"The Possibilities are Bewildering": The History and Mystery of the Cincinnati Warbler

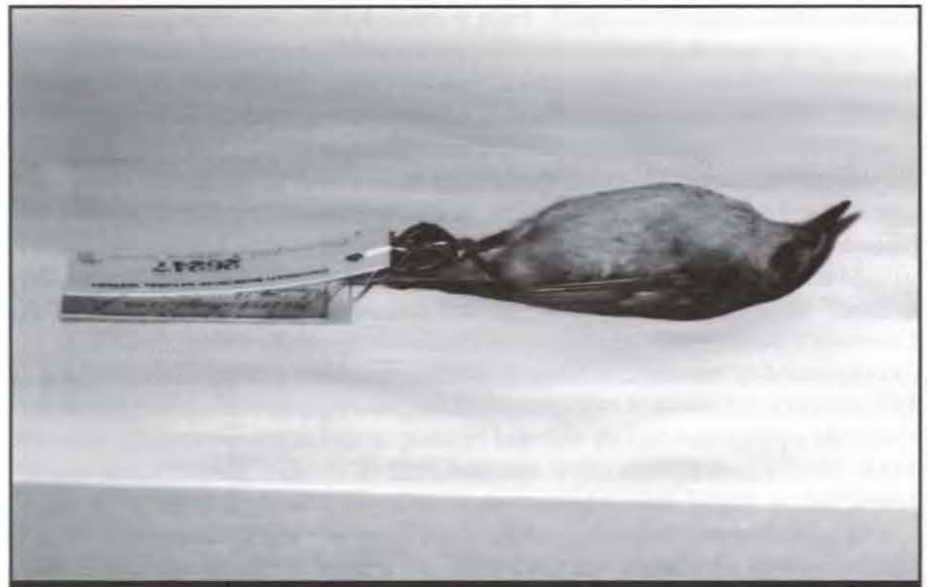
by Mike Busam

Dr. Frank Langdon carefully set the olive-green and yellow warbler on his desk. The skin was finally dry, and after waiting impatiently for three very long days, he was eager to examine and handle his find again. He had collected the bird while it was hunting for insects in a maple tree on 1 May 1880, in Madisonville, a small village in Hamilton County, next door to Cincinnati. After placing a fresh sheet of paper on his desk, he picked up the bird and stared at it intently. As he studied the bird, he scarcely noticed that the air coming through the open window in his study had turned cold, that day had surrendered to night; he stared at the bird held gently in the palm of his left hand, his thumb on the bird's nape, his index finger tucked under the throat. He turned his wrist over and back again, looking at the bird's upperside, then its underside. Finally, he began writing:

Adult male; spring plumage. Entire upper parts, excepting forehead, clear, bright, olive green, with a tinge of yellowish in certain lights; quills and rectrices dark plumbeous brown, their outer webs fringed with olive green like that of the back. Below, including crissum, bright cadmium yellow, of nearly the same shade throughout. Forehead, bright yellow, this color bounded anteriorly by a very narrow black line from the lores, and behind gradually merging into the clear olive green of the crown; feathers of vertex with a median concealed area of black. Lores velvety black; auriculars black, tipped with yellow-ish green, giving them a mottled appearance. A yellow area beneath the eye separates the black of lores from that of auriculars. (Langdon 1880)

When he was finished, Langdon was simultaneously elated and, he realized, due to the late hour, rather tired. He knew almost as much about ornithology and North American birds as the leading scientists in the east, people with names like Coues and Ridgway. He knew all that was known about the birds of the Cincinnati area, including southeastern Indiana, northern Kentucky, and southwestern Ohio. He knew enough to know that what he had in his hand wasn't anything that anyone before him had ever seen or described. He had the satisfied sense that comes from knowing one has realized—well before anyone else—that lightning had struck not just twice, but three times since 1874 in the genus *Helminthophaga*. Dr. Frank Langdon, eminent physician and natural scientist, had before him, lying on the desk in his study, a brand new species of warbler. Underneath his notes, at the bottom of the page, in his finest flourish, he wrote out the name he had chosen for his discovery in large script that would have earned the approbation of John Hancock: "*Helminthophaga cincinnatiensis,* the Cincinnati Warbler."

