camp located in a forest clearing slightly larger than the camp itself. The planter, one of four on the railing, measured 85 cm long, 15 cm high and 23 cm wide and contained flowering *impatiens* 20 cm high at both ends with Mexican heather *(Cuphea hyssopifolia)* in the center third. The nest, which was 9.5 cm outside diameter and 8 cm tall, was centered in the planter and concealed by the heather.

The nest was completed 4 Jul 2003, consistent with the date of second junco broods in New York (Eaton 1968), with first egg on 8 Jul, second on 9 Jul, and fourth by 12 Jul. Three eggs hatched 23 Jul (12 day incubation), and on 28 Jul the three nestlings were banded, at which time their wing chords measured 22-28 mm with flight feathers still completely sheathed. When checked on 2 Aug (ten days after hatching), the undisturbed nest was empty, the young having presumably fledged. One of those young was recaptured at the Yunick camp feeding station 305m away (1000 ft) on 13 Sep as a hatching-year female.

Since both adults wore bands, a mist net was placed near the nest when the young were banded on 28 Jul, affording capture of the female, but repeated misses on the male. The female had been banded at the Yunick feeder as an after-hatching-year bird on 21 Aug 2000 and recaptured there 24 May and 2 Sep 2002 as a local breeder as well as on 3 May 2003 with a male in breeding condition in the same net check. He was most likely the uncaptured male at the Chamberlin nest. He had been banded at the Yunick feeder 19 May 2002 as an after-second-year male in breeding condition, and recaptured on 3 May 2003 with the female and again alone on 9 May 2003.

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## Two Examples of Interrupted, Extended Rectrix Growth

Two examples of anomalous rectrix growth observed in a House Sparrow (*Passer domesticus*) and a Song Sparrow (*Melospiza melodia*) are described and illustrated here. The House Sparrow was captured on 19 Oct 2001 in my yard at Schenectady, NY, (band number 1521-55139), and the Song Sparrow on the property of Thomas Palmer, 923 Langley Road, south of Amsterdam, NY, on 24 Sep 2002 (band number 2181-04088).

The House Sparrow was a hatching-year male with an anomalous left rectrix (LR) 2 shown in Figure 1. Its right rectrices (RR) appeared normal in shape and length, measuring 57-59.5 mm; and LR3-6, measuring 58-58.5 mm, were similarly normal (Pyle, P. 1997. *Identification guide to North American birds*, Part I. Slate Creek Press, Bolinas, CA). Measurements were made with a steel rule graduated to 1 mm, estimated to the nearest 0.5 mm, by inserting the rule between the feathers while attached to the bird. LR1 was regrowing, sheathed at the base, and measured 18 mm; while the anomalous LR2 appeared to represent two stages of interrupted growth out to a total length of 78.5 mm. Its conjugate rectrix on the R side, RR2, measured 57.5 mm. In all other aspects the bird seemed normal and healthy (wing chord 77 mm, fat class 0 and weight 31.6 g).

Figure 2 is a microphotograph of the portion of the rachis where growth was interrupted and resumed.

It shows how, at the point of interrupted growth the rachis became flattened or spatulate, while the barbs at the tip of the bottom portion of the rachis separated from the rachis. In Figure 1 the tip of the top portion of the rectrix shows no such separation.

The Song Sparrow was a hatching-year bird of unknown sex undergoing extensive body molt, as well as renewal of its central pair of rectrices, which is not abnormal in some juveniles of this species (Pyle 1997). Figure 3 is a xerographic copy of this rectrix pair. What is unusual is that RR1 has extended feather growth showing at least one and perhaps two interruptions of growth beyond the base portion of the regrowing rectrix. Figure 4 is a microphotograph showing the tips of the base portions of both rectrices with the extended attachment on RR1. Other than for this central rectrix pair, the tail length measured out to the tip of the longest normal rectrices, R2 and L2, was 69 mm, a normal length for this species (Pyle 1997). This measurement was made using the same rule and method described for the House Sparrow above. The Song Sparrow rectrix measurements in Figure 3 were made on the pulled feathers with a caliper graduated to 0.1 mm.

