17. Cytological observations of the F_1 hybrids between maize and Nobogame teosinte.

Cytological study was made on the F_1 plants of reciprocal crosses of maize (Wilburs Flint) and Nobogame teosinte. It was consistently found that, at pachytene, all of the chromosomes from Nobogame teosinte are equal in length to the chromosomes from maize, despite the fact that in the parental Nobogame teosinte, chromosome 6 was found shorter than the average chromosome 6 from maize.

At pachytene, when any two homologues are heterozygous for either a terminal or an internal knob, the knob-bearing chromosome always appeared longer, at least for a knob length, than its partner. Such was the case for both chromosomes 7 and 9 in the present study.

A terminal inversion on the short arm of chromosome 9 was observed. The length of the inverted segment is approximately one-third of the length of that arm. In addition to a less frequently found ring-shaped configuration, the arms heterozygous for this inverted segment, often formed a V-shaped figure.

Centromeres of all the chromosomes in the hybrids were not so easily identified as they were in the parental species, suggesting that hybridization may perhaps have some effect on the centromere organization.

18. Internal knobs on the chromosomes of two tropical forms of Tripsacum.

Inflorescences of the two tropical forms of Tripsacum were collected by Dr. William Hathaway in Colombia in the summer of 1956. Taxonomically one form probably belongs to Tripsacum laxum Nash, the other, probably to T. australe Cutler and Anderson.

Cytological investigation of the forms showed that, in addition to terminal knobs, internal knobs are also present at pachytene. In the clones of T. laxum there are three chromosomes, probably 3, 5 and 8, having internal knobs on the long arm. Only chromosome 8 has an internal knob on the long arm in the smears of T. australe.

Pachytene chromosomes in Tripsacum laxum were very sticky and difficult to identify. Chromosome behavior was extremely irregular at both anaphase I and anaphase II. Mitotic chromosomes in the tapetal cells of the anthers proved superior to pachytene chromosomes for chromosome count in this species. It was found that there are 54 chromosomes in such cells. This particular clone of T. laxum is therefore triploid. Meiosis in the clones of T. australe is regular. The number of pairs of chromosomes was counted to be of 18 at both pachytene and diakinesis stages. Therefore, the clone of this species is diploid.

Y. C. Ting