CANADIAN STATUS OF THE LONG-TAILED CHICKADEE

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THIS paper is the result of an examination of a series of Black-capped Chickadees in the collections of the National Museum of Canada. As the Long-tailed Chickadee, *Penthestes atricapillus septentrionalis,* has long been unquestioningly accepted as a well-defined central-continental form ranging from Alaska to New Mexico, it seems well to present the details of the investigation. They are interesting in themselves but, as representative of a number of cases in which racial distinction is based upon the average of small, variable dimensional characters, they open the question of the desirability of formal recognition of subspecies of which few or no individuals can certainly be referred to their proper race by physical characters without reference to the geographical origin.

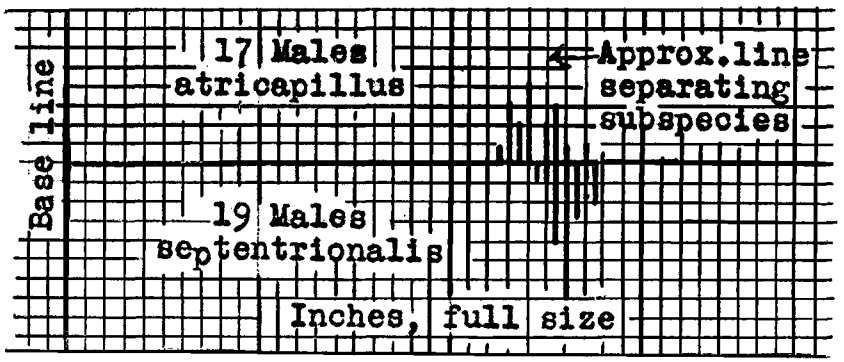
The Black-capped Chickadee is a comparatively sedentary species. There may be more or less seasonal shifting of range in individuals but little extended migrational movement is evident. At least long flights are not expected in the species nor many strays or wanderers from afar. Mr. F. C. Lincoln of the U. S. Biological Survey, who has charge of the banding records of that Bureau, informs me that of some 3,500 banding returns of the species on file in his office only five can be regarded as long range, the remainder being from within a mile or so of original banding. Local variation within widely separated centers of distribution therefore cannot be reasonably ascribed to hybridity with accidental visitors but must be regarded as inherent in the respective geographic associations.

Eliminating from the series imperfect and submature specimens and those from intermediate territories, it consists of 99 spring and summer individuals: 17 males and 14 females from southern Ontario, eastward to Nova Scotia; 19 males and 17 females from Manitoba, Saskatchewan and Alberta; 20 males and 12 females from the interior of British Columbia. Specimens from coastal areas of British Columbia referable to *P. a. occidentalis* were not included. These were all taken within two hundred miles of the international boundary and can reasonably be assumed to be of local breeding stock. They are from areas separated from each other by some eight hundred miles and include no specimens between.

The subspecies *septentrionalis,* as diagnosed by Ridgway (Birds of North and Middle America, pt. 3, p. 399, 1904) and as commonly

accepted is "similar to *P. a. atricapillus,* but larger, with wing and tail averaging *decidedly* [italics mine] longer; coloration paler, with whitish edgings to greater wing-coverts, secondaries and lateral rectrices broader, more conspicuous." The type locality is Yellowstone River about thirty miles above its junction with the Missouri, Montana.

In these birds, laid out in comparable seasonal mass groups, a highly critical eye can detect a slight average color distinction as above postulated, between the prairie and the eastern birds, but not enough to be readily detected and not consistent enough for the recognition of individual specimens. Every individual in one group can be matched in the other, and no single specimen can be confidently



TEXT-FIG. 1.—Comparative tail measurements of 36 male chickadees from Canada.

identified by this character, though winter and early-spring birds, before the wear and fading of nesting activity, show slightly more color differences than in later season.

