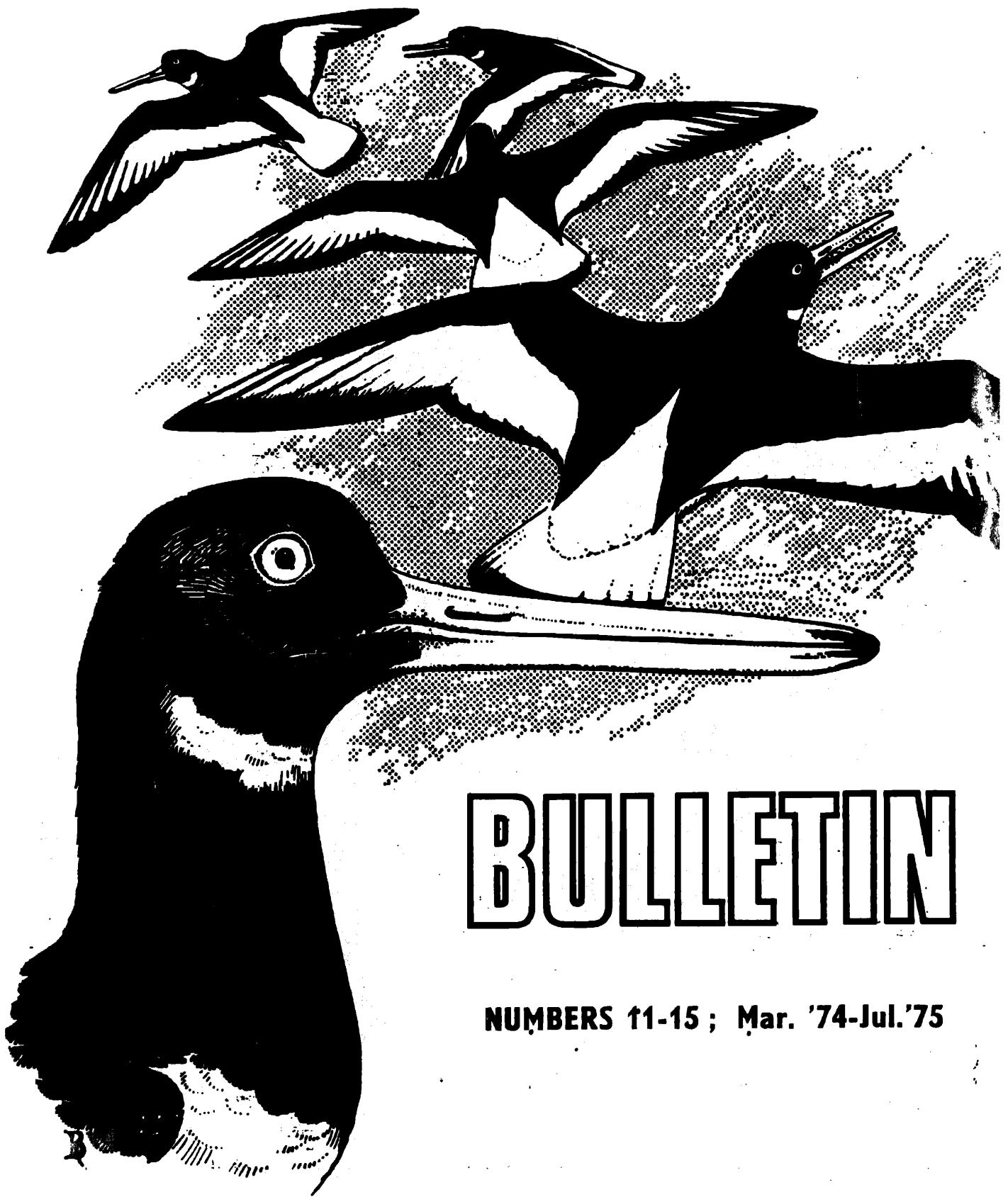


WADER STUDY GROUP



BULLETIN

NUMBERS 11-15 ; Mar. '74-Jul.'75

W A D E R S T U D Y G R O U P

OFFICERS AND EXECUTIVE COMMITTEE

Chairman: G.H. Green, Windy Ridge, Little Comberton, Pershore, Worcs. WR10 3EW, England.
(Tel: home 038674 - 377; work 0905 - 25238).

Administrative Secretary: Nigel & Jacquie Clark, Department of Zoology, University of Edinburgh, West Mains Road, Edinburgh EH9 3JT, GB (Tel: work 031-667-1081 Ext 3211; home 0968-74441)

Co-ordinator: William J.A. Dick, 125 Leathwaite Road, London SW 11 6RW, England.
(Tel: home 01 - 223 - 6681).

Treasurer: S.J. Sutcliffe, Eaton Cottage, Lydstep, Tenby, Dyfed, Wales.
(Tel: home 083482 - 508; office 0437 - 2686)

Editors: Michael W. Pienkowski, Department of Zoology, University of Durham, South Road, Durham DH1 3LE, England. (Tel: work 0385-64971 Ext 579; home 0385 - 733057).

G.H. Green (address above).

Committee member: A.J. Prater, RSPB, 4-8 Church Street, Shoreham-by-Sea, Sussex BN4 5DQ, England.

North American Section

General Secretary: Dr Marshall A. Howe, Migratory Bird and Habitat Research Laboratory, Patuxent Wildlife Research Center, Laurel, Maryland 20811, U.S.A.

Membership Secretary: Dr Edward H. Miller, Vertebrate Zoology Division, B.C. Provincial Museum, 675 Belleville St., Victoria, BC V8V 1X4, Canada

Editors: Dr R.I.G. Morrison, Canadian Wildlife Service, Ontario Region, 1725 Woodward Drive, Ottawa, Ontario, Canada K1A 0E7. (Tel. (613) - 998 - 4693).

Dr J.P. Myers, Vertebrate Biology, Academy of Natural Sciences, 19th and the Parkway, Philadelphia, Pennsylvania 19103, U.S.A.

CORRESPONDENCE

All general enquiries, applications for membership, initial subscriptions and renewals, changes of address, completed WSG data forms, matters relating to the circulation of the Bulletin, etc. should be sent to the Administrative Secretaries (Nigel & Jacquie Clark).

Matters and proposals concerning co-operative research projects and objectives should be sent to the Co-ordinator (W.J.A. Dick).

All material for the Bulletin and enquiries about this should be sent to one of the Editors (M.W. Pienkowski & G.H. Green).

Details of colour-marking schemes should be sent to M.W. Pienkowski, who will also try to forward to the appropriate person details of any colour-marked wader sent to him.

In America, membership applications, etc. may be sent to Dr E.H. Miller and material for the Bulletin to Dr R.I.G. Morrison or Dr J.P. Myers.

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All cheques should be payable to "Wader Study Group".

Payments sent to the N. American Membership Secretary may be in Canadian (preferred) or U.S. dollars. All other payments should be sent to the Administrative Secretary. These must be in British currency and sent by cheques, drafts or orders drawn on a UK bank or the British Post Office.

Details of membership and application forms are available from the Administrative Secretary or the N.American Membership Secretary. The current subscription is £5-00 (or \$12.50) per year. If Bulletin despatch by air-mail to addresses outside Europe is required, add £1.50 (\$3.75).

DEADLINES

For inclusion in the issue indicated:	APRIL	AUGUST	DECEMBER
articles, notices, etc. must be received by:	1 February	1 June	1 October
(If correspondence between editors and author(s) is likely to be necessary, <u>articles must be received well before these dates</u> if they are to be included in the next issue.)			
Ringings totals must be received by:	20 February	20 June	20 October

(It may also be possible to include short notices received by MWP by these dates.)

RE-ISSUE OF BACK NUMBERS OF WADER STUDY GROUP BULLETIN

We have reprinted WSG Bulletin numbers 1-20 in four volumes. They are facsimile reproductions and any errors in the first issue are still present.

Numbers 1-4 were originally produced on foolscap size paper and have been retyped on A4 to conform with later issues. The original pagination is indicated and should be used when citing references. Similarly bulletins should be referred to by number, not by re-issue volume.

Small numbers are still available and enquiries should be sent to N.A. Clark, Administrative Secretary whose address appears on the inside cover.

WADER STUDY GROUP

Bulletin No. 11

March 1975

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A Method for sexing Ringed Plovers
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We hope that these bulletins are now proving to be of even greater value than the earlier ones with the inclusion of national analyses of the data collected by the W.S.G. In recent bulletins the Bar-tailed Godwit and Lapwing were considered and in this one Ruffs and Common Sandpipers receive attention. More will be included in the future. Many of you will have no doubt seen the effects of new editorial arrangements, especially the considerable efforts by Mike Pienkowski to whom I would like to extend my thanks.

1974 Summer Meeting of the W.S.G.

From preliminary enquiries it is clear that many of the group representatives would be unable to make a June or early July date. It is, therefore, proposed that it be postponed until the autumn this year. The suggested date is Sunday, 29th September. We hope that you will be able to make this date, but if anyone has a strong preference for another Sunday near to the 29th, then would they please let me know at Beech Grove.

Expedition to N.E. Greenland

Harry Green has now received the funding necessary for this expedition and will be going in mid-June. The expedition will be colour dyeing and colour ringing waders, so if you see any of these waders (probably Dunlin, Ringed Plover, Sanderling, Knot and Turnstone), would you please let either Harry or the B.T.O. have full details of colour dyes and colour rings as well as place, date and any other details. They could start turning up any time from mid-July onwards.

RECENT RECOVERIESOYSTERCATCHER

Pull	11.7.63	Ayr	+	Coruna, Spain	21.10.73
Pull	23.6.73	S.Uist, Hebrides	x	Morbihan, France	late 9.73
Pull	7.7.73	N.Uist, "	x	Ballyhunion, Kerry	16.10.73
Pull	18.7.73	Ythan, Aberdeen	x	Full Island, Dublin	18.11.73
Ad	18.9.63	Walney, Morecambe	x	Nordland, Norway	4.5.73
Ad	12.8.67	Snettisham, Wash	x	" "	15.9.73
Ad	11.8.67	" "	x	Vest Agder, "	early 5.72
Ad	15.11.63	Point of Air, Dee	v	Faeroe Islands	8.8.73
Ad	29.6.68	Snettisham	x	Jylland, Denmark	Aug 73
Juv	15.8.73	Janol, Cornwall	+	Charente Maritime, France	20.8.73
Ad	6.6.67	Skokholm, Pems.	+	Coruna, Spain	4.2.73
Imm	26.5.70	Morecambe Bay	x	Kintore, Aberdeen	spring 73
Ad	18.9.63	Walney, Morecambe	v	Southernness, Solway	25.11.73
Ad	25.2.68	Hoylake, Dee	v	" "	25.11.73
Ad	29.8.69	Downmore, Wash	x	Stour, Suffolk	25.11.73
Ad	3.8.73	Friskney, "	v	Poole Harbour, Dorset	26.12.73
Ad	11.3.72	Arbroath	x	Lindisfarne	17.11.73
FG	17.10.63	Hoylake, Dee	x	Morecambe Bay	22.1.74

During the cull of Oystercatchers in the Burry Inle', the following British ringed birds were killed in November

Pull	15.6.66	Bardsca Island, Caerns
Pull	29.5.71	Glen Usk, Angus
Pull	29.6.71	Caannaroo, Inverness
Pull	27.6.73	Fair Isle
Ad	15.11.63	Point of Air, Dee

LAPWING

Pull	13.6.72	Coruna, Ayr	x	Landes, France	14.1.74
Pull	20.5.73	Polzeath, Essex	+	Cadiz, Spain	8.11.73
Pull	27.5.73	S.Uist, Hebrides	x	Shipley, Yorks	26.11.73
Pull	31.5.73	Ringwood, Hants	x	Alto Alentejo, Portugal	22.12.73
Pull	9.6.73	Shotley, Suffolk	+	Vendee, France	3.12.73

RINGED PLOVER

Pull	1.7.65	Scolt, Norfolk	x	Hilbre, Dee	4.11.73
Pull	15.7.73	Point of Air, Dee	v	Conway, Caerns	29.9.73
Juv	12.8.68	Snettisham, Wash	v	" "	14.10.73
Ad	5.5.73	Kincardine (- breeding)	v	Tay	10.11.73
PJ	19.5.72	West Bank, Morecambe	+	Aust-Agder, Norway	21.8.72
Juv	12.7.73	Fawley, Hants	+	Finistere, France	11.1.74

