

**FREEZING LEVEL STATISTICS FOR CANADA.** By R. L. TITUS. *Canada Department of Transport Meteorological Branch, 1968. 8½ x 11 inches, 40 pages. \$1.50.*

This paper is number 12 in the very valuable series of climatological studies published by the Meteorological Branch. Each one is the evaluation of a particular meteorological parameter for Canada.

The author gives statistical results of the evaluation of the freezing levels for Canadian radiosonde stations since 1955. The main part of the publication is comprised of statistical tables and maps constructed from these values. The text gives a short and clear description of the content of each table and the manner in which it was derived. Also a description of the method used for drawing the charts is given.

Information is given about the frequency of below zero temperatures above specified levels, temperatures above zero in specified levels, average thickness of surface layers below zero with higher than zero temperatures above and frequency of more than one freezing level.

These data will prove valuable for aviation climatology and an analysis of this wealth of information for a general climatology of Canada.

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**RELATIONSHIPS IN THE CHARADRII (SHOREBIRDS): A TAXONOMIC STUDY BASED ON COLOR PATTERNS OF THE DOWNY YOUNG.** By JOSEPH R. JEHL, JR. San Diego: *Society of Natural History, Memoir 3, 1968. 8½ x 11 inches. 54 pages, illustrated. \$3.50.*

Dr. Jehl's paper is a contribution to the understanding of relationships among the higher taxonomic categories of the avian Suborder Charadrii, the waders or shorebirds. Evaluations of relatedness are based on the topography of the dorsal down colors of the young. Specimens of 109 of the 201 wader species were examined, and use was made of descriptions or photographs of 53 more species. The median number of skins examined per species was 3 (range 1-74). Dr. Jehl's three seasons in the Canadian breeding range of about 14 wader species has added much to the content of this work.

The first few pages of this monograph are largely a discussion of the rationale for using the color pattern of downy young as a taxonomic character. It is argued that the character is "highly conservative" reflecting

phylogenetic relationships. Two larger sections constitute the main body of the study. The first describes the color pattern for each Genus with the aid of diagrams and 62 photographs of museum specimens. The second section considers the relationships among shorebird Genera and Families (and Tribes in Tringinae) on the basis of the down patterns and evaluates these in relation to existing taxonomies. Two short sections follow in which are presented an admittedly "highly speculative" shorebird phylogeny and a revised classification scheme. Finally, a very useful Appendix lists many sources of descriptions of downy young shorebirds.

In the introductory sections of his study, Dr. Jehl lists reasons for his feeling the color pattern is a "highly conservative" character reflecting "phylogenetic relationships and not environmental differences." Some of the arguments presented will not be compelling to every reader. Perhaps an equally strong case can be made for considering down patterns as reflecting environmental differences and as considerably less than "highly conservative." For example, Dr. Jehl points out the following observations: a) Two species may have similar or "identical" patterns and occupy different habitats. b) Young of species not closely related have different patterns and may occupy the same habitat. One is asked to accept the interpretation that such pattern similarities and differences are therefore not reflections of habitat similarities and differences. Surely this can only be argued from a framework of relevant data, and such data are lacking in this study. It may be equally probable, for example, that the occurrence of similar patterns in different "habitats" reflects similarity in microhabitat features where the young birds forage and where they hide in response to predators. Particularly damaging is that Dr. Jehl (citing Cott, H. B. 1957. Adaptive coloration in animals. Methuen) states that "The color of young shorebirds seems strongly correlated with that of the substrate in nesting areas . . . for this reason it is usually of little taxonomic value." Thus the importance of the observation that different patterns occur in the same habitat is considerably reduced because species whose chicks are quite differently colored also occur in the same habitat. My experience of two seasons in the Canadian north studying the foraging ecology and nest site selection in 6 species of shorebirds suggests that the alternate hypothesis that pattern is correlated with substrate and therefore a reflection of microhabitat crypsis must be disproved before the usefulness of pattern as a taxonomic character can be fully evaluated.