difference between the components of the normal 6 and the corresponding components of the abnormal 6 was tested by means of *t* test. There was no significant difference between the length of the satellite of the normal 6 and that of the terminal satellite of the abnormal 6 (t = 1.7452, d.f. = 43). The short arm of the normal 6 is apparently longer than the short arm of the abnormal 6 (t = 11.0689, d.f. = 43). However, when the interstitial satellite was taken as one part of the short arm of the abnormal 6, the difference between the short arm of the normal 6 and that of the abnormal 6 was not significant (t = 1.7999, d.f. = 43).

To study the transmission of abnormal 6, heterozygous plants were self-pollinated and backcrossed to N6/N6 and A6/A6 plants. The results from the crosses are shown in Table 2. The abnormal 6 was transmitted more frequently than the normal through the male gametes. It seems that the pollen grains with one, non-crossover, paracentric inversion on chromosome 6 may have selective advantages over the normal pollen grains (without A6) in germination and tube growth. Therefore, A6 will spread throughout the stock after several generations of self-pollination and/or sib-crossing.

C. C. Chen

5. Abnormal recovery of parental classes in the heterozygous translocation 9 - 2c.

A series of translocation stocks, all involving the short arm of chromosome 9, was obtained from the Maize Co-Op for mitotic studies. Meiotic and recombinational data were taken on a majority of the stocks. The stock in question, 9 - 2 c (9s.33 - 2s.49), T + + +/N wx bz_1 sh_1, was backcrossed to the chromosome 9 tester. The data in Table 1 demonstrate (a) no recovery of crossover events between sh_1 - bz_1; (b) a marked reduction in crossing-over between bz_1 - wx; and (c) an abnormal ratio for the two parental classes (+ + + and wx bz_1 sh_1) from both the ♂ and ♀ T/N parents.

A comparison of crossing-over in the bz_1 - wx region through the ♂ and ♀ (using X^2 and Maximum Likelihood variance estimates) showed no significant difference at the 5% level. Homogeneity tests within the o and o populations (cob to cob) showed no significance at the 5% level.

Table 1

Backcross data from T 9 - 2 c ++/N wx bz_1 sh_1 x wx bz_1 sh_1 tester

T/N Parent	Genotypes					Ratio : 1	% Recombination	
	+ / + / +	sh_1 / bz_1 / wx	+ / + / wx	sh_1 / bz_1 / +	Σ	$\frac{+ \quad + \quad +}{sh_1 \quad bz_1 \quad wx}$	sh_1-bz_1	bz_1-wx
♂	3051	1826	64	85	5026	1.69 ± .09	0	2.96
♀	4510	2457	132	66	7165	1.84 ± .05	0	2.76

A Wilcoxon Rank Sum test yielded a significant difference (1% level) between the ♂ (1.69 ± .09) and ♀ (1.84 ± .05) ratios. Thus the two populations (♂ and ♀) are each homogeneous; the recovery of the non-translocated chromosomes is, in each population, significantly higher than expected; and the two ratios are significantly different.

Abnormal segregation from a T/N has been reported previously. Nuffer (MGCNL 35:94) reported for the wx 9 translocation series a consistently higher ratio of normal to translocated chromosomes through the ♀. This effect, however, was not as consistent in the ♂. Lima-de-Faria (MGCNL 33:66) reported (T5-6y/NY) a significantly higher proportion of translocated chromosomes through the ♂. He suggested differential fertilization to account for his observed discrepancy commenting that "gametophytes carrying translocated chromosomes are apparently more viable than those with normal chromosomes."

The apparent recovery of a higher proportion of translocated chromosomes in our study supports Lima-de-Faria's suggestion of differential fertilization. However, if differential fertilization were involved, one would expect the proportion of starchy/waxy pollen grains to approximate a 1:1 ratio. From several thousand counts, we found the +:wx ratio to be 1.69:1, which approximates the ratio in the backcross progeny using the T/N as the ♂.

The frequencies of the configurations at diakinesis (Table 2) are similar to those suggested by Burnham (1962) for long interchange segments. However, we recorded 36.1% pollen sterility. B chromosomes and K10 are not present in this stock.

Table 2

Cytological data from T 9 - 2 c/N

	Diakinesis			Pollen	
	⊙4	Chain 4	Pairs	Abortion	Ratio : 1 +/wx
frequency	756	64	0	36.1%	1.69

At present, two more tests are being carried out; (a) intercross data from T/N x T/N, subsequent scoring of wx, bz_1, sh_1, and the occurrence of the three types of chromosomal combinations (TT, TN, NN); (b) screening of a large number of wx, bz_1, sh_1 genotypes in an attempt to recover crossover events between the waxy locus and the breakpoint. Recovery would permit the reciprocal test, namely the recessive alleles on the translocated chromosome and the dominant alleles on the non-translocated chromosome. Nuffer's data using the Wx allele as a marker on N, indicated a higher proportion of normal chromosomes were transmitted through the ♀. However, 9 - 2 c displays the reverse. By changing the allele-chromosome combination, some insight into the abnormal chromosome segregation and its relationship, if any, to the waxy or adjacent loci may be forthcoming.

W. G. Filion

6. Biometrical analyses of somatic (root-tip) chromosomes.

The maize root-tip karyotype procedures provide an experimental system within which can be studied environmental and heritable factors affecting chromosome parameters. We have initiated a study in which we propose to examine the biometrical modifications:

1. on the entire complement, which might result from the influence of gene loci known to alter chromosome behavior;
2. on individual chromosomes as a result of cytogenetic alteration.

Below are presented representative data from one of the stocks used as a basis for several studies in this laboratory.