TURNSTONE

IY	28.11.73	Bardsey, Morecambe	x	Vaasa, Finland	3.7.73
FG	4.9.71	Alwicks, Northumberland	x	Vaasa "	24.5.73
Juv	14.8.73	Hayle, Cornwall	x	San Pedro, Ivory Coast	17.10.73
				(4.45 N, 6.37W)	

SNIPE

IY	28.10.72	Shotley, Suffolk	x	Buskerud, Norway	4.11.73
PJ	17.3.73	Derbyshire	+	Akershus, Norway	10.9.73
PJ	3.1.71	Essex	+	Noord Holland, Netherlands	14.11.73
PJ	21.7.67	Farlington, Hants	x	West Cork, Ireland	17.11.73
PJ	30.11.68	Derbyshire	+	Waterford, Ireland	2.12.73
AD	10.8.61	Abberton, Essex	+	Calvados, France	3.12.73
Ad	3.10.69	" "	+	Mauche, France	14.11.73
FG	1.11.72	Abberton, Essex	+	Gironde, France	18.3.73
FG	7.10.73	Sevenoaks, Kent	+	Verdeo, France	5.11.73
Ad	11.9.70	Kembley, Kent	+	Ribatejo, Portugal	3.11.73
IY	27.8.73	Chew, Somerset	+	Pontevedra, Spain	12.10.73

WOODCOCK

PJ	8.3.70	Sandwich Bay, Kent	+	Fyn, Denmark	28.10.73
PJ	27.1.73	Colchester, Essex	+	Osnabruck, FDR	2.11.73

BARTAILED GODWIT

PJ	20.4.69	Cherry Cob, Humber	+	Krasnoyarsk, USSR (69.20N, 83.14E)	8.6.73
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GREEN SANDPIPER

IY	25.8.72	Frampton, Glos.	+	Sevilla, Spain	7.2.73
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COMMON SANDPIPER

Ad	21.7.68	Glossop, Derby	x	Creuse, France (Oct) 1973	
Although not ringed in Britain, the following is of some interest:					
FG	25.12.70	Lome, Togo, W. Africa	x	Lappi, Finland	24.5.73

REDSHANK

PJ	26.3.71	E. Tilbury, Essex	x	Mauche, France	22.10.73
IY	15.7.72	Cummock, Ayr	x	Killinchy, Co. Down	3.1.74
Pull	15.6.73	Glen Clova, Angus	v	Isle of May, Fife	27.12.73
Pull	18.6.73	Kingussie, Inverness	x	Alnwiok, Northumb.	8.12.73

KNOT

Ad	27.8.68	N. Wootton, Wash	x	Ellreka, Ellesmere, Canada, Summer 73	
Ad	5.5.69	Wolferton, "	+	Jamesonland, E. Greenland	30.6.73
Ad	27.8.68	N. Wootton, "	+	Jylland, Denmark	4.8.73
Ad	26.10.68	Heacham, "	x	(long dead) Schleswig, Holstein, F.D.R. Spring/Summer 1973	
Ad	19.2.72	Snettisham, "	x	" "	28.10.73
Ad	5.2.72	Joylake, Dee	x	Vlieland, Netherlands	1.11.73
Ad	19.3.72	Snettisham, Wash	v	Schiermonnikoog, "	24.9.73
Ad	4.8.73	N. Wootton, "	+	Mauche, France	30.10.73
IY	29.9.73	Wolferton, "	+	Morbihan, France	28.10.73
IY	21.9.73	Wexford, Ireland	x	Banc d'Arguin, Mauritania	24.11.73
Ad	3.9.63	Holbeach, Wash	v	Hilbre, Dee	9.2.74
Ad	5.2.70	Hoylake, Dee	+	Firth of Forth	5.1.74

This interesting series includes the first European Knot recovered, it was in a Gyr Falcon pellet, on its Canadian breeding grounds (though a movement the other way has been recorded) and the first Knot recovered in East Greenland - though it was a non-breeding bird.

CURLY SANDPIPER

Juv 1.9.69 Holboach, Wash x Crimea, U.S.S.R. 26.8.72

DUNLIN

Ad 3.1.71 Thurston, Dee ? Vaasa, Finland 5.1.74
 Ad 27.3.71 Snettisham, Wash x Romo, Denmark Spring/Summer 1973
 IY 7.10.72 Hurty, Kent + Jylland, " 20.9.73
 IY 23.12.69 Hurdsea, Morecambe v Schiermonnikoog, Netherlands 26.10.73
 Ad 19.11.71 Hurty, Kent v " " 2.11.73
 Ad 26.8.60 Dawsmerc, Wash + Charante Maritime, France 21.11.73
 IY 2.9.73 N.Wootton, " + " " " 21.11.73
 Ad 20.11.71 Hayling, Hants x Pas de Calais, " 2.9.73
 Ad 3.3.73 Portsmouth, " + " " " 15.11.73
 Ad 19.5.73 Newport, Mon. + Calvados, " 7.8.75
 Ad 6.9.69 Carnforth, Morecambe ? Baixo Alentejo, Portugal 9.12.73
 Ad 10.5.72 Bardsea, " + Beira Litoral, " 2.11.73
 Ad 17.8.73 Palstow, Cornwall v Sidi Moussa, Morocco 30.8.73
 IY 21.8.73 Radipole, Dorset v " " " 3.9.73
 Juv 11.9.71 Liverpool v Serini, Mauritania 11.11.73
 Ad 28.7.73 Foulney, Morecambe v " " " 11.11.73
 Ad 8.7.72 " " v Banc d'Arguin, " 19.11.73
 IY 19.5.73 Newport, Mon v " " " 19.11.73
 IY 4.8.73 N. Wootton, Wash v " " " 24.10.73

There were 13 long distance movements of Dunlin between British estuaries, the six which occurred in the same winter are presented below.

Juv 25.9.73 Snettisham Point, Wash x Teifi, Cardigan 16.1.74
 Juv 14.10.73 Solihull v Bangor, Caerns 10.11.73
 Juv 14.10.73 Angle Bay, Pemb v Poole Harbour, Dorset 27.10.73
 Ad 29.7.73 Wolferton, Wash v Bangor, Caerns 10.11.73
 Ad 31.7.73 Dawsmerc, " x Humber, " 25.1.74
 Ad 1.9.73 Wolferton, " v Clyde 6.11.73

SANDERLING

Ad 25.4.70 Heacham, Wash x Manche, France 27.1.74
 Ad 5.5.70 Middleton, Morecambe v Banc d'Arguin, Mauritania 2.11.73
 Ad 29.7.72 Point of Air, Dee v " " " 2.11.73

RUFF

Adm. 23.8.69 Wimbach St, Cambs v Shotton, Dee. 6.3.71
 x Welney, Norfolk 20.1.74

AVOCET

Pull 18.6.71 Minchere, Suffolk + Algarve, Portugal 18.8.73

THE BIOMETRICS, MOULT AND RECOVERIES OF BRITISH-
RINGED RUFF.

by Keith R. Anderson

Approximately 1200 Ruffs (*Philomachus pugnax*) have been ringed in Britain (Spencer 1973), and biometric data from 263 of these birds have been collected in the Wader Study Group files at Tring.

The following notes are based on 233 of these birds (the remainder were of uncertain age) of which 184 (79%) were ringed at Wisbech Sewage Farm (Lincolnshire/Norfolk). Biometric data have also been examined from 22 Ruffs caught by U.K. ringers overseas (in Morocco, Sweden and Turkey) and although these are not included in this detailed analysis the measurements appear to correlate closely with British data.

All but five of the population of 233 were ringed in the months July to October.

TABLE I - NUMBER OF RUFFS CAUGHT

	<u>July</u>		<u>August</u>		<u>September</u>		<u>October</u>		<u>Other</u>	<u>Totals</u>
	(a)*	(b)	(a)	(b)	(a)	(b)	(a)	(b)	<u>times</u>	
Adults	4	10	25	33	6	4	2	0	3	87
Juveniles	2	0	25	74	16	12	13	2	2	<u>146</u>
									Grand Total	<u>233</u>

* (a) = 1st - 15th of month, (b) = 16th - end of month

In common with many other species of wader there is a tendency for adults to predominate in the early part of the passage period. However, the overlap is greater than in some waders and this may in part be associated with the proximity of local British or Dutch breeding populations, the juveniles of which may well be appearing on passage before the main arrival of adults from breeding grounds farther east in Russia or Scandinavia.

Wing Length

The Ruff is a sexually dimorphic species in which the male is easily distinguished in spring and summer by its characteristic plumage and at all times of the year by its larger size.

The wing-lengths (maximum chord method) of 71 adults and 138 juveniles have been plotted as histograms (figs. 1 and 2), from which it can be seen that the sexes are readily separable. The ranges, means and standard deviations are shown in Table 2.

6.

FIG. 1
Adults
N = 71

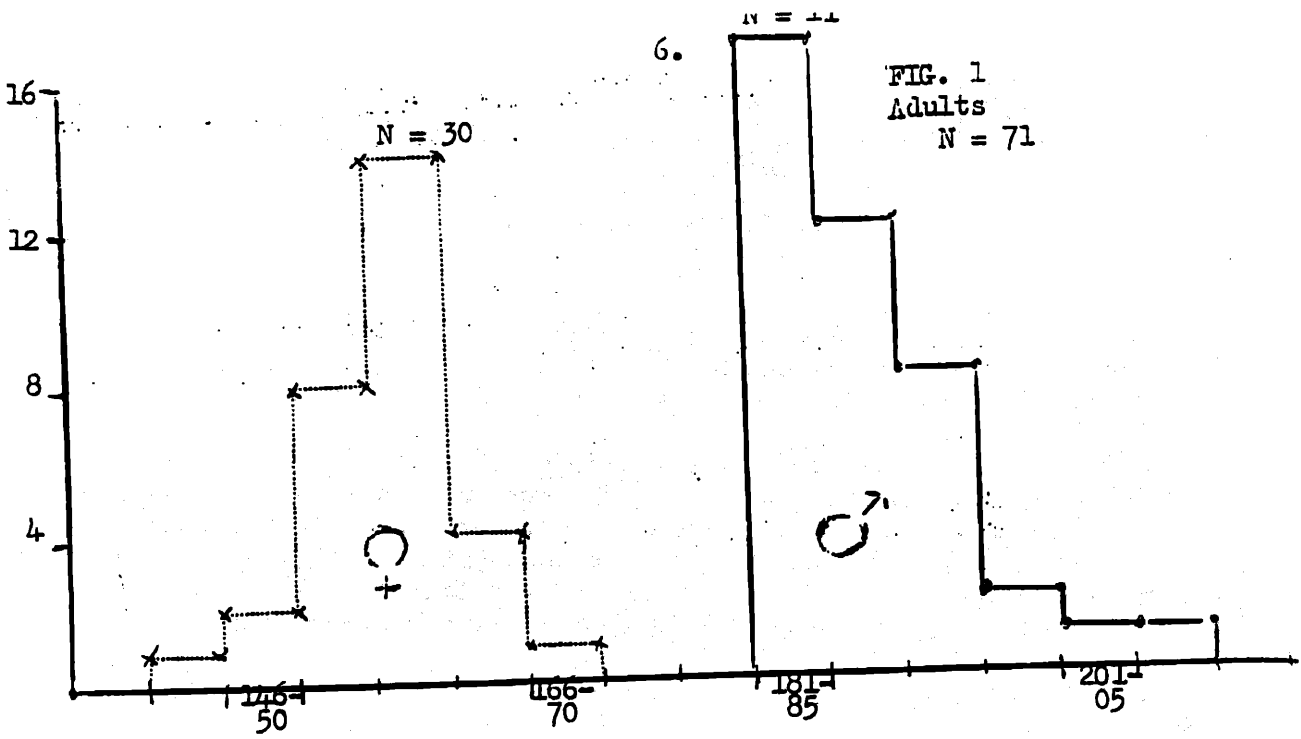
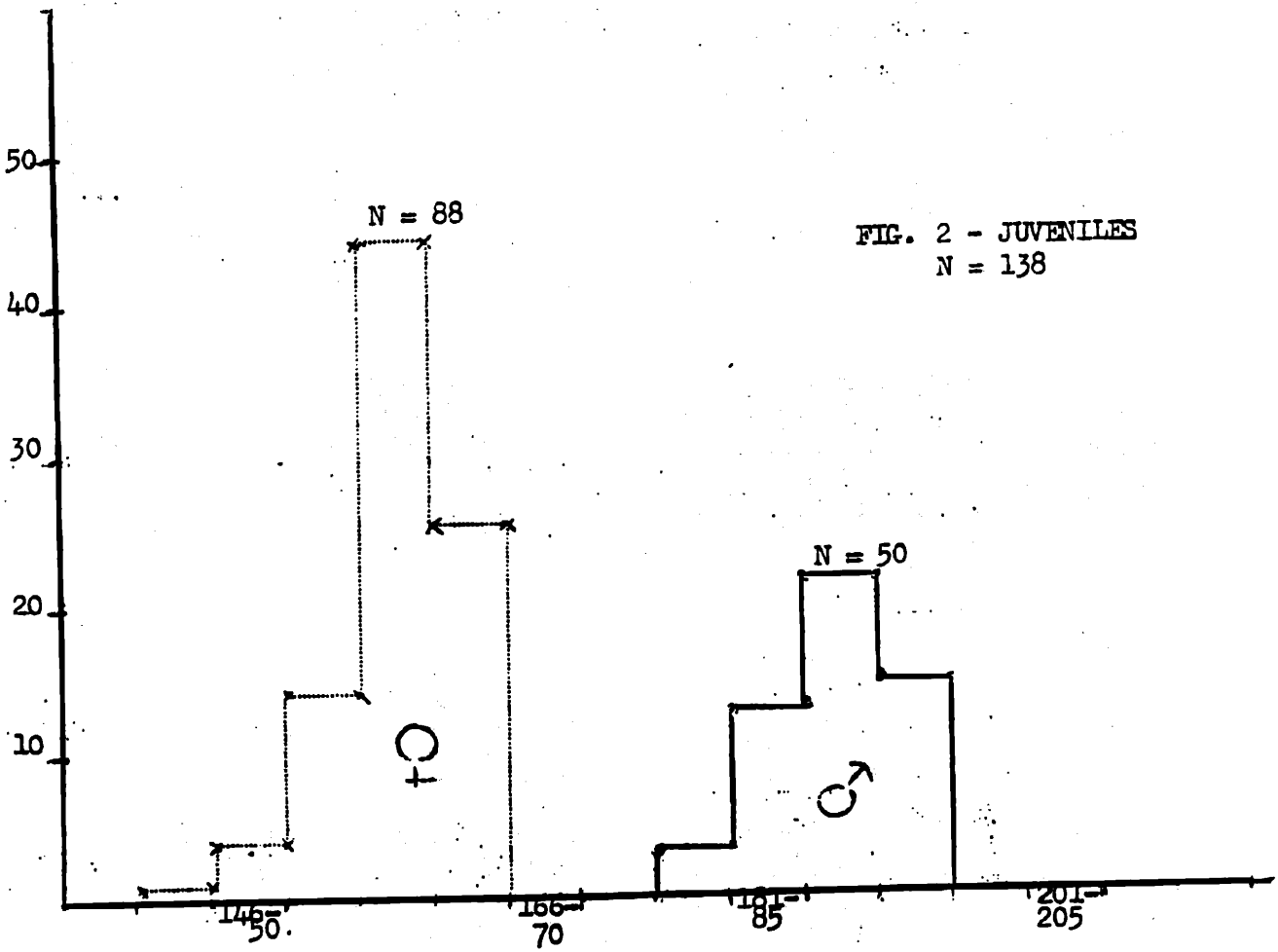


