

described as having maximum extent of homology in the short chromosome and no parts present in triplicate gave an average metaphase I trivalent frequency of 92 percent (as compared to 90, 93, and 95 percent in former findings); 2. two constitutions with approximately half maximum extent in the short chromosome and no parts present in triplicate gave average metaphase trivalent frequencies of 43 percent and 54 percent respectively (as compared to 48 percent for the previously known type of this category). However, a plant of a new constitution, in which the maximum extent of homology was present in the short chromosome with approximately half this region present in triplicate and half in duplicate, gave a metaphase I trivalent frequency of 83 percent in contrast to 67, 71, and 72 percent found earlier in comparable constitutions. More plants of this type will be sought to study whether this departure from expectation is consistent and meaningful. The constitution differs from the others of its category in that the chromosome region present only in duplicate is terminal and maize instead of *Tripsacum* in origin.

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2. Anaphase I distribution of an extra, interchange chromosome.

In certain 21 chromosome constitutions tests are possible for the frequency with which an extra chromosome disjoins from its partial homologue at anaphase I, both following its involvement in crossing over and following failure of such involvement. One such test depends upon estimation of chiasma frequency in the pertinent chromosome region in microsporocytes and determination of disjunctive versus non-disjunctive frequency of these elements from genetic tests in the progeny (Genetics 49: 69-80. 1964). Two such progenies are now available (with total plant numbers of 153 and 127 respectively). The total frequencies of non-disjunction of homologous elements in these were 29 and 46 percent suggesting a greater than expected tendency for the extra chromosome to accompany its partial homologue both following and not following chiasma formation. (Previous average non-disjunction frequency following chiasma formation in a different test designed to test this quantity genetically was 19 percent; trivalent frequency of parents was 90 percent). Thus preliminary results are in contrast to the reports of R. F. Grell on *Drosophila* where univalent single extra chromosomes were found to be distributed randomly. Additional progenies will be scored, and B chromosomes (which are

approximately the same length as the extra chromosome) will be added to test for the possible presence of "distributive pairing".

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3. The duration of synizesis.

A Black Mexican sweet corn plant was grown outdoors in a pot and brought into the laboratory at sporocyte stage. The stem was opened and the intact tassel (still attached to the plant) was spread out on a plate supported by a ringstand clamped to the pot. Anthers were removed from every second or third spikelet and scored for stage. The entire tassel and its supporting plate were then enclosed in a plastic bag to prevent drying. (Intact spikelets retained a fresh appearance throughout the entire experiment). Remaining anthers were removed periodically and scored for stage. Assuming that the 13 spikelets bracketed at the beginning of the experiment by spikelets at synizesis were themselves at that stage, the approximate duration of synizesis in this plant (at 25° C) is estimated to have been 50-52 hours. The time to typical early pachytene stage varied from 17 hours to 54 hours, and the mode was in the 46-50 hour class. It is thought that those spikelets requiring near maximum time most nearly represented a full synizetic duration, the others probably having progressed beyond earliest synizesis at the beginning of the experiment. From fewer observations it is guessed that the duration of pachytene under these conditions was approximately 5 hours, and the remainder of meiosis about 1 hour.

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1. Genetics of tillering.

The studies on attempted identification of tillering genes by means of a series of 17 translocations are continuing. Two sets were planted out last year. One group, involving grassy-tillered stock, showed no tillers in either the wx/wx crosses or the Wx/-