poster, suitable for classroom, office, or den.

This uncritical reviewer must admit some bias, having done his zoogeographic teething on Nova Scotia's herpetofauna, but I confidently predict that active provincial museums across Canada will begin emulating the style of this Nova Scotia Museum publication. This is not a book just for Nova Scotians, because these species range well into Ontario, have close relatives on the prairies, and even frequent the coast of British Columbia as sea turtles — a book suited to a general and professional audience coast to coast.

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An Analysis of Toads of the *Bufo americanus* Group in a Contact Zone in Central Northern North America

By Francis R. Cook. 1983. Publications in Natural Sciences No. 3, National Museum of Natural Sciences, Ottawa. viii + 89 pp., illus. Free.

Because this publication was derived from Cook's 1978 doctoral thesis, it contains numerous tables and appendices which are not the most stimulating reading. However, in addition to fine well-labelled drawings, Cook does include interesting accounts of his field work, and a reader would have little trouble following the clearly written dialogue. Publications such as Cook's are reminiscent of studies published three or four decades ago in that the study was undertaken over a long time period, involved a great number of individual samples, and required considerable patience for the meticulous detail of measuring and counting 34 different morphometric and meristic characters from more than 4000 toads. In today's scientific community the generation of short fast papers is a survival technique to avoid "perishing" at the hands of granting agencies which are more interested in titles than content. Unlike the early studies, however, Cook's analytical methodology involved computer generated univariate ratio analyses and discriminant function analyses. In addition to the morphological analyses, the study incorporates data derived from acoustics, breeding biology, experimental hybridization, and mark-recapture experiments. Few present studies, which use some of these techniques, have even a small fraction of the data base which was used by Cook. Even the computer could not handle all the information at one time. The power of discriminant function analyses is appreciated when we learn that the computer picked out one of 1644 specimens which was misclassified and this turned out to be a measurement error.

Cook provides a very clear description of the procedures involved in the different analyses and the utility of the procedures for systematics. Sections of this publication should be required reading for those students who contemplate using discriminant function analyses. The results lead into a theoretical discussion of species concepts and Cook concludes that the Canadian Toad and the American Toad are subspecies but close enough to being species that they could be considered megasubspecies. The process of speciation is an exciting area of research but controversy lies in the application of names to a dynamic process. If two or more species are derived from a single species, at what point can they be considered "good species"? Or, if two species hybridize and exchange genes, how much gene exchange would be required before we would consider the two species to have merged into a single species? Cook clearly documents morphological and acoustic differences between the Canadian Toad and the American Toad which would justify specific distinction but there is an area of contact where the morphological characters merge and intermediate individuals are common. The proposed scenario is post-pleistocene secondary contact of populations which morphologically diverged in response to different environments. The final outcome of the secondary contact will probably not be realized for another few thousand years. The application of names at the present time is subjective (and controversial). Megasubspecies is not a commonly used term and has not previously appeared in herpetological literature. It has received little use in other groups since its proposed usage in 1976.

Cook also discusses many species of toads in North America, questions the validity of *B. hemiophrys baxteri*, rejects the validity of *B. americanus copei*, and refutes the generality that *B. americanus* is larger in northern populations than it is in more southern populations. This publication will surely stimulate additional research concerning North American toads, contact zones, and the process of speciation.

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