classification was uncertain since it was of poor quality. The data are presented in Table 3.

Clearly, distributive pairing does not occur in these plants or it occurs with a very low frequency which is far lower than that found by Grell. These results are not compatible with those obtained by Michel (1966 News Letter and unpublished thesis). The reason is not known.

David Weber

2. Studies of the distribution of unpaired chromosomes in the progeny of plants hyperploid for a B and a ring chromosome.

An independent test of the distributive pairing hypothesis involved a study of the distribution of chromosomes in the progeny of plants containing two unpaired chromosomes. The two extra chromosomes were the B chromosome and the Wd ring.

Neither the B nor the ring chromosome affects the viability of the gametophyte or decreases the vigor of the sporophyte. Since both are found as univalents in essentially 100 per cent of the cells at diakinesis, the hyperploid plants provide an extremely efficient system for testing the distributive pairing hypothesis. The ring was detected genetically, and the B, cytologically (in root tip preparations).

Transmission of the ring is variable since it may be lost or structurally modified in somatic cells. Therefore, sectors may occur which contain no ring. Since ears often contain one or more ring-deficient sectors, absolute transmission frequencies of the ring in plants with and without one B chromosome are meaningless. B chromosomes, on the other hand, are not lost from somatic cells; their transmission is regular. Plants containing one Wd ring and one B were backcrossed as female parents to diploid plants.

If the ring and B chromosome pair and disjoin by distributive pairing, the frequency of B chromosomes would be much lower in the progeny with the ring than in plants without the ring. On the other hand, if the two chromosomes behaved independently, the frequency of B's should be the same in both classes.

The frequencies of B chromosomes in sibling plants with and without one ring chromosome are presented in the following table:

Frequency of B chromosomes in ring-containing and ring-deficient offspring from crosses of female parents possessing the Wd ring and a B chromosome by diploid males (pooled data from 2 plants)

Seed constitution	2 B's	1 B	0 B	Total	Per cent plants with 1 B chromosome
no ring	0	39	37	76	51.3%
ring present	1#	34	37	71 + 1#	48.6%
Total	1#	73	74	147 + 1#	

X^2 value between ring-containing and ringless plants + .330, .5>P>.3, DF = 1

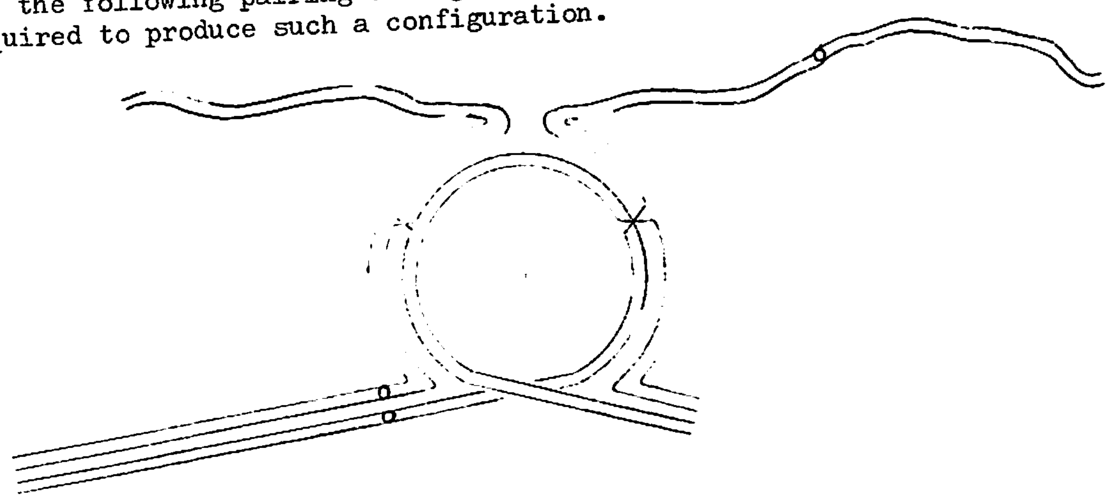
#This plant is not included in the totals and calculations since its origin is uncertain.

Differences in the values observed in the two classes of offspring were not statistically significant. Since both extra chromosomes should be found as univalents in essentially 100 per cent of the cells, this is a very sensitive test. The results are in agreement with the previous studies by this author, and favor the conclusion that distributive pairing does not occur in Zea mays.

David Weber

3. Evidence that recombination can involve both chromatids of one chromosome with chromatids of two differing chromosomes.

A very interesting configuration was observed in 2N+4+1B, In4a/N/N plants at anaphase I. Two cells were seen in which 3 chromosomes were joined by 2 bridges and 2 acentric fragments were released. The fragments were clearly smaller than B univalent chromosomes, and could not have been mistaken for them. Unless one hypothesizes chromosome breakage and reunion, the following pairing configuration and crossover positions would be required to produce such a configuration.



This exceptional anaphase demonstrates that recombination occurs at the four-strand stage (as earlier shown by single bridges and fragments in diploid plants containing a heterozygous paracentric inversion). It also shows that recombination can involve both chromatids of one chromosome with chromatids of two different chromosomes. Genetic evidence for the latter point comes from triploid Drosophila, but the author is unaware of any similar cytological demonstration of this point.

David Weber

4. On nonhomologous recombination.

The present study was initiated because a genetic system in Zea mays was available in which a well-marked segment was frequently involved in nonhomologous pairing and in which an efficient test for recombination between nonhomologous segments could be made. Nonhomologous recombination is defined as recombination between dissimilar nucleotide sequences.

Frances Clark Beard isolated a transposition from 3S into 9L. The transposed segment is about 1/4 the length of 9S. The cytogenetic behavior of