tion in the N 10/N 10 plants and 30.8% in the abn 10/N 10 plants. Apparently, in the present case, the combined reduction by the heterozygous translocation and the large knob is too great to be counter-acted by the abnormal chromosome 10 and the same low values are found in both types of plants.

The counts of rings versus chains and of 9-11 AI segregations are based on small populations of less than 200 cells. The increased frequency of 9-11 segregations in abnormal 10 heterozygotes is correlated with the increased recovery of trisomes from these plants. The increase in ring formation in abn 10/N 10 plants is difficult to explain. Presumably ring formation depends on the presence of a chiasma in the T-wd region of 9S. The T-Wx distance from Patterson's data is about 4 map units and the Wx-wd region in this experiment is only 2 units. Thus even the 41.4% of rings in N 10/N 10 plants cannot be accounted for if no more than 12% of the cells have chiasmata in the critical region. (This ignores another extremely short arm of the T which would not be expected to exhibit 100% chiasmata). Since both the cytological and genetic data on recombination and ring formation are based on small populations, further tests are necessary.

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5. Further studies on preferential segregation.

In the MNL 31, data on preferential segregation for loci in the long arm of chromosome 3 were presented. Representing abnormal 10 as K 10, normal 10 as k 10, the chromosome 3 with a large knob at position .6 as K 3 and the knobless chromosome 3 as k 3, backcross data using the heterozygous plants as the female parent were obtained for four combinations:

K 10/k 10, K 3/k 3
K 10/k 10, k 3/k 3
k 10/k 10, K 3/k 3
k 10/k 10, k 3/k 3

The data clearly showed that preferential segregation for the gl$_6$ lg$_2$ a$_1$ loci in the long arm of chromosome 3 occurred only in the K 10/k 10, K 3/k 3 combination. Some of the F_1 sibs of the backcrossed plants were self pollinated and the F_2 plants examined at meiosis for their constitution with respect to K 10 and K 3. These F_2 plants were backcrossed and the following data obtained which are given in summary form together with the data from the backcrosses of the F_1 plants. When there was no evidence of preferential segregation, the percent of segregation is indicated as 50 but it should be indicated that the actual values varied around this mean value.

Data from every possible combination of abnormal 10 and normal 10 with knobbed and knobless chromosome 3 have been obtained with the exception of the K 10/K 10, k 3/k 3 class which should yield 1:1 ratios

	% Gl	% Lg	% A
K 10/K 10, K 3/K 3	50%	---	50%
K 10/K 10, K 3/k 3	50	63.3	67.9
K 10/k 10, K 3/K 3	50	---	50
K 10/k 10, K 3/k 3	50 51.7	70.2 72.5	64.2 63.6
K 10/k 10, k 3/k 3	50	50	50
k 10/k 10, K 3/K 3	50	---	50
k 10/k 10, K 3/k 3	50	50	50
k 10/k 10, K 3/k 3	50	50	50

for all segregating loci. The data show clearly that preferential segregation occurs only when the chromosome 3 bivalent is heterozygous for the knob and when abnormal 10 is either homozygous or heterozygous. The slightly high percentage of preferential segregation of the A locus over that of the Lg locus in the K 10/K 10, K 3/k 3 class is anomalous but is almost certainly due to the relatively small population obtained for this combination.

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6. Level of polyploidy and size of chloroplasts.

Using the elongate gene which when homozygous results in the formation of unreduced megaspores in plants at all tested levels of ploidy (Rhoades MNL 30), a polyploid series consisting of 1N, 2N, 3N, 4N, 5N, 6N and 7N plants has been obtained. Although not isogenic, the close relationship of the different polyploids permits a comparison of the effects of ploidy level on various characteristics such as height vigor, etc. One of the more interesting findings is that the size of the mesophyll chloroplasts is the same throughout the range of polyploid although the number of plastids per cell increases with level of ploidy. This independence of plastid size from nuclear constitution is further indication of plastid autonomy.

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7. On the origin of abnormal 10.

During the course of the investigation discussed above on