E. V., and S. I. Maletzky, M.G.C.N.L. 48:63, 1974) that the activity of ADH in diploid and tetraploid plants homozygous for the F allele is the same. However, because the cell volume in tetraploid plants is about twice that in diploid plants, the enzyme activity per tetraploid cell should be twice as high.

E.V. Levites and R.S. Chukalina

Genetic control of meiosis: mutations affecting meiosis — Meiotic mutants should help to focus attention on single events in the process of meiosis and on specific aspects of the regulation of meiotic systems. Two meiotic mutants controlled by recessive genes were investigated. They were obtained after seed treatment with chemical mutagens (N-nitrosomethyl urea).

Desynaptic mutant: The 44 normal:15 desynaptic plants in the M_3-M_4 segregating progenies indicated that the meiotic irregularities are under the control of a single recessive mutant gene (dy*-G). (Ed. note: Dr. Golubovskaya proposed to use the symbol ds, which would be subject to confusion with Ds; dy*-G is suggested in view of parallel effects with the mutant described by Nelson and Clary, J. Hered. 43:205-210, 1952). Analysis of meiotic prophase I demonstrated all stages: leptotene, zygotene and pachytene. However, as early as zygotene the pairing chromosomes had desynaptic regions, which were more distinct at pachytene. It was found that at diakinesis most homologous chromosomes lie apart and very few open bivalents are formed. The mean numbers of bivalents and univalents at MI were 0.6 and 18.8, respectively.

Chromosome distribution at AI was irregular. Ten + ten chromosome distributions were observed in only 15.2% of 131 cells examined. Other cells showed no regularity in chromosome distribution. Second meiotic division was normal, and all the observed irregularities were the consequences of anomalies in chromosome segregation during first division.

Only 15% of the tetrads looked normal at the end of meiosis. The mutant plants were completely sterile. This desynaptic type of meiotic mutant is frequently observed among different plant species.

Mutation causing the absence of first division (Genetica, in press, 1975): Mutant plants exhibit characteristic meiotic peculiarities. (1) Prophase I of meiosis (leptotene, zygotene, pachytene and diplotene), including the pairing of homologous chromosomes, is absent. At the stage which presumably is diakinesis, all 20 chromosomes lie separately, resembling the mitotic condition. (2) The first meiotic division is of a mitotic type; the 20 univalents are arranged in an orderly manner along the equatorial plate at MI, and the 20 chromatids separate and pass to each pole at AI. (3) Although the centromeres have divided in the first division,

the second meiotic division takes place; the chromatids are randomly distributed at AII, giving rise to 100% anomalous tetrads. Mutant plants are completely male- and female-sterile.

This meiotic mutation is controlled by a single recessive gene (the segregation in M_3-M_4 plants heterozygous for this mutation was 64 normal:15 mutant plants, $\chi^2 = 1.52$, $P = 0.1 - 0.15$).

This mutation causing meiotic sterility was designated "the absence of the first division," and its symbol is afd-W23 (W23 is line Wisconsin 23 where this mutation first appeared). This new type of meiotic mutation has not been described in the literature. Meiotic mutants in plant and animal species are listed in a reference (Ontogenesis 6: 2, 1975). However, the first division was experimentally substituted by the second division by Astaurov (Cytogenetica razhvitiya tutovogo shelkopryada, M. "Nauka," 1968) in Bombyx mori and by Maguire (Chromosoma 48:2, 1974) in Zea mays L. The mechanisms of the substitutions are different from the mechanism we describe for afd-W23.

This type of meiotic mutation might have been involved in the course of evolution of apomictic plants as a cytogenetic mechanism underlying the gradual transition from meiosis to mitosis.

I.N. Golubovskaya

INSTITUTO DE GENETICA
Facultad de Agronomia, Maracay, Venezuela

Location of gl12 — A-B chromosome translocations were used to locate gl12 in a mutant stock received from the Maize Genetics Coop.

The data from the F_1 progenies presented in Table 1 clearly indicate the long arm of chromosome 3 as the carrier of the gl12 locus. After this result we looked to relate gl12 with Rg, lg2 and ra2.

Table 1. Results of the F_1 from gl12 gl12 x the A-B translocations.

Translocations	Breakpoint	Gl12	gl12	Total
B-1a	1L.2	37	0	37
B-1b	1S.05	169	0	169
B-3a	3L.1	88	15	103
B-4a	4S.25	232	0	232
B-7b	7L.3	62	0	62
B-8a	8L.7	119	0	119
B-9a	9L.5	121	0	121
B-9b	9S.4	146	0	146
B-10a	10L.35	59	0	59