

this assumption has resulted in the establishment of a basic fallacy in the taxonomic method of studying geographical variation. The tendency in this method has been to delimit races on the basis of one or several of the most obvious characters available in preserved material; the remainder of the geographically variable characters are then ignored, or if they are considered at all, they are analyzed only in terms of the subspecific units previously defined. A slight variation of the procedure is to choose several discordant characters, employ them in combinations of two or three to establish racial limits, and then analyze each character individually in terms of these limits.

A case in point is the recent study of the red-eyed towhee *Pipilo erythrophthalmus* by Dickinson (1952). Seven characters are used in various combinations to demarcate four races ranging successively from *alleni* in the south to the typical *erythrophthalmus* in the north. Wing length, plumage and iris color, and tail-spot size vary clinally along the succession of races. Culmen, tarsus, and toe length are greatest in the two intermediate "races" *rileyi* and *canaster*. The total picture of the variation gleaned from this study gives the strong impression that the intermediate forms are nothing more than segments of a broad, partly clinal intergrade zone connecting two extreme terminal populations. This is the conclusion reached by Huntington (1952, *vide infra*) in his analysis of remarkably similar variation found in the eastern purple grackle (*Quiscalus quiscula*); the same kind of characters vary in the same way in both the towhee and grackle, and the intermediate zones in both are geographically very close. The increase in culmen-tarsus-toe lengths in the intermediate towhee populations seems comparable to the increase in culmen-wing lengths in the grackle intergrade zone. In addition, the variation of independent characters in the towhee is obviously quite discordant, as evidenced by the rather poor correspondence of the iris-color distribution as

charted by Dickinson with the racial limits previously decided upon.

From Dickinson's data alone it cannot be proved that the geographical pattern in the towhee is the same as in the grackle, and that it may therefore be best expressed by the recognition of two races; yet the fallacy in Dickinson's method of analysis stands out clearly enough. His entire treatment is predicated on the shaky assumption that the races he has defined represent concrete biological units, and this despite his introductory warning: "In ornithological studies in large part the taxonomist is dealing with continuous variates and with variation that appears graphically as a cline. Under such circumstances lines of demarcation must be vague." Having established the four races, Dickinson thereupon uses them as sample groupings from which to analyze each character individually. Only one character, iris color, is plotted geographically as an independent variate. As a result, the true nature of the clinal trends can be inferred only from gross comparisons of the racial diagnoses. Instead of outlining the geographical variation of each character and then synthesizing from it the overall racial pattern, Dickinson has done just the reverse, thereby closing the door to further analysis and interpretation of the data which he has so laboriously gathered and presented.

Because of its closely similar nature and quite different approach, Huntington's analysis of geographical variation in the purple grackle deserves further attention. Much as in the towhee, four races can be demarcated arbitrarily along a southeast-northwest cline, but Huntington chooses to synonymize the intermediate two, *ridgwayi* and *stonei*, as segments of a clinal intergrade zone between the southern nominate race and the northern *versicolor*. Culmen length and wing length vary independently and discordantly with color, this time along a north-south cline. Huntington analyzes these two characters separately to demonstrate that both increase unexpectedly in size (with respect to their