

in what is known as the Alleghanian faunal belt, with a strong tinge of the Canadian fauna in the deep forests, and a slight Carolinian element in the lower clearings." The elevation of the lake is 1250 feet above sea-level, while the mountains around it rise 100 to 150 feet higher. With Mr. Dwight's paper on 'The Summer Birds of the Crest of the Pennsylvania Alleghanies,' published in the present number of 'The Auk,' and the various other recent contributions to the same subject, the bird fauna of the Alleghanian region, from Pennsylvania southward, bids fair to become soon well known. —J. A. A.

Allen on the North American *Colaptes*.* — As there are doubtless many readers of 'The Auk' who will not be so fortunate as to see this paper, it seems desirable on account of its great interest and importance to present a brief summary of its contents.

After mentioning the sources of the material (785 specimens) on which his study of this group is based, and referring to the several theories that have been suggested as to the relationships between *C. auratus* and *C. cafer*, the author proceeds to state the distinctive characters and geographical distribution of each member of the genus that is found north of Panama. The distribution is well illustrated by a map.

C. mexicanoides of Guatemala is essentially *C. cafer* with the coloration intensified, the black dorsal bars broadened, rump spotted with black, entire top of head and nape rufous, quills and malar stripe a deeper, darker red. Its habitat very probably reaches to that of *C. cafer* which species is found from the southern border of Mexico northward throughout Mexico, excepting western Sonora and Lower California, and from the eastern base of the Rocky Mountains to the Pacific north to British Columbia. "*C. rufipileus*, from Guadalupe Island, off Lower California, is an insular form of *cafer*, differing . . . mainly in smaller size, much longer bill, and rather deeper colors, in this latter respect rather more resembling *C. cafer saturator* of the Northwest Coast," which differs from *cafer* "in slightly larger size and much deeper colors."

C. chrysoides ranges through most of Lower California and parts of Sonora, southern Arizona, and southeastern California. "To the northward and eastward its habitat thus reaches, and at some points (at least in winter) overlaps, that of *C. cafer*, with which, however, it appears never to blend." It is "a small, pale form presenting the general appearance of *mexicanoides*," but having the quills golden as in *auratus*, though possessing no other of the distinctive characters of the Eastern form.

"*C. auratus* while ranging over the northern and eastern three fourths of the continent of North America, has also two outlying insular forms,

*The North American Species of the Genus *Colaptes*, considered with Special Reference to the Relationships of *C. auratus* and *C. cafer*. By J. A. Allen. Bulletin American Museum of Natural History, New York, Vol. IV, No. 1, Article II, pp. 21-44, map. Author's edition published March 8, 1892.

C. chrysocaulosus of Cuba, and *C. gundlachi* of Grand Cayman, both evidently offshoots from the *auratus* stock, modified by environment, and differing from *auratus* somewhat as *mexicanoides* differs from *cafer*."

Of the three groups into which these forms may be classed, (1) *cafer-mexicanoides*, (2) *chrysoides*, and (3) *auratus*, "the first and the last, so far as features of coloration are concerned are the most unlike, having no special characters in common, and yet it is these two, *cafer* and *auratus*, which, as shown by the material now in hand, thoroughly intergrade wherever their habitats meet, that is, over a belt of country from 300 to 400 miles wide, and some 1200 to 1500 miles long. They are also more or less mixed from the eastern border of the Great Plains westward to the Pacific Coast, from about the latitude of 38° northward to about latitude 55°." The intermediates between the two vary "from individuals of *C. auratus* presenting only the slightest traces of *C. cafer*," or vice versa, "to birds in which the characters of the two are about equally blended. Thus we may have *C. auratus* with merely a few red feathers in the black malar stripe, or with the quills merely slightly flushed with orange, or *C. cafer* with either a few black feathers in the red malar stripe or a few red feathers at the side of the nape, or an incipient barely traceable scarlet nuchal crescent." Where the mixture of characters is more complete, an unsymmetrical combination is the rule. The quills of wings or tail may be some red and others yellow; "a bird may have the general coloration of true *cafer* combined with a well developed nuchal crescent, or nearly pure *auratus* with the red malar stripes of *cafer*"; sometimes the body plumage is of one form, the head of the other. In short there are "almost endless variations, it being rare to find, even in birds from the same nest, two individuals alike in all their features of coloration."