After sending his specimen to Elliott Coues, who showed it to Robert Ridgway and other ornithologists—all of whom, with the notable exception of Ridgway, seem to have initially agreed the bird was a new species—Langdon published his description of the Cincinnati warbler in the *Journal of The Cincinnati Society of Natural History* in 1880. Toward the end of his article, Langdon noted "it is a little remarkable that this should be the third new species of this genus announced from the eastern United States during the past six years" (Langdon 1880).



The type specimen of the "Cincinnati" warbler collected in Hamilton Co. on 1 May 1880 by Dr. Frank Langdon. This study skin is housed at the Cincinnati Museum of Natural History (CMNH #26247). Photo by Mike Busam.

The other two species of *Helminthophaga,* the genus known today as *Vermivora,* are of course Brewster's warbler, which had been named white throated warbler when first described in 1874 by its discoverer William Brewster, and Lawrence's warbler, which was described and named by Herold Herrick, also in 1874 (Brewster 1874, Herrick 1874).

The type specimens of the "new" species of *Helminthophaga*, Brewster's and Lawrence's, were collected in Massachusetts and New Jersey, respectively. William Brewster collected a bird he suspected to be an immature male golden-winged warbler on 18 May 1870 in Newtonville, Massachusetts. The bird had a "bright yellow" crown, and a "restricted line of black through the eye" similar to that of blue-winged warbler, but the "cheeks, throat and entire under parts" were "white, with a slight tinge of pale yellow on the breast" (Brewster 1874). He noted that the wing and tail feathers were worn and faded, like that of an older bird, rather than a hatch year bird. He remained uncertain of the age and identity of his find until four years later, when in July 1874 Brewster collected specimens of immature male and female golden-winged warblers. After comparing the immature golden-winged warblers with the bird collected in 1870, he concluded that he had found a new

species. Thus, *H. leucobronchialis*, white throated warbler, was introduced on the front page of the *American Sportsman*—precursor to today's *Field and Stream*—on Saturday, 17 October 1874 (Brewster 1874).

Herold Herrick came across his new warbler in a slightly different manner. A friend, D.B. Dickinson, collected an odd-looking bird in May 1874 on the banks of the Passaic River, near Chatham, New Jersey. He showed the specimen to Herrick, who realized it was something new: "Its general appearance is at first like *pinus* [blue-winged warbler] with the black eye and throat patches of *chrysoptera* [golden-winged warbler], but a closer examination shows little peculiarities that do not exist in either" (Herrick 1874). He named the new bird *Helminthophaga lawrencii*, Lawrence's warbler, after his "esteemed friend, George N. Lawrence, Esq., in recognition of . . . his untiring labors towards the promotion of ornithology" (Herrick 1874).[1] As Langdon would echo six years later, Herrick was pleased to find a new species in a part of the country that was "already so thoroughly worked up" (Herrick 1874). "Ha!" Herrick practically shouts at the end of his short article. "Look what I found!"

The discovery of three new species of warbler in the same genus within six years in parts of the country that were home to a number of serious and active field ornithologists was remarkable, indeed. Even more remarkable, however, was the discovery in the early 1880s that the Cincinnati warbler, Brewster's warbler, and Lawrence's warbler were not new species at all, but hybrids.

Hybridization among passerines was not well understood in the early 1880s, and Gregor Mendel's seminal work on genetic inheritance was still more than 20 years from reaching the scientific community at large. Ornithologists of the day didn't expect to find passerines such as blue-winged and golden-winged warblers hybridizing; and when they did discover the birds were doing so, they still had trouble explaining the strange mix of features represented in the hybrid offspring. Take Brewster's warbler, for instance. Brewster named the bird white throated warbler for an obvious reason, but even after ornithologists agreed that the bird was a hybrid, they still couldn't explain how two parent species, neither of which had a white throat, could produce offspring with white throats!

Additionally, in the 1880s the blue-winged warbler's northward spread and "takeover" of its closely related congener, the golden-winged warbler, was a new development, the significance of which was not yet recognized. Today we have a good idea how blue-winged warblers have come to replace golden-winged warblers throughout areas in eastern North America. But that wasn't common ornithological currency in the days of Langdon, Brewster, and Herrick.

