6. Male sterility involving KYS.

In an attempt to obtain better cytological figures, asynaptic plants were crossed as female with KYS pollen parents. The $F_1$ plants were backcrossed to KYS. The progeny unexpectedly segregated 198 normal plants and 83 male steriles. The latter produced normally filled ears. This ratio approaches the 5 N: 3 MS expected if the male sterile condition is determined by a dominant male sterile gene Ms and a recessive s which permits expression of Ms. When male sterile plants were backcrossed by KYS, a ratio of 79 N: 61 MS was found. A ratio of 1:1 is expected on the above hypothesis. These results resemble those of Schwartz reported in Genetics 1951. He found a male sterile condition which was dependent on a dominant Ms gene, a recessive s and a specific cytoplasm. The dominant S acts as a suppressor of male sterility and is closely associated with a gamete factor so that in plants of S/s constitution, only S pollen functions. As a result no male steriles are recovered in a self pollination of Ms ms S s plants. In the present case one self pollinated plant from the original backcross population gave 53 N: 15 as: 19 MS: 8 MS as. If the S factor is the same as that reported by Schwartz, it has lost its gametophyte effect. Whether or not a "male sterile" cytoplasm is involved is not yet known.

In the 1955 maize Newsletter, Burnham reported an almost identical case in which male steriles were unexpectedly found in a backcross to KYS. The male sterile phenotype showed linkage with a translocation involving chromosomes 6 and 9. Data obtained from the self pollination mentioned above show independence of male sterility and sh on chromosome 9. One of the factors (Ms or s) may be located on chromosome 6.