birds increased; 68 on 5th February; 184 on 20th February.

PINTAIL (*Anas a. acuta*)

Numbers seen on the estuary varied widely, with a maximum of 150 or more

¹ Ibis 92 (3): 405-418, 1950. ² Ardea 31: 1-19, 1942.

on 12th March. More than 200 were reported in the flooded Tack Piece on 12th February (K. Shackleton). Up to 25 frequented the Rushy Pen from end of December till end of February. Over 40 on 5th February.

TEAL (*Anas c. crecca*)

Numerous on the estuary from September to March. No good counts were made in the early part of the winter, but c. 600 on 25th September; in February (410 on 20th) it was the most abundant species of duck on the river. The maximum number seen in the decoy was over 100 on 26th September. There was some indication of small numbers of fresh birds passing through at the end of March and beginning of April.

MALLARD (*Anas p. platyrhynchos*)

The population around Headquarters comprises a mixture of hand-reared and wild birds defying adequate analysis. The largest number seen on the estuary was c. 1,300 on 25th September, and counts fluctuated subsequently between 700 and 1,300 until early February. In mid-February the population declined sharply, so that by early March only about 50 were present.

GADWALL (*Anas s. strepera*)

A pair of wild birds appeared on the decoy on 31st October. The female indicated by her behaviour when the pair flew in to the Big Pen at feeding time that she was the unringed bird of the two females which arrived on 27th October, 1948, and left on 15th April, 1949. The pair had gone on the following day but returned on 18th November, and thereafter remained throughout the winter. As before, the female, although frequently feeding at one's feet defied capture, and the male who soon became as tame as his mate, could not be caught either.

A further female appeared for one day on the decoy on 11th December.

WIGEON (*Anas penelope*)

Large numbers on the estuary from November to early February (well over 1,000 on several occasions and up to 2,000 in mid-November). Very few seen after middle of February. Largest number in decoy 72 on 25th September. Thereafter disappointingly few. A few reappeared in decoy in April. Up to 15 regularly in Rushy Pen from November until early February. At least two males have become exceptionally tame and one appears to have been continuously present for 18 months.

GARGANEY (*Anas querquedula*)

Nine during year: one caught in decoy 16th April, 1949. One female in Rushy Pen from 28th May-7th June. One male in eclipse plumage from 10th June-c. 15th June. One female caught in decoy 21st August. One male seen in decoy 4th September and two 25th September. A pair in Rushy Pen on 7th April, 1950.

SHOVELER (*Anas clypeata*)

Present in small numbers on estuary from August till April. Some numbers on decoy till end December: 6 on 28th July, up to 14 during August, 32 on 22nd November, 53 on 4th December, 22 on 4th January; few thereafter, but 5 in April. One male frequently in second decoyside pen with pinioned females,

during April and comparatively tame. Second male with damaged quill feathers usually on decoy or in Rushy Pen.

COMMON POCHARD (*Aythya ferina*)

Single males in the decoy 3rd and 31st December and 15th January (possibly the same birds). During the previous winter up to 9 Pochards had frequented the decoy regularly. It was disappointing that these did not reappear during the present season.

TUFTED DUCK (*Aythya fuligula*)

The female which spent the winter of 1948-49 in the Rushy Pen left on 15th April, 1949. Three males appeared for one day on the decoy on 4th July. One female also for one day on the decoy on 1st November.

RINGING AND RECOVERIES

(Anatidæ)



THE ringing of geese and ducks was undertaken as usual for the Wildfowl Inquiry Committee and the birds were made available for the Committee's Duck Adoption Scheme (by which for the sum of 5s. a duck which has been ringed may be adopted and any future information of recovery is communicated to the adopter. The resulting funds are devoted to the development of the Committee's ringing effort).

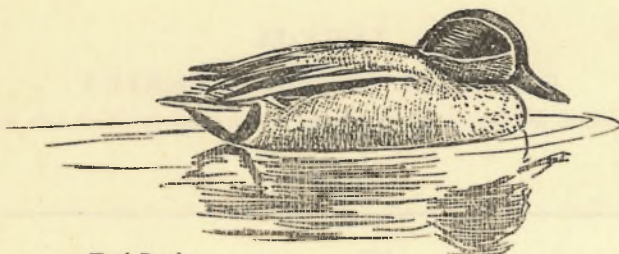
The rings used are, of course, those of the British Trust for Ornithology and carry the address of the British Museum of Natural History, London.

The following geese and ducks were ringed and released at the New Grounds during the year:

TABLE VII
BIRDS RINGED

Rocket-nets	Duck Decoy	Traps or other Methods of Capture
69 White-fronted Geese	410 Mallard 56 Teal 19 Wigeon 17 Pintail 23 Shoveler 1 Garganey	1 Mallard 6 Pintail 1 Teal

The following birds were ringed under the auspices of the Trust in Scotland—
Rocket-nets: 29 Greylag Geese; 7 Pink-footed Geese.

*Teal Drake*

RECOVERIES

Of the 883 ducks (870 in the decoy, 13 trapped) ringed at the New Grounds since November, 1946 when the Trust was formed, 77 have been recovered up till 30th April, 1950. This proportion will, of course, increase with the passage of time. For instance 534 of the 883 were caught in the present season, yet out of the 534 only 29 have so far been recovered, whereas of the 349 ringed in previous seasons already 48 have been reported—just under 14 per cent. Disregarding the current season's ringing, the following figures relate to the birds ringed up till the end of April 1949. Even these figures are likely to increase slightly.

TABLE VIII
PROPORTION OF RECOVERIES

Species	Number Ringed	Number Recovered	Percentage
Mallard	169	20	11.9
Teal	50	6	12.0
Wigeon	71	11	15.5
Pintail	18	1	5.6
Shoveler	35	10	28.6
Garganey	4	—	—
Gadwall	1	—	—
Tufted	1	—	—
Total	349	48	13.8

The longest and most interesting flights recorded were made by two Wigeon which were recovered beyond the Ural Mountains. A third Wigeon was also reported from Russia, and a Teal was recovered near Danzig. An example of abmigration was provided by a Mallard reared at the New Grounds which was shot near Hamburg the following summer—a very unexpected flight for a bird which in Britain usually appears to remain more or less resident in the vicinity of the breeding ground. A Pintail also reared at the New Grounds was shot in Queen's Co., Ireland. A Shoveler ringed in the decoy in September 1948 was found in Holland sitting on 11 eggs in April 1949. It was released and returned to the nest. One Mallard, 1 Wigeon, 1 Shoveler, and 2 Trust-reared Pintails were recaptured in the decoy in the season after they were ringed, and one Shoveler drake was recaptured two seasons later. Full details of the 56 recoveries about which we have received information during the past year are shown in the following Table:—

TABLE IX
DETAILS OF RECOVERIES

(Note.—The records of each species are placed in the order in which they were ringed.)

GEESE

Ring No.	Species	Date Ringed	Recovered
127316	Pink-foot	31. 8.48	Shot Dumfries, 29.1.50
127328	Pink-foot	—10.48	Shot Humber (Lincolnshire side), 21.1.49

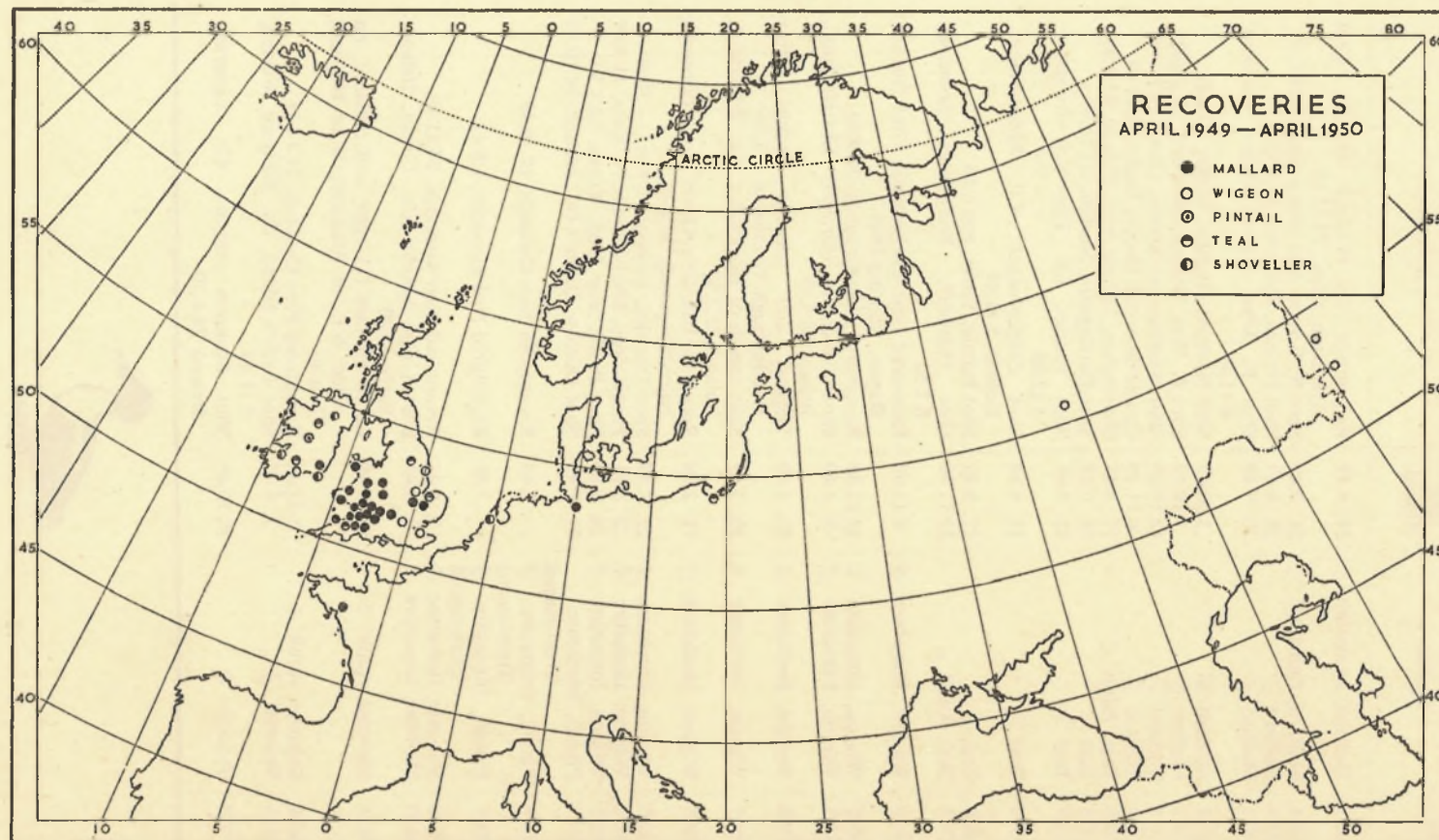
(Both these birds spent a winter and summer 'feather-cut'—i.e., temporarily unable to fly—at the New Grounds, but eventually flew off after growing their new primaries. The ringing dates are when they were last seen at the New Grounds.)

DUCKS

Ring No.	Species	Date Ringed	Recovered
926048	Mallard ♂	3. 3.48	Shot Bickington, near Barnstaple, Devon, 28.1.50
926062	Mallard, Trust-reared	8. 7.48	Recaptured New Grounds, 13.9.48. Shot R. Elbe, near Hamburg, Germany, 16.8.49
926447	Mallard, Immature ♂	6. 9.48	Shot Woodchester, Glos., —12.49
926483	Mallard, Immature ♂	18.10.48	Recaptured New Grounds, 10.2.50
926489	Mallard	—11.48	Skeleton found Clevedon, Somerset, 26.8.49
926491	Mallard ♂	8.11.48	Shot Criccieth, Caerns., Wales, 27.12.49
926524	Mallard ♀	29.12.48	Recaptured New Grounds, 20.10.49. Shot Wylle, Wilts, 2.1.50
926531	Mallard ♂	26. 1.49	Shot Hillington, King's Lynn, Norfolk, 3.11.49
926535	Mallard ♂	5. 2.49	Shot Tamworth, Staffs, 5.11.49
403706	Mallard ♂	30. 7.49	Shot Newcastle Emlyn, Carms., Wales, 4.1.50
403723	Mallard ♂	6. 8.49	Recaptured New Grounds, 17.9.49. Shot St. Marychurch, Glam., Wales, 17.12.49
403761	Mallard, Adult ♂	29. 8.49	Found dead in canal, Purton, Glos., —1.50
926471	Mallard	12. 9.49	Shot Lydbrook, Glos., 5.11.49
403768	Mallard, Immature ♂	13. 9.49	Caught Borough Fen Decoy, Northants, 22.11.49
403796	Mallard, Adult ♂	13. 9.49	Found dead, Arlingham, Glos., 31.1.50
403819	Mallard ♂	13. 9.49	Shot Paimboeuf, Loire Superieure, France, —1.50
403822	Mallard, Adult ♂	17. 9.49	Shot Ballingly Marsh, Co. Wexford, Ireland, 26.12.49
403833	Mallard, Adult ♂	17. 9.49	Shot R. Coln, Abbington, Glos., 1.12.49
403847	Mallard, Immature ♀	24. 9.49	Shot Bucknell, Shropshire, 31.1.50
927644	Mallard ♀	24. 9.49	Shot Bagington, Coventry, Warwickshire, 21.11.49
927652	Mallard, Immature ♂	24. 9.49	Shot Meare, Somerset, 24.11.49
927606	Mallard, Immature ♂	24. 9.49	Shot Andoversford, Glos., 26.12.49

Ring No.	Species	Date Ringed	Recovered
927663	Mallard, Immature ♂	24. 9.49	Recaptured New Grounds 26.9.49. Shot Aylburton, Glos., 23.12.49
927664	Mallard, Immature ♀	24. 9.49	Shot R. Severn, near where ringed, 28.1.50
927699	Mallard ♂	26. 9.49	Shot Nailsea, Somerset, 30.1.50
927811	Mallard ♂	30. 9.49	Shot R. Wye, Kerne Bridge, Hereford, 4.11.49
403858	Mallard ♀	3.10.49	Shot Narberth, Pems., Wales, 5.11.49
927567	Mallard ♂	5.10.49	Shot R. Wye, Sellack, Hereford, 28.10.49
927577	Mallard ♀	12.10.49	Shot Westbury on Severn, Glos., 12.11.49
927589	Mallard ♀	6.11.49	Caught Boarstall Decoy, Bucks., 9.12.49
904161	Teal, Adult ♂	17. 9.47	Shot Sztum, Danzig Area, Poland, 15.8.49
906478	Teal ♀	18. 9.48	Shot Dersingham, Norfolk, 17.11.49
906529	Teal ♀	13. 9.49	Shot Thurles, Co. Tipperary, Ireland, 4.12.49
906530	Teal ♀	13. 9.49	Shot Castleplunkett, Co. Roscommon, Ireland, 5.11.49
906688	Teal ♂	17. 9.49	Shot Bedale, Yorks, end 1.50
906712	Teal, Adult ♂	22.11.49	Shot Huntspill, Bridgwater, Somerset, 8.2.50
906350	Wigeon, Immature ♂	8.11.48	Recovered near Chelyabinsk, Ural District, Russia, "Spring 1949"
906449	Wigeon, Immature ♀	13.12.48	Recaptured New Grounds, 30.9.49
906499	Wigeon, Immature ♂	8. 1.49	Shot Sverdlovsk (formerly Ekaterinburg), Russia, 18.5.49
906500	Wigeon, Immature ♂	25. 1.49	Trapped and released Peakirk, near Peterborough, Northants, 6.3.50
906505	Wigeon, Immature ♀	10. 2.49	Shot mouth of Blackwater, Co. Waterford, Ireland, 22.2.50
906508	Wigeon, Immature ♂	11. 2.49	Recovered Balakhna, Gorki Govt. (formerly Nijni-Novgorod), 30.4.49
906675	Wigeon, Immature ♂	22. 8.49	Shot Ditchley, Enstone, Oxon, —.10.49
906676	Wigeon, Immature ♂	22. 8.49	Found dead, Isle of Grain, N. Kent, 11.9.49
906691	Wigeon, Immature ♂	24. 9.49	Shot Pawll, near Hull, Yorks, 14.1.50
906517	Pintail, Immature, Trust-reared	11. 7.49	Shot Durrow, Queen's Co., Ireland, 10.10.49
926098	Pintail, Immature ♂ Trust-reared	—. 7.49	Recaptured New Grounds, 12.10.49
926099	Pintail, Immature ♂ Trust-reared	—. 7.49	Recaptured New Grounds, 1.8.49
904218	Shoveler, Immature ♂	12.10.47	Recaptured New Grounds, 24.11.49
906420	Shoveler, Immature ♂	19. 9.48	Shot Lough Sheelin, Co. Cavan, Ireland, Early 11.49
906421	Shoveler, Adult ♀	19. 9.48	Lifted off nest (11 eggs) and replaced, on polder S.E. of Alkmaar, Nord Holland, 24.4.49
906438	Shoveler, Adult ♂	5.12.48	Recaptured New Grounds, 14.11.49
906526	Shoveler ♂	3. 8.49	Shot Lady's Island, Co. Wexford, Ireland, 5.11.49
906707	Shoveler ♀	18.10.49	Shot Shannon Airport, Co. Limerick, Ireland 24.1.50





MAP SHOWING RECOVERIES

BIRDS (Other than Anatidæ) RECORDED AT THE NEW GROUNDS

THE following records refer to birds seen between 1st April, 1949 and 30th April, 1950. They do not purport to comprise a full list of the species of wild birds seen in the locality, such as was given in the Second Annual Report, but are restricted to the more unusual species, except where recent observations on familiar species are at variance with those previously recorded.

