The knobs on the short arms of chromosomes 1, 2, and 6 were small. On the long arm of chromosome 4 and the short arm of chromosome 7, the knobs were large in size. Medium-sized knobs were present on the long arm of chromosome 9.

Despite the occasional occurrence of terminal asynapsis in the short arm of chromosome 4, no definite inversion in this chromosome was identified at pachytene. However, at anaphase I of the microsporocyte divisions, chromatid bridges and fragments were frequently observed in certain hybrids. It is likely that some short inversions were present in this teosinte. Perhaps the lengths of these inversions were so short that the force of homologous pairing could not overcome that of non-homologous pairing. Hence, only rod-shaped configurations were formed at pachytene.

b. Perennial teosinte: Microsporocytes of four perrennial teosinte plants were studied. These plants belong to the progeny of a selfed plant obtained through the courtesy of Dr. D. L. Shaver of Cornnuts Inc., California. It was found that the pachytene chromosomes of these plants were virtually knobless. There were terminal large chromomeres on the short arms of chromosomes 8 and 9. Most of the chromosomes formed regular bivalents at pachytene. Very few multivalents were demonstrated. No deficiencies, inversions or translocations were observed. Apparently these plants are different in terms of chromosome characteristics from those studied earlier by the author (Chromosomes of Maize-teosinte Hybrids, 1964).

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2. Further studies on the B-chromosomes of maize.

In the last year, 79 plants of the selfed progenies of two inbred maize strains, carrying six B-chromosomes each, were examined. For the inbred 67-14, the number of B's per plant among a subtotal of 18 plants was found to vary from three to 12, with the largest number of plants in the six B class. As for the other inbred 67-17, among a subtotal of 61 plants studied the number of B's per plant was found to range from two to 12, with the largest number of plants in the class with five B's.

For a study of the effect of B-chromosomes on the seedset of maize, three additional inbreds were used. They were 66-14, with 15 B's, and 66-15 and 66-16, each with 12 B's. Selfings of three plants in each of these strains were attempted in the summer of 1966. It was later observed that seedsets of all of these plants were very poor, averaging less than five per cent. However, seedsets of sib plants having zero to five B's per plant were close to normal. Hence, the poor seedsets of these plants were attributed to their possessing a large number of B-chromosomes. However, before a definite conclusion can be drawn, a study on a large number of plants together with a statistical analysis should be carried out. Furthermore, the plants with many B's were also

found to be later in flowering, and slower in growth than their sibs.

For another study on the differential DNA synthesis in eu- and heterochromatin of maize, kernels with varying numbers of B-chromosomes were grown. At the early seedling stage, when length of their primary roots averaged about two inches, they were fed with H^3 -thymidine in Hoagland's solution. In preparing autoradiographs a standard dipping technique was followed. Data gathered up to the present indicate that the time of DNA synthesis in eu- and heterochromatin (B-chromosomes) differs. The euchromatin of maize, or A-chromosomes, started DNA synthesis before the heterochromatin. The investigation, it is hoped, may also lead to a detailed analysis of the mitotic cycle of maize.

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3. Extra chromosome element.

At the first meiotic prophase of the microsporocytes of a maize plant 67-44-2, an extra chromosome element was consistently observed. It was stained as well as the regular chromosomes either with propionic carmine or with Schiff's reagent. At pachytene, it always formed a circular configuration and its length on the average measured about 20 u. Its location was not confined to a certain part of the cell.

As the division advanced to diakinesis, no evidence of shortening of this element was obtained. At metaphase I, it fragmented into two elements. No centromeres were identified. Apparently due to their lack of regular movement at anaphase I, both of these elements were always found in only one part of the spindle. However, at telophase I, they were no longer identifiable in most of the cases. Among a total of approximately 500 cells examined, these elements were definitely observed in only about two per cent of the cells.

A few years ago a similar element was seen in one of the teosinte derivatives. That element was somewhat shorter than the one reported in the present communication. But its meiotic behavior appeared to be the same. Selfings and crosses with this plant, 67-44-2, were attempted last summer in order to know more about the significance of this element.

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1. Genetic recombination among spontaneous and ethyl methanesulfonate-induced waxy mutants in maize.

Ethyl methanesulfonate (EMS) has been reported to produce "point mutations"[4] and "single locus mutations"[1] in maize. Since intracistron

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