

feeding, suggesting hunger. Perhaps, the inactivity of the cattle at this critical point set in motion the behavior of the egrets.

Enclosed in a field near the maintenance buildings of the plantation was a group of bulls accompanied by about six Cattle Egrets which fed along with them. When, in the late afternoon, the bulls sought a shady area to rest in some thirty feet from a house, the Cattle Egrets joined the bulls and walked all over the supine animals, picking flies off their bodies, the bulls appearing contented with the egrets' ministrations.—WALTER DAWN, 176 Wentworth St., Charleston, S. C.

The Status of the Semipalmated Plover.—The relationship between the small ringed plovers—*Charadrius hiaticula* and *semipalmatus*—has long been in dispute. These forms were described as full species under the old nondimensional species concept and so maintained until 1930. At this time Salomonsen (1930, Journ. f. Orn., 78: 65-72) pointed out the great similarity between these forms, that their ranges are allopatric and the lack of evidence of reproductive isolation between them, and therefore concluded that they were conspecific. Salomonsen's conclusion was accepted until Wynne-Edwards (1952, Auk, 69: 367-369) reported both *hiaticula* and *semipalmatus* from one locality in Baffin Island during the breeding season without showing any signs of interbreeding. Because of Wynne-Edwards'

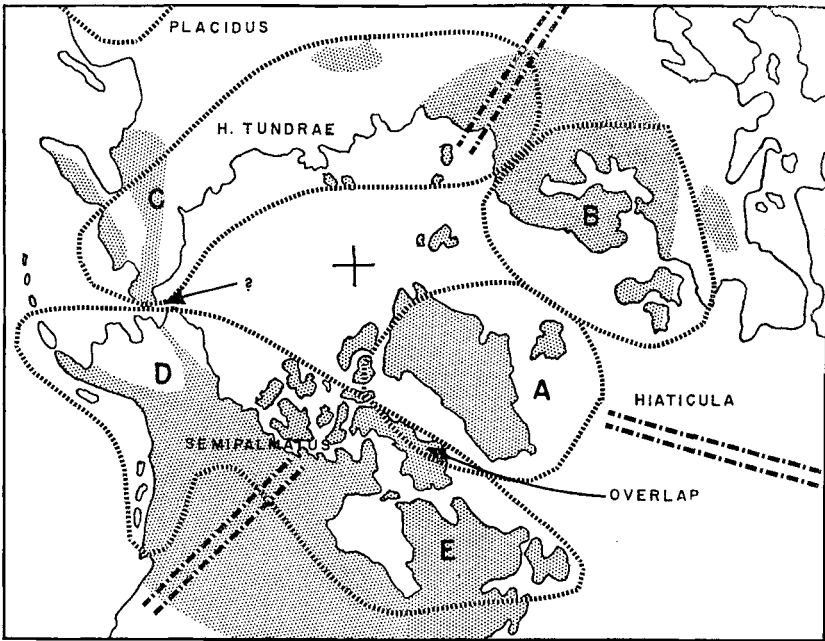


FIGURE 1. Distribution of the *Charadrius hiaticula-semipalmatus* complex during the breeding season. The letters A to E represent the five populations compared in this study; their limits coincide with the dotted lines except for the separation of the western and eastern *semipalmatus* populations which is not shown and which is approximately at Northwest Territories, Canada. The glaciated areas during the last ice advance are stippled. The heavy double lines separate the three major refuges for shorebirds during the last glacial advance.

findings, most ornithologists (e.g., the Committee on Nomenclature of the American Ornithologists Union, 1956, *Auk*, 73: 448) now regard the two forms as good species. In my review of the plovers (1958, *Bull. Mus. Comp. Zool.*, 118: 72), I maintained *hiaticula* and *semipalmatus* as conspecific, but did not give my reasons for this action. I wish to present these reasons here to bring the attention of more workers to this problem.

The accompanying map clearly illustrates the problem. *Charadrius hiaticula* and *semipalmatus* have a circumpolar distribution during the breeding season. (A related form, *placidus*, usually considered to be a separate species, is found in eastern China.) We know that *hiaticula* and *semipalmatus* coexist in a very small region in eastern Baffin Island during the nesting season without interbreeding. East and west of this point are connected, interbreeding populations of *hiaticula* and *semipalmatus* respectively until the Bering Straits are reached. Here is the problem: Does *semipalmatus* interbreed with *hiaticula tundrae* in this region or is there a reproductive gap between the two forms? There are two possibilities:

- (a) If the two forms interbreed, then *hiaticula* and *semipalmatus* are conspecific—a series of intergrading populations with terminal overlap in Baffin Island.
- (b) If there is a reproductive gap, then *hiaticula* and *semipalmatus* are good species.

What are the facts and which alternative do they support?

