y+/ywf). The reciprocal product is a centric fragment carrying the B^s marker, recovered as Bar, yellow, white, forked male (ywf/FR Y·B^s). An exchange between X and Y^S (the short arm of the Y chromosome) proximal to the y+ marker generates an X chromosome with Y^L and the appended B^s marker attached proximally and is recoverable as a phenotypically Bar, white, forked female (ywf·B^s/ywf) and the reciprocal product is also a centric fragment, carrying the marker y+ (FR Y·y+) recovered as a white, forked male (ywf/FR Y·y+). These exceptional males may also arise from the deletion of one of the two markers. From the recovery of both X and Y chromosomes following nondisjunction phenotypically Bar, white, forked females (ywf/ywf/B^s·Y·y+) are obtained. The reciprocal product is recovered as yellow, white forked males (ywf/0). Such a male may also arise from loss of both markers.

Table 2. Progeny from crosses of ywf females, mated with ywf/B^s·Y·y+ males. Treated (T) or not treated (C) with 1.25% calcium cyclamate medium (frequency x 10^{-4}).

	Regular		X-Y Exchange		Nondisjunction	
Series	Female	Male	Female	Male	Female	Male
C	10907	9022	0 -	1 (1±1)	4 (3.5±1.8)	6 (6.6±2.7)
T	39449	32172	1 (.25±.25)	6* (10±5.5)	9 (2.3±76)	[illegible] (1.6±.7)

*In one vial there were 7 exceptional males; the event probably occurred in the spermatogonia stage. It was scored as a single event.

The results are given in Table 2. The information from the exception flies of X-Y exchange class indicates that the frequencies in the treated series exceed those in the control series. Turning to the class of nondisjunctional, it may be seen that there is no harmful effect of calcium cyclamate to the disjunction of X and Y chromosomes.

In line with the findings in the first experiment, these data suggest that the calcium cyclamate not only inhibits the early developmental stages to cause lethality, but also causes chromosomal breakage during spermatogenesis of D. melanogaster.

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Effect of mating system on disruptive selection.

Among the different effects that disruptive selection can produce on a population, the increase in the phenotypic variability and consequently, the divergence between the extreme phenotypes is generally accepted. See Thoday (1972) for a review. However, there is not agreement about other effects that disruptive selection can produce, as well as the effecivity of different mating systems used.

In order to check the effect that the different mating systems can produce on the divergence of extreme phenotypes we have carried out a disruptive selection experiment using two mating systems: quasi-random and mating-choice.

With the quasi-random mating the gene flow in any generation depends only on the probability that the "hybrid" individuals will be included in the selected sample. With mating-choice is also depends on the probability that "hybrid" matings will occur, and on their success relative to the "non-hybrid", that is, assortive matings that occur.

The experiment has been carried out during 15 generations and the trait selected has been the interocellar bristles in D. melanogaster. All the experiments were done at 25±1°C with a selection intensity of 20%.

For each kind of mating two lines were set up. Figs. 1 and 2 show the divergence between extreme phenotypes in the two mating systems. From these figures we can conclude that while mating-choice mating does not produce divergence (neither MCh1 nor MCh2), in one line of quasi-random (QR1) there is a clear divergence (2.04% of overlap at 15 generations) although in the other the divergence is practically null.

These results seem to show that quasi-random mating is more effective; but something striking in these results is the resistence to divergence of this population, which con-

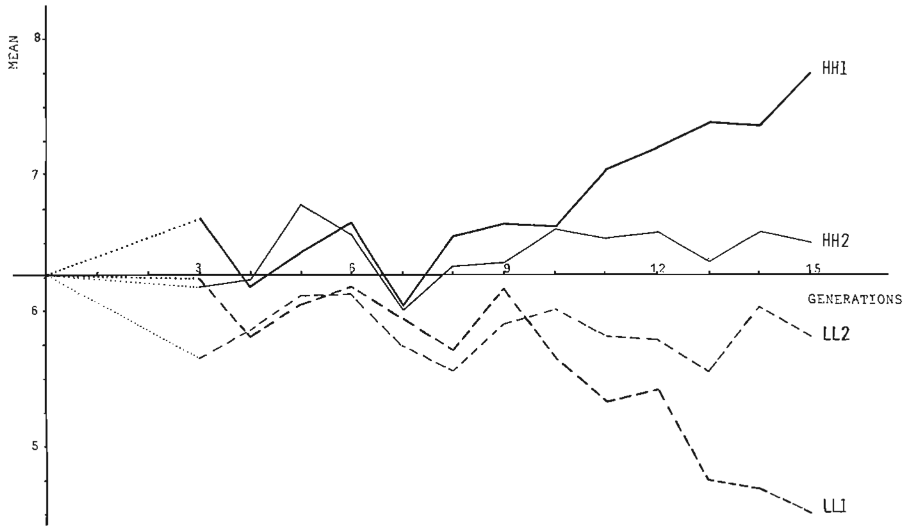

FIG. 1 (Quasi-random)

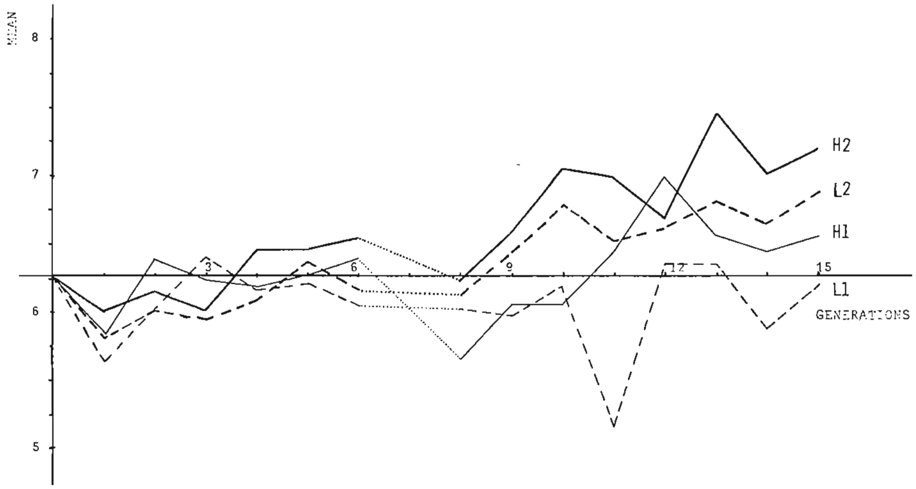

FIG. 2 (Mating-choice)

trasts with the results obtained on the same population in front of directional selection (Marcos 1977). This resistance may indicate a decrease in the genetic additive variance of the population although the phenotypic variance has been kept without variation.

References: Thoday, J.M. 1972, Proc. R. Soc. Lond. B. 182: 109-143; Marcos, R. 1977, DIS 52:61.

Yoo, B.H., J.J. Moth and J.S.F. Barker. University of Sydney, Australia. Abdominal bristle numbers and sex-dimorphism ratios in different Drosophila species.

The number of bristles on abdominal sternites has been used as a model character in many experimental quantitative genetic studies. However, the functional role of the bristles and adaptive significance of the variation in number are not well understood, although this character was described as being peripheral to reproductive fitness (Robertston 1955), and of ancient phylogenetic origin (Robertson and Reeve 1952). Mather (1941) observed enormous variation in abdominal bristle number, particularly in the ratio of numbers in the two sexes, among 4 species of Drosophila, and suggested the action of selection for this character in the process of speciation.