Tail and wing measurements were taken with dividers; the former by inserting one point between the middle feathers close against the meatus, the other extended to the longest tip; the wings by taking the distance between the bend of the wing (carpus) and the tip of the longest primary. These measurements were pricked directly off on cross-section paper from a common base-line, one under the other in their respective geographic groups. By this method the comparative lengths became readily visualized and could be analyzed with the least distortion by the human equation.

The tails of most of the eastern group fall short of the 2.5 inch (63.5 mm.) line in the case of the males and of the 2.3 inch (58.42 mm.) line in the females, while the majority of those from the prairie

provinces extend beyond but with many exceptions or contradictions. Interior British Columbian specimens more nearly agree with eastern ones than with their nearest neighbors of the prairies. Some of the tail measurements are here presented in condensed graph in which the horizontal distance from the base-line shows the lengths while the perpendiculars indicate the number of specimens having equivalent measurements, one space to an individual.

This can be analyzed as follows:

	Under	*On the division line of 2.5 inches (63.5 mm.)*	*Over*	*Total*
Ontario and eastward	10	2	5	17
Prairie Provinces	1	1	17	19
		3		36
British Columbia	7	3	10	20

Thus, three of the eastern and central groups are on the line and are indeterminate; 5 *atricapillus* measure into *septentrionalis;* 1 *septentrionalis* measures into *atricapillus;* 9 out of 36 or 25 per cent are unidentifiable by tail measurement.

There is a large overlap in extreme measurements: the smallest *atricapillus* is only 0.2 inches (5.08 mm.) smaller than the smallest *septentrionalis.* The largest *septentrionalis* is only 0.05 inches (1.27 mm.) larger than the largest *atricapillus.*

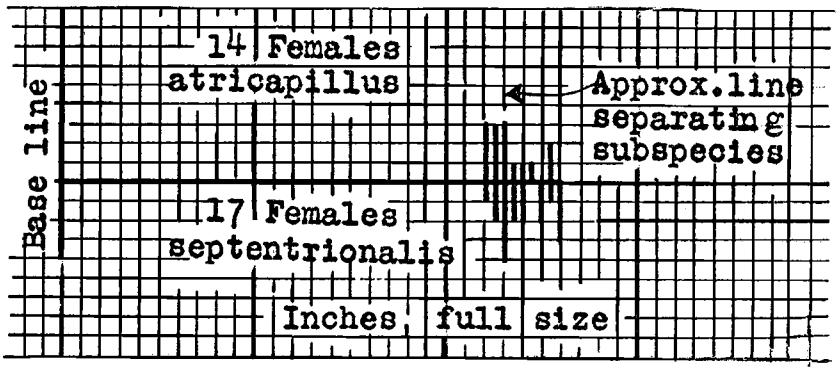
Treating similarly the wing measurements of 34 of these males (the wings of two were imperfect) gives even less definite results: 2.6 inches (66.04 mm.) seems to be the dividing line between the races, producing the tabulation:

	Under	*On the division line of 2.6 inches (66.04 mm.)*	*Over*	*Total*
Ontario and eastward	6	12	2	20
Prairie Provinces	2	6	6	14
		18		34
British Columbia	4	8	8	20

Thus 18 of eastern and central groups are on the line and are indeterminate; 2 *atricapillus* measure into *septentrionalis;* 2 *septentrionalis* measure into *atricapillus;* 22 out of 34 or 64 per cent are unidentifiable by wing measurement.

There is a large overlap in extreme measurements; the smallest *atricapillus* is only 0.1 inch (2.54 mm.) smaller than the smallest *septentrionalis;* the largest *septentrionalis* is no larger than the largest *atricapillus.*

Taking the 31 female tail measurements, 2.3 inches (58.42 mm.) seems the dividing line and we obtain the following condensed graph and tabulation.



TEXT-FIG. 2.—Comparative tail measurements of 31 female chickadees from Canada.

