The R^{nj} mutant thus obtained was tested for paramutagenicity, in R^{nj}/R^r heterozygotes, and compared with the parent R^g (self-colored) allele and R^{st} (stippled).

Genotype of staminate parent	Mean aleurone color score of $R^r/r^g/r^g$ kernels* from testcrosses on W23 $r^g r^g$ ♀♀
R^{nj} (mutant) $/R^r$	3.66
R^{nj} (mutant) $/R^r$	3.56
R^{sc} 134$/R^r$	5.10
R^{sc} 134$/R^r$	5.16
R^{st}/R^r	2.99
R^{st}/R^r	3.66
R^r/R^r (Control)	5.89

*Based on scores of 300 individual kernels (50 kernels from each of 6 testcross ears in each male family).

These data show that the R^{nj} mutant is paramutagenic, and is significantly more paramutagenic than the $R^{sc}134$ parent allele. There have been few instances in which a mutant allele at the R locus has been more paramutagenic than the parent allele. In the present sequence both the observed mutation events involved coincident alteration of R locus phenotype and level of paramutagenicity. In the Navajo mutant full paramutagenicity is restored, and this observation lends support to the idea that in certain self-colored (R^g) mutants derived from R^{st}, the unaltered genetic region determining paramutagenic action is suppressed by an extragenic element.

K. S. McWhirter

3. A dominant partial inhibitor of yellow endosperm.

A dominant gene which acts as a partial inhibitor of Y (yellow endosperm) has been isolated from Dr. A. L. Hooker's Source A *Helminthosporium turcicum* resistance stock. One plant from this stock, when crossed with W22 (ACr^g/ACr^g, Y/Y), produced a progeny in which half the plants segregated 3 dark yellow: 1 white endosperm, on selfing, and half the plants segregated dark yellow, pale yellow and white endosperm kernels, on selfing. On the latter ears the kernel types occurred in the ratio of 9 pale yellow: 3 dark yellow: 4 white. The segregation totaled for samples from 10 ears was:

1057 pale yellow: 331 dark yellow: 416 white.
Segregation (X^2 (2d/f) = 4.63, P = 0.20; heterogeneity
X^2 (16 d/f) = 14.1, P = 0.50).

These results can be interpreted as indicating the segregation of a dominant gene (Iy), which causes partial inhibition of yellow endosperm to produce a pale yellow kernel phenotype. On this basis the observed classes of kernels have the phenotypic formula 9 pale yellow (Iy Y): 3 dark yellow (iy Y) : 4 white (Iy y and iy y). There is some variation within the colored classes, presumably due to dosage effects, but the segregation is nevertheless readily recognized.

This interpretation is supported by the results of progeny tests of 115 plants grown from kernels on ears segregating 9 : 3 : 4. These data are summarized in Table 1.

Table 1

Progeny test results obtained by self-pollination of plants grown from kernels on ears segregating 9 pale yellow : 3 dark yellow : 4 white endosperm

Parent kernel type	Description of selfed ears	Number of plants observed*	Number of plants expected
White endosperm	Homozygous white	14	14
Pale yellow	Seg. 3 pale : 1 white	12	15
	Seg. 9 pale : 3 dark : 4 white	32	30
	Seg. 3 pale : 1 dark yellow	14	15
	Homozygous pale yellow +	9	7
Dark yellow	Seg. 3 dark yellow : 1 white	21	23
	Homozygous dark yellow +	13	11

*These results are approximate, counts have yet to be completed.
+Excluding 1 & 4 exceptional ears, respectively, probably due to heterofertilization.

After excluding a few exceptional ears, which were probably due to heterofertilization, these data show a good relation of parent kernel phenotype and the genotypic array expected within each class. Also there appears to be a reasonable correspondence of observed and expected frequencies of the different genotypes.

All four homozygous genotypes, Iy Iy Y Y, Iy Iy y y, iy iy Y Y and iy iy y y, have been established and the inhibitor (Iy) has no obvious pleiotropic effect.

The plant from Source A was of the genotype Iy/iy, Y/Y and W22 has the genotype iy/iy, Y/Y.

K. S. McWhirter

UNIVERSITY OF TEXAS
Austin, Texas
Genetics Foundation

1. Studies on the effect of temperature treatment on intergenic and intragenic recombination.

Plants heterozygous for T6-9b or for $wx^{90}wx^{c}$ were grown in a growth chamber with controlled temperature, light period and humidity. Temperature was maintained at 70°F (±2°F) at floor level (close to 75°F at sporocyte level); relative humidity varied between 85% (with light on) and 95% (with lights off); diurnal light period was 14 hours with a mixture of cool white fluorescent and incandescent lights. Each plant was grown in fresh "Carl Pool" potting soil; starting at the three-leaf seedling stage, each was fertilized once a week by addition of one teaspoon (in solution) of "Rapid Gro." Reasonably vigorous growth was achieved under these conditions. At sporocyte stage bracketing spikelet samples were removed from some tassel branches and fixed for stage determinations; the remainder of each tassel was carefully returned to the stalk and was either immediately heat treated, as described elsewhere (P.N.A.S. 55:44-50, 1966), or maintained at constant temperature as a control. Tassel branches (both bracket-sampled and intact) were then removed and fixed at intervals following initial sampling by 5, 24, 48, 72, 96 and 120 hours from plants heterozygous for T6-9b. Pollen samples were collected and fixed from treated and control $wx^{c}wx^{90}$ plants and will be examined for effects of treatment on interallelic recombination. Quartet stages from heterozygous T6-9b samples have been scored for frequency of normal nucleolus quartets. This quantity may be related to crossover frequency if it is assumed that the frequency of adjacent II distribution (from the ring of four translocation configuration) is inversely related to crossover frequency in the interstitial segment of the limb carrying the chromosome 6 centromere and if 6^9 univalents are distributed at random with respect to the normal chromosome 6. Results are shown in Table 1. The results are not suitable for standard statistical analyses because of interplant heterogeneity and because of the number of sampling times from various plants where data are missing (where samples did not contain any quartet stage cells). The greatest and most consistent departures from means of treated plants and from control values were found in the 72 hour samples of treated plants. Cells fixed at quartet stage 72 hours after initial sampling are estimated to have been at premeiotic interphase at the time of treatment although the possibility that some were at early synizesis cannot be excluded. Data so far available from studies of stage duration, based on samples of adjacent spikelets removed at the beginning of the experiment and at the various intervals following, and on relative frequencies of the various stages, are