6. The lack of a teosinte-like fourth chromosome complex in tripascum.

A segment on chromosome 4, estimated to include the whole short arm, as marked by Su1 locus, is essential to the development of the female spike of teosinte (Mangelsdorf and Reeves, 1949; Rogers, 1950). It controls an inclination of the spikelets toward the cupule, an induration of the outer glume and the development of a rachis abscission layer.

The homozygous addition stock for the Su marked chromosome (Td7) derived from *Tripsacum dactyloides* has none of the above-mentioned effects of teosinte's fourth chromosome nor did the hybrid of this 20+2 stock with the TB4b tester involving the Su1 region reveal any of these teosinte characters in a population of 36 plants.

Furthermore the Td7 chromosome marked by Su1 does not carry 5 other loci (la, gl3, bm3, ra3, j2) borne on maize chromosome 4. Another tripascum chromosome (Tfl3) derived from *T. floridanum*, a species closely related to *T. dactyloides*, is marked by the Gl3 locus, but does not carry any of the other fourth chromosome loci of maize. Various other unidentified tripascum chromosomes carry dominant alleles to the la, bm, ra, and j2 markers on the fourth chromosome of maize.

On the basis of the above facts, the hypothesis that *Tripsacum dactyloides* contributed this fourth chromosome segment during a creation of teosinte from maize would seem to be invalid.

In view of the 9 chromosome base for the more distant relatives of maize, i.e. *Manisuris* and *Tripsacum*, it seems possible that Zea (teosinte and maize) is 9+1 and that the fourth chromosome could represent the extra pair which was assembled during a divergence from 9 chromosome Andropogonoid stock. It is possible that another species of tripascum carries a linkage group more similar to Zea 4 from which such an addition chromosome was derived. We have already experimentally added homozygous chromosome pairs from tripascum to maize in true breeding stocks (20+2). One of these (Td7) carries the Su1 locus near the centromere as on Zea 4.

W. C. Galinat