Research Notes

Blanc, R. and Child, G. P. Reversal of dominance in the dumpy locus in D. melanogaster.

Larvae and pupae of heterozygous dumpy flies were subjected to 36,5° C. for 12 hours. A large percentage of the flies exposed to the heat treatment beginning at 12-16 hours of pupal life showed truncated wings. These varied from nearly normal through a simulation of the effect of the oblique allele of dp to an effect greater than that of homozygous dp. The treatment producing the greatest effect was that begun at 13-14 hours of pupal life. Females showed a less pronounced effect than males both as to number and degree of the truncates. The period of greatest effect was one to two hours earlier in females than in males. Vortex, part of the phenotypic manifestation of dp, showed an earlier temperature effect period, at 6-10 hours of pupal life. This reversal of dominance has been observed with respect to other genes, such as cv, f, c, px. The experiments are being continued with the use of a dumpy stock and a wild stock which are isogenic to each other with the exception of the region of the dp locus.

Brähme, Katherine S. A larval character in D. melanogaster.

In a study of the attached-X yw/+ stock, it has been found that the mouth armature of homozygous yellow larvae is characterized by a lighter color than that of non-yellow. This can be diagnosed with certainty in the living larva at all stages from hatching to pupation. The color is lightest in the first instar larvae, where the whole armature is very light brown, almost golden; wild type armature at this time is very dark brown. In the second instar, the armature is somewhat darker than in the first but all regions of the armature are distinguishable from wild type. In the third instar (about 70 hours until pupation at 25° C) the mouth hooks are as dark as those of the wild type; the middle region of the armature is somewhat lighter; the posterior part of the armature is light brown, in contrast to the very dark brown of the wild type. Separation of y w XXY females from wild type males and y w triple-X females was made by means of mouth armature color, and when checked against the colorless condition of the homozygous white Malpighian tubes, was found to be a perfectly accurate means of classification. That the mouth armature color is dependent upon the yellow gene and not the white was determined by examination of white and of yellow stocks. This character has been observed independently by N. Kaliss in another stock.

Brehme, Katherine S. Effects of the triple-X condition in D. melanogaster.

In a study of the giant larva, using the gt bbll/ gt w^a stock, a high pupal and first instar larval mortality was observed, as well as a high frequency of zygotes whose pupation was retarded, as expected for giant, but which did not form large (giant) pupa cases. In order to separate the effects of the triple-X condition from those of the giant, a study of larvae and pupae of y w/+ stock has been made. Counts based upon 350 experimental and 1000 control larvae show about 10% larval mortality, 17% pupal mortality in the attached-X stock, in per cent of total zygotes; Florida wild type controls show about 8% mortality in the larval stage, 1% in the pupal. In the y w/+ stock, 2% emerged as superfemales. Of the dead larvae, one-fourth died in the late third instar and were identified as triple-X by the color of the Malpighian tubes and mouth armature; the remaining dead larvae were all in the first instar and practically all were males and XXY females. In this stock, therefore, the lethal effect of the triple-X condition is confined almost entirely to the pupal and prepupal stages. In the gt bb^{ll}/g t w^a stock, a larval mortality of 14% (almost all in the first instar) and pupal mortality of 16% were observed. Apparently the triple-X lethality is affected by the genetic environment, a larger proportion dying in the early larval period in the giant stock.

In the y w/+ stock, it was also observed that triple-X larvae do not form puparia until about 24 hours later than the mean pupation time of the males and XXY females; some XXX larvae do not form puparia until 7 days after oviposition at 25° C. Although no measurements were made, larval growth does not seem to occur during the additional days of larval life.

Barigozzi, Claudio. Study of salivary chromosomes through the ash analysis.

Spodograms of D. melanogaster salivary glands were prepared in order to determine the presence of inorganic materials in the ash. After burning at 450°-500° C the residue was easily detected in euchromomatic regions, but no ash was found in the chromocentral region. This indicates that the euchromatin is rich in inorganic matter while the heterochromatin is either poor in it or that such materials are entirely eliminated at temperatures of 450°-500° Centigrade.

Bedichek, Sarah. A spontaneous reverse mutation of yellow^2.

A reverse mutation of y^2 occurred spontaneously in a homozygous y^2 v f triploid stock. A single diploid female of the constitution + v f/y^2 v f was found; contamination is thus excluded.

This reverse-y^2 was not only dominant over y^2, but also over the y alleles in the stocks y 99b, y 303h, and y ac sc^8 w^a 13 m. A cytological examination for chromosomal abnormalities has not yet been made.

Buchmann, W. Temperature experiments. Experiments with temperature shocks were performed in order to study the effects of these temperature shocks on the duration of the developmental stages and on the presence of modifications of D. melanogaster. My experiments, which are not yet completed, showed that temperature shocks slow development. At the same time it was found that there exists a parallelism between the hereditary and nonhereditary variability. The nature of the induced nonhereditary modification depends upon the treated developmental stages and upon the applied temperature.

Cochrane, Flora. Color of testis. Study of testis color in 20 eye-color mutant stocks of D. pseudo-obscura showed that the amount and quality of color present in the testes is comparable to the amount and quality of the pigment deposited in the eyes during the late phase of their development. It was also found that color appears in the testes at about the time of the onset of the late phase of eye pigment development and may therefore be affected only by genes active during this period.

