of a first generation hybrid between ordinary maize and the type of teosinte shown in figure 6. The resemblance between this figure and figures 1-5 is at once suggestive. There seems to be little room for doubt that the breeding stock used by both Burbank and Toledo was already as much corn as teosinte, and that both have simply selected out the characteristics of corn possessed by the hybrid.

That both did change the nature of the stock used is not to be doubted. But, on the basis of the figures cited, it is the writer's opinion that the probable impurity of the original stock and its possible contamination with corn during the experiment are sufficient to invalidate any conclusions that may be drawn from the experiment as to the ancestry of Indian corn.

NOTES ON GRASSES—II.

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The following are preliminary reports on two investigations, full details of which will later be published elsewhere.

Carpellody in maize.—The experimental inbreeding of maize has brought to light many latent characteristics not ordinarily connected with the plant in general botanical conception. One series of these occur in the form of various imperfections of the grain, either the endosperm or the embryo being poorly developed. Most, if not all, of these are inherited as Mendelian recessive *seed* characters. Another type of imperfect grain, however, similar to these in appearance, is inherited as a recessive *plant* character. It may occur in a few or many of the spikelets of the ear.[1]

This anomaly has been found to constitute a case of pistillody, or probably more accurately, *carpellody*. One, two, or all three of the rudimentary stamens in the functional pistillate flower are metamorphosed into the resemblance of pistils. The style and stigma of these are much like those of the normal pistil in appearance and in detailed structure. The ovarian portion, however, has no true ovarian cavity, and no ovule.

The metamorphosis of the androecium is evident in early stages of development of the flower, but the full development of the supernumerary structures is dependent upon fecundation in the normal ovary, around whose base they are attached.

A comparison of these carpellodia with normal pistils gives a basis for interesting speculation as to the morphology of the latter.

Many-flowered spikelets in maize.—The normal spikelet of maize has a typical two-flowered structure, and the full complement of bracts. The upper of these two flowers is the more advanced in development. Suppression of the gynoecium of flowers of the tassel during develop-

[1] Seeds of two strains showing this character were sent to the writer by P. C. Mangelsdorf, of the Connecticut Agricultural Experiment Station.

ment leaves these staminate; suppression of the entire lower flower, and the androecium of the upper flower, of the ear spikelet reduces it to a one-flowered pistillate structure.

A variation, supposed to be hereditary, has been found, in which some spikelets of the tassel have assumed the indeterminate form, the lower flower being more advanced in development, and the number of flowers being increased to three or often many more. This is accompanied by a change in sex, the pistils instead of the stamens being functional.

In extreme cases the rachilla of the spikelet has continued to develop until it is similar to the cob of an ear. This structure itself often bears two or four rows of pairs of spikelets, the whole having the character of a small four- or eight-rowed ear. The homology between this structure and a normal spikelet is seen in the empty glumes at the base, and in its constant association with a normal or slightly metamorphosed staminate spikelet.