did any one else, so far as we know, except J. E. McClary (Proc. Nat. Acad. Sci. 1940), and our attempts to repeat his work failed. However, a statement of his, "root tips often become abnormal and cease to grow, ...if they are allowed to penetrate the agar,...", set us on a course that promises success. There seem to be two important phases of the problem, viz., the composition of the medium and the physical nature of the substrate.

Composition--Our best medium, to date, has been Shive's "best" solution (Curtis & Clark--Introduction to Plant Phys. 1950, p. 384), plus 1% agar, 5% dextrose, 0.05% yeast extract, 30 ppm glycine and 5 ppm nicotinic acid.

Substrate--Our own early work corroborated McClary's quoted statement. Consequently, we sought a means of keeping the roots on the surface. Thus far, the best substrate has been a thin layer of the agar medium (15 ml in a 10 cm Petri dish) with an S-shaped piece of #20 wire imbedded in it and a $3\frac{1}{2}$" Blue Streak coffee filter on top. Aluminum wire has been used because of its cheapness, although growth seems to be a little better when platinum wire is used. The wire is simply a support for the coffee filter during sterilization, and can be dispensed with if three filter disks are used instead of one.

Using the best substrate and the best medium (but without nicotinic acid), with a single cross hybrid, Io B8 x NY H1, at a temperature of ca. 20°C, we have managed, with difficulty, to keep one set of roots growing for 17 subcultures covering a period of a little over 6 months. Only time and more experiments will tell whether the addition of nicotinic acid improves the solution sufficiently to extend the time of culture indefinitely.

Curiosity tempted us to a premature comparison of inbred and hybrid roots, with these results: Io B8--ca. 3 mm per day, slender; NY H1--ca. $4\frac{1}{4}$ mm per day, plump; Io B8 x NY H1--6 3/4 mm per day, medium thickness (6 subcultures).

A satisfying study of heterosis in excised corn roots must wait until it is possible to culture such roots for an indefinite period of time.

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1. Transmissibility of light endosperm phenotypes during progressive conversion of R-locus expression.

Many weakly pigmented phenotypes are observed on ears of $\underline{R}\underline{R}^{st}$ heterozygotes where the $\underline{R}$ allele has been kept heterozygous with $\underline{R}^{st}$ for several generations. The number of such weakly pigmented kernels increases with the number of generations that $\underline{R}$ has been heterozygous with $\underline{R}^{st}$. Since

the frequency of light phenotypes increases with each generation, that is, the penetrance of R decreases, it is of interest to know if selection may account for the altered incidence of R expression in the aleurone tissue.

Homozygous RR plants (represented as R^6R^6) from inbred W22 background were isolated after six generations with R^{st}. The lightest and darkest kernels were selected from the R^6R^6 ears to be planted out for testing. Some plants of each class were self pollinated to give $R^6R^6R^6$ endosperm phenotypes; an equal number of plants were pollinated with r^gr^g to give the $R^6R^6r^g$ phenotype. This mating plan made it possible to score aleurone pigment where two and three R^6 alleles were present. The scores reported are ear means based on sets of 50 kernels from each ear where each kernel was scored against a set of standard kernels ranging from colorless (zero) to a fully pigmented class (score of 22).

Table 1 summarizes the ear means of the two selected classes of kernels. Less than half a class interval now separates the two groups whose scores in the previous generation were separated by scores of ten or more intervals on our scoring standard. Another result which can be seen in the table is that no difference is evident between $R^6R^6r^g$ and the $R^6R^6R^6$ expressions. It is concluded that the initial difference upon which selection was based cannot be selected for. It would appear that it is the penetrance conditions which are being progressively altered from one generation to the next as R is maintained with R^{st}. The aleurone scores can be thought of as measures of penetrance for the R locus.

Table 1
Comparison of Selected Light and Dark Endosperm Phenotypes After R Has Been Heterozygous with R^{st} for Six Generations

	Self-color selection	Light selection	Self-color selection	Light selection
	$R^6R^6R^6$	$R^6R^6R^6$	$R^6R^6r^g$	$R^6R^6r^g$
	19.73	18.86	18.46	19.52
	18.64	20.40	19.88	19.00
	19.66	18.55	18.84	18.82
	19.18	20.64	19.08	20.18
	18.32	20.02	18.00	19.68
	19.70	18.46	20.30	19.06
	19.76	17.18	21.16	16.70
	18.96		19.72	17.49
	20.02		20.66	21.28
	20.02		18.22	18.74
	19.10		20.60	19.44
				20.16
pooled $\bar{X}$	19.37	19.16	19.54	19.17

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