Halfer, C. University of Milan, Italy. Different degree of compatibility in several stocks of Drosophila melanogaster, tested with ovary grafting.

A different degree of comptatibility between genotypically different stocks of D. melanogaster, tested using the method of ovary grafting, has been already observed in the first series of experiments (DIS 37).

In a later investigation, I took into consideration, as recipients, not only the two wild tumorous stocks: tuA_2 and tuB_3, but also the wild stock Varese, which is completely tumourless and the almost tumourless mutants vermilion and yellow white. In this way I obtained, besides the combinations between the different genotypes, as donors and as recipients, also combinations between donor and recipient of the same genotype. Only the larval survival after grafting and the percentage of graft attaching has been considered.

tuA_2 (28-45%) and vermilion (39-82%) yielded consistently high rates of survival, irrespective of the genotype acting as donor, while the other three stocks: tuB_3 (1-12%), Varese (2.7-9%) and yellow white (0-2.8%) showed a very low survival in almost all cases. From these considerations it is quite clear that this is a case of host specificity, where the host genotype only is important in these grafting experiments, being the genotype of the donor of no influence. The graft attaching was always good, even in the cases of genotype showing a poor compatibility with the graft. Grafting experiments were carried out also with heterozygotes obtained from reciprocal crosses between the stock vermilion (with a high rate of survival) and the three stocks: tuB_3, Varese and yellow white (with a low survival). They showed always a rather good survival rate (about 40%).

The different behaviour of homozygotes and heterozygotes supports the view that the host specificity is genetically controlled.

Peterson, G. V. and E. J. Gardner. Utah State University. Melanotic tumor associated with failure to pupate in the tumorous head stock of D. melanogaster.

Over a period of years it was observed that large abdominal melanotic tumors appeared in mature larvae of one tumorous head stock of D. melanogaster. These tumors were rarely, if ever, seen in the adults. The melanotic tumors first became visible 102-125 hours after hatching. Normal time of puparium formation was found to be approximately 102 hours. Some larvae from the strain carrying melanotic tumors and the lethal factor lived 200 hours or longer but never pupated. About half of all larvae that failed to pupate did not develop visible melanotic tumors.

The lethal effect was observed in about 33 percent of the larvae when the abnormal condition was first observed. It decreased at each generation with the proportion of tumorous larvae remaining between 35 percent and 65 percent of the total number of lethals.

Crosses with a stock bearing inversions on the second and third chromosome have indicated that both chromosomes from the tumorous head stock are associated with lethal or low viability effects. The third chromosome is mainly responsible for the failure of pupation, however. No indication of sex linkage has been found.

Crosses with other tumorous-head stocks and wild stocks indicated that melanotic tumor development was not influenced by either of the major genes (tu-1 on the first chromosome and tu-3 on the third chromosome) associated with tumorous head. However, crosses between parents, both of which expressed the tumorous head phenotype and crosses in which neither parent expressed the phenotype did show a significant difference. When they both expressed the tumorous head phenotype, the progeny showed 12.5 percent lethal and 6.5 percent with melanotic tumors compared to 6.0 percent lethal and 1.9 percent with melanotic tumors for the other parental

group. This may indicate that a modifier gene increased the penetrance of the tumorous head trait as well as influencing or being responsible for the lethal effect. Because only a certain proportion of the lethal larvae developed melanotic tumors, it seems probable that the tumor formation is a secondary characteristic resulting from a ring gland defect.

Sokoloff, A. University of California at Berkeley. A possible maternal effect on quantitative characters in D. pseudoobscura.

In a previous report (DIS 33:162-165) comparison was made between measurements of length and width of wing and length of tibia derived from flies whose progenitors had been reared deliberately under different conditions. The statistical tool was the t-test, taking one character at a time in flies reared, say at 24°C, but whose mothers had been reared at 16° and 24°C and vice versa. It was reported that this test failed to show any maternal effect on the three characters mentioned. Recently, in analyzing some data demonstrating geographic variation in D. pseudoobscura, it became evident that differences between populations derived from different localities (some as close as six miles) cannot be demonstrated if one takes one character at a time but, if one takes two characters, significant differences are easily found when Fisher's Discriminant Function method is applied. In the light of this finding the problem of maternal influence on quantitative characters has been re-examined, applying this, more powerful, statistical method. The technical details can be found in the above reference. A summary of the history of the flies measured is given at the bottom of Table 1, and the results of the statistical analysis can be seen in Table 2. Although not all the possibilities were tested, the conclusions from this analysis are as follows:

(1) Flies reared in bottles differ significantly from those reared in vials at both temperatures (compare A-B and F-G variance ratios), even though attempts were made to avoid crowding.

(2) As expected, a period of starvation in the larval stages results in flies which are smaller than flies well fed for the whole larval stage (comparisons E-F). In turn, their progeny differ, even though they were reared under identical, non-crowded conditions (comparisons C-D).

(3) The temperature prevalent during the development of the progenitors appears to influence the body characters of the next generation when the latter flies are reared at the higher temperature (compare F-G), the bigger mothers producing generally bigger offspring but the reverse situation (B-D) appears to have no effect.

These experiments omitted some combinations, owing to time limitations. However, the results suggest that, in studies involving quantitative characters, the history of the preceding generation of D. pseudoobscura, particularly if the flies are reared at 24°C, must be known and specifically stated.

(This investigation was supported by Research grant 4501 from the National Science Foundation, and in part by grants RG 7842 and RG 8942 from the U. S. Public Health Service).

Table 1. Means, variances and covariances of wing length (x) and tibia length (y) from D. pseudoobscura derived from Grand Canyon, Arizona. Upper block: flies reared at 16°C.; lower block: flies reared at 24°C. (for each sample N=50).

Sex		$\bar{m}_x$	s^2x	$\bar{m}y$	s^2y	cov_{xy}
	A	65.924	0.7998	23.612	0.2096	1,588.60
Females	B	63.692	1.181	23.100	0.2502	1,501.60
	C	63.308	1.080	22.896	0.1604	1,479.34
	D	63.372	1.022	23.052	0.1351	1,490.85
	A	59.184	0.9108	22.312	0.2010	1,347.54
Males	B	57.324	4.2365	21.808	0.7608	1,277.19
	C	57.208	0.7935	21.872	0.1824	1,276.99
	D	57.680	0.5878	21.988	0.1067	1,294.23