The northward push of blue-winged warblers was more pronounced in the eastern U.S. than in the Ohio Valley and southwestern Ohio, where golden-winged

[1] Regarding the species name "*lawrencii*": after Herrick, many subsequent authors, including Langdon (1880), Brewster (1881), Ridgway (1885), and even many contemporary authors, spell the species name "*lawrencei*." Others, Dunn (1997), for instance, use the spelling from Herrick's 1874 article in which the species was first named. I've chosen to follow Herrick's spelling, as well (whether or not it's grammatically correct), though I have not changed "*lawrencei*" when directly quoting a primary source.

warblers were only rare migrants in the first place (Langdon 1877), but wherever blue-winged warblers encounter golden-winged warblers, the same events ensue. During the initial period of contact between the two birds, records of Brewster's and Lawrence's warblers increased. Gradually, through a combination of competition and interbreeding (though many lean towards interbreeding as the leading cause), blue-winged warblers replaced golden-winged warblers—often to the point where the golden-winged warblers disappeared altogether as breeders. The entire process, from initial meeting of populations of blue-winged and golden-winged warblers, to the disappearance of the golden-wings as breeders, takes about 50 years (Gill 1980, Morse 1989).

In Ohio, golden-winged warblers have never been abundant breeders. Writing in 1935, Lawrence E. Hicks stated that golden-winged warblers were rare throughout the state, and that the only place they could be considered common was at Oak Openings in Lucas County. This population began to decline noticeably—and quickly—during the 1930s and 1940s (Campbell 1968). During the field work for the *Ohio Breeding Bird Atlas* a handful of summering golden-winged warblers were found, but never more than two or three in any given summer. Peterjohn and Rice (1991) surmised that "the Ohio summering population . . . currently totals no more than 3-5 males annually." In the 2000 summer breeding season there were no reports of golden-winged warbler (*The Ohio Cardinal* 23:4). Ohio seems to have followed the model for replacement of breeding golden-winged warbler populations by blue-winged warblers within 50 years or so of first contact.

Brewster's and Lawrence's warblers in Ohio are noted most often during migration, though during the *Ohio Breeding Bird Atlas* project both hybrids were found to be "very rare summer residents," with one Brewster's warbler nest reported from northern Tuscarawas County, and an adult Lawrence's warbler seen carrying food in Monroe County (Peterjohn and Rice 1991). In spring 2000, two Brewster's warblers were found in Ohio, with a bird in Ravenna remaining into June. Meanwhile, there were three records of Lawrence's warbler reported, all from June (*The Ohio Cardinal* 23:4). Peterjohn and Rice (1991) write that summering Brewster's and Lawrence's warblers could continue to be reported from time to time in Ohio well after our population of golden-winged warblers disappears, an outcome that appears inevitable, if indeed it hasn't already occurred. The likely source for summering hybrids would be "individuals produced in surrounding states and provinces."

The first of the new *Helminthophaga* triumvirate to "disappear" as a valid species, though, was, alas for us Queen City Birders, the Cincinnati warbler. In the very same issue of the *Bulletin of The Nuttall Ornithological Club* in which Langdon's article on the Cincinnati warbler was reprinted, Robert Ridgway contributed a brief piece in the "General Notes" section in which he questioned the validity of *cincinnatiensis* as a species. "At first sight," writes Ridgway, "the bird impresses one with its unique coloration, which on further examination is found to be a perfect combination of the plumage of *Helminthophaga pinus* [blue-winged warbler] and *Oporornis formosa* [Kentucky warbler]" (Ridgway 1880). Ridgway added that "the

forehead is yellow, as in *H. pinus*, but behind and along the postero-lateral edge of this yellow is seen a portion of the black cap which characterizes *O. formosa*" (Ridgway 1880). He went on to note that the Cincinnati warbler's measurements were intermediate between those of blue-winged warbler and Kentucky warbler, that the bill was closer to an *Oporornis* warbler in size and shape, and that feet were more like those of a *Helminthophaga* warbler.[2] Neither could Ridgway overlook the fact that throughout the Mississippi Valley and especially in the region around Cincinnati, both Kentucky and blue-winged warblers "breed very abundantly in the same localities, both nesting on the ground, and often having nests situated only a few feet apart" (Ridgway 1880).

