[1]from Wellhausen, E. J., et al - Table 14 in Races of maize in Mexico, 1952

[2]from Mangelsdorf, P. C. - unpublished

[3]Ear length from actual specimen

r = 0.881* (coefficient of simple linear correlation)

With 9 degrees of freedom at 1% level, significance = 0.735* (Tables of Snedecor, G. W., 1955)

*Highly significant since r is greater on the 1% level.

W. C. Galinat

12. Reciprocal introgression of high and low condensation in the American Maydeae.

The inflorescences of Tripsacum, teosinte and primitive corn are elongate and, in the staminate portions, are pendant as a result of low or relaxed condensation. But selection for higher kernel-row-number during domestication of corn has resulted in compact inflorescences with high or tight condensation. This high condensation might be associated with an objectionable fasciation or flattening of the ear, as it is in certain popcorns, if it were not for teosinte introgression in the more evolved races. Apparently the effects of genes for high condensation and fasciation in corn are modified by genes for low condensation from teosinte to the extent that the cob attains many rows but remains symmetrical. This observation was first made on some 700 year old cobs from Richards Cave, Arizona, in which there was a tendency for strongly fasciated cobs to be less Tripsacoid (Galinat, et al, Bot. Mus. Leaf 17 (4) ). Reduced condensation, which may come directly from Tripsacum introgression in certain South American races of corn (Mangelsdorf), may be so extreme as to allow space for the grain of the race Coroico to round out in shape and tesselate or interlock (Cutler, 1946.). Ordinarily the internodes are so short (condensed) that the adjacent pairs of grain are staggered by only one-half their thickness but in Coroico the internodes become sufficiently long for the kernels to round out and interlock so that the right member of one pair falls into a vertical row with the left member of the adjacent pair. The over-all effect is to reduce the kernel-row-number by one-half, a result which could also be achieved by the abortion of one member from each pair.

Reciprocal introgression of high condensation from maize into teosinte causes the primitive rectangular outline of the rachis segment to become compressed to a more triangular form. (Galinat, Bot. Mus. Leaf. 17 (8) ).

Corn with more than an average amount of fasciation should be more tolerant of reduced condensation from teosinte than the average strain. Inbreds with obvious fasciation (e.g. Iowa 5125) might be modified and improved by introducing one or two teosinte chromosomes.

W. C. Galinat

13. Chromosomes in the $F_1$ hybrids of maize and Jutiapa teosinte from Southern Guatemala.

Microcytes of $F_1$ hybrid plants of Wilbur's flint x Jutiapa teosinte and its reciprocal cross showed that meiotic chromosomes are sticky throughout all stages of this division. Chromosome knobs are usually fused into masses of heterochromatin, rendering chromosome identification and knob count extremely difficult.

At pachytene a paracentric inversion occupying the middle region of the long arm of chromosome 1 and equivalent to about one-fifth of its length was found. In addition to In 1 a practically terminal inversion in the short arm of chromosome 9 was definitely identified. Like In 9's in other previously reported teosinte varieties, this inversion underwent various configurations, predominantly loops, at pachytene. Measurements at pachytene showed the length of this In 9 to be about 62 per cent of the total length of the short arm, about the same length as in In 9's previously reported.

At metaphase I occasionally a few large sporocytes fail to undergo regular chromosome congress. Instead, the chromosomes form several chromatin masses scattering in the cytoplasm. These chromatin masses are well stained, but they no longer show any chromosome individuality. This phenomenon may be due to incompatibilities probably existing between the germplasm of maize and that of Jutiapa teosinte.

At anaphase I, chromatid bridges and fragments were counted in a total of 509 randomly chosen sporocytes. As shown in Table I, about 20 per cent of these sporocytes have either one bridge and one free fragment, or one free fragment without bridge. Three sporocytes having one bridge but without fragment were unexpectedly encountered.

At anaphase II the frequency of the occurrence of chromosome bridges was unexpectedly low. In a total of 415 single cells only one cell having a chromosome bridge was observed. (Table I.)