Background	cn treated			bw treated			s	σ_s
	# of tests	cn(A)	bw(B)	# of tests	cn(C)	bw(D)		
isogenic	123	.485	.515	119	.509	.491	.049	.010
non-isogenic	135	.493	.507	131	.512	.488	.039	.009

The s value is the mean reduction in viability of heterozygotes, or the heterozygous load and is derived as follows: if we let x be a measure of the relative survival of the treated class, and p and q the relative viabilities of cn and bw flies, respectively, then the expected ratio of cn:bw where cn is treated is px:q and where bw is treated, p:qx. The value x^2 may therefore be estimated from the ratio AD/BC, where these letters represent the observed proportions of flies in the classes as listed in the table. The load s is approximately 1-x, or with a Poisson correction, s = -ln x.

Thus, in the isogenic (cn bw) background the reduction in viability of heterozygotes carrying a treated chromosome was close to 5%, and in the non-isogenic (cn bw;e) background about 4%. Each of these was significantly different from zero, but not different from each other. If the data is subdivided by broods, the effect is consistent: in the isogenic background, s for brood 1 was .053 ± .011, for brood 2, .050 ± .017. In the non-isogenic background, the s values were .040 ± .010 and .025 ±.015 for broods 1 and 2 respectively. Further experiments are planned in which the heterozygous effects will be correlated with homozygous effects. In particular, lethal heterozygotes will be separated from non-lethal heterozygotes and their viabilities compared. In the preliminary studies reported here, a major fraction of the effect may well be due to lethals, based on extrapolation from measurements of lethals induced on the X, as follows. The standard M-5 tests, with an additional generation tested for the presence of mosaic lethals were carried out to establish the lethal rates at three doses. With .017M EMS, there were 28.9% sex-linked lethals (89/219) in the F_2 and an additional 7.3% lethals in the F_3 (15/191). At .021M EMS, the F_2 rate was 37.9% (143/377) and F_3, 3.5% (7/201). At .023M the lethal frequency in the F_2 was .421 (48/114).

Würgler, F.E. and M. Kälin. Swiss Federal Institute of Technology, Zürich, Switzerland. A "storage" effect with X-rayed mature sperm of Drosophila melanogaster.

Graf and Würgler (this volume) found that the rate of apparent X/O males recorded after anoxic X-irradiation of mature sperm of ring-X males depends on the genotype of the females used for the test crosses. In screening tests, in which several other types of females were used in addition to the y sn^3 and Inscy;dp bw;st p^p flies, another unexpected result was obtained. Data obtained with XY/XY females illustrate this: Two to three-day-old ring-X males (R(1)2, y B/B^S Y y^+) were pretreated with N_2 for 20 min and X-rayed (50 keV, 520 R/min) in nitrogen. Nonirradiated controls were treated with nitrogen in the same way. After the treatment, the males were mated for 7 to 8 hours to 4-day-old virgin females in empty bottles, where the females did not deposit eggs. The females are homozygous XY/XY (Parker 110-8, y^2 su $(w^a)w^a$ KS.KL y^+). At the end of the mating period the males were discarded and the inseminated females transferred to standard culture vials. Every 24 hours the vials were changed until 4 successive broods had been obtained. The progeny from every vial were classified according to the phenotypes: normal B/+ females (F), normal B^S males (M), apparent X/O males (non-Bar, su$(w^a)w^a$) (L), and mosaics for sex chromosome loss (ML). The pooled data of two experiments, which gave very similar results, are given in the table. The percentage of sex chromosome loss is calculated as 100 x (L/F+M+L+ML).

brood (day)	control	2000 R	4000 R
1	2.2% (11/266+227+11+0)	8.7% (49/225+282+49+6)	13.7% (115/286+428+115+9)
2	1.3% (3/125+91+3+1)	3.5% (7/78+113+7+1)	4.5% (12/105+148+12+2)
3	1.9% (6/154+145+6+0)	3.7% (11/138+146+11+1)	8.0% (22/113+139+22+1)
4	1.7% (2/55+63+2+0)	2.2% (4/80+100+4+0)	6.6% (14/67+128+14+3)
2 - 4	1.7% (11/334+302+11+1)	3.2% (22/296+359+22+2)	6.4% (48/285+415+48+6)

The data show that the rates of sex chromosome losses are extremely high in the first brood. In broods 2, 3 and 4 the rates are low, but more or less constant. This finding, which looks like a "storage" effect, could have different causes:

a) Since most sex chromosome losses result from damaged ring-X chromosomes, a preferen-

tial use of X-bearing sperm during the first day after insemination of the females would lead to the observed result. The variation of the sex ratio (F/M) in the controls from brood 1 to 4 (1.17, 1.37, 1.06, 0.87) does not show the systematic variation expected on the basis of this hypothesis. Statistically none of the 4 values is significantly different from the weighted mean of 1.13.

b) The extremely high rate of X/O males might result from the effect that during the first day, Stage-14 Oocytes which had been stored in the virgin females for 2 to 4 days, were inseminated. Physiological differences between stored and non-stored oocytes might be responsible for the high rate of chromosome loss. Experiments to test this possibility are under way.

c) As a third hypothesis one could assume that changes occur in the irradiated sperms during the first day of storage in the females.

Finally it should be stressed here that this "storage" effect is also found with two other types of females, but - as far as can be seen from preliminary data - seems to be absent in experiments with females of two other stocks.

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Mather, W.B. University of Queensland, Brisbane, Australia. The genus Drosophila at Cebu, Philippines.

An investigation of the evolution of the immigrans species group in South East Asia has made the determination of relative abundance at various stations of considerable interest. Data for Sabah (Mather 1968 and 1969) and Luzon (Mather 1970) have already been recorded. In February 1970 the genus Drosophila was sampled from fermenting banana baits within the grounds of the Cebu Forest Experiment Station at Camp 7. Sorting of the flies yielded the following results:

Species	Number	% of total
D. setifemur	278	16.7
D. pararubida	374	22.4
melanogaster group	1,014	60.9
	1,666	

References: Mather, W.B., 1968 The genus Drosophila in Sabah. DIS 43: 100-101; Mather, W.B., 1969 The genus Drosophila at Sandakan. DIS 44: 98; Mather, W.B., 1970 The genus Drosophila at Mt. Maquiling, Luzon, Philippines. DIS 45: 111.

Limbird, D.L. College of Wooster, Ohio. A test for mutagenicity of MA and its effectiveness in deactivating EMS.

Mercaptoacetic acid (MA) has been recommended as a deactivator of ethyl methanesulphonate (EMS) (Lewis and Bacher, DIS 43) although experimental tests were not reported which would support its effectiveness. In the following experiment, MA was tested for possible mutagenicity and for its effectiveness in deactivating EMS. The experimental procedure involved treating 4-5 day old Canton-S males with one of four test solutions: a) control: 1m KOH in 1% sucrose solution + carmine; b) 0.5% MA: 0.5ml MA/100 ml control solution; c) 0.025M EMS: 0.24ml EMS/100ml control solution; d) EMS/MA: 0.5ml EMS/100ml control solution. Males fed for 24 hours from a pad of Kimwipes saturated with one of the solutions. Only those flies having definitely red guts due to the vital dye carmine were used in M-5 tests for sex linked recessive lethals. According to the results tabulated below, MA should be considered safe to use as a deactivator of EMS, being non-mutagenic itself and effectively cancelling the mutagenic properties of EMS.

Treatment	No. X chromosomes tested	No. X chromosomes lethal	Mutation rate
Control	387	1	.003
MA	309	0	0
EMS	245	35	.143
EMS/MA	306	0	0