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- 1) June meeting. The June meeting of the W.S.G. will be held at Dr. C.D.T. Mintons house at Shenstone on Saturday 23rd June. The topic to be discussed will be reports on the knowledge of the waders of each estuary - with special reference to the application of the results to the Birds of Estuaries Enquiry.
- 2) Breeding waders. As little is known about breeding waders we would like to emphasise that it is extremely important that the biometrics, breeding seasons, success etc. of breeding waders should not be neglected. There are very few detailed studies in western Europe, and even fewer in Britain. Without these details we cannot hope to sort out population movements through the country. Every ringer can help by obtaining measurements of breeding adults as well as of pulli. We would urge that during the summers of 1973 and 1974 a big effort should be made to trap and ring waders in areas where they breed. Nest record cards are excellent for storing the information on, they are obtainable from the B.T.O.
- 3) 1973 Subscriptions. Sorry to mention it again but Ron Birch would like to have 50p. payments from those who have not yet remembered this subscription, address: 8 Thornberry Close, Saughall, Chester.
- 4) Ringers Conference. I should like to thank all of those who entertained us at Swanwick last January. In particular thanks go to Guy Morrison and James Wilson for their excellent talk on Friday evening and for showing the uncut version of the superb film of the Iceland expedition. To Harry Green for the quality of slides on eastern Greenland, to me exemplified by a magnificent picture of a Sanderling on the nest. To Peter Stanley, M. Pienkowski and D. O'Kill for their talks on their expeditions to Scandinavia and Morocco.

Ringing Totals : October-February

Below are the ringing totals for the winter period. Of special note are the start of wader netting on the Clyde (by Peter Mackie and Iain Gibson), the start of cannon netting on the Humber (at Spurn) and the continuation of cannon netting in Portsmouth Harbour (with the F.R.G.) and in Wales (both at Conway and in Monmouthshire).

	Clyde	FRG	MBWG	MRG	Spurn	Wales	TRG	WWRG
Oystercatcher	3	16	66	300		99	45	96
Lapwing		7		2	2	29		
Ringed Plover			30	39		50	3	
Grey Plover		2						50
Golden Plover			7	3				2
Turnstone		55	125	4	2	16	59	12
Common Snipe		28		40	5			
Jack Snipe		5		3	1			
Curlew		21	3	10			1	41
Black-tld Godwit		8						
Bar-tld Godwit		1		3				4

	Clyde	FRG	MBWG	MFG	Spurn	Wales	TRG	WTRG
Green Sandpiper				1				
Redshank	59	68	229	20	13	38	101	150
Greenshank		1						
Knot	1	1	1440	908	10		18	1308
Dunlin	55	238	608	504	715	390	55	1158
Sanderling				107			33	55
Purple Sandpiper				1			8	2

Recent Recoveries

Oystercatcher

Pullus	9.6.69	Skokholm, Pembs.	+	Safi, Morocco			22.10.72	
Pullus	7.7.70	Granton-on-Spey, Inverness	x	inner Clyde, Dunbarton			20.11.72	
Pullus	13.6.72	Orkney	+	Coruma, Spain			12.11.72	
Pullus	16.7.72	Skokholm	+	Charante Maritime, France			11.10.72	
Ad	13.4.68	Heacham, Wash	x	More & Romsdal, Norway			29.10.72	
2Y	28.7.68	Wolferton, Wash	x	Rogaland, Norway			14.7.72	
2Y	30.8.68	Snettisham, Wash	+	More & Romsdal, Norway			7.7.72	
Ad	16.10.63	Flookburgh, Morecambe Bay	x	Faeroes			28.8.72	
Ad	22.10.64	Point of Air, Dee	x	Faeroes			end 3.72	
1Y	17.2.68	Heacham	x	Faeroes			10.8.72	
Ad	23.11.69	Piel, Morecambe Bay	x	Faeroes			0.11.72	
Ad	20.2.72	Heacham	v	Faeroes			14.7.72	
FG	13.8.67	Snettisham	x	Jylland, Denmark			1.11.72	

In addition to these recoveries there were nine birds, found within Britain which appear to have been wintering further north than where ringed. All these birds were three or more years old. One first year bird ringed on 8.10.72 at the Point of Air, Dee was recovered at Prah Sands, Cornwall on 10.11.72, this showed a similar movement to the last two of the pulli recoveries. The first pullus is remarkable in that the bird was over 3 years old when recovered in Morocco. Also note the three late recoveries in the Faeroes, Norway and Denmark, probably a sign of the mild winter.

Lapwing

Pullus	3.6.72	Banffshire	+	Morbihan, France			early 12.72	
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Ringed Plover

Ad	24.9.72	Walney, Morecambe Bay	v	Conway, Caerns.			18.11.72	
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Snipe

Juv	17.8.67	Chew, Somerset	+	Beaulieu, Hants.			27.1.73	
PJ	20.11.68	Swale, Kent	+	Consett, Durham			19.10.72	
PJ	5.1.70	Cambridge	x	Schleswig-Holstein, W. Germany			16.10.72	
Juv	5.8.71	Billingham, Durham	+	Killorglin, Co. Kerry			16.1.73	
FG	18.9.71	Little Haltingbury, Essex	+	Zeeland, Netherlands			26.9.72	
1Y	23.1.72	Huddersfield, Yorks	+	Odeuse Fjord, Denmark			15.10.72	
EJ	25.7.72	Loch Eye, Rosshire	+	Ballymena, Co. Antrim			29.12.72	
FG	17.8.72	Appleby, Westmorland	+	Cotes du Nord, France			24.9.72	

Jack Snipe

FG	6.10.71	Fair Isle	+	mainland, Orkney			3.1.73	
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Woodcock

Pull	11.7.72	Beaulieu, Inverness	+	Killarney, Co. Kerry			26.12.72	
FG	14.10.72	Holme, Norfolk	+	Tamworth, Staffs.			25.11.72	

Curlew

Full	13.6.70	Kinbrace, Sutherland	+	Dingwall, Ross-shire	0.1.73
Full	6.6.71	nr Sheffield, Yorks.	+	Pembrey, Carm.	15.12.72
FG	16.9.61	Medway, Kent	+	Randers Fjord, Denmark	1971-1972
PJ	8.8.71	Walney, Morecambe Bay	v	Kuopio, Finland	25.5.72
Ad	7.11.71	Dundrum, Co. Down	+	R. Nith, Solway	15.9.72

