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

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

* (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.

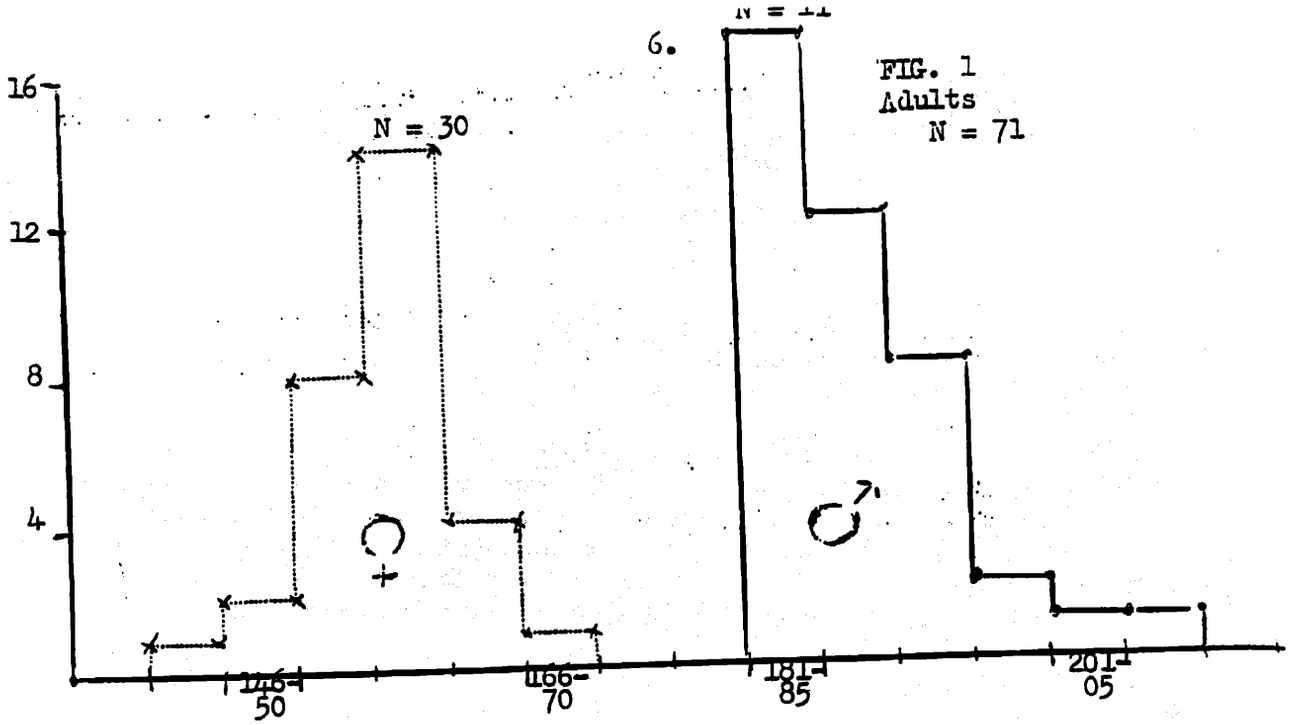


FIG. 1
Adults
N = 71

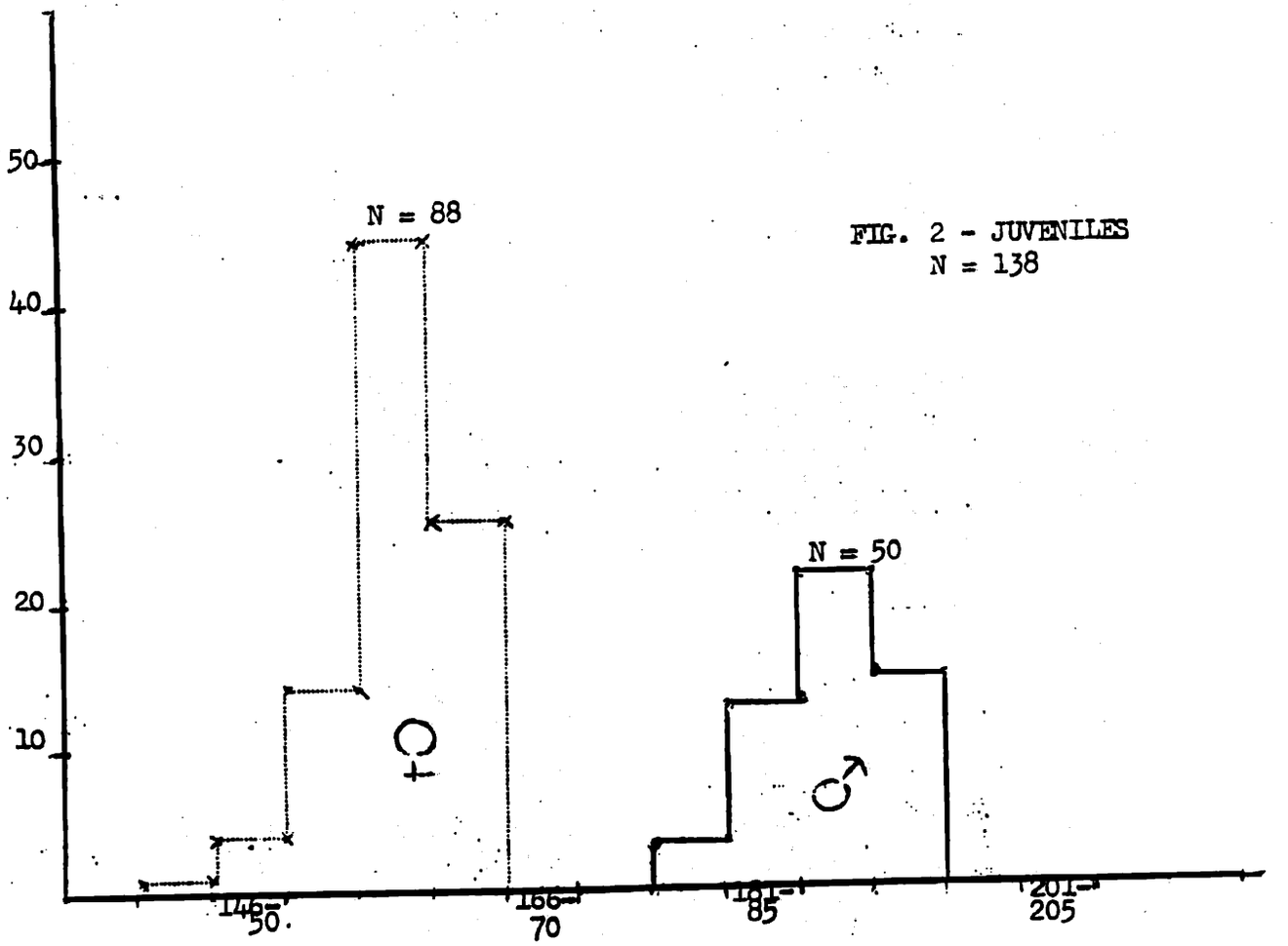
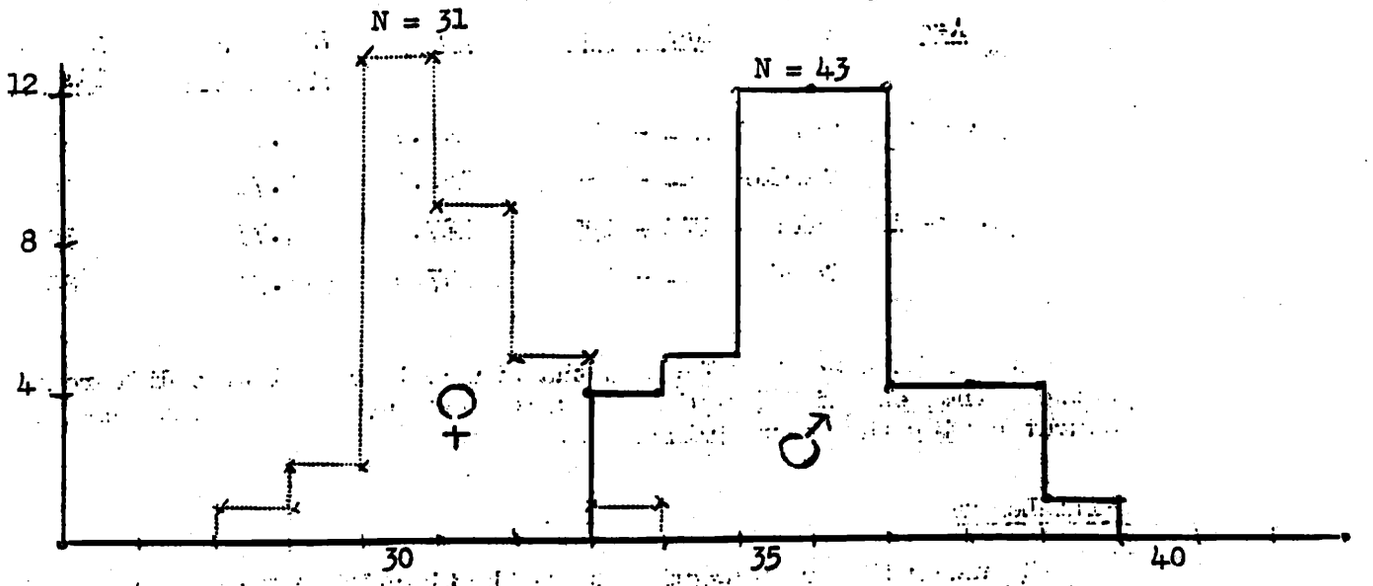


