

translocations involving chromosome 1. The cytological designations are those given by Anderson and Longley in the 1956 Maize Genetics Co-op. News Letter.

Trans- location	Total indiv.	Cytological determination	% c.o. with P
1-2b	767	1S.43 2S.36	5.0
1-2c	384	1S.77 2L.33	33.9
1-2d	822	1S.78 2L.56	20.9
1-3a	839	1S.19 3L.14	10.1
1-3d	235	1L.67 3S.81	11.1
1-3i	152	1L.68 3S.30	39.5
1-4a	248	1L.51 4S.69	41.5
1-4b	2103	1S.55 4L.83	7.3
1-4h	460	1S.94 4L.52	35.9
1-5b	6150	1S.17 5L.10	21.8
1-5i	7248	1S.71 5S.74	17.2
1-6c	649	1S.25 6L.27	7.7
1-8b	1209	1L.59 8L.82	45.3
1-10g	859	1S.80 10L.21	19.1

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3. The neutral effect of a heterochromatic knob on variegated pericarp.

A variegated pericarp stock was crossed to a strain heterozygous for a large heterochromatic knob (K) closely linked with R on chromosome 10, as shown below. (The knobbed stock was obtained from M. M. Rhoades.)

$$\underline{p}^{\underline{v}\underline{v}\underline{p}\underline{v}\underline{v}} \underline{r}\underline{k}/\underline{r}\underline{k} \times \underline{p}^{\underline{w}\underline{w}\underline{p}\underline{w}\underline{w}} \underline{R}\underline{K}/\underline{r}\underline{k} \longrightarrow \begin{cases} \underline{p}^{\underline{v}\underline{v}\underline{p}\underline{w}\underline{w}} \underline{R}\underline{K}/\underline{r}\underline{k} & \text{(purple, knobbed)} \\ \underline{p}^{\underline{v}\underline{v}\underline{p}\underline{w}\underline{w}} \underline{r}\underline{k}/\underline{r}\underline{k} & \text{(colorless, no knob)} \end{cases}$$

The plants reared from the kernels with colored aleurone were hand pollinated with II pollen to inhibit aleurone pigmentation in order to facilitate scoring for variegated pericarp, and the colorless kernels were allowed to open pollinate.

The pattern of variegation on the two classes of ears was then compared. The ears were lined up side by side and examined for any gross differences in the variegation pattern. A detailed examination of individual kernels was not made. There were 83 variegated ears carrying

knobbed chromosome 10 and 106 not carrying it. No difference in variegated pericarp pattern was observed. It would appear that either the heterochromatic knob does not have an effect on variegated pericarp, or that the effect is too small to be resolved by the technique used.

R. Bruce Ashman

4. Directed and specific genetic changes in an R^F allele occurring regularly in certain heterozygotes.

An R^F allele which has been in the writer's cultures for several years without showing any other unusual property has been found recently to change regularly and specifically to forms with decreased aleurone pigment-producing action in heterozygotes with stippled (R^{st}), light stippled (R^{stL})--a mutant from R^{st} , and marbled (R^{mb}). The changes in the case of R^{st} and R^{stL} have been shown to be heritable; that with R^{mb} remains to be tested in this respect. More or less marked reversion of the respective modified R^F 's toward the standard level of R^F pigment-producing action occurs in homozygous $R^F R^F$ plants extracted by selfing the three kinds of heterozygotes. In heterozygotes with certain r^F alleles, on the other hand, a modified R^F appears either not to revert, or to revert less rapidly and regularly.

The various R alleles in question had been incorporated previously into inbred W22, and so were on a uniform and relatively homozygous background when tested. The various endosperm phenotypes were scored in the Rrr form following testcrosses to two other inbred lines, 4Co63 ($r^F r^F$) and W23 ($r^F r^F$). A predetermined aleurone area on each kernel, approximately 12 mm², was scanned for pigmentation under a binocular microscope at 27X magnification, using a 20 x 20 reticule.

The initial body of experimental data, based on testcrosses on the 4Co63 $r^F r^F$ line, are summarized in the accompanying chart. The symbol R' is used to designate the modified form of R^F arising in $R^F R^{st}$ heterozygotes.

The results presented in the chart, supplemented by those from more recent experiments, may be summarized as follows:

1. All the R^F male gametes formed by $R^F R^{st}$ plants are changed to the R' form, which gives lightly mottled, rather than standard darkly mottled, kernels in testcrosses on $r^F r^F$.
2. The R' condition subsequently is transmitted by $R' r^F$ ♂♂ through the sporophyte, and reappears in the succeeding generation. It is now known that this holds for a second generation of $R' r$ plants also. R' is transmitted through the ♀ gametophyte also.