Principal contributors may be identified by their initials, as follows: H. J. B.—H. J. Boyd, S. T. J.—S. T. Johnstone, D. F. McK.—D. F. McKinney, P. S.—P. Scott.

JACKDAW (*Corvus monedula*).—Present throughout the year, though not plentiful October–December.

STARLING (*Sturnus vulgaris*).—No evidence of breeding. Seen in all months but in large numbers only from late January to March.

HAWFINCH (*Coccothraustes coccothraustes*).—One near central pill-box 12th January (D. F. McK.), one in Decoy Wood 16th January (S. T. J.), and another 30th March (D. F. McK.).

GOLDFINCH (*Carduelis carduelis*).—One pair nested in Orchard. Only a few seen, at irregular intervals, at other times of year.

LESSER REDPOLL (*Carduelis flammea*).—One in Rushy Pen 13th February (S. T. J.).

LINNET (*Carduelis cannabina*).—Very few seen, and only one winter record: small flocks reappeared at the end of March.

BULLFINCH (*Pyrrhula pyrrhula*).—Single birds often seen in Decoy Wood, and three 13th January, but no signs of nesting.

BRAMBLING (*Fringilla montifringilla*).—Four 28th November, nine 29th, five or more 30th, all near Goose House (H. J. B.), one 2nd December (H. J. B., M. J. Wotton), one in Big Pen 18th January (H. J. B.).

REED-BUNTING (*Emberiza schœniclus*).—Bred in Rushy Pen, and fairly numerous along nearby rhines, but not resident—only two seen in December and one in January.

TREE-SPARROW (*Passer montanus*).—Seen throughout year, but breeding still not proved.

MEADOW-PIPIT (*Anthus pratensis*).—Absent for most of December and January. Large passage movements apparent on several days in February and March.

[WATER-PIPIT (*Anthus spinoletta spinoletta*).—A pipit seen on the Dumbles 25th February was believed to be of this form (H. J. B., D. F. McK., D. Wood). Seen only at distances in excess of 30 yards, but in sunlight and with $\times 10$ and $\times 12$ binoculars and $\times 25$ telescope, it attracted attention by its larger size (about half an inch longer) as compared with nearby Meadow-Pipits and its Rock-Pipit-like stance. No streaking of the upper parts was evident: these were markedly greyer in tone than those of the Meadow-Pipits, especially on the nape. The breast was very pale with few (H. J. B.) or scarcely any (D. F. McK., D. W.) streaks, and the throat whitish. There was a pronounced whitish eye-stripe. In flight the outer tail-feathers appeared white. The colours of the soft parts could not be made out (H. J. B. thought the legs muddy), nor was a call-note distinguished.

The bird was in view for only a few minutes and subsequent search was rewarded only by a brief glimpse obtained by H. J. B., which added nothing to the details previously noted.]

ROCK-PIBIT (*Anthus spinoletta petrosus*).—One near Frampton Breakwater 15th January, two on Dumbles 3rd March (H. J. B.).

GREY WAGTAIL (*Motacilla cinerea*).—One in decoy 11th October (S. T. J.). One seen several times on canal during December (D. F. McK.).

WHITE WAGTAIL (*Motacilla alba alba*).—Four on Dumbles 19th April, 1950 (H. J. B., D. F. McK.).

PIED WAGTAIL (*Motacilla alba yarrellii*).—A nest with five young in Decoy Wood 16th May (S. T. J.). A few in pens during winter, much more plentiful on Dumbles (40 on 5th February the most noted).

NUTHATCH (*Sitta europæa*).—One in Decoy Wood 29th March (D. F. McK.).

MARSH-TIT (*Parus palustris*).—One seen in decoy 18th April (S. T. J.).

LONG-TAILED TIT (*Ægithalos caudatus*).—At least one pair nesting in Decoy Wood 1949 and 1950. Small parties seen frequently in winter (c. 20th–29th November (P. S.) the largest).

SPOTTED FLYCATCHER (*Muscicapa striata*).—Seven nests found in Decoy Wood (S. T. J.). First seen 16th May.

GOLDCREST (*Regulus regulus*).—One 1st April, 1949 (S. T. J.).

CHIFFCHAFF (*Phylloscopus collybita*).—Nested in Rushy Pen: first nest, with three eggs, found 30th April, 1949 (S. T. J.). First seen 7th April, 1949 and 21st March, 1950.

GRASSHOPPER-WARBLER (*Locustella naevia*).—One seen in decoy 7th May, 1949 (S. T. J.) and 30th April, 1950 (H. J. B.).

SEDGE-WARBLER (*Acrocephalus schænobænus*).—Nested in Decoy Wood (S. T. J.). First seen 7th May, 1949 and 30th April, 1950.

BLACKCAP (*Sylvia atricapilla*).—Seen in decoy 30th April, 1950.

WHITETHROAT (*Sylvia communis*).—A nest found in decoy 17th May (S. T. J.). First seen 26th April, 1949, 30th April, 1950.

WHEATEAR (*Enanthe ananthe*).—Seen near Frampton Breakwater in breeding season, but no nest found. One on sea wall near Goose House 29th November (H. J. B., D. F. McK.). First seen in spring 17th March, 1950.

WHINCHAT (*Saxicola rubetra*).—Present in Rushy Pen from 1st May through summer, but nest could not be found.

STONECHAT (*Saxicola torquata*).—A female in the Big Pen from 27th November to 14th January.

SWALLOW (*Hirundo rustica*).—One seen as late as 26th October (S. T. J.).

HOUSE-MARTIN (*Delichon urbica*).—Latest record 18th October. Two seen 26th March (S. T. J.).

SAND-MARTIN (*Riparia riparia*).—Last seen 18th October (S. T. J.).

GREEN WOODPECKER (*Picus viridis*).—Not seen in winter.

GREAT SPOTTED WOODPECKER (*Dendrocopos major*).—Seen occasionally in winter and spring.

LESSER SPOTTED WOODPECKER (*Dendrocopos minor*).—One in Decoy Wood 26th April, 1950 (H. J. B.).

BARN-OWL (*Tyto alba*).—At least two present throughout winter, persistently feeding in full daylight.

PEREGRINE FALCON (*Falco peregrinus*).—One, sometimes two, seen on Dumbles almost every day in winter.

HOBBY (*Falco subbuteo*).—One seen 15th September (J. Knowles, R. Parkes).

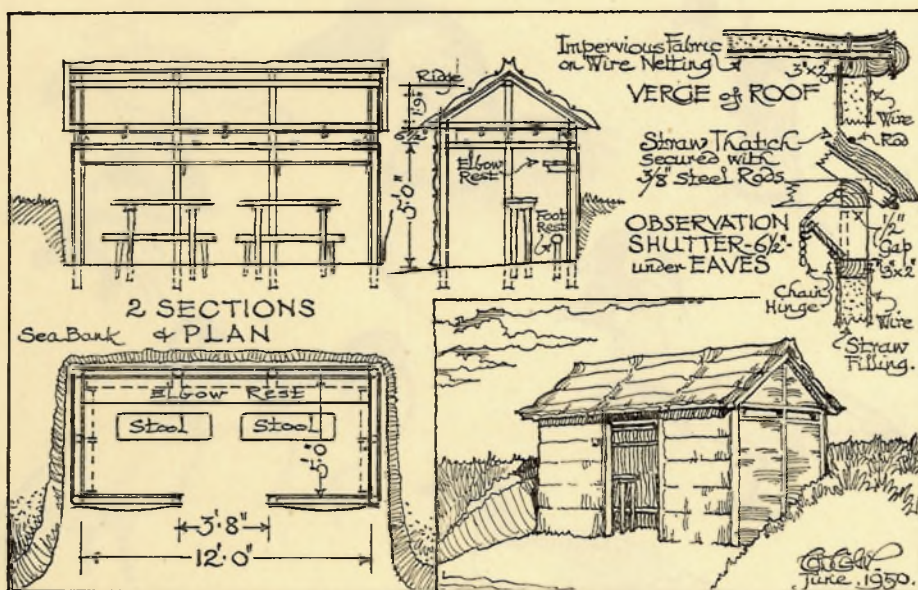
- MERLIN (*Falco columbarius*).—One 10th October (S. T. J.).
- COMMON BUZZARD (*Buteo buteo*).—Single birds seen over New Grounds 9th October (S. T. J.), 31st October (S. T. J., P. S.), 4th November (S. T. J.), 25th January (M. Everitt), 29th January (P. S. *et al.*), and 19th February (P. S.).
- SPOONBILL (*Platalea leucorodia*).—One seen on mud in estuary 29th October (—, Brown).
- BITTERN (*Botaurus stellaris*).—One flushed at close range from *Phragmites* west of Bottom New Piece 30th December (H. J. B.).
- Geese and Ducks: Details on pages 6 and 20, respectively.
- CORMORANT (*Phalacrocorax carbo*).—Present on the estuary from August to April. The numbers in winter remained nearly constant at 12-16.
- LITTLE GREBE (*Podiceps ruficollis*).—Up to three in decoy during August. One 22nd March (D. F. McK.).
- STOCK-DOVE (*Columba anas*).—No evidence of nesting. Fairly numerous in early part of winter but very few seen from January onwards.
- BAR-TAILED GODWIT (*Limosa lapponica*).—Fifty-two (eight in full breeding plumage) on Dumbles 14th May (M. J. Wotton).
- BLACK-TAILED GODWIT (*Limosa limosa*).—One 17th August (M. J. Wotton), two 4th September (A. Pritchard), and 9th September (J. Knowles, R. Parkes).
- COMMON CURLEW (*Numenius arquata*).—A flock of 15 in Big Pen 2nd July (J. Yealland). Numerous throughout autumn and winter on the estuary, 390 20th February, the highest count (H. J. B.).
- WHIMBREL (*Numenius phaeopus*).—One heard 5th March (B. King).
- WOODCOCK (*Scolopax rusticola*).—One in lane 26th February (G. Percy).
- GREY PHALAROPE (*Phalaropus fulicarius*).—One on flash in Tack Piece 9th-17th November (G. Percy, C. P. A. Garnett, P. S. *et al.*).
- TURNSTONE (*Arenaria interpres*).—Three 14th May (M. J. Wotton). Eight 8th September (J. Knowles, R. Parkes).
- KNOT (*Calidris canutus*).—Ten 17th August (M. J. Wotton), six 5th September (J. Knowles, R. Parkes), two 30th October (B. King).
- DUNLIN (*Calidris alpina*).—Present throughout winter, sometimes in large flocks, though biggest count only 350 6th February (H. J. B.).
- LITTLE STINT (*Calidris minuta*).—One 14th September (J. Knowles, R. Parkes).
- SANDERLING (*Crocethia alba*).—Twelve 14th May (M. J. Wotton). One 27th August (S. T. J.), one 5th September (J. Knowles, R. Parkes). Several among Golden Plover 13th December (D. F. McK.), five 22nd December (J. R. Justice).
- RUFF (*Philomachus pugnax*).—Two 4th September (A. Pritchard, S. T. J.), and 5th September (J. Knowles, R. Parkes). One 30th October (H. H. Davis, S. T. J., P. S.).
- COMMON SANDPIPER (*Actitis hypoleucos*).—One 14th August (S. T. J.), one 20th April, 1950, on canal (E. Overend), and two in decoy 26th and 27th April (S. T. J., D. F. McK.).
- GREEN SANDPIPER (*Tringa ochropus*).—One 21st August (S. T. J.).
- REDSHANK (*Tringa totanus*).—A flock of twenty settled in the Rushy Pen 21st August (S. T. J.). Seen infrequently on estuary in winter, no more than three at one time.
- GREENSHANK (*Tringa nebularia*).—Two 13th August (R. H. Poulding), three 21st August (H. H. Davis), two 14th September (E. Overend, A. Pritchard).

- RINGED PLOVER (*Charadrius hiaticula*).—Numerous on estuary in autumn, in small numbers at other times.
- GOLDEN PLOVER (*Pluvialis apricaria*).—Seen frequently from September to March. Largest flock recorded 142 in Tack Piece 28th February (D. F. McK.).
- GREY PLOVER (*Squatarola squatarola*).—One, in full spring plumage, 14th May (M. J. Wotton). Eight 5th September (J. Knowles, R. Parkes). One 23rd November, two 24th November (H. J. B.).
- OYSTER-CATCHER (*Hematopus ostralegus*).—One 5th September, 12th (J. Knowles R. Parkes), and 25th (S. T. J.).
- COMMON OR ARCTIC TERN (*Sterno hirundo* or *macrura*).—One 30th October (S. T. J.).
- COMMON GULL (*Larus canus*).—The large winter roost on Frampton Sands continues. On 2nd October B. King estimated not less than 20,000 present at dusk, with many still coming in from the Cotswolds.
- HERRING-GULL (*Larus argentatus*).—Only very few seen in winter.
- LESSER BLACK-BACKED GULL (*Larus fuscus*).—Seen irregularly through the winter: six 25th November (H. J. B.), but other mid-winter records of one to three birds only.
- GREAT BLACK-BACKED GULL (*Larus marinus*).—An apparently static winter population of 25–30 on the Dumbles.
- GLAUCOUS GULL (*Larus hyperboreus*).—One, probably in third or fourth winter, seen on Dumbles 8th February (D. F. McK.), 12th February (K. Shackleton), 17th, 18th, 20th February (H. J. B., P. S.), 6th March (H. J. B., D. F. McK.), 22nd March (D. F. McK.), and 19th April (H. J. B., D. F. McK.). The specific identification is based on the large size, heavy bill, and thick-necked appearance in flight, and the mode of flying, in all of which it closely resembled a Great Black-backed Gull.
- WATER-RAIL (*Rallus aquaticus*).—One or two seen frequently in decoy and Rushy Pen during winter, and until mid-April.
- COOT (*Fulica atra*).—Single birds in decoy and Rushy Pen in December and early January. In the Rushy Pen the number increased to nine in February, but declined again in March.
- COMMON PARTRIDGE (*Perdix perdix*).—Coveys seen in autumn and winter in fields, behind sea wall, and once on the Dumbles.

