Hexter, W.M. 1999. A two-factor sex-linked cross involving gene interaction. *Dros. Inf. Serv*. 82: 128.

A two-factor sex-linked cross involving gene interaction.

Hexter, W.M. [reprinted from DIS 31: 182-183, 1957].

The mutants g^{53d} and w^{a}, both sex-linked recessives 42.9 map units apart, are phenotypically indistinguishable. The phenotype of these mutants is orange, varying somewhat with age. The class is given as parents, females of one mutant and males of the other, and the cross is designated simply as "orange 1 × orange 2". F1 females are wild type and F1 males are orange. F1 are interbred to raise an F2. The F2 females are expected to be wild type and orange in equal frequencies, and the F2 males theoretically should be approximately 60 percent orange (parental types) and 40 percent crossovers, half of which are wild type and have double mutant (w^{a} g^{53d}). Actual class data were: females, 1530 wild type, 1402 orange; males, 690 wild type, 1420 orange, 454 white. Deviations from equality were due primarily to differential viability of the various genotypes. The student is confronted with the following facts: a wild-type F1 female; a mutant F1 male; a new phenotype (white) in the F2 but confined to one sex. From this information the student should conclude that orange 1 and orange 2 are not alleles and are recessive; that one of them is sex-linked; and that white is probably due to the combined action of orange 1 and orange 2. The student then usually assumes a second gene that is autosomal. This assumption will not account for the data. The second gene is then assumed also to be sex-linked, and the conditions of the problem are satisfied if linkage is assumed to be about 45 percent. In addition to the unexpected phenotypes and the challenging yet not too complicated analysis, this experiment has the advantage of simple and rapid classification.

Burdick, A.B. 1999. Monohybrid for sophisticated students. *Dros. Inf. Serv*. 82: 128.

Monohybrid for sophisticated students.

Burdick, A.B. [reprinted from DIS 29: 181, 1955].

One of our *Bar* stocks has two lethals on the first chromosome with *Bar*. These lethals, for reasons unknown, stay in the stock in high frequency and provide an interesting experiment in our advanced laboratory course. At the beginning of the semester we propose a sex-linked monohybrid involving *Bar* as the first experiment. Although this is quite beneath many of the students, the results challenge all of them for interpretation. We ask them to make five single pair matings of *B*/*B* female × + male. With the two lethals in the stock, these matings may be of several types:

1) l^1 *B*/*B* female × + male	gives	2 wide Bar females: 1 Bar male
2) *B*/*B* l^2 female × + male	gives	2 wide Bar females: 1 Bar male
3) l^1 *B* l^2 / *B* female × + male	gives	about 3 wide Bar females: 1 Bar male
4) *B*/*B* female × + male	gives	1 wide Bar female: 1 Bar male

We also get some matings that appear to involve l^1 *B*/*B* l^2 females which indicates that one of these "lethals" must, occasionally, go through the male.

The data of any given student usually contains one or more bottles with aberrant sex ratios. They find heterogeneity with Chi-square and, if they have only 2:1 and 1:1 ratios, usually come up with a lethal in their interpretation. But, when 3:1 (and sometimes 10:1) ratios appear, they seem to lose confidence in lethals especially when they consider how a female could get to be l^1 *B*/*B* l^2 to give an approximately 10:1 ratio. I feel they learn quite a bit about critical handling of data from this experiment. It evokes considerable discussion and frequently leads to interesting interpretations.