NOTES AND NEWS

Research Notes

Anderson, Ray. The effects of Minutes on Bristle Number. In checking the effects of various Minutes on the expression of the H^{32} gene, it has been found that the Minutes themselves frequently lack various bristles, especially the postverticals. Preliminary results show M(3)w and M(3)Fla to be more extreme in bristle absence than $M(2)1^2$. In compound with H^{32} the Minutes act to decrease mean bristle number, with M(3)w and M(3)Fla again more extreme than $M(2)1^2$. The expression of the Hairless and Minute genes in compound are greater than would be expected on the basis of mere additive effects.

Brehme, Katherine S. Classification of the larvae of body color and bristle color mutants. Certain of the mutations affecting adult body color or bristle color may be used as markers for classifying 3rd instar larvae, and are therefore useful in transplantation, physiological experiments or the preparation of salivary chromosome slides. It has previously been reported (Brehme 1937) that the mouth-parts of larvae homozygous for y are golden to golden brown and are classifiable in the living larva as early as the 1st instar. The following yellow alleles have mouth-parts light enough in color to be readily classifiable: y^{1S}, y^{2S}, y^{3d}, y^4, y^6, y^{td}. The following cannot be classified with certainty in the 3rd instar: y^2, y^{346}, y^{v2}; however, y^{3P} is classifiable with some difficulty.

The mouth-parts of stw^{32} are straw-colored at the basal prongs, and somewhat lighter than wild type at the vertical plate; this is classifiable in the living 3rd instar larva, and with some difficulty in the 1st instar. The basal prongs of stw^3 are light, but classification in the 3rd instar is difficult.

The tan alleles, t, t^2 and t^3, are recognizable in the dissected 3rd instar larva by slightly lighter basal prongs than those of the wild type; this difference cannot be used for classification of the living larva. The mouth-parts of su-t t are wild type. The ebony alleles have blacker mouth-parts than wild type throughout the larval stage, but the difference is too slight to be observable in living larvae. The mouth-parts of T(1;2)Bld and of b are wild type.

The ebony alleles, e, e^4, e^{11} and e^s are readily classifiable throughout the entire larval period by means of the sooty color of the sclerotization around the posterior spiracles, and, in the 3rd instar, around the anterior spiracles as well. This sclerotization is clear yellow in the wild type. Darkening of the spiracle sheath has not been observed in any other mutant.

Buzzati-Traverso, A. An extreme case of sex-ratio in D. bilineata. A fertilized female caught in nature near Pavia, Italy has given just females. Such flies outcrossed to normal males give just females, which show a great fertility. Studies are under way to find the origin of such aberrant sex-ratio.

Curry, V. S. The mutant dwarf-24F, 2-13.5±, which is included in two overlapping deficiencies. Homozygous dwarf-24F (dw-24F) is a small fly, with dark small eyes, bloated abdomen, and slightly drooping wings. It was found to be present in the l(2)cg cg/Cy, al^2 lt^3 L^4 stock, to the left of l(2)cg, and included in both Df(2)MB and Df(2)MC. Cytological analysis of these two deficiencies places it tentatively in salivary section 24F. (Schultz)

It was reported previously (DIS-12;46) that Df(2)MB included l(2)cg and Df(2)MC did not. This was an error due to misinterpretation of

the results of crosses to the l(2)cg stock which were made before the discovery of dw-24F. Since dw-24F/Df-Minute is relatively inviable, none survived in the cross to Df(2)MB, and it was concluded that the deficiency included the lethal. A few did survive in the cross to Df(2)MC, (though the phenotypic effects of dw-24F were not then recognized), indicating that this deficiency did not include the lethal. Retesting after the presence of dw-24F in the l(2)cg stock was discovered has shown that dw-24F is included in both deficiencies, and l(2)cg is included in neither.

Curry, V. S. Correction for Df(2)MB — Df(2)MB does not include the locus l(2)cg, but does include dw-24F. (See above).

Curry, V. S. New data on the locus of lightoid. — The locus of lightoid (ltd) in 2 was previously placed at 55.0, to the left of the sp-a. Counts with ltd en/M(2)S2, place it 1.4 to the right of the M(2)52 deficiency, hence to the right of the spindle attachment, ltd is therefore to the right of msf, since it is not included in a deficiency covering stw-msf.