Bar-tailed Godwit

2Y	29.8.72	Wolferton, Wash	+	Santander, Spain	14.10.72
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Redshank

FG	29.3.68	E. Tilbury, Essex	v	Vlieland, Netherlands	8.11.72
Ad	10.8.71	N. Wootton, Wash	v	Zeeland, Netherlands	26.8.72
Ad	2.8.69	Harty, Kent	v	Boyton, Suffolk	16.11.72
Ad	6.9.72	Spurn, Humber	+	Teesside	9.1.73

Knot

Ad	27.8.68	N. Wootton, Wash	+	Thule, Greenland	end 5.72
Ad	24.11.68	Heacham, Wash	+	Thule, Greenland	end 5.72
Ad	7.3.70	" "	+	" "	" "
Ad	7.3.70	" "	+	" "	" "
Ad	8.3.70	" "	+	" "	" "
Ad	15.11.70	Thornham, "	+	" "	" "
Ad	30.11.70	West Kirby, Dee	+	" "	" "
Ad	19.2.73	Snettisham, Wash	+	" "	" "
Ad	8.2.70	Middleton, Morecambe Bay	+	Upernavik, Greenland	0.6.72
1Y	14.2.71	Southernness, Solway	+	Satut, Umanak, Greenland	9.6.72
Ad	2.1.71	Point of Air, Dee	x	Thule, Greenland	0.7.72
Ad	19.3.72	Snettisham	+	Julianshaab, Greenland	20.7.72
Ad	24.11.68	Heacham	+	Thule, Greenland	16.9.72
Ad	13.9.69	Heacham	+	Vest Agder, Norway	26.8.72
PJ	14.2.71	Southernness	+	Bassin d'Arcachon, France	23.8.72
Ad	7.3.70	Heacham	+	" " "	20.8.72
Ad	11.1.71	Aldingham, Morecambe	+	Charante Maritime, France	8.8.72
PJ	12.8.72	Point of Air	+	Manche, France	21.1.73

The long distance British recoveries were

from	To	Dee	Wash	Morecambe Bay	Solway	Humber	Ribble	Tay
Dee		--	1	6	-	-	-	-
Wash		-	--	2	-	1	1	1
Morecambe Bay		2	1	-	1	-	2	-
Solway		-	-	1	-	-	-	-
Ribble		-	-	4	-	-	-	-

During this period another 13 recoveries in Greenland were reported this brings the total recovered during the 1972 summer to 30, about three times the previous grand total of recoveries there, clearly demonstrating the disastrous breeding season in northwest Greenland and northeast Canada. Also of note are the three autumn recoveries, all previous ones were in the spring, including one from the southwest tip of Greenland and one on the incredibly late date of 16th September.

Dunlin

Ad	3.9.71	Boyton, Suffolk	+	Jylland, Denmark	8.8.72
Ad	15.9.69	Snettisham, Wash	v	Schiermonnikoog, Netherlands	10.9.72
PJ	10.1.70	Hoylake, Dee	v	" "	18.8.72
1Y	13.9.70	Bardsea, Morecambe Bay	v	" "	8.9.72
PJ	20.11.71	Hayling Is., Chichester	v	" "	8.9.72
Ad	1.3.72	Walney, Morecambe Bay	v	" "	11.9.72
1Y	2.9.67	Kemsley, Kent	+	Bassin d'Arcachon, France	6.1.73
Ad	9.8.71	Terrington, Wash	+	Somme, France	16.7.72
1Y	5.11.72	Terrington	+	Cadiz, Spain	3.12.72
2Y	9.8.71	Terrington	x	Averio, Portugal	7-14.10.72
1Y	9.10.71	Heacham, Wash	x	" "	" "

The welcome sight of Dutch recoveries, presented in these last two reports, clearly indicates the upsurge in ringing waders in the Netherlands.

Only four distant controls within Britain were reported.

PJ	23.11.68	Hilbre, Dee	v	Harsea Isl., Portsmouth	18.12.72
FG	15.11.70	Seafield, Edinburgh	v	Inner Clyde, Dumbarton	2.2.73
1Y	14.3.71	Conway, Caerns	v	Holme, Norfolk	22.12.72
1Y	28.8.72	Ferrington, Wash	v	Inishkea Isl. Co. Mayo	3.1.73

Curlew Sandpiper

1Y	2.9.69	Brownsea, Poole Harbour	v	Lac du Rades, Tunis	24.7.72
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Sanderling

Ad	12.8.68 (& 18.7.70)	Snettisham, Wash	+	Hoal, Senegal	27.9.72
Ad	27.5.72	Thornham, Wash	?	Somme, France	14.7.72
Ad	13.8.69	Hoylake, Dee	x	Holy Island, Northumberland	31.10.72
Ad	23.9.72	Gibraltar Point, Wash	x	Cleethorpes, Humber	28.11.72

Avocet

Fullus	15.6.71	Havergate, Suffolk	+	Cadiz, Spain	1.12.72
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Some Notes on Bar-tailed Godwit Ringing, Biometrics & Moults

G.H. Green

Since ringing started in the British Isles in 1909 approximately 850 Bar-tailed Godwits (*Limosa lapponica*) have been ringed (Spencer, 1972 for totals to 1970 and wader study group bulletins since then). Over half of these were caught during the last 10 years and most by cannon or rocket netting. Relatively few have been weighed, measured and examined for moult. Far larger samples are available for most other commonly occurring passage and wintering sea-shore waders. However some information can be gleaned from the data available and the purpose of this note is to report this briefly and to show where further study is required.

