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GENETICS AND EMBRYOLOGY[1]

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THE rapid rise of genetics has led to difficulties in relating its findings to those of embryology. The view has been expressed that progress in genetics is endangered by explorations in border fields. The problem has a general significance and seems to warrant discussion before a group of zoologists.

INBREEDING AND OUTBREEDING

In treating these difficulties it may be allowable to take a theory of one of the necessary conditions of evolution and to apply it to the analogous realm of scientific progress. Among the numerous constructive contributions of genetics to the discussion of the factors of evolution is the support it gives to the view that periods of isolation alternating with periods of intermingling among groups are necessary for progress. Inbreeding and outbreeding are both essential. New hereditary constitutions are swamped by outbreeding, and their recessive genes are incapable of expression under the condition of free contact within a large population.

With progressive isolation, small, homozygous, closely knit populations are produced. Each establishes its own clear and definite racial qualities. Many of the groups die out because of inherent weakness. Others have innate vigor and continue to flourish under isolation for a considerable period of time.

For the latter, two roads are open. If they continue in isolation their homozygous constitution leads to stagnation and their incapacity for rapid response to changing environments dooms them to extinction. If, on the other hand, after they have established themselves under isolation and are no longer in

[1] Address of the vice-president and chairman of Section F—Zoological Sciences, American Association for the Advancement of Science, presented at the Zoologists' dinner, Atlantic City, December 29, 1932.