FIG. 2 - JUVENILES
N = 138



Wing lengths of Ruff

FIG. 3 - ADULTS N = 74

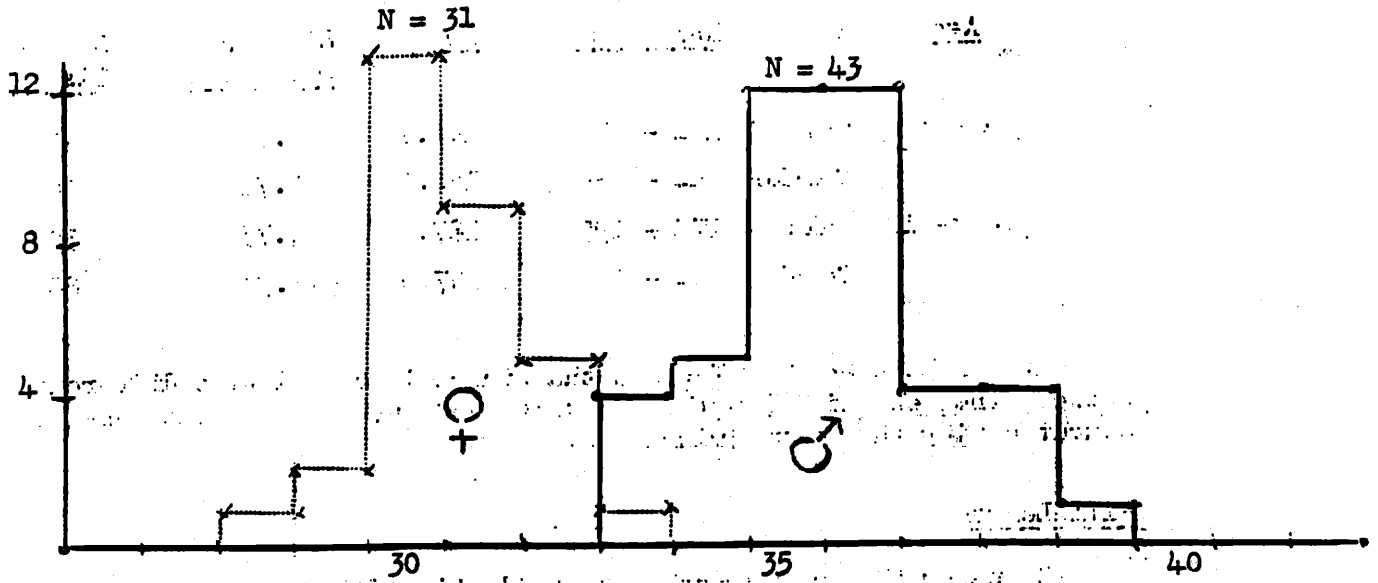
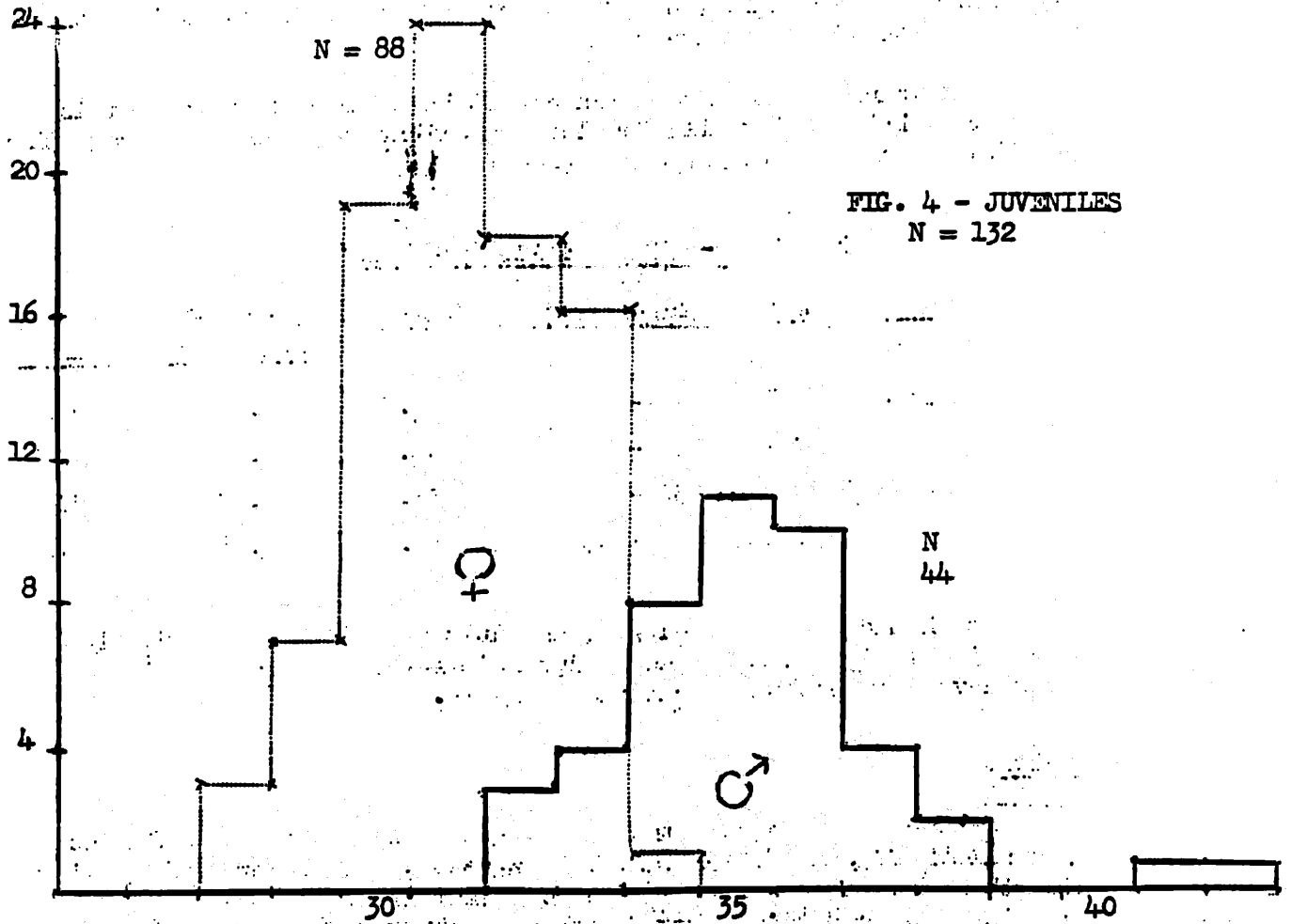


FIG. 4 - JUVENILES N = 132



Bill lengths of Ruff : Sex determined by wing length

TABLE 2 - WING LENGTHS OF RUFFS

<u>Age</u>	<u>Sex</u>	<u>Range (mm)</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Sample Size</u>
Adult	male	181 - 210	188.7	5.88	41
	female	145 - 166	156.5	4.72	30
Juvenile	male	177 - 195	187.8	4.75	50
	female	144 - 165	157.9	3.91	88

It can be seen from Table 2 that there is very little difference between the mean wing lengths of adults and juveniles of the same sex caught during the autumn migration.

Bill Length

By using the wing length data to distinguish the sexes, the bill lengths of males and females both adults and juveniles were plotted, fig. 3 and 4 respectively. It can be seen that the ranges of bill lengths of male and female Ruffs overlap to a small extent in both the adult and the juvenile age groups.

A feature of the data which cannot be explained at present is that the bills of juvenile females are slightly longer on average than those of adults of the same sex (see Table 3).

