approach to the problem, as it would not be possible to analyze what has happened to the structure of the chromosomes after several generations of repeated irradiation.

G. G. Doyle

5. The duplication of specific chromosome segments by crossing translocations involving the same chromosomes.

The F_2 and in some cases the F_3 generations of translocation crosses for the duplication of the su_1, ae, y and wx loci have been obtained. It is highly probable that all of these loci have been duplicated. Considerable work remains to be done to isolate plants which are homozygous for the duplication and to prove that the selected loci are included in the duplicated segment.

One of the questions to be answered is - how functional are the pollen grains which contain duplications in competition with normal pollen? If they cannot compete successfully then we could not get a homozygous duplication. However, it has been determined that the duplication pollen is functional in a few cases where one of the parental translocations carried the recessive gene and the other parental translocation carried the dominant allele. In the F_2 generation the frequency of recessives should be 1/6 if the duplication pollen is not functional. In the case of the translocation cross of 9S.68-4L.03/9S.25-4L.33, the frequency of wx kernels was 15.27% which is significantly lower than 16.66%. If we let x equal the frequency of duplication pollen transmission and let r equal the frequency of recessive gametes then we can set up the formula:

$$r = 1/6 - 1/6x$$

$$\text{or,} \quad x = 1 - 6r$$

In this example x equals 8.38%. This formula may be derived by a consideration of the diagram below. It is assumed that the deficient gametes are non-functional on both the male and female sides. It is assumed that the three kinds of gametes, the two parental translocations and the duplication type, function with equal frequency in the female.

♀ \ ♂	1/2(1-x) Wx 4^{9}_{a} 9^{4}_{a}	1/2(1-x) wx 4^{9}_{b} 9^{4}_{b}	x Wx wx 4^{9}_{a} 9^{4}_{b}	0 4^{9}_{b} 9^{4}_{a}
1/3 Wx 4^{9}_{a} 9^{4}_{a}	Wx	Wx	Wx	--
1/3 4^{9}_{b} wx 9^{4}_{b}	Wx	wx	Wx	--
1/3 Wx 4^{9}_{a} wx 9^{4}_{b}	Wx	Wx	Wx	--
0 4^{9}_{b} 9^{4}_{a}	--	--	--	--

G. G. Doyle

6. New sources of ae.

Two new sources of ae have been found in an exotic strain Bolivia 561, NRC No. 9815 and a South African open-pollinated variety, Potchefstroom Pearl, PI 221825.

M. S. Zuber

7. Mutants recovered in the selfed progeny of chemically and x-ray treated seeds.

In an earlier experiment (MNL 36, p. 57, 1962) Yg_2 yg_2 and Wd wd seeds were treated with ethyl methanesulfonate (EMS) and diethyl sulfate (DES). The frequent yellow-green and albino sectors on the leaves of the treated plants were regarded as phenotypic expressions of the mutation or loss of the dominant genes.