There is no direct proof that the two forms coexist during the breeding season in the Bering Straits' region. *Charadrius hiaticula tundrae* has never been recorded from North America, and while *semipalmatus* has been reported from Siberia (see "Catalogue of the Birds in the British Museum," vol. 24 and Hartert, "Die Vögel der paläarktischen Fauna," vol. 2), little is known of the exact distribution of these forms in the Chukotski Peninsula. Johansen (1958, *Acta Arctica*, Fasc. 9, pp. 10–12) states that no specimen of *semipalmatus* has been reported from the Chukotski Peninsula in recent years and indicates that the nature of the contact between *semipalmatus* and *tundrae* in the Chukotski Peninsula is still unknown. In fact, I would even question the identification of the *semipalmatus* specimens from Siberia, for these specimens were collected and identified before ornithologists realized that *C. hiaticula tundrae* bred in eastern Siberia. However, I have not seen the specimens and cannot be definite on this point.

I measured and compared the following characters—wing length, tail length, bill length and tarsus length—from the five populations shown on the map (table 1). When plotted on graphs, these structures all show the same pattern of geographic variation. There is a general cline from the large *hiaticula* in Europe to the small *semipalmatus* in eastern North America; however, the *hiaticula* populations form one cluster and the *semipalmatus* populations form a second cluster. The greatest difference is between the eastern *semipalmatus* and the Greenland *hiaticula* populations, but this is of scarcely more than "subspecific" value. The gap between the two Bering Straits populations is somewhat larger than the gaps within the clusters but still not even of "subspecific" value. The same conclusion is reached for color differences. In most features of plumage, *tundrae* is more or less intermediate between the European *hiaticula* and the eastern *semipalmatus*, which can be distinguished by these features. The Bering Straits populations could be separated only on the basis of the white superciliary stripe, and even this was not a very satisfactory means of separation. I was unable to examine the degree of webbing of the toes in the dried study skins.

TABLE 1

Population	Wing length			Tail length			Bill length			Tarsus length		
	R.	M.	S.D.	R.	M.	S.D.	R.	M.	S.D.	R.	M.	S.D.
"A" (7)	126-135	130	—	57-64	61.4	—	17-21	19.2	—	26-30	27.6	—
"B" (18)	120-134	129	4.66	57-66	61.4	3.49	18-23	20.3	1.33	23-28	25.8	1.35
"C" (26)	121-132	126.9	2.89	56-64	59.1	2.11	18-21	19.6	.75	24-29	26.2	1.45
"D" (33)	116-125	119.8	2.91	53-61	55.7	2.27	16-20	17.8	.94	22-27	24.3	.95
"E" (32)	114-129	122.5	3.22	53-60	56.5	2.02	15-19	17.2	1.00	22-26	24.3	1.13

TABLE 1. Mensural data for the five populations of the *Charadrius hiaticula-semipalmatus* complex. The symbols used are: R = range of the measurements, M = the mean, and S.D. = the standard deviation. All measurements are in millimeters. The sample size is given in parentheses after the letter designating the population.

The Pleistocene history of the shorebirds has been recently reviewed by Larson (1957, *Acta Vertebratica*, 1: 1-84). Following his data, I have indicated the glaciated areas on the map and shown the divisions between the three main refuges for shorebirds—Europe, Siberia-Alaska, and eastern North America—by the heavy double lines. Larson postulates, and quite correctly I believe, that *hiaticula* was present in Europe during the last advance of the ice sheets and *semipalmatus* was present in eastern North America and possibly Alaska at this time. Whether any member of this complex was present in most of Siberia at this time is still a matter of question. The important fact is that the ice sheets formed first and melted last in western Europe and eastern North America, thereby separating *hiaticula* and *semipalmatus* longer in this region than in the Bering Straits. Thus it is possible that the two forms met and interbred at the Bering Straits long before their ranges overlapped on Baffin Island.

These are the facts of the past and present distribution and of the geographic variation of external features. No definite conclusion can be deduced from them; more field work and collecting must be done in the Bering Straits before we can reach a final answer. However, the available evidence argues more for interbreeding of *hiaticula* and *semipalmatus* in the Bering Straits than for a reproductive gap between the two forms. Thus, I would recommend that *hiaticula* and *semipalmatus* be considered members of a single species which exhibits circular overlap. I must emphasize that this is only a suggestion, not a final decision; we must maintain an open mind until conclusive evidence has been gathered.—WALTER J. BOCK, *Biological Laboratories, Harvard University, Cambridge 38, Mass.*

Estimating a Hummingbird Population.—Having had a hummingbird feeding station for a number of years in my own garden in Denver, Colorado, and another on the Cherokee Ranch, 25 miles south of Denver in rough pine and scrub-oak country, I have found it of interest to work out a method for estimating the number of birds coming to the feeders. The basic requirement is for a type of feeder which does not leak or drip and which excludes other birds, bees, wasps, and in fact all customers except hummingbirds. The feeder I now use meets these specifications. An accurate record can be kept of the output from such a