Crew, F.A.E. and Rowena Lamy. Mosaics in D. pseudo-obscura. Thirty-eight mosaics have been obtained. They appear to be caused by chromosome elimination. First and second cleavage mosaics show no signs of gynandromorphism. Sex-combs develop on XX legs of male mosaics and not on the XO legs of female mosaics A fertile female mosaic having an abdomen bilaterally divided into XX and XO tissue produced a high number of sterile exceptional sons, which is considered as evidence that she had incorporated in one ovary some germ cells which were XO in constitution. Vermilion in those mosaics behaves similarly to vermilion in melanogaster and simulans; that is, it appears as a wild type eye in exceptional tissue. In two female "fore-and-aft" mosaics however in which the head and thorax were XO and the abdomen XX (and v/ +) the eyes were vermilion. Sepia and white show autonomous development in exceptional tissue. There is some indication that sex-dimorphic characters are expressed according to the sex of the mosaic and not according to the constitution of the tissue.

Dubinin, N. P., N.N. Sokolov, G.G. Tiniakov and V.V. Sacharov. Unilateral chromosome conjugation in the salivary gland cells of Drosophila.

In our work published in 1935 (Biologicheskij jhurnal, vol. 4, No. 1, Russian) we wrote about unilateral chromosome conjugation in the salivary gland cells, basing our work on an analysis of heterozygous aberrations. However, we have come to the conclusion that the material used cannot prove our point, because the homologous chromosomes are twisted about each other. The problem of unilateral chromosome conjugation remains, therefore, unsolved.

Dubinin, N.P., N.N. Sokolov and G.G. Tiniakov. Crossing over between the genes "yellow" "achaete" and "scute".

Crossing-over between y ac and sc in females of the composition y ac^3 sc^1 w f/ / has been studied. The females were in all instances heterozygous for the C^2R-$Cy^2L.1.$ inversion and in half of the cases they were at the same time heterozygous for the C^3R-1-C^3L inversion. The inversions were introduced in order to increase crossing over at the left end of the X-chromosome. Crossing-over between ac and sc was obtained. A total of 75578 flies was investigated, and among them four y ac^3 sc^+ flies and one y^+ ac^+ sc^1 individual were found. Genetic analysis of crossovers excludes the possibility of contamination. One y ac^+ sc^+ fly was found in the experiment. Crossing-over between yellow and achaete was therefore suspected, but the fly died and due to the impossibility to test it further, this problem remains unsolved. The experiment showed a general increase of crossing over at the left end of the X-chromosome. Crossing-over between yellow and white amounted to 3.7 per cent (n = 32548).

If the supposition is correct that ac and sc are adjacent, then crossing over between two adjacent genes has been proved for the first time. Under the conditions described above this crossing over occurs with a definite and relatively high frequency.

Dubinin, N.P., N.N. Sokolov and G.G. Tiniakov. D. simulans from Adzharistan.

According to the data of O. Duda communicated in his book "Drosophilidae" (1935) it is known that D. simulans is absent among the palearctic forms of the Drosophila species. In the summer of the year 1936 we found D. simulans in Batoume (Adzharistan). A cytological analysis of salivary glands of the F_1 of flies caught in nature disclosed that we were dealing with hybrids between D. simulans and D. melanogaster. Further work yielded pure strain of D. simualans. Individuals from this strain were crossed with the American form of D. simulans. No difference between the two sets of salivary chromosomes could be detected.

Hadorn, Ernst. Pseudopupae. This term is suggested to be used for all cases where only a more or less normal puparium is formed within which no development of the imaginal discs occurs. Such pseudopupae are for instance formed by "lethal-giant" larvae and by hybrid males of D. melanogaster and D. simulans. Formation of pseudopupae in normals can be experimentally induced by injecting mature "ring-glands" into immature larvae. Pseudopupae may vary in their form. The best developed ones are like normal pupal cases, the poorest show only a hardening and darkening of the larval skin.

Hollander, W. F. Bithorax alleles. The mutants bx^W and bx^D were both discovered in one female. Nothing like bithorax had ever been observed in the stocks before. Other bithorax stocks were obtained from Cold Spring Harbor, namely those containing bx, bx^{34e}, and bx^d. The following phenotypes were obtained in the various hybrids:

bx/bx^{34e} = nearly wild type, slight development of metathorax.
bx/bx^d = wild type.
bx/bx^W = nearly wild type, but some overdevelopment of methathorax, often asymmetrical.
bx/bx^D = same as bx^D alone.
bx^{34e}/bx^d = wild type.
bx^{34e}/bx^W = blend
bx^{34e}/bx^D = rounded, flat, wing-like halteres, but not very large. Otherwise wild type.
bx^W/bx^d = wild type
bx^W/bx^D = oval, flat, winglike halteres, fairly large; little if any metathoacic development; flight not vigorous, but possible.
bx^d/bx^D = same phenotype as bx^d homozygous.

From the above results, I have concluded that these five factors are alleles, with no seriation of effect. No attempts have been made to analyze the salivary gland chromosomes.

Just, G. and F. Steiniger. Natural selection in D. melanogaster (normal-winged and vestigal) on the isle Greifswalder Oie. The investigations on selection under natural isle conditions (DIS-7, p.91) are continued on the isle Greifswalder Oie. They were also begun in the part Gellen of the isle Hiddensee.

Kaliss, Nathan. Determination of the color of malpighian tubules in larvae. Poulson has shown that the pigment of the malpighian tubules appears in zygotes that are 20 hours old. With a magnification of 440x, the color can be seen to be due to the presence of discrete yellow spherical particles located in the walls of the tubules. With a magnification of 1500x

it was determined that the absence of color in genetically white first instar larvae is due to the absence of granules, either yellow or white, from the walls of the malpighian tubules. These observations were made on larvae dissected in Ringers' solution.