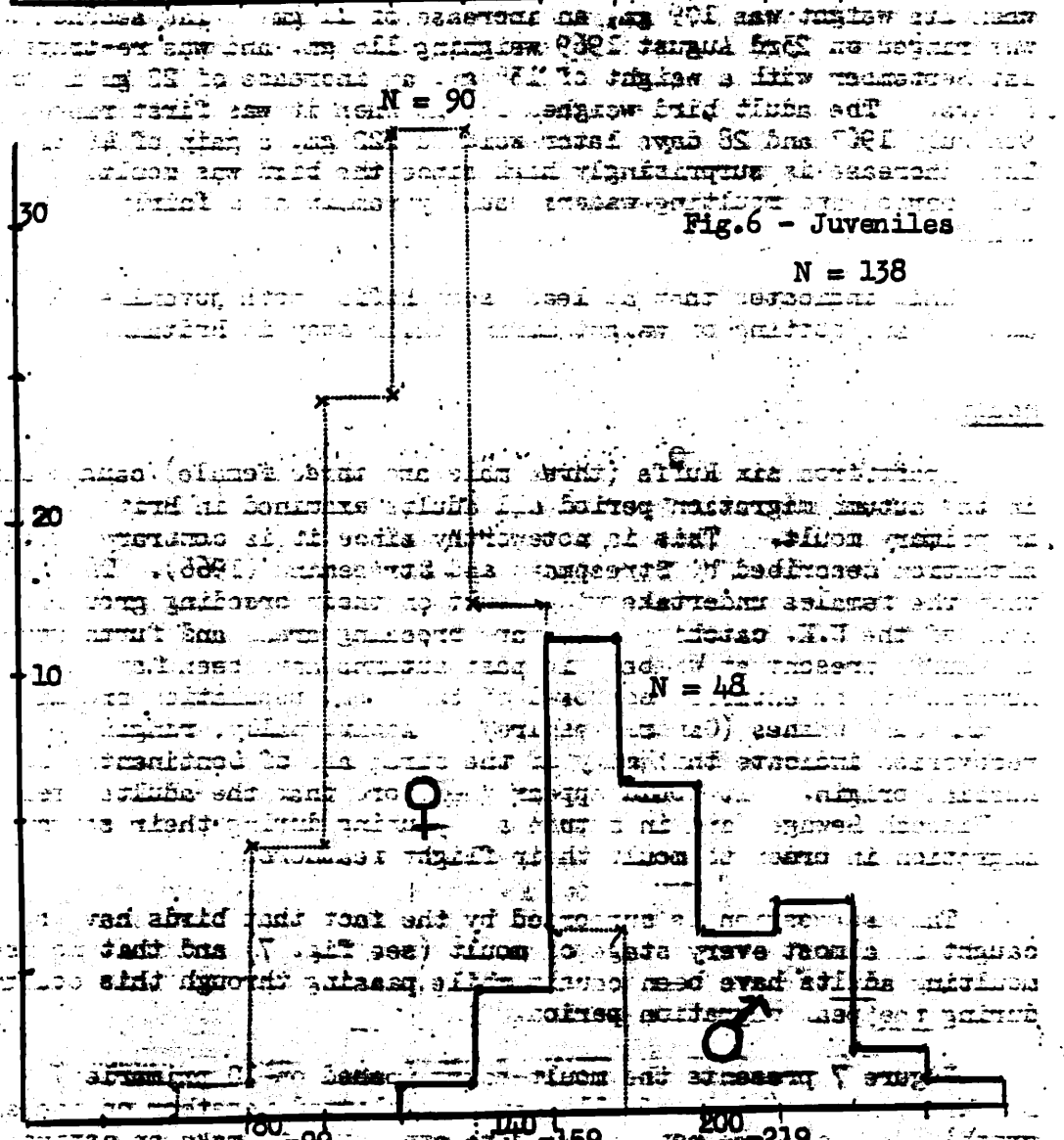
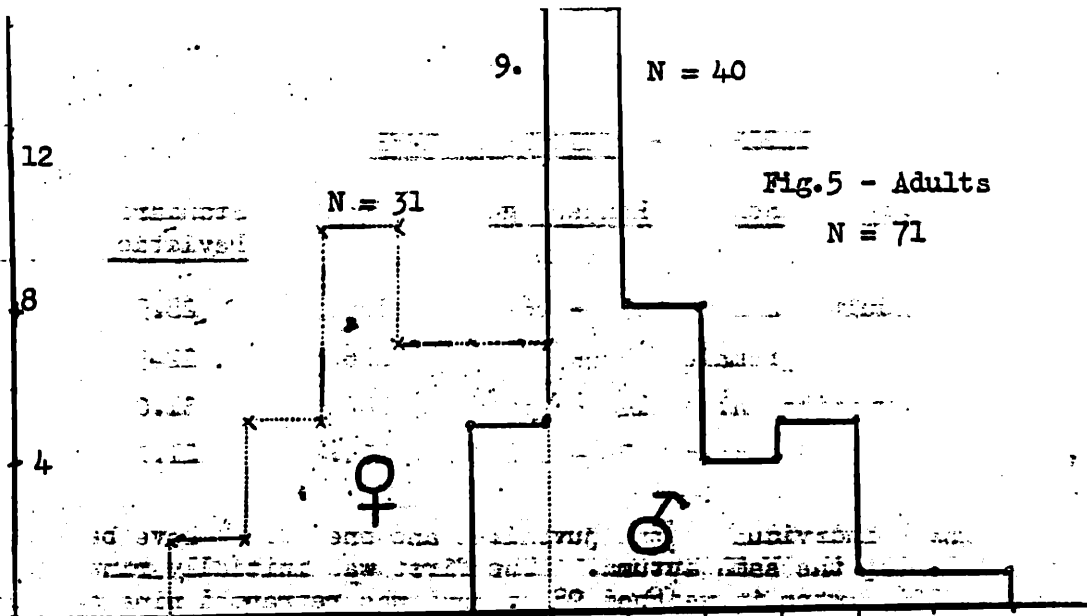
TABLE 3 - BILL LENGTHS OF RUFFS

<u>Age</u>	<u>Sex</u>	<u>Ranges (mm)</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Sample Size</u>
Adult	male	33 - 39	35.5	1.47	43
	female	28 - 33	30.6	1.06	31
Juvenile	male	32 - 42	35.3	2.03	44
	female	28 - 34	31.1	1.37	88

It should be mentioned that an adult male with an apparently exceptional bill of 45 mm and a juvenile female with a bill 37 mm long have been excluded from the analysis.

Weights

Figures 5 and 6 show the distribution of weights of adult and juvenile Ruffs, whose sex has, in each case, been determined by wing length measurements. It can be seen that the birds display a considerable range of weights with a small overlap between the sexes (Table 4). The heaviest individuals in each category were at least twice the weight of the lightest. On average juveniles were slightly heavier than adults of the same sex, the difference being about 9 gm for females and 5 gm for males. The higher juvenile weights may be associated with the fact that most of the adults were in moult and therefore probably not actively migrating.



Weights of Ruff sex determined by wing length

100-99 100-159 200-219

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TABLE 4 - WEIGHTS OF RUFFS

<u>Age</u>	<u>Sex</u>	<u>Ranges (gm)</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Sample Size</u>
Adult	male	150 - 267	186.5	28.5	40
	female	70 - 158	116.5	22.9	31
Juvenile	male	121 - 268	189.9	31.0	48
	female	76 - 168	125.4	21.1	90

Three individuals (two juveniles and one adult) have been caught twice during the same autumn. The first was initially ringed on 3rd August 1964, when it weighed 98 gm, and was re-trapped nine days later when its weight was 109 gm, an increase of 11 gm. The second juvenile was ringed on 23rd August 1969 weighing 116 gm, and was re-trapped on 1st September with a weight of 138 gm, an increase of 22 gm in only 8 days. The adult bird weighed 176 gm when it was first ringed on 9th July 1967 and 28 days later weighed 222 gm, a gain of 46 gm. This increase is surprisingly high since the bird was moulting during this period and moulting waders usually remain at a fairly constant weight.

This indicates that at least some Ruffs, both juveniles and adults, are putting on weight during their stay in Britain.

Moult

Apart from six Ruffs (three male and three female) caught early in the autumn migration period all adults examined in Britain have been in primary moult. This is noteworthy since it is contrary to the situation described by Stresemann and Stresemann (1966). They state that the females undertake wing moult on their breeding grounds. None of the U.K. catching sites are breeding areas and furthermore the Ruffs present at Wisbech in past autumns have been far too numerous to be entirely composed of the local population breeding at the Ouse Washes (Cambridgeshire). Additionally, ringing recoveries indicate that many of the birds are of Continental or Russian origin. It would appear therefore that the adults present at Wisbech Sewage Farm in autumn are pausing during their southward migration in order to moult their flight feathers.

This suggestion is supported by the fact that birds have been caught in almost every stage of moult (see fig. 7) and that no non-moulting adults have been caught while passing through this country during the peak migration period.

Figure 7 presents the moult-score (based on 10 primaries) related to date (birds of all years are plotted together on the same graph). There are not enough data available to make an estimate of the duration of the moulting period. However, an individual caught twice in the same year was moulting at a rate consistent with a minimum moulting period of 55 days, but in most waders the rate is not linear, it is therefore likely that the full primary moult takes longer than this. It is clear from fig. 7 that males are generally ahead of females in their moult. In the period with the largest samples (the fortnight 10th-23rd August) the mean moult-score for males is 3.3 higher than that for females viz:

Mean moult-score of males - 34.3
Mean moult-score of females - 31.0

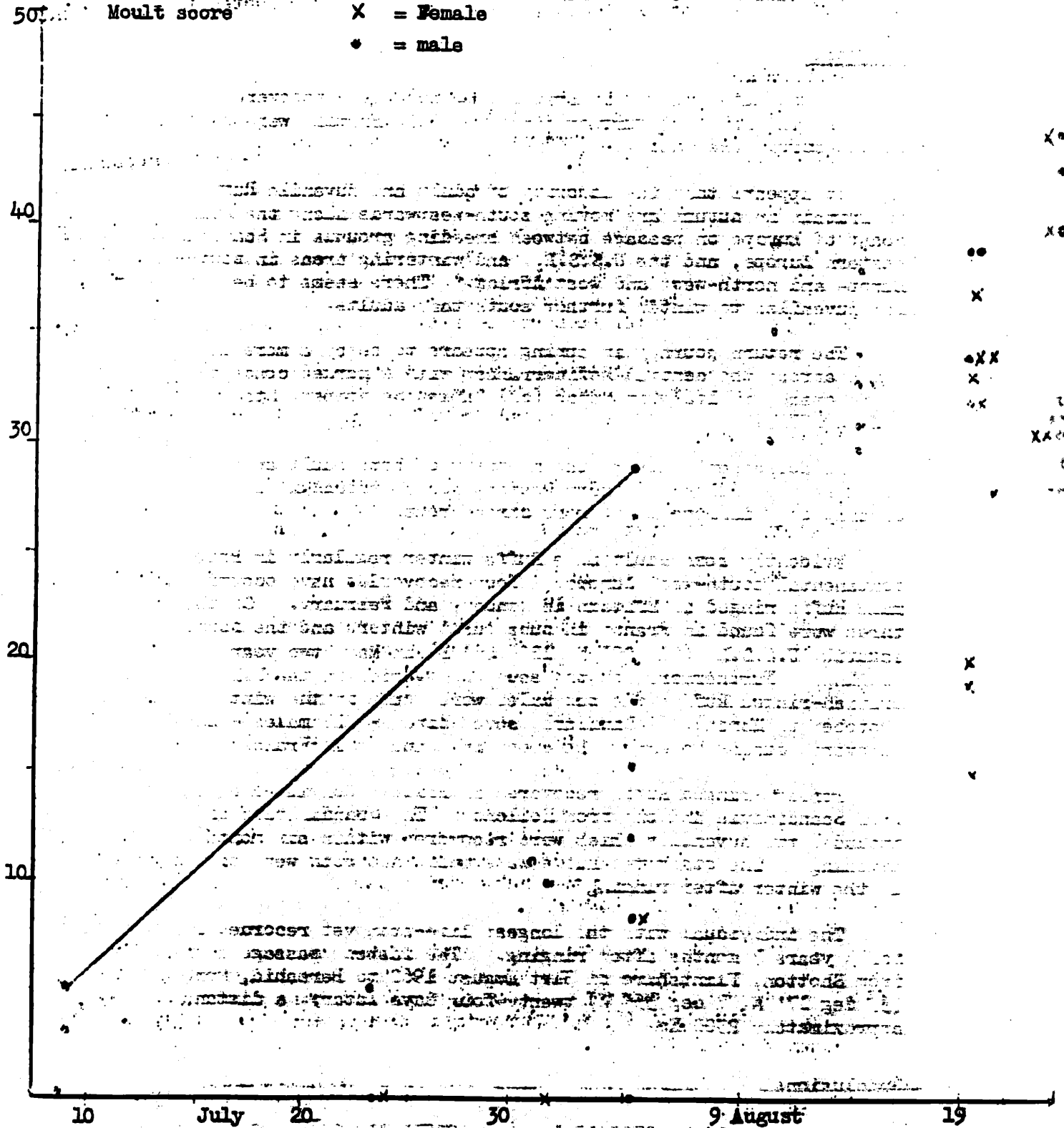


FIG. 7 - Moulting of Ruff in U.K.

This together with the observation that no females have been found moulting primary feathers in July, give strong support for the supposition that males leave the breeding grounds to start their migration before the females; a result to be expected in view of the breeding habits of the species.

Recoveries

Of the Ruffs ringed in Britain, 34 have been recovered overseas and 7 in the U.K. A further 4 recovered in Britain were originally ringed abroad (see Map).