RINGING OF BIRDS OTHER THAN ANATIDÆ

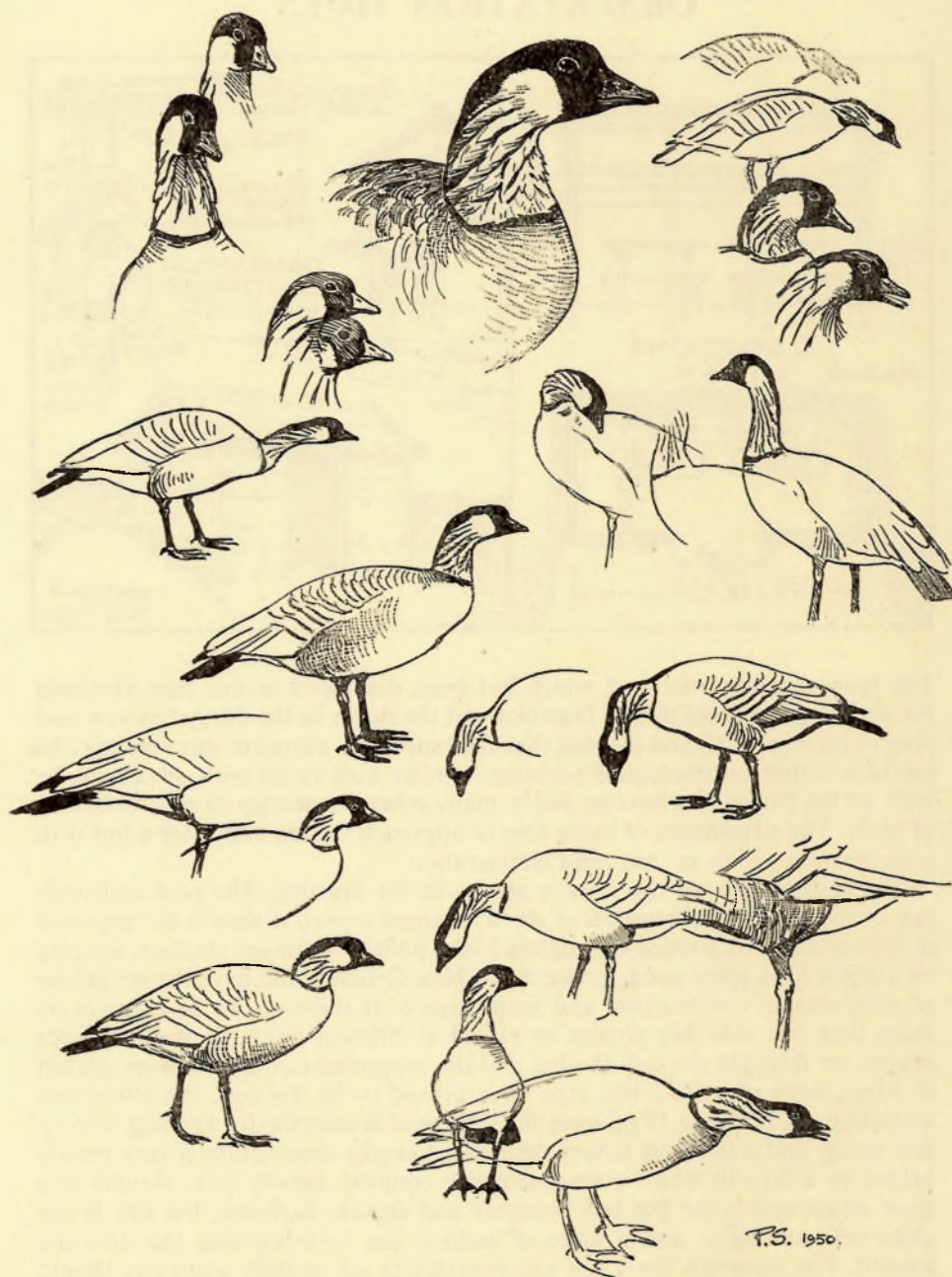
During the 13-month period covered by this Report 297 birds of 19 species were ringed, the majority of them being captured in a small portable trap. The numbers of each species were: 2 Starlings, 152 Greenfinches, 7 Chaffinches 1 Yellow Bunting, 6 Great Tits, 58 Blue Tits, 2 Willow-Warblers, 2 Mistle-Thrushes, 2 Song Thrushes, 13 Blackbirds, 21 Robins, 18 Hedge-Sparrows, 1 House-Martin, 1 Cuckoo, 1 Little Owl, 6 Herons, 1 Common Sandpiper, 2 Water-rails and 1 Coot.

OBSERVATION HUTS



THE type of observation hut which has been developed at the New Grounds for watching the geese on the Dumbles and the ducks in the decoy has now had several seasons' trial, and it is felt that the experience gained in this field may be useful to other ornithological societies. Similar huts could with advantage be built on the banks of reservoirs and in many other sanctuaries or regular haunts of birds. The advantages of being able to approach unseen and enter a hut with a commanding view do not need enumeration.

The construction of the huts is shown in the drawing. The roof and walls can be made either of wood or of straw. If straw is used it should be contained in wire-netting and packed very tightly in the walls. The hinged shutters, hanging on a chain have given good service at the New Grounds and have the advantage of simplicity in construction and maintenance. If there are to be shutters on more than one side they should be placed at different levels, so that the birds cannot see daylight through the hut and the movements of the observer against it. Fixed seats of a stool-like type have proved to be the best. An elbow-rest extending not less than 12 in. from the front wall is essential for keeping binoculars steady and a foot-rest is very desirable. Lengthy observation is very greatly helped by a lay-out which gives reasonable comfort. Ideally there should be a door which makes the hut less draughty and ensures darkness, but this is not absolutely necessary, and a piece of sacking can be hung over the doorway instead. The materials for a hut accommodating six to eight observers should cost approximately £15.

*Ne-Ne or Hawaiian Goose*

WATERFOWL COLLECTION

THE enclosures at the New Grounds have been improved during the winter by the construction of a series of pools and paddocks in the lower half of the Big Pen which will enable the birds to be grouped in a more satisfactory manner.

The Trust's great comparative collection of live waterfowl has been considerably improved during the past year. Sixteen new species or subspecies have been added, bringing the total to 119 forms and more than 700 individuals.

By far the most important addition is the magnificent pair of Ne-nes or Hawaiian Geese (*Branta sandvicensis*) brought back by our Curator, Mr. John Yealland, as a gift to the Trust from Mr. H. C. Shipman, of Keaau, Hawaii. Only 22 other specimens of this striking bird are known to exist and even the most optimistic estimates indicate that the present world-stock cannot exceed 40 individuals. Apart from the Ivory-billed Woodpecker (*Campephilus principalis*) it is therefore perhaps the world's rarest living bird.

The Trust's pair arrived on 22nd April and have settled down well. They are quite tame and will take food from the hand. For a bird with only half-webbed feet, they are rather unexpectedly aquatic and swim frequently on the Orchard Pond. It is, of course, hoped that they will breed.

The Koloas or Hawaiian Ducks (*Anas wyvilliana*) presented by Mr. Paul Breese of Honolulu Zoo, and brought back with the geese by our Curator, are also very rare birds, the world stock being estimated at 300.

The Yellowbill (*Anas undulata*) brought back by Mr. G. M. Durrell from the Cameroons is of exceptional interest and may ultimately prove to belong to a hitherto undescribed race. If not it will extend the range of the Abyssinian Yellowbill (*A. u. rupelli*) which it most nearly resembles by some 2,000 miles.

The Council wishes to record its great gratitude for the generosity of the many people who have presented birds (not all of whom are mentioned in the lists which follow) for the improvement and development of the Trust's collection. The collection is, of course, still far from complete, and a list of those species which are particularly needed will be found on page 42.

NEW SPECIES

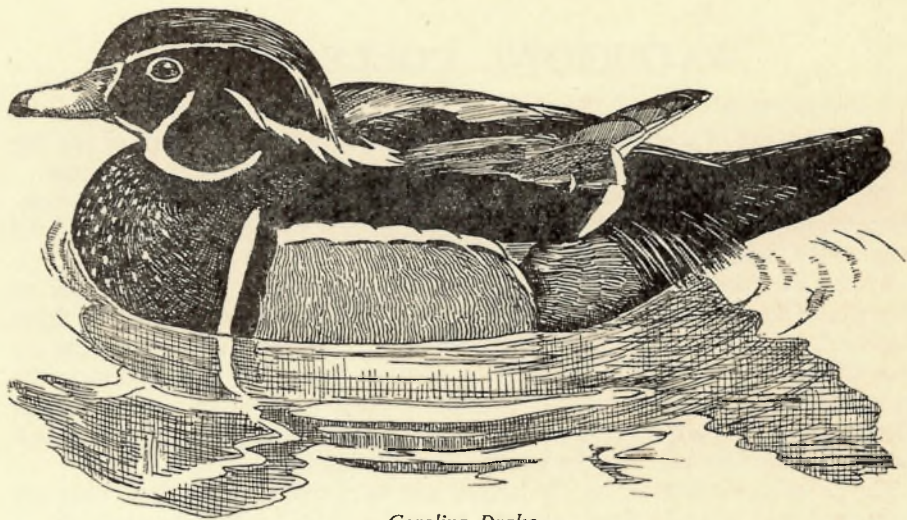
The new species which have been added are:

JAVAN WHISTLING DUCK (*Dendrocygna javanica*).—Eight sent from California as a gift from a member, Mrs. W. Gladwyn, of Santa Barbara.

EASTERN BEWICK'S OR JANKOWSKI'S SWAN (*Cygnus columbianus jankowskii*).—A pair in exchange from Leckford.

PERRY RIVER WHITE-FRONTED GOOSE (*Anser albifrons*¹ subsp.).—A pair captured by the Director on the R. Kennet (a tributary of the Perry River), N.W. Territories, Canada, when flightless during the summer of 1949. See p. 60.

¹ The geographical races of *A. albifrons* are not yet fully understood. These Perry River birds are not identical with the Tule Goose of California, but it seems doubtful whether this large western form should ever have been identified with *A. a. gambelli*, described originally by Hartlaub in 1852 from two specimens whose localities are given as 'Texas' and 'Southern United States.' It may prove necessary to find a new scientific name for the Californian bird. Meanwhile the Perry River birds appear to resemble Hartlaub's original *A. a. gambelli*. They are evidently larger than the typical North American White-fronted Goose, recently separated from the European form by Todd as *A. a. frontalis* (Condor. Vol. 52, No. 2, pp. 63-68. 1950). The vernacular name Perry River White-fronted Goose is therefore only provisional until the taxonomy can be clarified.



Carolina Drake

- NE-NE OR HAWAIIAN GOOSE (*Branta sandvicensis*).—A pair presented by Mr. H. C. Shipman of Keaau, Hawaii, and brought back by the Curator after his visit to Hawaii to advise on the Ne-ne Project (see p. 54).
- RED-BACKED RADJAH SHELDUCK (*Tadorna radjah rufitergum*).—Two females, hand-reared, in exchange from Leckford.
- ANDEAN CRESTED DUCK (*Lophonetta specularioides alticola*).—A pair, hand-reared, in exchange from Leckford.
- FALKLAND ISLAND FLIGHTLESS STEAMER DUCK (*Tachyeres brachypterns*).—A female brought back in the *John Biscoe* by Dr. W. J. L. Sladen from the Falkland Islands. Unfortunately it did not survive.
- AFRICAN RED-BILLED PINTAIL (*Anas erythrorhyncha*).—A pair, the male in exchange from the Zoo, and the female, in exchange from Leckford.
- NEW ZEALAND BROWN DUCK (*Anas chlorotis*).—A female in exchange from the Zoo, by permission of Mr. Sidney Porter, who brought the bird originally from New Zealand.
- KOLOA OR HAWAIIAN DUCK (*Anas wyvilliana*).—A pair presented by Mr. Paul Breese, Director of Kapiolani Park, Honolulu, and brought back by the Curator after visit to Hawaii.
- CAMEROON YELLOWBILL (*Anas undulata* subsp.)¹.—A drake brought back from the Indop Plain, Bamenda Province, British Cameroons, by Mr. G. M. Durrell and purchased by the Trust.
- CAPE SHOVELER (*Anas smithi*).—A drake and two ducks hand-reared from Mr. M. D. J. Wocke in Cape Province. Unfortunately the male died within a few hours of arrival. Both females died almost a year later from a form of dropsy.

¹ The plumage of this bird is as dark as that of the Abyssinian race *A. u. rupelli*, but the body-colour is less warm and the bill is even paler and more lemon-yellow than the typical form, *A. u. undulata* (instead of being darker and more orange-yellow as in *rupelli*). The slightly raised portions of the base of the culmen seem to be a little more prominent in this bird. No specimens of the species from the Cameroons can be traced in any museums, and in the absence of further examples, it would not seem justifiable to describe a new race from the single specimen, especially upon a character so subject to variation as the colouring of the soft parts. Nevertheless the yellow-billed duck from the Cameroons may ultimately prove to be a new subspecies.

- SOUTHERN POCHARD (*Netta erythrophthalma*).—Four drakes and five ducks from Mr. M. D. J. Wocke in Cape Province.
- RING-NECKED DUCK (*Aythya collaris*).—Two females, hand-reared, from the Delta Waterfowl Research Station, Manitoba.
- SOUTH AMERICAN COMB DUCK (*Sarkidiornis melanotos carunculatus*).—A female as a gift from Falcon Arts Inc. of New York.
- EUROPEAN GOLDENEYE (*Bucephala clangula clangula*).—A female, wild-caught at Peakirk, Northants, as a gift from Mr. D. Dandridge, of Walton, Peterborough.
- AMERICAN GOLDENEYE (*Bucephala clangula americana*).—A female, hand-reared, from the Delta Waterfowl Research Station, Manitoba.

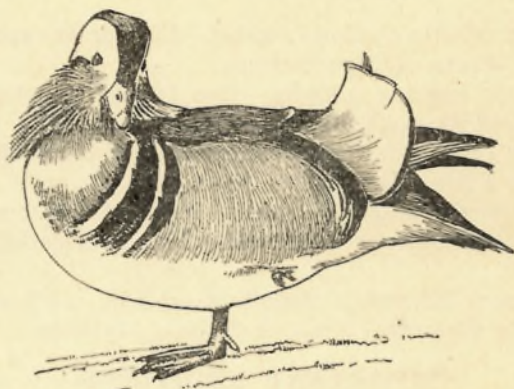
IMPORTANT ADDITIONS

In addition to the new species, a number of important specimens were received of species already represented in the collection. These included:

- WHITE-FACED WHISTLING DUCK (*Dendrocygna viduata*).—Ten as a gift from Falcon Arts Inc. of New York.
- BEWICK'S SWAN (*Cygnus columbianus bewickii*).—A female, wild-caught in Holland, in exchange from the Rotterdam Zoo.
- CKACKLING GOOSE (*Branta canadensis minima*).—Eleven, wild-caught in California, as a gift from U.S. Fish and Wildlife Service.
- SWAN GOOSE (*Anser cygnoides*).—A pair of young birds, hand-reared in Hamburg Zoo, as a gift from the Duke of Bedford.
- BEAN GOOSE (*Anser arvensis arvensis*).—A pair of young birds, hand-reared in Lapland, and brought back as a gift by Dr. Basil Morson. These birds are very tame and have been allowed to fly since growing their flight feathers in July.
- LESSER SNOW GOOSE (*Anser caerulescens hyperboreus*).—Twelve, wild-caught in California, as a gift from U.S. Fish and Wildlife Service.
- ROSS'S GOOSE (*Anser rossii*).—Six captured when flightless by the Director on the Perry River and River Kennet, N.W. Territories, Canada during the summer of 1949. See p. 60.
- ORINOCO GOOSE (*Neochen jubatus*).—Two females as a gift from Falcon Arts Inc., of New York.

(We were most unfortunate to lose the old female unexpectedly during the winter. She was a pre-war bird and laid two clutches of infertile eggs each year. A mate was procured just before the breeding season, but she did not immediately take to him, and the eggs were again infertile. Later in the summer, however, she became very friendly with the male and had she lived until the spring it is almost certain that a hand-reared strain of these birds would once more have been established in Europe.)

- RUDDY-HEADED GOOSE (*Chloephaga rubidiceps*).—A breeding pair in exchange from Mr. Noel Stevens, of Walcot Hall, Shropshire.
- CHILOË WIGEON (*Anas sibilatrix*).—Three brought back from the Montevideo Zoo by Dr. W. J. Sladen, in the *John Biscoe*. These provide much needed fresh blood.
- ARGENTINE RED SHOVELER (*Anas platalea*).—A female (which has paired with our single drake, the only other in Europe) in exchange from the Bronx Park Zoo, New York.
- EUROPEAN EIDER (*Somateria mollissima mollissima*).—Twelve young birds, hand-reared, from Colonel W. V. Lumsden, of Sluie, Banchory.



