With the presented A 632' and A 636' sister-line crosses, the following correlations were ascertained between the same yield component of B 14 relative line and its hybrid:

Number of kernels per row: $r = 0.9164^{+++}$

Kernel length: $r = 0.6427^{+++}$

Shelling percentage: $r = 0.6550^{+++}$

Thousand grain weight: $r = 0.6539^{+++}$

Ear length: $r = 0.5461^{++}$

Dry grain yield: NS, but significant at 10 per cent level

Row number: NS

$^{+++}$ = Significant at 0.1 per cent level

$^{++}$ = Significant at 1 per cent level.

$^{+}$ = Significant at 5 per cent level

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1. Synaptonemal complex in teosinte.

A study on the chromosome fine structure of maize and teosinte was continued last year. Anthers of diploid Michrona teosinte (Mexico) were fixed in glutaraldehyde and post fixed with osmium tetroxide. Then they were dehydrated by following alcohol series and embedded in Epon. The sections were generally 1000 A° in thickness. Stainings were made with both uranyl acetate (0.5%) and Reynolds lead citrate. The determination of division stages of the anthers for electron microscopy was made by following the standard aceto-carmine squash techniques by which one of the three anthers in each floret was fixed in aceto-alcohol fixative.

Particular attention was paid to the fine structure of pachytene chromosomes. At this stage, the synaptonemal complex was consistently observed. Three elements of this complex, two lateral elements and a central element, were clearly shown. The lateral elements measured about

300 A°, while the central measured 430 A°. The two clear zones flanking the central element were approximately 400 A° crosswise. Therefore, in frontal view, the diameter of the complex was about 1830 A°. In the cross-sections of the complex, these elements were also discernible.

With some of the clear electron micrographs it was possible to identify two fibrils, 100 A° across, within the central element of the complex. These fibrils were parallel with the central element. However, the transverse fibrils reported in several organisms were not revealed in my micrographs.

In addition, cytoplasmic invaginations into the nucleus were frequently observed. With the same procedures, these invaginations were never found in either haploid or diploid maize. Whether this is due to genetical control is unclear.

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1. Identification of the genotype of cultivar Ionia as to the Rf genes.

Dr. J. R. Edwardson, University of Florida, has kindly provided the senior author with a seed sample of the cultivars Moldavian (cytoplasmic male sterile) and Ionia (the maintainer), which he had obtained from the Soviet Union. He has identified the cytoplasm of the former to be S-type, although it is called M-type in the Soviet Union (Edwardson, personal communication). At the same time, he identified the genotype of both lines as $\underline{rf_3}\,\underline{rf_3}$, but he has not examined them for $\underline{Rf_1}$ and $\underline{Rf_2}$.

To identify the genotype of these materials, Ionia was crossed as the male to Minn A158T and R273N* female parents. The genotypes of both lines had been identified as follows:

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*These genetic lines have been provided by Dr. D. N. Duvick, Pioneer HiBred Corn Co., for which we are grateful.