As far as the inversions found in the populations are concerned not one included the mutations studied although some are on the same chromosome. Only the cardinal mutation was just at the beginning of the inversion (3R)P, which could cause a linkage disequilibrium. Nevertheless the small inversion frequencies in these populations make this impossible in practice.

It can therefore be concluded, in general, that the strong heterosis present in these artificial populations cannot be explained by the maintenance of inversions in heterozygosis.

References: Bridges, C.B. 1935, J.Heredity 26:60-64; Chigusa,S.I., L.E.Mettler & T. Mukai 1969, Genetics 61:s10; Lindsley,D.L. & E.H.Grell 1968, Carn.Inst.Wash.Publ. 627; McKenzie,J.A. & P.A.Parsons 1972, Oecologia 10:373-388; McKenzie,J.A. & P.A.Parsons 1974, Genetics 77:385-394; Mukai,T., L.E.Mettler & S.I.Chigusa 1971, P.N.A.S. 68:1065-1069.

Novitski, E. University of Oregon, Eugene USNA. Search for a tetraploid male.

The obvious usefulness of a tetraploid line in melanogaster has led a number of us to try to put together a tetraploid male. The existence of the entire compounds for both autosomes has made this project more hopeful. In addition, we have a compound X stock with a completely functional Y chromosome at the centromere region, this point being indisputable since the compound is a tandem metacentric which generates simple rings fertile in the male without a free Y chromosome.

A triploid line was constructed with the compound X and Basc, C(1)TM, XYS.YLX,y/Basc. Such females were mated to males with two second chromosomes attached together, C(2)EN, as well as two thirds joined together, C(3)EN. It would be anticipated that some of the gametes from the female would be diploid and would carry also the Y in the compound X, and that some of the gametes of the male would have two sets of the large autosomes, and a Y chromosome. The resulting zygote from the combination of the two would be 2X2Y;4A. The small fourth chromosomes were uncontrolled, except that the triploid stock was fresh and probably carried three fourth chromosomes, in some individuals at least.

366 triploid females of the above constitution were mated to an excess of C2;C3 males. The diploid progeny included females: 148 B/+, 38 y; males: 76 w^a B, 51 + and 6 y (the latter coming from crossing over within the TM). There were 27 B/+ and 6 y intersexes, 31 B/+/+ triploids and 40 non-B triploids. A few unusual products of crossing over or non-disjunction appeared: 2 w^a B females and 2 B males.

Of particular interest of course were the possible tetraploids. These included 4 y males and 3 B males with the large wing cell size characteristic of polyploids. There also appeared one female with a highly suppressed B phenotype and unusually large wing cells which might have been 4A in autosomal composition. All these individuals proved to be sterile, and it appears likely that the males were in fact male-like interesexes (a not too common occurrence) and that the female was 3X;4A.

From these results it would appear that if such higher level polyploids are viable and fertile in melanogaster, they are not easily produced by way of these entire compounds, although it can be surmised from the types of progeny described above that the 3N females and the C(2);C(3) males both produce the required diploid gametes.

Oguma, Y., S.Akai and H.Kurokawa. University of Tsukuba, Sakura-mura, Japan. Mating behavior in D.auraria complex.

We attempted to clarify what consists of components in mating behavior and how it genetically relates to species discrimination among the four siblings of D.auraria complex. A serial studies by means of observation for successive mating behavior were conducted by using a videocorder with a small observation chamber (ϕ15mm) under a light condition (1500 lux). The principal results obtained are as follows:

1. It was preliminarily found that there were a little but critical differences in sexual maturation between the four species. D.triauraria matured somewhat faster, conversely, D.biauraria did slower than the others. The male flies of the four species, in any case, all matured sexually by 4 days after eclosion at room temperature of 25°C. We accordingly conducted thereafter the video-observation by using flies of both sexes of 4-days through 6-days old.

2. None of fly of the all four species has mated under which set 30 minutes observation period in a dark condition. The flies tested, however, came to mate when they were shifted from a dark to a light condition with only 3 lux illumination. This implies a small amount of illumination is substantially permissible for beginning of mating in these flies.

3. Another experiment using a larger observation chamber (50x50x4mm) in which 10♀♀ and 15♂♂ were placed together revealed that the male flies behaved to show orientation to the females by means of their "sight". Furthermore, we could examine a critical distance which they could notice females was only 20mm. This fact indicates the more interesting subject of "sight" is characteristically used for partner recognition in this group.

4. After successive observations we could recognize 13 different but consecutive components belonging to mating behavior in this complex. All or almost all of male flies of D.auraria and D.quadraria similarly did not represent "wing vibration" while those of D.biauraria and D.triauraria did it. At the stage of attempted copulation, males of all four species consistently showed "wing display" and simultaneously the females spread both wings, following copulation. Just before copulation, males of D.triauraria postured at right rear of females, those of D.auraria and D.biauraria postured at a diagonal rear of females, and those of D.quadraria behaved both ways mentioned above. A tapping of females by males was intensely observed in D.triauraria.

Pascual, L. and R.deFrutos. Universidad de Valencia, Espana. Heat shock puffs in Drosophila subobscura polytene chromosomes.

It is well known that heat shock causes a response in larvae or early prepupae gene activity of Drosophila. Thus, a characteristic puffing pattern was described in the salivary gland chromosomes from several Drosophila species (Ritossa 1962; Berendes & Holt 1964; Ashburner 1970; etc.).

D.subobscura larvae, cultured at 19°C and synchronized for "prepupa 0h." stage (moment of eversion of the anterior spiracles), showed 93 active loci after heat shock (37°C during 10, 20, 30, 45 or 60 min).

Four different groups of chromosome regions reacting to the heat shock could be distinguished:

GROUP I: Puffs "induced" by heat shock and not normally observed at 19°C in this strain: 14AB, 27A, 31C/D, 54C/D, 60C/D, 89A and 94A. The loci 14AB, 54C/D and 60C/D are small and variable in their response (see Figure 1).

GROUP II: Puff which became highly active after the heat treatment when they were not seen to be active in normal development at this stage: 15DE and 18C (see Figure 1).

Figure 1. Principal heat shock puffs in Drosophila subobscura.