Mandarin Drake

LIST OF BIRDS IN THE COLLECTION

- MAGPIE GOOSE (*Anseranas semipalmata*)
 PLUMED WHISTLING DUCK (*Dendrocygna eytoni*)
 BLACK-BILLED WHISTLING DUCK (*Dendrocygna arborea*)
 JAVAN WHISTLING DUCK (*Dendrocygna javanica*)
 WHITE-FACED WHISTLING DUCK (*Dendrocygna viduata*)
 RED-BILLED WHISTLING DUCK (*Dendrocygna autumnalis* subsp.)
 COSCOROBA SWAN (*Coscoroba coscoroba*)
 BLACK SWAN (*Cygnus atratus*)
 MUTE SWAN (*Cygnus olor*)
 BLACK-NECKED SWAN (*Cygnus melanocoryphus*)
 WHISTLING SWAN (*Cygnus columbianus columbianus*)
 BEWICK'S SWAN (*Cygnus columbianus bewickii*)
 EASTERN BEWICK'S SWAN (*Cygnus columbianus jankowskii*)
 WHOOPER SWAN (*Cygnus cygnus cygnus*)
 CANADA GOOSE (*Branta canadensis canadensis*)
 GREAT BASIN CANADA GOOSE (*Branta canadensis moffitti*)
 WESTERN CANADA GOOSE (*Branta canadensis occidentalis*)
 TUNDRA CANADA GOOSE (*Branta canadensis leucopareia*)
 LESSER CANADA GOOSE (*Branta canadensis parvipes*)
 RICHARDSON'S GOOSE (*Branta canadensis hutchinsii*)
 CACKLING GOOSE (*Branta canadensis minima*)
 BARNACLE GOOSE (*Branta leucopsis*)
 DARK-BELLIED BRENT GOOSE (*Branta bernicla bernicla*)
 LIGHT-BELLIED BRENT GOOSE (*Branta bernicla hrota*)
 PACIFIC BLACK BRANT (*Branta bernicla nigricans*)
 RED-BREASTED GOOSE (*Branta ruficollis*)
 NE-NE OR HAWAIIAN GOOSE (*Branta sandvicensis*)
 SWAN GOOSE (*Anser cygnoides*)
 YELLOW-BILLED BEAN GOOSE (*Anser fabalis fabalis*)
 TUNDRA BEAN GOOSE (*Anser fabalis rossicus*)
 PINK-FOOTED GOOSE (*Anser brachyrhynchus*)
 WHITE-FRONTED GOOSE (*Anser albifrons albifrons*)
 GREENLAND WHITE-FRONTED GOOSE (*Anser albifrons flavirostris*)
 PERRY RIVER WHITE-FRONTED GOOSE (*Anser albifrons* subsp.)
 LESSER WHITE-FRONTED GOOSE (*Anser erythropus*)

GREYLAG GOOSE (*Anser anser anser*)
EASTERN GREYLAG GOOSE (*Anser anser rubrirostris*)
BAR-HEADED GOOSE (*Anser indicus*)
EMPEROR GOOSE (*Anser canagicus*)
BLUE SNOW GOOSE (*Anser caerulescens caerulescens*)
LESSER SNOW GOOSE (*Anser caerulescens hyperboreus*)
GREATER SNOW GOOSE (*Anser caerulescens atlanticus*)
ROSS'S GOOSE (*Anser rossii*)
RUDDY SHELDUCK (*Tadorna ferruginea*)
SOUTH AFRICAN SHELDUCK (*Tadorna cana*)
AUSTRALIAN SHELDUCK (*Tadorna tadornoides*)
NEW ZEALAND SHELDUCK (*Tadorna variegata*)
RED-BACKED RADJAH SHELDUCK (*Tadorna radjah rufitergum*)
COMMON SHELDUCK (*Tadorna tadorna*)
EGYPTIAN GOOSE (*Alopochen aegyptiacus*)
ORINOCO GOOSE (*Neochen jubatus*)
ABYSSINIAN BLUE-WINGED GOOSE (*Cyanochen cyanopterus*)
ASHY-HEADED GOOSE (*Chloephaga poliocephala*)
RUDDY-HEADED GOOSE (*Chloephaga rubidiceps*)
UPLAND GOOSE (*Chloephaga picta picta*)
BARRED UPLAND GOOSE (*Chloephaga picta dispar*)
CEREOPSIS GOOSE (*Cereopsis novæ-hollandiæ*)
ANDEAN CRESTED DUCK (*Lophonetta specularioides alticola*)
MARBLED TEAL (*Anas angustirostris*)
CAPE TEAL (*Anas capensis*)
VERSCOLOR TEAL (*Anas versicolor versicolor*)
PUNA TEAL (*Anas versicolor puna*)
AFRICAN RED-BILLED PINTAIL (*Anas erythrorhyncha*)
SOUTHERN BAHAMA PINTAIL (*Anas bahamensis rubrirostris*)
CHILEAN PINTAIL (*Anas georgica spinicauda*)
COMMON PINTAIL (*Anas acuta acuta*)
CHILEAN TEAL (*Anas flavirostris flavirostris*)
COMMON TEAL (*Anas crecca crecca*)
AMERICAN GREEN-WINGED TEAL (*Anas crecca carolinensis*)
BAIKAL TEAL (*Anas formosa*)
FALCATED TEAL (*Anas falcata*)
AUSTRALIAN GREY TEAL (*Anas gibberifrons mathewsi*)
CHESTNUT-BREASTED TEAL (*Anas castanea*)
NEW ZEALAND BROWN DUCK (*Anas aucklandica chlorotis*)
MALLARD (*Anas platyrhynchos platyrhynchos*)
KOLOA OR HAWAIIAN DUCK (*Anas wyvilliana*)
FLORIDA DUCK (*Anas fulvigula fulvigula*)
LOUISIANA MOTTLED DUCK (*Anas fulvigula maculosa*)
BLACK DUCK (*Anas fulvigula rubripes*)
AUSTRALIAN GREY DUCK (*Anas superciliosa rogersi*)
SOUTH AFRICAN YELLOW-BILL (*Anas undulata undulata*)
ABYSSINIAN YELLOW-BILL (*Anas undulata rupelli*)
CAMEROON YELLOW-BILL (*Anas undulata subsp.*)
PHILIPPINE DUCK (*Anas luzonica*)
GADWALL (*Anas strepera strepera*)
EUROPEAN WIGEON (*Anas penelope*)

AMERICAN WIGEON (*Anas americana*)
 CHILOË WIGEON (*Anas sibilatrix*)
 BLUE-WINGED TEAL (*Anas discors*)
 CINNAMON TEAL (*Anas cyanoptera cyanoptera*)
 GARGANEY (*Anas querquedula*)
 ARGENTINE RED SHOVELER (*Anas platalea*)
 COMMON SHOVELER (*Anas clypeata*)
 RED-CRESTED POCHARD (*Netta rufina*)
 ROSYBILL (*Netta peposaca*)
 SOUTHERN POCHARD (*Netta erythrophthalma*)
 CANVASBACK (*Aythya vallisneria*)
 EUROPEAN POCHARD (*Aythya ferina*)
 REDHEAD (*Aythya americana*)
 RING-NECKED DUCK (*Aythya collaris*)
 TUFTED DUCK (*Aythya fuligula*)
 LESSER SCAUP (*Aythya affinis*)
 COMMON SCAUP (*Aythya marila marila*)
 BRAZILIAN TEAL (*Amazonetta brasiliensis*)
 MANED GOOSE (*Chenonetta jubata*)
 MANDARIN DUCK (*Aix galericulata*)
 CAROLINA DUCK (*Aix sponsa*)
 INDIAN COMB DUCK (*Sarkidiornis melanotos melanotos*)
 SOUTH AMERICAN COMB DUCK (*Sarkidiornis melanotos carunculatus*)
 MUSCOVY DUCK (*Cairina moschata*)
 EUROPEAN EIDER (*Somateria mollissima mollissima*)
 BARROW'S GOLDENEYE (*Bucephala islandica*)
 EUROPEAN GOLDENEYE (*Bucephala clangula clangula*)
 AMERICAN GOLDENEYE (*Bucephala clangula americana*)
 RED-BREASTED MERGANSER (*Mergus serrator*)
 GOOSANDER (*Mergus merganser merganser*)
 NORTH AMERICAN RUDDY DUCK (*Oxyura jamaicensis jamaicensis*)

HYBRIDS

It has been decided to make a special study collection of hybrid waterfowl. It is evident that there is much to be learned of the relationships within the group by this means. The inheritance of certain characters such as behaviour and voice can be studied in the living birds and may be expected to add considerably to our knowledge, not only of the systematics, but also perhaps of the ethology of the whole group.

The following hybrids can now be seen at the New Grounds :

Andean × Upland Goose.
 Greylag × Barnacle Goose.
 Ross × Redbreasted Goose.
 Lesser Snow × Blue Snow Goose.
 Rosybill × Red-crested Pochard
 Chile Pintail × Red-crested Pochard
 Chile Pintail × Bahama Pintail
 Cape Teal × Tufted Duck.
 Chile Teal × Carolina.

The Trust is anxious to acquire any hybrids whose parentage is precisely known and will be grateful to any breeders who may be able to help in the matter.

OBTAINING NEW BIRDS

The Trust's collection can be improved considerably by the co-operation of Members in various parts of the world. Birds can be sent fairly easily these days, either by air or by sea. We shall be most grateful to anyone who can obtain any of the species shown in the lists which follow—ideally three pairs of each kind.

If you can help, this is what you should do :

- (1) Arrange for the catching of adult birds or well-grown young, or the collecting of absolutely fresh eggs, or alternatively, if they can be put under a hen or in an incubator within 24 hours, of eggs a few days from hatching. Of these adult birds are much the most satisfactory.
- (2) Write to tell us about it, so that we can arrange for import permits and other formalities.
- (3) Obtain small light boxes to hold preferably not more than two and ideally one bird in each compartment. A suggested design for such a box is shown in the diagram.

Each bird must have access to a small tin containing food and water, and this container should be able to be filled from outside without opening the box. It should have very little water, as if it slops over and wets the birds they may die. If possible it should be contrived that the birds cannot foul the containers. This can be done either by siting the container above the level of the birds' tails or preferably in such a position that the birds put their heads out between bars in order to feed and drink. Care must be taken that a bird cannot get its head caught by a tapering space between such bars.

For a long journey the box should have a floor of small mesh wire-netting on which the birds stand and keep themselves clean and dry, with a removable tray underneath it for cleaning. This is not normally necessary for an air journey. For short air journeys stout cardboard boxes are quite satisfactory.

All boxes should have good ventilation but not too much light. It is desirable that only one side should be open; other spaces in the structure can be covered by an inner lining of sacking.

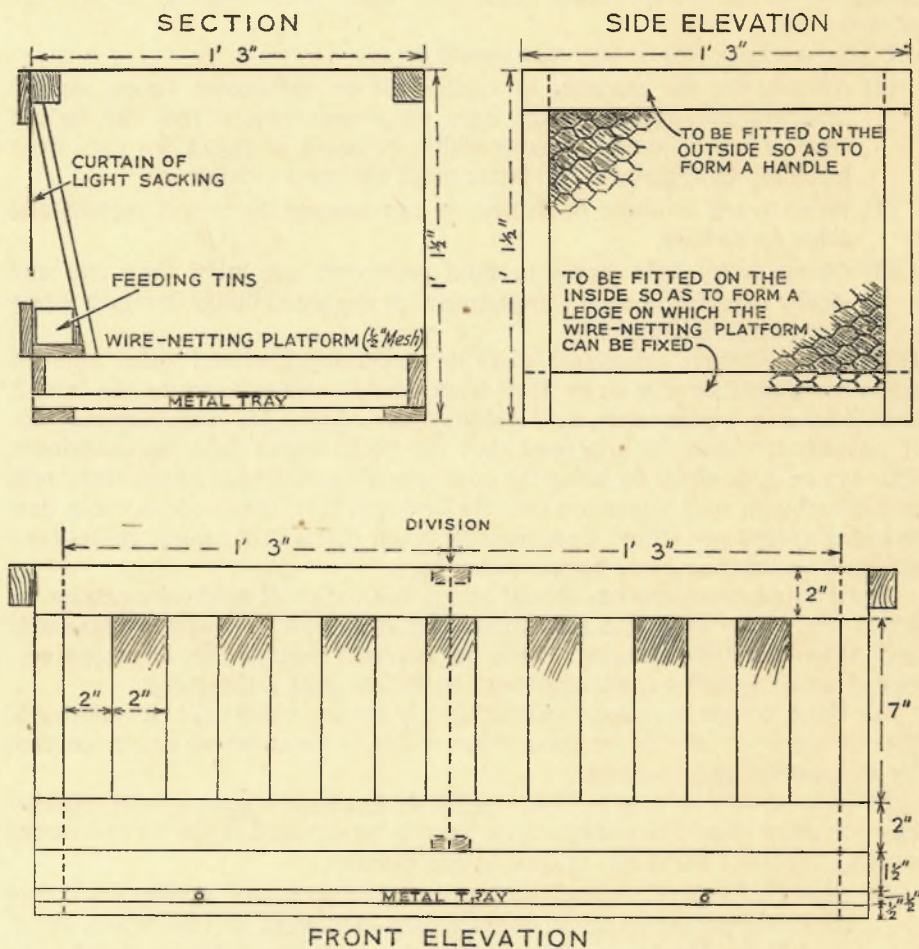
Sawdust should be used in boxes which do not have a netting floor. Neither hay nor straw should be used as these have to be removed at the port of arrival owing to special restrictions against animal diseases.

- (4) Send the birds off—geese and big ducks can go by sea, smaller ducks and all diving and spiny-tailed ducks by air—addressed to The Severn Wild-fowl Trust, Slimbridge, Gloucestershire, via Coaley Junction. Besides the address the outside of the box should have :
 - (i) A notice saying "Live Birds. Urgent".
 - (ii) The Licence No. (The number will be sent to you by us.)
 - (iii) A notice giving instructions for feeding if the journey is more than a week.
 - (iv) A small bag of food¹ (grain of some kind for most species) attached to the box for replenishing the containers during the journey.

The birds should be sent as soon as possible after catching. They can manage without food for 4-5 days (but need water) and with food most species can quite easily get through a journey of several weeks.

¹ For a sea journey it is customary for birds to be placed in the care of the Ship's Butcher. The food in the bag may be augmented by lettuce and bread, and a note to this effect should be included in the instructions.

TRAVELLING BOX

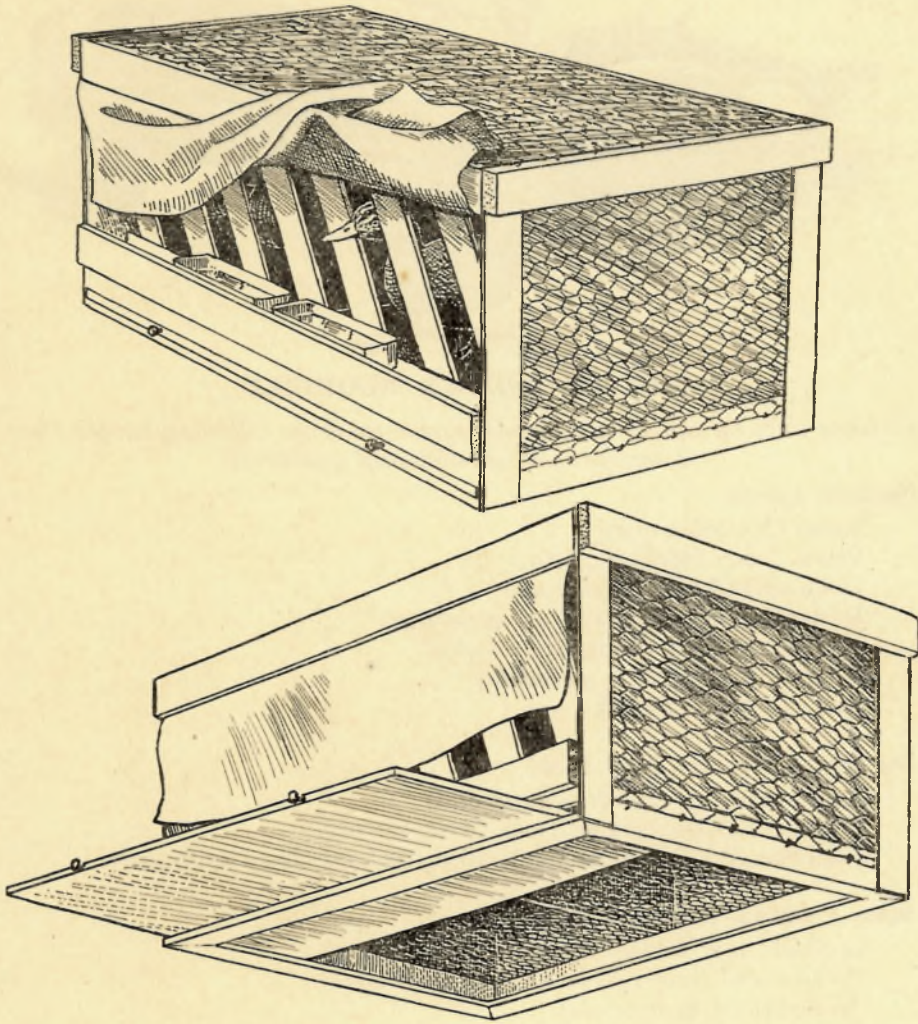


Divisions of compartments to be made of $\frac{1}{2}$ in. mesh wire-netting.

Doors not necessary. Top corners of wire-netting and sacking may be left unfastened and fixed after the birds are put in.

Edges of front slats to be rounded and any sharp points on the wire-netting formed by the galvanising to be removed.

Wire-netting (1 in. mesh of thin gauge) and sacking to be put on the *inside* of framework.

