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1. Alleles at the vp-9 locus.

Viviparous-nine is a white-albino mutant (white endosperm-albino seedling) that has been placed on chromosome 7 eleven units to the left of gl-1. This mutant is very strongly viviparous, with only an occasionally dormant seed observed. As was indicated last year, positive allele tests based on single segregating F₁ ears were obtained in crosses between pas₄₈₈₉ (a white endosperm, pale green seedling mutant) and w₈₆₅₇ (a yellow endosperm, albino seedling mutant) and between pas₄₈₈₉ and vp₉. This year, numerous crosses involving these three mutants confirmed the allelism of pas₄₈₈₉ and vp-9 but failed to confirm that of the pas₄₈₈₉ and w₈₆₅₇, nor did w₈₆₅₇ prove to be allelic to vp₉.

Last spring, several of the white-albino mutants grown under dim light were analyzed for the accumulation of beta-carotene, zeta-carotene, phytofluene and phytoene. In these tests, it was found that vp₉ and its pas₄₈₈₉ allele accumulate zeta-carotene and phytoene. A mutant contributed by Dr. Brawn (w_{Brawn #2}), which we had not been able to place and for which no alleles had been found, accumulated the same two carotenoid precursors as vp₉ and in the same relative amounts. Extensive allele tests between these two mutants this past summer have established that they are alleles.

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2. The relationship between the accumulation of carotenoid precursors and vivipary in the white-albino mutants.

The white-albino mutants can be divided into at least two groups: 1) those that have a tendency to germinate prematurely, and 2) those that very rarely if ever germinate prematurely. It has been shown by using A-B translocations (Robertson, Proc. Nat. Acad. Sci. 38: 580-583, 1952) that this tendency to germinate prematurely is independent of the genotype of the endosperm and depends on the genotype of the embryo. Thus, vivipary must be the result of changes in the embryo.

As has been indicated above, several of the white-albino mutants including both viviparous and non-viviparous types have been analyzed for the accumulation of the carotenoid precursors, zeta-carotene, phytofluene, and phytoene. The non-viviparous mutants, lw₁, lw₂, w₇₇₄₈, and cl₁ have very little or none of these compounds. However,