FIG. 2 - JUVENILES
N = 138

Wing lengths of Ruff

FIG. 3 - ADULTS N = 74



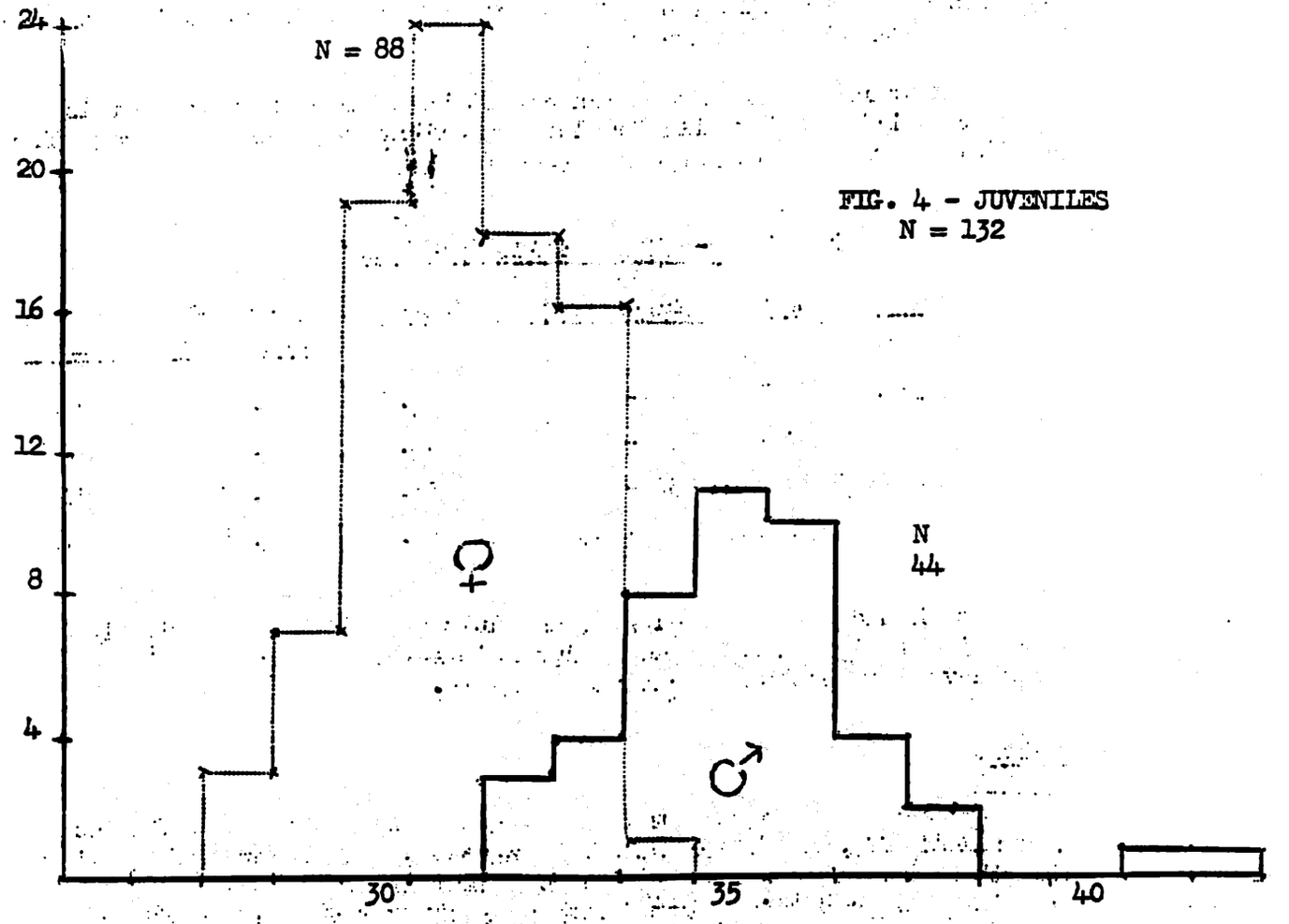


FIG. 4 - JUVENILES
N = 132

Bill lengths of Ruff : Sex determined by wing length

TABLE 2 - WING LENGTHS OF RUFFS

Age	Sex	Range (mm)	Mean	Standard Deviation	Sample Size
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

Age	Sex	Ranges (mm)	Mean	Standard Deviation	Sample Size
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.