Ridgway's doubts proved to be correct. Later studies supported his claim that the Cincinnati warbler is the progeny of a blue-winged warbler and Kentucky warbler. That's not to say that similarities between the Cincinnati warbler and the two birds we now know produced it were overlooked when it was discovered. In his description of the Cincinnati warbler, Langdon writes that according to Coues "its relations are mainly with [blue-winged warbler], although in the concealed black of vertex and auriculars it slightly resembles certain plumages of Kentucky warbler" (Langdon 1880). Similarities in facial features aside, Coues and Langdon ruled out an unusual-looking Kentucky warbler because of the Cincinnati warbler's "smaller size, dissimilar proportions, short tarsi, yellow forehead, and white margin to [the] outer tail feathers" (Langdon 1880). They also felt the bird wasn't an oddball blue-winged warbler because of its large size, lack of wing bars, and the presence of black auriculars. The potential that this was a blue-winged x Kentucky hybrid crossed their minds, but, according to Langdon, given what they knew at the time, the "suspicion of hybridism" was considered "inadmissible" (Langdon 1880).

To appreciate the theoretical leap that Robert Ridgway took when he suggested the Cincinnati warbler was a hybrid, one needs only to read an important 1881 article William Brewster wrote for the *Bulletin of the Nuttall Ornithological Club*. In this article, Brewster describes in detail all 12 of the known specimens of white throated (Brewster's) and Lawrence's warbler, noting that all the specimens were collected in areas where both blue-winged and golden-winged warblers breed, and observing that when laid side-by-side there was a tremendous amount of variation in the different birds: "Taken as a whole," writes Brewster of the 12 specimens, "the series perfectly connects *leucobronchialis* with *pinus*, as well as showing an extension of the former toward *chrysoptera*" (Brewster 1881).

Brewster singled out two birds in particular to put the exclamation point on his argument that white throated warbler and Lawrence's warbler were not valid species. The first bird was a female Lawrence's warbler he had collected and labeled No. 4,667; the second bird was No. 4,668, which Brewster believed to be one of 4,667's offspring. When collected, No. 4,668 was molting from its juvenal plumage into its first basic (first fall) plumage. Brewster explains that across the breast and along the sides of the bird patches of "bright yellow feathers" were replacing the

[2] At some time between 1881 and 1988 the tip of the bill of the Cincinnati warbler type specimen was broken off and lost.

gray feathers of the juvenal plumage. More importantly, writes Brewster, "the sprouting second plumage of the throat is *pure white*; the lores are black, but the few second feathers which appear on the auriculars are, like those of the throat, *white*" (Brewster 1881; emphasis in original). Since the offspring of No. 4,667 looked more like a white throated warbler than a Lawrence's, he hypothesized that the bird likely mated with a blue-winged warbler.

In summation of his argument Brewster made three points to support his claim that both *H. leucobronchialis* and *H. lawrencii* were hybrids. First, neither bird had any original characteristics that weren't borrowed from either blue-winged or golden-winged warblers (with the exception of the white throat that tends to show up on *leucobronchialis*, a point that Ridgway used four years later to argue *in favor* of the validity of white throated warbler as a species); second, "the characters of *leucobronchialis* are inconstant, and that this supposed species intergrades with [blue-winged warbler];" and third, the characteristics of Lawrence's warbler "are also inconstant" and that it "interbreeds with some unknown ally—presumably [blue-winged warbler], producing offspring that resemble aberrant specimens of *leucobronchialis*" (Brewster 1881).

Without an understanding of the ways in which dominant and recessive traits are mixed and matched through crosses and backcrosses to create different physical characteristics, Brewster suggested that perhaps white throated warbler resulted from a paring of a male blue-winged warbler with a female golden-winged warbler, while Lawrence's warbler might result from a male golden-winged warbler mating with a female blue-winged warbler. Whatever the case, "the possibilities opened by this field are bewildering" marveled Brewster. He continued, writing that

> *[u]ntil very recently there was not a single established example of hybridity among North American Passeres, and many of our leading ornithologists were incredulous as to its occurrence in a state of nature save among the Grouse and some of the Swimming Birds.* (Brewster 1881)

In presenting arguments that favored hybridization as the origin of the Cincinnati, white throated, and Lawrence's warblers, Brewster and Ridgway were on the verge of untying an ornithological Gordian knot that was both exciting and intriguing. Exciting because heretofore hybridization was unknown among North American passerines; intriguing because it was hard to sort out where all the different characteristics of these hybrids came from.

