The Chuspillo seed was stored in a small screw cap bottle under constant refrigeration below 40°F. It is part of a collection of about 1900 items from Latin America collected chiefly in the period from 1940 to 1950 and stored at Harvard University until June 1968 and since then at the University of Massachusetts in Waltham.

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2. The morphological nature of "string-cob" corn.

In my previous study of the inheritance of the string cob trait in which the cob has about the same diameter as the central spike of the tassel, segregation in one background revealed control by two incompletely dominant genes (Mass. Agric. Exper. Sta. Bull. 577). Correlations of condensation in the tassel and kernel row number with cob diameter indicated that one of the dominant factors was the normal allele to a recessive gene for fasciation.

In the present studies, the effects of this dominant allele involved in the string cob trait have been identified as also including narrow cupules. In the recessive condition, wide cupules become associated with fasciation or sometimes a branching of the cob when the requirements for cupule space cramped by high row numbers (via condensation and ramosa) require an increase in surface area.

The second component of the string cob trait is now recognized as one for reduced pedicels (foot stalks). The pedicel is that portion of the spikelet axis beneath the glumes and the rachilla is above the glumes. In a thick cob, an elongate pedicel is embedded in the floor of the cupule where it is commonly identified in error as the spikelet trace.

In the tassel, only one member of the pair of spikelets is usually pedicellate. In the thick cob of Corn Belt corn usually both members of the pair are pedicellate although pedicels are fused into the cupule floor. All combinations of pedicellate and sessile spikelets in the ear have been identified in variant forms.

The reduction of pedicels appears to involve the interaction of two complementary genes, thus increasing to three the number of genes

involved in the string cob trait. When the area of pith is expanded, as in inbred C13, the inheritance is further complicated.

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3. Relationship between pedicel length and cob diameter and its inheritance.

The direct control of pedicel length over cob diameter has been proven beyond any doubt in these studies (Table 1). The pedicel has not been recognized previously as a morphological factor of importance in cob structure. Rather the length of rachilla or spikelet stalk above the glumes has been measured with little or no apparent significance such as in the series of monographs on the races of maize in Latin America. The pedicel or foot stalk below the glume has been overlooked because it was erroneously considered as a spikelet trace or a part of the vascular system of the cob rather than a stalk fused within the floor of the cupule, as is now apparent.

When cob diameter is plotted against pedicel length the shape of the curve is slightly sigmoid. At the low end of the curve, the slope is gradual because the pedicel length is small in relation to pith diameter. At the high end of the curve, the slope tapers off once again, as growth factors limit the pedicel's capacity for elongation.

The short pedicels of string-cob maize and presumably of teosinte as well are determined by the interaction of two incompletely dominant genes, as indicated by a highly significant fit of an F_2 segregation of string cob X Corn Belt dent to a 9:7 ratio (Table 2). The F_1 hybrid is intermediate in pedicel length between its parents. Recovery of the string cob phenotype depends upon the homozygous recessive condition at either one of two loci. There is a clear cut separation between the means by over three standard deviations (Table 2).