Gladys M. Keener
Executive Editor

Ecological Taxonomy

THE article "Taxonomy Today" by Robert Cushman Murphy (SCIENCE, **115**, 3 [Feb. 1, 1952]) depicted the relatively strong position that taxonomy properly holds, because (*a*) only about 15 per cent of the fauna is known and more needs to be known; (*b*) a chaotic world of life is being replaced by one of order through taxonomy; (*c*) a large proportion of the known myriad physical manifestations of life are on permanent and accessible file in museums; and (*d*) the modern taxonomist regards his specimens as representing genetic complexes in protoplasm that display infinite varieties of patterns evolved under a condition that man cannot "control"—the amassed effect of secular time.

To this important array of values of taxonomy should be added others. Much time and energy have been devoted by taxonomists to isolating morphological patterns of species and subspecies and determining the geographic ranges of each. This is only a steppingstone to further progress in many lines—units around which accumulations of knowledge could be formed for comparison with one another. Until such units are stabilized so that they can be recognized, specific knowledge cannot accumulate—it will of necessity be generalized because, without such standardization, one worker cannot add to the specific knowledge of others.

Many species and subspecies occupy not only geographic ranges but also ecological ranges, delimited by certain types of habitats, certain types of biota, and certain niches within such habitats or biota. If these ecological ranges can be established, it will facilitate study of the divergent characters by means of which species and subspecies have been developed during long periods of time under the aegis of natural selection and under different conditions of habitat.

The ecological range can be determined in much the same way as the geographic range and by similar methods of specimen collection. The need for recording the habitat and biotic unit points to the necessity for standardized ecological classification, with units that can be recognized and used in collecting such data. The ecological point of view is already infiltrating taxonomy but, if extended and incorporated, would lead to better concepts of species and subspecies relationships and would yield a better foundation for understanding the ecological units of the biota found in nature. If the ecological point of view is increasingly adopted in taxonomy, then taxonomists would be equipped to move into the field of ecology and establish the taxonomy of ecological units.

This would necessarily involve a shift in basic units, but similar rules of nomenclature could be applied. The basic units, which would, of necessity, deal with both plants and animals, should (1) be natural subdivisions of the total biota and not merely special groups of plants or of animals; (2) comprise groups of species that interact with one another and evolve together; (3) occupy geographic areas that may be either continuous or discontinuous; (4) be distinctive aggregations of species; (5) be aggregations of species that are more or less interdependent; (6) be groups occupying habitats that are more or less distinct from other habitats; (7) be groups that are more or less independent of other communities (minor exchanges); (8) be aggregations that have histories as communities and that may have pioneer, developmental, and stable stages; (9) have boundaries, but these may be relatively abrupt or intergrade with adjacent units; (10) have recognizable physiognomies that can usually be delineated in the field.

If a species be regarded as potentially an interbreeding population of similar individuals, then this ecological unit differs in being an ecological aggregation of interacting species that evolve to fit one another. This approach could lead to a taxonomy of ecological units, to a study of the mechanism involved in natural selection aspects of evolution, and even to an experimental taxonomy.

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