this material were carried out in 1958, the results of which may be summarized as follows:

(a) T2-10a R^r and T4-10b R^r are, in fact, significantly stronger in aleurone pigment-producing action than standard R^r in a normal chromosome 10.

(b) On reincorporation into a normal chromosome 10 from a T chromosome, R^r retains its enhanced pigment-producing action. This observation excludes an explanation of the phenomenon in terms of position effect of the conventional kind.

(c) Enhancement of R^r action does not appear in the offspring of plants carrying a T chromosome bearing an r (colorless aleurone) allele, with standard R^r present in a normal chromosome 10 (Tr/R^r). Evidently the original change to enhanced R^r action requires that R^r be in coupling, not in repulsion, with T, in the translocation heterozygote.

(d) Testcrosses on rr plants of TR^r/TR^r homozygotes yield the same enhanced R^r phenotype as results when pollen from TR^r/r plants is used. Seemingly, "pairing stress" at meiosis is not a factor in the enhancement process.

(e) Partial reversion of the enhanced pigment-producing action of R^r in a TR^r chromosome toward the level of standard R^r is found among the offspring of TR^r/R^r plants.

(f) Paramutability of TR^r in TR^r/R^{st} heterozygotes (and also of R^r extracted from a TR^r chromosome) is markedly lower than that of standard R^r in ordinary R^rR^{st} individuals.

(g) The partial reversion of enhanced R^r toward standard R^r, observed among the offspring of TR^r/R^r plants, is paralleled by an increase in paramutability when an R^r allele with this history is made heterozygous with stippled.

Margaret Blackwood*
R. A. Brink

* Permanent address: Melbourne University, Melbourne, Australia.

3. Basis of the light stippled phenotype.

A few stippled aleurone kernels with a much reduced frequency of spotting were regularly observed in a series of matings of R^rR^{st} and $R^{st}r^r$ with r^gr^g. When such kernels were planted, and the resulting individuals were selfed, ears were formed that showed an R^{st} (light) phenotype. The frequency of such germinal changes to R^{st} (light) was found to be 58.7/1000 and 50.3/1000 R^{st} gametes when tested in R^rR^{st} and $R^{st}r^r$ heterozygotes, respectively. A population of 13,084 R^{st}

gametes was tested. The frequency of germinal changes to R^{st} (light) in homozygous R^{st} stocks was found to be only 0.3/1000, based on a population of 18,586 R^{st} gametes.

The difference between the frequency of changes to R^{st} (light) in R^{st} heterozygotes with R^r and r^r and in R^{st} homozygotes suggested that such changes are either 1) associated with heterozygosity, per se, at the R locus, or 2) a product of crossing over between R^{st} and a linked modifier carried on the R^r and r^r chromosomes.

A test was made using a proximal marker, golden (g), and a distal marker, a terminal heterochromatic knob (K), to test for the association of crossing over with changes of R^{st} to R^{st} (light). The following cross was made: g R^g K/G R^{st} k x g r k. R^{st} (light) kernels were selected and planted; the resulting plants were scored for golden, and the ears were pollinated with rr. K was scored by making counts of the number of R^{st} (light) and r kernels on each ear to determine whether preferential segregation for R^{st} (light) had occurred. The results from this test showed that changes to R^{st} (light) were always associated with crossing over between R and K.

It is hypothesized that there is a locus about 5.7 crossover units distal to R, the alleles of which modify the expression of R^{st}. The modifier conditioning normal stippled expression was designated M^{st}, and the one conditioning R^{st} (light) expression was designated m^{st}.

The R^r and r^r chromosomes in the first test carried m^{st}, and the crosses made may now be diagrammed as follows: R^r m^{st}/R^{st} M^{st} x r^g m^{st}. Crossing over produced an R^{st} m^{st} chromosome which conditions R^{st} (light). The complementary crossover class would be R^r M^{st} in the R^rR^{st} heterozygotes, and r^r M^{st} in the $R^{st}r^r$ heterozygotes. Both of these complementary crossover classes have been identified, and they occur with the same frequency as R^{st} (light).

The changes of R^{st} to R^{st} (light) in R^{st} homozygotes cannot be ascribed to recombination between R^{st} and a linked modifier. The few mutants obtained from these matings have been interpreted as mutations of M^{st} to m^{st} or transpositions of M^{st} (see below).

R. B. Ashman

4. Transposability of M^{st}, a modifier of stippled aleurone.

Numerous self-colored kernels were selected after the following cross: $R^{st}r^g$ x r^gr^g. These kernels were grown out to verify the presumed mutations of R^{st} to self-color. The ears produced by the resulting plants were pollinated with r^rr^r. As observed in an earlier test, less than half of the phenotypically self-colored kernels gave self-colored (R^{sc}) offspring. Fifty plants, in fact, grown from 64 self-colored kernels did not