The second method approaches the problem of developing multi-inverted chromosomes by the irradiation of material which already has one inversion in the hope of inducing a second one on the same chromosome. Last summer pollen from In 3a/In 3a plants was given 1000 r and was placed on silks of trisome 3 plants with constitution of $\underline{a}_1/\underline{a}_1/\underline{a}_1$. If no new inversion was induced then the frequency of $\underline{A}_1$ (from the In 3a stock) in the backcross progeny of the trisome used as the pollen parent should be about 22%. If another inversion has been induced in chromosome 3 then this frequency should be less. The modified In 3a chromosome will be subjected to further irradiation to obtain a third inversion and so forth. Eventually a new chromosome 3 will be produced which will have very little pairing affinity for the standard chromosome 3. If this procedure works satisfactorily it will be done with the other chromosomes.

The third method is suggested by the results obtained with the exotic trisomes. While none of the exotic chromosomes exhibited enough differential pairing affinity to be used in an allotetraploid, it should be possible to find recombinant chromosomes in the progeny of hybrids of exotic strains which will exhibit more preferential pairing than either of the parents. For example a hybrid of Zapaluta chica and Papago flour corn will be crossed with the standard trisome 3. Recombinant chromosomes should show transgressive segregation for pairing affinity if these two strains have different structural rearrangements. Other hybrids will be used.

G. G. Doyle

3. Numerical non-disjunction in tetraploid corn.

Numerical non-disjunction is the 3 to 1 separation of four homologous chromosomes of a tetraploid at the first division of meiosis. This event results in aneuploidy in the offspring of a eutetraploid.

The frequency of numerical non-disjunction can be determined for a particular chromosome by crossing a quadriplex (AAAA) with a nulliplex (aaaa), and then progeny test the offspring. If numerical non-disjunction has not occurred the result is a plant with the constitution of AAaa which will give a testcross ratio of about 5:1. The products of numerical non-disjunction will be triplex and simplex (usually AAAaa and Aaa) which give testcross ratios of about 12:1 and 1:1, respectively. All these ratios can be easily distinguished. The frequency of numerical non-disjunction has been determined for two chromosomes, 2 and 9, using the Lg_1 and Wx loci, respectively. The initial crosses of quadriplex by nulliplex were made by D. L. Shaver.

Table 2. The frequency of numerical non-disjunction

Cross	Triplexes	Number of Duplexes	Simplexes	% Numerical Non-disjunction
4n lg X 4n Lg	2	83	1	3.5
4n Lg X 4n lg	5	239	9	5.5
4n wx X 4n Wx	4	332	1	1.5
4n Wx X 4n wx	2	93	5	7.0

G. G. Doyle