The non-mutable types in Column II are probably $\underline{a}_2^{m(nr)}$ types and crosses with an $\underline{a}_2^{m(r)}$ (a colorless $\underline{a}_2$ that will respond to $\underline{En}$) will test this.

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1. Genetic studies involving homozygous T6-9e: The location of $\underline{Y}_1$ with respect to the break point in chromosome 6 and a reduction in crossing over observed in chromosome 9.

Patterson (1958, Maize Genet. Coop. News Letter 32:54-66) reported on linkage relations of T6-9e (6L.18, 9L.24) in which he indicated that the break point in 6 was probably proximal to $\underline{Y}_1$. This break point position has been confirmed by testcrossing plants homozygous for the translocation and heterozygous at the $\underline{Y}_1$ and wx loci. If the break point on 6 is proximal to $\underline{Y}_1$, wx and $\underline{Y}_1$ should be linked in the homozygous translocation plants. If the break point is distal to $\underline{Y}_1$, independent assortment should be observed. Table 1 gives the results of the testcross.

Table 1

Testcross data of plants homozygous for T6-9e and heterozygous at the $\underline{Y}_1$ and wx loci ($\frac{\underline{Y}_1\ \underline{T}\ \underline{wx}}{\underline{Y}_1\ \underline{T}\ \underline{Wx}}$).

Direction of cross	Phenotypes				% C.O.
	White waxy	Yellow starchy	White starchy	Yellow waxy	
F_1 as males	913	948	34	23	
F_1 as females	919	857	22	24	
	1832	1805	56	47	2.8%

The data indicate that the break point in chromosome 6 is proximal to $\underline{Y}_1$ and that about 3% crossing over takes place between wx and $\underline{Y}_1$. Since the cytological distance between waxy and the break point in chromosome 9

is much greater than that between $\underline{Y}_1$ and the break point in chromosome 6, it is reasonable to assume that most of the observed crossing over takes place in the chromosome 9 segment and that $\underline{Y}_1$ is located cytologically very close to the break point in 6 (L .18).

These data establish that the centromere on 6 is definitely to the left of the $\underline{Y}_1$ locus.

The attachment of a segment of chromosome 6 to chromosome 9 has resulted in a marked decrease in crossing over in the wx-break point region. Linkage data reported at the annual Maize Genetics Conference indicate that the distance between wx and $\underline{gl}_{15}$ (located cytologically at L .1) is 15 units. Since the T6-9e break point (L .24) is distal to $\underline{gl}_{15}$, a minimum of 15% crossing over would be expected between wx and $\underline{Y}_1$ in a homozygous translocation. The observed value of 2.8% represents a considerable reduction in crossing over.

Rhoades (1960, Maize Genet. Coop. News Letter 34:67 and 1966, Maize Genet. Coop. News Letter 40:60-62) reported that the insertion of a duplication for chromosome 3 between bz and wx reduced crossing over between these two loci rather than increasing it as apriori considerations might suggest, since the length of chromosomal material was being increased. However, he did find increased crossing over in the $\underline{C}$-$\underline{sh}_1$ and $\underline{yg}_2$-$\underline{C}$ regions. This latter effect would rule out the possibility that the presence of the homozygous break points somehow acts to reduce crossing over or that the presence of homozygous foreign chromatin of necessity reduces crossing over in adjacent regions.

Contrary to Rhoades' observations, the attachment of a segment of chromosome 6 to the long arm of chromosome 9 creates a marked reduction in crossing over in the region adjacent to the break point in the homozygous translocation. It would be of interest to determine how the presence of this homozygous segment of chromosome 6 affects crossing over between other genes located in the wx-break point region and if this effect extends beyond the wx locus, and also, if a similar reduction in crossing over is observed in chromosome 6. Anderson, Kramer, and Longley (1955, Genetics 40:531-538) found that heterozygous translocation involving the long arm of chromosome 6 often exhibited a marked suppression of recombination in the region between Y and Pl. The work reported here suggests that this suppression may be due to more than just the poor pairing expected in a heterozygous translocation but might involve an effect due to transferring the long arm of 6 and to a foreign environment.

Donald S. Robertson

2. A new opaque gene located on chromosome 7.

This mutant was given me by Dr. Brawn of MacDonald College of McGill University. In his stocks the seeds had pale yellow endosperm which produced yellow-green seedlings when germinated.

The apparent pale color is evidently not the result of less pigment but rather is due to a difference in endosperm texture that, in a flint or dent background, produced an opaque phenotype. The appearance of this