analyzed as a preliminary trial. Analyses have been made with material fixed in Carnoy's fluid, following the Ogur-Rosen procedure for nucleic acid extraction and estimation.

Acid soluble RNA per unit weight of fixed tissue is significantly greater in asynaptic plants than in the normal sibs. The "apparent" DNA (probably containing some acid resistant RNA) is found to be in equal amounts in both normal and asynaptic material. The amount of "histones" (Daly and Mirsky) is only slightly higher in the asynaptic material.

Besides the possible effect of histones (Ansley's finding), an excess of RNA appears detrimental to meiotic pairing in asynaptic maize plants. In view of a similar situation in ameiotic maize, it appears interesting and necessary to examine in detail as to how the situation in asynaptic plants differs from that in the ameiotic ones. Further work will be undertaken with regard to this and other biochemical aspects.

-- S. K. Sinha

3. Chemically induced chromosomal asynapsis in maize.

Paper chromatographic studies have indicated the presence of some phenolic compounds in ameiotic maize plants and their virtual absence in the normal sibs (MNL 33). In the ameiotic plants meiosis is found to be replaced by a type of mitotic division. The possibility of converting meiosis to mitosis experimentally by the administration of several phenols has been investigated.

The compounds tested were: 1) phenol, 2) resorcinol, 3) hydroquinone, 4) catechol, 5) pyrogallol. Solutions of these compounds in two different concentrations, viz. 0.01M and 0.1M, were fed into the plants through cut stems for 24 hours about a week before the initiation of meiosis in the tassels. A few plants were similarly fed with distilled water to serve as controls. All plants were heterozygous for Inversion-4a against a KYS background. Two replicate plants were taken for each concentration of a particular compound. Pollen mother cells were examined 9 days after treatment.

At the higher concentration all compounds prevented an appreciable percentage of meiocytes from undergoing any division. The nuclei appeared pycnotic. However, no mitotically dividing meiocytes were observed. On the other hand, various degrees of asynapsis of chromosomes were noted. Since no asynapsis was observed in the control plants fed with distilled water, the effect was evidently due to phenols. A maximum degree of asynapsis was found in plants treated with 0.1M phenol. Other compounds produced less extreme effects at this concentration, and still less at the lower concentration. In most cells, where asynapsis was less drastic, at least one chromosome was found to be more severely affected than the rest. In some cells this could be identified as the chromosome heterozygous for the inverted segment. Thus the synapsis of the segment heterozygous for an inversion appears more readily affected. A second feature noted in the mildly affected cells was that the segments containing knobs were more frequently asynapsed than the other regions.

However, more thorough examination is necessary before ruling out the possibility of involvement of some phenolic compounds in suppression of meiosis or its conversion to mitosis.

-- S.K. Sinha

4. Effect of RNA on meiosis in maize.

The finding that there is an excess of RNA in ameiotic plants suggested the possibility of converting meiosis to mitosis by treatment with RNA. Treatments were made as above along with necessary controls. No mitotically dividing meiocytes could be observed. However, several other interesting

effects were noted in anthers of RNA-treated plants, but not in the control ones. These were: 1) fusion of meiocytes forming plasmodial masses of varying sizes; 2) polyploid metaphase plates; 3) single cells with both hypoploid and hyperploid metaphase plates; 4) elongation of spindle; 5) precocious anaphase separation of some chromosomes, etc. These effects are similar to those found by Morgan (J. of Hered, 1956) in a monosomic plant (a member of two monozygotic twins). In both cases there might be a common basis in disturbed nucleic acid balance.

Further studies on the effect of variously induced nucleic acid imbalance on meiosis are in progress with a view to testing the hypothesis of a critical nucleic acid balance in the interconversion of meiosis and mitosis.

-- S. K. Sinha

5. Preferential pairing in trisomes, triploids, and tetraploids which are heterozygous for inversion 3a.

In the Maize News Letters (1958 and 1959) preliminary data were presented which indicated that preferential pairing was active in chromosome 3 trisomes and in tetraploids which were heterozygous for inversion 3a (3L.4 -.95). Rhoades (MNL 1957) has presented data which showed the presence of preferential pairing in triploids which were heterozygous for In 3a and In 3b. These data concerned the effect of preferential pairing on gene segregation (Rhoades 1957, Doyle 1958 and 1959) and on chromatid bridge frequency (1959). More extensive data have been collected and will be reported here. In addition, another method of detecting preferential pairing based on the trivalent frequency in control and inversion heterozygote trisomes will be discussed and data obtained by use of this method will be analyzed.

A. Gene segregation in inversion heterozygotes and corresponding controls.

CROSS	PROGENY					
TRISOME	CONTROL			INVERSION HETEROZYGOTE		
	ASh	aSh	ash	ASh	aSh	ash
ASh*/aSh/ash X ash/ash	1868 47.1%	1322 33.3%	777 19.6%	2473 44.2%	1654 29.6%	1462 26.2%
ash/ash X ASh*/aSh/ash	116 33.6%	119 34.5%	110 31.9%	847 21.7%	1530 39.4%	1518 38.9%
	A	a	A : a	A	a	A : a
a/a X A*/a/a	1843 33.6%	3644 66.4%	1 : 1.98	1481 22.1%	5234 77.9%	1 : 3.53
a/a X A*/A*/a	7473 66.8%	3722 33.2%	2.01 : 1	3092 78.6%	840 21.4%	3.68 : 1
A*/A*/a X a/a	2592 79.5%	667 20.5%	3.84 : 1	1355 90.7%	139 9.3%	9.75 : 1
A/A/a* X a/a				150 92.0%	13 8.0%	