Bateman, A. J. Christie Hospital, Manchester, U. K. X-irradiation of heterozygous attached-X.

The attached-X used had arisen in progeny from sc ec cv/ct v g ♀♀ which had been irradiated. It was homozygous for sc ec and cv, and heterozygous for ct v and g. ♀♀ were irradiated with 4000 rad or kept as unirradiated controls. The progeny of eggs laid on days 7-11 after irradiation were scored for homozygosis for ct v and g, with the following results:

		Homozygous for			
	Total ♀♀	ct	v	g	Detachments
Control	1167	81	80	39	None
as %		6.9	6.9	3.3	
4000 rad	534	38	81	56	10
as %		7.1	15.2	10.5	
Increase over Control		0.2	8.3	7.2	

It is seen that 4000 rad produces a 3-fold increase in c-o between g and the centromere. The increase in homozygosis for v is the same as for g, meaning that there has been no change in c-o between v and g. The absence of any change in homozygosis for ct means that c-o between ct and v must have decreased by an amount equal to the increase proximal to g. These results confirm those presented in DIS 37:68 in respect of segments ct - v - g and add the additional information that X-rays enhance c-o near the centromere (to the right of g). The controls show relatively low homozygosis for ct. This is in all probability due to some parental attached-X ♀♀ being homozygous $+^{ct}$.

Bateman, A. J. Christie Hospital, Manchester, U. K. ND of chromosome 2, production of iso's, and reconstitution of normals from iso's by X-irradiation of ♀♀.

For these experiments we used an iso-chromosome stock (2L dp. 2R px) supplied by the Institute of Genetics at Pavia. ♂♂ of the stock were mated to irradiated ♀♀ of constitution dp b cn bw/b pr vg. The progeny obtained were dp px (from nullo-2 eggs) b + ^{px}(from diplo-2 eggs) dp + ^{px} (egg with 2R iso) and b px (egg with 2L iso). The greatest yields were obtained over the first 8 days of laying after doses of 2-6 K rad. Nullo-2 eggs accounted for 66% of all progeny and diplo-2 eggs for 9%. This is the ratio found for X-ray induced ND of the X chromosome. We were surprised to find 25% of all progeny were from iso-2 eggs (50/50 2L and 2R). Triploid progeny were very rare. These induced iso's are homologous to attached-X, which however are rarely produced by irradiation. Of the diplo-2 eggs, only 5% were homozygous at the centromere. By contrast, 25% of the iso's were homozygous at the centromere. It is concluded that 25% of the iso's arise by misdivision of the centromere (sensu lato) and 75% by centric fusion (sensu lato).

Reciprocal matings, with irradiation of 2L dp.2R px ♀♀, freely produced flies of constitution dp px/b. Thus a normal second chromosome has been reconstituted from two iso's. The reconstituted chromosome does not appear to be deleterious. The heterozygotes are fertile and the homozygotes viable and fertile. The ease of reconstitution is suggestive of a close association between the centromeres of the iso's (which are of course homologous) with X-ray induced c-o within the centromeric zone.