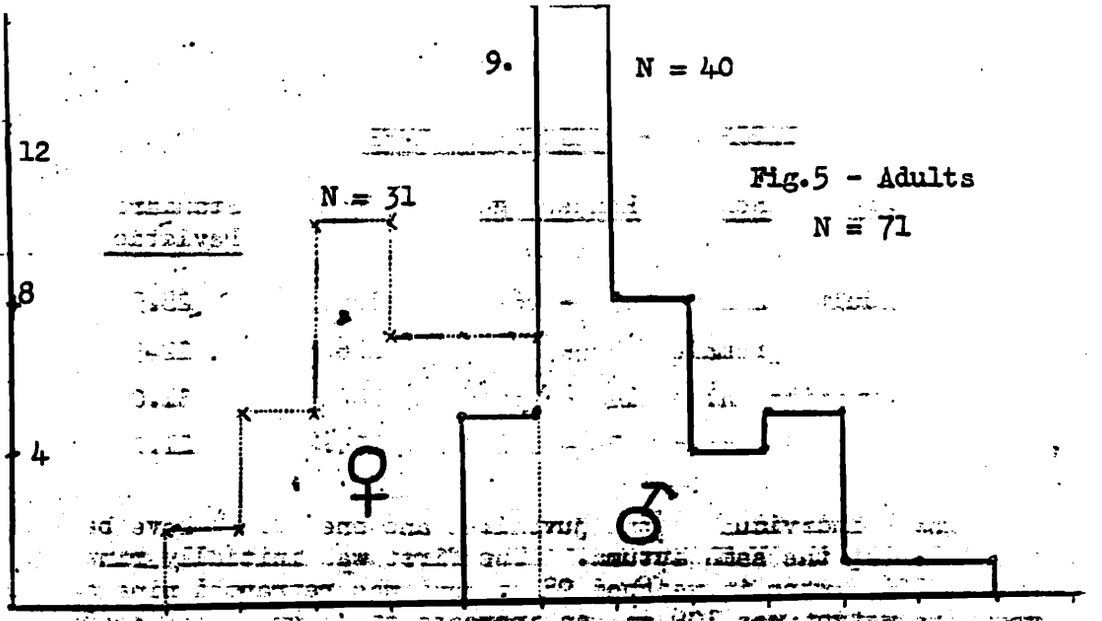


Fig.5 - Adults

N = 71

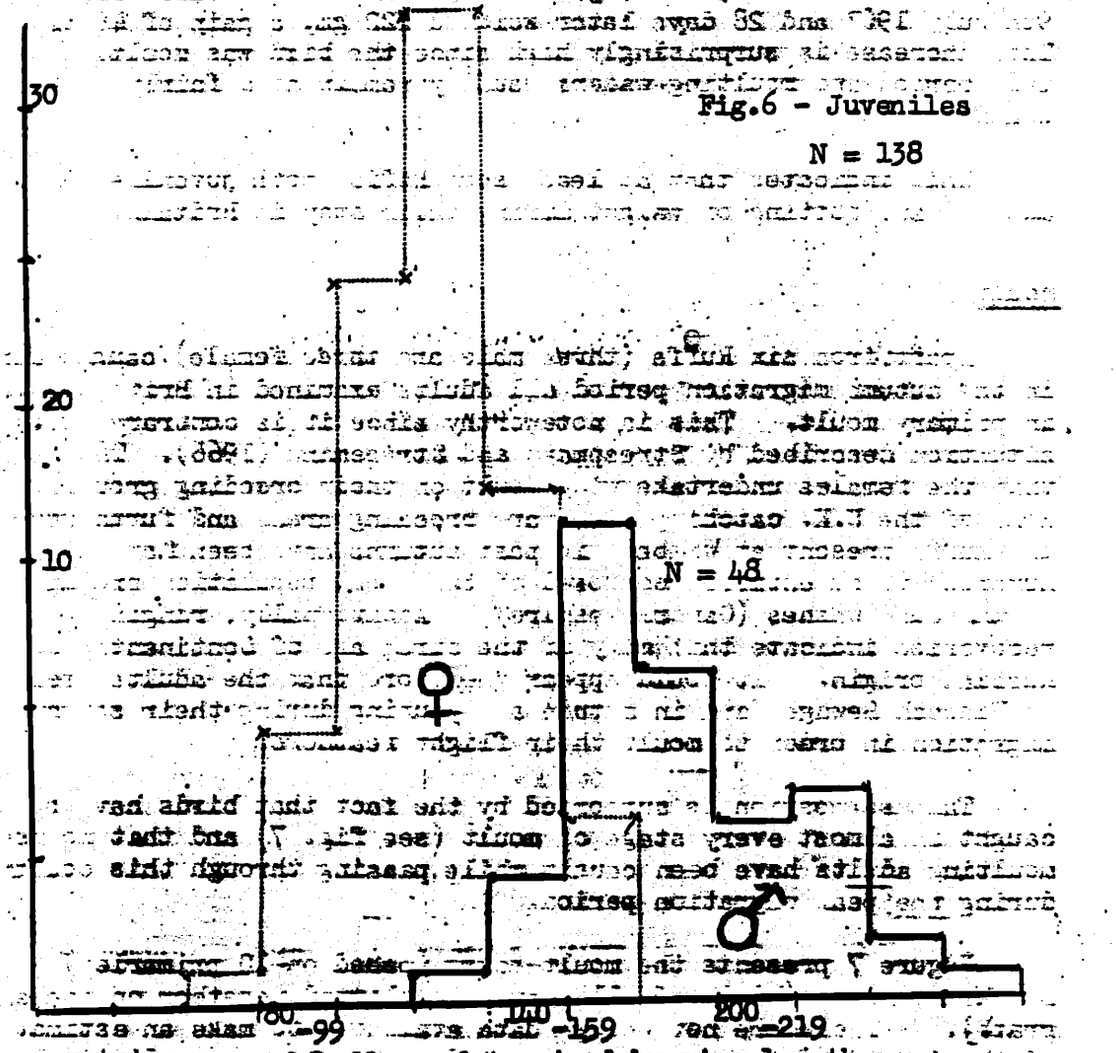


Fig.6 - Juveniles

N = 138

Weights of Ruff sex determined by wing length

TABLE 4 - WEIGHTS OF RUFFS

Age	Sex	Ranges (gm)	Mean	Standard Deviation	Sample Size
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 retrapped 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