Bill length - adults

Bar-tailed Godwits show a marked sexual dimorphism, the females are considerably larger than the males and this is well shown by bill size. The majority of adult (over one year old) birds can probably be sexed by this parameter. Witherby et al (1940) in the 'Handbook of British Birds' give the following ranges

bill length, male	72-83 mm (12 birds)
bill length, female	95-106 mm (sample size not given)

Fig. 1 shows the bill lengths of 324 birds clad in adult plumage. Birds designated 1st year, juvenile, full-grown and post-juvenile are excluded. The ranges are

bill length, adult males	71-91 mm (213 birds)
bill length, adult females	93-115 mm (111 birds)

It is obvious that the size ranges are considerably greater than reported hitherto. Without a long series of dissection examinations it cannot be certain that separation of the sexes by bill length is complete but it certainly seems highly likely. In the whole series of measurements available (about 412 birds) only 2 full-grown and one juvenile have a bill length of 92 mm. Such birds should remain unsexed!

Bill length - juvenile and first-year birds

Fig. 2 shows the bill length of the 43 birds plotted in the month of measuring. It is apparent that birds with bills less than 70 mm (the adult minimum) occur - 8 out of 48. Most of the short billed birds were juveniles caught in

BILL LENGTH BAR TAILED GODWIT

JUVENILE FIRST YEAR
EACH MONTH

MAY

FEBRUARY

JANUARY

DECEMBER

NOVEMBER

OCTOBER

SEPTEMBER

AUGUST

70

80

90

100

110

MALES (213)

FEMALES (111)

ADULTS

70

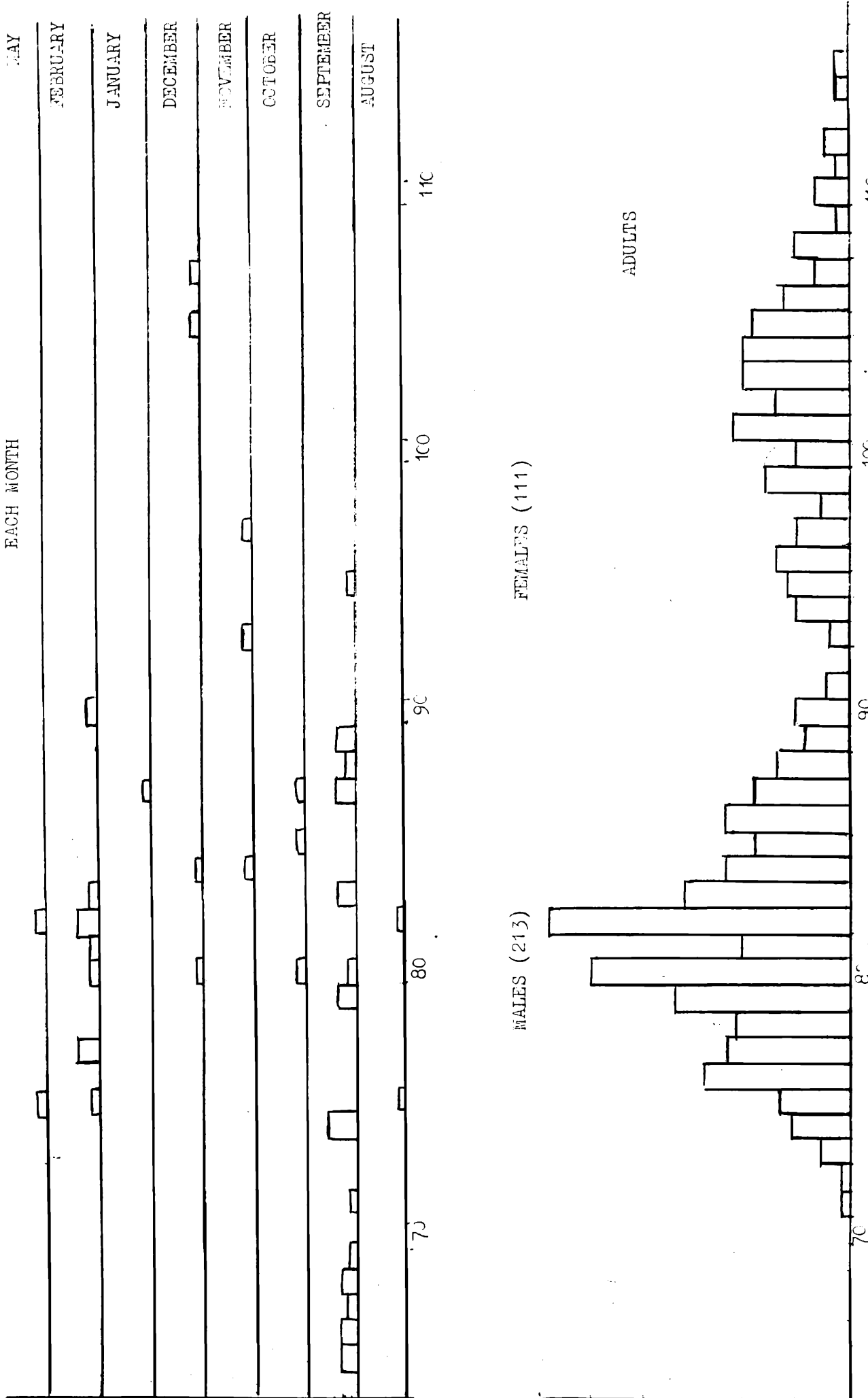
80

90

100

110

110



September and 5 out of the 8 were measured in Morocco by Derek Stanyard (Cambridge Sidi-Moussa Expedition 1972). It seems likely that juveniles migrate before their bills are fully grown and that during August and September (and possibly October) they cannot be accurately sexed by bill length.

Wing length - adults

Wing lengths taken by maximum chord are available for 164 birds in adult plumage. If sexual separation by the bill length is accepted the ranges are as follows

wing length, adult males	198-232 mm (100 birds)
wing length, adult females	212-239 mm (64 birds)

There is considerable overlap between sexes. It is perhaps significant that males with long wings and females with short wings tend to have bill lengths between 90-95 mm. and it is possible that sexual separation by bill length is not as perfect as it appears.

Wing length - juveniles and first-year birds

Most adult wing lengths exceed 204 mm. (only one amongst 164 birds was less - 198 mm.). Data from 48 juvenile and first year birds are available.

wing length, juvenile & first year	197-235 mm (48 birds)
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Most of this data was collected in September but 5 first-year birds measured in March also measure less than 304 mm. It is likely that Bar-tailed Godwits have somewhat shorter wings in their first year (see Pienkowski & Minton, 1973).