East of the Mississippi, with rare exceptions, the *cafer* characters out-cropping in *auratus* are confined to traces of red in the malar stripe which are to be seen in "perhaps one male in a thousand (or more probably a still smaller proportion)." This occurs about equally throughout this area, "quite as frequently along the Atlantic seaboard as at any point east of the Mississippi River." Nearly pure *auratus* probably "prevails westward to the eastern border of Texas, Indian Territory, Kansas and Nebraska, and over the greater part of both Dakotas and Manitoba." Throughout the Plains mixed birds are the rule, though in winter in the more southern portions there is some influx of both *auratus* and *cafer*. From central Colorado and western Texas to Nevada and southern California nearly pure *cafer* prevails in the breeding season, though mixed birds are not uncommon in winter. From Wyoming and Montana west to the Cascades the mixed birds occur with but few exceptions, while from Puget Sound southward to central California are found mixed birds together with nearly pure representatives of both *cafer* and *auratus*.

All this array of evidence, to which scant justice can be done here, but which Mr. Allen has marshalled so admirably, leads him to re-affirm the hypothesis, originally suggested by Baird, "of hybridization on a grand

scale between *Colaptes auratus* and *C. cafer*." This conclusion seems inevitable, for, while the transition between geographic races is apt to be gradual and symmetrical, what we have here is quite the reverse, an utterly irregular intergradation with, at the same time, all sorts of asymmetrical combinations of the characters of the two birds.

Mr. Allen has investigated also the geographical, individual and seasonal variation among the Flickers, with interesting results. Geographical variation in size amounts in *C. auratus* to about 10 per cent in the length of wing between Arctic America and southern Florida, while the West Indian forms are even smaller. The difference between *C. c. saturator* and *C. rufipileus* is nearly parallel to this, but in *C. cafer* itself the variation is less uniform with latitude, being perhaps complicated, Mr. Allen suggests, by opposing effects of altitude. *C. chrysoides* shows hardly any difference in size geographically. In the Florida *auratus*, though it is smaller and darker than the northern bird, the average difference "proves too slight and too inconstant, in either size or color, to make a separation practicable."

Individual variation is considerable, both in size and in color. The bill varies in length from 15 to 25 per cent, the wing from 8 to 12, the tail from 12 to 18. In color the variation "affects (1) the size and shape of the circular black spots on the lower plumage, (2) the width and number of the dusky crossbars of the upper plumage, (3) the size and form of the malar stripe, (4) the presence or absence of black spots on the white rump, (5) the tone of color suffusing the general plumage." These variations are discussed in detail, as is the tendency in the females to develop a malar stripe.

The only seasonal changes in color are those due to fading and abrasion.

Throughout the group the nestling plumage differs from the adult chiefly in showing more or less red in the crown and in having the markings in general coarser and heavier. An interesting variation is shown in the malar stripe which in the adults is so prominent, and yet so unstable, a character. Young *C. auratus* shows in both sexes the black malar stripe that in the adult is confined to the male. In *C. chrysoides*, *C. cafer*, and *C. c. saturator* this marking is red in the male, and rufous in the female, as in the adults.—C. F. B.

Chapman on the Origin of the Avifauna of the Bahamas.*—Mr. Chapman gives a general review of the bird life of the Bahamas, grouping the species, in accordance with their distribution, primarily into two classes: (1) those of more or less general distribution, numbering 32 species, and (2) species peculiar to the Bahamas, 24 in number. The species of the first class are further divided, as regards their distribution, into cos-

* The Origin of the Avifauna of the Bahamas. By Frank M. Chapman. American Naturalist, June, 1891, pp. 528-539.



Allen, J. A. 1892. "Allen on the North American Colaptes." *The Auk* 9, 177–179.
<https://doi.org/10.2307/4067952>.

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