investigation of the tubes gave the following result:

DD	N = 101 pairs,	44 with offspring,	57 negative .
LL	N = 105 pairs,	22 with offspring,	83 negative .
LD	N = 85 pairs,	21 with offspring,	64 negative .

Mass cultures and single pairs concordantly show a clearly negative influence of light on successful mating. That result is rather remarkable in a species originally completely light-dependent in courting behaviour and mating. Further investigations concerning circadian rhythmics and the evolutionary importance of the reversion of the ecological valence of light under special conditions are in progress.

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Fertility in a white eye mutant of D.subobscura.

White mutants in D.subobscura have been found repeatedly (Spurway 1945). These mutants all proved to be sterile. This in itself is surprising, since in other Drosophila species white mutants are fertile. The reason that has always been given for this discrepancy is that D.subobscura depends, for mating, largely on the optical sense, so that white mutants are essentially behaviorally sterile, not physiologically.

This interpretation is supported by our finding that a white eye mutation selected from a light-independent selection stock of D.subobscura (Springer 1973) turned out to be fertile. Attempts to see whether carriers of this white allele lose their fertility in a genetic background of a light-dependent wild-type stock are under way.

References: Springer,R. 1973, DIS 50:133; Spurway,H. 1945, J.Genet. 46:268-286.

Taylor, C.E. University of California, Los Angeles, California. Microhabitat selection by mutant strains of D.pseudoobscura.

Waddington, Woolf, and Perry (1954) described an apparatus in which microhabitat preferences of Drosophila could be measured. With this they compared several mutant strains of D.melanogaster (wild type, rough, aristaless, purple, apricot, and forked) and found large differences among their microhabitat preferences. They interpreted this to mean that habitat choice might contribute to the maintenance of stable polymorphisms. We have constructed a similar apparatus and have measured the microhabitat preferences of mutant strains of D.pseudoobscura. Our purpose was to see if Waddington, Woolf, and Perry's results extended to this species as well.

Five strains of D.pseudoobscura were used: 7,8,45,76, and 82. These were supplied to us by W.W.Anderson, and are homozygous for the following markers respectively: w; y sn v co sh; gl; or px; or. Undoubtedly the strains differed at other, unknown, loci as well. They were raised at low density on standard, cornmeal molasses medium at 19°C and were run when 4-6 days old in groups of approximately 200--40 individuals of mixed sex of each strain. At no time prior to running were they anesthesized.

The maze consists of 8 large plexiglass chambers (12" high, 18" long, 18" wide at the outside, 4½" wide at the inside) joined to form a central antechamber (see Figure 1). Microhabitats consisted of the eight possible combinations of light or dark (0 ft candles or ca. 13 ft candles), maltose/agar or lactose/agar medium cups, and dry or moist (ca. 25% RH or ca. 65% RH). The moisture conditions were produced by placing either $CaSO_4$ in a gas chromatograph bag or else H_2O in a flask with a cheesecloth wick into the chamber. (It is possible, in addition, to regulate temperature in the maze by means of heating coils under the bottom of the chambers controlled by thermostats that extend into the centers. These are shown in the figure.) The chamber was charged for 4-5 hours before the flies were introduced at 4:00-5:00 p.m. At 8:00-9:00 the next morning the chambers were flooded with CO_2 and the flies removed. There were 10 replicates.