Kaliss, Nathan. The larval expression of the gene for yellow. While observing male zygotes, 24 hours or older, that were deficient for the loci yellow and achaete, it was noticed that the mouth armature was yellow, as distinguished from the pale gray or black mouth parts of non-deficient wild-type eggs. Examination of genetically yellow late zygotes and first, second, and third instar larvae showed that the mouth armature was brown-yellow as contrasted with the black of non-yellow animals. The color darkens progressively with age.

The accuracy of this distinction was tested in the following manner:

1. From the cross y w/♀ x +/♂, 40 first instar larvae were selected as phenotypically wild-type by their mouth parts. From these larvae 39 adults were recovered: 25 +♀♀, and 14 +♂♂. From the same cross 39 first instar siblings were selected as having yellow mouth parts. From these larvae 38 imagoes, all yellow white males, were recovered.

2. From the cross w/In-49, y Hw♀ x +/♂ 19 second instar larvae were selected as yellow. These were recovered as 19 In-49, y Hw males.

3. A large number of 3rd instar larvae from the crosses (y ac)-B/In-49, y Hw♀ x +/♂, and w/In-49, y Hw♀ x w♂ were put on a slab of food. After they had worked through the food for half and hour, and presumably had become thoroughly mixed, 15 non-yellow and 15 yellow larvae were segregated. From the 15 non-yellow larvae, the following 15 imagoes were recovered: 4 wild-type ♀; 5 white ♀; 6 white ♂. From the 15 yellow larvae, 14 imagoes were recovered: 3 In-49, y Hw♀; 3 y Hw B♀; 8 In-49, y Hw♂.

It is interesting to note that Muller's classification of the mutation yellow as hypomorph is borne out by the appearance of the mouth armature in the hemizygous eggs deficient for the loci yellow and achaete. In these zygotes the armature is yellow. Miss Katherine B. Brehme has independently discovered the larval expression of the yellow locus while working on attached-X yellow larvae.

Komai, T. Collection of D. simulans from Japan. In December 1936, D. simulans has been collected by Mr. K. Daido from Titizima and Hahazima of Ogasawara Islands (Long. 142° E.; Lat. 26-28° N.). This may be the first record of capture of this species from Asia.

Liebäch, W. Gene manifestation. Since 1936 the manifestations of a variable wing-gene (vli) shortening the longitudinal veins has been under examination. In the first place the different forms of the manifestation were divided into qualitatively distinguishable classes. Further investigations concern the influence of alcohol upon D. melanogaster.

Morgen, L. V. A compound duplication of the X-chromosome of D. melanogaster. Crossing-over and disjunction have been studied in two lines of a duplication (Dp-100) in which the extra fragment is a deficient X-chromosome containing a distal section (X^d) from the y end to prune inclusive and a proximal section (X^p) from fu to the spindle fiber attachment. In one line (1,1) the fragment is attached to one X at spindle attachment and in the other line (1,f) the fragment is free on its own spindle attachment.

Crossing-over between the two entire X's was less frequent than in the diploid control, as in other duplications. In the region homologous to X^p the reduction in crossing-over is proportional to the length of X^p when compared with the proximal Dp-138 and other duplications studied by Dobzhansky (Studies III '34). The reduction in this region is the same in both lines of Dp-100. In the region homologous to X^d the reduction is very slight and is much less than in distal duplications (carrying some of the inert region) of comparable length. In the 3rd region, cv-ct (not homologous to the fragment), crossing-over is as frequent as in the control in the (1,1) line and is still more frequent in the (1,f) line. In the (1,1) line when a Y-chromosome is present, crossing-over is still more reduced especially in the most proximal region. Crossing-over of the proximal fragment (X^p) is only 0.3 times as frequent as crossing-over between the X's in the homologous region in line (1,f) and only about .08 times as frequent in line (1,1). Crossing-over within the distal fragment (X^d) rarely takes place.

Non-disjunction of X's occurs in about 3.5% of gametes in the (1,f) line. The X's of XXY females are usually non-crossovers, but a small percentage in one experiment were crossovers for a distal region. It is computed that non-disjunction of X's occurs in about 31% of no-exchange tetrads. Non-disjunction of X's in line (1,1) was infrequent being about the same as in XX controls. When a Y was present in the (1,1) line there was about 19% of non-disjunction which is 56% of estimated no-exchange tetrads.

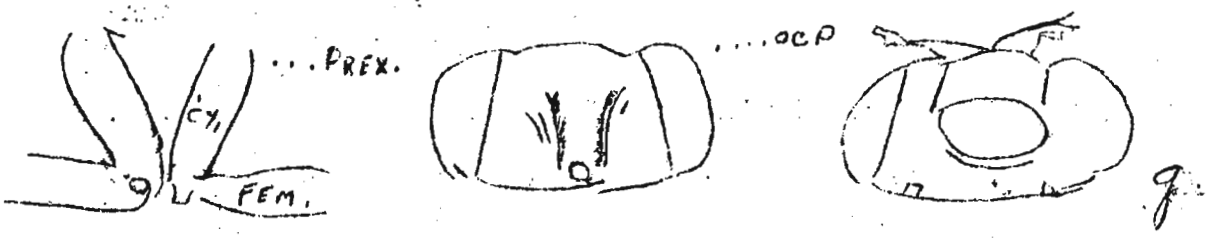
Moriwaki, D. Drosophila repleta found in Tokyo. In Tokyo, where D. repleta had never been found, the flies were first collected last year, 1936. Mr. S. Uchida, a student of Tokyo Imperial University, collected a few of them on November 13, 1936 at Shibuya-district in

Tokyo, after that we caught them occasionally even in winter, for example on Dec. 29, 1936; and all of them were cultured by corn-meal-agar method. That they were certainly D. repleta was secured by mating them with D. repleta in America which was sent to me by Dr. Kikkawa in Kyoto. On Dec. 12, 1936, one female and six males of scarlet eyes appeared in my culture, and it was a mutant character caused by an autosomal recessive gene, which I named as scarlet. This summer, however, the stocks of wild and scarlet were at the point of death, but fortunately we could capture again the flies in nature in Tokyo on August 25, 1937. Then the culturing of wild and scarlet stocks of D. repleta obtained in Tokyo is now continued.

