Burnet, B., K. J. Connolly, and J. E. Beck. Departments of Genetics and Psychology, University of Sheffield, England. Restoration of visual acuity in an eye color mutant strain by environmental means.

Kalmus (J. Genet., 45: 206-213, 1943) tested the optomotor responses of a number of mutants of Drosophila affecting eye pigmentation. The optomotor responses were used as a measure of visual acuity. One of the findings was that a deficiency of eye pigment reduced visual acuity. Since Kalmus used different strains of flies it is possible that he was recording strain differences in optomotor responses which were independent of eye pigmentation. If the loss of acuity is referable directly to loss of screening pigment, environmental reversal of the mutant phenotype should lead to restoration of visual acuity. A direct test of this possibility can be made using the double mutant strain vermilion; brown of D. melanogaster which lacks both ommochrome and pterin eye pigments. Ommochrome biosynthesis can be restored to v; bw individuals by supplying the missing substrate, kynurenine, in the larval diet thus bypassing the v mutant block.

Optomotor responses were used as a measure of visual acuity. These were measured by placing flies at the centre of a rotating striped circus.

Preliminary experiments indicate that bw flies, lacking pterin eye pigment only, are indistinguishable from wild type whereas v; bw flies show a considerable reduction in optomotor responses. v; bw flies in which brown pigment synthesis has been restored by kynurenine feeding show almost complete restoration of optomotor response to the level observed in the bw control group, as Kalmus's theory predicts. The results are to be reported in detail elsewhere.

Parsons, P. A. Department of Genetics, La Trobe University, Bundoora, Victoria, Australia. A lack of positive correlation between adult density and oviposition rate in D. melanogaster.

A series of experiments were carried out (Table 1) where 20, 100 and 200 pairs of Canton-S and yellow flies were permitted to oviposit on a watch glass in a 1/2 pint milk bottle for a 4 hour testing period. The flies were 4-5 days old when tested, and had been starved for 2 days prior to oviposition, the sexes remaining together for this time.

Table 1

Mean number of eggs per female laid in 4 hours according to adult density
(The numbers in brackets are the number of replicates)

Genotypes	Canton-S			Yellow		
Adult density (pairs of flies)	20	100	200	20	100	200
Experiment 1	0(3)	-	0.317(3)	0.318(8)	0.700(2)	1.525(2)
Experiment 2	0.242(6)	0.935(2)	0.873(3)	0.317(6)	1.630(1)	1.945(3)

For both genotypes, more eggs per female were laid at the 2 higher adult densities compared with the lowest density. More detailed work is needed to show whether the differences between adult densities of 100 and 200 pairs of flies are real. The observation of fewer eggs per female at a low adult density seems opposite to expectation, which is that aggression between flies at high densities would interfere with oviposition. A possible explanation is that there is a "facilitation" phenomenon, whereby it takes a certain period of time for a fly to commence oviposition, and that once any fly begins, others follow. As adult density increases, the chances of any fly commencing quickly would increase. Another possibility is that the presence of the first eggs triggers off further oviposition. The latter possibility was tested by comparing respectively the mean number of eggs laid over 4 hours on watch glasses on which 20 newly laid eggs less than 1 hour old had been placed, and the mean number of eggs laid on watch glasses initially without eggs. For these two contrasts 0.275 and 0.205 eggs per female were laid respectively for the Canton-S stock, and 1.755 and 1.560 eggs per female respectively for the yellow stock bases on 10 trials in each case. Thus the presence of eggs seems not to induce laying, hence the "facilitation" phenomenon may be a more likely explanation of the results.