The rachis extension on RR1 was very flimsy, causing the extended growth beyond 58.5 mm to hang limply downward from the base rectrix, unlike in the House Sparrow rectrix where the stiffness of the rachis supported the extended tip without any drooping. Close examination of Figure 4 shows that the apices of the base portions of RR1 and LR1 are similarly shaped with slight indentations rather than a point at those apices and the rachis tip of LR1 appears blunt and broken off.

These observations coupled with the fact that both base portions are of nearly equal length (58.5 mm and 58.1 mm, respectively) suggests that LR1 may have had a similarly extended tip which broke off. Otherwise, had the two feathers commenced replacement simultaneously, which is the normal expectation in a replacement of this sort, and only RR1 underwent this anomalous growth, the time that it took RR1 to grow partially, momentarily interrupt growth, then resume growth would have been sufficient for LR1 to have fully grown out to the total length of the tail. Since LR1 instead matched the base growth of RR1, this supports the suggestion that it too had had and lost an extended tip similar to that on RR1.

Looking again at Figure 4, the flimsy portion of rachis connecting the two parts of RR1 lacks the pigmentation of the other parts of the rachis and, as in the case of the House Sparrow, is slightly spatulate. Using the 60.6-mm and 66.0-mm marks noted in Figure 3 to reference areas in Figure 4, this area showed nearly black pigmentation contrasting with the otherwise brownish coloration (not discernable in the black-and-white presentation here). At the 66.0-mm mark, a second interruption in growth occurred but looks more like a growth bar (Pyle 1997) which weakened the integrity of the barbs at that point, but not the rachis, causing some barbs to break off. The few remaining barbs show structural weakness at 66.0 mm.

A.A.Voitkevich (1966. *The feathers and plumage of birds* [English translation]. Sidgwick and Jackson Ltd, London,U.K.) describes experiments on Rock Pigeons (*Columba livia*) where new flight feather growth was halted intentionally by cloth dressings applied to the wing. In some cases (see Voitkevich, p. 69, Figs. 7-9), the initial growth was sloughed off as new growth resumed when the dressings were removed; but in another (p. 70, Fig. 10) he illustrates retention of the defective tips on the apex of the newly developing feather, resembling the rectrices of these two sparrows.

The collected rectrices from both birds were deposited with the New York State Museum (NYSM) in Albany as accession numbers NYSM 9160 and 9339, respectively. The micro-photographs shown here, as well as additional photos, were recorded on compact discs and are in the collection.

**ACKNOWLEDGEMENTS**

I thank Thomas Palmer for the opportunity to band on his property; and express further thanks to Dr. Roland Kays, curator at NYSM, and Joseph Bopp, collections manager, for their assistance and cooperation; and to Dr. Kays for microphotographs and CDs of the Song Sparrow rectrices; and to Dr. John Haines of NYSM for microphotographs of the House Sparrow rectrix.

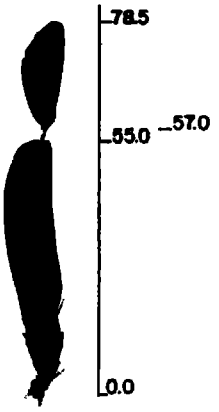


**Figure 1. Xerographic copy of House Sparrow LR2. Numbers on the scale right of the rectrix represent measurements in mm taken on the feather while still attached to the bird.**

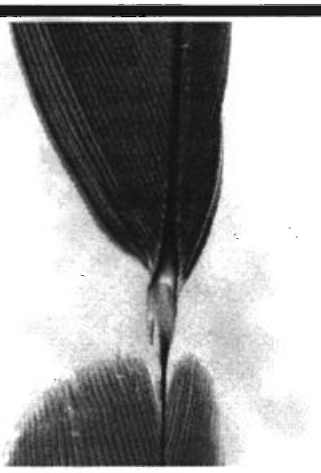

**Figure 2. Microphotograph taken at 6X magnification of House Sparrow LR2 at point of interrupted, extended growth, courtesy of John Haines at NYSM.**

