3. Analysis of crossing over in haploid gametes of asynaptic plant:

Haplcid gametes produced by asynaptic plants show a higher rat of crossing over than the gametes produced by normal sibs (Rhoades and Dempsey, MNL 23). The frequency of double crossovers is especi: high. Since asynaptic plants on the average produce ears with many borted ovules, the possibility existed that the recovered gametes r presented a selected portion of the total population--namely those rived from EMC's which had the advantage of frequent chiasmata and therefore a more regular chromosome behavior. If this hypothesis i correct, it would account for the results without the need to assum higher crossing over in the EMC's of asynaptic plants. One would e the number of crossover gametes to be the same in an equal populati of ovules from asynaptic and normal plants if all could be analyzed Since only part of the population of gametes can be tested, no conc can be reached unless the number of recovered crossovers per asynap ear actually exceeds that from a normal ear. On this hypothesis th might also be a bias in asynaptic plants toward simultaneous recove of crossover strands from two different bivalents in the same gamet These possibilities were tested in the following way. Backcrosses made using asynaptic and normal sibs as female parents and the offs were classified both for c sh wx on chromosome 9 and for ws lg gl o chromosome 2. The number of ovules on ears of both types was count The results are given below:

	% Sh-Wx	% C-Sh	% Doubles	Σ Seed	% Set	Corrected % Set"	Correc Σ Ovu
N	21.2	3.7	.18	2780	74.9	100.0	2780
as	21.2 8.7*	6.3 2.3*	.67 .28*	2377	30.6	40.9	5811

" corrected for reduced set of normal ears
* based on corrected number of ovules

	% Ws-Lg	% Lg-Gl	% Doubles	Σ Seedlings	% Set	Corrected % Set"	Corr Σ Ov
N	8.4	18.9	0.2	1362	77.7	100.0	13
as	14.5 4.8*	29.0 9.6*	2.1 0.69*	1255	25.8	33.2	37

" corrected for reduced germination and for reduced set on normal e
* Based on corrected number of ovules

Only a part of the seeds classified for c sh wx have been test in the seedling bench so the ws lg gl data are incomplete. However the number of observed crossovers in the ws-lg and lg-gl regions is greater in asynaptic plants than in their normal sibs. The same pl 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.

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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