In Memory of the Avian

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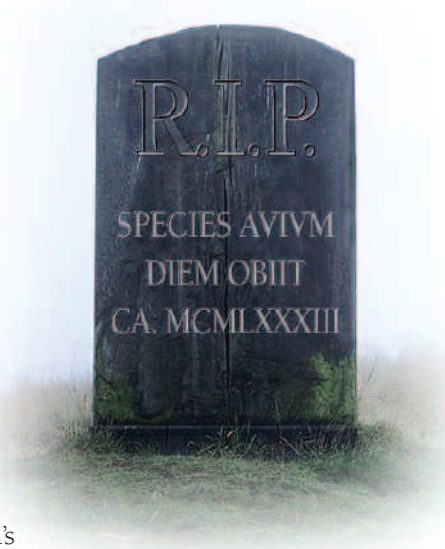
Back in the early 1970s, when I was cutting my teeth on everything birds, life was simple: We hand-wrote manuscripts for bird journals, our bible was the Robbins-Bruun-Zim-Singer (1966) field guide, our biggest ID problem seemed to be "confusing fall warblers," and we understood a bird "species" to be a relatively fixed and usefully applied concept. During the 200+ years since Linnaeus (1758) first named some of the birds, the species concept had been kicked and coddled, stretched and skewed, assaulted and defended, but ultimately stabilized in what we thought was a utilitarian and generally agreed-upon definition. Although a few taxa straddled the line between species and subspecies, as expected, the line itself seemed relatively fixed.



I first became interested in the subject in 1973, when the American Ornithologists' Union came out with the 32nd supplement to their *Check-list*. In that supplement, the AOU lumped 19 North American bird species while splitting only three: Thayer's and Herring gulls, Alder and Willow flycatchers, and Boat-tailed and Great-tailed grackles. Lumps that elicited disbelief and wonderment from my teenage birding cohorts and me at that time included: Great White Heron with Great Blue Heron; the three flicker taxa into Northern Flicker; Audubon's and Myrtle warblers into Yellow-rumped Warbler; Bullock's and Baltimore orioles into Northern Oriole; and Slate-colored, White-winged, Oregon, and other juncos into Dark-eyed Junco.

Of the 19 lumps, only two combinations, the orioles and Gilded Flicker, have since been re-split by the AOU. Several others, however, are now being challenged; for example, some want to re-split the Yellow-rumped Warbler—and not just back into two species, but four. Between 1974 and the arrival of the AOU's next edition of the *Check-list*, in 1983, the AOU lumped another 18 species while splitting 22 species, most or all on defensible grounds and followed to this day. By that time, the concept of North American bird species, while still being tweaked, was apparently fairly balanced in terms of placing species or subspecies on either side of the defined line. I assumed that the avian species concept had more-or-less stabilized, and I was content to seek more interesting and bewildering topics than avian taxonomy—avian molt, for example.

Then something changed.

Between the 1983 and 1998 *Check-lists* (the latter covering both North and Central America), the AOU split 77 species while lumping only four, and between 1998 and 2012 the AOU split another 71 species and lumped another five; that's an average of 5.1 splits and 0.3 lumps per year since 1983.

Needless to say, speciation does not occur this quickly. But human concepts of species limits can, especially when bolstered by refined information. The AOU's approach to the avian species has thus evolved—from one of relative balance between splits and lumps during the period

Species

Myrtle [Yellow-rumped] Warbler. *Worcester County, Massachusetts; July 2012. Photo by © Josh Gahagan.*

Baltimore Oriole. *Worcester County, Massachusetts; July 2012. Photo by © Josh Gahagan.*

White-winged [Dark-eyed] Junco. *Jefferson County, Colorado; March 2005. Photo by © Kayleen A. Niyo–VIREO.*

