The Auk 113(4):968–969, 1996

Terminology in Molt and Wing Feathers: Use of Descendant, Ascendant, and Lesser Coverts

RAFFAEL WINKLER[1] AND LUKAS JENNI[2,3]
[1]*Natural History Museum, Augustinergasse 2, CH-4001 Basel, Switzerland; and*
[2]*Swiss Ornithological Institute, CH-6204 Sempach, Switzerland*

There appears to be confusion in the use of two terms that describe the order of replacement of the remiges and one term that describes a group of wing coverts. We raise these issues in the interest of improving communication among ornithologists.

The order in which the remiges are replaced usually may proceed in one (or both) of two directions: (1) from the body (i.e. proximal) toward the wing tip (i.e. distal), and (2) from the wing tip toward the body. Heinroth (1898) introduced the term "descendant" for the usual sequence of primary molt that proceeds from the inner primaries toward the wing tip, and "ascendant" for the usual sequence of secondary molt that proceeds from the outer secondaries toward the body. Since then, these terms have been widely used for indicating the sequence of molt of all feather tracts on the wing (e.g. Stresemann and Stresemann 1966, Cramp 1977, Ginn and Melville 1983, Jenni and Winkler 1994).

The terms ascendant and descendant also are used for indicating the numbering of remiges. In the nineteenth century, primaries typically were numbered ascendantly, from outside to inside, an approach followed by several subsequent authors (e.g. Witherby et al. 1943, Vaurie 1959, Svensson 1992). Since the turn of the century, however, the convention has been to number the primaries descendantly, from inside to outside (see Ashmole et al. 1961). Because both ways of primary numbering are still in use, the terminology has created confusion. Therefore, it is important to state which system is used whenever authors refer to the numbering of remiges. Indeed, papers that describe exceptional molt patterns without giving this vital information are much less useful as a result.

The confusion becomes much greater when authors use the terms ascendant and descendant in a sense contrary to the original definitions. Pyle et al. (1987: 2) stated that "primaries are numbered ascendantly (innermost to outermost) and secondaries descendantly (outermost to innermost)," which obviously contradicts the definitions of ascendant and descendant. In their book on New World warblers, Curson et al. (1994:10) perpetuated the error by stating that "the primaries (p) are numbered ascendantly (i.e. the outermost primary is p9)." Regarding the molt of Painted Buntings (*Passerina ciris*), Thompson (1991: 224) stated that "all primaries and S1-S6 molt in ascending order." Moreover, Young (1991) indicated that in Lazuli Buntings (*P. amoena*), "primary and secondary development proceeds in typical ascending order" (p. 240) and "the primaries and rectrices grow in the usual ascending manner" (p. 243). As is well known, *Passerina* buntings replace their primaries descendantly and secondaries 1 to 6 ascendantly. These authors probably used the terms "ascending order" and "ascending manner" to express that the sequence of molt follows the order in which the feathers are numbered. Strictly speaking, this terminology is not incorrect, although it may confuse many readers because of its similarity to the term ascendant and because terms such as descending mode, ascending molt, etc., have been used in a morphological sense (e.g. Stresemann 1967).

The incorrect or imprecise use of the two terms prompts us to plead for correct usage in the sense of the original definitions and to suggest that authors report the order of numbering and the molt of remiges in a more descriptive manner (e.g. from inside to outside, from carpal joint to wing tip, etc.). Other terms that describe the order in which remiges are replaced (for details, see Stresemann and Stresemann 1966, Ginn and Melville 1983, Jenni and Winkler 1994) are: "convergent" (from body and wing tip toward center of wing); "divergent" (from center of wing toward body and wing tip); "eccentric" (from center usually toward wing tip; for primaries only); "centrifugal" (from central rectrices toward outside of tail); "centripetal" (from outer rectrices toward middle of tail); "transilient" (two feathers growing simultaneously are separated by one or more nongrowing feathers); "alternating" (two feathers growing simultaneously are separated by only one nongrowing feather); and "Staffelmauser" (stepwise molt).