It appears that the majority of adult and juvenile Ruffs ringed in Britain in autumn are moving south-westwards along the Atlantic coast of Europe on passage between breeding grounds in Scandinavia, eastern Europe, and the U.S.S.R., and wintering areas in south-west Europe and north-west and west Africa. There seems to be a tendency for juveniles to winter further south than adults.

The return journey in spring appears to be by a more direct route across the central Mediterranean with a marked concentration of recoveries in Italy in March (of. Curlew Sandpiper; Stanley and Minton 1972).

In subsequent autumns the majority of both adult and juvenile Ruffs seem to follow the same western route, though one in Italy was clearly on a different and more direct route.

Evidently some adult male Ruffs winter regularly in Britain and continental south-west Europe. Four recoveries have occurred of male Ruffs ringed in Britain in January and February. Of these three were found in France in subsequent winters and the fourth at Yakutsk, U.S.S.R. ($62^{\circ} 05' N$, $129^{\circ} 41' E$) in May, two years after ringing. Furthermore, of the seven recoveries in the U.K., of British-ringed Ruffs, the six males were found in the winter period (October to March). Similarly seven birds - all males - have been recovered during November, December and January in France and Spain.

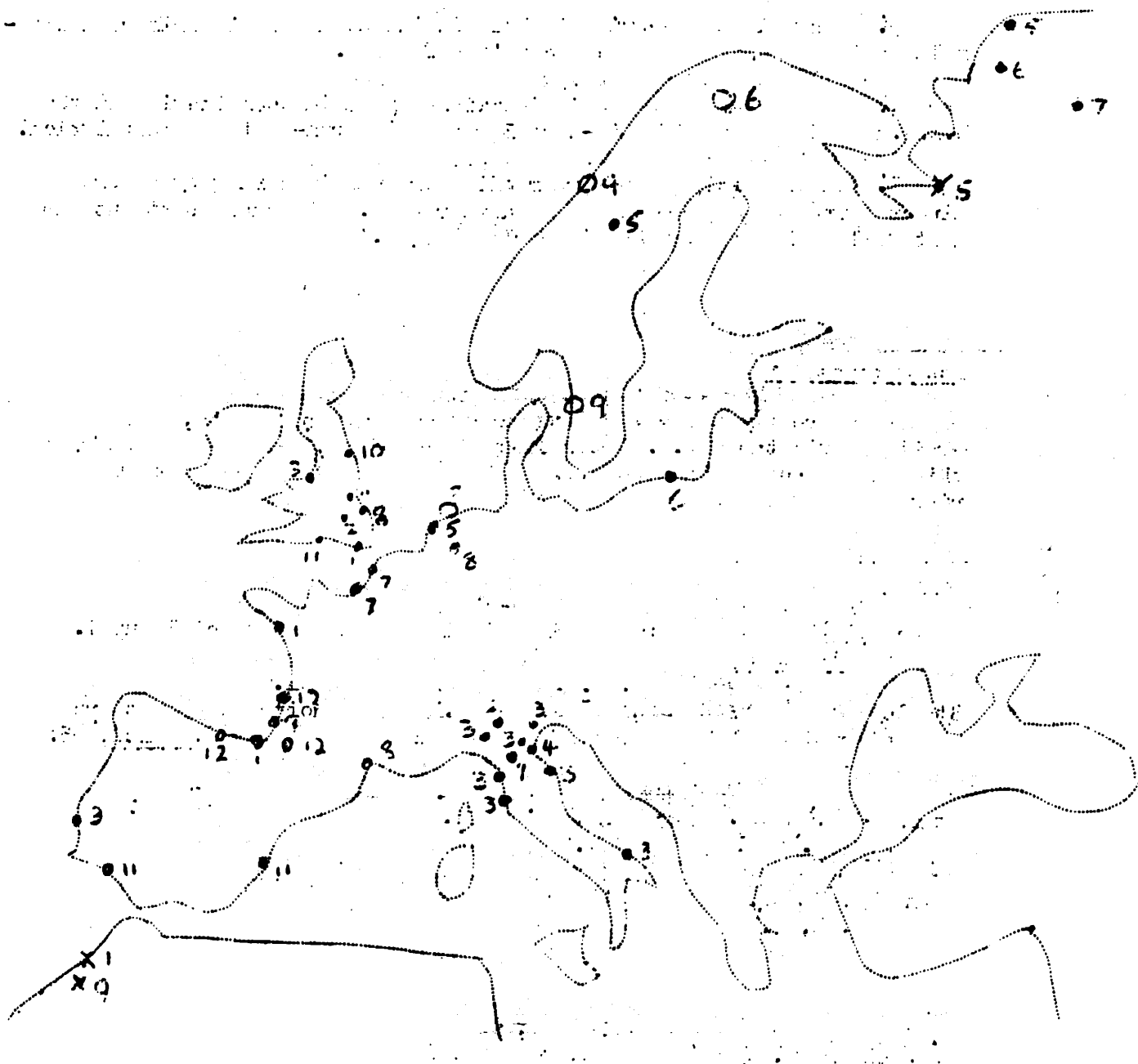
Foreign-ringed Ruffs recovered in Britain consisted of three from Scandinavia and one from Holland. The Scandinavian birds included two juveniles which were recovered within six months of hatching. The other two Ruffs were males and both were recovered in the winter after ringing.

The individual with the longest life-span yet recorded lived for 5 years 7 months after ringing. The fastest passage so far was from Shotton, Flintshire on 31st August 1962 to Berechid, Morocco, ($33^{\circ} 17' N$, $7^{\circ} 35' W$) twenty-four days later; a distance of approximately 2300 Km.

Conclusions

1. There is no overlap in wing length and only a small overlap in bill length between male and female Ruffs. In autumn, adults and juveniles are similar in size except that juvenile females have a slightly longer (and unexplained) bill length than adult females.

2. Ruff weights vary widely in autumn. Juveniles average 5-10 gm more than adults. Both appear to put on weight while in Britain in autumn.



- x JUVENILE
- ADULT Ringed U.K. recovered abroad
- Ringed abroad, recovered U.K.

The figure is the month of recovery and the age is the age when recovered.

Map. Recoveries of Ruff ringed in Britain

Not included in this map are two birds, one at Yakutsk (see text) and one in the important wintering grounds in Mali.

3. Most adults occurring in Britain in autumn are in primary moult - males being slightly more advanced than females.

4. Ruffs which visit Britain mainly breed in Scandinavia and the U.S.S.R. and winter in south-west Europe and north-west and west Africa.

5. Ruffs return to their breeding grounds in spring by a more direct route across the central Mediterranean. In subsequent autumns most follow the route taken in earlier years.

Acknowledgements

I am greatly indebted to the wader ringers whose data, made available via the B.T.O. Wader Study Group files, have been used in this paper and also to the B.T.O. Ringing Scheme for access to the ringing recoveries.

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K.R. Anderson, Wymondham College, Norfolk

A METHOD FOR SEXING ADULT RINGED PLOVERS
Charadrius hiaticula L., in Summer Plumage

Robert C. Taylor

Whilst undertaking a taxonomic study of the Ringed Plover Charadrius hiaticula using museum specimens, I have found that adult males and females in summer plumage show slight differences in the pectoral band.

It is known that in winter plumage, adult males and females can be differentiated in the hand. The "Handbook" states that in females there is a variable number of brown feathers intermixed with the black feathers that form the distinctive bands on the head and the pectoral band of this species. In males there are only very rarely any brown feathers present. According to the literature the sexes cannot be separated on any plumage characteristics when in summer plumage.

A large series of birds in summer plumage was assembled from museums throughout the world. It became apparent whilst studying these specimens that many of the summer females showed varying amounts of brown feathers in the black pectoral band and it was decided to quantify these subjective observations in an attempt to find a criterion for sexing adult birds in the band.

One hundred and eighteen sexed adult birds, that had been collected between April and September, mostly from western Europe but a few from Greenland and Siberia, were examined closely for the absence or presence of brown and black feathers in the pectoral band. It was noted that most of the brown feathers were situated in the side regions of the band; adjacent to, and sometimes partly covered by, the folded wing. The feathers in this region were counted by gently depressing the plumage along the anterior edge of the pectoral band and drawing a seeker gently across the band to the posterior edge. As the seeker passes the tip of each feather along the depressed line, the feathers spring up one at a time and, under good illumination, can be counted individually.

In this manner sixty eight adult males and fifty adult females were examined. The feathers counted were divided into two categories, brown or black. The percentage of brown feathers present was calculated for each group of birds for each month studied and the percentage of birds with black feathers only, brown feathers only or a mixture of the two types was also calculated. The results are shown in Table I and in Figure I.

Male

Month	Apr	May	Jun	Jul	Aug	Sep
Mean %	12.3	1.7	0.8	1.6	6.1	3.1
S.D.	22.3	3.3	2.4	3.9	16.0	8.1
n	16	12	10	10	13	7

Female

Month	Apr	May	Jun	Jul	Aug	Sep
Mean %	13.5	40.4	24.0	26.5	44.4	75.5
S.D.	17.9	28.1	20.7	20.2	29.8	22.1
n	9	10	10	10	7	4
t	0.11	3.94	3.17	3.27	2.44	5.14

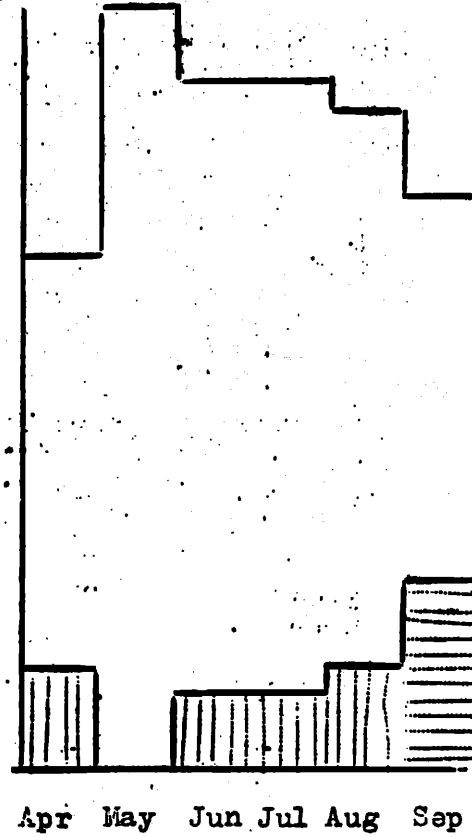
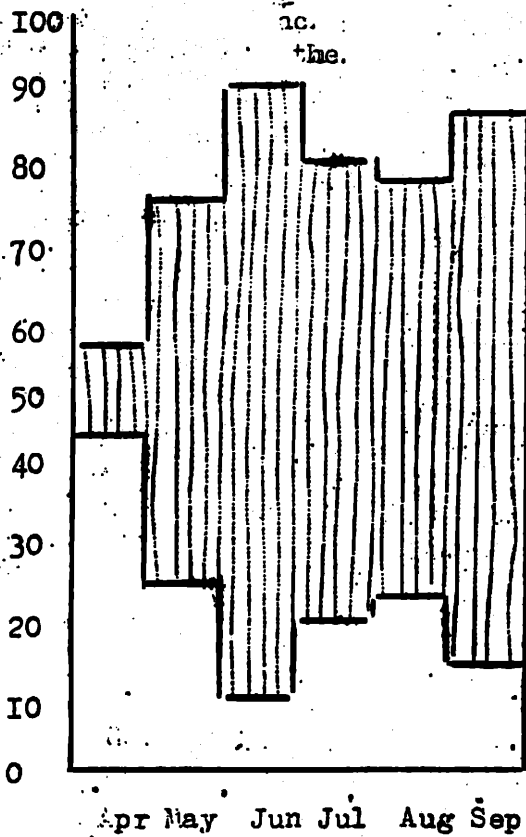
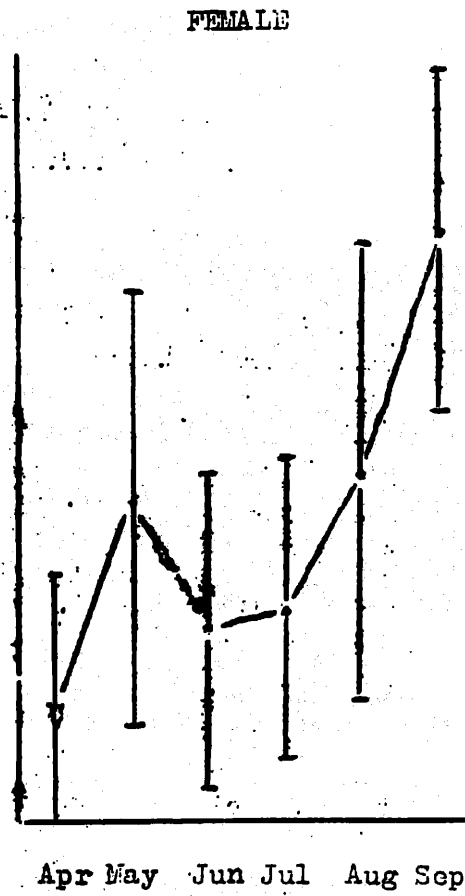
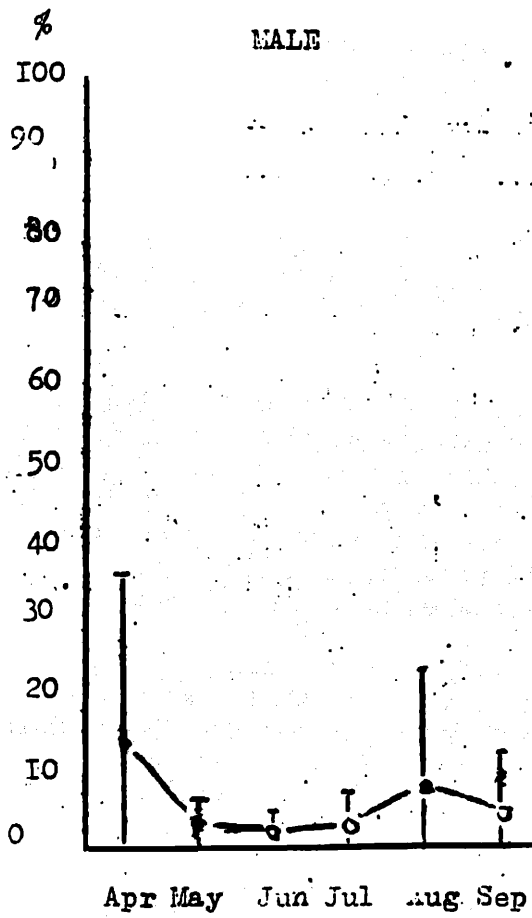