Neuhaus, M. Crossing-over in the bobbed region. In order to study the frequency of crossing-over in the bobbed region the following crosses were undertaken. Females possessing y sc^4 (y sc^4- a long inversion, the right break occurring in the inert region to left of bobbed) and $\frac{y^2\ w^a}{f\ bb\ Y^L}$ were mated to $\frac{f\ Y^S\ Y^L}{}$ males. F_1 y sc^4 males were tested for fertility. In general those males are sterile, but if an ordinary crossing-over to the right of the inversion takes place then a fertile y sc^4 male arises. And if the X-chromosome of that male contains bb then this indicates that the cross over has taken place to the right of the bobbed locus. 1500 y sc^4 males were tested for fertility and among them one fertile male was observed. A genetical investigation of the X-chromosome of this male showed that the X-chromosome contain bb and the long arm of the Y attached. Similar experiments were carried out with one sc^8 inversion and a testing over 5000 sc^8 males for fertility, but only sterile males were obtained.

Serebrovsky, A. S. On some newly appearing bristles. A detailed study of s^9L-Ry^4 flies has revealed in the latter the appearance of some new bristles, designated by the author as praecoxales and occipitales. The former (prex) arise on the lower surface of the thorax anteriorly to the anterior coxae, one on each side, often asymmetrically and for the most part in homozygous females. Those bristles are fine and more slender and shorter than macrochaetes, being usually directed outwards. The latter (occ) develop on the posterior surface of the head, one on each side, between the edge of the eye and the dark "trapeze". Those short bristles are directed upwards. Apart from the above said, there takes place a doubling of bristles, to which the term of genales (g) is given by the author. When examining the head from beneath, those bristles seem to be directed backwards. The occurrence of the above bristles is apparently caused by the doublication of loci ac^+ and sc in the chromosome of that structure. It is of interest,

that flies having deletions, often display the appearance of the same bristles, probably due to a similar cause of hyperploidy for sc and ac. The study of several deletions has shown each of them to exert a characteristic influence either on prex or on ocp and g. Having compared eleven different deletions, the author was able to distinguish easily some of them according to those characters, when examing groups of flies. Such a circumstance may be utilized in working on deletions. Praecoxales are also to be observed in Hw and in h flies.



Serebrovsky, A. S. Interaction between the genes divers and yellow and scute.

V. V. Sakharov, by whom the divers mutation in D. melanogaster was found, detected the appearance of a new character in y div flies, viz. a strong upcurling of wings, more pronounced than in flies Cy. That phenomenon was studied by the author in combinations of div with other allelomorphs of yellow. In y^3 div (yellow body, black bristles) the wings get curved as strongly as in y^1 div. In y^3 div the wings are seen to curve somewhat less, but still very strongly. In y^N div (gray body, yellow bristles) (see Neuhaus DIS-4) the wings are either flat or slightly curved as in some y^+ div. Thus the degree of the wing curving is parallel to the body color ($y = y^3\ y^{3P}\ y^N$), showing no connection with the color of bristles. At the same time some allelomorphs of scute and achaete were investigated. The sc^3 div flies are of a very poor viability, the same being the cause of the failure in obtaining sc^{10} div. In sc^3 div, sc^6 div and sc^8 div the wings were found to be flat.

Shapiro, N. The frequency of the somatic mosaic occurrence in males and females.

The writer has observed the frequency of the mosaic occurrence in the stock h ss/+ after X-raying heterozygous larvae. The latter were treated at the age from 3 to 48 hours from the moment of egg laying. The dose of irradiation was 1000r. The results are summarized in a table.

	Number of flies	Number of mosaics: hairy	spineless	Total
♀♀	1420	3	6	9
♂♂	1132	3	5	8

From the above given data it may be seen that the frequency of the mosaic occurrence for autosomal genes is alike both in males and females.

Surrarrer, T. C. Time of pupae case coloration. In obtaining pupae cases of known age of a vermilion mottled eyed mutant strain at 27°C the pupae cases do not undergo any noticeable darkening during the first hour after pupation.

Waletzky, E. A haploid mosaic of D. melanogaster. In a cross between W +/+ wp pP x wp pP ♂ a single female was found in which thorax, abdomen and the right side of the head were W +/+ wp pP. The left side of the head was smaller than the right side. The left eye was peach in color and approximately two-thirds the size of the normal, red, right eye. The left posterior ocellus was peach and approximately half the size of the normal, right posterior ocellus. The arista and all macrochaetae and microchaetae on the left side of the head, were not more than half the size of those present on the right side of the head.

Whittinghill, M. Salivary studies on translocation. Salivary analyses (and supplementary tests as to the localizations of several mutants on the salivary map) have been obtained in a series of Y-2 translocations (found and first used by Dobzhansky: Biol. Zbl. 50:671-685, 1930; also Z.i.A.V. 60:235-286, 1932) and in T(2,3)Moiré (formerly Me[lx]).

Three of the translocations, T(Y;2)A, B and C, were indistinguishable from each other in the salivaries, though differentiated genetically by crossing-over relations with thick (Dobzhansky) and by a position effect with rolled (see below). In each of these three translocations the break in the second chromosome was found to be just before band 41A1 of Bridges' 1935 map. Synapsis in 2R was greatly interfered with, especially near the region of the break.

