
Ecology and Linkage versus Gene Infiltration

Every breeder, amateur or scientist, who ever attempted to shift the desirable characters of one kind of plant or animal over into another kind of plant or animal had to practise introgressive hybridization. Introgression was originally defined as the gradual infiltration of the germplasm of one species into that of another species. As a phenomenon, however, introgression may occur across any taxonomic boundary so long as hybridization followed by repeated backcrossing is possible. Thus introgression occurs in nature as well as the breeder's experiments. It has therefore played a role in evolution, unevaluated as yet, by enriching the genetic variability of the participating entities. The effects of geneteic linkage in restricting both the types and the frequencies of gene recombinations to a "recombination spindle" foster introgression of genes in groups rather than one at a time. Consequently, by careful study of a hybrid population and one of its parent populations it should be possible to detect a group of characteristics which are introgressing from the other unknown parent population. Once this group of characteristics becomes specified, it constitutes a critical taxonomic description, even though the unknown parent population has never been seen. Introgression takes place in direct relation to the degree of survival of hybrid segregates. Thus, its most rapid pace occurs under human husbandry by a breeder. Cultivated plants and weeds are man's respectively conscious and unconscious products of introgression. In nature, its rate is greatest where the habitat has been disturbed. It is here that new ecological niches are available to the new gene recombinations constituted in the hybrid segregates. As the previous ecological balance becomes restored, those recombinations most like the original parents will be the ones most likely to survive. Thus only a few genes will introgress at a time even under the most favorable natural conditions. Introgression is considered to be of greater fundamental biological significance the more gradual and imperceptible it is.

These concepts began developing in Dr. Anderson's mind some 15 years ago. Studies of natural populations in the field since then have verified all the gross aspects of his ideas. Refinements in technique are still desired.—*Elton F. Paddock.*

Introgressive Hybridization, by Edgar Anderson. 109 pages. New York, John Wiley & Sons, Inc. 1949. \$3.00.