1. Instability at $A_2$ and $C_1$.

In tests to uncover instability at the $A_2$ and $C_1$ loci, twenty-two newly induced and independent changes have been confirmed in a population of over 10 million gametes. These unstable loci representing a wide spectrum of states (time and frequency of the mutation event) were found in $a_{m}$ lines containing the $E_m$ system and will be tested to: (1) identify the controlling element system involved, (2) determine the state of each, and (3) compare the state induced with the state of the original $a_{1}$ mutable. Although there are differences in states between lines (resulting in identifiable patterns), the patterns of mutants isolated within lines are strikingly uniform. This suggests that the transposable element is the determinant for the pattern phenotype.

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2. Phase variation of regulatory elements.

Two particular phenotypes represented by reciprocal patterns of mutability in the aleurone are due to the modification of activity of the regulatory elements ($E_m$, $E_n$) governing mutability at the $a_{1}$ locus. The one, $E_n$ (flow), is active at the base of the kernel but inactive at the crown, while the other, $E_n$ (crown), is active at the crown of the kernel but inactive at the base. Mutability is found only where $E_n$ is active. It is hypothesized that here the regulatory elements "switch on" and "switch off" (phase variation) during development of the endosperm.

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3. Linkage and control of mutability of $w_{13}^m$ - a white seedling mutable.

A white mutable seedling, $w_{13}^m$, was found among the progeny of some $P_{m}$ lines. The states of $w_{13}^m$ mutability, like those of $P_{m}$, vary from very early to very late. Stable forms have been isolated. $w_{13}^m$ is located on chromosome 3, 28-30 units from $a_{1}$ and near $l_{2}$. Its exact location with reference to $l_{2}$ is under investigation.

In order to determine whether the mutability of $w_{13}^m$ is related to the $E_m$ system, crosses were made with the $E_n$ tester - $a_{m(r')} / a_{1} sh$ x $w_{13}^m$. From the cross, $a_{1} m(r') / a_{1} sh$ x $w_{13}^m$