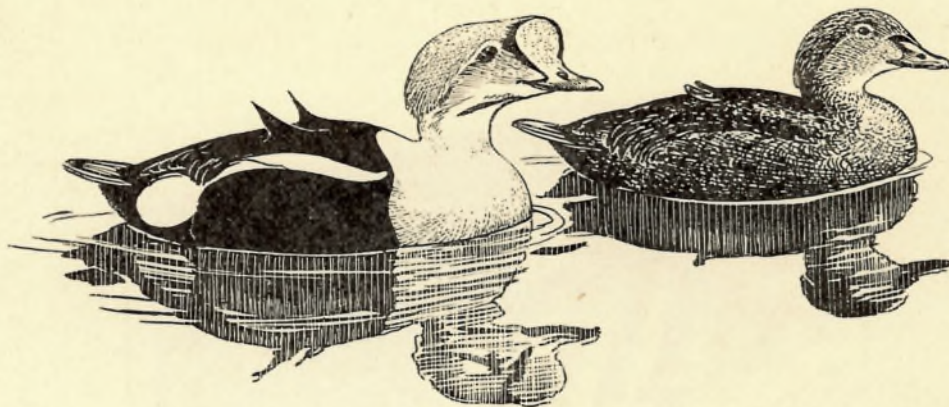


Dimensions shown are suitable for a box of two compartments each large enough for two ducks of Mallard size for five days.

Tray to be made of thin aluminium or aluminium alloy if possible.

It is advised that geese should travel singly and ducks not more than two in each compartment.

Large and small ducks should not be packed together.



King Eiders

LIST OF SPECIES REQUIRED

(In many cases the Species are already represented in the collection, but the Trust is anxious to obtain additional specimens)

Northern Europe

- Scoter (*Melanitta nigra*)
- Velvet Scoter (*Melanitta fusca*)
- Goldeneye (*Bucephala clangula*)
- Harlequin Duck (*Histrionicus histrionicus*)
- Long-tailed Duck (*Clangula hyemalis*)
- King Eider (*Somateria spectabilis*)
- Smew (*Mergus albellus*)

Southern Europe and Near East

- Red-breasted Goose (*Branta ruficollis*)
- White-eye or Ferruginous Duck (*Aythya nyroca*)
- White-headed Stifftail or Spiny-tailed Duck (*Oxyura leucocephala*)

India, Pakistan, Burma and Ceylon

- Spotbill (*Anas pæcilorhyncha*)
- Pink-headed Duck (*Rhodonessa caryophyllacea*)
- White-eye (*Aythya nyroca*)
- Pygmy Goose or Cotton Teal (*Nettapus coromandelianus*)
- Comb Duck or Knob-bill (*Sarkidiornis melanotos*)

East Indies and Malaya

- Spotted Whistling Duck (*Dendrocygna guttata*)
- Wandering Whistling Duck (*Dendrocygna arcuata*)
- Radjah Shelduck (*Tadorna radjah*)
- Salvadori's Duck (*Anas waigiensis*)
- Spotbill (*Anas pæcilorhyncha*)
- Grey Duck (*Anas superciliosa*)
- Pygmy Goose or Cotton Teal (*Nettapus coromandelianus*)
- Green Pygmy Goose (*Nettapus pulchellus*)
- White-winged Wood Duck (*Cairina scutulata*)

China and Japan

- Swan Goose (*Anser cygnoides*)
- Middendorf's Bean Goose (*Anser fabalis sibiricus*)
- Eastern Bean Goose (*Anser fabalis serrirostris*)
- Lesser White-fronted Goose (*Anser erythropus*)
- Falcated Duck or Bronze-capped Teal (*Anas falcata*)
- Baikal or Formosa Teal (*Anas formosa*)
- Spotbill or Grey Duck (*Anas pæcilorhyncha zonorhyncha*)
- Eastern Scaup (*Aythya marila mariloides*)
- Baer's Pochard (*Aythya baeri*)
- White-eye or Ferruginous Duck (*Aythya nyroca*)
- Mandarin Duck (*Aix galericulata*)
- Pygmy Goose or Cotton Teal (*Nettapus coromandelianus*)
- Chinese Merganser (*Mergus squamatus*)

Africa

- Fulvous Whistling Duck (*Dendrocygna bicolor*)
- Red-billed Pintail (*Anas erythrorhyncha*)
- Hottentot Teal (*Anas punctata*)
- Black Duck (*Anas sparsa*)
- Cape Shoveler (*Anas smithi*) (*Spatula capensis*)
- Pygmy Goose or Cotton Teal (*Nettapus auritus*)
- Hartlaub's Duck (*Cairina hartlaubi*)
- Comb Duck or Knob-bill (*Sarkidiornis melanotos*)
- Maccoa Duck (*Oxyura jamaicensis maccoa*)
- White-backed Duck (*Thalassornis leuconotus*)

Madagascar

- Bernier's Teal (*Anas bernieri*)
- Meller's Duck (*Anas melleri*)
- Madagascar White-eye (*Aythya innotata*)
- Pygmy Goose or Cotton Teal (*Nettapus auritus*)
- White-backed Duck (*Thalassornis leuconotus*)

Australia

- Magpie Goose (*Anseranas semipalmata*)
- Wandering Whistling Duck (*Dendrocygna arcuata*)
- Plumed or Eytons Whistling Duck (*Dendrocygna eytoni*)
- Radjah Shelduck (*Tadorna radjah*)
- Australian Shelduck (*Tadorna tadornoides*)
- Chestnut-breasted Teal (*Anas castanea*)
- Australian Shoveler (*Anas rhynchotis*)
- Freckled Duck or Monkey Duck (*Stictonetta nævosa*)
- Pink-eared Duck (*Malacorhynchus membranaceus*)
- Australian White-eye (*Aythya australis*)
- Australian Pygmy Goose (*Nettapus coromandelianus albipennis*)
- Green Pygmy Goose (*Nettapus pulchellus*)
- Blue-billed Duck (*Oxyura jamaicensis australis*)
- Musk Duck (*Biziura lobata*)

New Zealand

- Paradise Duck (*Tadorna variegata*)
- Brown Duck (*Anas aucklandica chlorotis*)

Auckland Island Flightless Teal (*Anas aucklandica aucklandica*)
 Campbell Island Flightless Teal (*Anas aucklandica nesiotis*)
 New Zealand Shoveler or 'Spoonbill' (*Anas rhynchotis variegata*)
 Blue or Mountain Duck (*Hymenolaimus malacorhynchos*)
 New Zealand Scaup or 'Black Teal' (*Aythya novæ-seelandiæ*)
 Auckland Island Merganser (*Mergus australis*)

North America

Trumpeter Swan (*Cygnus cygnus buccinator*)
 Emperor Goose (*Anser canagicus*)
 Ring-necked Duck (*Nyroca collaris*)
 Lesser Scaup (*Aythya affinis*)
 King Eider (*Somateria spectabilis*)
 Spectacled Eider (*Somateria fischeri*)
 Steller's Eider (*Somateria stelleri*)
 American Scoter (*Melanitta nigra americana*)
 White-winged Scoter (*Melanitta fusca*)
 Surf Scoter (*Melanitta perspicillata*)
 Harlequin Duck (*Histrionicus histrionicus*)
 Old Squaw (*Clangula hyemalis*)
 American Goldeneye (*Bucephala clangula*)
 Bufflehead (*Bucephala albeola*)
 Hooded Merganser (*Mergus cucullatus*)

South America

Orinoco Goose (*Neochen jubatus*)
 Andean Goose (*Chloëphaga melanoptera*)
 Upland Goose (*Chloëphaga picta picta*) (Eastern Race)
 Ashy-headed Goose (*Chloëphaga poliocephala*)
 Ruddy-headed Goose (*Chloëphaga rubidiceps*)
 Kelp Goose (*Chloëphaga hybrida*)
 Crested Duck (*Lophonetta specularioides*)
 Steamer Duck (*Tachyeres pteneres*)
 Flying Steamer Duck (*Tachyeres patachonicus*)
 Bronze-winged Duck (*Anas specularis*)
 Puna Teal (*Anas versicolor puna*)
 Silver Teal or Grey Teal (*Anas versicolor versicolor*)
 Southern Silver Teal (*Anas versicolor fretensis*)
 Sharp-winged Teal (*Anas flavirostris oxypterum*)
 Andean Teal (*Anas flavirostris*)
 Argentine Red Shoveler (*Anas platalea*)
 Ringed Teal (*Anas leucophrys*)
 Brazilian Teal (*Amazonetta brasiliensis*)
 Comb Duck or Knob-billed Duck (*Sarkidiornis melanotos carunculatus*)
 Brazilian Merganser (*Mergus octosetaceus*)
 Argentine Ruddy Duck (*Oxyura vittata*)
 Rusty Lake Duck or Peruvian Ruddy Duck (*Oxyura jamaicensis ferruginea*)
 Masked Duck (*Oxyura dominica*)
 Black-headed Duck (*Heteronetta atricapilla*)
 Torrent Duck (*Merganetta armata*)

BREEDING SEASON

The summer of 1949 produced excellent weather for rearing waterfowl and the breeding season was the most successful we have had so far. Once again, however, the results from the shipment of eggs from Iceland were disappointing. The main burden of rearing operations fell upon the Curators, Mr. John Yealland and Mr. S. T. Johnstone, who gave their usual conscientious care to this arduous task.

Eggs were obtained from 45 species and subspecies. (Last season's total was 27 species and subspecies.) Details of the breeding of birds in the collection are shown in Table X.

Once more a small number of eggs was sent to Dr. H. B. Cott at Cambridge for his research into the palatability of eggs.

In addition the following young were reared from eggs sent from Iceland and elsewhere :—

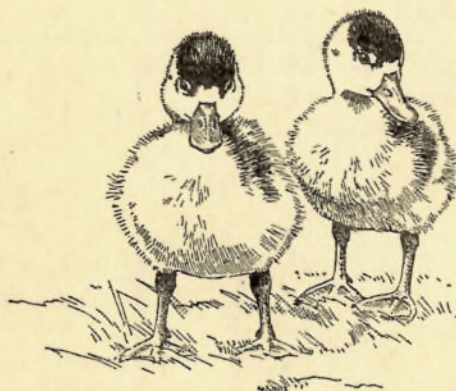
18 Tufted Duck

5 Red-breasted Merganser

A total of 310 young birds (41 goslings and 269 ducklings) was reared, of 37 different kinds, excluding some 60-70 Mallard reared by their own parents in the pens and decoy. Last season's figure was 147 young birds of 17 kinds, excluding 150 Mallard reared as call ducks.

Apart from a few impure specimens of some of the local races of the Mallard (Spotbill, Australian Grey Duck, etc.), the only hybrids which were raised were three specimens of Chile Teal $\times$ Carolina. These are a drake and two ducks, and the male bird is a most handsome creature, with a rich suffusion of chestnut red on breast, flanks and tail coverts. It was noted that the incubation period of the hybrids was 30 days. (That of the Chile Teal—the male parent—is 25-26 days, and of the Carolina 29-30 days.)

The crosses between the Swan Goose male and the Domestic Chinese Goose which had been mated back to their father did not breed in 1949, but have both laid in April 1950. It is hoped in one more generation to produce something scarcely distinguishable from the true wild Swan Goose. The importance of this strain is much reduced since the gift of a splendid pair of pure bred wild goslings from the Duke of Bedford. Before this it had been thought that the two pure males at the New Grounds were the only Swan Geese in Europe. It now appears that there is a wild breeding stock at the Hagenbeck Zoo in Hamburg.



Shelducklings

TABLE X
HATCHING AND REARING

Species	Breeding Pairs	Date of First Egg	Eggs	Taken by Vermin	Infertile	Broken by Hen	Added	Dead in Shell	Hatched	% Hatched of Eggs Laid	Crushed or killed by Hen	Taken by Vermin	Reared	% Reared of Eggs Hatched	Remarks
Great Basin Canada Goose	1	17.4.49	5	—	4	—	—	—	1	20%	—	—	1	100%	—
Tundra Canada Goose	2	16.4.49	23	—	19	—	—	—	4	17%	—	—	4	100%	—
Barnacle Goose ..	2	2.7.49	6	—	3	—	—	—	3	50%	—	—	2	67%	One destroyed after swollen tibio-tarsal joint failed to respond to penicillin
Bar-headed Goose ..	2	28.4.49	9	—	—	—	—	1	8	89%	—	—	6	75%	One suffering from apparent strained leg muscle. Improved but relapsed later and was destroyed
Emperor Goose ..	1	27.4.49	12	1	3	—	2	2	4	33%	—	—	4	100%	One died after being reared. Cause not ascertained
Blue Snow Goose ..	1 +1 ♀	10.5.49	14	2	2	—	—	—	10	71%	—	2	6	60%	—
Greater Snow Goose	2 +1 ♀	2.5.49	20	—	9	—	1	—	10	50%	—	2	3	30%	One died from epilepsy. One ♀ bred here in 1947. Five eggs laid, three hatched; all rather weakly and small. Only survivor after two weeks killed by hawk

Ross's Goose	..	2 +1 ♀	5.5.49	17	—	10	—	3	—	4	23%	—	—	2	50%	Male bred here in 1947 is father of one reared gosling. One gosling died from tuberculosis in one lung ; the other had not assimilated yolk
Ruddy Shelduck	..	1	13.4.49	11	—	10	—	—	—	1	9%	—	—	—	0%	Died soon after hatching
New Zealand Shelduck		1	13.4.49	7	—	6	—	—	—	1	14%	—	—	1	100%	—
Common Shelduck	..	Brought as eggs		29	—	—	1	—	—	28	96%	—	1	18	64%	One killed by Mallard. For total add those brought as ducklings
Egyptian Goose	..	1	3.3.49	13	—	2	—	—	1	10	77%	—	—	9	90%	One strangled in hen's feathers. (Another clutch reared by the parents is shown in Table II)
Orinoco Goose	..	1	18.3.49	19	—	19	—	—	—	—	0%	—	—	—	—	—
Upland Goose	..	1	1.4.49	9	—	9	—	—	—	—	0%	—	—	—	—	—
Cereopsis Goose	..	1	12.2.49	2	—	1	—	—	—	1	50%	—	—	—	0%	Died on 8th day. Yolk not assimilated
Cape Teal	..	1	2.4.49	4	—	3	1	—	—	—	0%	—	—	—	—	—
Puna Teal	..	1 +1 ♀	10.4.49	14	—	5	—	—	6	3	43%	3	—	—	0%	No clutch larger than three
Bahama Pintail	..	2	12.5.49	16	—	2	—	—	—	14	88%	—	—	9	64%	Two subsequently killed by Sparrow Hawk
Common Pintail	..	?	14.5.49	21	—	6	—	2	4	9	43%	2	2	3	33%	One died from tuberculosis. Two killed by Mallard
Chilean Pintail	..	1?	15.4.49	16	2	7	—	—	3	4	25%	—	—	2	50%	—
Chilean Teal	..	1 +1 ♂	16.5.49	2	—	—	2	—	—	—	0%	—	—	—	—	Plus 3 × Carolina

TABLE X—continued

Species	Breeding Pairs	Date of First Egg	Eggs	Taken by Vermin	Infertile	Broken by Hen	Added	Dead in Shell	Hatched	% Hatched of Eggs Laid	Crushed or killed by Hen	Taken by Vermin	Reared	% Reared of Eggs Hatched	Remarks
Black Duck	1 +1 ♀	21.3.49	36	—	6	2	1	2	25	69%	—	—	11	44%	One ♀ laid three clutches. Plus 2 × Mallard and one reared by parents. Total of hatched inclusive of hybrids
Florida Duck ..	1	29.4.49	7	—	3	—	—	—	4	57%	—	—	2	50%	One defective—very small sized
Mottled Duck ..	1	20.4.49	12	—	2	—	—	3	7	58%	—	—	5	71%	Plus 1 × Mallard
Spot-bill	1	17.3.49	31	—	5	1	1	7	13	42%	1	—	3	23%	Plus 4 × Mallard. Four eggs left with parents
Australian Grey Duck	1	18.4.49	16	—	2	—	—	1	10	62%	—	—	4	40%	Plus 2 × Mallard (three eggs left with parents)
African Yellow-bill ..	3	19.3.49	29	—	10	1	2	5	12	41%	1	—	3	25%	One killed by goose. Plus 2 × Mallard
Gadwall	1 +1 ♀	27.5.49	18	—	—	—	—	—	15	83%	—	—	8	19%	Four escaped. Plus three young left with parents (one reared)
Wigeon	2 (3?)	20.4.49	23	—	4	—	1	7	10	43%	—	—	6	60%	One died from tuberculosis
American Wigeon ..	2	15.5.49	34	9	8	—	1	7	9	26%	1	—	8	89%	—
Chiloë Wigeon ..	?	9.4.49 (?)	34	—	12	—	—	4	18	53%	—	2	12	67%	—
Blue-winged Teal ..	1	21.4.49	18	—	1	1	—	—	16	89%	—	—	5	31%	These proved to be hybrids between Blue-winged and Cinnamon Teal

