

crossing over (Table 1). This is much higher than the percentage found in the sporocytes having In 8 and In 9 but not In 3, in which among about a thousand counted none had chromosome bridges at anaphase II.

It is of interest that the interchromosomal effect of inversions on crossing over is not apparent in maize-teosinte hybrids carrying only In 8 and In 9, but as soon as In 3 comes into the karyotype with these two inversions, the interchromosomal effect becomes distinct. It is not unlikely that this phenomenon is controlled by position effect as suggested by Steinberg and Fraser (1944) to explain a similar situation in *Drosophila*.

Table 1. Frequency and percentage of bridges and fragments observed at anaphases I and II in the sporocyte divisions of an F_1 plant of Wilbur's flint X Xochimilco teosinte in which In 3, In 8 and In 9 are present.

Division	Anaphase I						Anaphase II		
	OB	1B	1B	2B	OB	OB	OB	1B	1B
Class	OF	1FF	2FF	2FF	1F	2F			1FF
Frequency	356	29	1	2	19	1	424	13	1*
Percentage	87.2	7.1	0.2	0.4	4.6	0.2	97.0	2.9	0.1

*unexpected

Y. C. Ting

9. Haploidy in the backcrossed progeny of a maize-Huixta teosinte hybrid.

Among the progenies of the third backcross to its maize parent (Wilbur's flint) of a maize-Huixta teosinte hybrid, a haploid plant was identified. It had 10 chromosomes instead of 20 as found in its sibs and it originated through gynogenesis. This plant was late in maturity, small in growth, and tillered profusely. During microsporogenesis, the sporocytes appeared much smaller than those of the diploid sibs. At early prophase, synizesis was always present. The identity of each univalent was then difficult to recognize. At pachytene, univalent chromosomes were extremely entangled, and they frequently folded back upon themselves to form nonhomologous associations. Pairing between heterologous chromosomes was rarely observed.

At metaphase I, practically all of the chromosomes appeared as univalents. Among a total of 308 randomly selected sporocytes, only eight had in addition to eight univalents, one bivalent possessing a chiasma-like appearance. Therefore, exchanges (or translocations) between two heterologous chromosomes are to be anticipated. At anaphase I, irregular chromosome distributions of various types were seen. Hence aneuploidy in the subsequent generation is expected to occur. A further investigation of this haploid plant is being carried on with the following objectives: (1) to study its derivatives by crossing to a standard

inbred strain of Wilbur's flint, (2) to compare the phenomenon of homozygosis with that of heterozygosis for teosinte chromosome segments by both selfing and crossing to its maize parent.

Y. C. Ting

10. Estimation of tripsacoid germplasm in teosinte and "Tripsacum" derivatives of maize.

In last year's News Letter, a new method for estimating teosinte and "Tripsacum" introgression into maize was described. This was based upon the comparative study of the cobs in a longitudinal section. While these studies are still in progress, another method has been found to be of some additional help. This involves crossing with Nobogame teosinte: (1) the original strain of A158, (2) strains of A158 modified by introducing teosinte chromosomes, (3) A158 strains modified by introducing extracted chromosomes from tripsacoid races of maize which are not in obvious contact with teosinte. The F_1 pistillate spikes have been studied for the following characteristics: (1) distichous versus polystichous arrangement, (2) single versus paired spikelets. The results for the first character which are based upon scores of 1-3 are shown in Table 1. The three grades are: 1 = distichous; 2 = intermediate; 3 = polystichous. In addition to this, those pistillate spikes having single spikelets are marked with one or two asterisks respectively depending upon whether less than or more than half the individuals of the F_1 population exhibit this feature. Absence of an asterisk indicates no single spikelets. Observations are based on 18-24 spikes from 9-12 plants.

Table 1. Results of crosses between modified and unmodified strains of A158 with Nobogame teosinte.

"Tripsacum" derivative X Nobogame teosinte		Teosinte derivative X Nobogame teosinte	
Country ¹	Average score	Derivative ²	Average score
Cuba	1.00*	Nobogame 4	1.0**
Honduras	1.07	Durango 1,9,7	1.0**
Nicaragua	1.18	Florida 4	1.0*
Bolivia	1.20	Florida 9	1.0*
Argentina	1.21	Florida 1,3 or 9	1.0*
Paraguay	1.27	Florida 3,4,9	1.0**
Brazil	1.33	Florida 3	1.1*
Mexico	1.43		
Control:			
A158 X Nobogame	2.6		2.6

¹Countries representing the source of races from which the chromosome with "Tripsacoid" effects has been extracted and introduced into A158.

²Varieties of teosinte representing the most likely source of chromosomes or chromosomal segments which have been introduced into A158.