normality is evidently an inflation of the crop, which Eidmann (1924) has shown to be concerned in the hydrostatic mechanism of wing expansion; and the opening of the crop into the oesophagus, its only connection to the surface, is in the head.

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PROOF THAT BAR CHANGES TO NOT-BAR BY UNEQUAL CROSSING-OVER

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The hypothesis of unequal crossing-over at the bar locus in the X-chromosome of *Drosophila melanogaster*, advanced by Sturtevant to account for so-called reversion of bar, has been fully supported by his experimental evidence.[1] By use of the characters forked and fused combined with bar and a new allelomorph, infrabar, he showed that "sixteen different kinds of changes at the bar locus" occur "exclusively, or nearly so, in eggs that undergo crossing-over at or near the bar locus."

Sturtevant noted, however, in the data on the changes at the bar locus a deficit in one class of individuals, namely, double-bar. "This hypothesis makes reverted round and double-bar complementary cross-overs, and they should accordingly be produced with equal frequency. Table 1 agrees with Zeleny's more extensive data in showing that round is far more frequent than double-bar, but such a result was to be expected for two reasons. Double-bar is not as viable as round, so that fewer of the double-bar mutant individuals would be expected to survive; and double-bar is not always clearly distinguishable from bar, so that some mutant individuals are probably overlooked, while it is not likely that any reversion is overlooked through difficulty of classification" (loc. cit., p. 122). (A corresponding deficit was observed in the case of infrabar (loc. cit., p. 126).) Later experiments[2] confirmed all the previous results and showed the viability of double-bar to be 75% that of round, and improved technique lowered the ratio of observed numbers of round and double-bar from 3.5:1 to 1.9:1.

The explanation of the deficit of double-bar individuals is convincing and, as Dr. Sturtevant pointed out, the only evidence for the hypothesis that might be added would be a demonstration of the production of the two complementary kinds of chromosomes at one event of crossing-over. Such a demonstration has now been found in the analysis of a non-disjunctional daughter of a homozygous bar female. She was discovered because of her exceptionally narrow eyes in a mass culture of yellow males mated to females homozygous for bar whose X-chromosomes were attached; the females were therefore non-disjunctional and were bar over bar $\left(\frac{B}{B}\right)$. The narrow eyes of the exceptional fly were due presumably to two genes for bar being in the same chromosome. When this occurs, Sturtevant has found that the eyes are narrower than in homozygous bar. Not only is this true when in the opposite chromosome bar is present $\left(\frac{BB}{B}\right)$, but also when no bar is present there $\left(\frac{BB}{+}\right)$. The facet number for $\frac{BB}{+}$ is 45.4 and for $\frac{B}{B}$ 68.1. If the narrow-eyed fly were $\frac{BB}{B}$, only one of her chromosomes was a cross-over; but if she were $\frac{BB}{+}$, then both chromosomes were cross-overs and were of the complementary types due to unequal crossing-over.

To test her constitution, the narrow-eyed fly was mated to yellow males. About 5.1% of homozygosis for forked occurs in attached X's when one of them carries forked; hence, if the narrow-eyed female were of the constitution $\frac{BB}{+}$, about 5% of her daughters (bar being only 0.2 units to the right of forked) should be round; but if she were $\frac{BB}{B}$ none of her daughters would be round. (The possibility that she was $\frac{B}{B}$, and that the narrow eyes were due to a modifier was also put to the test by the same experiment, because she would then produce no round daughters.) She gave, in fact, in F_1, about 56 narrow bar-eyed females like herself, and 3 round-eyed females. Also in an F_2 mass culture from F_1 narrow bar daughters there were 93 narrow bar-eyed to 6 round-eyed females. The number of round-eyed flies is clearly too large to be due to reversion of bar to round and is nearly the 5% to be expected from crossing-over.

The fact that the constitution of the narrow-eyed fly was double-bar over round $\frac{BB}{+}$, added to Sturtevant's evidence for crossing-over when reversion occurs, supplies the final proof of his hypothesis. It shows that a reverted chromosome (+) and a chromosome showing unequal crossing-over by the presence of two genes for bar (*BB*) originated together in the same egg from two bar chromosomes. Reversion of bar to not-bar was the result of unequal crossing-over at the bar locus.

[1] Sturtevant, A. H., "The Effects of Unequal Crossing Over at the Bar Locus in Drosophila," *Genetics*, **10**, 117–147 (1925).

[2] Sturtevant, A. H. "A Further Study of the So-called Mutation at the Bar Lccus of Drosophila," *Genetics*, **13**, 401–409 (1929).

DIFFERENCES BETWEEN CHROMOSOME GROUPS OF SOMA AND GERM-LINE IN SCIARA[1]

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In our earlier studies on chromosomes in Sciara[2] the customary assumption was made that the fundamental chromosome group of an individual is constant throughout the different tissues of the body, somatic and germinal. Consequently, the tissues most easily studied were used in identifying the chromosome groups of the male and female, respectively, in the species used. Because of their favorability in this respect the ovarian follicle cells, on the one hand, and the spermatogonia and spermatocytes on the other were used for the chromosome studies.

These studies revealed a consistent difference between the chromosome groups of the two sexes; the female group possessed four pairs of chromosomes and the male group the same four pairs plus two larger chromosomes,