Perhaps the most striking feature of this experiment is the extraordinary similarity in the observed SF and GD scores for Cross A throughout the life cycle. The correlation between the two characters is strong (r=0.82) suggesting that, on average, 67% of the GD variance is directly dependent on the variation among SF scores (r^2=0.67). The correlation would be even stronger if the sharp increase in egg production seen during the pupal phase (days 11-13) could be excluded. This increase in egg production is not matched by an increase in hatchability and a similar effect has been reported previously (Eggleston & Kearsey 1980). It seems likely that this phenomenon is due to a temperature shock occurring during meiosis. Such shocks are known to increase both recombination and DNA replication (Grell 1972) and this may result in an increased egg production. This effect would appear to be independent of the hybrid dysgenesis syndrome since it occurs to an equal extent in the developing Cross B progeny. The results of this and similar experiments reveal a remarkable similarity in the response of SF and GD sterility to changes of developmental temperature. Such a degree of similarity would be unlikely to occur if the two traits were under independent genetical control. It may well be that SF and GD sterility and therefore I-R and P-M hybrid dysgenesis are, in fact, causally dependent and that the same nuclear-cytoplasmic interaction is responsible for all of the dysgenic traits which can be induced in a cross of this kind.

References: Eggleston, P. & M.J.Kearsey 1980, Heredity 44:237; Grell, R.F. 1972, Genetics 73:87; Kidwell, M.G. 1979, Genet.Res. (Camb.) 33:205.

Ehrman, L. and D.Baumann-Meringolo. State University of New York, Purchase, New York USNA. Courtship followed by rare D.pseudoobscura male matings.

To determine if the rare male advantage (observed in eight species of Drosophila [see Ehrman & Probber 1978; Meringolo et al. 1982]) is the result of the females' preference for males of a type different from tnat by which they are first courted (Spiess & Schwer 1978; Spiess 1982) D.pseudoobscura of the CH and AR strains were tested. (These are highly inbred and were originally reported by Ehrman et al. 1965.)

A profoundly modified direct observation mating chamber was used; the chamber is divided into two equal compartments by a removable, rotatable barrier made of fine wire mesh. Groups tested were of the following composition: 13 females plus 39 males--13 minority and 26 majority types. Males were marked (in half of the groups the rare type was marked, and in the other half, the majority type male was marked) by placing a small drop of white liquid paper on the dorsal thorax. First, with the barrier in place, the 13 females plus 13 males (either rare or majority) were placed in one half of the chamber, with the remaining 26 males in the other half of the chamber. The males were allowed to court but not to mate. After 15-20 min, the barrier was removed, all the files were allowed to mingle, and matings were scored (Table 1).

Table 1. Type of D.pseudoobscura male preferred when females were courted by rare type first, and when females were courted by majority type first. (NM = no mount) (Within each group of females tested, half the time the rare males were CH and half the time they were AR males.)

AR Females		
AR female w/rare males first, then majority introduced:		
AR x rare	33	31.7%
AR x majority	49	47.1
NM	22	21.2
AR female w/majority males first, then rare introduced:		
AR x rare	35	33.7%
AR x majority	41	39.4
NM	28	26.9

CH Females		
CH female with rare males first, then majority introduced:		
CH x rare	29	27.9%
CH x majority	55	52.9
NM	20	19.2
CH female with majority males first, then rare introduced:		
CH x rare	31	29.8%
CH x majority	51	49.0
NM	22	21.2

Table 1 (contin.):

All Females Combined:

Female w/rare male first, then majority introduced:			Female w/majority male first, then rare introduced:		
w/rare male	62	29.8%	w/rare male	66	31.7%
w/majority male	104	50.0	w/majority male	92	44.2
NM	42	20.2	NM	50	24.1

In sum then, with a constant 2 Common:1 Rare male ratio, and with a total of 324 observed matings after observed courtships, when the females were courted by rare males first, they mated with the rare males 37.3% of the time; when courted by majority type first, they mated with rare males 41.8% of the time. Although increases in rare male advantages occur when majority males courted first, a rare male advantage is still maintained when rare males initially court. In addition, note that both AR and CH females award about the same magnitude of rare male advantage. Results therefore indicate that the type of male which courts first influences the subsequent degree of rare male advantage, at least in these strains.

References: Ehrman, L. & J.Probber 1978, Amer.Scient. 66:216; Ehrman, L., B.Spassky, O.Pavlovsky, & Th.Dobzhansky 1965, Evolution 19:337-346; Meringolo, D.B., R.Silibovsky, & L.Ehrman 1982, in: Genetics, Development and Evolution of Drosophila (ed: S.Lakovarra), Plenum Press; Spiess, D.B. 1982, Behavior Genetics 12:209-221; Spiess, D.B. & W.A.Schwer 1978, Behavior Genetics 8:155-168.

Engeln, H. Institute fur Genetik, Freie Universitat Berlin, FRG. Oviposition site preferences in different populations of Drosophila melanogaster.

As Parsons (1978) pointed out habitat selection plays an important role in the evolutionary strategies of organisms and in influencing their fitness in nature. In this context oviposition site preference is an important behavioural trait and has been studied already by several authors (e.g., McKenzie & Parsons 1972; Richmond & Gerking 1978; Fogleman 1979; Krause et al. 1980). For an optimal survival of larvae it is necessary that Drosophila females choose optimal conditions at oviposition sites. One important factor pointing to the quality of the food composition is the amount of ethanol in it. For example the sibling species Drosophila melanogaster and D.simulans differ in their adaptations to environments containing ethanol and occupy different ecological niches when competing in the same area; D.simulans prefers medium without ethanol and is less tolerant to ethanol than D.melanogaster (McKenzie & Parsons 1972). Since differences between species are existing the question arises whether there are different adaptations within one species concerning ethanol preferences.

Three samples of different Drosophila melanogaster populations were used in this experiment (Table 1). The first one (+K, +T, Da, Ma, Pa) involved laboratory populations collected from places located far away from each other (Europe, Africa, South-America). The second one (UI, UII, MP) consisted of fresh captured populations collected from three habitats within Berlin, Germany. The third group (I1, I23, II5, M4, M19) involved five single female lines derived from the Berlin populations of the second sample.

Fifty 3-4 days old non-virgin females were anaesthetized with carbon dioxide for about 5 seconds and then put into a glass cylinder of 11cm diameter and 5.5cm height. Each cylinder contained 4 food copus (3.5cm diam), two of them filled with standard medium (cornmeal, agar, molasses) and two filled with medium including ethanol of 9% by volume (prepared after McKenzie & Parsons 1972). Because the number of eggs laid per time unit varied between strains, flies were allowed to lay eggs for 1-2.5 hours to receive egg densities that were countable. After this period the flies were removed and eggs were counted. Experiments were carried out at light intensities between 250-650 lux and at a temperature of 25±1°C.

Of each strain the mean percentages of eggs laid on ethanol medium were calculated from 8 replicates each with two glass cylinders. A statistical analysis was performed using the Student-Newman-Keuls-test (SNK-test). The greatest differences exist between laboratory populations originated from places located far away from each other, but there were found also significant differences between populations and between single female lines collected