

whenever the compounds of the group V, VI and VII elements act as Lewis bases,  $\pi$ -bonding should be an important factor in the base strength of these compounds.

DARL H. McDANIEL

Department of Chemistry, University of Pittsburgh, Pittsburgh, Pennsylvania

#### References and Notes

1. There is a slight irregularity in the amine family, the tertiary amines being less basic than the secondary amines. This anomaly has been explained by H. C. Brown, H. Bartholomay, and M. D. Taylor in terms of B-strain [*J. Am. Chem. Soc.* 66, 435 (1944)] and by R. G. Pearson and F. V. Williams in terms of solvation effects [*J. Am. Chem. Soc.* 76, 253 (1954)].
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12 December 1956

### Distribution of Calcium in Adult *Drosophila melanogaster*

It has been shown by Levine (1) that the amount of crossing over observed in females of *Drosophila melanogaster* can be decreased by feeding adults on medium containing increased amounts of calcium. Similar effects are produced if the females are desiccated during pupal life. On the other hand, crossing over is increased if the females are fed during larval life on a medium containing the chelating agent, ethylenediaminetetraacetic acid. To explain these results, Levine postulated that calcium normally plays a role in the nuclei of *D. melanogaster* and that this role is to "stabilize" the chromosomes. Therefore, if the cellular calcium concentration is increased by feeding the fly extra calcium or by decreasing the water content of the cells by desiccation, the chromosomes are "stabilized" and show less crossing over. Conversely, if the calcium content is decreased by administering a chelating agent, then the chromosomes become "unstable" and show increased amounts of crossing over.

However, it is hard to reconcile this theory with certain information that is available concerning the calcium requirements of *D. melanogaster*. It is known, for example, that if calcium is required by *D. melanogaster* at all, it is necessary only in minute quantities (2). Furthermore, Yasuzumi and Sawada (3) have shown that, whereas calcium is present in the cytoplasm of the larval salivary gland cells of *D. virilis*, it is apparently absent in the chromosomes, and Poulson and Bowen (4), utilizing radiocalcium, found no evidence for nuclear localization of calcium in larvae of *D. repleta*. In addition, Poulson and Bowen state that "the rapid transfer of the element to storage areas of the malpighian tubules contraindicates the existence of any major calcium component in tissues generally."

The results of our autoradiographic studies (5) of  $\text{Ca}^{45}$ -localization in adult *D. melanogaster* are in complete agreement with the statement of Poulson and Bowen. Flies of the Oregon-R strain were fed during the larval and adult stages on *Saccharomyces cerevisiae* homogeneously labeled with  $\text{Ca}^{45}$ . Autoradiograms of adults showed  $\text{Ca}^{45}$  to be homogeneously distributed in the blood and tissue fluids and concentrated only in the terminal portions of the anterior malpighian tubules. Developed grains were equally abundant whether above the nuclei or the cytoplasm of the cells making up various tissues. There was no concentration of calcium in oocyte nuclei or sperm heads. The calcium content of the adults was 165 ppm. Males and females did not differ significantly with respect to the distribution of calcium. The distribution of calcium from yeast ingested during adult and larval stages was as follows: head, 0.131; thorax, 0.141; legs, 0.051; wings, 0.024; gut, 0.084; reproductive system, 0.037; malpighian tubules, 0.109; abdominal residue, 0.066; and liquid residue (mainly hemolymph), 0.357 (for adult flies 0 to 1 day old).

We conclude (i) that *Drosophila melanogaster* requires at most trace amounts of calcium, (ii) that the majority of the calcium taken in is rapidly transferred to and stored in the excretory organ of the insect, and (iii) that calcium is not required as a component of chromosomes in concentrations higher than those found in the cytoplasm and body fluids.

It follows that, if calcium plays a role in "stabilizing" the chromosomes of *D. melanogaster*, then extremely small amounts are required. It is difficult to see under these conditions why adding more calcium to the standard medium should have any effect. It also seems unlikely that ethylenediaminetetraacetic

acid can reduce the available calcium in the standard medium below the traces in which it is required.

R. C. KING

ANN C. RUBINSON

Brookhaven National Laboratory, Upton, New York, and Northwestern University, Evanston, Illinois

#### References and Notes

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5. This work was supported by the U.S. Atomic Energy Commission.

10 January 1957

### Purification of Poliovirus with Fluorocarbon

When we were searching for a procedure for removing protein from crude viral suspensions, the report of Gessler *et al.* (1) came to our attention. Gessler *et al.* have described a procedure for the purification of vaccinia and Rous sarcoma virus in which infected tissues are homogenized in a high speed blender with a fluorocarbon mixture. On separation of the two phases, it was found that nonviral protein was removed from the aqueous layer, whereas the virus remained in it. This communication (2) reports results following the application of a similar procedure to the purification of poliomyelitis virus, type II, strain MEF-1, that was grown in a culture of HeLa cells.

The medium used for propagation of

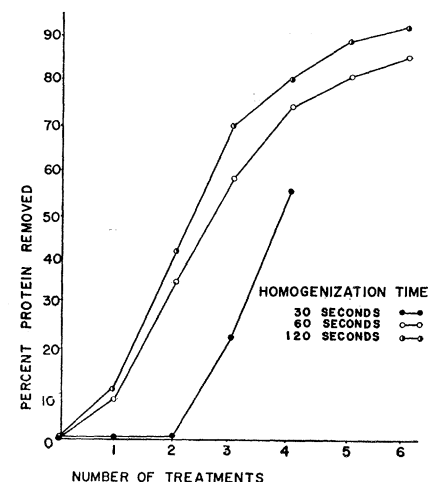


Fig. 1. Protein removal by fluorocarbon treatment.