Curry, V. S. Rotated genetalia in the mutant engrailed. — The mutant engrailed, in addition to previously described effects, produces rotated and malformed genetalia in ♂♂. The ♂♂ with extreme manifestation of this effect are sterile, hence there is selection for modifiers suppressing it in homozygous stocks. For example, the stock "blo en", which has been kept homozygous for a number of years, shows the effect so little that it had not been detected, though an occasional ♂ shows the extreme rotation. Homozygous engrailed from balanced stocks give it in much higher frequency; while among homozygotes recently extracted from a cross-over experiment (allowing for relatively complete change of genetic constitution) all the ♂♂ had rotated genitalia, some with the penis entirely lacking, and all were sterile. A heterozygous stock was made and from this homozygous ♂♂ capable of breeding were obtained later. A homozygous stock is now maintained by means of transferring large numbers of flies. (The heterozygous stock is kept for safety.)

Comparison of this homozygous stock and the heterozygous stock, after about two months, gives striking evidence of the selection for suppressing modifiers where there is necessarily a selection for fertility. The heterozygous stock gives homozygous all of which show strong rotation; while in the homozygous stock, more than half show the strong rotation (90° or more) and the remainder show varying degrees of asymmetry or rotation approaching normal, or slight malformation without discernible rotation.

There is some evidence that the extra sex-comb of the engrailed ♂♂ is heavier in those showing the more extreme effect on the genitalia, but this has not been checked by accurate measurements.

Green, M. M. A spontaneous mutation of the gene vg to a weaker allele. — An apparently spontaneous mutation of the gene vg to a lesser penetrant allele, tentatively called vg^{nG}, was observed in 1 ♂ and 4 ♀ in a vg stock inbred in mass culture. Homozygous vg^{nG} exhibits wild type wings. vg/vg^{nG} exhibits notched wings in 100% of the cases studied thus far. Occasionally marginal scalloping occurs. $vg^{nG}/Df(2)vg^{D}$ exhibits a somewhat more extreme scalloping than the vg/vg^{nG} phenotype. No decrease in the haltere size or scutellar bristle arrangement has been detected in the compounds thus far tested. Tentatively this mutant is considered as similar to vg^{n}.

Kalmus, Hans Resistance to desiccation of some body color mutants in Drosophila.

Differences in resistance to desiccation have been found in mutants of the four species D. melanogaster, simulans, pseudoobscura, and subobscura. The methods employed were measuring the death rate and loss in weight, presumed to be loss in water, by means of a torsion balance. In all four species the yellow mutant is loss resistant to desiccation than the normal. In melanogaster, ebony and black increase the resistance to desiccation.

Kikkawa, H. Chemically detective methods of the substances concerning eye, egg and other colors in insects.

Recently I have discovered that the cn^+ substance which has the v^+ property as well found in Drosophila and in other insects can be detected by the so-called Ehrlich's diazo reaction technique, namely; Reagent I 1.75% HCl containing 0.5% sulphanilic acid and Reagent II 0.5% sodium nitrite ($NeNO_2$).

Mix the reagents in the ratio 40(I) to 1(II) when used. Add the mixture to the solution to be tested to which a few drops of concentrated ammonia is added. The solution shows a beautiful scarlet color when the cn^+ substance is present. The substance showing the above reaction may be called the + chromogen, for this substance is ananlogous to Sachs' color-substance (Hoppe-Seyler's Z. 242, 1936) or to Weiss' urochromogen (Biochem. A. 133, 1922), both of which are assumed to be the derivatives of tryptophane. But there are some differences in chemical properties among these substances. It seems difficult to obtain the substance in crystalline forms with the ordinary method. Ehrlich's diazo reaction as well as its modified method; Pauly's one, is not specific to the + chromogen and its analogous substances, because imidazol derivatives like histidine and p-oxybenzene derivatives like tyrosine show a similar reaction. But there are certain evidences that Ehrlich's diazo reaction of the water-soluble substances of insects can not be attributed to the presence of histidine or of tyrosine. The extract of v or cn mutant of Drosophila does not show this reaction, but that of wild, bw or of other eye-color mutants containing the cn^+ substance does show it. Similarly in Bombyx, the body-fluid of wild pupa and the extract of eggs directly after oviposition show this reaction, but some extracts which contain no or little cn^+ substance give almost negative results.

