Table 2. Rates of change of moult score and percentage mass for Redshanks caught and retrapped whilst moulting within moult scores 1 to 25, and within 25 to 49.

	Mean rate of change of moult score (units/day)	95% C.L.
Caught and retrapped within scores 1 & 25	0.93	0.75 to 1.11
Caught and retrapped within scores 25 & 49	0.36	0.32 to 0.40
	Mean rate of change of percentage mass (units/day)	**95% C.L.**
Caught and retrapped within scores 1 & 25	1.30	1.05 to 1.55
Caught and retrapped within scores 25 & 49	0.86	0.73 to 0.99

Results and discussion

In 1978 the Highland Ringing Group made a series of Redshank catches and several retraps resulted. We selected those which were ringed and retrapped whilst moulting within moult scores 1 to 25, and those within 25 to 49 in order to look at the moult rates early and later in the moult. The changes in the moult scores of the retraps are shown in Figure 1. It is evident that the rate of change of moult scores is faster earlier in moult. The dog-legged appearance of the figure is due to the method of presentation and does not imply that the moult of an individual follows this pattern. The rate of change was calculated for each bird and averaged (Table 2). The two means differ by a factor of 2.6.

The moult scores of the birds were converted to percentage mass and the data presented in a similar way (Figure 2, Table 2). Clearly, Figure 2 does not have the dog-legged appearance of Figure 1, but the mean rate of change of percentage mass is still significantly greater early in moult ($t = 3.88$, $p < 0.001$). Also the 95% confidence limits of the difference (0.20 to 0.68) do not include negative values. However, the two means (Table 2) now differ by a factor of only 1.5 showing that we have straightened the data considerably, but not completely. Linear regression analysis is now less inappropriate.

The slowing in the rate of growth of the primaries in the latter half of their moult may be due to the influence of other feather tracts (e.g. secondaries) which are moulted after the start of the primary moult. The growth pattern of all feather tracts would be worth investigation.

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Estimates of the duration of the primary moult of the Redshank

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Abstract of talk at WSG Meeting at Münster

Moult records collected from 1,647 Redshanks *Tringa totanus* caught in eastern Scotland were analysed by different methods to show the variations one can obtain for estimates of duration of primary moult. A line by eye through the mean moult scores for dates of capture, and linear regression analysis of moult scores against dates (moult score as the dependent variable) gave exaggerated values for moult duration (106 and 109 days respectively). The linear regression analysis gave earlier dates for the beginning and end of moult because the rate of change of moult score was less towards the end of moult. A line through the median moult scores for each date of capture gave a value of 90 days. This method relies on obtaining unbiased proportions of non-moulting and moulting birds. This is not always possible. Also the total moulting population must be present throughout the moulting season. This is unlikely since the moulting and migration seasons overlap. A line by eye through the mean dates for each moult score, and a linear regression analysis of dates against moult score (date as the dependent variable) gave values of 70 and 74 days respectively. An even amount of data is required throughout the moulting season in order to obtain an unbiased estimate. The data used in this study were not evenly distributed.