SEASONAL CHANGES IN BILL-LENGTHS OF KNOTS, AND A COMMENT ON BILL MEASURING TECHNIQUES FOR WADERS

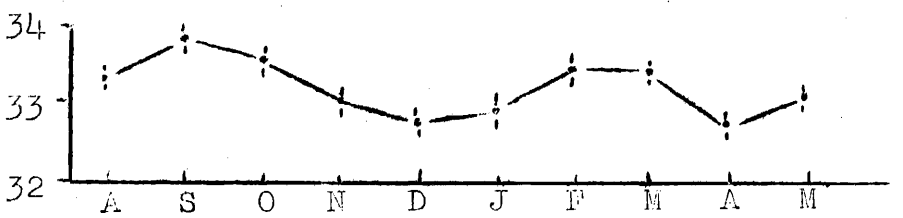
by Mike Pienkowski

The problem

Wing-lengths and bill lengths are the methods at present most used by ringers in order to attempt to separate wader populations. The difficulties in standardising wing measurements between different observers are notorious, and, even when this is overcome, there may be problems concerned with seasonal changes of wing-length in individual birds (Pienkowski & Minton 1973). The measurement of bill-lengths is possibly easier to standardise between observers, but little attention has been given to the possibility of seasonal changes in these, although White and Gittins (1964) subjectively considered seasonal changes in the bill shapes of Oystercatchers Haematopus ostralegus.

While attempting to separate Palaearctic and Nearctic Knot Calidris canutus populations on the basis of bill-lengths (to be published elsewhere), William Dick and I found that, in most areas, the mean bill-lengths of the Knots caught varied cyclically (Fig 1).

Fig 1 Monthly mean (I one standard error) bill lengths of adult Knots at the Wash.



It was clearly important to discoverif the variations were due to changes in the racial composition of the flocks or to changes in bill-lengths of individuals. Fortunately, a large number of retraps within the same year had been accumulated by the Wash Wader Ringing Group and these data show that the seasonal changes in the population means were due to variations in the bill-lengths of individuals during the year. (Elsewhere, Dick, Pienkowski, Waltner & Minton, in prep.), We have shown that the seasonal changes shown by retrap data are statistically significant.

We can suggest two possible explanations for a seasonal change in measured bill-length of an individual bird:

a) seasonal changes at the feather-margin at the base of the upper mandible associated with abrasion and moult; or
b) seasonal changes in the growth or wear (or, perhaps, the degree of compression) of the rhampotheca, perhaps related to feeding conditions.

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Effect b) has been suggested for some birds, especially passerines (e.g. Davis 1951, Stettenheim 1972). It could possibly occur in Oystercatchers (White & Gittins 1964) and Turnstones Arenaria interpres (see Summers 1976), both of which have rhampothecae extending well beyond the bone structure; but this is not the case in the Knot and many other waders (Dr P.J.K. Burton in litt.), and so cannot cause the variation described above. Changes in the feather margin are a more likely cause as the apparent bill lengthening coincides with wear and loss of feathers prior to autumn and spring body moults.

A possible solution?

If the bill length variation is due to changes at the feather margin, then it ought to be eliminated by measuring from a more prominent feature on the bill. One possibility is measuring from the nostril to the tip, and the rear of the nostril may be the best point to use as this would keep the measurement to be taken as large as possible. I tried this measurement on a number of waders caught at Teesmouth in November and December 1975, and some of the results are shown in Table 1.

Table 1. Comparison of bill lengths taken from feather margin to tip with those taken from rear of nostril to tip

	sample size	bill from feathers		bill from nostril		difference (mm)	correlation coefficient
		m*	v*	m*	v*		
Turnstone	23	22.7	1.57	20.7	1.04	2.0	0.933
Redshank	32	41.4	2.32	38.3	2.67	2.1	0.863
Dunlin	80	33.3	5.99	30.6	5.43	2.7	0.978

m* = mean; v* = variance

Not surprisingly, the two different types of bill measurements are well correlated for all three species, the mean measurement from the nostril being 2 to 3 mm shorter than that from the feather margin. It is also important to note that, at least for Redshanks and Dunlins, the variance has not been reduced by using the measurement from the nostril. This may indicate that taking the shorter measurement may not reduce the usefulness of bill-lengths for population separation.

It cannot yet be concluded whether or not the use of bill-lengths measured from the nostril will remove any cyclical effect, but I hope that this note will encourage ringers who catch waders - especially Knots - more regularly than I do to try this measurement. I should, however, stress that the bill-lengths from feathers should continue to be measured also; otherwise it would not be possible to make use of both old and new data.

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DYED WADERS FROM AFRICA

The studies of the migration of waders in Africa are still in their infancy when compared with those in North Western Europe. This is partly due to the fact that wader enthusiasts are few and far between, the majority being found in Kenya and South Africa. Also waders are smallish birds and therefore do not lend themselves to high recovery rates, and it is significant that the majority of recoveries are made by other ringers. As a result, the recovery rates of African ringed waders is very low. We therefore know little about the migration routes through Africa and between the African and Palaearctic regions.

In an attempt to improve our understanding of the migration patterns of waders, large numbers of Knots, Sanderlings, and Curlew Sandpipers will be dye-marked in the Cape Province by the Western Cape Wader Study Group in early 1976 before the birds depart for their northward migration.

We appeal to all bird watchers to look out for these marked birds during the spring and autumn passage of 1976. If you do see a marked bird, which should be especially obvious in flight, please contact either: A.J. Prater, British Trust for Ornithology Beech Grove, Tring, England, or: Dr R.W. Summers, Percy FitzPatrick Institute of African Ornithology, University of Cape Town, South Africa, giving as many details as possible, including the colour of the dye and its position on the bird.

The scanty ringing evidence suggests that the migration routes of these 3 species may cross anywhere between western Europe and central Asia, so if you know a site where any of these species occur on spring (April-May) or autumn (August-October) passage, please keep a special lookout.

WSG winter meeting, January 1976

This was held during the Ringing and Migration Conference at Swanwick, Derbyshire. About 80 members attended and Dr. Minton chaired the discussion.

The business session was short with three principal reports.

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