and it occurs sporadically. Of special significance is that Gurgel made a statistical analysis of the frequency of association and found that all kinetochores associated at random except the one of chromosome 5. The frequency of association was much higher for this chromosome.

This result can now be better interpreted as the compound kinetochore structure here described can be easily conceived to mutate or rearrange, leading to the formation of kinetochores with different properties.

McClintock (Genetics, 1938) has shown that chromosome 5 could be fragmented through the middle of its kinetochore, the two halves retaining their functional activity on the spindle. The functioning of one half and the structural similarity of the segments reveal that the kinetochore of maize is a repeat. The kinetochore of rye is also a functional repeat, since a kinetochore with one chromomere and two fibrils (with about one third of its elements) functions normally on the spindle, being perpetuated through mitosis and meiosis (Lima-de-Faria, Chromosoma, 1955), and further each half of the kinetochore forms a separate iso-chromosome (Lima-de-Faria, Hereditas, 1956).

When the nucleolar organizer of maize chromosomes is split into two segments both retain their functional activity, but the large proximal segment of the nucleolar organizer forms a smaller nucleolus than the small distal segment (McClintock, Z. Zellf. u. Mikr. Anat., 1934). Similarly, a kinetochore with a deletion shows higher ability to withstand elimination at meiosis and less power to influence the pattern of the arms (Lima-de-Faria, Chromosoma, 1955). The elements of both the kinetochore and the nucleolar organizer have the same essential properties but they differ from each other in their functional power.

A. Lima-De-Faria

2. Viability of translocated chromosomes in maize.

In the study of chromosome organization it is relevant to know whether chromosomes with new arrangements are more or less viable than those with the normal pattern. With this in view a cross was made using pollen of plants heterozygous for translocation 5-6 (T 5-6 $\underline{y}$/N·$\underline{Y}$) and female plants carrying small $\underline{y}$. Translocated chromosomes carry small $\underline{y}$ (white kernels) and normal chromosomes large $\underline{Y}$ (yellow kernels). The results are summarized in Table 1.

The differential fertilization of gametophytes carrying $\underline{Y}$ and $\underline{y}$ is highly significant. Gametophytes carrying translocated chromosomes are apparently more viable than those with normal chromosomes.

In this translocation the nucleolus organizer is moved to the end of a long arm after a knob, quite far away from the kinetochore. In

TABLE 1 - Differential fertilization of gametophytes carrying Y (normal chromosome 5 and 6) and y (translocation 5-6) in maize.

Kernel Color	Ear				Total
	1	2	3	4	
Yellow Y	138	92	30	172	432
White y	192	122	27	187	528
Total	330	214	57	359	960

$$x^2 = 9.6 \quad P < 0.01$$

strains of maize raised outside experimental conditions the nucleolus organizer is known to occur regularly at a definite locus close to the kinetochore. Outside experimental conditions any other nucleolus location is apparently selected out. Thus, from the point of view of chromosome organization the translocated chromosome is expected to have a lower survival value.

The easy survival of the translocation under controlled culture conditions is not necessarily to be attributed to the presence of the new chromosome arrangement but to the association of the translocation with one of the many gametophytic factors known in maize.

A. Lima-De-Faria

ISTITUTO DI GENETICA VEGETALE, FACOLTA' DI AGRARIA
University of Piacenza, Italy

1. Defective endosperm factors from maize-teosinte derivatives.

Additional data have been obtained on the defective endosperm types in the derivatives of the controlled introgression of teosinte in the inbred A 158. Other defective factors are turning out to be identical or allelic. Except for allelism not yet having been clearly established for de^{t4} and de^{t15}, all the following factors should be considered allelic:

de^{t4}, de^{t5}, de^{t10}, de^{t11}, de^{t14}, de^{t15}, de^{t17}, de^{t18}, de^{t19}, de^{t20}, de^{t23}, and de^{t24},