Table I. Frequency of dicentric bridges (B) and acentric fragments (F) at anaphases I and II of F_1 plants of maize and Jutiapa teosinte.

	Anaphase I						Anaphase II based on single Cell Counts	
	0 B 0 F	1 B 1 free F	0 B 1 free F	1 B 0 F	0 B 2 F's	1 B 1 attached F	0 B	1 B
Frequency	405	53	46	3	1	1	414	1
% of total	79.5	10.4	9.0	0.6	0.2	0.2	99.8	0.2

Y. C. Ting

14. Low temperature effects on chromosomes similar to those of X-rays.

In the winter of 1959, inflorescences of nine F_1 plants of Wilbur's flint x Jutiapa teosinte and its reciprocal cross were collected and fixed with aceto-alcohol fixative in Homestead, Florida. The time of fixation of these inflorescences was about one week after frost occurring on the 24th of January, which killed a part of the winter-grown maize plants. When microsporocytes of these inflorescences were investigated with standard squash technique, synizetic knob, ubiquitous univalents, mitotic chromosomes, chromatin aggregates, precocious division, elongated spindles and micronuclei were constantly observed. These irregularities are similar to those induced by x-rays. However, when the same materials were grown in Jamaica Plain, Mass., in the summer of 1960, the above abnormalities were rarely obtained with the same technique. It seems difficult to exclude a conclusion that these irregularities are probably induced by low temperature.

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15. Cross-sterility in Chalco teosinte.

Eleven Chalco teosinte plants grown from open-pollinated seeds were employed as seed parents and crossed with our standard inbred strain of Wilbur's flint. Only four seeds were produced. The total number of receptive silks involved was estimated at 785, which

represents an 0.5 per cent of seed set. When Wilbur's flint was used as the female parent, the seed set was normal and abundant. It appears likely that the low percentage of seed set on the Chalco teosinte is due to a barrier similar to the Ga factor found in the majority of popcorn varieties and in many varieties of Mexican maize. Chalco teosinte--one of the most maize-like teosintes--has absorbed R plant coloration and pilose leaf sheaths of the predominating maize of the vicinity. These facts on cross sterility may indicate that it has also absorbed the Ga locus.

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1. Effect of natural and artificial selection on seed set of elongate-derived autotetraploids.

A major disadvantage of raw tetraploids derived from diploid species is reduced fertility. We have found that newly-established tetraploid stocks are relatively sterile. However, pronounced improvement in seed set has been encountered in synthetic varieties created by pooling the derivatives of corn belt inbreds. Doubtlessly natural and artificial selection both have contributed to the improvement since mass selection has been practiced since the inception of the experiment.

Summary of Fertility Data in Tetraploid Synthetic Varieties, 1958 - 1960

	Seed Set (%)		
Synthetic	1958	1959	1960
B	59_2	68_3	76_4
C	54_1	59_2	65_3

The subscripts indicate the number of generations the synthetic has existed as a tetraploid, i.e., the number of generations separating it from its diploid ancestors.

Individual ears have been encountered that have exceedingly high seed set, as high as 94% in fact.

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