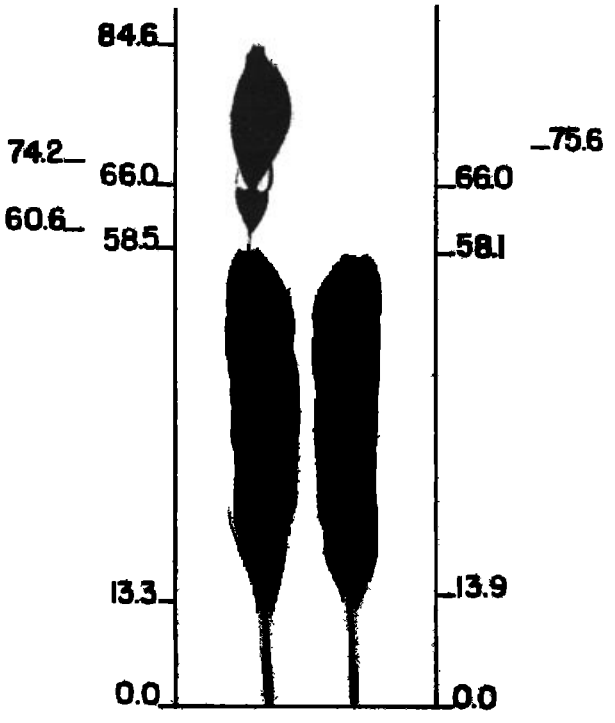


**Figure 3. Xerographic copy of Song Sparrow rectrix pair 1. Numbers on the left and right scales refer to measurements made in mm with a caliper on the feathers from the base of each feather after removal from the bird. The scale on the left represents measurements from the right side of the right rectrix, while measurements on the right up to 58.1 mm represent the left rectrix, then above 58.1 mm the left side of the right rectrix (the feathers are inverted here compared to how "right" and "left" would be viewed dorsally on the live bird).**

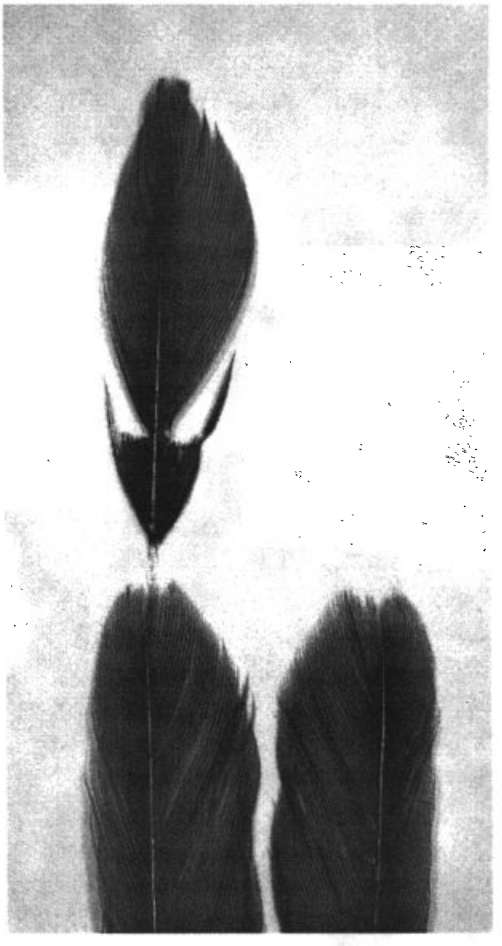

**Figure 4. Microphotograph of Song Sparrow rectrix pair 1 showing interruption and resumption of growth at the apex of RR1 (left side of photograph) and similar apex shape on LR1 (right side of photograph). Courtesy of Roland Kays, NYSM.**

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