(i) fraction supposed to contain only RNA and (ii) fraction containing the pyrimidine bases obtained from the apurinic DNA.

The first fraction showed a clear absorption peak at 260 mμ and differed only in the height of the peak indicating a quantitative difference. The possibility of a qualitative difference in terms of base composition has not been explored.

The second fraction showed distinctive patterns of u.v. absorption spectra between 200-300mμ. While the extract from normal plants had a big peak of absorption at 280mμ, that from ameiotic plants showed less absorption at the same wavelength. Chromatographic separation of the bases followed by systematic elution and further spectrophotometric analysis seemed to indicate differences in the components of the fraction. These differences might be due to one or both of two causes: (1) a difference in the composition of the nucleic acid, (2) a difference in the amount or nature of proteins. That the proteins do not differ in their amino acid composition in normal and ameiotic plants has been indicated by a chromatographic study of hydrolysates of leaf proteins, though the same has not been tested in the reproductive structures.

Further studies along these lines and concerning other biochemical aspects are in progress.

S. K. Sinha

2. Preferential pairing.

In the last issue of the M.G.C.N.L. it was reported that in tetraploids heterozygous for a structural aberration (inversion 3a 3L .4- 3L .95) preferential pairing was proved to be operating. The evidence cited was genetic. The backcross ratio of the control duplex (AAaa) was 4.03A : 1a and that of the structural heterozygote duplex was 7.11A : 1a. The inverted segment is marked with A_1 and the corresponding standard segment with a_1. The difference in these ratios can only be explained by assuming that preferential pairing occurs. In the event of preferential pairing when two bivalents are formed only gametes of the type Aa would be formed. Preferential pairing in a quadrivalent would also lead to an excess of Aa gametes, because firstly double reduction cannot take place and secondly the chromosomes of a quadrivalent do not disjoin at random, there being a frequency greater than 1/3 of alternate disjunction.

Now, it is possible to present some cytological evidence which indicates that preferential pairing does occur and also to make an estimate of its magnitude, something which is very difficult to do from genetic data.

Cytological observations were made on the chromatid bridge frequency of the simplex structural heterozygote as compared with that of the duplex

structural heterozygote. Since a chromatid bridge is formed after crossing over between a paired inverted and standard segment, it follows that the frequency of chromatid bridges is a function of the frequency of non-preferential or homoeologous pairing.

The use of the chromatid bridge frequency of a diploid heterozygote probably would not be legitimate since the frequency of crossi over may not be quite the same on the diploid and tetraploid levels. Also in the tetraploid there is the possibility that in the case of quadrivalent formation, two chromosomes with a potential bridge may p to the same pole and consequently the bridge will not be resolved at the first division. The use of the simplex tetraploid should provide a fairly good control for these two possibilities. Below is a total tabulation of the number of chromatid bridges observed at anaphase o

	No bridges	One bridge	Two bridges
Simplex	172 65.2%	92 34.8%	-----
Duplex	237 85.3%	36 12.9%	5 1.8%

If there were no preferential pairing the bridge frequency of t duplex should be twice that of the simplex times 2/3 (since 1/3 of t time the pairing would be of the preferential type by chance alone.)

Since (2 X .348 X 2/3) or .464 ≠ .165, the frequency of pairing of the non-preferential type is not the random value 2/3 but is redu by a factor designated by "p", the preferential pairing factor. Thu by inserting the term 2/3 - p the equation may be balanced and the v p solved for.

$$2 \times .348 \times (2/3 - p) = .165$$
$$p = .43$$

This means that 76% (1/3 + p) of the time the inverted segment pairs with the inverted segment and the standard with the standard. Only 24% of the time is the pairing the other way.

The use of trisomics to study preferential pairing appears to be quite promising. Here it will be possible to examine pachynema configurations (something which is extremely difficult to do in tetraploids) and to tabulate the different types of pairing. This part of the work remains to be done. However, there is some genetic data which can be presented which indicates that preferential pairin is operative on the trisomic level.

	Cross	No. of ears	Number A	Number a	Ratio A : a	
(1)	In A/ N A / N a X N a/ N a	3	450	149	3.02 : 1	X^2 = 6.9**
	N A/ N A/ N a X N a/ N a	3	417	108	3.86 : 1	
(2)	N a/ N a X In A/ N a/ N a	8	421	1620	1 : 3.85	X^2 =259**
	N a/ N a X N A/ N a/ N a	12	1045	1966	1 : 1.88	
(3)	N a/ N a X In A/ N A/ N a	3	471	270	1.74 : 1	X^2 = 7.6**
	N a/ N a X N A/ N A/ N a	5	843	392	2.15 : 1	

The theoretical effect of preferential pairing at the trisomic level on genetic ratios remains to be worked out in its entirety. The problem would be simple if the chromosomes always paired as a bivalent and an univalent. Thus the results in (2) above could be explained as follows:

		Gametes expected				
		AA	Aa	aa	A	a
The preferential type (1/3 + p')	$\frac{N\ a}{N\ a}$ In A	0	.5	0	0	.5
The non-preferential type (2/3 - p')	$\frac{In\ A}{N\ a}$ N a	0	.25	.25	.25	.25

Since n = 1 gametes are recovered with a low frequency when a trisomic is used as the pollen parent we may neglect them. Only if p' has a value of greater than 0 may the results be explained.

A difficulty arises when we try to figure out what will happen when a trivalent is formed. Will there be an excess over random of "a" gametes produced when preferential pairing occurs? This depends on the mode of disjunction of the trivalent. Do the two chromosomes which have their long arms paired, go to the same pole more often, less often or at random? Would the presence of a chromatid bridge influence disjunction?

Another difficulty which should be mentioned is the fact that deficient and duplicate-deficient chromosomes are formed following chromatid bridge breakage which may lack the A locus. This would give a higher value for the recessive class and would bias the genetic results. This is true for the tetraploid ratios as well. However, it cannot explain the different ratios obtained with the tetraploids since it acts in the other direction.

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