$$\frac{k3\ lg}{k3\ lg}\ \frac{k10\ r}{k10\ r}\ \female \quad x \quad \frac{K^{L}3\ Lg}{k3\ lg}\ \frac{K^{L}10\ r}{k10\ R}\ \male$$

$$\frac{r\ Lg}{1755}\qquad \frac{r\ lg}{1683}\qquad \frac{R\ Lg}{1812}\qquad \frac{R\ lg}{1811}$$

These results indicate preferential segregation does not take place in the male under the conditions of these experiments. Since the above data only apply to segregation at MII, further crosses are being made to determine MI segregation as well as MII segregation in plants with knob consitutions differing from those in the crosses reported here.

Annette Waters

4. Studies with tetraploids and haploids containing abnormal 10.

The perennial question as to the relative influence of chromosomal and genetic effects on autotetraploid sterility is being re-examined in maize. Tetraploid seeds, with and without abnormal 10 (K10), have been obtained by selecting full grains from the cross, K10/k10 as X 4N, and will be grown this summer, sporocyted, and selfed to determine fertility levels. Data on chromosome association and anaphase behavior will be collected from the sporocyte material and correlated with the fertility data to determine the effects of K10-induced meiotic alterations on fertility.

Haploid plants, with and without K10, will be selected this summer from among the gl seedlings resulting from the cross, K10/k10 gl X Coe's haploid inducer stock-6. These plants will be sporocyted and outcrossed as females to provide material amenable to an analysis of the effect of K10 on the nature of crossing-over in maize haploids (see Alexander, 1964, Nature 201:737).

A. J. Snope

5. Recombination in homozygous T6-9b and normal chromosome 9.

Crossover studies with $\frac{Yg\ c\ wx}{wd\ C\ Wx}\ \frac{T6\text{-}9b}{T6\text{-}9b}$ individuals showed an altered distribution of exchanges when compared with standard values for the same regions in plants having normal chromosome structure. Crossing

over was increased in the C-Wx region and decreased in the Yg-C region (MNL 35: 64). The results were open to question, however, first because no adequate control was available and secondly because the difference in chiasma distribution might have been due to the wd deficiency instead of to the T6-9b translocation.

The effect of the deficiency on crossing over in normal chromosomes 9 was tested in K^s Yg Sh Wx/ wd sh wx compounds with sibs of K^s Yg Sh Wx/ K^s yg sh wx constitution as controls. The following data were obtained:

Table 1
Recombination Between Homologues of Chromosome 9 with Different Knob Constitutions

		Sh-Wx		Yg-Sh	Σ	Total Recomb.
26726 K^s/K^s	♀	20.8	1008	21.4	588	42.2
	♂	25.2	1716	22.3	1502	47.5
26726 K^s/wd	♀*	18.3	350	4.3	325	22.6
	♂	30.8	1205	7.7	1111	38.5

* Based on one ear.

It is evident that heterozygosity for wd causes a drastic reduction in crossing over in the region distal to Sh which, in the microsporocytes, is accompanied by an increase in the Sh-Wx region. The small population from female gametes does not show the compensation effect in the Sh-Wx region. In both K^s/K^s and K^s/wd compounds, the total recombination is higher in the male gametes than in the female.

The wd deficiency includes the terminal knob and half of the first chromomere (McClintock, Genetics 29: 478). However, gametophytes carrying the deficiency function as well as Wd gametophytes. The K^s/wd compounds of Table 1 used as pollen parents gave 7.7% crossing over between Wd and Sh. McClintock (Carnegie Inst. Wash. Year Book No. 42, 1943) reported values of 17.0 and 21.1 for the Df-C region in pollen parents heterozygous for a deficiency including the knob and the entire first chromomere. If the reduction in crossing over in Wd/wd

heterozygotes is due entirely to the loss of terminal chromatin in which chiasma formation is very frequent (McClintock, Carnegie Inst. Wash. Year Book No. 42, 1943), one would expect to find more crossing over in the Wd-Sh segment than in the Df-C region which is shorter. However, another factor known to influence crossing over is knob heterozygosity and part of the reduction in the Wd-Sh segment is probably attributable to the K^S/wd (as opposed to K^S/K^S) constitution. Kikudome found lower Wd-Wx values in K^L/wd plants than in K^M/wd compounds and the highest values occurred in K^S/wd plants. Even higher values would be expected in k/wd individuals. The highest Wd-C value (14.1%) obtained in my material was found in k/wd T/T female parents and crossing over in the male gametes should be increased above this amount. Thus, if we discount the influence of modifier genes on crossing over in my $\frac{K^S\ Wd\ Sh}{wd\ sh}$ and McClintock's $\frac{Df\ C}{N\ c}$ plants, the higher crossover frequency in the latter could be accounted for if the N c chromosome were knobless.

T/T individuals without the wd deficiency were used as female parents in testcrosses. These included both K^S/K^S and K^S/k constitutions for the terminal knob in the 6^9 chromosome and all were heterozygous for C and Wx. On the basis of crossover frequency in the C-Wx region, the plants were divided into two groups. Group I with a population of 1042 averaged 23.9% and group II with a population of 1305 averaged 34.4%. Sibs of N/N constitution gave 22.4% C-Wx. Unfortunately, there was no correlation of crossover values and knob constitution and at present no explanation for the different frequencies in T/T plants can be advanced. Plants heterozygous for $\frac{Yg\ C\ Wx}{yg\ c\ wx}$ and homozygous T/T gave 18.1% Yg-C and 21.3% C-Wx in a progegy of 537. These values are very similar to the 21.4% Yg-C and 20.8% C-Wx found in the unrelated K^S/K^S compounds with normal chromosomes cited in Table 1. It appears that entirely normal values for the 2 regions are possible in T/T chromosomes and fluctuations in these values cannot be attributed to the translocation per se.

Ellen Dempsey