Kynurenine shown by Butenandt et al to be one of the v^+ substances could be found in a mutant of Bombyx called white-1, which lacks the $w\text{-}1^+$ (W) gene and shows a meternal inheritance. I have succeeded in obtaining crystals of kynurenine-sulphate from the extract of eggs of this mutant, but kynurenine does not show Ehrlich's diazo reaction. The evidence that kynurenine is transformed to the + chromogen showing Ehrlich's diazo reaction has been derived by the following experiments. When the v, bw larvae of Drosophila are bred with food containing dynurenine, the body-fluid does not show the kynurenine reaction (see below), but gives Ehrlich's diazo reaction. Similarly when the white-1 eggs of Bombyx are colored grayly by an implanted ovary having the $w\text{-}1^+$ (W) gene, the extract of those eggs shows both Ehrlich's diazo reaction and the kynurenine reaction, though lightly. Besides, when the + chromogen is heated with alkali, one can smell a jasmine-like aroma of o-aminoacetophenon, as in the case of kynurenine. Furthermore, one can detect the presence of anthranilic acid in the resolutive solution of the + chromogen. These findings indicate that the + chromogen is composed of a substance similar to kynurenine.

A specific and very keen method of detecting kynurenine has been found by Otani and Honda who are collaborators of Prof. Kotake (Oska-Izikaizassi, 37, 1938). Ehrlich's reagent, 15% HCl containing 2 % p-dimethylaminobenzaldehyde (sometimes 10% HCl is more adequate is added to the solution to be tested, to which 3% hydrogen peroxide of the amount half of the reagent is further added. The solution is then heated 10-20 minutes in a water bath of ca. 70°C. The

solution shows a beautiful violet color if kynurenine, anthranilic acid or aminoacetophenon is present. The latter two substances may be distinguished from kynurenine by shaking the solution with butanol for several times, because they are transsolved into butanol. The grade of keenness of the above method is increased by leaving the mixed solution at a room temperature for 14-20 hours, instead of being heated.

As far as my examinations go, only the white-1 mutant of Bombyx shows this reaction clearly. The cinnabar of Drosophila and the orange and ivory mutants of Habrobracon seem to belong to this category, but are not conclusive at present. Thus we can obtain at least the following system in connection with the formation of eye and egg colors, etc.: Compound tryptophane, Kynurenine → chromogen → chrome (eye-color substance, egg-color substance, etc.). It is needless to say that there are several intermediate forms in the above processes. For example, alpha-oxytryptophane and prokynurenine are to be located between tryptophane and kynurenine. Probably enzyme actions (resolutive and synthetic) or physiological conditions take part in the above transformation. It seems very plausible that these enzyme actions or physiological conditions are controlled by the genes such as v^+, cn^+ and $w\text{-}1^+$. This assumption was already suggested by Butenandt et al. It is to be noticed here that the above system concerning the color-formation may be operated similarly not only in Drosophila and Bombyx, but also in insects such as Ephestia, Habrobracon, Calliphora, and even in various other arthropods.

Milani, R. Two new eye-shape mutant alleles in D. melano. From a culture with a number of eye-color mutants of the X-chromosome, a new mutation has been isolated which produces the total disappearance of the eyes. A few bristles placed on a line are present where the eye is lacking, in its most extreme manifestation.

Such mutation shows a rather large variability: sometimes the antennae are fused, sometimes just a few ommatides are present, sometimes one eye is normal while the other one is transformed into two small ones. Such mutation is placed in the second chromosome; the flies carrying such mutation have a good fertility; the viability of mature pupae is lowered (30% at 17° C., 99% at 30° C.). The mutation has its best manifestation at 20° C., while at higher or lower temperatures a number of rudimental eyes are produced.

A less extreme allele of such mutation has been found. It can be easily distinguished from a less expressed form of the original mutation by the total disappearance of the ocelli in such allele.