Figure I. Upper left and right - percentage of brown feathers in the pectoral band of Ringed Plover; plus one standard deviation either side of the mean. Bottom left and right - percentage of birds with all black feathers, vertical hatching; all brown feathers, horizontal hatching; brown and black feathers mixed, no hatching.

TABLE I The percentage of brown feathers in the pectoral band of Ringed Plover. S.D. is one standard deviation from the mean, t is the results of Students' t test comparing the means of males and females from the same month - no notation above t means that the means are not statistically significant; ' = significant $P=0.5 - 0.1$; '' = $P 0.01 - 0.001$; ''' = $P 0.001$.

Figure I Upper left and right - percentage of brown feathers in the pectoral band of Ringed Plover; plus one standard deviation either side of the mean. Bottom left and right - percentage of birds with all black feathers, vertical hatching; all brown feathers, horizontal hatching; brown and black feathers mixed, no hatching.

It can be seen that in all months excepting April, the females contain a much higher percentage of brown feathers in the side region of the pectoral band than do the males; these differences are statistically significant (see Table I, t tests). The only month where a large difference does not exist between males and females is April. I consider that this is probably due to the presence of some first year birds in the male sample retaining a few brown juvenile breast feathers through the post-juvenile moult. One of the birds in this group was positively identified as a first year bird by the incomplete ossification of the skull. The retention of a few juvenile feathers in the body plumage is by no means exceptional and has been observed in 19.5% of one hundred and twenty three first winter Purple Sandpipers *Calidris maritima* examined. (Taylor, unpublished data). Three females with all black pectoral bands in April are difficult to explain. It may be that these birds have been incorrectly sexed by their collectors - this would not be too unlikely since it has been estimated that up to ten per cent of birds are incorrectly sexed in the field when time is at a premium.

The appearance of brown feathers in 19.2% of males collected between May and September, and the lack of any brown feathers in 7.3% of females collected in the same period suggests that it is not a straightforward "all black or all brown" situation.

The conclusions that may be drawn from this limited study are that birds caught in April containing brown feathers in the side region of the pectoral band could be either males or females, but are more likely to be females. However those birds with brown feathers caught in May to September will almost certainly be females and those with all black feathers males. A larger series of birds would clarify the situation further, but for practical purposes it should be possible to sex correctly about 85% of adult birds caught between May and September using the criterion described above.

Summary:

April	-	Feathers all black	male or female
		Feathers black and brown	male or female
		Feathers all brown	female
May	-	Feathers all black	⊙ 80% male
Sept.	-	Feathers black and brown	⊙ 90% female
		Feathers all brown	female

COMMON SANDPIPER BIOMETRICS

Stuart C. Brown

This analysis is of the data collected by the Wader Study Group. Data are available for approximately 600 birds caught in Great Britain (S. England 265, Mid. England 290, N. England 5, Scotland 55, Ireland and Wales 0) from 1963 to 1973 and for 7 from Sweden, 37 from Jordan and 29 from Morocco.

1. Adult/Juvenile Ratio

Table I presents the numbers of adults and juveniles caught during the period from July to October in G.B. and the percentage of juveniles in these samples.

TABLE I

	1-15 JULY	16-31 JULY	1-8 AUG	9-16 AUG	17-24 AUG	25-31 AUG	SEPT	OCT
No. Juvs	13	39	15	48	92	18	61	5
No. Ads	14	38	33	45	35	8	6	0
TOTAL	27	77	48	93	127	26	67	5
% Juvs.	50	50	30	50	72	70	90	(100)

From Table I it can be seen that the passage of adults tends to be earlier than that of juveniles - as in most species of waders. However, there is considerably more overlap in the migration period than in many other species with juveniles being present in significant numbers right from commencement of migration in early July.

2. Bill Length

The distribution of bill lengths for both adults and juveniles has an apparently normal distribution. Mean Ads = 25.02 (n = 104) Juvs = 24.80 (n = 175). Range 22-31 mm.

This perhaps suggests that the bills of juveniles are not quite fully grown at the time of the first autumn migration. Also any difference in bill length between the sexes is probably small.

3. Wing Length

The distributions of wing lengths are also normal, for both adults and juveniles (Fig. 1)

The means are: adults 110.1 mm (n = 185), juveniles 110.7 (n = 283). However, this may be misleading because the wing feathers of adults in autumn will have already been exposed to shortening by wear for 6-9 months (Pienkowski and Minton 1973). Therefore the wing lengths of newly moulted adults may well be rather greater than those of juveniles.

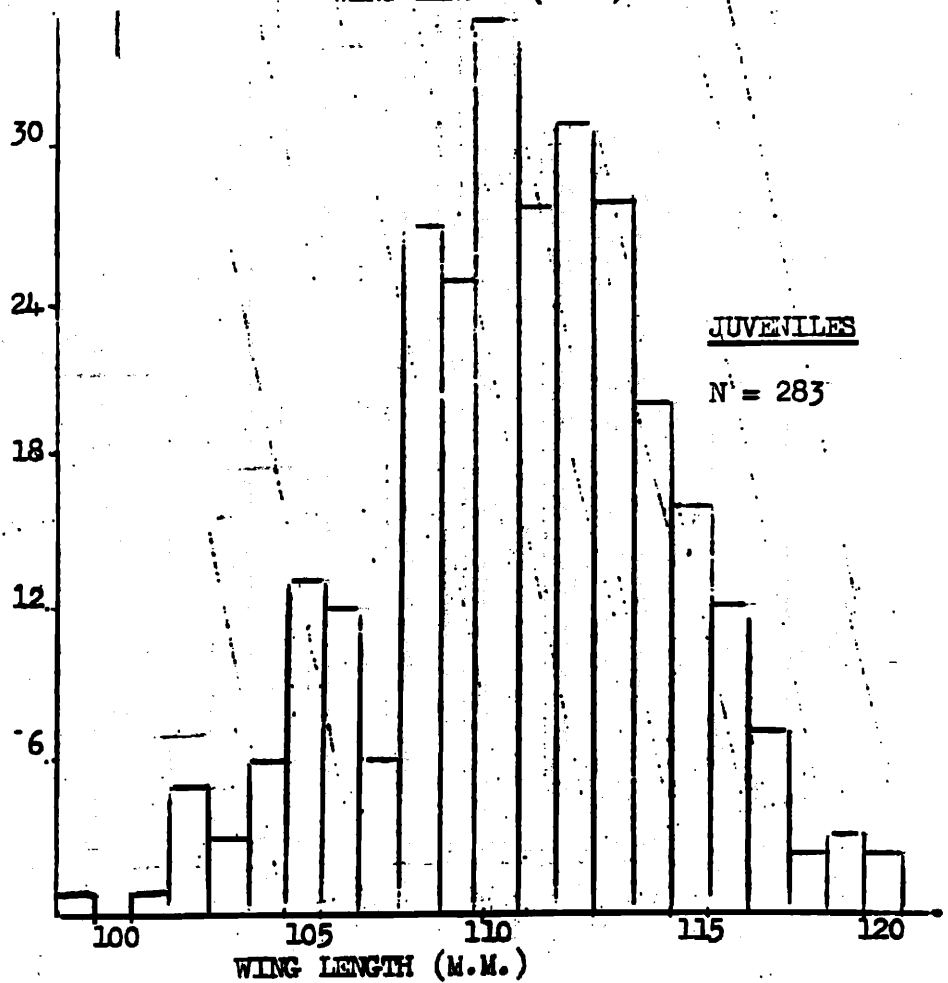
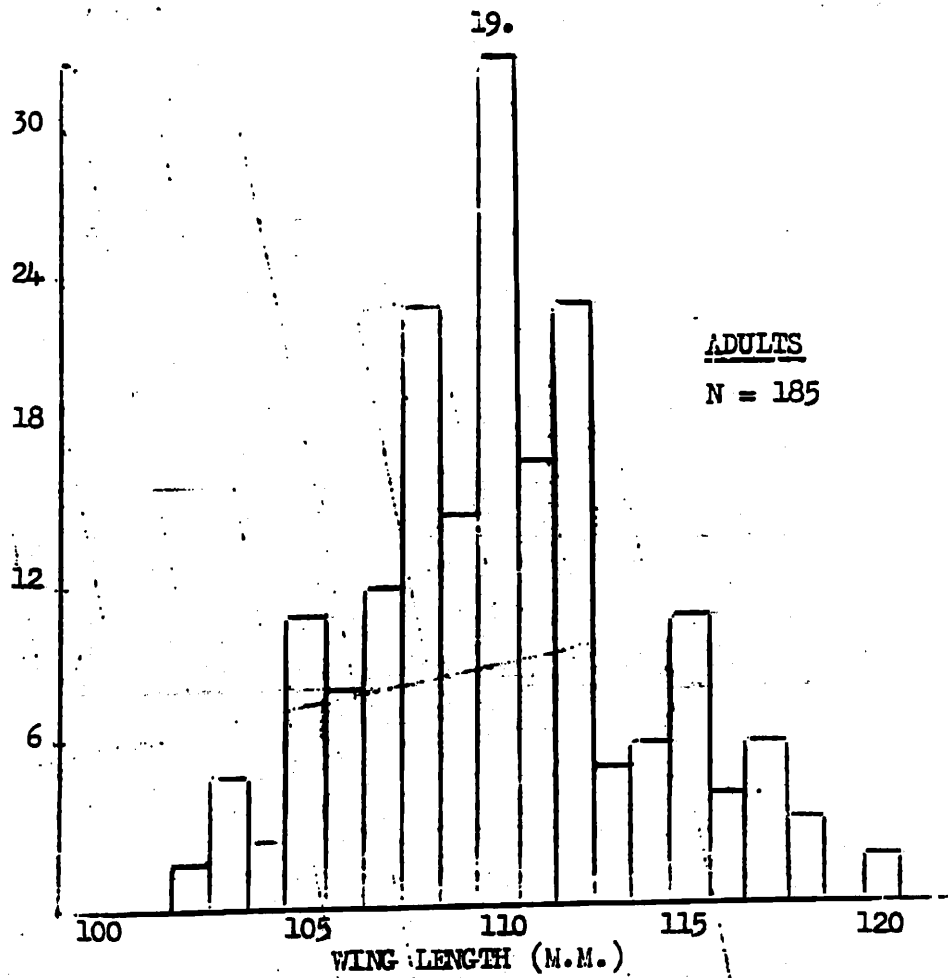


FIG. 1 - WING LENGTHS OF COMMON SANDPIPERS (G.B.)