Members-only Online Content

Want more? Of course you do! ABA members can't get enough of splits and lumps, of name changes and checklist shuffles, of anything and everything affecting their lists. Peter Pyle and Michael L. P. Retter—authors of two feature articles in this issue—hold strong opinions on these topics. And they share their opinions, by means of an online conversation available only to ABA members. To hear from Peter and Michael, click here: aba.org/birding/2012-september

What do the **Myrtle Warbler** (top), **Baltimore Oriole** (middle), and **White-winged Junco** (bottom) have in common? They were all victims of 20th-century "lumping" by the American Ornithologists' Union. (The oriole has since been "split" again, but the warbler and junco remain lumped.) In the past several decades, however, lumps have been few, whereas splits have been legion. Why? In this commentary, Peter Pyle explores possible reasons.

1973–1983 toward an increasingly less-balanced position during the period 1983–2012. For me this represents a distressing trend, as the entire purpose of the species concept, to allow us humans to box and categorize taxonomic units in a standardized manner, becomes greatly compromised by a moving interpretation of what a species is.

The AOU's approach to avian species limits has long been informed by the *Biological Species Concept* (BSC), as promoted by Ernst Mayr (1942). The BSC essentially relies on how reproductively isolated a bird population is from other "diagnosable populations," those whose traits are perceived to be measurably distinct in some standardized way. Reproductive isolation is a real phenomenon in biology, a fact acknowledged by all biologists. However, the BSC, like taxonomy itself, is not perfect; it has been challenged on a number of fronts, notably by adherents (e.g., Cracraft 1983) of the *Phylogenetic Species Concept* (PSC).

The PSC defines a bird species as the smallest cluster of diagnosable individuals based on genetic descent, and would cause many populations now regarded as subspecies, and even some populations that are diagnosable only through molecular genetic analyses, to be elevated to full-species status. Pages and pages have been written among avian taxonomists defending either of these concepts against each other, not to mention the debating of up to 20 other proposed species concepts among all zoological and botanical taxonomists. While I and some of my colleagues became fond of blaming the PSC for the moving definition of bird species, the AOU has shown restraint in applying concepts other than the BSC to North and Central American birds; indeed, the reigning edition of the AOU *Check-list* contains a strong affirmation of the BSC (AOU 1998:xiv–xv).

I applaud this restraint by the AOU, not because I believe the BSC to be "better" than the PSC; they both have their pros and cons. Rather, if we are to attempt to define a "species" for our own narrow purposes, it is essential, in my opinion, to have the definition be stable and as consistently applied as possible. A lot of anguish and pen ink might have been saved if those proposing the PSC had simply used another term, entrusting the word "species" implicitly to the BSC. Indeed, *Evolutionarily Significant Units* (ESUs) are now being employed to describe biodiversity (Fraser and Bernatchez 2001), and this sort of concept could have been introduced to the bird-species debate much earlier.

Of course, the plethora of exciting new molecular genetic evidence cannot and should not be ignored in species concepts, and it has been of great assistance in defining higher-order taxa (orders, families, and genera) of birds. But "exciting" and "objective taxonomy" make dangerous bedfellows and probably should be left in separate rooms. Recently, the AOU and others have begun to consider genetic distances in support of other evidence for defining bird species. I propose we move very slowly and deliberately in this regard, being careful not to redefine "species." I worry, though, that the train has already left the station, especially when I look at what is occurring within such or-

Black-footed Albatross. *Monterey Bay, California; November 2008. Photo by © Christopher Taylor.*

Band-rumped (provisionally identified as "Grant's") **Storm-Petrel.** *Gulf Stream, off Hatteras, North Carolina; June 2010. Photo by © Chris Sloan.*

ders as the Procellariiformes.

A British systematist recently told me that his research group, in reviewing world avian taxonomy, has concluded that:

> "...both in the Diomedidae and in the Procellariidae there is a degree of anarchy introduced by the espousal of limited molecular studies beginning over 10 years ago with the albatrosses as a basic [template] for the PSC treatment of these groups, which is obviously beneficial to conservation but not a good fit with most other avian groups."

