UNIVERSITY OF TEXAS
Austin, Texas

1. Apparent juxtaposition of homologues at premeiotic mitotic early anaphase.

Sporocyte samples (from KYS and Coop chromosome 2 tester stock) collected at early tassel development were examined in acetocarmine squash preparations with a Zeiss photomicroscope equipped with a bright field 63X oil immersion objective, N.A. = 1.4. Most of the sporocytes in these samples were at premeiotic interphase. Previously unnoticed details of metaphase and anaphase in the occasional cells found at these stages were observable with this optical system. At premeiotic metaphase all or most chromosomes gave the appearance of having been pressed into parallel alignment throughout their length with each other and with the metaphase plate. At early anaphase, separating sister chromatids formed configurations which superficially resembled bivalent configurations of metaphase I to early anaphase I of meiosis (generally considered to be held together by terminalizing chiasmata). The significance of sister chromatids apparently tending to resist separation at the premeiotic mitosis is not understood; the most appealing speculation may be that these cells tend to develop some of the attributes of meiosis prematurely, in this case presumably some sort of generalized adhesiveness of sister chromatids. Of special interest is the fact that very similar configurations of separating sister chromatids tended to lie closely adjacent to each other in pairs at the premeiotic mitotic early anaphase stage. These paired configurations probably represent the most convincing demonstration yet seen of homologous pairing at the premeiotic mitosis in maize.

M. Maguire

2. Experimentally produced meiotic abnormalities.

Reports of previous years have dealt with the induction of diverse meiotic abnormalities in maize microsporocytes when various irritants were introduced adjacent to tassels containing sporocytes at meiosis and the tassels were gently heated in the presence of these substances. Of particular interest was a tendency noticed in some cases for apparent

sister centromere separation at the first meiotic division followed by plate re-orientation of these centromeres, so that equational distribution at the first division and disjunctional distribution at the second division were possible. Results of a systematic study of defects found after application of the various irritants used show that this type abnormality seems to be associated only with treatment with ethylene glycol and related compounds. These include carbowax, a polyethylene glycol which is a common base for medicinal ointments.

M. Maguire

UNIVERSITY OF TORONTO
Toronto, Ontario
Department of Botany

1. Differential Giemsa staining in maize.

Direct application of mammalian Giemsa banding techniques to the somatic chromosomes of maize does not result in banded chromosomes. Further, techniques employed with other plants do not yield suitable banding in maize. This report describes a series of experiments designed to obtain reproducible banding patterns concomitant with the maintenance of chromosome morphology.

Slides were prepared according to Chen[1] with the exception that a 23 hour cold treatment (4°C) was used in lieu of the 8-hydroxyquinoline treatment. Cover slips were removed by the dry ice method and the slides were air dried. The dry slides were stored in a dessicator for up to one week. Dry slides were then "pretreated" with one of various reagents or a combination thereof (Table 1), stained in Giemsa solution, air dried and made permanent.

Giemsa stain is a complex mixture of dyes and as expected, different sources, e.g., Fisher Scientific Co., Gurr R66 and Curtin Scientific Co., produced variable results. That is, different dilutions and staining times were required to yield equivalent staining; Fisher brand is used currently. Reference to Table 1 shows the range of pH, concentration and temperatures used to stain the slides. Salient points include the