of paramutagenic alleles ($\underline{R}^{st}$, $\underline{R}^{mb}$, $\underline{R}^{sc}$, etc.).

3. Introduction of methyl groups produces an alteration in the structure of DNA. The biological consequence of this alteration is repression of R action, i.e., the paramutant phenotype, perhaps by interference with the transcription process.

4. The level of repression of R action is proportional to the extent of methylation of the DNA segment involved. This postulate is necessary to account for different levels of paramutation of the $\underline{R}^{r}$ gene. In host-controlled modification, there is evidence that T_1-DNA may be methylated to different extents, depending on its host specificity.

5. The reversion of paramutant $\underline{R}^{r:st}$ alleles has its basis in the specific but incomplete demethylation of the methylated DNA segment of the $\underline{R}^{r}$ allele. Chemically induced complete reversion may involve complete demethylation of the DNA segment.

6. Persistence of the paramutant state requires replication of the methylated form of DNA. This postulate is questionable, but is necessary to account for replication of the paramutant state following removal of the paramutagenic allele.

The hypothesis, as presented, bears many similarities to Brink's metamere hypothesis. Perhaps translation can be effected by substituting "methyl group" for "metamere" and the "process of specific methylation of DNA" for "under and over replication of metameres" in Brink's hypothesis.

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1. The effect of synaptic partner change on crossover frequency in adjacent regions of a trivalent.

Genetic markers B and sk flank the point of an interchange between maize chromosome 2 and a Tripsacum chromosome. In plants which carry a normal maize chromosome 2 as well as the reciprocal products of this interchange, synapsis is virtually limited to homologous maize segments so that a trivalent configuration is usually formed. Stocks were constructed to measure recombination in regions near the interchange point and beyond with the following results:

Region	% Recombination
B-interchange	8.8
interchange-sk	1.6
sk-v	40.9

Crossover frequency appears near normal or slightly increased in the vicinity of the region of partner exchange in trivalent configurations (in

spite of frequent synaptic failure of these portions) but markedly increased in a large adjacent region (sk-v) which includes the centromere.

Marjorie Maguire

2. Mechanism of high transmission frequency of a Tripsacum chromosome in maize.

An extra chromosome derived from Tripsacum in an otherwise apparently normal maize complement has been found to be transmitted to about 90 per cent of the progeny through the egg (Genetics 48: 1185-1194). Since high ovule abortion accompanied this high transmission (and other possible explanations were ruled out or seemed relatively improbable), it was suggested that zygotes or female gametes lacking the additional chromosome from Tripsacum may be selected against (killed) in the presence of a maternal background which contains it. In more advanced backcross generations to maize of this stock, a line has appeared in which transmission of the Tripsacum chromosome seems to approximate 50 percent, and seed set approaches normal in 21 chromosome plants. This is consistent with the interpretation that female gamete or zygote selection is indeed the mechanism of the high transmission mentioned above and that capacity for selection has been lost from the exceptional line. Further tests are in progress.

Marjorie Maguire

3. Normarski interference contrast microscopy of maize chromosomes.

An appearance of longitudinal doubleness in maize diakenesis chromatids as viewed with bright field light microscopy has been reported (P.N.A.S. 55: 44-50. 1966). This effect was seen in bivalents in which unusual decondensation or uncoiling had been induced, thought to be the result of heat treatment of the living material but since shown to be due to rapid and immediate chilling of material fixed in alcohol acetic acid 3:1 mixture. More recently, structures resembling half chromatids have been found to be visible in normal maize diakenesis microsporocytes fixed in alcohol acetic acid 3:1 mixture at room temperature and stained with acetocarmine in the usual way. These can sometimes be resolved with bright field optics (with planapochromat objective), but are commonly and clearly visible with the Zeiss Nomarski interference contrast system (with planapochromat objective). The apparent structural subunits have a diameter only slightly greater than the theoretical limit of resolution of light optics and do not seem to become visible until mid to late diakinesis.

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