being intensively subjected to disruptive selection and coevolution, would not be expected to fit such a relationship.

Walton C. Galinat

5. An interchange between two different Tripsacum chromosomes that are partially homoeologous to maize chromosome 4.

We have reported previously that several different Tripsacum chromosomes carry individual loci assembled on maize chromosome 4 (M4). Tripsacum chromosome 7 (Tr7) bears the Su_1 locus in common with the short arm of M4 while Tr13 bears the Gl_3 locus in common with the long arm of M4. Neither Tr7 nor Tr13 carries certain other M4 loci tested (ra_3, bm_3, j_2). We have reported the pachytene morphology of Tr7 and Tr13 in the 20+2 condition (MNL44:126-128, 1970 and Ann. Rev. Gen. 5:470, 1971).

Tr7 and Tr13 were combined in the 20+1+1 condition on su gl_3 maize for pairing studies by selecting for the Su^d and Gl_3^f combinations. After four generations of inbreeding, we collected cytological material from 38 of the double dominant plants in 1971. In six plants carrying the standard knobless Tr7 (Su^d) and standard knobbed Tr13 (Gl_3^f), we did not observe any pairing between them although they were occasionally observed in close proximity at pachytene. However, one family of the Tr7-Tr13 combination carried two knobbed but different Tripsacum chromosomes. Thus, we suspected that the originally knobless Tr7 had acquired a knob from Tr13 by an interchange during an earlier generation.

To determine if the Tr7 chromosome had acquired this knob from Tr13, we made cytological collections from the Su^d gl_3 phenotypes segregating in this family which would be 20+1 carrying the Su^d marked Tr7 but not the Gl_3^f marked Tr13. These 20+1 individuals did indeed carry a knob on their extra Tr7 chromosome.

The reciprocal event producing a knobless Tr13 was recovered in some of the Gl_3^f 20+1 segregates from an earlier generation of this line in which Gl_3^f showed an abrupt increase in transmission frequency, as described last year (MNL 46:114-115, 1972). Furthermore, we have now recovered all four possible combinations of the knobbed and knobless forms of Tr7 and Tr13 from these 20M + 1Tr7 + 1Tr13 families. When both Tripsacum chromosomes were knobbed or both were knobless, one was longer than the other as in

the original Tr7 and Tr13. When only one of the two Tripsacum chromosomes was knobbed, it could terminate either the longer or the shorter one, according to independent assortment of these reciprocal alterations with their standard counterparts.

It is not known how much, if any, chromatin interchange took place accompanying the knob transfer nor into which arm of Tr7 the knob was transferred. It might be possible to obtain information on this in the heteromorphic bivalent condition now being developed by crossing the old standard Su^d (20+2) line of Tr7 with its altered Tr7+K as well as the old standard Gl_3^f (20+2) line of Tr13 with its altered (knobless) Tr13-K.

Studies of interchanges (translocations) between different Tripsacum chromosomes that are partial homoeologs to the definitively important fourth chromosome of maize and teosinte are important in uncovering the course of evolutionary differentiation in the chromosomes of the American Maydeae.

R. V. Tantravahi
W. C. Galinat
P. Chandravadana

6. Results of crossing annual and perennial teosinte with ig/Ig maize.

Pollinations were made on Kermicle's stock of ig/Ig W-23 maize with three varieties of annual and perennial teosinte in an attempt to recover androgenetic monoploids of both annual teosinte and "diploids" (polyhaploids) from tetraploid perennial teosinte.

Studies of meiosis in haploid teosinte have not been reported. Perennial teosinte is generally considered as an autotetraploid, although it is questionable if it originated by chromosome doubling from one of the present day annual teosintes. If a "diploid" can be obtained from the perennial teosinte, one can observe if it will still remain perennial and if its cytological behavior reflects any genome differentiation.

The kernels from these pollinations were classified as follows: (1) those showing aleurone color at the crown of the kernel or at the scutellum and embryo axis; (2) those that are shrivelled (defective) and (3) those with no obvious color (Table).