Neeley, John C. University of Portland, Portland, Oregon. The interchromosomal effect of triploids upon crossing-over.

Regular diploid daughters and sons of 3n females marked with $\overline{XX}$, Df(1)60g, Ins(1)sc^8, dl-49, y w ec•B f, v m, w^a sc^8/ ct^6 s f (a reversed-acrocentric, see DIS 37:113) were analyzed for recombination products. Of 66 females mated, 36 produced no progeny whatsoever and 24 produced less than ten F_1 each; only six 3n mothers (9.1%) produced ten or more scorable offspring. The distribution of scored F_1 is given in tables A and B. Table C compares these values with those obtained by Beadle (1934. J. Genetics 29:227-309), by Schultz and Redfield (1963. DIS 38: 46-48), and with the diploid map unit values.

In an effort to gain similar data from the proximal arm of the RA, a transposition of dl-49 to the left arm was attempted. Fifty-eight separate matings failed to accomplish this. Consequently, the procedure was altered so that the proximal arm retained the dl-49 and the free-X homolog contained sc^8, dl-49 inversions, viz. $\overline{XX}$, y w ec•B f, v m, w^a sc^8/Ins(1)sc^8, dl-49, y^{31d}.

Unfortunately, exchanges between the scute and apricot loci (high distal exchange region 1) go unrecognized. Of 33 crosses, only 17 females produced a total of 63 sons (2n daughters were not counted here). Highly tentative results from these exchanges are: white-miniature, 27%; miniature-vermilion, 1.4%; vermilion-forked, Bar, 21.6%; distal to forked, Bar, up to 10%. The value of such data is highly doubtful.

The quantitative significance of the distal data is reduced, due to the high infertility rate (54%) and the low family size (mean family size for all 66 females is 2.61, for the six females producing over ten F_1, 18.2). Nevertheless, qualitative conclusions can be drawn from these recombination events:

1. Corroboration of the pattern of interchromosomal effects--an increase of exchange at the distal tip with a reduction near the middle portion of the chromosome;
2. Further delineation of this distal regional increase--from the yellow-echinus region into the yellow-white and the white-echinus regions;
3. Not only does triploidy per se increase these exchanges (Beadle's and Schultz and Redfield's data in table C), but the configuration of the chromosomes apparently superimposes additional effects.

Confirmation of this last conclusion can occur only with the accumulation of additional data. This 3n stock has recently died out, so that such confirmation must come from other sources.

Table A. Distribution of progeny according to sex and recombination type.

sex	non-cross-overs	Single exchanges					Multiple exchanges									SUM
		y-w 1	w-ec 2	ec-ct 3	ct-s 4	s-f 5	1-3	1-4	1-5	2-4	2-5	3-4	3-5	4-6	1-2-3	
♀♀	46	6	8	14	5	4	1	0	1	0	1	2	2	1	0	91
♂♂	36	4	8	10	10	4	4	1	1	1	0	0	1	0	1	81
SUM	82	10	16	24	15	8	5	1	2	1	1	2	3	1	1	172

Table B. Frequency of exchanges classified as to regions of exchange.

REGION	0	1	2	3	4	5	6
Numbers	82	19	19	35	20	14	1
Frequencies	47.7%	11.0%	11.0%	20.3%	11.6%	8.1%	0.5%
2n map intervals	---	1.5	4.0	14.5	23.0	13.7	9.3

Table C. Comparison of various cross-over frequencies

Regions involved	Standard 2n map interval	Beadle (1934) $\overline{XX}$,RM	Schultz & Redfield (1963) free-X	Neeley (this paper) $\overline{XX}$,RA
y - ec	5.5	7.1-8.4*	8.0-12.1*	22.0
ec - f	51.2	32.7	23.1	40.5

*values indicate 2X1A and 1X1A gametes, respectively