Translocation D was found to be a complex rearrangement involving the third chromosome also and is, therefore, here designated as T(Y;2;3)D. Six(or more) breaks were found in the second and third chromosomes as follows: before 30A1, before heaviest band of 34C, undetermined breaks (or break) proximal to 41D, before 61F1, before or after 62A5 (which is the last of four similar light bands), and in 78F. The new arrangement of chromosomes was found to be as follows: Proximal part of Y; 29F to 2L tip. - Distal part of Y; 30A1 to 34C; 78F through spindle attachment to 3R tip. - 3L tip to 61E2; deficiency of 61F1 to 62A4 or 5; 62A5 or 6 to 78F; 34C to spindle attachment; unanalysed rearrangement in 41A to C; 41D1 to 2R tip.

Translocation (Y;2) E was found to have its break between the two heavy capsules of 36D. This is to the right of the locus of black, rather than to the left as determined genetically by Dobzhansky.

Translocation (Y;2) I was found to contain exchanges between 3 and Y as well as between 2 and Y, so it was thereupon designated T(Y;2;3)I. The salivaries showed a break in 2R after 47A1 capsule and five breaks in the third chromosome, after 69C2, between 74A1 and B1 capsules, after 84E1 or 2, between the heavy doublet of 91E and in 99C. The new order of segments was found to be: 2R tip to 47A; s.a. Y; 91E to 84E; 69C to 74A; 99C to 3R tip. 2L normal through s.a. to 47A1; tip of one arm of Y. Tip of other arm of Y (presumable, not seen); 91E to 99C; 74B through s.a. to 84E; 69C to 3L tip.

Translocation (Y;2) J as studied by both Bridges and this writer revealed an inversion in addition to the translocation. The entire 2R is carried by the Y in this order: Y s.a.; 57F1 to 41A1; 57F2 to 2R tip.

The Moire used as a balancer for the entire third chromosome, formerly called Moire^{11x} (DIS-3:13 Pub. Glass '33. J. Gen.28:104) was found to require the designation T (2;3)Me. It is composed of the translocation of the tip of 2R to the spindle attachment of 3, the inversion, of an adjacent segment of 2R, the Payne inversion (carrying Me), a new In(3R), plus a reciprocal exchange between L and R arms, i.e., a central inversion extending across the s.a., which cuts into the L and R inversions. Breaks were found at eight places, as follows: through 48C1 capsule, after 59D1 capsule, after 63B1, in 69E, in 72E, in 89B, in 91C and in 97D. The altered chromosomes were found to have the constitution outlined below:

2L normal through s.a. to 48C1; 59D1 to 48C2. 3L tip to 63B1; 72E to 69E; 91C to 97D; 89B through s.a., which bears 59D to 2R tip seemingly as a lateral attachment; along base of 3L to 72F; 63B2 to 69E; 91C to 89B; 97D to 3R tip.

Genetic studies were undertaken on some of these, chiefly T(Y;2;3)D, to determine the nature of phenomena not explained on cytological grounds, such as the difference between Translocations (Y;2) A, B, C and J, and the pale and the Minute characteristics of the T (Y;2;3) D phenotype. The results of matings of translocations to genes located at the base of 2R can best be presented in tabular form.

Translocations: genes	A	B	C	D	J
lightoid	x	x	x	x	x
blot	x	x	x	x	x
straw	x	x	x	p.e.	x
rolled	x	p.e.	x	x	x
thick	x	x	x	x	x
apterous	x	x	x	x	x
Minute-p	-	-	-	allel	-
misformed	x	x	x	x	x

Legend: p.e., position effect found; x, no effect; -, not tested satisfactorily.

The position effect of T(Y;2)B with rolled was found by Mrs. V. Curry, others by the writer.

Breakages in other regions of the second chromosome showed no position effects in the following series of matings: T(Y;2)J with wt, sm, hy, a, px; T(Y;2)E with j, lm, el, rd, pu, an, cru, rh, ck, hk, bri; T(Y;2;3)I with en, upw, chl; T(Y;2;3)D with Mz, Sk, cl, pi, Sp, spd, gt^4, tkv, d, tkd, J, ab.

After the cytological discovery of a deficiency around the locus of roughoid in T(Y;2;3)D, matings were made with all mutants in this vicinity to find out whether the deficient material might not be present somewhere else in the nucleus and, if not, what other loci it might include. It was found that this is a true deficiency and that the loci of anarista, roughoid and veinlet (but not Roughened) are included within its limits, 61F1 to 62A4 or 5.

Zimmer, K.G. and N.W. Timofeeff-Ressovsky. Production of mutations by neutrons in D. melanogaster.

A statistically significant increase of the rate of sex-linked mutations in D. melanogaster (ClB-method) was obtained by irradiation with neutrons (0, 96% ± 0, 20, as compared with 0, 19% ± 0, 07 in the controls) from an "artificial source (Philips, Eindhoven). Against all other radiations (X-rays produced by the neutron-apparatus) the flies were protected, so that the whole difference in the mutation rates (0, 77% ± 0, 24) is due to protons secondarily induced within the flies by neutrons. Dosage-work (determination of neutron-irradiation-dosages in r-units, equivalent to those of X-rays), as well as further irradiation-experiments are in progress, and will allow an exact comparison of the effectivity of equivalent dosages of neutrons and X-rays. The last question is of interest in connection with the problem of the influence upon the effectiveness of the total dosage of the time-and space-distribution of ionization along the path of the secondary electron or particle.