Morgan, L. V. Allelomorphism of Cat and spa, Mutants in chromosome 4 of D. melanogaster. The loci of Bolgovsky's dominant mutation Cataract (Cat) and of the recessive sparkling (spa) in chromosome 4 of Drosophila melanogaster have not been determined, but the mutants are found to be allelomorphs. Cat is homozygous lethal. The posterior third (or half) of the ye of a fly heterozygous for Cat is decidedly rough and the arrangement of facets is confused. The eye in homozygous spa female is somewhat bulging and the entire surface is more or less rough and sparkling. Both characters are variable; spa is more pronounced when flies are raised at 19° than at 25° and its manifestation is suppressed in the presence of a Y-chromosome (in XXY and XY). Among Cat/spa flies:--the eyes of XXY females show Cat and not spa (Y present); eyes of XX females are bulging and show the rough and sparkling effect of spa and also posteriorly the effect of Cat; eyes of XY males show Cat but not spa (Y present); eyes of XO males, like those of XX females, show both Cat and spa. The relation of heterochromatin to the manifestation of spa is being studied.

Parshley, Elsa M. Development of the eye of Minute (3) Fla. Larvae from crosses of ca/ca ♀♀ by M(3) Fla/ca ♂♂ on a background of Florida wild type were cultured at 25° C in 7 cm. Petri dishes, 30 larvae to a dish, on a cornmeal-agar-molasses medium with brewer's yeast. Their age was known within 2 hours from hatching from the egg. At 48, 72, 96 and 122 hours, the larvae were classified by Malpighian tube color and the optic disks dissected out in physiological saline solution. The disks were flattened on a slide by means of a thin film of larval grease, and camera lucida outlines drawn; planimeter measurements were then made of each drawing. It was found that the 48-hour and 72-hour wild type disks were more than twice as large as the Minute disks; at 96 hours, the wild type disks were approximately 1.5 times as large as the Minute. Preliminary measurements of 122-hour Minute disks indicate that they continue to increase in size after the time of puparium formation of the wild type. - Facet counts of adult eyes show that there is no significant difference between wild type and M(3)Fla (clarot ♀♀, 731.2 facets, Minute ♀♀, 741.8; clarot ♂♂, 676.1 facets, Minute ♂♂, 681.1). Superimposed drawings of blocks of 9 facets each from corresponding parts of Minute and wild type eyes showed no difference in facet size. Tibia measurements of the same flies as those used for eye measurements show that the Minute adult, taking tibia length as an index of body size, is slightly smaller than the wild type. - It is concluded that the M(3)Fla factor affects growth of the optic disk in such a way that the area of the Minute disk by 48 hours is less than half that of the wild type; growth of the Minute disk continues during the interval between puparium formation of the wild type and Minute larvae; the final product, the imaginal eye, is the same in facet number and facet size in both genotypes. Body size of the Minute fly is smaller than the wild type; the Minute eyes are therefore larger in proportion to body size than the wild type eyes.

Philip, Ursula The chromosomes of D. subobscura. The mitotic complement consists of five pairs of rod shaped and one pair of dot-shaped chromosomes. The X and Y chromosomes, which are indistinguishable from each other, are the largest of the set. Whereas the secondary pairing at metaphase is complete in the autosomes, only the proximal portions of the sex chromosomes pair, the distal portions repelling each other.

The nucleus of the salivary gland cell shows five long and one very short chromosome. The number of strands thus corresponds to the number of chromosomes. The general morphology of the nucleus shows some interesting features. The chromosomes are held together in a chromocenter which however is so small that the strands are liable to break away. This means a relative lack of heterochromatin. We have not yet identified the strands with the linkage groups. One of the chromosomes provisionally labelled IV has an intercalary segment of heterochromatin, which in favorable preparations can be observed to pair with the chromocenter. Chromosome 2 has a proximal and a distal segment of heterochromatin and is often seen as a loop, both ends fixed in the chromocenter.

The Y chromosome contains a euchromatic section of at least 15 bands.

The stocks in this laboratory contain many aberrations.

