(Kaplan, et al, D.I.S. 1962; Kaufmann and Demerec, Am. Nat. 1942).) This view is supported by the data of Stromnaes and Kvelland (Hereditas, 1962) who showed that females inseminated by highly active males (those mating with all ten of the females provided by 12 hours) produce fewer progeny, on the average, than females inseminated by less active males. However, on a per male basis, the more active ones produced the greatest total number of progeny.

Maroni, Gustavo P. Atomic Energy Commission, Buenos Aires, Argentina.

Mutations induced at specific loci in motile sperm.

Adult virgin "Binsc" males 7-9 days old were X-rayed (3000r) and immediately mated to females bearing the "maple" chromosome (y ac sc pn w rb cm ct^6 ras^2 v g^2 f car) heterozygous with Ins(1)sc^{S1}, dl-49, y sc^{S1} v B. Mating was allowed for only 2-3 hours in order to sample fully mature (motile) sperm (Lefevre and Jonsson, Mut. Res. 1, 1964). F_1 B females were observed for mutations at the marked loci. Altogether, 3163 males were irradiated, 10,132 F_1 females were examined and 69 mutants were found.

The yellow mutants were considered apart from the rest because in the Binsc chromosome this locus is near a portion of heterochromatin and has been shown to be very frequently involved in rearrangements (especially small deletions) with one break in this heterochromatin. The mutation frequency of yellow in this condition is a good estimate of heterochromatic rearrangement frequency. The overall mutation frequency of the y locus was 8.67 x 10^{-7}/r, which is significantly higher than the mean overall mutation frequency found for the remaining loci (ac and sc excluded), which was 1.43 x 10^{-7}/1/r. (The overall frequency includes cases of mutant F_1 females which were inviable or sterile.)

In the table, the results are compared with those obtained by R. Valencia (unpublished) in a similar experiment where a mixture of spermatozoa was studied. In this case, sperm was collected during about 3 days after treatment of 3-5 day old males. Point mutations have been separated from chromosome rearrangements according to the viability and fertility of the mutants which were kept in stocks, the classifications being based upon past experience of Muller and the Valencias with these same loci. This classification will be checked by cytological analyses now in progress.

The results for the 10 "maple" loci observed (other than y) are in agreement with those of Lefevre (Genetics, 1967). That is, the increase in X-ray induced mutation frequency in motile sperm is due to an increase in chromosome rearrangements and not point mutations.

Mutations	Sperm	Av.mut.freq./locus/r x 10^7 (2)	Freq.(motile) / Freq.(mixture)
Point mut. 10 loci(1)	Motile	.4	.8
	Mixture	.5	
Chr. rearr. 10 loci(1)	Motile	.7	1.4
	Mixture	.5	
Chr. rearr. (yellows)	Motile	3.7	1.5
	Mixture	2.4	

(1) pn w rb cm ct ras v g f car

(2) Frequencies include only those mutations of which stocks could be made.

Chromosome rearrangements involving the y locus show a relative increase in frequency in motile sperm which is quite similar to that observed for the other loci. This suggests that the X-ray sensitivity (either increased breakage or impaired ability to repair) of heterochromatic regions and of euchromatic regions is equally enhanced in fully mature sperm. This situation is quite different from that found in female germ cells, in which the increase in yellows due to heterochromatic rearrangements in stage 14 as compared with stage 7 oocytes was about 88 times greater than the increase in other loci (Valencia and Valencia, Rad. Res. 14, 1961, and R. Valencia, Genetics 52, 1965).