Weights - adults

Mean weights for birds sexed by bill length are available for birds caught at the Wash as follows

February	males	267 gm	(10 birds)
	females	332 gm	(6 birds)
August	males	272 gm	(55 birds)
	females	327 gm	(33 birds)
October	males	273 gm	(114 birds)
	females	331 gm	(51 birds)
December	males	273 gm	(7 birds)

Samples from other months are too small to be of value.

Mean weights from a March catch on the Dee Estuary, North Wales are

March	males	313 gm	(38 birds)
	females	354 gm	(24 birds)

No marked variation in weight during the year can be seen in the data available from the Wash but unfortunately information is lacking for the time of most hard weather during January and February. The birds caught at the Dee Estuary in March show higher mean weights but whether this reflects local conditions or a true gain amongst Bar-tailed Godwits at that time of year is not clear.

Weights - juveniles

Data are scanty. The most striking information is from Morocco.

September	juveniles	mean weight	190 gm (11 birds)
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These birds had perhaps recently arrived in the area during the autumn migration, however 8 of the birds were held some hours after capture before they were weighed and may have lost weight during this time. More information is required.

Sex ratio amongst adults

If the dividing line of 92 mm bill length is accepted for separation of the sexes amongst adult birds

of 324 birds 213 are males (66%) and 11 females (34%)

The sex ratios in 5 major catches were as follows

<u>Date</u>	<u>Place</u>	<u>Total</u>	<u>% males</u>	<u>% females</u>
13.3.71	Dee Estuary	62	60	40
28.8.61	The Wash	57	62	38
29.8.68	The Wash	79	64	36
18.10.70	The Wash	24	54	46
26.10.69	The Wash	140	68	32

In all cases there appear to be more males than females. The reasons for this can at present only be speculative. The criterion for sex determination by bill length could be wrong. Differential migration of the sexes as seen in some waders (for example Dunlin, Soikkeli, 1967) is perhaps unlikely as, according to the 'Handbook' both sexes take an equal part in incubation and tending the young. Females may have a higher mortality in the breeding season which is reflected in the mainly adult population occurring in Britain on passage and winter.

Sex ratio amongst juvenile and first-year birds

As previously suggested bill growth of juveniles is not complete until October. Lack of data prevents any attempt to calculate sex ratio during the period of bill growth.

Of 20 juvenile/first year birds measured between November and May, which presumably have full grown bills

14 are males
6 are females

Apparently there are more juvenile males than females. There is no obvious explanation for this.

Proportion of juveniles in the population

Data from the British Isles

	<u>Ad</u>	<u>FG/FJ.</u>	<u>Juv</u>	<u>1Y</u>	<u>total</u>
Number of Birds	380	54	32	8	474

Data from Morocco

11 juveniles in September, no adults.

Only about 10% of the Bar-tailed Godwits caught in the British Isles were juvenile/first year birds.

Insufficient data is available to draw concrete conclusions but at all times the year few juvenile/first year have been caught in Britain. Amongst 171 moulting adults caught in August and October there were only 2 juveniles. During September the only Bar-tailed Godwit caught in Morocco were 11 juveniles. These results may be purely accidental but it can be tentatively suggested that juvenile birds only occur in Britain in small numbers and do not generally associate with flocks of moulting adults. They may rapidly migrate south to winter quarters on the West African coast.

Moult - adults

Wing moult (primary feathers) data has been collected in an abbreviated form : 167 birds caught in late August. Most adults are in active moult at this time and about half of the birds were actively growing 5 inner primaries and had 6

old feathers remaining. 0.3% had not yet started to moult and 1.5% were recorded as having all new primaries. This is somewhat unlikely and they were perhaps incorrectly aged as juveniles.

Similar data has been collected from 164 birds caught in October. On 18.10.70 of 24 birds most had completely re-grown 7-8 inner primaries. On 26.10.69 of 140 birds most had renewed 8-9 inner primaries and only 5% of the birds still retained one old outer primary.

Little data is available for the end of October and November but moult is probably complete in most birds by mid-November. A bird caught on 11.11.70 had only 9 full grown primaries and another from 23.12.72 had only three-quarters grown the long 10th primary, (the small 11th outer primary was full grown).

Therefore most adults moult between the beginning of August and early November and primary growth is probably completed in 90-100 days.

Moult - first year birds

Data is available from 4 birds caught in May, which were all in winter plumage (at a time when most adults were in nearly full summer plumage). They were probably remaining in Britain for their first summer. 3 of the 4 showed no moult but the fourth was actively growing 3 inner primaries.

One bird called 'full grown' caught on 6.7.69 was in winter plumage. It had renewed inner primaries 1-3 and was actively re-growing primaries 4 and 5. This bird could be either a first year bird or a non-breeding adult.

A bird just entering its second year was caught 29.8.72 (and well advanced wing moult with 8 new inner primaries. Adults at this time were regrowing this group of feathers.) This bird was recovered at Santander, Spain on 14th October and had presumably migrated on completion of moult.

Therefore some first year birds remain in Britain for their first summer where they have an early moult. Some migrate south after this moult, at the beginning of their second year. It is possible that some juveniles return part way to the breeding grounds in their first spring and after moulting in their first summer move south again at the beginning of their second year.

Conclusions

- 1) Adult Bar-tailed Godwit can be sexed by bill length. Those shorter than 92 mm are males, those longer females.
- 2) Juveniles migrate before bill growth is complete and cannot be sexed by this method until November.
- 3) Juvenile wing length is on the average shorter than for adults.
- 4) Adult birds moult in Britain during August, September and October. Some birds do not complete feather growth until December, Complete primary moult takes 90-100 days.
- 5) All aspects of Bar-tailed Godwit study in Britain are in their infancy. Far more ringing, measuring and moult data collecting is required.
- 6) All Bar-tailed Godwits found dead and those which may be casualties of catching activities should be weighed and measured immediately and later sexed by dissection. Wings should be kept as a study skin. Dead birds should never be wasted.

The future

Any data from Bar-tailed Godwits are valuable - even from single birds. The author hopes to extend this study and would be very pleased to receive any information, which will be fully acknowledged.

