Only recently, one 21 chromosome plant has been found which appears to be truly perennial, and has been cloned to 15 propagules. It is now producing fourth generation branches from third generation culms. It is hoped that this plant or clone, which cytogenetically undoubtedly represents the simplest form in which perennialism in Zea has yet been observed, will furnish a beginning point for definitive studies of the cytological, genetic, and biochemical basis of perennialism in Zea.

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2. Further studies of the inheritance of two interspecific traits in derivatives of maize and teosinte.

Distichy of ears and photoperiodism are two traits which are considered to be taxonomically useful in distinguishing maize from teosinte. Both of these traits have been found in maize as well as in teosinte. That photoperiodism in maize can be inherited as a monogenic trait is not doubted. The inheritance of distichy, however, has been variously reported to be monogenic and polygenic.

It is suggested that very close taxonomic affinities of the two forms would be indicated if both traits were inherited in maize and teosinte as expressions of the same loci.

The inheritance of distichy was studied in selfed backcrosses of (eight-rowed Longfellow Flint x Fla. teosinte)xLongfellow Flint. If Florida Teosinte carries a locus which can confer distichy in a 75% maize background, then 1/2 of the selfed backcross progenies should segregate 3:1 for the presumed recessive distichous trait:

Progeny No.	Distichous plants	Polystichous plants
557	0	16
558	5	8
559	10	0
560	7	8
561	11	1
562	6	7
564	5	10
565	0	3
566	6	5

It is obvious that the expression of distichy in this 75% maize background is not monogenic. Moreover, there was no evidence of the expression of the type of photoperiodism conferred by the id locus in pure maize.

In the same manner, the inheritance of photoperiodism in selfed backcrosses of (Inb. Kys x Fla. Teosinte) x Kys was studied in 11 progenies totaling 107 plants. Photoperiodism of the type found in adjacent plants of pure maize carrying the id locus was not found at all. Whereas the pure maize plants segregating for id fell into two sharply separate classes of determinant and photoperiodic-indeterminant, the maize-teosinte derivatives showed a continuous range of flowering times, none, however, as late as pure maize homozygous id/id. No distichous plants at all were found in this selfed population of 75% Kys, 25% Florida teosinte plants.

One must concede that this study has failed to reveal the existence of teosinte loci which can confer either distichy or the id type of photoperiodism in a 75% maize background as single gene expressions.

A year ago the writer reported that 3 plants of the hybrid between teosinte and Andean maize which has been reported to be homozygous id/id were indeterminant-photoperiodic in growth habit. This appeared to be true in greenhouse culture. However, the observation could not be repeated out of doors in 1962, since this hybrid flowered about a month before either pure teosinte or maize homozygous id/id. Moreover, there has been no indication of a single gene segregation for photoperiodism in selfed hybrids of the Andean maize and corn belt inbreds. Therefore, there is no evidence in these studies that the Andean maize carries the classical id/id locus.

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3. Further studies of linkage and preferential segregation in allotetraploids of Zea.

Data from a new region, gl_6 - lg_2 have been obtained from both autotetraploids and allotetraploids of Zea. Testcross data from the two types of coupling duplexes were as follows:

	..."Phenotype of Gametes"....					Constitution of Duplex tested	
	Gl_6Lg_2	Gl_6lg_2	gl_6Lg_2	gl_6lg_2	Total		
allotetraploid	1165	25	36	126	1352		
percent	86.2	1.8	2.7	9.3		Gl_6	Lg_2
autotetraploid	524	84	54	79	741	Gl_6	Lg_2
percent	70.7	11.3	7.3	10.7		gl_6	lg_2
						gl_6	lg_2