Barthelmess, I.B. and F.W. Robertson. Department of Genetics, University of Edinburgh, Scotland. Quantitative relations between variation in red eye pigment and related pteridine compounds in D. melanogaster.

Lines selected for high and low red eye pigment, various lines derived by chromosome exchange, inbred lines etc., have been used for measurements of quantitative differences in fluorescing pteridines, which have been separated by chromatography. The genetic situation was different in high lines, when compared with lines selected for low pigment or inbred without selection. The high lines remained heterozygous and showed dominance and epistasis in crosses to the unselected stock while, in low lines, fixation for genes which reduce pigment content had taken place. Increase in pigment content led to increase of all the observed precursors while the low and inbred lines showed accumulation of certain pteridines and reduction of others. The genetic behaviour of the fluorescing compounds parallels that of the red pigment. The reduced pigment content in both low and inbred lines could be accounted for by reduced enzyme activity in later stages of the pathway leading to red pigment, while the positive relation between precursors and pigment content in high lines could be due to an increase in early precursors. Many of the general features of the inheritance of differences in pigment content recall those shown by body size.

Banerjee, M. and A.S. Mukherjee. University of Calcutta, India. Effect of split-dose X-irradiation on fractional mutations in D. melanogaster: preliminary results.

In order to examine the effect of split X-ray dose on fractional mutations in D. melanogaster (Oregon R+) four sets of experiments were performed: (i) 3 KR given to 48 hrs. old adult males, (ii) 1 KR given to a batch of white pupae and again the males which eclosed from these white pupae were given 2 KR when 48 hrs. old, (iii) 1 KR given to white pupae and the males emerging from them were utilized and (iv) 1 KR given to 48 hrs. old males (the dose rate varying from 36-40 R/5 sec., with Picker's X-ray machine operated at 110 KV, 4mA, using 0.25mm Al filter). The males were crossed to "maxy" ♀♀ (for 4 days) and the F_1 females were examined for visible mutants for the 15 loci. The results of the preliminary series of experiments are presented in Table 1. It is clear that as expected the frequency of whole-body mutations is higher with 3 KR than with 1 KR (singles), but the proportion of fractionals

TABLE I. RESULTS OF THE FOUR EXPERIMENTS SHOWING CHANGES IN FRACTIONAL MUTATION FREQUENCY IN DIFFERENT CONDITIONS

Expt. No.	Total Dose	Stages of Irradiation	Total No. of F_1 ♀♀ Examined	Whole Body Mutants No.	Whole Body Mutants %	Fractional Mutants No.	Fractional Mutants %	Whole Body/ Fractional Ratio	% of Visibles
1	1 KR	48 hr adult ♂♂	3080	1	0.032	2	0.065	0.5	0.097
2	1 KR	white pupae	8708	10	0.114	8	0.092	1.25	0.206
3	3 KR	48 hr adult ♂♂	4159	15	0.36	8	0.19	1.87	0.553
4	3 KR (1 KR + 2 KR)	white pupae & 48 hr adult ♂♂	5551	14	0.25	7	0.125	2.0	0.377

among the total mutants is higher with 1 KR than with 3 KR (singles). In addition, proportion of fractionals as compared to whole-body tends to be higher in samples of sperms (Expt. 1) than in samples of spermatids and spermatocytes (Expt. 2). When 3 KR is fractionated and given in two stages (Expt. 4), the total mutation frequency is decreased as compared to that in 3 KR single dose series (Expt. 3), but the net frequency of fractionals (whole-body to fractional ratio) appears to have been more in the former than that expected for spermatids or sperms alone with 3 KR. However, it appears that this effect of split-dose depends upon the specific stage of irradiation. The details of these works are in progress.

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