Acknowledgements

The study of an infrequently caught species is only possible through the co-operation of many people. I am most grateful to the Merseyside Ringing Group for use of the data from the splendid March catch on the Dee Estuary, to Alan Bronby for data from Poole Harbour, Peter Evans for data from Northumberland, Derek Stanyard and Michael Pinowski for data from their Moroccan Expeditions.

Most of the data used comes from Wash Wader Ringing Group records and I thank all members of the group - particularly Clive Minton for "encouragin" me to study Bar-tailed Godwits.

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Black-tailed Godwits on the Ribble Estuary in autumn

M.A. Greenhalgh

The Ribble Estuary, with its complex of wader habitats ranging from freshwater marshes, salt marches and reedlands to wet oozy mudflats and sandy beaches, attracts a good variety of waders in large numbers as all participants in the B.T.O. Estuary Enquiry and W.S.G. will know. One of the most important of these is the Black-tailed Godwit Limosa limosa which frequents one corner of the estuary during autumn passage. This short account summarizes personal records for the past ten years and published records since 1948.

Largest numbers occur in autumn on the north estuary off Lythan-Fairhaven. First immigrants arrive in late June to early July, numbers increasing rapidly during late July and early August to peak in late August to early October. Table 1 shows two autumns data collected before the Estuaries Enquiry was fully under way. Numbers decrease during late September and October leaving the wintering birds.

Table 1. Fortnightly counts of Black-tailed Godwits on the Ribble Estuary, 1967 and 1968.

	2 June	1 July	2 July	1 Aug	2 Aug	1 Sept	2 Sept	1 Oct	2 Oct
1967	19	47	520	620	1100	890	240	89	15
1968	1	2	40	200	430	1500	320	150	5

Autumn peak counts are available for 21 out of the past 24 years and these are given in Table 2. Most counts up to 1963 were made on the feeding areas as well as roosts whilst from 1963 all have been made of the birds as they left the roosts. The peak counts show a marked increase in the number of Black-tailed Godwits passing through the Ribble from the late 1940s to late 1960s since when numbers appear to have declined from the counts. This decline, shown in 1970-71, is probably a fall in numbers due to not enough counts. In 1970 I made only two autumn counts, in 1971 only three whilst in 1972 I counted the roost six times and this year obtained a peak count closer to those found in the 1960s. However, it does seem from these peak counts that about 1500 is the maximum number which the present Ribble feeding areas can hold, and a study now in progress on feeding ecology suggests that this is possible in the case.

Table 2. Peak counts of Black-tailed Godwits in autumn on the Ribble Estuary.

1948	145	1958	400	1966	1150
1952	240	1959	415	1967	1100
1953	180	1960	500	1968	1500
1954	290	1961	350	1969	1500
1955	193	1963	640	1970	362
1956	330	1964	570	1971	703
1957	260	1965	1050	1972	1240

The distribution of Black-tailed Godwits on the estuary is very much limited to the wettest mud and their main roost is on the marsh closest to these areas (see figure 1). The bulk and best of the feeding areas occur very close to the low tide mark and are exposed for only 4-6 hours each tide. Black-tails thus tend to roost for much longer than Bar-tailed Godwits L. lapponica on the Ribble which feed on higher sandier substrates and mostly roost away from the Black-tails (see figure 1). The latter begin 'roosting' - sleeping on or near the feeding area from about 3 hours after low tide and move into the saltmarsh roost two to three hours before high tide, on average a good hour before the Bar-tails. Usually the birds sleep in Spartina through the four hours over high tide, leaving for the marsh edge a good two hours after the tide. Here they may continue roosting until they finally leave for the main feeding areas three to four hours after the tide. Such a pattern prevails on the higher tides, 25 feet or more on the Freston Dock Gauge.

On lower (neap) tides, less of the lowest Black-tailed Godwit feeding area is exposed as these tides do not fall as low as spring tides. However, that which is exposed remains exposed for much longer and the godwits spend more time on this restricted feeding area. Thus they spend correspondingly less time at roost (whether on mudflat or saltmarsh). Study now in progress suggests that the godwits need the extra time on the restricted neap tide feeding areas collecting the same amount of food which they obtain in less time but over a slightly larger feeding area on spring tides. This aspect of Black-tailed Godwit feeding ecology is reminiscent of that of Oystercatchers Haematopus ostralegus when feeding on mussels Mytilus. On spring tides they wait until the lowest mussels are exposed and quickly gorge themselves on these during the two hours over low tide. On neap tides, when only the poorer higher mussels are exposed, it takes them over twice as long to collect the same biomass of food (personal data, confirmed in litt. Dr P.J. Dare).

It would be extremely worthwhile catching and ringing some of these godwits but the position of the roost on a creek-ridden marsh and the flight-lines over the river channel and wettest mudflats makes netting almost impossible. The five specimens I have examined from the area have all been the Icelandic race islandica. There is relatively little data available from ringing on the movements and wintering areas of these migrants. Also work in progress suggests that the bulk of these passage migrants consists of adults which arrive in full to almost full summer plumage and these remain in the area until they have assumed winter plumage. Many birds would have to be processed in order that this moult be properly described.