Ridgway could understand how Cincinnati and Lawrence's warblers were hybrids—the birds were clearly in debt to their respective parent species for all of their physical characteristics. But he differed with Brewster's claim that white throated warbler was a hybrid. Focusing on the unique white throat of Brewster's warbler, Ridgway agreed that the variation in a number of *leucobronchialis* specimens was the result of hybridization with either blue-winged or golden-winged warbler (Ridgway 1885). However, the variation that made Brewster doubt the validity of white throated warbler actually strengthened the case for the bird keeping

its status as a species in Ridgway's mind. Because neither blue-winged or golden-winged warblers have white throats, he reasoned, then they cannot produce Brewster's warbler; however, a Brewster's warbler hybridizing with a blue-winged or golden-winged warbler *could* produce the variation noted by Brewster when he reviewed the known specimens (Ridgway 1885). If only Ridgway had known that the gene for the white underparts of golden-winged warbler is dominant, and that when this dominant gene meets the recessive gene for the yellow underparts and throat of blue-winged warbler, the dominant gene for white underparts will also make the throat white. The result is a bird with a white throat, paradoxically produced by parents that lack this feature (Curson 1994). But that was a discovery that in 1885 was still some years away. Given what they knew at the time, Brewster and Ridgway's work on the hybridization of blue-winged and golden-winged warblers, as well as the latter's work on the Cincinnati warbler, is fairly on the mark—and in a word, groundbreaking.

Sightings and studies of Brewster's and Lawrence's warblers continue to the present day. But for decades after its discovery in 1880 there was but one Cincinnati warbler. It was an interesting specimen in that, unlike blue-winged and golden-winged hybridization, the Cincinnati warbler is the result of an intergeneric pairing, but for all practical purposes the Cincinnati warbler was merely an enigma, a yellow and olive green bolt out of the blue that fell to earth from the limb of a maple tree near Cincinnati one fine May morning.[3]

However, the story of the Cincinnati warbler wasn't finished after Ridgway's article raised questions about the validity of its species status in 1880. Sixty-eight years after Langdon discovered the first Cincinnati Warbler, Frank McCamey collected a *second* Cincinnati warbler in Cass County, Michigan, 18 miles north of the Indiana state line.

On 19 May 1948, while birding in a mature oak woods called Russ Forest, McCamey heard a "puzzling song—a loud 'kuh-chee, kuh-chee, kuh-chee', which rang through the woods like the song of an Ovenbird. The syllables were repeated with even rhythm and unvarying pitch" (McCamey 1950).[4]

When McCamey located the warbler he immediately realized it was not an ovenbird, but a bird that resembled a blue-winged warbler, minus the white wingbars. McCamey observed the bird for nine consecutive days. Unlike Langdon's account of the Cincinnati warbler type specimen, McCamey's paper included

[3] For information on other intergeneric as well as intrageneric warbler hybrids such as Sutton's warbler, Audubon's warbler x myrtle warbler, Townsend's warbler x hermit warbler, and other hybrids, see Curson 1994, Dunn 1997, Morse 1989, Peterson 1980, Sibley 1994, and Sibley 2000. Peterson's 1980 guide is the only major field guide with an illustration of Sutton's warbler, though this hybrid hasn't been recorded since the early 1970s. For more information on hybridization in North American wood warblers see the April 1998 (vol. 115, no. 2) issue of *The Auk*. As of March 2001, the abstracts for the articles in this issue, as well as an interesting introductory essay by Frank B. Gill, were available on the internet at http://www.aou.org/aou/ABS1152.HTML

[4] Sutton and McCamey allude only briefly to this in their article, but McCamey's description of the song of his mysterious warbler fits a Kentucky better than a mourning warbler—though some mourning warblers have a song that "may suggest" Kentucky warbler (Dunn 1997).

