Somewhat different results were obtained from the Flint - Gourdseed varieties cross. The smooth grain of Flint is dominant over rough grain of Gourdseed. In the F_2 progeny several ears were of grades 2 to 4 (Table 3).

Table 3. Pericarp grades in the F_2 of Flint - Gourdseed cross.

Cross	Progeny pericarp grades						Total
	1	2	3	4	5	6	
Flint x Gourdseed	153	2	6	3	-	-	164

The appearance of ears with pericarp grades 5 and especially of grade 6 seemed to support our assumption that the genes for loose pericarp are not uncommon, and that the rough grain is the result of interaction of denting (genes for hard and soft starches?) and for loose pericarp.

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1. Further data on the compound nature of the tunicate locus.

In a previous News Letter (No. 34) we reported that "mutations" from Tu to tu^h were accompanied by crossing over between Su and Gl_3, genes on either side of the Tu locus. An additional population was grown in 1960 and in the three years since this experiment began a total of 10,248 plants have been classified. Of these, 5273 were tunicate and 4975 were nontunicate. The significant deficiency of nontunicate plants is probably due to the linkage of tu and su and the poorer germination of sugary seeds as compared to starchy in 1960 when poor stands were obtained.

Of the 5273 plants classified as some form of tunicate, four were definitely half tunicate. All four of these plants proved to be crossovers, two of the genotype Su gl_3 and two su Gl_3. This indicates that the "mutations" are due to crossing over within a compound locus and that the rate of crossing over is one in 1318 or .08 percent.

Three additional plants classified as possible mutations but representing the noncrossover genotype, Su Gl_3, proved upon testing to be not mutations to half tunicate but phenocopies. This evidence, though negative in nature, provides a further indication that mutations from Tu to tu^h are the product of crossing over.

These half-tunicate mutations are being introduced as rapidly as possible into isogenic stocks through repeated backcrossing to the inbred A158. Those originating from the crossover Su gl_3 represent the left hand or l (levo-) component of the compound tunicate locus and those from the crossover su Gl_3, the right hand or d (dextro-) component. If these two components prove to be identical then it is probable that the tunicate locus is one which has originated during domestication and in this case the wild locus probably was tu^h. If the two components prove to be different then the following two possibilities must be considered. (a) The wild locus is Tu since it seems highly improbable that the two components have become differentiated during only a few thousand generations of evolution under domestication. (b) There are two wild loci, tu^h-l and tu^h-d, each characteristic of a distinct wild race of maize. During domestication these two loci have been brought together on the same chromosome to produce the present Tu locus.

In two stocks which are now five eighths A158 the two components are consistently slightly different. The genotype containing the l component having slightly longer, more hairy pistillate glumes than the genotype containing the d component. The differences may, however, be due not to the components themselves but to other genes on the same chromosomes and they may disappear as additional backcrosses make the stocks more nearly isogenic.

In any case it now appears certain that wild corn was a form of pod corn either tunicate or half tunicate. If the latter, it is possible that there were two slightly different forms of half tunicate.

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2. The behavior of pod corn in a simulated wild habitat.

In a recent paper "Reconstructing the Ancestor of Corn" it was shown that by combining the primitive characteristics of pod corn and popcorn it was possible to produce a corn bearing part of its seeds in the tassel and the remainder in one or more small ears arising from the higher nodes of the stalk and having only a few husks which open at maturity allowing the seeds to be dispersed. It was assumed that this corn represented a genetic reconstruction of the ancestral form and an accompanying drawing showed how this ancestral form might have grown in several different environments including a poor site in nature in competition with other vegetation. Under these conditions it was assumed that it would produce no ears but would have an unbranched terminal inflorescence with staminate spikelets borne above and pistillate spikelets below on the same unbranched spike.