What to do with breeding waders and their pulli

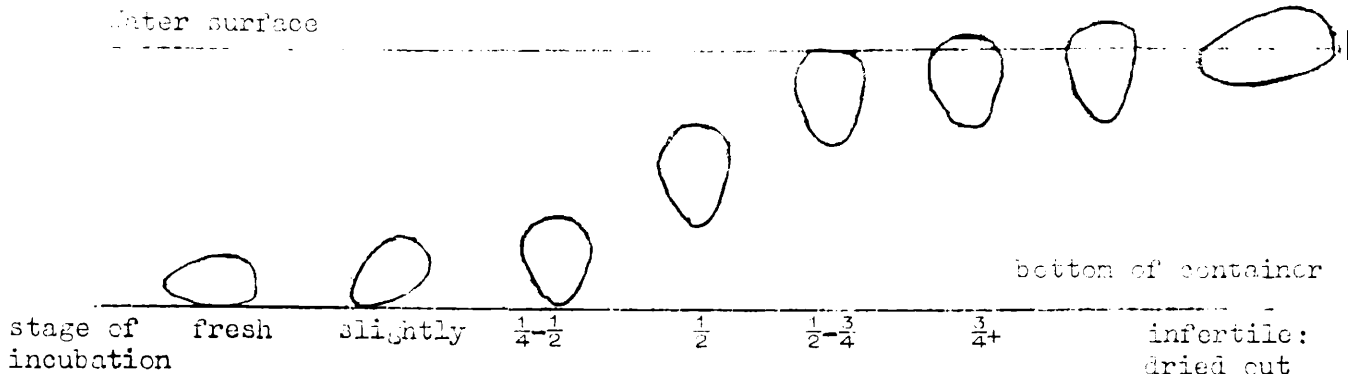
Tony Prater

Now that we are obtaining a great deal of information on the biometrics etc. of migrating and wintering waders, there has clearly appeared to be an enormous gap in our knowledge. In Britain we know next to nothing about our endemic waders, unlike many countries on the continent where several detailed studies have been made of their breeding waders. What do we really know about British Ringed Plover, Golden Plover, Redshank, Curlew and Dunlin? Very little. We still do not know too much about even such common species as Lapwing and Oystercatcher! It really is time that this was rectified.

I know that several individuals are considering looking at breeding waders in some detail both in Britain and elsewhere, so I thought it would be a good idea to write a short piece based on the lessons learnt from analysing British and Icelandic breeding data. All ringers can help but please keep disturbance to a minimum.

1) Breeding adults: these are relatively easy to trap on nest by using a fair large drop or similar trap. Snipe are so tame that often, once the nest is discovered, you can drop a mist net over the sitting bird. Biometrics of known breeding adults (and first years if they can be still aged) is vital to enable biometric analyses of mixed populations to be made.

2) Eggs: obviously the number of eggs in each nest should be recorded. Waders lay eggs on approximately every other day, sometimes the gap between eggs may be as long as six days, this means that clutch size must be determined by visits at least 3 days apart - preferably by two visits in one week. The earlier in the laying cycle that the nest is found the better the information. Once there is a full clutch you can still check on the 'age' of the eggs. Newly laid eggs are full of albumen and yolk. They are heavier than water so sink if placed in a small container of water. As incubation proceeds more air is found in the egg and it becomes lighter until it floats on the surface of the water. The diagram below helps to determine the stage of incubation. Weighing the eggs gives similar information.



The hatching date is important to discover and with waders it usually occurs 22-30 days after the clutch is complete. The egg starts to be chipped by the pullus inside about 2 days before the pullus emerges - so please record if any eggs (and how many of them) are chipped. Also check to see if any eggs are infertile and are left in the nest - this is needed for hatching success.

Once the pulli emerge they spend a few hours drying out in the nest but after that they start to wander. For the first few days the young can usually be found around the nest but after that the parents may lead them away to a better feeding area. Ringers can gain much information from pulli by applying normal biometric studies.

(a) the weight: wader pulli have a reasonably predictable growth curve so knowing the hatching weight, the fledging weight and time taken from hatching to fledging we can predict to within 2 or 3 days the age of the pulli. Most of these parameters are 'known' but more information on all of them is needed. So weigh the pulli - the nearest gram or half gram is usually sufficient. Retraps of pulli are very useful to check the rate of growth and pulli ages.

(b) wing, bill. These grow at a more or less constant rate through the fledging period. The latter only need be measured once the primaries have emerged from their sheaths. What we need to know is the difference between the measurements of a newly fledged bird and a fully grown juvenile. All the evidence is that it takes 2-3 weeks after fledging before the bird is fully grown, this is important for biometrical studies of migrating waders.

(c) Brood size. The number of young per brood will give an indication of the success of the successful broods. To find out the number in a brood a few minutes careful watching may be needed (it is easier with Ringed Plover and Oystercatcher than with Dunlin, Redshank or Curlew). Once the number in the brood is known then catch as many of the pulli as possible and weigh them. By comparing the brood size with the weight (i.e. age) of the pulli, you can show the mortality of the chicks.

An example for Ringed Plover in Iceland (1972) was

<u>Weight</u>	<u>Average brood size</u>
under 10 grams	2.84
11-20 grams	2.67
21-30 grams	2.18
31-40 grams	2.14

This indicates that just under a quarter of the pulli, which hatch, die. The fledging success is an important parameter to see how well the species is standing up to environmental factors.

To Summarise Do not just ring and fling pulli

Perhaps in the order of importance

- 1) after ringing, weigh all pulli, including retraps
- 2) catch breeding adults and measure
- 3) observer brood size
- 4) look of clutches - check state of incubation
 - see if they are chipping
 - see how many clutches fail, how many eggs are lost or are infertile.

We need a blitz on breeding birds to finally tie up many unknowns about migration periods. Also of course the more you ring the better chance of a recovery.

Record these details on Nest Record Cards - a supply of which can be obtained through the B.T.O. - and please send them back promptly at the end of the season.

YOU MUST NOTE Many species of breeding wader are on the protected list in Britain. Permits must be obtained (from the B.T.O.) before you go for them and, as always, disturbance kept to an absolute minimum.

GENERAL LIST. Little Ringed Plover, Whimbrel, Greenshank, Stone Curlew.

SPECIAL LIST. Kentish Plover, Dotterel, Black-tailed Godwit, Wood Sandpiper, Temminck's Stint, Ruff, Avocet, Black-winged Stilt, Red-necked Phalarope.

Some Results from Ringing Dunlin on the Dee in winter

R.A. Eades

Some results from ringing Dunlin C. alpina on the Dee Estuary during May and the autumn months of July, August and September have been given in previous bulletins, and I should now like to look at the Merseyside Ringing Group's results from Dunlin ringing in the "winter", that is the months October to April inclusive, again during the period from June 1958 to June 1971.

Although the M.R.G. started ringing Dunlin on the Dee in 1958, it was not until 1963 that Dunlin were ringed in the winter time, because previously waders were mainly caught at Shotton Pools and Dunlin did not visit these pools in the October to April period, apart from a few in April. After the decline

of Shotton Pools the M.R.G. started to mist net wading birds on the tidal arc of the estuary on the new moon night tides, mainly at two roost sites, The Point of Air, Flintshire, and West Kirby, Cheshire. This led to Dunlin being caught in all periods when present on the Dee, including the winter months.