I agree. Starting with the AOU's 2002 decision to split the Dark-rumped Petrel based on small and largely average differences that stretched the limits of the BSC's definition of a species, I have since heard rumors of the splitting of practically all "subspecies" of southern albatrosses, the splitting of Japanese and Hawaiian Black-footed Albatrosses, the splitting of Band-rumped Storm-Petrel into multiple (phenotypically undiagnosable) species, the splitting of Atlantic and Pacific Northern Fulmars, the further splitting of both Hawaiian and Galápagos petrels, and, most recently, the splitting of Short-tailed Albatrosses breeding on nearby islands into separate species. I've even heard an opinion that all breeding seabird colonies should be considered different species!

The genetic differentiation among populations of seabirds that are fully capable of wide dispersal, intercolony recruitment, and interbreeding has been described as a "paradox" (Milot et al. 2008), and explained by inexplicably strong natal philopatry; but I think it might better be explained by genetic-distance factors that are not fully understood in relation to those of other avian taxa (see Taylor and Friesen 2012). The splitting of species primarily for conservation reasons, although justified from certain holistic perspectives, could represent a slippery slope that ultimately discredits taxonomy as a "science" in the first place (Fitzhugh 2005). I touch upon this matter later.

But back to the splitting vs. lumping imbalance. If the AOU is not substantively changing its criteria for defining North and Central American bird species, why has it split 148 species and lumped only nine species since 1983? The answer may be multifaceted and ultimately based on the opportunistic tendencies of human nature.

The split of the Western Flycatcher into the Pacific-slope and Cordilleran flycatchers, based on Ned K. Johnson's detailed and careful work (Johnson 1980,

If it's got a "tube" in its "nose," somebody's probably proposed splitting it! Examples: **Black-footed Albatrosses** (p. 36, left) breeding on the Hawaiian Islands vs. those breeding around Japan; **Band-rumped Storm-Petrels** (p. 36, right), hypothesized to comprise up to four distinct species; Pacific Ocean (here) vs. Atlantic Ocean **Northern Fulmars** (p. 37, left); and **Short-tailed Albatrosses** (p. 37, right), conjectured to consist of two species at nearby breeding colonies.

Northern Fulmar. *St. Paul Island, Alaska; June 2012. Photo by © Christopher Taylor.*

Short-tailed Albatross. *Midway Atoll, Hawaii; April 2011. Photo by © Bob Steele.*

Johnson and Marten 1988), seemingly signified a shift in the AOU's approach to species, and some novel and perhaps questionable criteria may have been applied toward that decision. These include reliance on too many characters (11 in this case) to define differentiation statistically rather than biologically, reliance on poorly understood criteria such as variation in allozyme frequencies and vocalizations, lack of consideration of the entire range of the species complex (see Rush et al. 2009), rushing too quickly to decision, and perhaps a bit of cronyism (Johnson was a longstanding member of the AOU's Committee on Classification and Nomenclature—North and Middle America). Whatever the reasons for the committee's decision to split the Western Flycatcher, it appears to have opened a floodgate of splits.

None of these reasons for splitting Western Flycatcher (with the possible exception of cronyism) is necessarily an assault on objective taxonomy. However, the urge to split rather than lump species appears to result from the fundamental human (and animal) trait of self-promotion, ultimately for procreation, survival, and conveying influence. Allan R. Phillips (1986, 1991) seems to have recognized this early on. Frequently referencing the Western Flycatcher complex, Phillips noted that splitting is more exciting than lumping, and that splitters ultimately receive more funding than lumpers. After all, who wants to undertake funded and laborious taxonomic work to conclude that the BSC taxonomists of the past 200 years had it correct all along? Would such work result in publications and more funding for the researcher? And if we simply accepted the old tried-and-true definition of "species," what would avian taxonomists do to keep themselves employed?