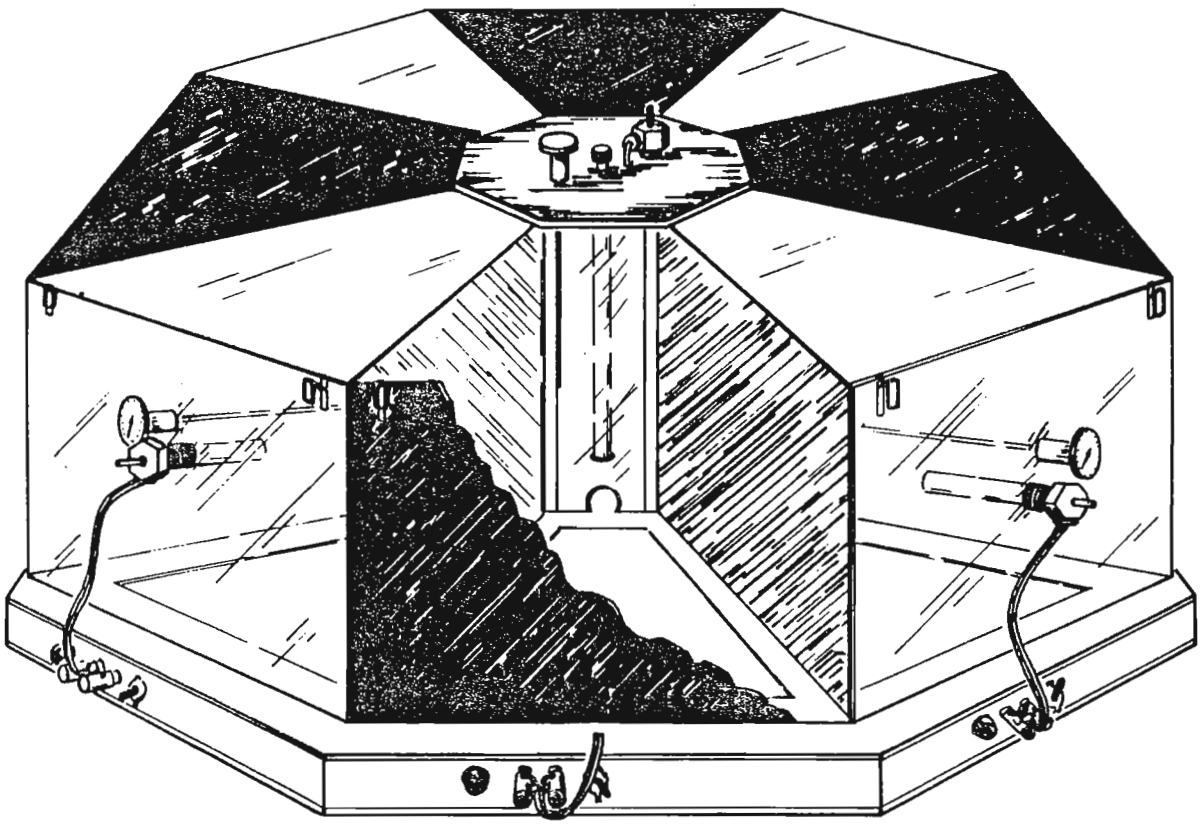

Table 1. Distribution of mutant strains of D.pseudoobscura among microhabitats.

Strain		Dry				Humid				Center	Total
		Dark		Light		Dark		Light			
		Maltose	Lactose	Maltose	Lactose	Maltose	Lactose	Maltose	Lactose		
7	N	4	8	43	23	54	23	43	72	48	318
	%	1	3	14	7	17	7	14	23	15	
8	N	3	4	59	40	44	18	65	77	53	363
	%	1	1	16	11	12	5	18	21	15	
45	N	65	39	78	68	41	23	29	22	1	366
	%	18	11	21	19	11	6	8	6	0	
76	N	2	3	48	40	45	24	93	81	42	378
	%	1	1	13	11	12	6	25	21	11	
92	N	1	8	47	40	44	28	47	65	42	322
	%	0	2	15	12	14	9	15	20	13	
Total		75	62	275	211	228	116	277	317	186	1747

The numbers of flies going to each chamber are shown in Table 1. In general the light chambers were preferred to the dark (1080 vs 481), the wet were preferred to the dry (938 vs 623), and the maltose was preferred to the lactose (855 vs 706). All these differences are significant at the .001 level. Overall the most popular chamber was the light, humid chamber with lactose. This was most favored by 3 of the 5 strains (7,8 and 92), and was second most favored by the fourth strain (76). The remaining strain (45) however, went to this chamber least often. In contrast to the others, strain 45 generally avoided the humid chambers and went most frequently to the dry, light chamber with maltose. The test of strain X chamber

homogeneity was highly significant (χ^2 = 427.7, 32 df, p < .001), in good agreement with the earlier observations in D.melanogaster mutants made by Waddington, Woolf, and Perry.

Reference: Waddington, C.H., B. Woolf, and M.M. Perry 1954, Evolution 8:89-96.

Thompson, V. Roosevelt University, Chicago, Illinois. Failure of the Hn^{r3} ry^6 combination to behave as a recessive synthetic lethal.