Cinnamon Teal ..	4 (?)	27.4.49	40	—	14	—	—	1	25	63%	2	1	2	8%	—
Garganey	1	23.5.49	7	—	2	—	2	1	2	29%	—	—	1	50%	—
Shoveler	2	2.5.49	20	—	1	—	—	—	19	95%	—	—	12	63%	Five died the first night, possibly on account of some disturbance
Red-crested Pochard	5 +3 ♀	31.3.47	63 (+11)	—	35	1	1	3	34	56%	1	1	14	41%	Eleven eggs given to Mr. G. Goodhart. Plus 3 × Common Pochard
Rosy-bill	3 (?)	2.5.49	44	—	20	—	1	2	21	48%	3	—	14	67%	—
Common Pochard ..	1	9.5.49	9	—	—	—	—	—	5	56%	—	—	2	40%	Plus 3 × Red-crested Pochard
Red-head	2	3.6.49	15	—	—	—	1	1	13	87%	—	—	10	77%	—
Tufted Duck	2 (?)	12.6.49	12	—	8	—	1	—	3	25%	—	—	2	67%	Plus 16 reared from eggs laid elsewhere
Scaup	1 (?)	7.5.49	—	—	—	—	—	—	—	—	5	—	3	—	—
Carolina	}	25.3.49	341	—	110	3	33	45	161	47%	—	—	72	46%	Only one Carolina laid third clutch. Two killed by Mallard. A number of weaklings, many not assimilating yolk (one of these surviving 26 days). Plus 3 × Chilean Teal. Fertility of second clutches very low, e.g., Eggs 48, clear 21, addled 16, dead in shell 1, hatched 10
Mandarin		22.3.49	Eggs not identifiable with certainty owing to similarity and indiscriminate laying in one another's nests. Not more than 12 Mandarin eggs are known to have been laid of which four hatched									3	2		
Red-breasted Merganser	1 ♀	5.6.49	4	—	1	3	—	—	—	0%	—	—	—	—	Plus five reared from eggs from Iceland
Ruddy Duck	1	12.6.49	5	—	—	—	—	1	4	80%	—	—	—	0%	Two had not assimilated yolk and two died from congestion of lungs

TABLE XI

EGGS LEFT WITH PARENTS										
Species	Eggs	Taken by Vermin	Infertile	Addled	Dead in Shell	Hatched	% Hatched of Eggs Laid	Reared	% Reared of Eggs Hatched	
Egyptian	8	—	1	—	—	7	87%	4	57%	
Black Duck	6	—	1	—	—	5	83%	1	20%	
Spot-bill	3	—	—	—	—	3	100%	—	0%	
Grey Duck	2	—	1	—	1	—	0%	—	—	
Gadwall	3	—	—	—	—	3	100%	1	33%	
BROUGHT AS DUCKLINGS						13	—	9	69%	
Shelduck	—	—	—	—	—	13	—	9	69%	

FULL-WINGED BIRDS

A pleasant feature of the collection is the ever-increasing number of birds which now have the free use of their wings. As a result during the year the following species could be seen on the wing at the New Grounds:—

Fulvous Whistling Duck (*D. bicolor*)
 Grey-breasted Whistling Duck (*D. a. discolor*)
 Javan Whistling Duck (*D. javanica*)
 Coscoroba Swan (*C. coscoroba*)
 White-fronted Goose (*A. a. albifrons*)
 Greylag Goose (*A. a. anser*)
 Greater Snow Goose (*A. c. atlanticus*)
 Blue Snow Goose (*A. c. caerulescens*)
 Barheaded Goose (*A. indica*)
 Pintail (*A. acuta*)
 Gadwall (*A. s. strepera*)
 Mallard (*A. p. platyrhynchos*)

In the course of the next winter this list will be augmented by the following species, which are either those at present feather-cut, or species likely to be reared during the summer:

White-faced Whistling Duck (*D. viduata*)
 Dark-bellied Brent Goose (*B. b. bernicla*)
 Barnacle Goose (*B. leucopsis*)

Swan Goose (*A. cygnoides*)
Bean Goose (*A. f. fabalis*)
Emperor Goose (*A. canagica*)
Wigeon (*A. penelope*)
Shoveler (*A. clypeata*)
Carolina Duck (*A. sponsa*)
Bahama Pintail (*A. bahamensis*)

WILD BIRDS IN THE PENS

So many are the degrees of wildness and tameness among the wildfowl at the New Grounds that the situation is often bewildering to any newcomer. There are all stages between the wild flocks of White-fronts which never seem to lose any of their wildness, and the hand-reared pinioned birds which feed from the hand. In between are the two categories of full-winged birds, the hand-reared ones described in the previous paragraph and the wild-bred birds which have taken up with the tame ones in the pens, and have become as confiding as they are. There is also the point at which these mix, where the offspring of hand-reared full-winged birds have been brought up outside the enclosures and brought in later by their parents. To this last category belong a large proportion of the Mallards to be seen flying in and out of the pens.

But in spite of this confusing mixture, there is a particular satisfaction in seeing truly wild-bred birds which have settled down in the pens and come up to feed with the rest.

During the past year the following wild birds have come into the pens:

WHITE-FRONTED GOOSE (*A. a. albifrons*).—A single bird in late March and early April 1950.

CANADA GOOSE (*B. c. canadensis*).—A party of five which arrived on 27th March and remained until 13th April.

PINTAIL (*A. acuta*).—Up to 25 regularly in the pens and over 40 on 5th February.

TEAL (*A. crecca*).—A few in the Orchard and Rushy Pen and quite tame. Probably the same as those of last year.

MALLARD (*A. platyrhynchos*).—Some of those in the Rushy Pen at times have undoubtedly been wild.

GADWALL (*A. strepera*).—A pair, the female one of the two which spent the previous season in the Big Pen.

WIGEON (*A. penelope*).—Up to 15 regularly. Two drakes exceptionally tame, and one which remained through last summer.

GARGANEY (*A. querquedula*).—A pair in the Rushy Pen, 7th April, 1950.

SHOVELER (*A. clypeata*).—One or two occasionally in Rushy Pen. A male frequently in second Decoyside Pen during April 1950.

POCHARD (*A. ferina*).—A drake in Rushy Pen at end of December.

COOT (*F. atra*).—Up to nine in Rushy Pen in February. Only two were seen there during the previous season.

MOORHEN (*G. chloropus*).—A dozen or more regularly in the Pens, especially in the Rushy, where they have become fairly tame and will feed unconcernedly at about 20 yards. It is interesting to note that they do not become tame and confiding as ducks and geese do.

PATHOLOGY

The Trust is greatly indebted to Mr. D. Nelson, Veterinary Surgeon to the Trust for the work he has undertaken. By an unfortunate oversight his name was omitted from the Second Annual Report. We are also most grateful to Mr. C. S. Adams and Mr. T. Spence for the veterinary services which they have rendered, and to Miss P. A. Clapham of the I.C.I. Game Services, Fordingbridge, for the bacteriological investigations and post-mortem examinations which she has made.

There has been a small number of deaths in the collection, but it is interesting to note that only in very few cases do the causes appear to be similar. Nothing in the nature of an epidemic has occurred.

Parasites

Only one death, a Barnacle Goose, was traced to Gizzard Worm (*Amidostomum anseris*), which caused some trouble in the previous year. Several birds apparently suffering from an infestation of this parasite were cured by treatment with Phenothiazine.

Tapeworms (*Hymenolepis* sp.) were found in the intestines of a Ruddy-headed Goose, but were not thought to have been the cause of death.

An infestation of small leeches (not identified) appeared to be the cause of death of the Steamer Duck (*Tachyeres brachypterus*). They were removed by a solution of brine, but too late to effect a cure.

Diseases

Two Emperor Geese and a Barnacle were lost as a result of infection of the respiratory system. In one case a *Diplococcus* was isolated.

Some deaths have been caused by a growth in the liver and other diseased conditions of that organ. Others have been caused by pneumonia, although in most cases it seems that this disease assails only birds whose condition has been previously reduced by some other cause.

A Barnacle gosling had finally to be destroyed after infection and swelling of the tibio-tarsal joint which failed to respond to treatment with penicillin. This showed a condition very similar to 'Housemaid's Knee', and the organism *Corynebacterium arthropyogenes* was isolated.

BEHAVIOUR

The Trust was visited by Dr. Konrad Lorenz, the distinguished Austrian ethologist in August 1949. Plans were made for him to spend a period of several weeks studying the behaviour of the Dabbling Ducks during the spring of 1950, but his visit had to be postponed. Dr. Lorenz was much interested in the case of the male Blue Goose which became attached to the kennel-type nesting-box and suggested that the box should be left during the winter in order to observe any seasonal changes in the bird's behaviour. This was done and the bird joined up with others of its own species in the autumn. But early in February he once more showed interest in the box. As the spring advanced he defended the box, albeit not very courageously, as he always retreated behind the box on being approached.

The Lesser White-front described in the Second Annual Report (p. 34) which previously showed a fixation for our keeper, Mr. Cameron, has now been

moved from the Orchard Pen to the first Decoyside where he has taken up with a female Canada Goose of the race *B. c. moffitti*, to which he is now firmly paired. It may be remembered that prior to his attachment to the brooder and Mr. Cameron in the summer of 1947 the bird had been paired with a female Tundra Goose (*B. c. leucopareia*). It is therefore $2\frac{1}{2}$ years since he has been in the same enclosure with any of the races of Canada goose, but he immediately joined the Canada although a different race and size from his earlier mate.

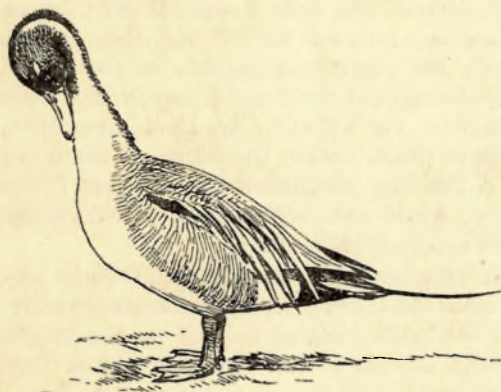
A male Grey-breasted Whistling Duck (*D. a. discolor*) has become attached to a Greylag. Both birds are full-winged and always fly in company. The Whistling Duck has recently become extremely aggressive, and on one occasion almost killed a White-fronted goose, twice his own size.

PREENING STUDIES

By arrangement with Bristol University, Mr. F. McKinney has begun a series of studies at the New Grounds which he intends to extend over a period of two years. He has contributed the following note for this Report which describes the scope of the problems he is setting out to solve:—

The study of preening and bathing activities appears to have been largely neglected by students of bird behaviour. The literature contains many references to these subjects and many artists have drawn birds in preening postures, but there seems to have been no detailed analysis of these important activities.

The main movements involved in preening are familiar to anyone who has watched birds, but there are many problems relating to these movements which still remain to be solved. What is the extent of individual, sexual and specific differences in these movements? Is there an orderly sequence of movements, and if so, what is its significance?



*Pintail
Drake*

The feathers of most birds do not grow from all parts of the body but are arranged in definite restricted 'feather-tracts'. It has been suggested that birds preen along these tracts, though differences in preening-movements have yet to be correlated with the differences which do occur in the pattern of the feather-tracts in the various groups of birds.

Are preening-movements inherited or learned? When does the young bird first preen? Does the young bird use typical preening-movements before it develops the adult feather-tracts? These questions have already been answered

for a few species of birds, but a comparative study of a number of species of the same group should furnish new and important data.

One of the most interesting features concerns the circumstances under which these activities occur. Are they regular after sleeping or after feeding or at any particular time of the day? In the *Anatidæ*, moreover, there occurs what has been termed 'false-preening' and 'false-bathing'. Many of the true preening- and bathing-movements are used by the birds as part of the display, or after a disturbance, and probably under a variety of other conditions.

These are some of the problems which it is hoped to study during the next two years. The *Anatidæ* as a group are very suitable for an analysis of these activities and the collection at the New Grounds offers an ideal opportunity for a study of this kind.

RESEARCH FACILITIES

The Council is anxious that the facilities for scientific research offered by the Trust's collection and installations at the New Grounds should be put to the fullest possible use. The studies now being undertaken deal with only a few of the many scientific problems presented by this group of birds. The Trust will welcome the opportunity of helping students to undertake special studies connected with the *Anatidæ*.

THE NE-NE PROJECT

AT THE invitation of the Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii, the Trust has taken an active part in the attempt to save the Ne-ne or Hawaiian Goose from imminent extinction. Only 24 individuals are known to survive. Mr. John Yealland, our Curator, went to Hawaii early in the New Year and returned on 3rd May. His passage across the U.S. was made possible by the generous assistance of two Members—Mrs. Carl Tucker and Mrs. Gladwin—and the journey was further facilitated by the U.S. Fish and Wildlife Service. The Council feels that this project, although a new departure, falls without doubt within the scope of the objects for which the Trust was formed. A practical contribution to the preservation of a vanishing species is a matter of world-wide significance. Mr. Yealland contributes the following note on his successful mission:—

In the wild state the Hawaiian or Sandwich Island Goose (*Branta sandvicensis*) occurs and, so far as is known, has always occurred entirely on the island of Hawaii, and except for a few isolated records on the neighbouring island of Maui, not on the other islands of the Sandwich group. During the first four months of 1950 only five wild birds, two of them young ones, were seen, and it seems unlikely that there are more than 12 or 15 others.

In captivity on Hawaii there are a further 17 and outside Hawaii only the pair presented to the Trust by Mr. Shipman, who has kept a flock at Keaau, near Hilo, since 1918. Thus it seems that the world stock in April 1950 is between 24 and 40 birds.

The diminution of the Ne-ne—its native name—from an estimated 25,000 less than a century ago, is known to be due to several causes, the chief of which has been their destruction by the islanders for food, particularly during the flightless moulting period, when they are easily run down.

On the island there are numbers of feral cats, dogs and pigs, all of which must have destroyed many nests, eggs and goslings, and early in the present century the mongoose was introduced in the hope that it would kill the rats that were damaging the sugar cane; but evidently it found other foods, including the eggs and young of the geese, more easily obtainable, for the rats continued to thrive and the mongoose is now very common below 4,000-5,000 feet, though less so above that altitude because of the cooler conditions. A changed pattern of vegetation may also have been a contributory cause.

The island, which is of volcanic origin, is dominated by three mountains; Mauna Loa, an active volcano, Mauna Kea, an extinct one, both of some 13,700 feet and Hualalai, and it is on the slopes of Mauna Loa and Hualalai that the geese have lived and the few remaining ones have been seen.

On the sides of Mauna Loa the lava flows are, of course, of varying ages; these form, as it were, islands of vegetation more or less surrounded by the more recent flows (on which little or nothing is growing). It is these 'islands'—known by the natives as Kipukas—which were favoured by the geese. Indeed, the one which I went to was called Kipuka Ne-ne. In general character they are a kind of moorland—moss and lichen covered rocks, a few trees, various grasses and other plants, some of them bearing berries which are eaten by the geese, a favourite being the Ohelo—*Vaccinium reticulatum*. Here and there the lava is impervious enough to hold water, so that there are some shallow pools, but no large areas of water.

Some years ago an attempt was made on the island to propagate the Ne-ne in captivity and some success was met with, but then, it seems, all the birds were given to various ranchers and there is now only one survivor.

When, in 1949, the Board of Commissioners of Agriculture and Forestry set up a project for the breeding of the geese in vermin-proof pens on Hawaii, Mr. Shipman lent two pairs of the birds from his flock. Without these four and the pair presented to the Trust, the Keaau flock now consists of only eight birds, although at one time Mr. Shipman informed me that he had 43 birds. They are all full-winged and a number have from time to time reverted to the wild state, while some disappeared when a tidal wave swept through the garden in 1946.

The site of the new project (which is being carried out under the supervision of Mr. J. Donald Smith, the Board's Game Conservationist) is at Pohakuloa, some 40 miles from Hilo on the 'saddle' road between Mauna Loa and Mauna Kea at 6,000 feet.

This area has an annual rainfall of only ten inches, but there is a plentiful water supply laid on from tanks further up the mountain side. The day is generally warm but there is sometimes frost at night. The earth is very porous but by means of a water-sprinkling system an excellent growth of grass and clover has been obtained in the pens, each of which measures 50 feet by 50 feet, so that each pair has 2,500 square feet of ground surface.

During December one pair laid four eggs, two of which hatched and the young were reared without difficulty, mainly on the grass and clover of the pen, with the addition of watercress, which grows where the water tanks overflow, and milk thistle. Although the adults must have been much inbred and closely related one to the other, the young ones seem to be excellent birds and when I came away they were eight weeks old, and almost as large as the parents.