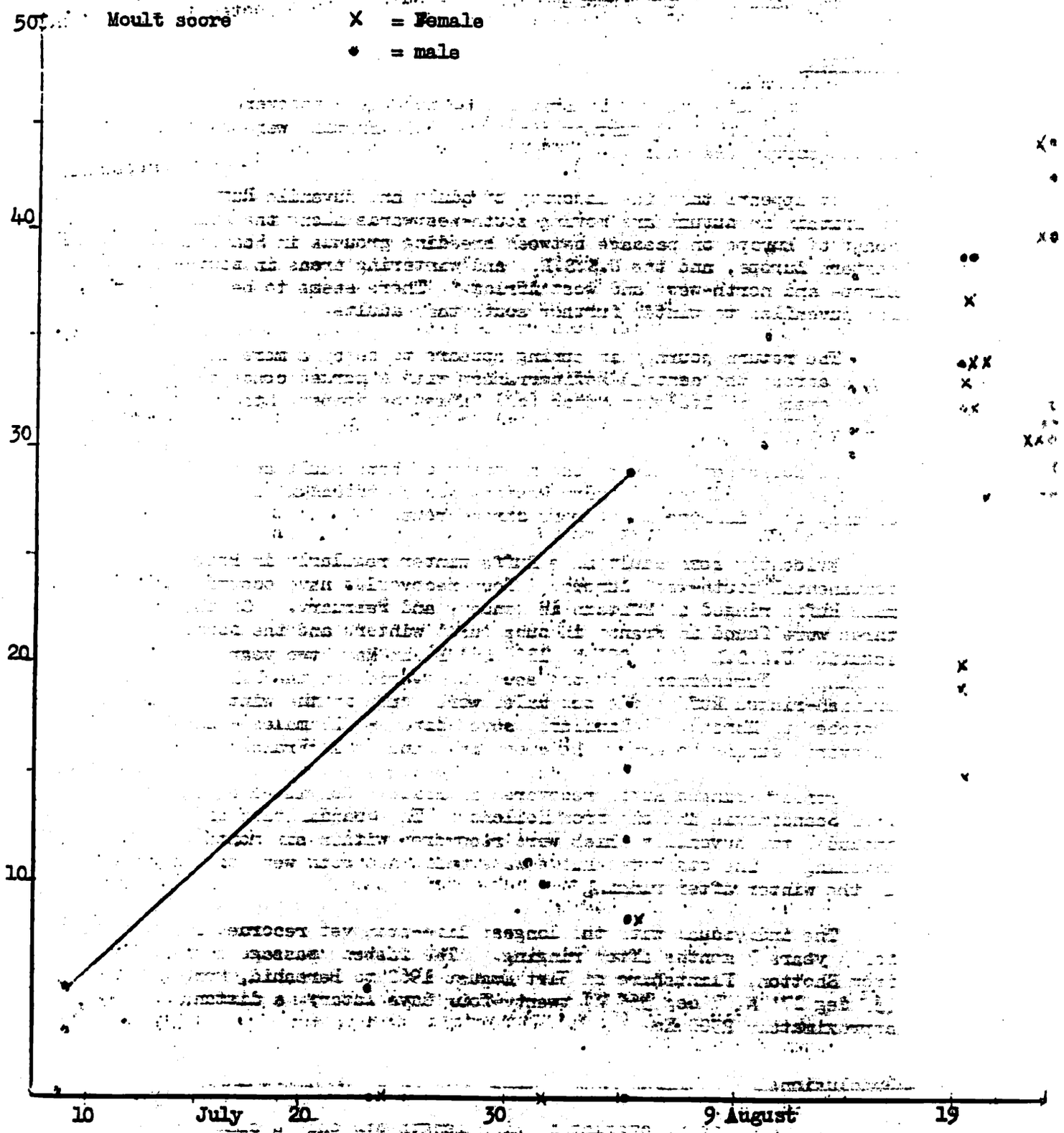


FIG.7 - Moult of Ruff in U.K.

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 (cf. 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° 05' N, 129° 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.

