Notch is lethal to males, the male which grew upt from the treated embryo could not have received the Notch mutation from its mother; in all probability, then, it was induced by the treatment. This gives strong evidence that, when pole cells are treated, not all cases where the same lethal is found in all gametes receiving a given chromosome have been caused by the pre-existence of the lethal in one of the parental germ cells; they must sometimes be caused by induction of the lethal in one pole cell while the other pole cells are killed off. (2) This particular Notch is seen not to have acted as a cell lethal during the stages of spermatogenesis, even though the X chromosome was present in haploid dose, and all germ cells had Notch in their X chromosome. (3) Though only one functional primordial germ cell was left, about fifty female offspring were obtained, and about the same number of male offspring (of which 43 were analyzed for mutations in their second chromosomes).

Now since all offspring receiving a given treated chromosome showed the given induced mutation (whether Notch or autosomal lethal) it could be concluded--as pointed out by H. J. Muller--that in all probability these mutations must have been present in both chromatids that were derived from the given treated chromosomes of the survivor pole cell. This indicates strongly that none of these chromosomes were split into two daughter chromatids during interphase, since cells of the polar cap are known to be in interphase at the time chosen for treatment. This conclusion could be avoided only be supposing exactly the same mutation to have been simultaneously induced in both chromatids in the case of all three chromosomes--an assumption which seems highly unlikely--or by supposing that one of the two daughter cells of the surviving pole cell failed to give rise to any functional germ cells. The last supposition also appears unlikely. This because, firstly, the pole cells do not undergo division until some 14 hours after the stage at which they are treated. Therefore, a physiological injury would be unlikely to have remained so localized until that time as to kill off one daughter cell completely while allowing the other one to give rise to numerous descendant germ cells. Secondly, the cells are by the time of this first post-polar division located within the definitive gonads, but for some divisions after that still appear to be entirely undifferentiated from one another. Thus it also seems very unlikely that one of the two daughter cells produced by a given pole cell at that stage would, through its later divisions, give rise to a multitude of functional germ cells, while the other daughter cell gave rise exclusively to nongerminal cells. Conceivably, however, one of the two daughter cells might have been killed by an unrestituted break or other dominant lethal genetic changes that had occurred in only one of a pair of sister chromatids.

During our 4 years of work on the induction of mutations by ultraviolet treatment of the polar cap, three other cases had been found (but none in the about equally numerous controls) in which all tested offspring that had received a given second chromosome contained an identical lethal, while at the same time all the other offspring, which received the homologous second chromosome, contained another lethal, identical in all the latter. These cases either resulted from coincidence of pre-existing lethals in both the parental and the maternal second chromosome or were due, like the case of Notch reported above, to one surviving germ cell with lethals induced in both second chromosomes, which also were presumably in an unsplit condition during interphase, in which stage the pole cells are known to be.

Mickey, George, H. Origin of a new R allele in mosaic D. melanogaster.

A new dominant allele of Roughhened, which is lethal in homozygous condition and which produces an extreme eye surface resembling glass or Glued when heterozygous with

Roughened, arose in a single mosaic male among 102 progeny of a female treated with cold shock at an early embryonic stage. The mosaic male produced 788 offspring, only one of which showed the roughened eye. The latter produced 50% offspring, rough in both sexes, indicating its normal viability in a heterozygote. Consequently it appears that possibly a single cell carrying the mutant was incorporated into the mosaic gonad of the original male. This observation is significant in considering mutation rates resulting from treatment of pole cells.

Mickey, George H. and Blount, Jerry Somatic polyploidy in D. melanogaster induced by cold shock.

The effects uponsomatic cells (ganglia) of cold shock applied to embryos at the pole-cell stage and to third-instar larvae of D. melanogaster were investigated. Results were scored from aceto-carmine squash preparations of the third-instar larval brains by comparing the ratio of normal diploid metaphases to the polyploid metaphase figures. Results were as follows:

Stage	Treatment	No. Indiv.	No. Figures	No. Poly.	% Poly.
control	untreated	53	1746	0	0
pole cell	1/2 hr. -5.5° C	22	957	38	3.3
pole cell	2 hr. -3.3° C	19	976	102	9.1
pole cell	1 hr. -6.1° C	16	729	106	12.0
third instar	24 hrs. -6.1° C recover 24 hrs.	9	763	289	29.7

Both temperature and length of treatment influence polyploidization but the temperature appears to be relatively more important. The last experiment gave the highest percentage of tetraploid cells and the most consistent figures. This may be due to the fact that there was less opportunity for the elimination of these tetraploid cells before their detection. Gloor's treatment of D. hydei larvae at higher temperatures (8°-12° C) and for a longer period (10 days) gave a much higher degree of ploidy (Gloor, DIS-24; 82). The length of treatment in our experiments allowed for only a single doubling of chromosomes.

Mickey, George H. and Di Paolo, J. A. Lethals induced in Drosophila by combined action of urethane and H_2O_2.

Adult males of D. melanogaster were injected with M/4 urethane (ethyl carbamate) in Holtfreter's salt solution. From 12 males a total of 641 chromosomes were tested for sex-linked lethals, using the Muller-5 techique. Only 2 lethals were detected (from separate flies). From 23 males injected with the same solution of urethane but also treated for 24 hours with fumes of superoxol (3% H_2O_2) a total of 1203 chromosomes were tested and 17 lethals were detected. Two flies gave three lethals each, three gave 2 lethals each, and the others only 1. Crossover tests proved all the cases of multi-lethals from single males to be distinct (with one possible exception). The rate of lethal production in the experiment using urethane ($0.31 \pm 0.22\%$) was not significantly different from the controls ($0.26 \pm 0.12\%$); but the percentage of lethals induced by the combined treatment ($1.41 \pm 0.34\%$) was significantly greater than in either the controls or the urethane experiment.

Mickey, George H. and Sturtevant, F. M. Jr. Failure of phenol to produce lethals in Drosophila.

Phenol had been administered to Drosophila previously by subjecting adults to vapors, injecting adults, soaking fertilized eggs or excised ovaries, and placing phenol in the food. We employed