

In addition to the true trivalency, 33% of cells at diakinesis and 20.3% of cells at metaphase I showed a false association of the tripsacum univalent with one of the maize bivalents. In these cases the univalent was positioned in such a way that a chiasma could not be inferred.

Thus, it could be that the higher trivalency in the triple heterozygote (65%) over that of one control (23%) was due to the presence of the teosinte segment. On the other hand, it is possible that mere heterozygosity for this segment had an effect. This possibility will be tested by combining Tr7 with the homozygous t^4s , t^4s teosinte segment.

In the triple heterozygote M_4 , t^4s , Tr7 reported last year, the pachytene spread was generally very poor. Whenever we could identify the tripsacum univalent in a small sample of analyzable cells, it either appeared as a univalent or it was clearly "hooked" onto the maize-teosinte fourth chromosome bivalent in the long arm and not with the short arm where the essential segment of teosinte has been assumed to be located. Additional linkage studies of this teosinte chromosome segment are necessary and are in progress.

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9. Altered morphology of the $G1_3$ chromosome in progenies showing a higher transmission rate.

During a cytological study of a family of plants showing a higher transmission rate of the $G1_3$ chromosome (Tr 13) in progenies of 20 + 1 plants, a single plant was found where the original Tr 13 chromosome seems to have suffered a morphological change. This chromosome, which originally had a knob in its long arm, lost it and appeared as a small fragment at pachytene. In 10 of the 15 observations made at pachytene, the fragment was found to be attached to the centromere of a maize bivalent. In three cases it was found lying free and in two other cases it was found on a maize bivalent. A somewhat similar fragmentation of the Su^d chromosome (Tr 7) has been reported earlier by Rao and Galinat (MNL 42:105-106). It is not known if the fragment represents the knobless arm of the original Tr 13 chromosome, derived as a result of breakage at

the centromere and the centromere of the fractured chromosome sticking to the centromere of a maize bivalent (non-homologous centromere association), or an acentric fragment which would be lost in the next generation. A large number of cells examined at diakinesis and metaphase I showed the fragment appearing separately from the rest of the bivalents and at anaphase I it showed a tendency to divide with the two sister chromatids attached by a "fiber."

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10. Comparative studies of American Maydeae and the Andropogoneae:
III Morphology of the pachytene chromosomes of *Manisuris cylindrica*
($2n = 18$).

The cytology of *Manisuris cylindrica* is of special interest in our cytological comparisons of the Andropogoneae to their close relatives in the American Maydeae because of the speculations that *Manisuris* is both one parent of *Tripsacum* and the evolutionary link connecting their respective tribes.

From about 250 observations made on individual *Manisuris* chromosomes at pachytene, it was possible to identify each of the nine members of the complement by their relative lengths and arm ratios (see Table). Due to poor spreading, not all chromosomes could be identified individually in any single cell.

The chromosomes are knobless. The position of their centromeres is median to submedian except for chromosomes 3 and 8 in which it is subterminal. The centromeres are oval achromatic regions with deeply stained heterochromatic areas on either side, as in *Coelorachis* and *Tripsacum*. *Manisuris* ($n = 9$) has half of the number of chromosomes and, on the average, shorter chromosomes than those of the other two genera ($n = 18$).

The nucleolar chromosome is assigned the 8th position. The organizing body itself is subterminal in the short arm as in *Coelorachis* and maize but not in the species of *Tripsacum* studied so far.