this would leave an average frequency of 31% nondisjunction from trivalents. It is suspected that genetic background may strongly influence frequency of non-disjunction.

In some stocks a substantial deficiency of 21 chromosome progeny (and excess of 20 chromosome progeny) from non-disjunctive distribution were found (total average = 12%). These deficienceies and excesses were not correlated with mortality (although mortality was high and a potential source of error).

It is thought that they may have resulted from a tendency at metaphase I for trivalents destined to have nondisjunctive distribution to orient so that only the 2^T chromosome is directed toward the basal position. Such a tendency would not have been detected in the previcus study and would have resulted in a slight underestimation of frequency of nondisjunction and of crossover frequency.

Further tests are underway. B chromosomes, which are similar in length to the T^2 chromosome, are being added to the stocks for study of their possible effects on disjunction.

M. P. Maguire

2. Recombination studies in maize with segmental substitution from Tripsacum.

Although a segment derived from a Tripsacum chromosome has been found to carry dominant alleles for markers on the short arm of chromosome 2 of maize (ws, lg, gl), crossing over between this segment and the corresponding region of chromosome 2 rarely occurs. Previous results have suggested that in maize stocks which carry this segment as a heterozygous substitution such crossover inhibition is accompanied by an enhanced frequency of crossing over in adjacent regions. Disomic stocks heterozygous for the substitution were constructed to test the frequency of crossing over in the gl B, B sk, and sk v regions. Unfortunately, only pollen from plants heterozygous for sk was available from the tester stock at the appropriate time, and severe spring weather reduced the testcross progenies to a total of 622 plants. Results suggest that the b locus is very near the proximal end of the Tripsacum segment, that the recombination frequency between B and sk is high (13 per cent in these studies) and between sk and v very high (50 per cent). The tests are being repeated with pollen from sk sk plants and hope of low spring mortality.

Similar tests in 21 chromosome plants carrying a normal chromosome 2, a 2^T chromosome and a T^2 chromosome also suffered from high mortality and the use of an Sk sk tester, but similarly suggested high recombination frequency in the sk v region. These tests are also being

repeated. They provided convincing evidence, however, that the T^2 chromosome carries an Sk allele in its Tripsacum region.

M. P. Maguire

3. The relationship of crossing over to chromosome synapsis in a short paracentric inversion.

Frequencies of (any) reverse pairing at pachytene and bridge and/or fragment formation at anaphase I have been compared in three plants heterozygous for inversion 1 Lh (Longley 5083). This inversion is listed by Longley as having breakpoints at .70 and .87 in the long arm of chromosome 1, and is thought to contain well less than 50 crossover units. Pooled data (homogeneous at the 5 per cent level in chi square tests) are as follows:

Plant	Frequency of reverse pairing at pachytene No.	%	Combined anaphase I bridge and fragment, and fragment only frequency No.	%
1	182/505	36.0	466/1303	35.8
2	149/495	30.1	303/1023	29.6
3	190/544	34.9	426/1244	34.2

Since 2 strand double crossovers within the inversion are rare, the anaphase I data are considered a measurement of crossover frequency within the inversion. Such a close correspondence of frequency of homologous pairing at pachytene and crossover frequency in a region of considerably less than 50 map units is interpreted as further evidence that either crossing over is a precondition for homologous pachytene synapsis or invariably follows pairing of the tested region.

M. P. Maguire