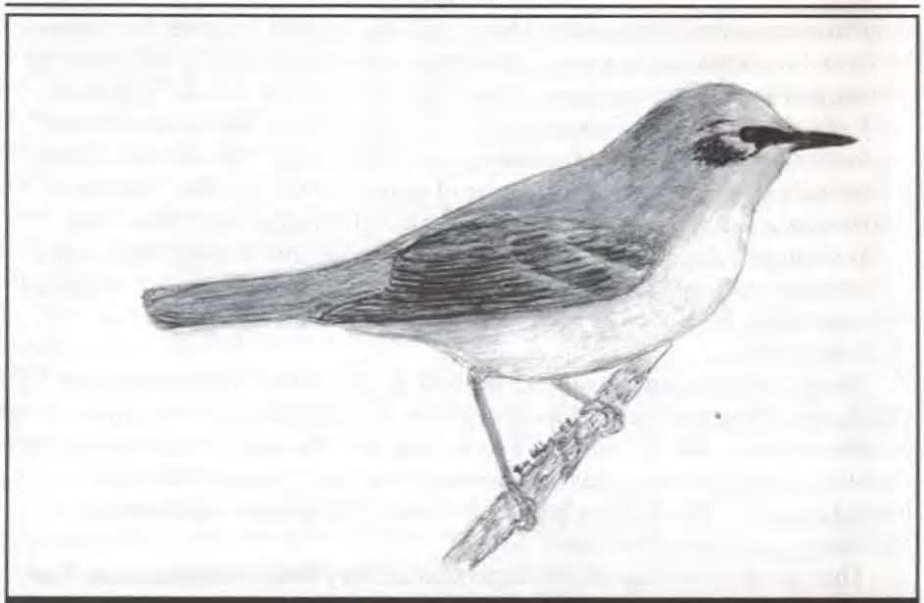
detailed notes on the Michigan bird's behavior. Like Langdon's warbler, McCamey's bird was discovered high in a tree. It preferred to perch between 20 to 60 feet off the ground, and would drop down into 20-foot high undergrowth to feed. "It devoted much of its time to singing," writes McCamey, "and probably did not have a mate." Furthermore, when foraging in the under-growth, the warbler "moved rather slowly, occasionally singing without flying to one of its regular song-perches." McCamey searched for a nest and a possible mate for the bird, but had no luck. There were plenty of singing blue-winged warblers near the wooded area in which McCamey's bird spent its time, but McCamey never saw the warbler attempt to attract or interact with those birds. Finally, on 28 May, McCamey collected his mystery warbler (McCamey 1950).

Shortly after McCamey collected the bird, he showed his find to George M. Sutton, who recognized similarities between the Michigan bird and the warbler described years earlier by Langdon. Sutton compared McCamey's bird with the Cincinnati type specimen, which he borrowed from the Cincinnati Museum of Natural History. After studying both birds closely, Sutton made a painting of McCamey's specimen (McCamey 1950).[5]

The type specimen and the Michigan bird are very similar in appearance. The Cincinnati bird is a little larger; other than that, the main difference between the two birds is that the Michigan bird lacks a distinct, black auricular patch, while retaining a black loral streak that runs through the eye, similar in appearance to the loral streaking on a blue-winged warbler. McCamey and Sutton were fairly certain that the bird's parentage was at least one-half blue-winged warbler, and that the other likely candidate was either a Kentucky or a mourning warbler (McCamey 1950). Kentucky warbler was all but ruled out, in large part because in 1948 there were only three records of that warbler from Michigan, while mourning warbler was known to breed just north of the location where McCamey collected his mystery warbler. Additionally, the size of the wings and tail of the Cincinnati specimen are closer to that of a Kentucky warbler (though overall it is intermediate in size between blue-winged and Kentucky warblers) than are the more blue-winged warbler-sized wings and tail of the smaller Michigan bird. McCamey and Sutton concluded that "at least provisionally" the Michigan bird was a cross between a blue-winged warbler and a mourning warbler (McCamey 1950). So lightning didn't strike in *exactly* the same place twice (though it came very close!), and the Cincinnati warbler discovered by Frank Langdon in 1880 remained the only one of its kind.

Given the oddity of these two very similar hybrids, as well as the fact that parentage of both birds is at least one half blue-winged warbler, one had to know

[5] David Sibley made illustrations of both Langdon's Cincinnati warbler and McCamey's warbler for an article titled "A Guide to Finding and Identifying Hybrid Birds" that appeared in the June 1994 (vol. 26, no. 3) issue of *Birding*, pages 172 and 173 respectively. As of March 2001, these drawings were also available on the internet at http://www.sibleyart.com/hybrid_warblers.htm. The Cincinnati warbler type specimen is in the upper left corner and the Cincinnati warbler collected in Michigan is in the lower right corner. A reproduction of the rather stylized illustration that accompanied Langdon's article describing the Cincinnati warbler in 1880 can be viewed on Ned Keller's *Birding in Cincinnati* website at http://w3.one.net/~keller/cincybirds/index.htm.



