agreed to have the lowest X-ray-induced mutation rate of all germ cell stages of adult *Drosophila melanogaster*. However, reports have disagreed concerning whether their rates are alike in both sexes. Our present experiments have investigated the frequency of second chromosome recessive lethals induced in early gonia of both sexes X-rayed simultaneously with 4000r (100 kvp, 240r/min). Lethals induced in coisogenized chromosomes carrying *fes-ms-b-cn-sp*, of flies heterozygous for Curly-Oster, were detected by "criss-cross sterility" tests improved since MULLER's Drosophila Inform. Serv. description. Individually identified young females and males, breeding for three days just before irradiation, produced control progeny denoted "YFC" and "YMC," respectively, and, *after* a 10-day or 15-day postirradiation period of active breeding, produced experimental progeny denoted "10FX," "15FX" and "15MX," respectively. As another control, "15MC," progeny were taken from other males, unirradiated, after breeding them as long as those irradiated. Determination of induced lethal rate was made unusually accurate by allelism tests of lethals derived from the same parent before and after irradiation, some spontaneous mutations being thereby excluded from the "rectified" experimental rate. Allelism tests also disclosed "clustering" within experimental or control sibships, thus permitting more accurate standard error determinations (MULLER 1952, GSA Records). Harmonically weighted mean frequencies (MULLER 1941, Am. Naturalist) of six such experiments gave, for "unrectified" controls: YFC (3159 chromosomes tested) $.61 \pm .16\%$; YMC (2718) $.29 \pm .11\%$; 15MC (2282) $.17 \pm .08\%$. For "rectified" experimentals: 10FX (1962) $6.3 \pm .7\%$; 15FX (1441) $6.5 \pm .6\%$; 15MX (2029) $7.4 \pm 1.2\%$. These results, which for oogonia concur with our previous X chromosome results, show no significant sex difference. (Supported by U. S. Public Health Service N.I.H. RG-5286-C2,3.)

MEYER, JAMES R., and VESTA G. MEYER, Delta Branch Experiment Station and Agricultural Research Service, U. S. Department of Agriculture, Stoneville, Mississippi: *Cytoplasmic male sterility in cotton.*—Male sterility has been found in derivatives of cotton species hybrids which combine the cytoplasm of one species with the genes and chromosomes of another species. When the cytoplasm of the wild, lintless African species, *Gossypium anomalum* Warsaw and Peyr. ($2n = 26$), was combined with genes and chromosomes of an Asiatic cotton (*G. arboreum* L.: $2n = 26$), the anthers were usually modified into petal-like structures. These male-sterile flowers produced fully-developed bolls after hand pollination. A double haploid genome of Upland cotton (*G. hirsutum* L.: $2n = 52$) was transferred into cytoplasms of the diploid species, *G. anomalum* and *G. arboreum*, by backcrossing. The aborted anther type of male sterility was frequently found on vigorous, female-fertile plants derived from these backcrosses. After three and four backcrosses, some populations were completely male-sterile and others had a high incidence of male-sterile plants. Both the petaloid and aborted anther types of male sterility were probably due to cytoplasmic-genetic interaction (cytoplasmic male sterility).

MILLER, W. J., University of California, Davis, Calif.: *Evidence for two new systems of blood groups in cattle.*—From studies of three new blood factors N, R′ and S′ discovered in this laboratory, it has been observed that they segregate independently of the blood factors in each of the genetic systems named A, B, C, F-V, J, L, M, S and Z. Blood factors R′ and S′ segregate as genetic alternatives and have been observed in only three phenotypes, R′, R′S′ and S′. It is concluded, therefore, that R′ and S′ belong to a new genetic system designated R′-S′ which presently involves but two alleles.—Blood factor N segregates as an alternative to no-N and independently of R′ and S′. Consequently, another genetic system, designated N, is postulated, thereby bringing the total number of bovine blood-group systems to 11.

MITTLER, SIDNEY, Northern Illinois University, DeKalb, Ill.: *Development of resistant strains of tumor S 180 to chemotherapy.*—The sudden development of resistance of tumors to antitumor drugs is a constant problem in a chemotherapy program. Tumor S 180 which was maintained in random-bred albino Swiss mice was tested for development of resistance to the antitumor drugs, mustargen, actidione, and *n*-methylformamide. The S 180 tumor was implanted weekly