We have so far been unable to find a single stock which could be used as a standard, with all the chromosomes homozygous. The aberrations are mostly inversions, but two small deficiencies and one small duplication have been found as well. Double inversions of three types have been seen.

The chromosomes are in process of being mapped. No racial groups have been established, because the material, though derived from the inbreeding of flies from several English localities, has been extensively crossed.

1 (1) Median deficiency 10 bands distal inversion 30 bands
2 ----------
3 Distal two overlapping inversions 70 bands
4 Distal single inversion 60 bands
Distal deficiency inside overlapping inversion 2 bands
Distal duplication 3 bands
5 Median two included inversions pairing in the middle portion leaving a loop at each end (60 bands)
Two adjacent independent inversions 80 bands.

Russell, E. S. Comparison of benign and lethal tumors in D. melanogaster. Transplantation of benign tumors from five different strains and of the "lethal" l(1)7 tumors into normal Canton-S and Oregon-R larvae have produced "takes" with all types, the tumors proliferating until pupation of the host and normal adults developing containing the injected tumors. Histological studies of the tumors show that all of them, including the l(1)7 tumors, are very similar in structure, spherical masses of tiny cells surrounded by hollow spheres of melanin. They arise in general in the same organs, at the same time, and their history is the same. These data indicate that the l(1)7 tumors are no more malignant than the benign types, and suggest there may be another cause of death in the l(1)7 larvae. An abnormality of the mid-gut, practically obliterating the lumen, has been found in these larvae, and it may be the cause of death. Experiments are going on at present to determine the origin and manner of action of this abnormality. The inheritance of tu36a, a benign, is also being studied in detail.

Schultz, J. Change in temperature of the stock room at Pasadena--an opportunity for experiment. The stock room at Pasadena has been maintained at a temperature of 19° ± 1° for the past five years. Stocks are transferred at this temperature about every three weeks, the continuation being from small samples. Under these conditions there is of course a selection in each of the 812 strains for modifiers providing an optimum viability, etc. It is now intended, in the interests of reducing the labor of stock maintenance, to lower the temperature to 17°. For each of the stocks this will bring about an "evolutionary" change in which by selection as time progresses the genetic structure of the population will be changed. An opportunity is thus offered for many diverse types of experiment. We suggest therefore that anyone interested in making use of this opportunity, and desirous, for purposes of later comparison, of studying the present structure of any given stock, communicate with us within sixty days.

Schultz, J. Confluons a tandem duplication of the Notch region. The mutant Confluons, located by Gottschewski in the Notch region, was found by him to neutralize the Notch phenotype, and to give crossovers with split (DIS-4: 7, 14, 16; DIS-8:12). Current reinvestigation of this case has shown that: (1) Confluons is associated with a tandem duplication of the Bar type, for the bands $3C_5$-$3D_6$ (approximately); (2) that the Confluons phenotype (dominant, not as previously described recessive) is the result of duplication of the $3C_7$ band, deficiency for which gives Notch (evidence from crossover experiments between Notch and

Confluens); (3) reversion to wild type occurs in homozygous Confluens; (4) pairing of the duplicate sections may be quite close and so simulate a "swelling" of the region such as has probably confused Hager's study of double-Bar types; (5) X-radiation of Confluens has given a series of derivatives, some of which show the characteristics of the mutants Abruptex (Ax) and split (spl), associated with breakages in this region. Their properties, as well as those of Ax (itself probably a shorter tandem duplication like Hw) are under study.

Timoféeff-Ressovsky, H. A. and N. W. On the determination of the number of individuals in populations of Drosophila.

