If possibility (2) were tenable one might expect that the presence of K10 would result in an increase in those quadrivalents with free ends, that is, those configurations with one or more chromosome arms not involved in a chiasma. However, data reported in the above table show that such quadrivalent types scored at diakinesis actually decrease in the presence of K10.

Possibility (3) postulates a relationship between K10-induced non-disjunction and knob constitution. This prediction seems to be fulfilled at least for T6-9b/N heterozygotes. Dempsey (MNL 33:55, and personal communication) has obtained data which indicate, first of all, a substantial K10-induced increase in 3 to 1 segregation in these translocation heterozygotes and secondly, a greater increase in 3 to 1 segregation in those heterozygotes with two chromosome 9 knobs than in those with only one. Pachytene analysis of several line B plants in the present study revealed that chromosome 6 was quadriplex for one knob in the long arm and duplex for another more distal knob.

Limited data (Carlson, personal communication) suggest that non-disjunction may also be increased by K10 in T5-9c/N heterozygotes. Non-disjunction of chromosome 10 itself has been found to occur in K10 carrying diploids (Emmerling, 1959, Jour. Hered. 49:203; Ashman, 1964, MNL 38:122) and has been attributed by Emmerling to neocentric activity.

A. J. Snope

3. <u>The effect of abnormal chromosome 10 on female fertility in autotetraploids</u>.

Autotetraploid sterility in maize, as well as in other plants, has been attributed to both genetic and cytological causes although its precise nature remains unresolved. In a new approach to this problem (suggested by Dr. Rhoades) abnormal 10 (K10) was introduced into three tetraploid lines A, B, and C, as described in the above report, to investigate the possibility of correlating K10-induced neocentric activity, or increases in crossing over and chiasma frequency, with effects on fertility. Forty-chromosome tetraploids were pollinated daily until fresh silks no longer appeared. Developed kernel and ovule counts were made on the resulting ears from which the tip and butt ends had been removed and fertility is expressed below as the per cent of ovules which successfully developed into mature kernels.

	0K10			1K10			2K10		
line	A	B	C	A	B	C	A	B	B
#ears	6	2	4	7	4	5	-	9	2
tot. # ovules	2631	607	1188	2887	1610	2239	-	3434	633
% successful ovules	72.3	74.7	76.8	73.0	73.9	65.1**	-	70.7	54.8**

**significantly different from 0K10 at P=0.001 (t test)

No significant differences in female fertility between K10-carrying plants and k10 controls are noted for lines A and B although larger populations may be required to detect small differences that may exist. In line C, however, there was significantly greater ovule abortion in K10-carrying plants than in k10 controls.

Although K10 was found to increase the recovery of chromosome 3 and 9 genetic recombinants in lines A and B, respectively, its presence was not accompanied by significant changes in chiasma frequency, as determined from the metaphase I frequencies of bivalents, trivalents plus univalents, and quadrivalents, in any of the three lines. It is thus not possible to correlate K10 effects on female fertility with changes in chromosome pairing relationships at meiosis.

However, in view of the previous report, it may be suggested that an increase in female sterility in the presence of K10 in line C reflects an increase in gametic aneuploidy resulting from K10-accentuated numerical non-disjunction. The lack of a detectable effect of K10 on fertility in lines A and B could be a reflection of the differences between line C and lines A and B in overall chromosome knob constitution. That is, if non-disjunction is correlated with neocentric activity (see above report) then plants with more chromosome knobs should exhibit more non-disjunction. On this basis, there should be a greater number of knobs in line C than in line A or B plants to account for the differential effect of K10 on fertility. Because of the lack of complete information on knob constitution in the three lines, it will be necessary to await further experimentation designed to adequately test the hypothesis of a relationship between knob constitution, non-disjunction, and K10-accentuated sterility.

A. J. Snope

4. A plant with opposite leaves.

During the summer of 1964, twin plants from one seed were observed which apparently bore two leaves at each node. The leaves were inserted opposite each other, and ear shoots also appeared in pairs inserted opposite each other. Both members of the uppermost ear shoot pair were fertile. It seemed highly possible that this trait might be inherited since two plants germinated from the same seed, and both possessed this trait.

However, when the plant was selfed, no opposite-leaved offspring were obtained in a population of 100 plants.

A careful morphological examination revealed that there were two meristematic areas at each apparent node. This indicates that the plant actually had alternating long and extremely short internodes.

David Weber
Paul Weatherwax