Taira (1960) and Goldberg et al. (1962) report that the D.melanogaster third chromosome mutant eye color alleles Hn^{r3} and ry^6 combine to form a recessive synthetic lethal and Lucchesi (1968) lists the Hn^{r3} ry^6 combination among the established synthetic lethal systems involving laboratory mutants. I have synthesized Hn^{r3} ry^6 chromosomes and find the homozygotes to be viable.

The ry^6 allele was obtained from A. Chovnick in the form of a balanced stock of genotype M(3)S34 Dfd kar ry^6/In(3R)Ubx^A, cu kar Ubx^A. Males of this stock were crossed to females homozygous for Hn^{r3} and sr (Fig. 1) following the general scheme of Goldberg et al. Heterozygous M(3)S34 Dfd kar ry^6/Hn^{r3} sr daughters were backcrossed in turn to males homozygous for Hn^{r3} and sr. F2 males with Henna eye color and no Deformed eye phenotype were individually test crossed to a stock carrying the ry^2 allele linked to Sb (sr could not be readily scored and was ignored). F3 Stubble rosy phenotype males from test crosses that produced rosy offspring were crossed to females heterozygous for the Ubx^{130} balancer chromosome and resulting F4 Ubx^{130} heterozygotes (without Sb) were crossed inter se to produce the F5 generation. All crosses were performed at 25±1°C on cornmeal-malt-yeast medium.

One hundred twenty-four Henna phenotype F2 males were successfully test crossed. Twenty-six proved to carry the ry^6 allele on the maternally derived Hn^{r3} bearing chromosome. Sixteen of the twenty-six also bore the Dfd allele and were discarded. The F3 and F4 crosses were carried out independently and in parallel for the ten remaining lines each of which carried an independently arising Hn^{r3} ry^6 chromosome.

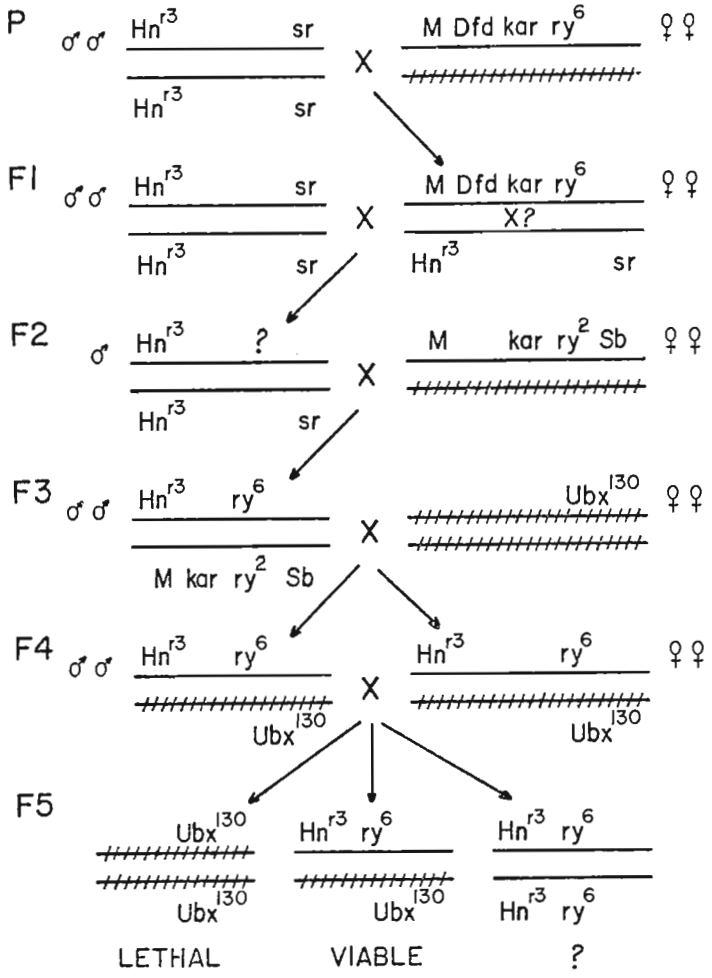

Fig. 1. Crosses used to synthesize and test the homozygous viability of Hn^{r3} ry^6 third chromosomes. Only mutant alleles are shown and no attempt is made to indicate proportional map distances. Cross hatched chromosomes carry recombination suppressing rearrangements. Genotypes of balancer chromosomes are omitted when not directly relevant.