I believe that little of this splitting trend has resulted from intentional self-promotion, although I have seen cases in which taxonomic splits were proposed for conservation reasons by persons who, conveniently, are standing by to receive federal funding for a re-designated endangered taxon. On the whole, most of it (including Johnson's work) has been performed in good faith. Nevertheless, we need to consider the eye-opening work, summarized in December 2010 by Jonah Lehrer in *The New Yorker* <tinyurl.com/LehrerEssay>, of Jonathon Schooler and colleagues, who have pointed out how it is almost impossible for well-intentioned scientists not to bias their results toward preconceived and desired conclusions. Thousands of small decisions go into research design and implementation. Without knowing it, we are all guilty of subconscious selection of methods and results to come up with desired, novel, and/or publishable findings. With the ever-present pressure to "publish or perish," along with other perceived benefits that come from proposing a new bird split, it is easy to see how we've collectively and subconsciously trended toward a splitting imbalance. Each decision to split a species on marginal or incompletely understood grounds encourages the next author to marginalize the species definition further in order to recommend a split. A curious article by Boreo (2010) sums up some of the political issues affecting species definition.

In this regard, the next shaky limb for over-exuberant avian splitters appears to be vocalizations, with recent splits of moorhens, murrelets, and wrens being prime examples. But how genetically fixed are vocalizations across a BSC species? When I travel more than 500 miles from my home base in central California, even the most common species such as American Robins and Purple Finches—of the same subspecies, I might add—sound different to me; they give calls and song types not given by their central California counterparts. How well do we understand variation in vocalizations, what are the environmental vs. genetic bases for vocal variation, and how selective, really, are females about male vocalizations? Until we better understand these subjects, I have to view the use of vocalizations in avian species concepts as yet another excuse for questionable splitting.

I do not disagree with Ted Floyd <tinyurl.com/FloydBlog> and others who argue that the species concept may be flawed beyond hope, and that we might want to seek a new paradigm in our attempts to understand and conserve biodiversity. But in some respects I believe these views miss the point, by assuming that taxonomy is or should be infallible and concrete "science" when in fact it should be viewed simply as an imperfect but very useful tool to enable humans of all stripes to communicate with each other about nature. When I go into the field, I still see "species" of plants and animals, rather than a gallimaufry of ECUs, and I still think the "species" is a most-effective means to communicate biodiversity to both scientists and artists. But how long will it last in the face of the human spirit of opportunism and self-promotion?

If it were up to me, I might go back to the taxonomy of the 1983 AOU *Check-list* and try again. Perhaps the nine recommended lumps should be balanced by about the same number of splits, or even twice as many, rather than 148. But I also recognize that it may already be too late to save the avian species in an increasingly polarized and self-serving world. Eight species of North American Red Crossbills? Six species of Greater White-fronted Geese? I think I'll remain hidden in the lonely but relatively objective field of avian molt.

Acknowledgments

I thank Tristan McKee, Steve Howell, Paul Hess, and Ted Floyd for comments on this essay.

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An apparent turning point in recent taxonomic trends was the split of the Western Flycatcher into the **Cordilleran** (here) and Pacific-slope flycatchers. *Pima County, Arizona; June 2004. Photo by © Brian E. Small.*

The trend toward increased species-splitting appears not to be slowing down at the present time. The most-recent (53rd) *Supplement* (July 2012) to the AOU *Check-list* consists of five splits—for example, the split of Xantus's Murrelet into **Guadalupe** (here) and Scripps's murrelets—but only one lump (involving neotropical taxa). *Santa Barbara County, California; July 2010. Photo by © Larry Sansone.*

What's next? Six "species" of **Greater White-fronted Geese?** And, if so, what's the motivation behind all the splitting? How much of it is science? And how much of it is opportunistic human nature? *Barrow, Alaska; June 2011. Photo by © Alan Murphy.*