female gametogenesis. Cytological observations of microsporocytes in plants with (4,4,B^4) genotype, show homologous pairing at pachytene, in the region of the short arm of chromosome 4, between the chromosome 4 and the B^4, in the typical way of trivalents, and also non-homologous pairing in the same region. The B^4 may undergo partial or complete autosyndesis. During diakinesis the B^4 is often observed close to a bivalent, presumably the chromosome 4. At metaphase I the univalent B^4 is outside the equatorial plate in about 30% of the cells, while at metaphase II the B^4 shows the same behavior in about 20% of the cells. During anaphase I the univalent B^4 undergoes division in about 30% of the cells, but often at late anaphase or at beginning telophase. Both telophase I and II show micronuclei. These micronuclei at telophase I are presumably the result of lagging of the univalent B^4. Those observed at telophase II are thought to derive from the B^4 that divided at the previous division.

The (4,4,B^4) plants, once selfed, yielded kernels of the following constitution (observations were made on the plants obtained from them):

Genotypes	Expected ratio	Observed frequencies	Expected frequencies	Observed ratio
4,4	1	67	22	1
4,4,B^4	2	21	44	0.3
4,4,B^4,B^4	1	0	22	0
Total		88	88	

These data indicate that: (1)The (4,4,B^4,B^4) class, expected in ¼ of the progeny, was not found. (2) The (4,4) class largely exceeded the expected ½.

These observations suggest that: (1) Meiosis is an obstacle for the transmission of the B^4 in the normal genotypes examined. (2) Presumably the few pollen grains carrying the B^4 that escaped the meiotic barrier are then selected against, when in competition with normal pollen grains.

A. Ghidoni

3. The "smoky" derivative of R^{st}.

In the 1965 News Letter it was reported that following introduction of Mp into an R^{st} stock, several ears were observed carrying kernels with abnormal spotting patterns among the

standard stippled kernels. One of them has a very fine spotting pattern and has been called "smoky," symbolized $\underline{R}^{st}$ (sky).

Chromatographic comparison of pigment extracts of homozygous $\underline{R}^{st}/\underline{R}^{st}$ and $\underline{R}^{st}(sky)/\underline{R}^{st}(sky)$ seeds does not disclose any qualitative difference between their anthocyanin content. The smoky derivatives are strongly paramutagenic.

When $\underline{R}^{st}(sky)/\underline{r}^{g}$ is crossed with $\underline{r}^{g}/\underline{r}^{g}$, some of the resulting ears show, besides the expected colorless kernels (genotypically $\underline{r}^{g}/\underline{r}^{g}$) two kinds of smoky, darker and lighter, often in equal frequency. While the former breed true in successive generations, the lighter segregate again, when crossed with $\underline{r}^{g}/\underline{r}^{g}$, for darker and lighter smoky, in a ratio of 1:1.

Similar results seem to indicate that the lighter smoky phenotype results from the interaction of $\underline{R}^{st}(sky)$ with a Modifier of the smoky expression that assorts independently of $\underline{R}^{st}(sky)$.

Giuseppe Gavazzi

4. Chromatographic and spectrometric analysis of root and seed pigments.

Pigments are extracted from roots and seeds of a W22 $\underline{A}_1$. $\underline{A}_2$, $\underline{C}_1$, $\underline{C}_2$, Pr, R stock carrying one of the following $\underline{R}$ combinations: $\underline{R}^{st}/\underline{R}^{r}$, $\underline{r}^{g}/\underline{R}^{r}$, $\underline{r}^{g}/\underline{R}^{r}$.

The extracting solvent used is a 0.1% concentrated hydrochloric acid in 95% ethanol (v/v) solution. The pigment extracts are concentrated under vacuum and then chromatographed with the ascending method on Whatman paper #1. Two solvent systems have been used:
(1) n-butanol, acetic acid, water (4:1:5)
(2) ethyl acetate, t-butanol, acetic acid, water (3:4:1:3).
Both seed and root extracts are separated into three red bands that turn blue when exposed to ammonia vapours. They represent three different anthocyanins. An additional yellow component appears in chromatograms of root extracts.

The absorbance spectra of the four components chromatographically separated are then determined spectrometrically. In Table 1 the Rf values and the absorption peaks (λ max.) of the four components are reported and in Fig. 1 their absorption spectra, after chromatographic separation, are indicated. It appears, from the graphs, that the three anthocyanins chromatographically separated have slightly different peaks of absorbance and are present in quite a different proportion. Their concentration increases from compound 1 up to the third in band three.