Technical Notes

Bridges, C. B. Concentration of moldex in culture media.

A concentration of 1.0% of a 10% alcoholic solution of moldex (Moldex-A from Glycol Products Co., 148 Lafayette St., New York, N. Y.) was used at Pasadena for some months in culture media (DIS-6:62) for several species of Drosophila. It was found to control mold perfectly, but was reported by several workers to give fewer fertile cultures, lowered productivity and smaller flies - presumably through hindering growth of live yeast. For the past year a concentration of 0.7% of the solution (0.07% of the chemical) has

been used. This is adequate to keep molds from appearing and seems not to give bad effects on the flies.

Bridges, C. B. On the seeding of culture with yeast.

On some five occasions the method of seeding the surfaces of culture bottles by spraying with very thin yeast suspension (see DIS-6;66) has been hopefully put into practice and then abandoned in favor of seeding with one, or better two fat drops of thick yeast suspension. Always the failures of pair cultures to produce offspring became so large as to seriously hinder the experimental breeding. The main advantage of the spraying was the suppression of mold growth - and this is now better accomplished by moldex.

Bridges, C. B. On distinguishing larvae for salivary preparations.

The notes by Beadle (Am. Nat.71: 277; DIS-6:24), Hoover (DIS-6:24) and Brehme DIS-8: -) show how the distinction between the yellow of normal malphigian tubules and the colorless or paler tubules associated with certain light eye-colors (notably w and lt but also cm, g^2 p^p and ca) and the brown color of the mouth parts of yellow larvae, can be used to select larvae of the type desired for salivary preparations. A survey of our balancers shows that a few of them are especially useful for general use in balancing any mutant whose salivaries might need investigation. For chromosome I, these are: Cl, y Hw (carrying y and g^2) dl-49, m^2 g^4 (carrying g^4, already recommended by Hoover) and dl-49, w lz^s. For chromosome II, the best is Cy, al^2 lt^3 L^4 sp^2 (carrying lt^3 of Beadle) and for chromosome III, the best is Payne, Dfd ca. These balancers are the best of the ClB, dl-49, Cy and Payne varieties, and should be kept on hand and favored in stock making.

For second and third chromosome aberrations, use can be made of the dominant eye-color p^G which has pale tubules (perhaps p^G/p^p are better). First cross to $T(Y;2;3)p^G$, pick out the $T(2;3)p^G$ aberration ♂♂ and cross to p^p ♀♀, using the normal yellow tubuled larvae.

A second and third chromosome method needing no distinguishing of larvae, except the easy one of femaleness, has been the use (by Schultz and myself) of T(Y;2;3)I. Cross the female bearing the aberration to ♂ males carrying T(Y;2;3)I, pick out sons carrying the aberration (all are T(Y;2;3)I and cross to any standard female. All daughters are heterozygotes for the aberration.

Buzzati-Traverso, A. Method for making salivary gland chromosomes permanent smearing.

I found very convenient for making permanent salivary gland chromosome smears the following method: (1) Dissect as usual the larva and leave the salivary gland in normal aceto carmine till well stained; (2) pass the gland to the slide and take off all the aceto carmine which might

be on the slide, avoiding the gland to dry; (3) let two or three drops of the following liquid fall on the gland; 1 part Faure's liquid (50cc. of distilled water + 50cc. of chloral hydrate + 20cc. of glycerine + 30cc. of arabic gum) mixed with 2 parts of normal aceto carmine (the proportion 1:2 should be changed slightly to fit the different materials); (4) put the cover slip on and smear as usual, leaving the liquid in excess to dry around the edges of the cover slip. The slide will be dry enough to be used in a few hours, and keeps in very good conditions practically indefinetely.

Just, G. and F. Steiniger. Food. The marketable fruit-marmalades, which could be used as a convenient Drosophila food, in Germany nowadays contain remedies for preventing fermentation, and the food becomes very acid in short time. These marmalades are to be used only with great cautiousness.

Lüers, H. The use of the dominant Bobbed in the Y-chromosome of D. funebris in genetic experiments. A dominant bobbed-mutation was induced by X-rays in the Y-chromosome of Drosophila funebris (Bb^y). Some properties of this new mutation make it useful in some genetic experiments. (1) Bb^y has a markedly slower development. Since it is present in males only, it facilitates the obtaining of virgin females from mass-cultures. (2) Bb^y is a good marker of the Y-chromosome. (3) Bb^y enhances non-disjunction of the X-and Y-chromosomes, and facilitates the obtaining of XO- and XYY- ♂♂ and of XXX-, XXY- and XXYY- ♀♀.

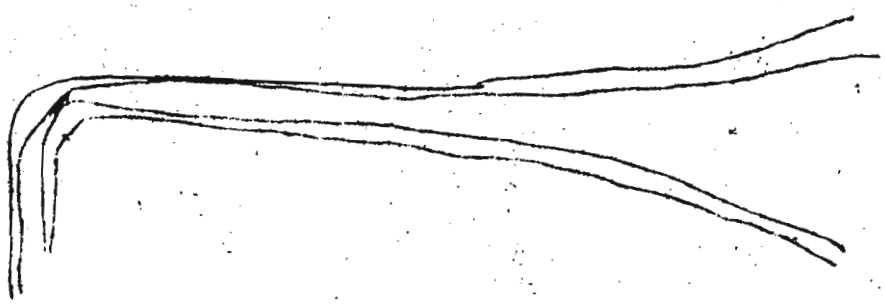
Medvedev, N.N. How to make Drosophila larvae immobile for a short time. In order to carry out transplantation experiments on Drosophila larvae it is necessary to make them for some time immobile. Beadle and Ephrussi in their work use the current method of etherization. This treatment, however, is very undesirable, because it makes transplantation experiments tedious by themselves still more difficult, especially in the case when they are carried out by but one person.