The first Dunlin to be ringed on the open shore were two "Fully Grown" birds at the Point of Air in October 1963, and a hundred Dunlin were ringed there during that winter season. In 1964 the first catch was made on the open shore at West Kirby and by 1965 techniques had improved sufficiently to catch over six hundred birds in a season. Table 1 shows the numbers caught each October to April period, and it can be seen that totals were low in 1967/68 and 1968/69, but increased thereafter. The dramatic increase in 1970/71 followed successful cannon-netting visits by the Wash Radar Ringing Group. 680 were ringed at the Point of Air, and the two catches on fields at Thurstaston, with 12611 ringed, were the first to be ringed at that site by the Merseyside Ringing Group whilst three hundred Dunlin ringed at West Kirby were mist netted in the normal way.

Table 1.

<u>October/April Period</u>	<u>Numbers of Dunlin Ringed</u>	<u>Number with Non-Dee Rings</u>	<u>Percentage with Non-Dee Rings</u>
1963/64	107	3	2.8%
1964/65	155	1	0.6%
1965/66	611	11	1.8%
1966/67	403	6	1.5%
1967/68	133	2	1.5%
1968/69	115	0	zero
1969/70	704	15	2.1%
1970/71	2257	28	1.2%
Total	4485	66	1.4%

These four and a half thousand Dunlin ringed in the winter months over a period of eight years have yielded sufficient information to draw some tentative conclusions.

THE DEE AS A WINTERING GROUND

The Dee is an important wintering area for Dunlin, and it seems that Dunlin remain all the winter upon the Dee, and return year after year.

Remaining all "winter"

There are 28 cases of a Dunlin being caught twice during the same October to April period, of which 12 were caught again at the same roosting site, whilst 16 changed roost. It is interesting that the changes in roost in the same season are mostly between a day time roost site and a night time one. Thus birds ringed at night on the shore at West Kirby were caught again in the day time on ploughed fields at Thurstaston, six birds roosted by day on Hilbre I, and West Kirby by night, and a bird cannon-netted at the Point of Air was controlled at Thurstaston. However, only three Dunlin interchanged between night roosts of West Kirby and the Point of Air. (Fields are only used sporadically as roosts, always in the day time.)

Loyalty to the Dee as a wintering ground

There are only two recoveries indicating a shift in wintering ground between the Dee and another estuary. An adult ringed in March 1970 at Carnforth, Morecambe Bay, was controlled at Thurstaston in February 1971 and an adult ringed in December 1965 at West Kirby was controlled in January 1970 at Carnforth. This is despite a large ringing programme on Morecambe Bay, only 60 km north of the Dee.

In contrast, 90 Dunlin have been ringed in one winter and controlled during a subsequent winter, as shown below.

	<u>Same Roost Site</u>	<u>Different Roost Site</u>	<u>Total</u>
One winter later	9	14	23
Two winters later	7	15	22
Three winters later	12	9	21
Four winters later	9	3	12
Five winters later	6	3	9
Six winters later	1	2	3
	<u>44</u>	<u>46</u>	<u>90</u>

It is apparent that the Dunlin is quite a long lived bird, and probably the introduction of longer lasting alloys for wader rings will increase the number of old birds being controlled. Apart from these controls, only eight Dunlin have been found dead locally and reported to the Ringing Office, and none have been reported shot (the Dunlin is, of course, protected by law).

Ratio of Adults to Juveniles

Since 1969 all Dunlin ringed on the Dee have been identified, as either adult or juvenile, whereas previously some birds were not separated; so it is possible to work out a proper ratio of adults to juveniles in recent years.

In the winter of October 1969 to April 1970 there were 655 adults to 49 juveniles, i.e. 13:4 adults to one juvenile. These birds were ringed at night, almost all at West Kirby, often under cold, uncomfortable conditions. It would not be unreasonable to expect some juveniles to be missed, especially when looking for ageing criteria by torchlight.

In the winter 1970/71 there were 1833 adults to 424 juveniles, a ratio of 4:3 adults to one juvenile. This ratio is much higher than that of the previous year and has some interesting aspects. Thus, at West Kirby a series of night catches yielded 235 adults to 52 juveniles, i.e. 4.5 adults to one juvenile and at the Point of Air, a daylight cannon net catch resulted in 618 adults to 69 juveniles, of 8.8 adults to one juvenile. At Thurston in January, a cannon net catch on a ploughed field resulted in 154 adults to 72 juveniles or 2.1 adults to one juvenile, and a second catch in February gave 818 adults to 217 juveniles or 3.2 adults to one juvenile. At Shotton Pools there were 8 adults to 14 juveniles or 0.4 to one.

Thus the higher ratio of juveniles in the 1970/71 winter was a feature at all sites, and it was pleasing that night tide samples also had higher ratios. It seems that observer error is not too high at night, and it was also interesting to see that more juveniles were cannon netted on the ploughed field than were cannon netted on the beach. Possibly, juveniles are more likely to roost on a field than adults, or juveniles are not as shy of cannon net as adults. There is no reason to suppose that the distribution of juvenile birds in a roosting flock is random, so cannon net catches probably do not give a really random sample from the Dunlin population.

DUNLIN RINGED AWAY FROM THE DEE AND CAUGHT IN "WINTER"

Amongst the four and a half thousand Dunlin ringed in the "winter" on the Dee a total of 66 were found to have been already ringed away from the Dee. Table 1 shows how many were controlled each season, and the percentage of controls each season. It can be seen that winters with totals below 200 tend to fluctuate much more (from zero to 2.8%) than those winters with larger totals (from 1.2% to 2.1%). This is probably a result of sampling error, suggesting that a winter total of at least four hundred birds is needed to monitor the ratio of birds ringed elsewhere.

Apart from the ups and downs of winters with low totals, the percentage of non-Dee birds has remained fairly steady at about one and a half percent, i.e. for every two hundred Dunlin ringed in the winter, three carry rings from elsewhere. Some Dunlin are controlled many years after ringing, often with rings very worn and corroded (see below).