In two previous notes (DIS-11) the determination of the spatial distribution and of the "radius of activity" of Drosophila-individuals was described. The method used consisted essentially in subdividing a certain territory ("experimental field" of an area of 1-5 hektars) into equal squares (of 10-30 m side-length), in the centers of which food-bottles were placed; once or twice a day during a period of 1-2 weeks the flies caught in these food-bottles were counted and registered; for determining the "radius of activity" - a certain number (1000-5000) of "marked" (by one or two non-deleterious mutations) flies were let out in the center of the "experimental field", which then were caught and registered in the bottles of the surrounding squares during the next two weeks, thus showing the extension of the dissipation-area of Drosophila-individuals. Essentially the same method can be used for determining the approximate number of individuals per isolated colony of a Drosophila-species, or on a certain limited area. If the numbers of "marked" flies which were let out in the center of a certain area (larger than their "radius of activity"), and of the marked and non-marked flies caught on this area are known, then the total number of the non-marked (wild) individuals on the area can be easily calculated with a certain approximation (considering some sources of error, due to possible differential mortality and catchability). Such determinations of the number of individuals were repeated several times during a breeding season in an isolated small population of Drosophila melanogaster and Drosophila funebris (showing maximum values of about 35000 for funebris in July-August, and of over 60000 for melanogaster in August-September), and on a garden-area for melanogaster and species of the "obscura"-group (showing peak values of about 5000 for melanogaster in July, and of about 15000 throughout the whole summer for "obscura"). This method can be used in different modifications, and in connection with different problems concerning the dynamics of populations.

Technical Notes

Beadle, G. W. A rapid method for removing pupal cases.

In observing the development of Drosophila pupae it is often an advantage to remove the pupal case. This has been done by a number of workers, for example, Robertson and Bodenstein. In injecting solutions, such as those containing eye-color hormones, into pupae it is desirable to remove the pupal cases for two reasons: (1) to reduce breakage of pipettes, and (2) to reduce internal pressure in the pupae. Since the method of dissecting away the case requires great care and is time consuming, an easier and more rapid method has been developed. Pupae of the desired age are lined up on the edge of a glass slide cut down to fit in a shell vial. We use slides about $2\frac{1}{2}$ x 3/4 inches - these fit conveniently into 8 dram shell vials. About 15 to 20 pupae can be put on one slide. Duco waterproof cement is run down the center of the slide and the pupae quickly moved into this with fine forceps. Pupae are lined up transversely to the long axis of the slide, ventral side down. After drying, a dorsal-lateral strip of the pupal case running the entire length of the pupa is "shaved" off with a scalpel made from a chip of a double-edged

safety razor blade. Such razor blade chips can be mounted in a small pin vise or dissecting needle holder chuck. Care must be taken not to injure the wing during this process, but with practice the cut can be made quickly and in a single operation, starting at the posterior end of one emergence suture. With a sharp pointed pair of watchmakers' forceps the cases can be peeled away from the pupae. If desired the pupae can then be lifted out of the cases, but for injection operations it is convenient to leave them in the opened cases. Injections are made into the anterior dorso-lateral portion of the abdomen with the pipette directed toward the posterior end of the pupae. After injection the entire slide is put in a shell vial with moist filter paper. Pupae prepared in this way develop normally although not all of them are able to extricate themselves from the pupal membranes at emergence time.

Gordon, Cecil Nomenclature

The term 'spontaneous' as opposed to 'due to irradiation' is ambiguous for it draws no distinction between newly mutated genes and those probably present in the original population from which the flies have been drawn. The following is suggested. Spon. (S) - Spontaneous from an established stock and hence likely to have arisen recently. Spon.(P) - Spontaneous, but from stocks not long in laboratory and hence probably present in original population.

Kalmus, Hans Skimmed milk as a culture medium for Drosophila.

Drosophila melanogaster, virilis, subobscura, buskii, and probably other species can be bred on skimmed milk. The method is as follows: Cellu-cotton, mentioned by Spencer, (DIS-8) is pressed into vials or bottles which are stoppered and sterilized. They are filled with fresh skimmed mild and put into the incubator for 24 hours. After this period the skimmed milk has turned sour and vials and bottles are ready for the flies to be put in. The four mentioned species grow satisfactorily on this medium, and the number of offspring of 5 females cultured in a vial were: melanogaster 62 ♂, 77 ♀ ; virilis 41 ♂, 29 ♀ ; subobscura 60 flies; buskii 83 ♂, 78 ♀ ; from bottles the numbers were of course, larger. For example, for virilis 192 ♂, 203 ♀ . The time of development seems to be shorter than on the ordinary food medium, but this may not be significant. The medium apparently contains very little yeast and its flora consists mainly of Streptococcus thermophilous, Lactobacillus bulgarious, and similar milk bacteria.