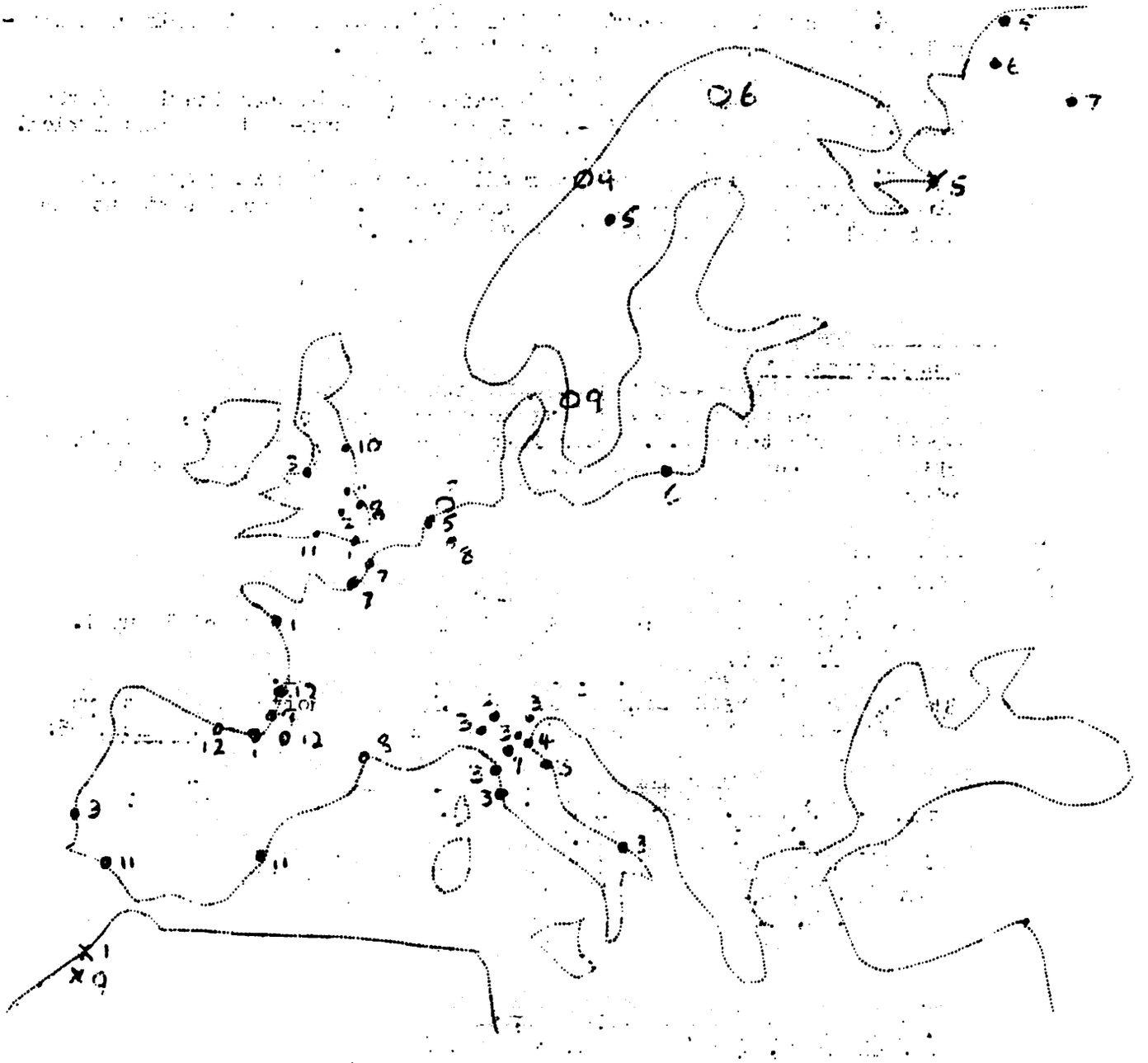
Foreign-ringed Ruffs recovered in Britain consisted of three from Scandinavia and one from Holland. The Scandinavian birds included two juveniles which were recovered within six months of hatching. The other two Ruffs were males and both were recovered in the winter after ringing.

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 Bereohid, Morocco, (33 deg 17' N, 7 deg 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.



× JUVENILE

• ADULT

Ringed U.K. recovered abroad

O 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 occuring 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

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