showed an increase in the c-sh region but none in the sh-wx region. In the case of single crossovers in both chromosomes, the frequency of crossovers based on total ovules was less in asynaptic plants. The reduced set on these ears results in recovery of fewer crossovers per ear. With double crossovers, however, asynaptic plants produced more per ear than did the normal sibs. In the chromosome 2 data, about 2 per 1000 ovules occurred in normal plants while 7 per 1000 occurred in asynaptic plants. The latter rate is certainly a minimum since 70% of the gametes were inviable. A greater number of double crossovers (for both ws lg gl and c sh wx regions) occurred among the 30% of viable zygotes on asynaptic ears than occurred on normal ears with a much greater number of viable zygotes. This indicates either a preferential segregation of double crossover strands to the basal spore or alternatively a higher rate of production of such strands.

When the data for the two chromosomes were correlated, it was found that the ratio of chromosome 2 crossovers to chromosome 2 non-crossovers was the same among chromosome 9 crossovers and chromosome 9 non-crossovers. This was true for populations from both normal and asynaptic individuals. There is no evident association of crossover strands in single gametes.

While these observations do not support the idea of selective recovery of crossover gametes on asynaptic ears, they do not rule it out altogether. It is possible to conclude that something in addition to selection is operating, at least in the case of the double crossovers, since more double crossover individuals per ear are found on asynaptic ears than occur in the larger populations from normal ears.

E. Dempsey

4. **Aberrant segregations from T6-9b heterozygotes.**

The studies to be reported are based on the descendants of a single plant of a homozygous T6-9b stock obtained from Patterson. This translocation had been studied genetically by Patterson (MNL 32) and the backcross ratios were essentially normal. Burnham (Genetics 1950) reported 50.2% aborted pollen and 26.8% adjacent-2 segregation in T6-9b heterozygotes. Since the data below show striking deviations from the normal behavior found by Patterson and Burnham, it appears likely that these results are due to some additional modification in the single plant from which my material is derived.

The first indication of unusual behavior was found in self pollination of T wx/N Wx and backcrosses in which the heterozygote was used as female parent. The former gave 7-12% wx and the latter 21-26% wx. Pollen from sib plants gave normal ratios. Reciprocal backcrosses of T wx/N Wx plants gave the following results:

Heterozygous parent	Wx	wx	%wx
♀	601	233	27.9
♂	375	395	51.3

The translocated chromosomes are not recovered with the expected
frequency in the female backcross progeny. Apparently there is no
increased sterility, however, since the frequency of abortion on
one $\underline{T}/\underline{N}$ ear was observed to be about 50%.

One family segregating for the $\underline{T}$ and for abnormal chromosome 1
was studied cytologically. Plants heterozygous for the $\underline{T}$ were clas
for the presence or absence of the abnormal chromosome $1\overline{0}$. The sam
plants were used as females in backcrosses. The results are given
below:

Female parent		Wx	wx	% Wx
$\dfrac{\text{T Wx wd k}}{\text{N wx Wd K}^L}$	$\dfrac{\text{N 10}}{\text{N 10}}$	212	525	28.8
$\dfrac{\text{T Wx wd k}}{\text{N wx Wd K}^L}$	$\dfrac{\text{abn 10}}{\text{N 10}}$	482	407	54.2

It is evident that the ratios approach normal in the plants wi
abnormal 10. The large knob (K^L) present on chromosome 9 has littl
effect on segregation since similar ratios were obtained in plants
heterozygous for a small knob and a knobless chromosome.

A small sample of the above population was grown to seedling
stage to classify for wd and to obtain root tip counts. It was fou
that 3.2% of the offspring of a N 10/N 10 plant were tertiary triso
whereas 12.9% of the abn 10/N 10 progeny were tertiaries. The incr
frequency of tertiary trisomes from abn 10/N·10·plants partially ac
for the altered Wx:wx ratio mentioned above since 12 of the 14 tri
were of Wx phenotype. However, something more must be operating i
10/N 10 plants to cause the increase from 28.8% Wx to 54.2% Wx.

The genetic and cytological data from the limited population
in the greenhouse may be summarized as follows:

	% trisomes	Σ	Σ *	% Wx*	% wd*	%wx-wd recomb.*	
$\dfrac{\text{T Wx wd k}}{\text{N wx Wd K}^L} \dfrac{\text{N 10}}{\text{N 10}}$	3.2	154	149	30.9	30.2	2.0	41
$\dfrac{\text{T Wx wd k}}{\text{N wx Wd K}^L} \dfrac{\text{abn 10}}{\text{N 10}}$	12.9	108	94	37.2	37.2	2.1	72

* trisomes excluded

The wx-wd recombination value is extremely low. In sib N 10/
and abn $1\overline{0}/N\overline{10}$ plants not carrying a translocation but possessing
same k 9/K^L 9 constitution, Kikudome (in press) found 12.6% recomb

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.

E. Dempsey

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