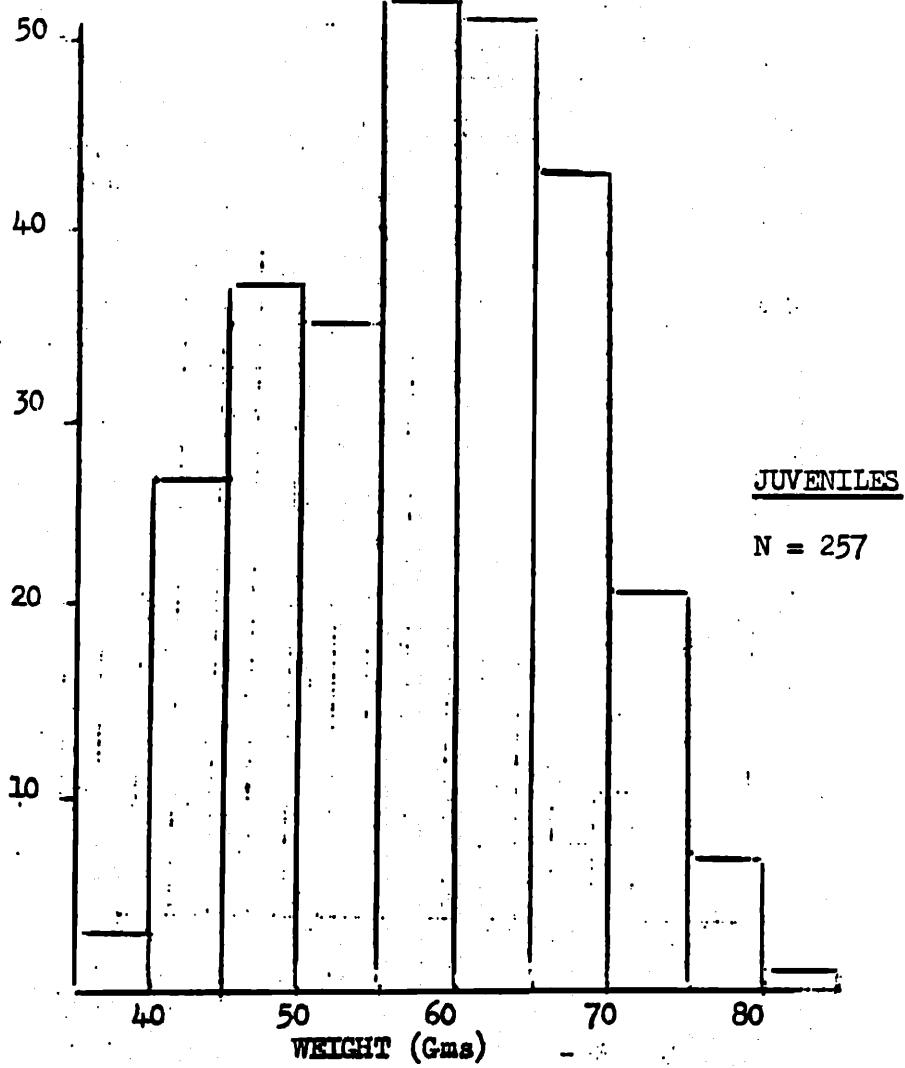
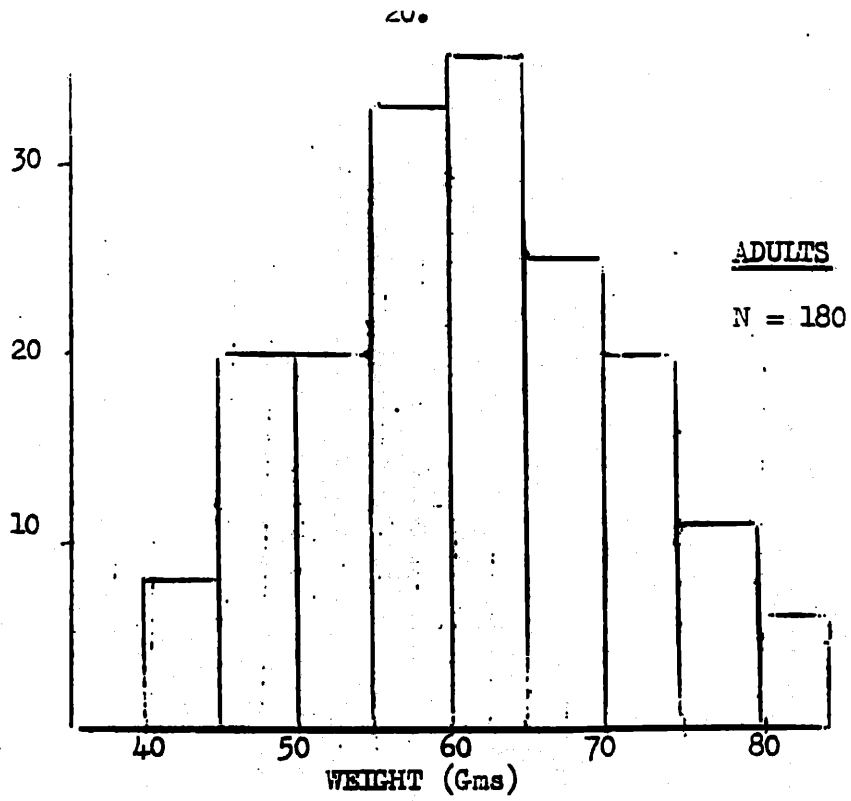


FIG. 2 - WEIGHT OF COMMON SANDPIPERS

The 21 mm range of wing lengths (99-120mm) is fairly large. This may be partly due to inter-person differences in technique of measuring maximum cord wing length. Nevertheless even in small samples of birds caught on the same day and measured by one person the range is up to 16 mm. It is possible, however, that the wide range is also due to the presence of populations with different origins each having a slightly different mean wing length. Samples of wing lengths of birds of known origin (o.g. British or Scandinavian populations) would help clarify the situation. Examination of the histograms of wing lengths for five periods from July to September sheds no additional light on the situation since both adults and juveniles showed no consistent pattern of change in the means or distributions of wing lengths; For the present therefore wing lengths of British caught common Sandpipers cannot be used to separate birds into discreet groups.

4. Weight

The weights of Common Sandpipers caught in Great Britain vary from 38 gms to 84 gms. Birds are rarely recorded below 40-45 gms and this therefore probably corresponds fairly closely to their fat-free weight (Dunlin of similar wing length have a similar average fat-free weight). Thus it would appear that at least some individuals are capable of doubling their weight before migration, putting these individuals in the "long hop migrant" category of waders.

However, from the weight histogram (Fig.2) it would appear that most birds depart when they have reached a weight of about 65-70 gms.

An analysis of the birds weighing less than 45 gms showed that about a quarter (8 birds) were adult and three quarters (30 birds) were juvenile. Of the "heavy birds" (75 gms) two thirds (17 birds) were adult and one third (8 birds) were juvenile. This suggests that juveniles may have a smaller body size than adults and/or that they are less efficient at feeding, since they seem less capable than adults of reaching or maintaining the higher weights. Juveniles may therefore have a smaller flight range.

Common Sandpipers caught in Morocco and Jordan were all below 55.5 gm (63 birds) with weights as low as 34 gms in both countries, such birds probably being near the minimum weight at which they can live. The Moroccan birds caught in autumn had a mean weight 42.5 gms (range 34-51 gm, 31 birds) 4 spring birds had a similar mean. The Jordanian birds were caught in a desert oasis in spring and may have been "lost" migrants; they had a weight 43 gms (range 34-55 gms, 32 birds).

Weight changes from retraps

The weight changes of birds retrapped during the same autumn were plotted against date and are shown in fig.3.

There is no apparent change in the rate of weight increase during the period for which retraps are available.

This contrasts with the Curlew Sandpiper (Stanley and Minton 1972) where the rate decreases later in the season. Unfortunately there were no retraps among the late caught Common Sandpipers.

The weight changes of the birds retrapped more than three days after ringing, are plotted against the number of days between capture and recapture (Fig.4)

From this it can be seen that:-

1. The rate of weight increase varies considerably for different birds.
2. There does not seem to be any difference between adults and juveniles, indicating contrast to earlier suggestions that juveniles were less efficient feeders.
3. The maximum rate of increase is 3.2 gms per day, but the average rate of increase is 1.2 gms per day (An average rate of increase for juvenile Curlew Sandpipers is between 2.6 gms per day and 3.9 gms per day (Minton and Stanley 1972))

There is a suggestion that birds put on weight more rapidly to begin with, since the average initial weight (49.1 gms) of the five birds with the greatest rates of increase is less than the average initial weight (58.4 gms) of the five birds with the next greatest rates of increase, which in turn is less than the average initial weight (60.6 gms) of the five birds with the slowest rate of increase i.e. as weight increases the rate of deposition of fat decreases.

5. Primary Moult

All but six of the approximately two hundred adult Common Sandpipers caught in autumn showed no signs of active wing moult and no examples of arrested moult were recorded. It would appear therefore that most Common Sandpipers migrate through Britain before commencing their primary moult.

The six which were moulting were all following a pattern markedly different from that of most waders which regularly moult in Britain. Only one or two feathers at a time were in moult and therefore the pattern is similar to that of the Green Sandpiper which regularly moults while on migration. There was considerable variation between the number of primaries left to be moulted, i.e. 4 in one, 5 in two and 8 in two birds.

By a remarkable coincidence two of the records refer to the same bird from Wisbech Sewage Farm. On 24th September 1964 its moult was N° 3'0 and on 25th August 1969 its moult was N° 4'2' 0. This eliminates any possibility that moult in the U.K. is limited to first summerbirds.

It is worth noting that on the first occasion this bird was "aged" as a juvenile! Some moulting birds caught in Morocco were also of questionable age.

REMARKS

It is suggested that anyone handling Common Sandpipers in the future should be very careful about ageing them correctly. As well as measuring the wing, bill and weight carefully, attention should be paid for signs of active or arrested moult since it is possible that some instances have been overlooked in the past.

Any measurements of known breeding birds would be very useful.

An analysis of Common Sandpiper recoveries is to be carried out and will appear in a future edition of the W.S.G. bulletin.

ACKNOWLEDGEMENTS

My thanks are due to all those who have contributed data on Common Sandpipers to the Wader Study Group.