For this purpose the author successfully uses a very simple method. After placing a larvae on the slide where we are going to perform the transplantation, it is quite sufficient to press it gently with a piece of filter paper and to roll it over a few times around its longitudinal axis. After this simple manipulation the larva becomes immobile for a time sufficiently long to perform a transplantation.

Medvedev, N.N. Pipette in Drosophila transplantation experiments.

In distinction from the pipette described for transplantation experiments on Drosophila by Beadle and Ephrussi we are using the pipette represented in our text-figure.

The very end of such a pipette during performing transplantation is wholly visible in the field of a microscope in a horizontal plane. This peculiarity provides the possibility of checking the movement of an organ under implantation within the capillary of the pipette and at the same time to check more precisely the quantity of physiological solution injected.



Spencer, W. P. Factors involved in oviposition.

As an increasing number of workers are undertaking problems involving the collection and hatching of Drosophila eggs (transplantation experiments, study of larval lethals etc.) a few notes on factors leading up to and inducing oviposition may prove of interest.

(A) Pre-feeding of females. Starved flies will lay few or no eggs. It is important to furnish flies which are to used in egg laying experiments an adequate supply of fresh food, particularly on the day or two days prior to the collection period. It is also well to use flies which have been matured for several days to two weeks depending on the species. If flies are aged in vials fresh food chips should be added or the old ones so cut as to furnish fresh surface, as the surface of a food chip in a vial soon dries or forms a film which cuts down on food comsumption.

(B) Humidity. To elicit the ovipositing reaction the air in contact with the surface where the eggs are to be laid must have a high humidity, probably close to or at the saturation point. This condition is frequently supplied, but sometimes unwittingly. Enclosing moist food medium in a glass container tends to supply the proper humidity. However, a small paper spoon of medium in a half pint bottle,

particularly in a dry climate, may not raise the humidity sufficiently to secure optimum results. The scraping and roughening of the food surface described by a number of workers supplies tiny humid valleys where the ovipositor meets an environment sufficiently moist to induce the reaction. However, eggs will be deposited in or on a smooth surface if the air in contact with it is saturated with moisture. Conversely no eggs are deposited in dry air. In a dry climate fresh medium may be left exposed to flies which will feed on it but will no oviposit. If, however, the same dish of medium is covered so that the humidity rises oviposition occurs. Thus in nature flies invariably oviposit in cracks or on the under surface of exposed food.

(C) Temperature. Ovipositing occurs through a wide range of temperatures differing somewhat for different species of Drosophila. The range however, is not as great as the upper and lower limits of temperature to which the fly is tolerant. Thus females which have been well-fed may be kept at temperatures below 10C for long periods of time without ovipositing. When the temperature is raised the first eggs laid are small and abortive, indicating a resorption of material from eggs held in the uterus for a long period. Roughly the temperature range is somewhere between 10C and 30C with the optimum differing for different species.

(D) Medium for oviposition. When all other conditions are satisfied, i.e. females properly aged and well-fed, temperature neither too high nor too low, and humidity conditions correct, flies will oviposit readily on a great variety of substances from the most elaborately prepared media heavily yeasted to cellucotton or tissue paper soaked in distilled water or tap water. The writer has collected eggs on cellucotton soaked in sugar-water, or yeast solution, or water alone, on raw beet, raw potato, various fruits such as apple, pear, banana, moist oatmeal, moist bran and the usual media. Stangely enough, all previous notes on the collecting of eggs including notes of the writer in DIS-7 mention yeasting the surface as a necessary part of the routine. Actually yeasting has little or nothing to do with inducing oviposition. If the same surface is made to do triple duty as food for the parent fly, ovipositing medium and food for the larva hatched from the egg, then possibly yeasting is indicated. However, the logical time to do the yeasting would be after the eggs have hatched or are about to hatch, as overgrowth of yeast is likely to cover and smother the developing egg. This is particularly true of small, slow-hatching eggs, deeply buried in medium. It is quite possible to provide in the same vial one surface for the feeding of the flies and another of quite a different nature for the collection of a large part of the eggs laid. Where the same surface is to be used for the three purposes mentioned above, and young larvae rather than eggs are desired the writer recommends small wads of cellucotton soaked in sugar water. This serves as an ideal feeding surface for adult flies, and reduces to a minimum the danger of weak adults sticking and drowning. The moist,

porous surface induces oviposition. The addition of fresh baker's yeast dissolved in water or for some species in a Ringer's solution containing particularly Mg and K ions brings the larvae through to pupation under optimum feeding conditions. The dissolved yeast may be added to the cellucotton at about the time the larvae hatch. Eggs or larvae may be secured for study or experiment at any time by shaking a bit of the cellucotton in Ringer's solution.

Spencer, W. P. The use of cellucotton in Drosophila culture.

A porous cellulose compound under the trade name, Cellucotton, furnishes and excellent base for culture media for Drosophila. This material comes in large bats, 2lb, 5lb, and 8lb. It is extremely porous and absorbent. One gram will soak up and hold without dripping 20 cc. of water or other liquid media. The material may be readily cut into wads of convenient size and placed in any design of culture bottle. Liquid media of which the main constituent is a sugar, (cane sugar, either refined or brown, or molasses), together with salts such as are added in the culturing of yeast, may be poured or pipetted onto the cellucotton and the surface seeded with a little powdered yeast. Flies are then put in. If there is any trouble with molds, moldex or other mold preventatives may be used. At any time during the life of the culture food may be added either in the form of the original solution or of baker's yeast in liquid suspension. It is also possible to raise the larvae from the start on yeast suspension, to which for some species salts must be added. In this case a small wad of cellucotton soaked in sugar water should be stuck to the side of the culture vessel as food for the parent flies.

