between maize and teosinte. Thus, it appears that mutations in both directions--from recessive to dominant as well as from dominant to recessive states--and at more than 4 loci, would be required to transform teosinte into a primitive maize-like plant with respect only to the first 4 of these items. Also, the mutation frequencies observed by L. J. Stadler for dominant to recessive endosperm characters, ranging from about 1:150,000 to 1:2,000,000 or more, might be much less frequent for the loci under consideration since at some of these loci reverse mutations from recessive to dominant would be required and all would involve reproductive structures which have been shown by the archeological record of the past 7,000 years not to have changed significantly during that time. However, after having accumulated the required mutations it could be assumed that teosinte would have a bright future as an important food plant.

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1. Non-liguleless liguleless-1.

A narrow-based Cuzco flour corn synthetic was found to be segregating for upright leaves as a discrete phenotypic class. Plants having the extreme upright leaves were sib pollinated and outcrossed to 26 standard inbred lines. The sibbed progeny was uniformly extreme upright-leaved, and have bred true for this phenotype in two further successive generations. The 26 F_1's involving standard inbred lines were each backcrossed to the respective inbred parent, and then selfed once. The combined BC_1I_1 populations segregated cleanly in the 7:1 ratio expected if the trait were monogenically inherited. In all 26 backgrounds, the gene was clearly expressed and always produced the extremely upright leaf condition. Development of the ligule was normal or nearly normal in all inbred backgrounds.

BC_1I_1 segregates were outcrossed to $\underline{lg_1}$ and $\underline{lg_2}$ synthetics as a test for allelism. Progeny of the $\underline{lg_2}$ outcross was all normal. Progeny of the $\underline{lg_1}$ outcross all had extremely upright leaves and normal ligules. We propose the nomenclature for this new allele of $\underline{lg_1}$ to be "$\underline{lg_1}^u$", the "u" superscript designating "upright leaves." It is interesting to note that if $\underline{lg_1}^u$ had been the first allele to be described at this locus, it might have been named "$\underline{ul}$" instead of "$\underline{lg_1}$".

D. L. Shaver
Dennis Chamberlain

2. Tp fails to replace pe in the expression of perennialism in 2n maize.

Shaver (J. Hered. 58:271-273, 1967) showed that perennial 2n maize could be produced on the basis of a simple genetic change involving only the three genes id, gt, and pe. However, the evidence for the existence of pe as a single gene was only circumstantial. Upon attempting to transfer this locus to diploid maize singly, he succeeded only once in identifying a clear phenotype that could be ascribed to the presumed gene, when there was a clear segregation in the inbred line backgrounds, K55W and K64W, for the pe phenotype: Ear branches were replaced by a semi-vegetative branch, plants had a slightly slower growth rate, but later achieved a somewhat greater height. In following years, further evidence for pe was obtained in experiments wherein perennial plants were obtained only from crosses involving stocks having the presumed pe gene, with stocks having gt and id.

Dr. L. M. Josephson furnished a stock of "Potch Teopod" which, besides having the extreme tillering phenotype, has the ear on the main culm replaced by a semi-vegetative branch, similar to the once-observed effect of pe in K55 and K64. However, upon attempting to produce perennial diploids of the genetic constitution, gt/gt id/id tp/tp, none was found to be perennial.

D. L. Shaver