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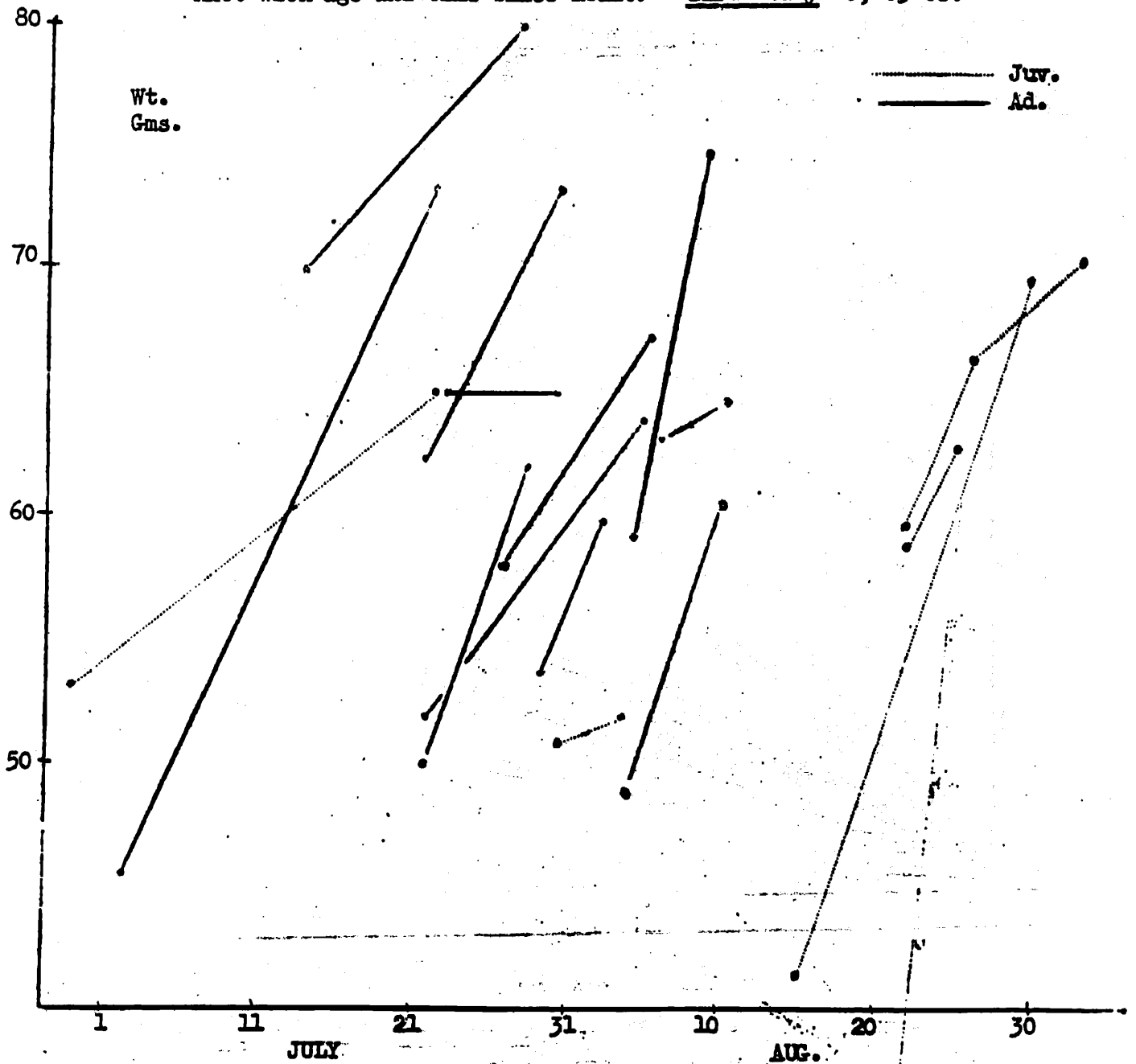


FIG. 3 - Weight Changes of Common Sandpipers retrapped during the same year.

WADER STUDIES IN MOROCCO

In the last WSG Bulletin (No.10) I asked people contemplating wader catching in Morocco to contact me. Since then Mr. Adjan de Jong has decided to try to organise a team to work in Morocco (probably at Sidi Moussa and possibly elsewhere) in July and August of this year. He is hoping that some British wader ringers may join him. If anyone is interested would they please write to me or directly to him. To encourage readers, below are a report of last year's visit and a summary of some of the ringing recoveries and controls resulting from the expeditions in 1971, 1972 and 1973.

Mike Pienkowski, 5 Brockmill Cottages, Beal, Berwick-upon-Tweed,
Northumberland.

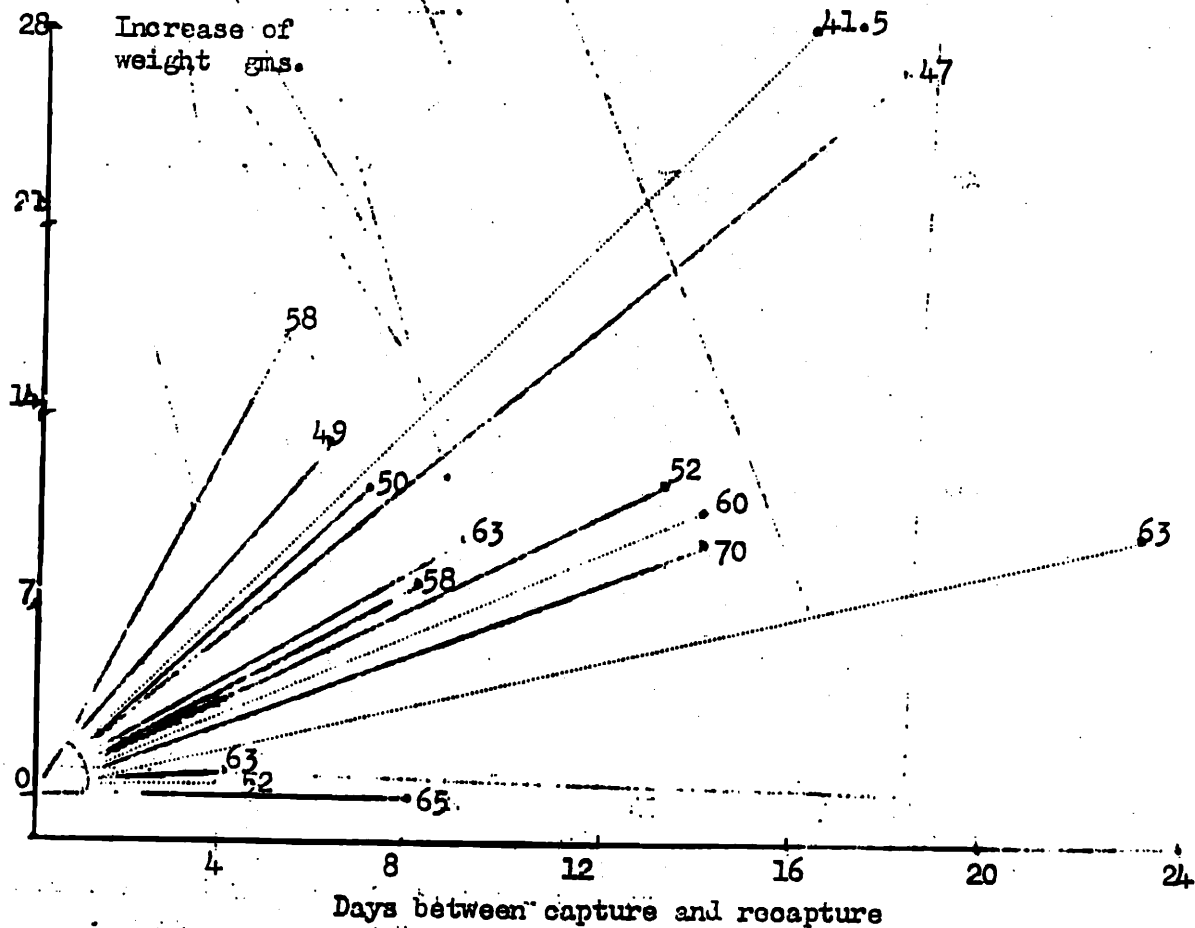


FIG. 4 - Change of weight between handlings against number of days. The figure is the weight at first handling

MOROCCAN WADER RECOVERIES AND CONTROLS

by Mike Pienkowski

The total numbers of waders ringed in Morocco in the years 1969 and 1970 were 53 and 452 respectively, the latter especially being a considerable achievement on the part of the very few ringers in Morocco who usually have to work single handed. The University of East Anglia Expedition in 1971 helped increase the total for that year to 1,770; and the total number of wader handlings by the four British expeditions in 1971 to 1973 were nearly 4,000. These included a number of foreign controls while the birds ringed by the Expeditions have already resulted in a number of recoveries. At the request of several people in the Wader Study Group, I have prepared the following summary of these. The list was compiled in conjunction with Derek Stanyard and Francis Argyle, and we would all like to acknowledge the co-operation received from the Moroccan and British Ringing Offices.

Note: Sidi Moussa is on the northwest coast of Morocco, a few miles south of El Jadida; Puerto Consado is in the extreme south west, in Tarfaya Province.

RINGED PLOVER

Pull 22.6.70 Skipalon, Eyjafjardarsysla, v 20.3.71 Sidi Moussa,

Pull 31.5.62 Sodviken, Oland, Iooland v 10.9.72 Sidi Moussa.

Plus 3 different ^{Sid} year and 4 within year retraps in Morocco.

KENTISH PLOVER

P.J. 16.8.73 Sidi Moussa + 11.1.74 El Khemis des Zemara,
Morocco.

Plus 12 different year and 32 within year retraps by the Expeditions.

BAR-TAILED GODWIT

Juv. 9.9.72 Sidi Moussa + 22.10.72 local

Plus 1 within year retrap

REDSHANK

FG. 17.12.69 Ovalidia, Morocco v 18.9.71 Sidi Moussa (local)

Juv. 18.9.71 Sidi Moussa + 28.1.72 local

Juv. 18.9.71 Sidi Moussa + 6.2.72 local

Juv. 16.9.71 Sidi Moussa + 5.3.72 local

PJ. 17.9.72 Sidi Moussa + 25.2.73 local

Juv. 16.9.71 Sidi Moussa + 15.3.73 Berrechid, Casablanca,
Morocco.

PJ. 9.9.72 Sidi Moussa + 16.3.73 Marais de la Maola,
Algeria

PJ. 18.9.71 Sidi Moussa v 21.9.71 & 16.9.72 local

+ 21.3.73 St. Bonnet, Gironde,
France.

PJ. 18.9.71 Sidi Moussa + 25.11.73 Berrechid, Casablanca,
Morocco

Plus 16 different year and 21 within year retraps at Sidi Moussa.

GREENSHANK

- PJ. 16.9.71 Sidi Moussa x 13.5.72 Saravesi, Laukaa,
Vaasa, Finland
- PJ. 12.8.73 Sidi Moussa. + 19.1.74 Oualidia, Morocco.

Plus 3 within year retraps.

KNOT 8 within year retraps only.

LITTLE STINT 3 different year and 7 within year retraps.

DUNLIN

- Juv. 21.7.71 Amager, Kobenhavn, Denmark v 21.9.71 Sidi Moussa
- Juv. 31.8.71 Gerdar, Gullbringusysla, Iceland v 21.9.71 Sidi Moussa
- IY. 9.10.71 Harty, Sheppey, Kent, England v 25.3.72 Puerto Cansado
- Juv. 17.8.70 Makkevika, Giske, More & Romsdal, Norway v 9.9.72 Puerto
Cansado.
- 3J 13.9.71 West Kirby, Wirral, Cheshire, England v 9.9.72 Puerto Cansado
- PJ 24.7.72 Garmouth, Moray, Scotland v. 7.9.72 Sidi Moussa
- PJ 16.7.72 Wolferton, Kings Lynn, Norfolk, England v. 8.9.72 Sidi Moussa
- PJ 17.8.73 Rock, Padstow, Cornwall, England v. 30. 8.73 Sidi Moussa
- IY 21.8.73 Radipole, Weymouth, Dorset, England v. 3.9.73 Sidi Moussa
- PJ 21.9.71 Sidi Moussa + 13.8.72 Etang de Thau, Herault, France.
- Juv. 20.9.71 Sidi Moussa + 12.8.72 Bain des Veys, Manche, France.

Plus 12 different year and 68 within year retraps by the Expeditions

CURLEW SANDPIPER

- 26.8.69 Radas-La Goulette, Tunis, Tunisia v. 25.8.72 Puerto Cansado
- IY. 1.10.70 Vlieland, Holland v. 25.8.72 Puerto Cansado
- Juv. 26.8.72 Ottenby, Oland, Sweden v. 8.9.72 Sidi Moussa
- Germany ring, no details yet v. 11.9.72 Sidi Moussa
- Juv. 10.9.65 Ottenby, Sweden v. 11.9.72 Sidi Moussa
- Juv. 5.9.73 Sidi Moussa v. 7.11.73 Serenni, Banc
d'Arguin, Mauritania
- PJ. 10.9.72 Sidi Moussa v. 13.8.73 Local
- v. 19.11.73 Cap Timiris,
Banc d'Arguin, Mauritania

Plus 2 different year and 8 within year retraps by the Expeditions.

RUFF 1 within year retrap only

BLACK-WINGED STILT

- Juv. 12.9.72 Sidi Moussa + 18.12.72 Oualidia, Morocco
- Plus 1 within year retrap.

NON-WADER have included one control at Oued Chebeika, Tarfaya Province, Morocco of a Dutch-ringed Common Tern and one recovery in Senegal of a Black Tern ringed at Sidi Moussa. Black Terns have also produced 8 retraps.

RECENT PUBLICATIONS ON WADERS

The last list appeared in Bulletin 10. I would like to thank those people who pointed out omissions and repeat my request for readers to let me know of any references which they think ought to be included (especially those in obscure or local publications). Readers are also referred to the abstracts in Ibis, Auk and Bird-Banding amongst others and to the lists of titles in IWRB Bulletin.

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Corrections to the last list (Bull.10)

Under Davidson, for "Zeffer", read "Letter".
For "Ruchs", read "Fuchs".