Tokunaga, C. Lawrence Radiation Laboratory, University of California, Berkeley, California. The effect on somatic crossing over of an ey^D insertion into chromosome 3.

In an earlier study Stern and Tokunaga (1967) described a striking example of nonautonomy in the differentiation of the multiple sex comb pattern of ey^D males. The evidence was based on the appearance of sex comb differentiation in genetic mosaics consisting of ey^D and not-ey^D areas. The genetic constitution of the zygotes was $y;T(1;3;4)sc^{J4}ey^D/+$ where the X chromosome carried y and one of the third chromosomes carried y^+ of the sc^{J4} translocation at its left tip and ey^D inserted in region 70C of the salivary map. The other third chromosome was normal. Somatic crossing over to the right of ey^D, i.e. between ey^D and the kinetochore can result in a y;not-ey^D constitution and crossing over to the left of ey^D in $y;ey^D$. Both constitution may be recognized as yellow spots on a y^+ background. They could be distinguished from each other provided not-ey^D behaved autonomously on the ey^D background. As, however, the great majority of yellow spots formed multiple sex combs it was concluded that y;not-ey^D spots behaved nonautonomously so that they could not be distinguished from $y;ey^D$ spots. An estimate of the relative frequency of the two kinds of y spots was based, in an independent experiment, on the relative frequency of somatic crossing over to the right and left of h, (3-26.5, salivary map unit 66D), this gene having been substituted for ey^D. Hairy (h) behaves autonomously in mosaics and the occurrence of h spots was studied on the scutellum of $y;T(1;3)\ sc^{J4}/h$ males. Sixty five spots that included at least one macrocheata were clearly recognizable as yellow. Of these, 45 were hairy and 20 were not-hairy giving a ratio of crossing over to the right and the left of h as 45:20 or more than 2:1.

It has been suggested that the ratio of right to left crossovers in the preceding experiment with h may not be a reliable index for the ratio in the main experiment which involved the insertion of ey^D. This was tested by a new experiment in which both ey^D and h were present. Among 3329 males of the genotype $y;T(1;3;4)sc^{J4}ey^D$, 36 had mosaic scutella exhibiting a yellow spot which included at least one macrochaeta. Of these spots, 28 were hairy and 8 were not-hairy, giving a ratio of crossing over to the right and the left of h as 28:8 or more than 3:1. This ratio does not differ significantly from that found in flies without the ey^D insertion. It is concluded that the estimate of the somatic crossing over ratio to the right and the left of ey^D that forms the basis of the interpretation of nonautonomy of the not-ey^D effect in sex comb mosaics is a valid one.

Adamkewicz, S. Laura. and R. Milkman. The University of Iowa, Iowa City. Apparent heterosis in the second chromosome of D.m.

From two wild Amherst isofemale strains, pure slo and pure fast α-glycerophosphate dehydrogenase lines, respectively, were obtained. These were crossed, and the F_1's were backcrossed to each parent line in each direction. Uncrowded (25-50 eggs per vial) and crowded (400 eggs per vial) backcross progeny were examined. All flies emerging from each vial were counted.

Table 1
Numbers of each genotype among flies tested and survival

Cross	Genotype	N		Adults/Eggs*	
		Crowded	Uncrowded	Crowded	Uncrowded
Slow x F_1	FS	575	270	0.31	0.72
	SS	481	260		
F_1 x Slow	FS	561	283	0.42	0.79
	SS	505	272		
Fast x F_1	FS	563	289	0.34	0.83
	FF	258	271		
F_1 x Fast	FS	534	303	0.27	0.88
	FF	337	309		

* In all crosses, about 94% of the eggs hatched (137-142 of 150)

The data in Table 1 suggest density-dependent heterosis. Moreover the heterozygotes emerged much earlier than fast homozygotes in crowded, but not in uncrowded, vials. We have no evidence that the α-glycerophosphate dehydrogenase locus is itself involved in the apparent heterosis: indeed comparison of reciprocal cross result in Table 1 tends to suggest a contribution some distance away, since the excess of heterozygotes is not so great when the F_1 parent permitted crossing over.

The multiple applicator (see Technical Notes, this issue) was used.