type, while cd has more red pigment.

As the work progresses it is becoming more and more evident that many of these eye-color genes are such only by nature of some secondary reaction--for example, the provision of a by-product of their primary action, this by-product being utilized in the synthesis of one or the other, or both, of the pigments. While some genes, as for example w, v, cn, bw, might be assumed to be primary eye-color genes, others, as for example rb, cm, g, car, do not appear to be connected with a series of basic stages in pigmentation. In compounds between these genes no epistasis appears, but instead a sub-additive type of interaction, and sometimes even a super-additive interaction as in the case of the compound rb g car, which produces more red pigment than the compound rb car.

Novitski, E. Autonomy of sterility of transformed females. Using the unstable ring In(1)X^{c2}, w^{VC}, which has been shown by Griffen and Lindsley to give rise to a high frequency of gynandromorphs, it was possible, from transformed females of the constitution In(1)X^{c2} w^{VC}/In(1)dl-49, y Hw m^2 g^4 f5/Y; tra/ tra, to select mosaics in which the ring had been eliminated in early cleavage, giving rise to part normal-male and part transformed-female tissue. Of 24 such mosaics, 16 were sterile and the remaining 8 produced, among their 1595 female offspring, no progeny carrying the ring-X which would have been indicative of the normal proliferation of 2X+Y spermatogonia in the mosaics.

Novitski, E. The compound X chromosomes. There are four ways in which two single X chromosomes may be arranged to give simple compounds since (1) the order of loci may be mirror-image or tandem, and (2) the centromere may be median or terminal. Since each type is unique in its pairing configuration and gives different kinds of information about crossing over, the writer wishes to suggest that each type be given a simple designation. Although the type that is generally called attached-X had, in the earlier days, been referred to at times as double-X, and the double-X of Muller has, more recently, been described as an attached-X, it is felt that a simple consistent scheme is provided by referring to those compounds with median centromeres as attached-X's and those with terminal centromeres as double-X's. In the ordinary attached-X, as well as in Muller's double-X, the arrangement of the two chromosomes is in mirror-image fashion. Consequently, the distinction between the mirror-image tandem arrangements may be adequately provided by referring to the latter as tandem double-X's, as the case may be, and by using no further designation for the mirror-image types.

Two new types have been recently derived; these are (1) the double-X and (2) the tandem double-X.

(1) The double X. Pairs by simply folding back on itself (like the attached-X). Unfortunately, from the standpoint of further genetic analysis, the double-X discovered by Muller and now commonly used instead of the attached-X for stock keeping carries In49 in the heterozygous state. Two new cases have been discovered in the progeny of sc^8 f v cv/y w females where, apparently, a crossover occurred between the distal heterochromatic region of sc^8 and the base of the normal chromosome. The double-X is designated structurally as Normal X + sc^8 and genetically as y w + f (?) v cv sc^8. Homozygosis for the heterozygous mutants may be achieved by double crossing over (singles produce bridges in this type of compound X), and both cv and v appear with a low frequency. Cases of homozygosis for forked have not been

found. There is some doubt, therefore, that this double-X carries that gene. Examination of ganglia show that the chromosome is very long at anaphase (and therefore is of the double type); at metaphase, the chromosome appears V-shaped, but a tip of the V rather than the apex is directed toward the center of the plate.

(2) The tandem double-X. Pairs by forming a spiral and, by crossing over, manufactures single rod chromosomes. This compound was derived by inducing a crossover between the short arm of the Y at the tip of the X·Y chromosome and the base of sc^4. Structurally, the chromosome may be written as sc^4 + EN· YLsc8; the raised dot indicates the position of the centromere. The sc^4 chromosome used carried y car m w^a; the X·Y chromosome may be represented as car^+ m^+ y·y^+. Crossover studies indicate that a striking excess of single chromosomes is recovered; it is presumed that crossing over is occurring with normal frequency but that nonrandom disjunction favors the inclusion of the single X in the egg nucleus. The long arm of the Y, present at the base, has been replaced by the duplication B^S. Such a chromosome should, with some low frequency, yield instances where crossing over has occurred between this duplicating fragment at the base, and the homologous region at the end of the sc^4 chromosome. This chromosome would be a double ring, of interest because the recovery of single rings from it by crossing over would have to depend on certain three-dimensional properties of this type of chromosome.

Novitski, E. Useful derivatives of the X·Y chromosome. Among a large number of rearrangements involving the X·Y chromosome found while looking for a special type of inversion, two may be of particular interest in experiments where the inverted sequence of the X·Y chromosome is troublesome because it gives either too much or too little, crossing oveer when heterozygous with a normal sequence. One of these, labeled X·Y In X·Y 26, has one break in the heterochromatin, the other in section 10A. No crossovers have been found when this chromosome is with sc^8 or a normal chromosome. Another, X·Y In X·Y 24, appeared to be an almost complete reinversion since it crosses over freely with a normal sequence. The crossover class with the left end of a normal chromosome and the base of In X·Y 24 is inviable in the male, however, indicating that some normally proximal genes, located distally in the X·Y chromosome, had not been shifted back into their normal position by the second inversion. To make a chromosome that would be free of this complication, In X·Y 24 was crossed to an attached-X detachment (A2) which carried the long arm of the Y chromosome. A single crossover replaced the deficient base by a normal base. The chromosome thus constituted has been tested by mating to $\underline{y^2\ su^{wa}\ w^a\ bb}/0$ females. F_1 males are fully fertile and viable, although there must still be a small duplication at the distal end. It is carried in stock as: Ins 24L + A2R y/ $\underline{y^2\ su^{wa}\ w^a\ bb}$ and Ins 24L + A2R y v/$\underline{y^2\ su^{wa}\ w^a\ bb}$.

Oftedal, Per Genetics and histogenesis of a new tumor tu(2)49k. A tumor stock developed spontaneously from a stock of ma^{49d} shows black aggregations in about 50%-60% of the flies in stock. The tumor may be located in any part of the fly, but usually in the abdomen. In outcrosses 2% incidence is obtained in F_2. In backcrosses the incidence is up to 10% and may rise to 34% when crossed to the stock from which it arose. The main gene is completely recessive and is located in the second chromosome, probably between c and px. It is not an allele of mt^A of Hartung (Hartung, J. Hered. 41:269). Modifiers have been located in the middle of chromosome 3, rather closely linked to ma, and in chromosome 1. The third-chromosome modifier is present in the Sb and H chromosomes of the Cy/Pm; H/Sb stock in this laboratory.