involved in the string cob trait. When the area of pith is expanded, as in inbred Cl3, the inheritance is further complicated.

W. C. Galinat

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).

Table 1

Correlation of pedicel length to cob diameter in an F_2 population
of cobs with a relatively constant pith diameter

Cob Diameter* (mm, .0 to .9)	n Diams.	Pedicel Length** (Mean)	Standard Deviation
10	4	1.15	.38
11	8	1.75	.35
12	24	1.62	.61
13	19	1.77	.42
14	31	1.60	.54
15	59	1.78	.60
16	68	1.95	.54
17	69	1.90	.53
18	85	2.10	.57
19	78	2.06	.56
20	79	2.33	.62
21	80	2.44	.60
22	79	2.79	.64
23	75	3.00	.80
24	80	3.32	.65
25	108	3.50	.56
26	103	3.60	.70
27	129	3.85	.75
28	99	4.30	.61
29	63	4.20	.58
30	54	4.17	.64
31	28	4.38	.69
32	13	4.09	.69
33	7	4.60	.31

*Measured to kernel attachment.

**Measured to divergence point of lower glume.

Correlation Coefficient (r) = .94 at 23 d.f., 5% level = .396 and
1% level = .505. Since .94 is greater the correlation is highly signifi-
cant.

Table 2

Inheritance of pedicel length in an F_2 of string cob X Corn Belt dent.

Observed	Theoretical on a 9:7	Pedicel Length Mean (mm)	Standard Deviation
786	841	3.9	.6
710	654	2.0	.5

chi sq = 8.38

1 d.f. at 1% level = 6.64

Therefore the fit to a 9:7 ratio is highly significant.

W. C. Galinat
P. J. Eugene

4. **On the possible assemblage of a synthetic teosinte.**

The following mutant genes and variants involving the maize cob are being recombined to produce a synthetic teosinte.

1. pd: single female spikelets, a mutant discovered by Hepperly (1949) and others.

2. tr: two ranked (distichous); although most mutants are unstable, rare stable forms were discovered by Tavcar (1935), Lindstrom (in Burdick, 1951) and myself (unpub.).

3. Sg: string cob (reduced pedicels), extracted from Confite Morocho (Galinat, 1969).

4. is: cupulate interspace, extracted from Coroico (Galinat, unpub.).

5. chr 4 complex: inclination of spikelets toward cupule, induration of the outer glume and development of an abscission layer. The extraction of this complex from Maiz Amargo or Enano, both of South America, may be critical. However, its components may be discovered and isolated individually. For example, the sweet corn inbred W400 out of the variety Buttercup has weak abscission layers in the rachis.

Other teosinte-like mutations, tsb (teosinte branched), nl (narrow leaf) and id (short-day response), are not considered as essential in