It is further hypothesized that the heterosis which would lead to the production of a hybrid swarm is functional only in those recombinant types which do not also contain poorly adapted combinations in other parts of the genotype (such as factors affecting fertility). As a result, the probability of obtaining "good" male and female recombinant types in a population consisting predominantly of the parental species is very low. This is thought to be due to (1) the low frequency of interspecific hybrids (2-3% of the population), (2) the low adaptive value bestowed upon these types by their non-coadapted gene complex, and (3) the greatly reduced fertility of hybrid males.

Thus, a reproductive barrier exists between the parental species beyond the one dealing with the initial production of F_1 hybrids. If the second barrier (production of highly fit heterotic recombinants) is hurdled, the production of a hybrid swarm, or more correctly an introgressed population, would result.

Paik, Y. K., and J. S. Geum. University of Texas. Distribution of natural lethal genes on the second chromosome of *D. melanogaster*.

Twenty-nine lethal genes extracted from Korean natural populations were localized by use of three recessive marker genes. The distance between marker genes and lethal genes was adjusted by Kosambi formula. The results are as follows:

Collection	Non-allelic loci	Distribution Left	Middle	Right
S62	17	4	11	2
K62	12	2	5	5

It can be seen that the lethal genes of S62 population are distributed in the central region (X^2 = 10.0, d.f. = 2, P = 0.01 - 0.001). However, the lethals of K62 population seem to be randomly distributed (X^2 = 1.5, d.f. = 2, P = 0.3 - 0.5).

Browning, L. S., and E. Altenburg. University of St. Thomas, Texas. A comparison of the sterilizing effect of X-rays, quinacrine mustard and azaserine on *Drosophila* males.

Males of Muller's Maxy stock were treated with X-rays, quinacrine mustard and azaserine and individually mated (in vials) to Maxy females (2 to 3 per male). The males were transferred to new food vials with fresh virgins every third day for several such broodings. The dose of X-rays was 3000r or 5000r and that of the quinacrine sufficient to give a 2 to 3% lethal rate in mature sperm. The azaserine was weakly mutagenic (about 1% lethal inducing). In the present experiments, the X-rays produced a drastic drop in fertility in the third brood (8-10 days after treatment) from which there was a large measure of recovery in the fourth brood. In the case of chemical treatments, there was no such definite brood pattern. The effect of the three agents on the fertility of the Maxy males is shown in the following table:

Agent	Brood (and days)	No. ♂♂	No. Fertile Cultures	Percent
X-rays	1 (1-4)	793	739	93
	2 (5-7)	748	633	85
	3 (8-10)	712	208	29
	4 (11-14)	635	470	74
Quinacrine	1	721	332	46
	2	507	201	40
	3	279	127	46
	4	191	109	57
Azaserine	1	432	241	55
	2	388	237	61
	3	252	202	80
	4	214	74	35

These results might indicate that the reduced fertility of the males after the chemical treatments is due to a toxic effect on their soma (reducing their life span and fitness to mate), rather than a sterilization of the germ cells at a sensitive stage (as in the case of X-rays), since the viability of the cultures undergoes considerable reduction from one brood to the next after the chemical treatments. With the X-rays, there is no such drastic drop in the viability.

Narise, Takashi. University of Chicago. The migration of *Drosophila ananassae* under competitive conditions.*

It is probable that the mode of migration of flies in a heterogeneous population is quite different from the mode of migration in homogeneous population, even though the strains in the former population have their own migratory activity genetically as shown by Sakai et al. (1958) and Narise (1962). From this point of view, an experiment was conducted with four strains of *D. ananassae* in order to find out the mode of migration under competitive conditions.

Two of four strains were so called light *ananassae* which have yellow body color and collected in Pogo Pogo (L-pp), Tutuila, American Samoa, and Majuro (L-maj), Marshall Islands. The other two strains were so called dark *ananassae* having black body color, and collected in Pogo Pogo (D-pp) Tutuila, American Samoa, and Rarotonga (D-rar), Cook Islands.

Two kinds of experiments were conducted: 1) migratory activity of light and dark *ananassae* in a mixed population, and 2) the mode of migration in dark and light *ananassae* in a mixed population. In the experiments, four migration tubes were connected with each other radially in the former experiment, and eleven radially in the latter experiment. All experiments were conducted in $25^{\circ} \pm 1^{\circ}$C in a dark room.

From the results in the first experiment, the following conclusions have been drawn: 1) the migratory activity in light *ananassae* was stimulated by dark *ananassae*, while the activity in dark *ananassae* decreased under the mixed condition; 2) in some combinations, for example D-rar and L-pp, the migratory activity of those strains depends on the relative frequency of both strains in the original tube into which the flies were introduced at the beginning of the experiment, but in other combinations the activity has no connection with the relative frequency in the original tube; and 3) the rate of increasing or decreasing of the activity due to mixing in a strain is quite different, depending on the combination of two strains. In this connection it is of interest to find that the migratory activity of D-rar strain is stimulated by mixing with L-pp, while it loses activity when coexisting with L-maj.

In the second experiment, it was found that light *ananassae* dominated in all tubes in the combinations D-pp and L-pp as well as D-pp and L-maj. However, light *ananassae* dominated in central tubes, but dark *ananassae* in the surrounding tubes in the combination D-rar and L-maj as well as between D-rar and L-pp, although the total number of migrant flies in light *ananassae* is greater than in dark *ananassae*.

From those two experiments, it is expected that light *ananassae* should be widely distributed in natural populations and dark *ananassae* should occupy marginal populations or isolated populations. It is also clear that the migratory activity of a strain is affected by other strains in the population and the mode of migration is determined by what kinds of strains coexist in a heterogeneous population.

Ullman, S. Institute of Animal Genetics. Edinburgh. Epsilon and polar granules in *Drosophila* pole cells and oocytes.

An electron microscopic investigation of the pole cells of *D. melanogaster*, *D. virilis* and *D. willistoni* has revealed, beside the polar granules, the presence of other organelles, the epsilon granules. Polar granules are spherical and lack a bounding membrane. Each consists of a granular, electron opaque cortex surrounding a less dense core.

Epsilon granules are ovoid or dumb-bell shaped organelles, bounded by a delicate double membrane. Within a fibrous matrix ill-defined spaces occur. The functions and interrelationships of the polar and epsilon granules is still obscure.

Preliminary observations suggest that the epsilon granules arise late in oogenesis, from convolutions of the oocyte plasmalemma.