Parker, D. R. University of California, Riverside, California and Oak Ridge National Laboratory, Oak Ridge, Tennessee. On the sequence of elements in compound-XY # 129-16 and in some of its derivative marked Y chromosomes.

A number of detachments resulting from induced exchange between an attached X and the y^+Y were found to be attached-XY, and were considered to be of the sequence $XY^S \cdot Y^L y^+$ if the marker were retained (Parker and McCrone, 1958). One stock, # 129-16, that has been used in making some doubly-marked Y's has been found instead to be of the sequence $Xy^+Y^L \cdot Y^S$, with the break in the y^+Y distal to ac^+ and y^+, but proximal to $1(1)J1^+$. This stock differs from the other compound XY detachments that retain y^+ in having some yellow variegation in combination with yellow or $yellow^2$ in the attached-XY/O. Variegation in the presence of $yellow^2$ is most easily seen as pale spots in the darker sclerites at the tip of the male abdomen.

One derived Y (Y-66d, $Y^S y^+ Y^L \cdot Y^S$) arose spontaneously in a 129-16/O male and was recovered as a single y v bb/Y-66d female. Males of the constitution y sc/Y-66d are fertile and show a more pronounced yellow variegation than do y sc 129-16/O males. Variegation in this case and in the case of the original 129-16 stock suggested a different relationship of the yellow locus in these stocks. Furthermore, were y^+ in a terminal rather than in an interstitial position, the derived Y, having two doses of the y^+ duplication should show the pronounced Hw-like phenotype of extra hairs in the Second Posterior Cell of the wing, branched Posterior Crossveins, etc., that is regularly found in iso-marked y^+Yy^+ chromosomes (Williamson).

A test of the position of the y^+ marker was to reconstitute an attached X from 129-16. Were the marker terminal, it should almost surely be lost in forming a new attached X; if interstitial, it should be retained. One such attached X arose spontaneously in the 129-16/O/y v bb stock; it retained the marker. The interstitial position was further confirmed by finding that the y^+ duplication in 129-16 and in Y-66d did not cover $1(1)J1$ either with or without an extra Y.

Williamson has obtained a number of spontaneous attached X detachments from a doubly-marked Y derived from 129-16, where the detachments carried either both of the markers (y^+ and B^S) or neither, showing this derivative to be $B^S y^+ Y$ rather than $y^+ Y B^S$ as formerly believed.

The interstitial position of y^+ in 129-16 suggested that Y-66d could carry two doses of the Y^S male-fertility complex (KS) as well as one of the Y^L complex (KL), hence should be of the structure, KS y^+ KL·KS. This was verified by testing a series of radiation-induced detachments, using ability to complement FR-2 as a test for the presence of a complete KS. Of 8 detachments that carried y^+, and therefore should in any simple exchange also carry one or the other of the KS complexes, 7 were found to give fertile males in combination with FR-2. The eighth case proved to be a complex one, having all of the markers of 4R as well as y^+ and kl-5 linked with the X, requiring a total of 4 breaks to form the detachment. (ORNL is operated by Union Carbide Corporation for the U.S.A.E.C.)

Mittler, Sidney and Donald D. Grube. Northern Illinois University, DeKalb, and Argonne National Laboratory, Argonne, Illinois. Beta rays and chromosome loss.

Beta rays from Y^{90} source were compared to X-rays (150 Kv 15 ma, 150 r/min) with respect to induced chromosome loss by the XO method, and dominant lethals in spermatogenesis of X^{C2} yB/Y^+ [illegible]^8. The adult males 1 to 4 hours old were positioned inside a lusteroid cylinder so that they only received beta rays 455 r/hr (mean of 0.91 MeV) from 360°. After 1600 r the males were mated daily for 12 days to ywf at ratio of 1 male to three females. The mature spermatozoa were more sensitive to beta rays than X-rays by the XO method; and in the dominant lethals, the induced sterile period as represented by brood day 8 were intensified somewhat by beta rays. There was no difference in genetic effects between beta rays and X-rays in the broods which represent spermatogonia at the time of irradiation.