A SOMATIC VARIATION IN THE SWEET PEA.

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(With Plates V and VI.)

The purpose of this note is to record a bud variation in the sweet pea in which the mutant branch was altered from the recessive to the dominant condition.

The occurrence of somatic variation is widespread among plants. Chittenden (1927) gives many examples of this phenomenon in his monograph on genetic segregation.

It will be noticed that in the vast majority of recorded cases the "sport" has been from the dominant to the recessive condition. Usually, but not always, the mutant tissue differs from the remainder of the plant by one genetic factor only.

The recorded occurrences of dominant bud sports are very rare. The nectarine has been known to sport sections of peach and a red currant has sported white sectors. Other cases, for example the mutation of speltoid wheats to normal, may be explained on the basis of chromosomal abnormality (Huskins, 1928).

Blakeslee (1920) described an ever-sporting race of *Portulaca grandiflora* in which the recessive dwarf form frequently gave rise to branches of the dominant tall form. He supposed that somatic mutations to the dominant took place, giving rise to heterozygous shoots. Chittenden, however, suggests a chromosomal hypothesis to account for this behaviour.

"Cupid" varieties of sweet peas differ from normal varieties in having a dwarf habit, due to very short internodes; they have short flower-stalks and foliage of a darker shade of green. The Cupid condition was shown by Bateson, Saunders and Punnett (1905) and later by Punnett (1925) to be due to the action of a simple Mendelian recessive factor.

Several hundred Cupid plants were grown at Merton in 1931 from seed supplied by Messrs Vilmorin. At a stage in the development of the plants when the majority of the secondary shoots had started into growth, an abnormally vigorous shoot was observed on one plant (in a plot of a white-flowered variety). This shoot developed the characteristics of a normal tall plant and as far as visible characters were concerned, differed

from the Cupid portion of the plant by one genetic factor only, namely that for tallness (see Plate VI).

White flowers were produced on both portions of the plant, but unfortunately, owing to the susceptibility of Cupid plants to bud shedding, no seed was set on the Cupid part of the plant, indeed little or no seed was set on any Cupid grown in the open. Attempts were made to propagate both portions of the plant by cuttings, but without success. The tall branch, however, set 114 seeds, which owing to the season were very poorly developed. Of these only 10 germinated and gave 6 tall and 4 Cupid plants, showing that the mutant branch was heterozygous for the Cupid factor.

This indicates that a somatic mutation to the dominant condition must have occurred in one of the two chromosomes carrying the Cupid factor. If the plant had occurred in a family segregating for tall and Cupid the opposite might have been thought to be the explanation, namely that a heterozygous plant had sported a branch of Cupid. Since the plant was one of nearly a thousand Cupids, the chance of one plant being heterozygous for tall *and* sporting a Cupid branch is too remote for consideration.

Further breeding and a cytological examination will be undertaken, but at present it appears that a dominant somatic mutation must have taken place.

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EXPLANATION OF PLATES V AND VI.

From photographs taken by Mr H. C. Osterstock.

PLATE V. An early stage in the development of the mutant shoot.

PLATE VI. A later stage in development.