The second pair did not attempt to nest and it may have been that the female was too young to breed. Nor did the third pair breed; it is made up of a gander

loaned by the Honolulu Zoo (the survivor of the previous propagation scheme) and a young goose which was caught last autumn by a hunter's dog and was quite uninjured. Both pairs were seen to display, and the display consisted of dipping and washing movements carried out by both sexes, but generally on land. The third pair, and especially the gander, showed some interest in two of the three artificial nests, each containing a single hard-boiled turkey's egg, which had been provided in their pen.

Unfortunately all the eggs laid at Keaau were infertile and the reason is not easy to see, for the birds, which have bred there in former years, live on several acres of lawn and lake and seem to be in perfect health.

There is sound reason to believe that the new project will produce an increasing number of good young birds each year; but that is only half the battle, for the provision of suitable places on Hawaii where the geese may live in peace and safety presents many difficulties. To introduce the species to some other place as a wild bird may not be altogether desirable, but there is no doubt that it would be wise to establish a reserve of birds in suitable collections where young ones of sound quality could be bred.

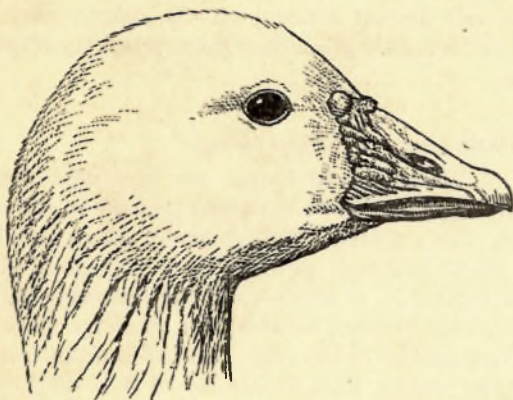
THE PERRY RIVER EXPEDITION, 1949

THE Director was a member of an expedition to Arctic Canada during the summer. Its principal objects were ornithological; a study of the breeding geese was made and live specimens were brought back for the collection. A preliminary report follows :

The Perry River lies in the North West Territories of Canada between Hudson Bay and the Mackenzie Delta. It drains into Queen Maud Gulf at a point about 75 miles north of the Arctic Circle in longitude 102° West. Although not particularly far north it has hitherto proved rather inaccessible and no scientific expedition had previously been into the area.

This is a brief preliminary report covering the activities of the 1949 Perry River Expedition which was supported by the Arctic Institute of North America with funds provided by the United States Government. Support was also received from *Life Magazine*, Ducks Unlimited and Colonel Arthur Sullivan, K.C. The members of the expedition were Harold Hanson of Urbana, Illinois, Paul Queneau of Westport, Connecticut, Peter Scott of Slimbridge, England, and James Bell (pilot for the last two weeks) of Sudbury, Ontario.

The party arrived by train at Edmonton, Alberta, on 23rd May, flew from Edmonton to Yellowknife on 27th May and took off from there for the Perry River on 31st May in an Associated Airways Anson, Douglas Ireland, pilot. Conversion from wheels to skis was made during a forced landing on a frozen lake. Some difficulties were experienced on the flight north largely due to weather, and arrival at Perry River, via Musk-Ox Lake and Bathurst Inlet, was not until 6th June. Camp was made on a gravel ridge in the lee of a prominent hill about 14 miles up the Perry and half a mile east of it. The tundra was snow-blanketed, practically the only ground showing being the upper wind-blown portions of the rocky hills. The surrounding area was explored on foot and, after break-up, by canoe until 18th July, when Jim Bell, veteran bush pilot of Nickel Belt Airways, joined the party with a Fairchild Husky on floats.



Ross's
Goose

During the following two weeks, the sea coast, Ellice River, McAlpine Lake, Armark River quadrangle, was explored by air. The party then returned south via Baker Lake, Churchill and Moose Factory on James Bay arriving at Sudbury on 5th August. In spite of an unusually late summer season an extensive programme of research and survey was carried through.

A full report of the summer's work will be submitted to the Arctic Institute in due course. Meanwhile a short summary of the ornithological work follows.

ROSS'S GOOSE (*Anser rossii*)

Only one breeding colony of Ross's Geese was found in the area. Two hundred and sixty nests were counted on five islands in a lake about 25 miles inland. No Ross's Geese were breeding on the lakes where they were previously found by Angus Gavin. Ross's Geese were found moulting on lakes to the west of the Armark River, and others which may have been of this species were seen on some lakes near the headwaters of the Perry. None of these were nesting this summer, but the lakes may have breeding colonies in a normal summer.

It is rather unlikely that any other substantial colonies of Ross's Geese exist in this area. There are indications therefore that the world stock of Ross's Geese in June 1949 may have been under 2,000 birds. Stringent protection everywhere may be needed to save this species from extinction.

The average brood-size of those which successfully hatched goslings was 2.8. Flocks of early-moulting, broodless birds contained adults apparently in breeding condition.

A striking polymorphism was observed in the downy young of the Ross's. In one brood of five, two goslings were silvery white, one grey, one greenish yellow and one bright yellow. Among broods observed the proportion appeared to indicate that the yellow forms might be recessive and the white and grey ones dominant. Twenty-five Ross's Geese were ringed and 10 were brought back alive. The latter were sent from Churchill to the Delta Waterfowl Research Station, Manitoba, and later to the Severn Wildfowl Trust for study and propagation purposes. One succumbed after the journey. The other nine were examined under the fluoroscope at Delta and three were found to be carrying eggs.

shot in various parts of the body, in spite of the fact that the Ross's Goose has been a totally protected bird in the U.S. and Canada for nearly 20 years. Since the Eskimos rely almost entirely on .22 calibre rifles to secure game, shooting south of the breeding grounds is most probably responsible for body-shot in this species.

WHITE-FRONTED GOOSE (*Anser albifrons* subsp.)

Only one form of White-fronted Goose was identified. No breeding colony was found but pairs appeared to be scattered sparsely in the study area. Only four breeding pairs were located although many other individuals were seen. Seven full-grown birds and four goslings were collected. They differed substantially from the typical *A. a. albifrons* in the following ways. Bills of adult males much larger. Heads heavier, necks longer, plumage more brown, less grey; call of adult male very similar to Greylag. This call is unknown in *A. a. albifrons*, but other notes of the present form are similar to *A. a. albifrons*. The eyelids of some specimens show a tendency to be yellowish buff, but not so much so as in *A. a. flavirostris*, the Greenland White-front. The relationship of this form to *A. a. gambelli* and to the newly separated *A. a. frontalis* (Todd, Condor 1950) is still obscure.

Weights of seven specimens:

Adult ♂	6 lb. 8 oz.	Yearling ♀	5 lb. 4 oz.
" ♂	5 lb. 10 oz.	" ♀	5 lb. 4 oz.
Yearling ♂	4 lb. 13 oz.	" ♀	5 lb. 3 oz.
		" ♀	5 lb. 2 oz.

It is thought that this striking variation in size may have accounted for Angus Gavin's report that two races of White-fronted Geese were to be found in the area. Two of these geese were brought back alive and are now at the New Grounds. The fluoroscope showed that the male was carrying No. 6 shot in the breast.

BRENT GOOSE (*Branta bernicla*)

Only one colony of breeding Brant was studied. This was on an island about $1\frac{1}{2}$ miles east of the mouth of the Perry. There were 14 nests. All the breeding pairs were typical *B. b. nigricans* but a single female which formed a trio with a pair of Black Brant, but did not seem to have a nest, was typical of the race *B. b. hrota*. During an aerial survey from the Ellice River to the Armark—about 90 miles of coastline—only one other colony of Brants was observed. This consisted of some 30 pairs with young broods and a further 60 broodless moulting birds. The subspecies to which these belonged could not be determined from the air. No Brents were breeding in the delta of the Perry, and the island mentioned by Gavin for its colony of Atlantic Brent has been deserted for several years according to the Eskimos. The Black Brant colony was found in the habitat reported by Gavin as that of the Atlantic race.

Although all the nesting females were typical of *B. b. nigricans* considerable variation in the colour of the nest down was observed, some being dark brown while in other nests it was fairly pale grey.

CANADA GOOSE (*Branta canadensis* subsp.)

Many pairs bred singly on islands in lakes and also among the Ross's Goose

colony. Their eggs mostly hatched at least four days after the Ross's. The size of these birds was strikingly constant and indicated that they belonged to *B. c. parvipes*.

Weights of six specimens:

Adult ♂	6 lb. 3 oz.	Yearling ♀ ..	5 lb. 9 oz.
„ ♂	5 lb. 12 oz.	Adult ♀ (after in-	
„ ♂	5 lb. 12 oz.	cubating) ..	3 lb. 11 oz.
„ ♂	5 lb. 8 oz.		

Before the breeding season parties of big Canada Geese (? *B. c. moffitti*) were seen migrating down the river. Four were found moulting with Lesser Canadas and Ross's, and on the last day of July a party of nine big Canadas was seen on the Perry already able to fly on new primaries. There was no evidence of breeding of the large race, but it was recognised by the natives as distinct from the Lesser Canada. It is thought that non-breeding birds may continue northward this far in order to find suitable moulting territory.

LESSER SNOW AND BLUE GOOSE (*Anser caerulescens*)

Lesser Snows bred in small numbers in the Ross's Goose colony. A few Blue Geese were also present, but only two are known to have bred. These were both males and were mated in both cases to Lesser Snow females. In one case where the Blue was a bird with white flanks and belly—the two young were both yellow and typical of *A. c. hyperboreus*; in the other case there were also two young—one yellow and one sooty (typical *A. c. caerulescens*).

Relative Abundance of Geese

An analysis of all field observations made inland from the Arctic sea coast between 6th and 21st June indicates the following relative abundance of the various species of geese which nest in the Perry River area: Lesser Canada Goose 33 per cent., White-fronted Goose 29 per cent., Ross's Goose 19 per cent., Lesser Snow Goose 17 per cent., Blue Goose 1 per cent., Black Brant 1 per cent.

PINTAIL (*Anas a. acuta*)

Large numbers of moulting males were present but very few females. No nests were found and no young seen. This may have been caused by the unusual weather conditions or it may be that only males move so far north. One Eskimo report was that the nests were never found. Another said that they nested sparsely and scattered over the tundra.

About 30 were ringed. (One has since been recovered. It was shot on the Pacific Flyway at Hannaford Valley, Lewis County, Washington on 23rd December, 1949.)

Other Waterfowl

The two common breeding ducks in the area were the King Eider (*Somateria spectabilis*) and the Long-tailed Duck (*Clangula hyemalis*). One Green-winged Teal was seen (among Pintails) and three Red-breasted Mergansers (*Mergus serrator*). No Eiders of the species *Somateria mollissima* were seen.

It was interesting to note that the spiked feathers on the drake King Eider's back were much more prominent than is usually figured in illustrations, and

that, in the spring, the female shows definite spikes of the same kind, though markedly 'blunter'. These feathers seemed to be under the bird's control. They were not always visible in the female and lay flat in skinned specimens of both sexes.

Species not Previously Recorded from the Area

The following birds were seen which were not shown in Angus Gavin's paper on the birds of the Perry River region: Peregrine (*F. p. anatum*), Pomarine Skua (*S. pomarinus*), Glaucous Gull (*L. hyperboreus*), Green-winged Teal (*A. c. carolinensis*), Red-breasted Merganser, Bonaparte's Sandpiper (*C. fuscicollis*), Dunlin (*C. alpina*), Baird's Sandpiper (*C. bairdii*), Knot (*C. canuta*), Ruddy Turnstone (*A. i. morinella*), American Pipit (*A. s. rubescens*), Savannah Sparrow (*P. sandwichensis*). Nests were found of Peregrine, Glaucous Gull, American Pipit and Savannah Sparrow.

Museum Collections

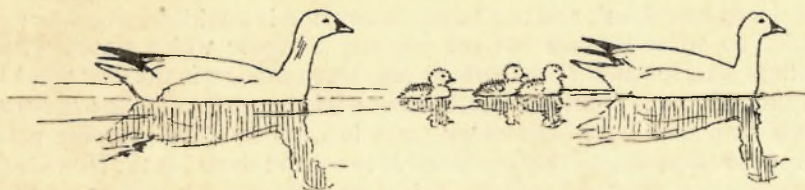
Over 100 bird skins were collected. The handling of these birds entailed considerable work in the expedition's laboratory, as for each specimen the following procedures were carried out: weighing, recording body fat, preservation of gonads, preservation of stomach contents, examination for internal parasites, and preservation of faecal samples for coccidia studies. Blood smears were obtained from many species but none showed the presence of blood parasites. A few ecto-parasites were also collected.

CAPTURE OF LIVE GEESE FOR THE COLLECTION

It may be of interest to record the circumstances in which the Ross's Geese and Perry River White-fronted Geese were captured in the Arctic for the collection at the New Grounds. The following account is taken from the Director's Journal of the Expedition.

Thursday, 28th July, 1949

' . . . We set off (from the base camp at Radio Hill, 14 miles inland from the mouth of the Perry River) on the goose-catching expedition to the River Kennet. Young Taanoo (a 16-year-old Eskimo boy) carried the aluminium canoe, Patsy (Taanoo's father—his Eskimo name is Topelakon) carried the nets, and Adaa, the grandfather came too. We used the big canoe to cross the Perry, and at the last moment the two little girls joined the party (two Eskimo girls of about 10 years old). Across the river the plan was to use a chain of lakes in order to have the shortest portages. In this way we covered the two or three miles, Patsy taking the canoe across each lake with Taanoo and the gear while the rest of us walked round and then portaged to the next lake. A caribou had been sighted in the morning and there seemed to me little enough chance of finding it, but the grandfather was more concerned with that than with our goose drive. Another new factor had now entered the field. The mosquitoes had finally hatched. Up till now the nuisance had been negligible, and could well be kept in check by our repellants. But today there were five times as many, and their attacks were, at times, pretty determined. They troubled the Eskimos a good deal and there was frequent and exasperated mention of *kiktoriaak*.



'We reached the Kennet just above a large open pool, on the banks of which I saw a bunch of between 20 and 30 white geese with their broods. We decided to go for them, and Taanoo was dispatched to cut off their retreat down stream, for already they had seen us. When we got to the river the birds were in a cluster in the centre of the pool. There were two pairs of Lesser Snows, about 12 pairs of Ross's and two pairs of White-fronts (Perry River race). Most of the geese had broods, and still had unmoulted primaries, but one pair of the White-fronts had no young and was flightless. The two little girls were stationed one on either side of the pool, and grandpapa went to the top of a hillock to do double duty as longstop and caribou spotter. Patsy and I then tried to find a place to set up the nets. The obvious place—an old overflow channel—was no good because the ground was stony and the stakes would not drive in. So we crossed in the canoe, to find a place on the other side of the pool. On the way over a Pintail flew past on little stumpy wings. This is the first I have seen which is quite evidently a post-moult bird.

'Then began the laborious task of setting up about 80 yards of string netting on the little aluminium stakes which could not be pushed more than six inches into the ground, because of the permanent frost level. The net was laid out in the form of an unequal V with a circular trap at the apex, the short arm stretching 10 yards into the water. It took us about an hour during which the geese remained clustered in the middle of the river about 70 or 80 yards away. At the end of that time Patsy and Taanoo took the canoe while I took up position on the shore below the trap and the drive began. All that I felt sure we would get was the broodless and flightless pair of White-fronts, because as far as I could see none of the other adults had moulted their primaries. But these two would not stay with the white geese and in due course the white ones were herded into the net without much difficulty. They ran all the way into the trap. Then I expected them to fly out, leaving the goslings and at best two or three adults. But only half a dozen flew out, and many with complete black primaries either wouldn't or couldn't fly, while in others the primaries fell out as they tried. So there were at least 15 adults in the trap. Very foolishly I had not led the trap onto hard dry land. It was on a soft muddy patch and in a moment it became a quagmire. I went into the trap and seized as many Ross's still with primaries as I could manage. Unfortunately we had only two sacks to hand and they were obviously insufficient. The next thing to do was to get the goslings out of the trap before they were trampled on. They were too small to be ringed. There were over 30 including the Lesser Snow babies, but in the excitement of the moment I did not start counting them until I had let about six go, also Patsy and Taanoo were letting them out as fast as they could. One was on its back and looked a bit bedraggled but it ran off with the rest to join the flying parents who were waiting about 50 yards away.

'Then we started to ring the adults, a fairly difficult operation requiring

pliers in order to close the U.S. rings which are of much stiffer metal than ours. We ringed nine Ross's and two Lesser Snows, and in addition I kept four Ross's. I tried to select ganders but the majority of those which stayed with the goslings were females. Thus there are only three ganders in the four that I kept. (My intention was to bring males, because wild-caught females do not normally breed until they have been many years in captivity. The breeding stock in Europe in the spring of 1949 consisted of two ♂ and three ♀ at the New Grounds and one ♂ and two ♀ at Leckford. This stock originated some 40 years ago and no fresh blood appears to have been introduced since. It was therefore desirable that the five breeding females should be provided with wild-caught males and it was for this reason that an excess of males was selected.)