"Cincinnati" Warbler
by Ben Winger

that the issue of their genetic origins wasn't going to be left dormant for too long. Eventually, someone was going to pull both specimens out of their metal storage drawers and take a long close look. Finally, in 1988, Gary R. Graves of the Smithsonian Institute compared size and plumage characteristics of the Cincinnati and Michigan specimens, which he borrowed from their respective keepers; in addition he ran measurements on numerous specimens of pure blue-winged, Kentucky, and mourning warblers, and charted where the Cincinnati and Michigan birds fell in comparison to the two species of *Oporornis* (Graves 1988).

Graves' findings affirm that the Cincinnati bird is a little larger than the Michigan bird, though it is intermediate in size between blue-winged and Kentucky warbler (Graves 1988). The Cincinnati bird also shares plumage characteristics with both blue-winged and Kentucky warbler—that is, facial features that reflect both the eye line of blue-winged warbler and the auricular patch of Kentucky warbler, underparts like those of Kentucky warbler, and upperparts similar to those of blue-winged warbler. As Ridgway, Langdon, and Coues all noted at one time or another, the Cincinnati bird truly bears striking resemblances to both blue-winged and Kentucky warblers.

Graves put the Michigan bird under a microscope and discovered that it had "black barbs on the edges of a few auricular feathers"—a "Kentucky-like" characteristic. The Michigan bird is, as McCamey noted, closer in size to a blue-winged warbler, but the other half of its parentage isn't necessarily a mourning warbler, particularly given the presence of auricular coloring, albeit all but invisible to the naked eye. Furthermore, Graves observed that both birds have "small black dots

above each nostril" and "scattered black feathers, tipped with grayish olive, at the sides and rear of the hindcrown…Because crown feathers of [mourning warbler] are uniformly gray, black spots above the nostrils and black crown feathers could only have been inherited from [Kentucky warbler]." Additionally, neither the Cincinnati nor the Michigan bird has any trace of the gray or black bib of mourning warbler (Graves 1988).

At the conclusion of the article Graves writes that the "correlation between intermediacy in plumage and morphology" of the Cincinnati bird suggests it is a first generation hybrid, while the lack of an obvious auricular patch and the Michigan bird's smaller size are due to the fact that the Michigan bird could very well "represent the progeny of [a first generation Cincinnati warbler] hybrid back crossed with a pure [blue-winged warbler]" (Graves 1988). It's quite possible, then, that there hasn't been just one Cincinnati warbler, but at least as many as two or three.

CONCLUSION

Though not nearly as well-known as its *Vermivora* hybrid siblings, nor the much more famous intergeneric hybrid Sutton's warbler (northern parula x yellow-throated warbler), the Cincinnati warbler nonetheless played an important role in the process by which 19th century ornithologists worked to discover the origins of Brewster's and Lawrence's warblers, the most studied of North American hybrid passerines. Brewster's and Lawrence's warblers are still sighted in Ohio today during migration and occasionally into the breeding season, though they are very rare. Might another Cincinnati warbler ever be encountered? Who's to say it couldn't happen again? And if it does, maybe some lucky Ohio birder will get to discover yet another *Vermivora cincinnatiensis* (Langdon): the Cincinnati warbler.

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(Continued on the following page)

REFERENCES

Brewster, W. 1874. A new species of North American warbler. *American Sportsman* 5:33.

Brewster, W. 1881. On the relationship of *Helminthophaga leucobronchialis*, Brewster, and *Helminthophaga lawrencei*, Herrick; with some conjectures respecting certain other North American birds. *Bulletin of the Nuttall Ornithological Club* 6:218-225.

Campbell, L. W. 1968. *Birds of the Toledo Area*. Toledo Blade Company, Toledo, Ohio.

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

Dunn, J., and K. Garrett. 1997. *Warblers*. Houghton Mifflin, Boston.

Herrick, H. 1874. Description of a new species of *Helminthophaga*. *Proceedings of the Academy of Natural Sciences of Philadelphia* 26:220

Hicks, L. E. 1935. *Distribution of the Breeding Birds of Ohio*. Ohio Biological Survey Bulletin No. 32, 6(3):125-190.

