repairs completely the temperature effect observed on the thermosensitive line (W 22) and brings out differences between reciprocals which are not observable with the minimal medium.

On the whole these results fit the model of the contribution of temperature-sensitive alleles to the heterotic advantage exhibited at high temperatures. However, in this case the role played by the cytoplasm should also be considered. Furthermore, it is not possible at the moment to exclude the involvement of ontogenetic processes that are temperature sensitive in this phenomenon.

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1. A ring-of-20 chromosomes.

An association of 20 chromosomes at diakinesis was observed by John Stout in F_1 plants of a cross between two multiple interchange stocks. One multiple interchange parent was a 6-3-2-4-8 homozygote, the other was from semisterile plants selected from (5-7-1-9-10 x 8-10) backcrossed to 5-7-1-9-10. Plants with the crossover in the differential segment of chromosome 10 were expected to be semisterile, i.e. 5-7-1-9-10-8/5-7-1-9-10 heterozygotes. These were crossed on 6-3-2-4-8 and also self-pollinated for increase to establish the 5-7-1-9-10-8 homozygote. Half the plants from the cross were expected to have the ring-of-20. The selfs were grown and the fertiles increased and the test-crosses will be grown this summer to identify the 5-7-1-9-10-8 homozygote.

The Inman scheme (Burnham "Discussions in Cytogenetics," p. 113) will be used to combine the interchanges in one pure stock. A (6-3-2-4-8 x 8-10) F_1 was backcrossed to 6-3-2-4-8, and will be grown this summer. Semisterile plants, which should carry the 6-3-2-4-8-10 crossover, will be increased and also crossed with 5-7-1-9-10-8. Since the 8-10 interchange is common to both parents, one combination from random segregation should combine the two for a 6-3-2-4-8-10-9-1-5-7 multiple interchange stock.

There are several possible uses for hybrids with such a stock: (1) in tests of exotic stocks or mixtures for genes that may induce apomixis. (2) The absence of seeds on the ears should result in an increase of sugars and carbohydrates in stalks and leaves (J. Amer. Soc. Agron. 28:85-91, 1936). Since female and male sterility are very high, this would be more effective than male sterility against stray wind pollination. Under open pollination in the genetics field, plants with two rings of 10 had 0 to six seeds.

C. R. Burnham
J. T. Stout

2. Tests for non-random segregation in unequal chromatid pairs in interchange heterozygotes.

Data presented by Zimmering (Genetics 40:809-825, 1955) show that in *Drosophila* there is non-random disjunction when crossing over in an interstitial segment produces unequal chromatid pairs. The shorter chromatid is the one preferentially recovered.

If the shorter chromatid is the normal one, fertile progeny will be in excess; if the shorter one is the interchange chromosome, interchange heterozgotes will be in excess.

In corn, data from T2-3a (an interchange from Dr. R. A. Emerson's cultures) with breaks at about 2S.9 and 3L.6 and from T1-5 (8041) with breaks at 1L.80 and 5L.10 furnish information on this point.

For T2-3a, the interchange arm of the 2^3 chromosome would be about 50% longer than the normal short arm of 2, and the interchange arm of the 3^2 chromosome would be about 50% shorter than the normal long arm of chromosome 3. Crossing over in either interstitial segment would produce a pair of unequal chromatids, but it is probable that most of such crossovers would have been in the interstitial segment in chromosome 2. The shorter chromatid in that case would be the normal one from chromosome 2.

For T1-5 (8041), the new interchange chromosome 1^5 is 44% longer than the normal long arm of 1. Again, the shorter of the two chromatids resulting from crossing over in the interstitial segment would be the normal chromatid of chromosome 1. Preferential recovery of the shorter chromatid would lead to an excess of fertile plants among the progeny from interchange heterozygotes crossed with normal stocks. The data from