It is concluded from these data that two recessive genes are necessary for the expression of the lutescent character. They have been designated *lu*$_1$ and *lu*$_2$. One of these appears to be homozygous in some maize lines such as the waxy-marked translocation series. Furthermore, in certain genetic backgrounds, one of these genes (not necessarily the same one) appears to be affected by those growing conditions which differ between the field and the greenhouse or growth chamber.

Environmental studies carried out in a growth chamber indicate that temperature is a factor in the overall expression of the lutescent mutant. F_2 and testcross populations grown at 21°C day and 15°C night temperatures could not be scored visually. All plants appeared green. At 26°C day and 15°C night some plants in these populations were slightly paler than others, although it was not possible to determine clear-cut patterns of segregation. At 29°C, the lutescent expression was unmistakable and the populations could be scored with relative ease. These observations paralleled those obtained in the greenhouse. During the winter months when the temperature seldom rose above 21°C, F_2 and testcross populations could not be scored, while those populations planted in the greenhouse in the spring, when increased sunlight brought higher temperatures, could be scored. The expression of the lutescent trait under these conditions was not as intense as that observed in the field, however. To date all field work on this mutant has been carried out in Pennsylvania. It will be interesting to observe the effect of the New Mexico summer on the expression of this trait.

The small F_2 greenhouse population from the cross of lutescent with a stock carrying several chromosome 5 markers gave a definite indication of linkage between *lu*$_1$ and *a*$_2$, *bt*$_1$ and *pr*. Because the population was small, no accurate map distances could be calculated. However, based on the tables of Immer, the closest linkage appeared to be with *a*$_2$.

David K. Shortess

3. A low temperature-chlorosis effect in Oh51A.

When seeds of inbred line Oh51A were germinated at low temperature, the leaves formed during the germination were completely devoid of chlorophyll. Seeds were planted in trays of moist vermiculite and kept in a cold box in the dark at 11±1°C for 21 days. By this time the coleoptiles were from 1 to 3 cm long and the trays were transferred to an illuminated growth chamber at about 29°C. The initial leaves which subsequently developed were completely chlorotic, while the second leaves were chlorotic at the tips. The chlorotic regions did not become green but remained very pale yellow and eventually died. Those leaves which formed later at the higher temperature were all green. Oh51A plants germinated in an illuminated growth chamber maintained at 10°C displayed the same pattern of chlorosis, so that temperature rather than light appeared to be the determining factor.

A number of other lines listed below, including both eastern and Texas inbreds, were tested for this low temperature effect.

A509	Pa11	Tx61M	Tx303	Tx601
CMD5	Pa32	Tx102A	Tx305	Tx602
Mich1334	Pa36	Tx127C	Tx403	W37A
NY16	Pa54	Tx203	Tx585	W153R
NYD410				W182B

In no case did a chlorotic condition result from the germination at the low temperature. All seedlings appeared to be normally green. Both F_1 and F_2 populations of crosses in which Oh51A had been a parent were available. The other parent was a U.S.D.A. plant introduction which did not result in a chlorosis from the low temperature treatment. When 13 F_1 and 44 F_2 seeds were germinated at low temperature, all resulting seedlings were green. Apparently there is not a simple genetic explanation for this phenomenon.

The Oh51A seeds used in this study were obtained from the Pennsylvania Agricultural Experiment Station. I am in the process of obtaining seeds of this inbred line from a variety of sources in order to determine whether or not this is a universal trait of this line.

David K. Shortess

NORTH CAROLINA STATE UNIVERSITY
Raleigh, North Carolina
Department of Genetics

1. Surface waxes of maize.

Preliminary investigations have begun on the surface waxes of maize. Surface waxes are extracted from the leaves by immersion in chloroform for 15 seconds. Several other lipid solvents have proven equally effective but a personal preference exists for chloroform. Immersion time can be varied; however, if too long, internal lipid extraction will also occur. For this same reason, broken or cut ends of leaves are avoided. Inbred lines, CI 21, Kys and T 204 were used as the normal or wild type for maize while 13 stocks carrying different glossy genes represent the mutant types. The 13 different glossies were $\underline{gl}_1$, $\underline{gl}_2$, $\underline{gl}_3$, $\underline{gl}_4$, $\underline{gl}_5$, $\underline{gl}_6$, $\underline{gl}_7$, $\underline{gl}_8$, $\underline{gl}_9$, $\underline{gl}_{11}$, $\underline{gl}_{14}$, $\underline{gl}_{15}$ and $\underline{gl}_{16}$.

Initial analysis of the surface lipid constituents has been by thin layer chromatography. The extract, after reducing by evaporation, has been spotted on silica gel G plates and developed in benzene for a distance of 10 cms. Spots were located by spraying with 50% sulfuric acid and heating on a hot plate for about ten minutes. Four spots are located by this technique when the sample extract was taken from a seedling in the two or three leaf stage. Two of the spots have been identified as fatty acids