Gill, F. B. 1980. Historical aspects of hybridization between blue-winged and golden-winged warblers. *The Auk* 97(1):1-18.

Graves, G. R. 1988. Evaluation of *Vermivora* x *Oporornis* hybrid wood-warblers. *The Wilson Bulletin* 100(2):289-293.

Langdon, F. W. 1877. *Catalog of the Birds of the Cincinnati Area*. The Naturalist's Agency, Salem, Massachusetts.

Langdon, F. W. 1880. Description of a new warbler of the genus *Helminthophaga*. *Journal of The Cincinnati Society of Natural History* 3:119-120.

McCamey, F. 1950. A puzzling hybrid warbler from Michigan. *The Jack-Pine Warbler* 28(3):67-72.

Morse, D. H. 1989. *American Warblers: An Ecological and Behavioral Perspective*. Harvard University Press, Boston.

Peterjohn, B. G., and D. L. Rice. 1991. *The Ohio Breeding Bird Atlas*. The Ohio Division of Natural Areas and Preserves, Columbus.

Peterson, R. T. 1980. *A Field Guide to the Birds*. Fourth edition. Houghton Mifflin, Boston.

Ridgway, R. 1880. Note on *Helminthophaga cincinnatiensis*, Langdon. *Bulletin of the Nuttall Ornithological Club* 5:237-238

Ridgway, R. 1885. *Helminthophaga leucobronchialis*. *The Auk* 2:359-363.

Sibley, D. A. 1994. A guide to finding and identifying hybrid birds. *Birding* 26(3):162-177.

Sibley, D. A. 2000. *The Sibley Guide to Birds*. Knopf, New York.

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A History of the Crow Roost at Cincinnati

by Frank Renfrow

Evening has returned. The heavens have already opened their twinkling eyes, although the orb of day has yet scarcely withdrawn itself from our view...Crows are flying towards their roosts...
—John James Audubon, from his account of fishing in the Ohio

The winter roosting behavior of the American crow *Corvus brachyrhynchos* has been well documented in various sections of the United States, with numbers of over five million having been reported at a great roost in Kansas (Angell 1978). *Corvus* species from other temperate regions of the world are also known to form large roosts (Wilmore 1977).

Alexander Wilson's vivid description of crows flying to their roost, penned some 200 years ago, aptly describes what can still be witnessed in the Cincinnati area today:

About an hour before sunset, they are first observed flying, somewhat in Indian file, in one direction, at a short height above the tops of the trees, silent and steady, keeping the general curvature of the ground, continuing to pass sometimes till after sunset, so that the whole line of march would extend for many miles...Burns in a single line, has finely sketched it: The blackening trains of Crows to their repose.

In 1848 Joseph Longworth built a country home at Walnut Hills, at the time a suburb, but now an inner-city neighborhood of Cincinnati. He named the estate "Rookwood," due to the large number of crows that (in his word) "inhabited" the area. In 1880 his daughter, Maria Longworth Nichols, founded the Rookwood Pottery. Many years later she explained that "the Crows in an old dead elm tree had begun the Rookwood Pottery." Although the Pottery was originally located on Eastern Avenue near the Ohio River, it was later moved to the top of the hill at Mt. Adams (Peck 1968).

In 1891, Raymond W. Smith, the editor of Lebanon, Ohio's newspaper, *The Western Star*, wrote an account of the birds of Warren County. There he describes the daily movements of the crows:

In speaking of the crow as a resident, it should be stated that the crows to be seen in all parts of the county any winter day, return every evening to the great crow roost at Clifton, a suburb of Cincinnati. Every morning from November to March, they arrive in the vicinity of Lebanon about an hour after sun-rise. The day is spent searching for food along the numerous water-courses of the county, and about three o'clock in the afternoon they may be seen returning, in small flocks, to the Clifton roost. So, while during the day-time, in Winter, crows are more abundant than at any other time of the year, by five o'clock in the afternoon there is probably not a crow left in the county.

During the first half of the twentieth century, the crow roost seems to have split into two locations, possibly due to human disturbance and persecution. The noted Ohio naturalist and photographer Karl Maslowski remembers one roost near the mouth of the Great Miami, in Indiana just north of the Oxbow, in a grove of large