2. A test o Goldschmidt's hypothesis of the "sensitive" segment.

The occurrence of a number of cases of closely linked genes with similar effects has suggested to Goldschmidt that the adjacent member alleles in such series may represent not factors with separate identity in the classical sense, but impairments at various points within a segment the whole of which is concerned with the development of normal phenotype for tho character involved. This is an engaging hypothesis and to the extent that evidence confirms it as an explanation for such closely linked systems it would supplant the hypothesis which argues the origin of such loci through duplication. It has the further merit that it may be tested readily for it requires that mutations of independent origin at a "locus" be distributed essentially at random within the hypothetical, sensitive segment and hence leads to the expectation that most combinations of heterozygotes of such mutant types give rise to reversions to wild type associated with crossing over within the specified segment. Most heterozygotes involving mutant alleles now available at particular loci in maize would not represent valid tests of this hypothesis, for in this material new alleles have been sought ordinarily among the progenies from crosses of normal plants with those carrying a mutant allele. Barring a position effect, this method favors the isolation of alleles which, on the above hypothesis, lie at the same point within the hypothetical segment. The hypothesis is being tested in maize under conditions which, it is hoped, will eliminate this bias. Plants which are homozygous for the A factor are crossed with T B-3a plants carrying A on the interchanged segment. Hypoploid endosperms among the progeny (see discussion under previous heading) will appear colorless if there has been a mutation of A to its recessive form in the egg parent. If there exists a relatively extended segment on the chromosome within which slight impairments at any one of a number of points may produce the effect of recessive a the isolation of mutants from such hypoploid progenies should insure that a random sample of mutants representing aberrations at various points within the hypothetical segment is obtained. Heterozygotes of these mutant forms may then be made in various combinations and analyzed for the occurrence of reversions associated with crossing over in the region concerned. The C and R loci are being analyzed in the same manner using appropriate A-B translocation stocks. We would be happy to receive, from cooperators, stocks carrying mutants of the above types which may have been obtained incidentally in crosses involving pollen parents carrying A-B interchanges.

John R. Laughnan and
E. H. Coe, Jr.