We started selection for increased bristle number from the two unrelated populations. When both selection lines had a mean of about 8 (the response continued to means of 13 and 15 respectively) crosses between the lines were made. Stabilizing selection for 8 bristles was started from the F_3 and was continued for 25 generations. Phenotypic variance decreased to less than half the original value. A progeny test showed that this was partly a consequence of a decrease of the genetic variance. Probit analysis revealed that, while the width of the 7 and 9 bristle classes remained constant the width of the 8 class increased to more than two times the original value. Simultaneously the difference between mean values of ♀♀ and ♂♂ decreased from more than 1 bristle to 0.5 bristle. The predominant pattern of 8 bristles consisted of 4 anterior bristles, 2 posterior bristles and 2 apical bristles.

Bos, M. and Ch. van Dijken. University of Groningen, Haren (Gr), The Netherlands. The fertility of large and small flies in a disruptive selection experiment with Drosophila melanogaster.

In previous experiments (DIS 44: 105, 1969) disruptive selection with random mating (D^R) on thorax length produced a 10% increase in length. This could be the result of a larger reproductive success of the large flies. Therefore two new D^R lines were started.

After G7 D^R2 showed an increase of thorax length (in G 11 the mean value (sexes averaged) was: in the Control line 102.1, in D^R1 102.2, and in D^R2 104.5 units. 1 unit=1/100 mm); in the D^R1 line the mean value rose slowly after G 11. The phenotypic variance, calculated as squared coefficients of variation (c.v.^{2}), in both D^R selection lines showed an increase (in G 11 c.v.^{2} was: in C 4.7, in D^R1 10.0 and in D^R2 12.2), which declined a little, when the mean value of thorax length started to rise. Egg production of selected females and the number of eggs, which yielded adults was determined in generations 1-5 and 10. The combined results are (Table 1):

Table 1: Mean egg production/♀/24 hr.

(Within brackets the number of eggs which yielded adults)

	D^R1		D^R2		C	
	Production	n	Production	n	Production	n
Large females	16.3 (7.4)	38	21.2 (10.9)	44	21.8 (12.2)	43
Small females	12.6 (7.5)	38	12.0 (8.9)	44	12.5 (6.3)	42

In each line the large females produced more eggs than the small females, but only in D^R1 this did not result in a larger production of adults. Mating success of large and small flies was tested in mating choice experiments. Two pairs of large flies and two pairs of small flies were brought together in a culture vial and the copulation types were scored. (Table 2). All flies were four days old and marked with a just-visible, not inconvenient spot of feltpen ink on the posterior end of the left or right wing. Large flies and small flies (within a culture) did always differ at least 7 units in thorax length.

Table 2: Number of the four possible types of mating recorded in the mating choice experiments (L=large, S=small).

	D^R1			D^R2			C		
♀ x ♂	G5	G10	Combined	G5	G10	Combined	G5	G10	Combined
L x L	6	8	14	10	12	22	6	3	9
S x L	4	10	14	10	12	22	5	2	7
L x S	2	9	11	1	4	5	2	4	6
S x S	5	6	11	1	8	9	3	5	8
Total	17	33	50	22	36	58	16	14	30

In the D^R lines L males are more successful than S males, but this is significant only in D^R2 (in G 5: $P<0.005$; in G 10: $P<0.05$). This and the greater egg-to-adult survival of the eggs of large females in D^R2 suggest indeed, that the increase in thorax length in disruptive selection lines with random mating could be the result of a larger reproductive success of the large flies in relation to the small individuals.