could have been increased from 10 to 18 by either duplication or fragmentation. We have already ruled out duplication on a basis of the transmission rate of dominantly marked Tripsacum chromosomes onto seven recessively marked corn chromosomes in the "WMT" stock and also on a basis of the number of Tripsacum chromosomes which are unmarkable in terms of the "WMT" marker genes.

If our hypothesis that Tripsacum is an amphidiploid of wild corn and Manisuris is correct, then we may also rule out fragmentation. The fact that some of the Tripsacum chromosomes, which are unmarkable in terms of the "WMT" genes, have Manisuris-like effects supports this hypothesis (MNL 38: 50-51, 1964). However, the data presented in the previous item suggests that some translocations involving entire arms of chromosomes have occurred and have set the stage for introgressive evolution. Following an introgression of this "manisuroid" germplasm into corn, two forms of selection have yielded two distinct products. Teosinte is the product of natural dissemination and modern corn is the product of dissemination by man.

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4. <u>Possible unreduced eggs in corn x *T. floridanum* hybrids and hybrid derivatives.</u>

The success in making the first backcross of a corn-Tripsacum hybrid to corn is dependent upon the production of unreduced eggs by this hybrid. In the case of our WMT corn x *T. dactyloides* hybrid, we had to resort to doubling the chromosomes with colchicine in order to get these fertile, "unreduced-type" eggs. But corn x *T. floridanum* hybrids are highly fertile without doubling the chromosomes and this has led Chaganti to suspect that this species may contain a factor similar to the elongate gene which causes unreduced eggs in corn.

This suspicion has been strengthened by the peculiar nature of a segregation involving *T. floridanum* chromosomes. Although the transmission rate for the homeolog to the short arm of chromosome 2 from *T. dactyloides* has remained constant at about 23% for four generations, a much higher transmission frequency as well as some large off-type plants have occurred in the second backcross to corn of a lg_1 gl_2 v_4 x *T. floridanum* hybrid. The increase in transmission over that expected for the random segregation of a Tripsacum chromosome corresponds to the frequency (25%) of these large plants, as shown in the table. They are highly suggestive of their 3n parent in being excessively tall and profusely tillered. Chaganti suggests they result from unreduced eggs and is studying the cytology of these plants at Andhra University in Waltair, India in order to determine this.

Genetic Data for Transmission Rate to 57 *lg1 gl2 v4* Corn Plants of Two Dominantly Marked *T. floridanum* Chromosomes Derived from a Corn-Tripsacum BC_1 Hybrid

	Arm of corn chromosome 2	
	Short	Long
Dominants from Tripsacum	Lg_1Gl_2	V_4
Rate (%) excluding plants from "unreduced eggs"*	54.5	38.6
Rate (%) including plants from "unreduced eggs"	63.2	66.6

*The large plants resembling their 3n parent and which may be Z(ZZT).

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1. Year-round corn in Hawaii.

Sweet and field corn varieties are grown regularly throughout the year at most of the 13 field experiment stations of the University of Hawaii. The stations embrace a wide range of climates, from wet to arid, subtropical to temperate. Corn is grown commerically from sea level to 4000', almost exclusively in summer months. A picture of the range of variation encountered is given below for Golden Cross Bantam sweet corn (7' in height, 85 days to harvest, in corn belt):