

Chicago Natural History Museum

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HYBRIDIZATION IN BIRDS

By AUSTIN L. RAND
CURATOR OF BIRDS

A new exhibit of birds in Boardman Conover Hall (Hall 21) illustrates hybridization, with examples and an account of the conditions under which hybrids occur.

The word *hybrid* is used here for the offspring of parents of different species. In general, bird hybrids are rare in nature. Hybrids tend to be more frequent between more closely related species, and the hybrids between more closely related species tend to be fertile more often than hybrids between more distantly related species. Hybrids occur most frequently in areas in which two species that are relatively young, geologically speaking, have recently met and overlapped. In certain groups such as the ducks and the gallinaceous birds hybrids tend to be frequent.

The yellow-shafted and the red-shafted flickers provide an example of the first category. Presumably before the latest glaciation of North America there was but one species of flicker across northern North America. With the advance of the glaciers, their ice and the desert conditions in front of them in the central part of the continent divided our northern forests into an eastern and a western one. The flickers, dependent on trees for their nesting, thus became divided into an eastern and a western

population, each completely isolated from the other. In this isolation each population evolved different characters: the western bird a gray throat, red malar stripes (in the male), red shafts to the flight and tail feathers, red linings to wings and tail, but no red nuchal patch; the eastern bird a tan-colored throat, black malar stripes (in the male), yellow shafts to the quills, yellow linings to the wings and tail, and a red nuchal patch (in the male).

CHANGES SUPERFICIAL

Then the ice retreated. The forests moved north again, toward the center of the continent, where they met. With them moved their flicker populations. Finally the flickers met. Though in appearance the flickers now were quite different, biologically they had changed less. They had not yet developed a barrier to interbreeding.

Where their ranges overlapped they cross-mated freely, and over considerable areas in the central west there are no pure-bred birds at all. Whole populations are composed of hybrids. These hybrids show a blending of characters that results in many of the birds being intermediate in type or with a mixture of the characters of the two species, as is shown by four selected examples in our exhibit.

Though the yellow-shafted and the red-shafted flickers are so different in appearance that most bird students call them species, to a biologist they still could be considered subspecies, interbreeding freely where they meet. It is possible that, if given time, the two forms could fuse completely into one again.

HYBRID WARBLERS COMMON

The golden-winged and the blue-winged warblers are another example. They are respectively northern and southern species in the forests of the eastern United States, but there is a broad overlap in their ranges. Presumably they resulted from populations isolated in the eastern part of the continent and later brought into contact. The appearance of the parents is very different, but hybrids are of common occurrence. These hybrids present a different picture from that of the hybrid flicker. The hybrid warblers tend to be of four types:

Type 1. Like parent golden-winged warbler with black head pattern, gray back, white underparts, and yellow in wing.

Type 2. Like parent blue-winged warbler, without black head pattern, with olive back, yellow underparts, and white and blue in wing.

Type 3. Similar to a golden-winged warbler, but without black head pattern and yellow on breast (this when first found was thought to be a new species and called Brewster's warbler).

Type 4. Similar to a blue-winged warbler, but with the black head pattern of a golden-winged warbler (this, too, when first found

—THIS MONTH'S COVER—

Its love of a uniformly cool and moist environment makes the salamander admirably suited to life in damp caves. However, a great drawback is the scarcity of food there, and this is probably the reason that few true cave species exist. The mouths of caves, on the other hand, offer much better conditions for getting food and are frequented by many kinds of salamanders that live for the most part outside the caves. The true cave species are characterized chiefly by a lack of color and by blindness. The Ozark species shown does not represent the extreme adaptation to subterranean life but rather a condition intermediate between the true cave species and the usual woodland or aquatic salamander. Our cover picture is published by courtesy of Charles E. Mohr, of Greenwich, Connecticut, who is widely known as an outstanding photographer of cave life. An article on salamanders in general, by Clifford H. Pope, Curator of Amphibians and Reptiles, appears on page 3.

was thought to be a new species and called Lawrence's warbler).

The first generation hybrids appear to be of the Brewster warbler type. Later matings of hybrids produce the four types of hybrids given above, but not in equal number. The Lawrence warbler is much the rarest of the types, and genetic calculations have shown that this is probably because the Lawrence type is a double recessive for two characters. The frequency of occurrence in hybrids probably fits the frequencies of Brewster's 9 out of 16, golden-winged 3 out of 16, blue-winged 3 of 16, and Lawrence's 1 of 16.

The pheasants and their relatives are particularly well known for the frequency with which hybrids are produced. We have illustrated this with a hybrid golden-Lady Amherst pheasant of a kind commonly seen in aviaries as an ornamental. The black and white "cape" is that of the Lady Amherst, the red on the flanks is that of the golden, while crest and tail are intermediate, to mention the more obvious points.

In ducks, too, hybrids are known to occur with some frequency, and we have illustrated this with a cross or hybrid between a black duck and a mallard. Though such crosses occur in nature and may be fertile, they do not seem to persist, and presumably they are not so hardy as the parent stock.

This exhibit was planned in the Division of Birds and executed by Carl W. Cotton, Staff Taxidermist.



Rand, Austin Loomer. 1953. "Hybridization in Birds." *Bulletin* 24(7), 2-2.

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