TIME ELAPSING BETWEEN RINGING AWAY FROM THE DEE AND CONTROL ON THE DEE

Less than 12 calendar months	18
between 1 year and 2 years	10
" 2 years and 3 years	15
" 3 " " 4 "	6
" 4 " " 5 "	6
" 5 " " 6 "	2
" 6 " " 7 "	2
" 7 " " 8 "	4
" 8 " " 9 "	2
" 9 " " 10 "	1

66

Two Dunlin from Sweden have been controlled twice, one ringed in 1963 was controlled in 1968 and 1971, and one ringed in 1965 was controlled in 1966 and 1968. The oldest Dunlin was ringed at Revtangen in September 1957 and controlled in December 1966.

Although the percentage of Dunlin ringed away from the Dee has remained fairly constant over the year, there have been changes in the proportion of Dunlin ringed at various countries. See Table 2.

TABLE 2

PERCENTAGES OF DUNLIN EACH WINTER RINGED AWAY FROM THE DEE

	<u>Revtangen</u>	<u>Sweden</u>	<u>Denmark</u>	<u>Finland</u>	<u>Poland</u>	<u>Germany</u>	<u>Wash</u>
1963/64	0.92%	1.87%	-	-	-	-	-
1964/65	-	0.62%	-	-	-	-	-
1965/66	0.31%	0.49%	0.14%	0.16%	-	0.49%	0.16%
1966/67	0.49%	0.49%	0.25%	-	-	0.25%	-
1967/68	-	2.25%	-	-	-	-	-
1968/69	-	-	-	-	-	-	-
1969/70	0.42%	0.28%	-	-	-	0.28%	1.13%
1970/71	0.17%	0.48%	0.09%	0.13%	0.09%	-	0.13%

The percentage of Swedish ringed birds has remained fairly steady at about half a percent, whilst Revtangen has slowly lost ground from the mid-sixties. The percentage of Dunlin ringed in Germany (including Heligoland) and Denmark has decreased, whilst the first Polish ringed birds were caught in 1971. The percentage of Wash ringed birds was low in the early sixties, but extremely high in 1969 as the large catches of 1971 showed a drop. In recent years the Wash Wader Ringing Group have concentrated on other species than Dunlin, so one could expect a fall in this percentage.

TABLE 3

DUNLIN CAUGHT IN WINTER ON THE DEE WHICH WERE RINGED ELSEWHERE

<u>Month and Place of Ringing</u>	<u>March</u>	<u>April</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>Total</u>
Revtangen	-	-	-	1	9	2	12
Ottenby	-	-	4	4	2	1	11
Rest of Sweden	-	-	3	8	1	-	12
Denmark	-	-	2	2	-	-	4
Finland	-	-	2	-	2	-	4
Poland	-	-	-	2	-	-	2
Heligoland and Germany	-	1	-	1	5	-	7
Wash	2	-	-	7	3	-	12
Northumberland	-	-	-	-	1	-	1
Morecambe Bay	1	-	-	-	-	-	1
Total	3	1	11	25	23	3	66

The 66 controls give some insight into the migration routes of the Dunlin which winter on the Dee. Autumn migration seems to start in July, with adults ringed in Sweden, Denmark and Finland. August appears to be the peak month for ringing Dee-bound Dunlin in Sweden, with birds ringed throughout that country. Surprisingly, Finland is not represented, but there are birds in Poland and Denmark, and the North Sea is crossed by August with seven birds caught on the Wash, and singles from Heligoland and Revtingen. The first juveniles appear in August, with four juveniles in Sweden and one from Revtingen, but only one of the Wash birds being first year.

In September there is a definite change in emphasis, away from the Baltic to the North Sea, with nine birds from Revtingen, five from Heligoland and West Germany, three from the Wash and one from Northumberland. Possibly, there is one migration route from South Norway to Northeast England and another from the South Baltic to North Germany and thence across to the Wash. Eight of the Revtingen birds were aged as "Fully Grown", but in fact two of these were found to be juvenile birds when controlled by the M.R.G. By October, Scandinavian ringers do not seem to catch many Dunlin, with only one juvenile from Ottenby and two "fully grown" from Revtingen.

The spring migration is not so clear, with only four controls. Two Dunlin ringed together on the Wash in March 1968 have been controlled in the winter and a bird ringed in the German Frisian Islands in April 1965 was controlled in January 1970.

TABLE 4

RECOVERIES OF DUNLIN RINGED ON THE DEE IN WINTER

	<u>January</u>	<u>March</u>	<u>May</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
Skonor, Sweden	-	-	-	3	1	-	4
Denmark	-	-	-	-	1	-	1
Finland	-	-	-	-	2	-	2
Poland	-	-	-	-	1	-	1
Waddensee	-	1	2	-	-	-	3
North France	-	-	-	1	-	-	1
S.W. France	-	1	-	-	-	-	1
Humber	-	-	-	-	-	1	1
Wash	-	-	-	-	2	-	2
Morecambe	1	-	-	-	-	-	1

There have been 17 recoveries away from the Dee from the Dunlin ringed in the winter months. Autumn recoveries are almost all of birds controlled by other ringers, often at sites mentioned previously. It is worthy of note that there have been no recoveries of winter ringed birds from Ottenby or Revtingen, the two stations which send the most controls to the Dee. This is puzzling, but perhaps the explanation is that these stations catch Dunlin on migration to many wintering grounds, Morecambe Bay, the Wash, France, the Dee etc. with a large turnover of birds, and Dunlin en route to the Dee form a small part of the total. Thus, although many of the Dunlin wintering on the Dee pass through Revtingen and Ottenby, and in passing, about one in a hundred have been ringed there, to the ringer at Revtingen and Ottenby, the birds with Dee rings are so diluted by other birds that they do not catch birds with Dee rings. The bird recovered in North France was shot.

There are few recoveries in spring. A bird ringed at Shotton Pools in April was shot on the Gironde, Southwest France at the end of March the following year. It seems very likely that this bird was not a wintering bird but on passage from further south to breeding grounds in Iceland or Greenland (see previous WSG Bulletin)

It is also noteworthy that there are three spring recoveries of birds found dead in the Dutch/German Waddensee area. Thus one was found dead on Borkum Island on 27th March, another on Scharhorn Island on 1st May and another in May on Texel Island. Three deaths in the same area in spring suggest that the migration in spring is more taxing to the birds in some way than the autumn. One bird was