		F_1 [redacted] and tested on a^{mI}**		On testcross to a^{mI}**	
		Gave a-mutable		Did not give a-mutable	
		In progeny of [redacted]		In progeny of [redacted]	
1958	Total No. of ears	segregates pg^m & pg^s	segregates only pg^s	segregates pg^m & pg^s	segregates only pg^s
1370	8	4	0	0	4
1371	4	1	0	0	3
1372	3	2	1****	0	0
1373	12	8	0	0	4
		15	1	0	11

** a^{mI} is mutable only in the presence of En
*** this a responds to Dt and not to En
**** only exception to correspondence of En causing pg^s to be mutable and a^{mI} to be mutable. In all other cases, the occurrence of pg^m is correlated with a-mutability.

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2. Other factors associated with a-mutable.

Dense factor

Among the tested progeny of one a^m allele, two very distinct pattern types were observed: very dense mutable (almost full color) and fine mutable (like Dotted). The following sample data represents some of the typical segregations of the two phenotypes.

The Cross: a^m Sh/a sh x a sh/a sh
(Dense) x colorless shrunken

1957 non-shrunken kernels

	mutable	
	very dense	fine
410-30 x a sh	93*	89**
31B-1 x a sh	44	52
410-4 [redacted]	117	49
410-14 [redacted]	168	42
410-31 x a sh***	76	39

* On further tests, Dense gives rise to 1/2 dense : 1/2 fine.
** On further tests, fine mutable gives rise only to fine.
*** These off-ratios have not as yet been analyzed.

It is evident that the two phenotypes are due to the segregation of a factor, designated "D", in whose presence, a dense pattern results; in its absence, the pattern is fine. "D" can be lost in somatic tissue since large sectors of the 2 pattern types occur on the ear as well as on the kernels. "D" is not an added dosage of activator (En) since in the case of a^{mI} with D, but without En, the kernels are not mutable.

Pale allele

In one family of dense type mutable ('57 262) 13/41 of the testcross ears (a^m/a sh x a sh/a sh) were segregating Dense purple : Dense pale in various ratios, some of the ratios being 1/2 : 1/2. Subsequent tests have shown that there is a factor P that determines purple; in its absence, the kernel is pale-mutable. The relation of the purple factor (P) to Dense factor (D) has not been determined.

In summary, the a-mutable has the following components:

a^m = autonomously mutable - many patterns from dense to very fine; mutates from colorless to colored.

a^{mI} = stable or colorless in the absence of controller of mutability - En; mutable in its presence.

En = independent controller of mutability, arises from position at the a locus; similar to En of pg-mutable.

D = Independent Dense factor causes the fine type, autonomous or independent mutable to be very dense; is lost somatically and arises somatically; its presence causes the fine pattern to be earlier and higher in frequency of mutability.

P = Purple factor causes a basic pale to become purple; arose in purple stocks.

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3. The number of cell divisions in the growing seedling leaves.

Coincident with a study of temperature effect on mutation rate of pg^m (Jour. of Heredity 49: 121) it was shown that cell divisions occur in the leaf blade during the germination process and that more occur in the younger leaves than in the older ones. It is estimated that 15, 31 and 47 new cells arise between the time of germination and time of counting (when 3rd leaf is 15 cm long) in the 1st, 2nd and 3rd leaf, respectively.

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