A less grave, but still imprecise usage of feather terminology concerns the smallest wing coverts of passerines, which correctly are called the "marginal coverts." In many publications, these feathers are called "lesser coverts." However, it is characteristic of passerines that the lesser coverts are absent or reduced to downy feathers (Wray 1887, Reichling 1915, Steiner 1917/19, Zeidler 1966, Stephan 1970). Some

[3] Address correspondence to this author. E-mail: jennil@orninst.ch

publications (mostly older) used the correct term marginal coverts (e.g. Miller 1928, Michener and Michener 1940; but not Dwight 1900), whereas the term lesser coverts apparently is receiving increased usage in contemporary papers.

Literature Cited

Ashmole, N. P., D. F. Dorward, and B. Stonehouse. 1961. Numbering of primaries. Ibis 103a:297–298.

Cramp, S. (Ed.). 1977. Handbook of the birds of Europe, the Middle East and North Africa. Oxford University Press, Oxford.

Curson, J., D. Quinn, and D. Beadle. 1994. Warblers of the Americas. Houghton Mifflin, Boston.

Dwight, J., Jr. 1900. The sequence of plumages and moults of the passerine birds of New York. Annals of the New York Academy of Sciences 13: 73–360.

Ginn, H. B., and D. S. Melville. 1983. Moult in birds. British Trust for Ornithology Guide No. 19, Tring, United Kingdom.

Heinroth, O. 1898. Verlauf der Schwingen-und Schwanzmauser der Vögel. Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin 8:95–118.

Jenni, L., and R. Winkler. 1994. Moult and ageing of European passerines. Academic Press, London.

Michener, H., and J. R. Michener. 1940. The molt of House Finches of the Pasadena region, California. Condor 42:140–153.

Miller, A. H. 1928. The molts of the Loggerhead Shrike *Lanius ludovicianus*. University of California Publications in Zoology 30:393–417.

Pyle, P., S. N. G. Howell, R. P. Yunick, and D. F. DeSante. 1987. Identification guide to North American passerines. Slate Creek Press, Bolinas, California.

Reichling, H. 1915. Die Flügelfederkennzeichen der nordwestdeutschen Vögel. Journal für Ornithologie 63:229–267; 305–340; 513–548.

Steiner, H. 1917/19. Das Problem der Diastataxie des Vogelflügels. Jenaische Zeitschrift für Naturwissenschaft 55:221–496.

Stephan, B. 1970. Eutaxie, Diastataxie und andere Probleme der Befiederung des Vogelflügels. Mitteilungen aus dem Zoologischen Museum in Berlin 46:339–437.

Stresemann, E. 1967. Inheritance and adaptation in moult. Pages 75–80 *in* Proceedings XIV International Ornithological Congress (D. W. Snow, Ed.). Oxford, England, 1966. Blackwell Scientific Publications, Oxford.

Stresemann, E., and V. Stresemann. 1966. Die Mauser der Vögel. Journal für Ornithologie 107 (Sonderheft):1–445.

Svensson, L. 1992. Identification guide to European passerines, 4th ed. Published by author.

Thompson, C. W. 1991. The sequence of molts and plumages in Painted Buntings and implications for theories of delayed plumage maturation. Condor 93:209–235.

Vaurie, C. 1959. The birds of the Palearctic fauna. Passeriformes. H. F. & G. Witherby, London.

Witherby, H. F., F. C. R. Jourdain, N. F. Ticehurst, and B. W. Tucker. 1943. The handbook of British birds. H. F. & G. Witherby, London.

Wray, R. S. 1887. On some points in the morphology of the wings of birds. Proceedings of the Zoological Society of London 1887:343–357.

Young, B. E. 1991. Annual molts and interruption of the fall migration for molting in Lazuli Buntings. Condor 93:236–250.

Zeidler, K. 1966. Untersuchungen über Flügelbefiederung und Mauser des Haussperlings *Passer domesticus*. Journal für Ornithologie 107:113–153.

Received 1 November 1994, accepted 6 July 1995.