Analyzed as follows:

	Under	*On the division line of 2.3 inches (58.42 mm.)*	*Over*	*Total*
Ontario and eastward	6	3	5	14
Prairie Provinces	3	4	10	17
		7		31
British Columbia	6	2	4	12

Thus 7 of eastern and central groups are on the line and indeterminate; 5 *atricapillus* measure into *septentrionalis;* 3 *septentrionalis* measure into *atricapillus;* 15 out of 31 or 48 per cent are unidentifiable by tail measurement.

There is a large overlap in extreme measurements: the smallest *atricapillus* is no smaller than the smallest *septentrionalis;* the largest *septentrionalis* in only 0.05 inches (1.27 mm.) larger than the largest *atricapillus.*

In wing measurements of 27 of these females (four being discarded

as imperfect) 2.5 inches (63.5 mm.) is the dividing line, giving a tabulation:

	Under	*On the division line of 2.5 inches (63.5 mm.)*	*Over*	*Total*
Ontario and eastward	3	5	2	10
Prairie Provinces	5	4	8	17
		9		27
British Columbia	6	4	3	13

Thus 9 of the eastern and central groups are on the line and are indeterminate: 2 *atricapillus* measure into *septentrionalis;* 5 *septentrionalis* measure into *atricapillus;* 16 out of 27 or 59 per cent are unidentifiable by wing measurement.

There is a large overlap in extreme measurements; the smallest *atricapillus* is only 0.05 inches (1.27 mm.) smaller than the smallest *septentrionalis;* the largest *septentrionalis* is only 0.1 inch (2.54 mm.) larger than the largest *atricapillus.*

Summarizing these figures we find that birds of the prairie provinces average longer in the tail and wing than do either eastern or British Columbian specimens but with many doubtful and even contradictory individuals. The tail measurements seem to be the best guide to the differentiation of characters but there are the following percentages of probable error:

	Color estimated	*Wing*	*Tail*
Males	40 per cent	64 per cent	25 per cent
Females	40 per cent	59 per cent	48 per cent

An examination of a larger series might refine these figures but probably would not alter them seriously. Also they reflect chickadee conditions north of the international boundary and do not bear upon conditions that may be found southward. At least it may be said that the subspecies *septentrionalis* as it occurs in Canada is a very faint micrometer form, that the word "decidedly" used in description of it does not apply, and that no specimen unassociated with its geographical origin can be racially identified with more than approximate certainty.

The common practice in cases of variable differentiation is to average the characters and decide on the *ensemble* with the assistance of intuition based upon experience and personal equation. When,

however, only two characters are available (color in this case being quite uncertain) there is little to average, each character being one thing or the other and mutually independent. Where they conflict it is 'Hobson's choice' as to which to give most weight.

The position of the British Columbian birds is anomalous. From their geographical position they would be expected to exhibit extreme long-tailedness, instead of which they are intermediate, resembling their more distant instead of their closest neighbor as is indicated in the tabulations. How to treat these birds is a taxonomic problem, whether as a discontinuous distribution of far-eastern *atricapillus,* or as a fainter group of mid-western *septentrionalis,* or to erect them into a new subspecies as is done in the nearly similar case of the two dark east- and west-coast forms of the Horned Owls. There is a possibility that, with more high-northern material available, we may find that short-tailed *atricapillus* extends across the northern woodlands above the prairie form *septentrionalis,* around north of the Rocky Mountains and down into British Columbia in very slightly modified form. Present literature and experience do not encourage the idea, though there is little to indicate that such northern identifications as are recorded in literature are the result of critical examination of specimens or more than the perfunctory geographical assumptions that are so common in current faunal treatments.

The newly described northeastern form, *P. a. anamesus* Todd (Auk, 55: 116, 1938) here naturally intrudes itself. It is advanced with some apology for presenting another "millimeter race" and is described as intermediate between *atricapillus* and *septentrionalis.* We have not comparable northern Ontario and northern Quebec series for carefully testing it, but can see little justification in "splitting the difference and doubling the difficulty" in formally naming an intermediate between such faintly differentiated races.

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