If larvae are raised on yeast alone be sure to add a wad of cellucotton soaked in sugar water before emergence of adults as they will not live long on a yeast diet.

The advantages of the cellucotton will be obvious to anyone using it. There is no cooking of food media necessary. There is no necessity for cutting out a food plug to allow escape of CO_2. There is less tendency for flies to become stuck in the food medium. There is a more effective use of the media by the larvae and an increased yield per culture bottle. Large, well-nourished larvae are more readily available for salivary chromosome study. Much smaller containers can be used for rearing a given number of flies, thus cutting down on incubator space necessary for running an experiment. With proper handling of adults as to numbers and time left in culture overcrowding should not occur. When this is allowed to take place more cellucotton soaked in yeast may be added.

Steinberg, A. Micro-burner. A cheap and easily prepared micro-burner can be made by cutting away the sharpened end of a hypodermic needle and mounting the remainder on a block of wood. A burner prepared from a B-D gauge 27 needle has been found to give excellent results in the preparation of needles for the Ephrussi and Beadle transplantation technique.

Stern, Curt. Methylene blue - staining of peripheral nervous system in D. melanogaster. Every macro- and microchaeta of Drosophila is innervated by a peripheral nerve cell. The centripetal axons of these cells join into nerves which form a characteristic pattern underlying that of the setae. Method: Very lightly etherize adult flies. Inject into the sternum, by means of a fine pipette, a solution of methylene blue BX-Grueblcr (1% in 0.7% saline). Enough fluid should be injected to make the whole animal appear blue. After 20 minutes to 2 hours dissect desired parts, such as whole head or dorsal half of thorax, in cold 10% ammonium molybdate solution. Leave in this fixative fluid for 2 or more hours. Make total mount according to ordinary technique. - This is not an original method except for its application to Drosophila. It is not invariably successful.

Tanaka, Y. and T. Takami. New food material. We tested Koji (malted rice), rice-bran, wheat powder, banana, dried fruits, etc., and found that rice-bran might be the cheapest material in Japan giving good results. An example of our rice-bran food formulas is as follows:

Water	1000 cc
Rice-bran	80 g
Brown sugar	60 g
Agar-agar	20 g

Heat agar in water until it dissolves, add rice-bran and sugar, then boil the mixture during some ten minutes stirring well.

News

Seventh International Congress of Genetics. - "The question as to the place for the next International Congress of Genetics has now been considered and voted upon by the International Committee of Genetics Congresses. The International Committee has by a large majority resolved to invite the British geneticists to arrange the next congress in Great Britain in 1939. The committee of the British Genetical Society has passed a resolution welcoming the invitation. The British Geneticists will take the earliest opportunity of appointing an Organization Committee which

will send out further information concerning the date and place of the congress." - (O. Mohr).

Reprints of Drosophila genetics articles wanted: Having just started Drosophila research work for the first time in Italy, I shall feel very grateful to any research worker who will send his reprints in exchange of the articles which shall be sent from my laboratory. Also the old reprints will be welcome. - (A. Buzzati-Traverso).

Due to prolonged delays in completing spraying apparatus for testing contact poisons, our experiments using Drosophila vestigial flies for the biological assay of the toxicity of plant extracts of insecticidal value are just starting. Experiments with local food media have been completed and are being prepared for publication. They were unusual in applying Yates' method of randomized pairs for eliminating differences in productivity between individual females from the estimate of error and have led to a simplification and improvement of the medium used elsewhere in Leningrad. (C. I. Bliss).

Additional Reasearch Notes

Pollitzer, Otto. Crossingovervariabilität. Bei Untersuchungen über Crossovervariabilität an einem III ple Stamm mittels Rückkreuzung nach dem Schema se gl^3/cp e^{11} x se cp gl^3 e^{11} zeigte sich bei einer Versuchstemperatur von 25 Grad C. und einem Weibchenalter von uber 36 Tagen ein Absinken der Austauschwerte. Angaben über ein Verhalten in dieser Altersstuffe habe ich bisher in der Literatur nicht gefunden. Die Altersvariabilität zeigte maximale Abweichungswerte in der Region se-cp minimale in der gl^3 e^{11}. Weitgehende Unterschiede im Crossoververhalten fanden sich bei extremen Zuchttemperaturen. Die Interferenz zeigte ein ständiges Ansteigennmit dem alter bei 31 und 25 Grad C. Zuchttemperatur, bei 15 Grad C. hingegen ein anfängliches Absinken der Werte gleichzeitig mit einer Verringerung der Internodienlange, nach dem 20. Lebenstag machte sich aber auch hier ein Ansteigen der Interferenz mit dem Alter bemerkbar. Neuere Berechnungen der Lokalisation der Mutation cp III chromosome (fruher ci Mainx) ergaben einen Wert van 46.5 ± 0.8.

Seventh International Congress of Genetics - In accordance with a resolution of the International Committee and with the decision of the Crganizing Committee elected by the Genetical Society of Great Britain, the VIIth INTERNATIONAL CONGRESS OF GENETICS will meet in Edinburgh in 1939, probably from August 23rd-30th inclusive. Professor F.A.E. Crew, Institute of Animal Genetics, University of Edinburgh, Edinburgh 9, has been appointed General Secretary to the Congress and to him all correspondence concerning it should be addressed.