'Meanwhile the White-fronted Geese were still in the pool and being held there by the two little girls fielding, as it were, at mid-on and mid-off. Patsy and Taanoo set off in the canoe again to round them up. I remained ashore, because, with rubber boots on, I reckoned I could wade out, although in the event it was never necessary. After the success of the first drive, the second effort was surprisingly poor. Patsy did not seem to have the idea of patience and was rushing the geese in spite of my cries of "*Ahungeitomik*"—(slowly) and "*Tigumearung*"—(carefully). The result was that they split up and the pair with the brood went up stream; the gander could fly quite well. It was, no doubt, all for the best, as I should have been tempted to try to keep the goslings and it is very doubtful if it would have been a success. The remaining pair split up and began to dive. This was the result of hustling them too much. The female went and crouched under the far shore. When the gander was headed in the right direction I told them to go off and get the female. The gander proceeded to go straight into the net all on his own. By taking her slowly they brought the female in behind him and we had a beautiful pair of these interesting geese. As we had observed before there was a striking difference in size between the sexes. The gander is a big bird, the female with a completely orange-stained front, is much smaller. Her flight-feathers were ahead of his and in five or six days she would have been able to fly. Having found our third sack we packed the six birds into the canoe, for the first stage of their journey from the Northwest Territories to Gloucestershire; we dismantled the nets and laid them out to dry and then we repaired up the slope to where the two little girls were brewing tea over a heather fire. It was a delightful and triumphant picnic. . . .'

* * *

A further catching expedition was made on **Sunday, 31st July.**

'I finally got off at about 2.30 p.m. after an elaborate operation of collecting the nets with Marki (a young Eskimo) from across the river while Patsy collected the canoe. We set off up the Perry—Patsy, Marki and the two little girls—and portaged round the rapids. Then I walked on ahead picking up a number of new flowers—including a spectacular one which has bracts, coloured rich crimson pink or nearly white and every degree in between, a very variable and handsome plant. There was a yellow Lupin and a pinky blue one, a little purple bladder campion, all bladder and tiny petals, and many more.

'On Upper Goose Island were nine large Canada Geese which had evidently finished their moult, as they flew off up the river. It was already 6 p.m. and still

a grey, rather windy evening when I decided to cross the river (about 150 yards wide) and look round one more corner before portaging over to the Kennet to try our luck there. Round the next corner, however, was a little party of White Geese. There were two broods of Lesser Snows and two broods of Ross's and about 15 broodless birds.

'We set up the nets which took much less time than before. Patsy is now quite adept at it. I could only get the river wing about 10 yards out into the water, but I made the trap in a gap in the mud furrows which looked as though it led back into the water. This is a good way of reducing pressure on the wings, which means less time spent in anchoring the bottom of the net. It was all finished in under an hour and then Marki was sent up stream to go round the birds. Patsy and I went to the headland on the corner to watch. The geese were ashore feeding, and above them were the nine large "honkers" — "*Oodlo*" is the Eskimo name. The white geese started down stream nicely and as they approached the corner Patsy and I hurried back to the canoe excitedly. As we did so the clouds blew away and the low evening sun came out with a clarity and brilliance which was supremely beautiful. It was very exciting waiting for the geese to come round the corner, and even more exciting when they finally appeared shining white in the sun. We waited a little to let the stream bring them down to our nets and then we suddenly paddled out from our hiding place. The geese bunched more tightly and turned to head the stream. So we gradually eased them over and then worked them to the short stretch of shore inside the V of our nets, the longer arm of which was not more than 30 yards. They went in perfectly and the whole lot ran into the trap. I quickly caught and released the 13 goslings (still too young to ring) and then ringed the three Lesser Snows (the gander of one pair had flown out). Then I selected six birds and put them into three sacks and ringed the rest of the Ross's—12 more—in quick time, Patsy taking the rings off the string and handing them to me. The whole operation had been completely successful.

'I walked over to the Kennet to see if there were any prospects there for a second drive. It was already 8.30 p.m., but for more White-fronts or Lesser Canadas we could have made the necessary portage. . . . I walked over in the evening sun. The mosquitoes, which had been out of sight and out of mind during the cold grey weather, were emerging a little but not enough to be tiresome. I walked on to a brood of six or seven young Ptarmigan which could fly quite well, and I also came upon a young Buffon's Skua which showed defiance. Curiously enough its parents were much less demonstrative than the pair near camp. A pair of Golden Plovers and some Pectoral Sandpipers had young near my route but I did not see either. I came to the Kennet at the point where we had found the first young Ross's Geese on the way up to Lake Arlone. Exactly opposite me was a large group of Ross's with broods. There were 28 adults and 41 downies; the 14 broods consisted of 2 fours, 9 threes and 3 twos (average 2.93). They were sitting ashore on the grassy bank opposite to me. I contemplated the long business of portaging the canoe and setting up the nets, and made the lateness of the hour an excuse for leaving those 14 families of Ross's Geese in peace. Instead I lay on the tundra looking over the brow at them, counted their broods and drank in the peaceful sight. Some of them half saw me and took their goslings into the water. But they landed again on my side and I watched them for another half-hour. Most of the parents were now flightless; only three or four had

black primaries still showing. The young were well grown, between two and three weeks. They all looked very grey and the sharp polymorphic distinctions in colour which we had seen in the small downies were at least not nearly so obvious.

'It was my last view of the Kennet—an unforgettable one—the low sun shining on the steep red bank on one side and the green pasture on the other, the calm water a deep blue, and the bright white geese with their silver-grey goslings. Had it been expressly in honour of our efforts to save them from extinction they could not have staged a more rewarding farewell scene on their traditional rearing grounds by the banks of this lovely little river.

'When I got back to the Perry the Eskimos had finished their tea and opposite them, stemming the stream, were two little goslings, obviously lost. Patsy and Marki took the canoe and tried to catch them but they dived, so we abandoned it. It was strange that they should have come back so exactly to the last place where they had seen their parents. Patsy ferried Marki and the little girls across the river for the five mile walk home then came back for me. We loaded in the nets and the live geese and set off paddling down stream looking for the two goslings. Soon we came upon them and caught them severally after a considerable chase and much diving. (I finally caught both under water in the shallows.) I was not absolutely sure whether they were Ross's or Lesser Snows, but inclined to the belief that they were Lessers. We paddled down stream. The wind had died; the sun had set; it was 11 p.m., but the northern sky was clear and orange. To the south the sky was pink and below that deep blue on the horizon. The river banks were sharp and black. As we came down to East Bend I could see the party of white geese ahead—the party we had already caught. We paddled hard and cut them off, so as not to drive them on down stream ahead of us. As they turned I counted them. All that we had ringed were there and the broods were complete except that one Lesser Snow had only one gosling instead of three. So I opened the bag and released the two downies. They swam off towards the flotilla ahead. We passed rapidly round the corner in order to allow the parents to slow down and wait for the young which they would probably see and certainly hear astern of them. We took the canoe down the edge of the main rapids. Patsy and Marki began it but when we came to a place which I could more easily negotiate because of my long boots, I took over and brought it the rest of the way. I shot two sets of rapids and then tried to cross above some others and got swept broadside on, the one unforgivable sin. However, my luck was in; I did not hit a rock in my short broadside sweep and got safely, if a trifle breathlessly, to shore. From there it was easy and on the last stretch I paddled slowly and peacefully in the still dusk, savouring this last impression of our river—for the morrow was our day of departure.'

GENERAL ACTIVITIES AND ADMINISTRATION

VISITORS

ON 4th March the Trust was honoured by a visit from H.R.H. the Princess Elizabeth. Some 1,500 geese were still on the estuary on that day and the whole flock was feeding in the Tack Piece—the field immediately adjacent to the Rushy Pen. A few minutes before Her Royal Highness arrived, the geese were inadvertently disturbed and flew out to the estuary. This meant that the Royal Party, instead of seeing the geese at close quarters, saw the flock far out on the sandbanks of the estuary, but it did not, as some Press reports attempted to indicate, spoil Her Royal Highness's visit. On the contrary, the Royal Party had a good view of the ducks in the decoy and spent the morning in most agreeable weather watching and feeding the birds in the Pens. After lunch in the Headquarters Cottage, Her Royal Highness went aboard the Narrow Boat *Beatrice* and visited the Trust's Gypsy Waggon. During the visit the Trust's Staff and a number of local people who have given particular help and support to the Trust were presented.

On 19th January H.H. the Princess Marie Louise visited the Trust. Unfortunately the day was foggy but Her Highness spent some time watching the birds in the pens.

The number of visitors has been double that of last year. Some 10,000 people have visited the New Grounds, including 193 parties, 63 from schools and educational establishments.

The problem of showing visitors over the collection has been greatly eased by the 'Key to the Wildfowl of the World' which has been on sale as a separate pamphlet at 2s. 6d. The problem of escorting them to see the wild geese is still most difficult owing to the shortage of staff.

Once more, however, a number of Members have come forward and kindly consented to act as Honorary Wardens. The following, who are well acquainted with the behaviour of the wild geese, have offered their services from time to time in order to augment the permanent staff:

J. Field, Esq.	J. Russell, Esq.
C. P. A. Garnett, Esq.	J. Savidge, Esq.
B. King, Esq.	Miss C. L. Sansom.
Dr. B. Morson.	K. H. Shackleton, Esq.
J. E. Murphy, Esq.	R. J. F. Taylor, Esq.
J. P. Paige, Esq.	D. Weir, Esq.
Miss A. Pritchard.	G. T. Wilkins, Esq.
A. Richardson, Esq.	

STAFF ARRANGEMENTS

The scientific work of the Trust is being greatly developed. Mr. Hugh Boyd has been engaged as Resident Biologist. The arrangement with Bristol University by which Mr. Frank McKinney is now working at the New Grounds for his Ph.D. has been mentioned earlier.

Extensive experiments for the perfection of the nets for catching and ringing

wild geese have been carried out under the enthusiastic direction of Lord Geoffrey Percy.

The Council wishes to draw particular attention to the service which has been given by the secretarial staff during the past year. The Trust is deeply indebted to Miss P. Talbot-Ponsonby, Mr. E. A. Scholes, Mrs. Scholes, Mr. Douglas Eccleston and Mrs. S. T. Johnstone for the enthusiasm and energy which they have put into the work.

This kind of enthusiasm has permeated the development of the Trust in all its spheres and has, in the opinion of the Council, been responsible for the great progress which it continues to make, and the steady increase in Membership.

MEMBERSHIP

The Council is happy to announce that Her Royal Highness the Princess Elizabeth has been graciously pleased to accept Honorary Membership of the Trust.

The total Membership figures at the time of the Annual General Meeting were as follows (the figures in brackets are the totals at the previous Annual General Meeting):

Life Members	..	..	..	34	(17)
Members	..	..	..	2,518	(1,888)
Corporate Members	..	..	..	54	(34)
Associates	..	..	..	477	(561)
Parish Members	..	..	..	35	(9)
Contributors	..	..	..	33	(25)

The substantial increase in Life Members, at a fee of 50 guineas, is most gratifying. There has also been a considerable increase in the number of Members who have covenanted their subscription for seven years, among them Mr. Bernard Shaw. This arrangement is strongly recommended, as, provided that the Member is able to commit his or herself to remain a Member for that period, the Income Tax on the subscription is recoverable from the Inland Revenue by the Trust. At the present rate of Income Tax this nearly doubles the sum received by the Trust without any extra cost to the Members.

FINANCE

The financial position of the Trust was greatly improved by a magnificent donation from our senior vice-President Lord Dulverton of Batsford, of £1,000 for capital development and a further donation from Mr. Guy Benson, of £500 has already been mentioned. The Newport and District Naturalists' Society and a number of individual Members have come forward most generously with gifts of daffodil and narcissus bulbs, shrubs, a typewriter, binoculars, etc. The Council wishes to place on record its gratitude for the generous way in which Members and contributors have supported the Trust in these various ways.

The Accounts of the Trust's operations for the year ended 31st December, 1949, will be found on pages 71-72, and it will be seen that Income for the year exceeded Expenditure.

The First Annual Report made a profit of £147 and it seems that the Second Annual Report together with the printing of the 'Key' as a separate pamphlet should at least pay for itself. A sum of £180 was raised by the sale of a Christmas

card (printed in black and white). The Council, however, still feels that every effort must be made to increase the Income. It is proposed to issue a Gift Token for a year's Membership, in an attractively printed form, which should make an ideal Christmas or birthday present. Members will be informed as soon as the Tokens become available. Meanwhile, since our principal support must always be derived from a strong Membership, the Council would urge you to enrol at least one new Member this year. The Council is not diffident in making this appeal because it feels that the Trust has something worth while to offer to the community and that those who become associated with its work are not likely to regret having done so.

LEASE AND LICENCE

The Council is pleased to announce that a 25-year Lease has now been executed with the Berkeley Estates Company. This concerns the Headquarters Cottages, the Duck Decoy and the area of the enclosures. In addition a Licence has been granted to the Trust in order to regularise the privileges which Members enjoy of using the observation huts along the sea wall. This licence is designed to allow full facilities for watching the geese, while at the same time safeguarding the interests of the birds themselves and of the farmers upon whose land they feed.

BIRD OBSERVATORIES SCHEME

Now that it is possible to accommodate visiting students, the Trust has been included in the Observatories Scheme of the British Trust for Ornithology. The Director, the Head Warden and the Resident Biologist attended the Bird Observatories Conference at York on 12th February, 1950. This provided a very useful opportunity for an exchange of ideas with others undertaking similar problems although with different groups of birds.

THE DIRECTOR'S LECTURES

In the course of the past year the Hon. Director, Mr. Peter Scott, has given 35 lectures (in the previous year the figure was 48 lectures). The sum raised from these lectures, including the sale of literature, was £1,377 3s. 9d. (in the previous year £1,114 8s. 9d.). Although some of these lectures dealt with the Director's expedition to the Perry River in Arctic Canada, the Trust has invariably been mentioned and lecturer's fees or collections in their entirety have been handed to the Trust. In this connection the Council would remind Members that the Director receives no payment whatever from the Trust's funds for this or any other service to the Trust—on the contrary he contributes £200 annually under Deed of Covenant.

THE CANAL LECTURE TOUR

During April 1950 the Director undertook a lecture tour of the Midlands by canal, travelling in the Trust's converted Narrow Boat *Beatrice*. During the cruise the number of the crew varied between six and nine. Mr. Robert Aickman, Chairman of the Inland Waterways Association, was one of those on board.

Lectures, which were given at Macclesfield, Manchester (2), Southport, Liverpool, Northwich, Chester, Dudley, Birmingham and Worcester, raised £484 for the Trust including sale of literature.

The distance covered was 450 miles including the passage of 273 locks.

The whole journey occupied 31 days. These included five days delay with engine trouble. Three features of the cruise need especial remark. The passage from Liverpool to Weston Mersey Lock, 15 miles on salt water in the open estuary, had not previously been made by a converted Narrow Boat. Fortunately, in spite of the 15 m.p.h. wind, the sea remained fairly smooth and the passage was made without mishap. The same could not be said of the passage of $1\frac{3}{4}$ mile Harecastle Tunnel in which *Beatrice* stuck fast about 1,100 yards from the entrance. At this point the tunnel has subsided, owing to adjacent coal workings. After a great deal of hard work loading and shifting brick ballast the boat passed through after $6\frac{1}{2}$ hours. Previously *Beatrice* had been lowered from the Trent and Mersey Canal into the River Weaver Navigation on the famous Anderton Lift, which moves boats, with 200 tons of water in a caisson, vertically up or down 80 feet.

MARKET HARBOROUGH FESTIVAL

The Council approved the participation of the *Beatrice* in the Inland Waterways Association's Festival and Rally at Market Harborough in August 1950.

ARRANGEMENTS FOR VISITORS

The local rules governing the facilities at the New Grounds have been subject to minor amendment since last year. For this reason and for new Members, they are printed below.

Wild Geese

(i) Members, accompanied by one guest each, shall have access to all observation huts, provided that such access does not disturb the geese, but must be accompanied by a Warden or Honorary Warden. This is a condition of the Deed of Licence concluded with the Berkeley Estate Company. A notice giving the times when a warden will be available in the Orchard Pen to escort parties of Members to the observation huts will be displayed inside the main gate. The object of the scheme is to ensure that every Member spending a morning or afternoon at the New Grounds should know when and where to find a warden, and so have the opportunity of watching the wild geese.

(ii) Associate Members have the same facilities as full Members while at the New Grounds except that they are not entitled to bring a guest.

(iii) Corporate Members (this Membership is only open to educational institutions) shall have access to all observation huts, but must have made prior arrangements for the visit and only receive full facilities when in parties