This method, where the medium is more simply prepared than the ordinary food, is slightly quicker.

La Cour, L. F. Acetic Orcein for Salivary Chromosomes.

The use of this new combined staining fixative gives more selective staining than acetic carmine. The methods employed are the same, with the new formula, which consists of 0.5% orcein (elastin type) dissolved in hot 45% acetic acid and filtered when cold.

This acetic orcein shows the gene structure of the chromocenter as well as the ordinary bands in the salivary gland chromosomes of many species of Drosophila more clearly than acetocarmine. In particular it reveals the gene thread connection between the chromocenter and various bodies in the nucleolus. In D. funebris it appears that there were several of these bodies, which possibly act as nucleolar organizers since they are connected by separate threads with the chromocenter.

Lefevre, George An electron bombardment of D. males.

An attempt to bombard Drosophila melanogaster males with electrons has been made in the hope that chromosomal rearrangements might be produced. A very simple apparatus is sufficient. Two tungsten electrodes are sealed into the ends of a glass tube about 4 inches long and 3/4 inches in diameter. From the middle a side-tube extends through which the flies may be introduced into the chamber, and which can be connected to a vacuum pump. The electrodes are connected to an induction coil, and current is furnished by three storage batteries. A vacuum of about 1/1000 mm. Hg. is required for a maximum flow of electrons, and the flies are able to survive such a low pressure for several minutes in most cases. Minature males were introduced into the tube, which was then evacuated, and the current turned on for 1/2 to 2 minutes. Fifteen flies have survived this treatment, but only one male, mated to an attached-X yellow female, has produced progeny. No visible mutants have been observed. Further efforts are being made.

Poulson, D. F. and Power, M. E. The application of Bodian's silver impregnation method to Drosophila.

For studies on neurology and the development of the nerve fibers in Drosophila, modifications of Bodian's method give excellent results, both in early stages and in adults. Since the method produces a brilliant picture of details (except within the nucleus) preparations of this kind are useful for much more than the study of nervous and sensory structures. For instance, cytoplasmic differentiation is visible in the salivary gland cells within 8 hours of fertilization of the egg. The following procedures have been used: - Eggs and Larvae--Fixation in formol-alcohol-acetic (F.A.A., 5:15:1), or Petrunkevitch's paranitrophenol to which an equal volumen of 10% formalin has been added, for 24 hours. Proceed as usual in preparation of sections of eggs or larvae. Cut at 7-10 u. Mount on carefully cleaned slides (see below). Before impregnation it is well to harden the mounted sections and albumen by allowing the slides to stand overnight in 95% alcohol. Impregnate in 1% protargol solution (aqueous) at 38° C. for 48-96 hours. Copper shot should be placed in the bottom of dish in which this is done. Slides are then rinsed in water and the silver reduced for 10 minutes in a solution of 1 gm. hydroquinone and 5 gms. sodium sulfite per 100 cc. distilled water. Rinse three times in distilled water and place in 1% gold chloride solution for 15-20 minutes; rinse, then place in 2% oxalic acid for 15-20 minutes, controlling with a microscope until sections appear quite dark. Rinse with care in water and fix in 5% sodium thiosulfate for 10 minutes. Rinse gently 3 times in water and dehydrate slowly using a graded series of alcohols. This care is to prevent sections from coming loose after such prolonged hydration. Clear and mount as usual. - Adults--In preparing adult tissues for staining with the Bodian method entire flies or parts (in this instance, heads) are fixed in alcoholic Bouin's for one or two days. If the tissues float the dish containing them and the fixative is placed in a vacuum chamber. Alcohol, tuluol, and tissue-mat are used for dehydration, clearing and embedding. The slides are carefully cleaned in cleaning solution and ammoniacal alcohol to insure that the sections remain attached throughout the procedure. Adult nerve fibers are larger and require longer impregnation than that mentioned above. A 2% aqueous solution of protargol is used, and enough copper shot to cover the bottom of the dish is added. Impregnation is at 38° C. for 24-48 hours, after which time the slides are removed, rinsed in distilled water, reduced in the 1% hydroquinone-5% sodium sulfite solution, rinsed in three changes of distilled water, and returned to the oven in a fresh bath of protargol and copper for another 24-48 hours. At the end of this time the slides are removed and rinsed, reduced and washed as above. Then the slides are placed for 10-15 minutes in 1% gold chloride, rinsed, treated with 2% oxalic acid for 10 minutes, rinsed, and left in 5% sodium thiosulfate for 10 minutes. The slides are then carefully

rinsed three times and run up and covered in the usual manner. Fresh solutions should be used for each batch of slides, except the gold chloride which may be re-used. - Appearance of structures--In the preparations nerve fibers, nerve endings, Golgi material and other cytoplasmic elements, muscle striations, and chitin are deep purplish black; the bulk of the cytoplasm is light purplish red, occasionally almost gray; nuclei and chromosomes very dark red; in dividing cells spindles as well as chromosomes are dark red. Some preparations may be darker and more purplish than others; occasionally paler than redder.

Ross, Elinor, and Russell, E. S. A satisfactory histological technique for D. larvae.

Fixation: Larvae are immersed in hot Carnoy's solution (60°) until straightened, pierced with a glass needle. Then they are passed through the following solutions:

Solution	Time
hot Carnoy's	30 minutes
cold Carnoy's	30 minutes
95% alcohol	rinse, then 1 hour
95% alcohol + eosin (stain for embedding)	1 hour
absolute alcohol	1 hour
xylol	until clear (1 hour +)

Embedding: The larvae are put through three changes of tissue-mat (56-58°) and imbedded in tissue-mat. They may be sectioned sagittally or transversely at 8 u. - Staining: Galigher's alum-hematoxylin for 90 seconds or less, counterstained with Triosin (.5% solution in 90% alcohol) for 20-45 seconds gives a clear delicate stain which is very good both for study and photography, especially where contrast with black material such as melanin is desired.

Personal and Laboratory News

(Editor will be glad to receive and to circulate information about colleagues in Europe and about working conditions in European laboratories)

Europe

France

L'Heritier is back at teaching and has facilities for research work. All his Drosophila cultures were lost. A collection of 12 stocks was sent to him by air mail.

Ephrussi, according to the information just received, he and his family are now with L'Heritier in Clermont-Ferrand.

Vandel is well and his work is going on.

Germany

Information received indicates that the work at Berlin-Dahlem and at Buch is going on normally.

Great Britain

John Innes Horticultural Institution

Drosophila work is still flourishing here though it has to be subordinated to other problems notably certain economic lines that we have taken up. All the people in our last directory are still here and have been joined by two newcomers. (K. Mather, December 26, 1940)

University College, London

The department has at last gone away from London; Dr. Gruneberg to Mount Vernon Hospital, Northwood, and Professor Haldane and the three Drosophila

workers to the Rothamsted Experimental Station. Dr. Philip has been working at the John Innes Horticultural Institution since September 1939. University College has been very gravely damaged but we have escaped so far with a few smashed windows and an erratic and scanty supply of gas. However we have kept all our stocks and even collected a fair amount of data by means of shifts like cooking at home or at the John Innes. Two members of the department have been bombed - one out of a house, the other in a public shelter - and one has been forced to washhis baby in Highgate pond water. - At Rothamsted we have been made very welcome and are going to try to carry on throughout the war. (H. Spurway).

Cambridge: Christ's College

We are getting on fairly well here, with practically no bombing in the to so far. As a fair number of people from the lab have been taken away to other jobs, those of us who are left are rather overburdened with teaching, and what research we can do is directed as far as possible towards practical ends, so that Drosophila is rather suffering. (C. H. Waddington).

Edinburgh, Scotland

The conditions of work here are really very nice. The institute is working very efficiently and one would never guess that there is a war. (Slizyniski, B.)

Italy

Research work with Drosophila at the Pavia Institute has stopped. Only one member of the staff and one student are present--none of them working with Drosophila.

Norway

It has been learned from reliable source that Dr. Mohr and his family were in good health early in November. - A letter written in January was received indicating that Mohr is well.

Switzerland

Work was interrupted several times by military service.