

three elements of the complexes were clearly shown. However, as soon as the divisions reached late pachynema and early diplonema, the central element became diffused. At middle diplonema, the two lateral elements also disappeared, and the chromatin areas of the nuclei were apparently devoid of any structure. In parallel with this, investigations with light microscopy were likewise carried out. It was found that during microsporocyte divisions of haploid maize, chromosomes behave unconventionally. For instance, from zygonema to early pachynema, most of the chromosomes formed nonhomologous pairings of the foldback type. Most of these pairings seemed loose. As the divisions advanced to middle pachynema, the pairings became complete and close. However, from late pachynema to early diplonema, they gradually dissociated themselves. At middle diplonema, all of the chromosomes straightened out and became single. This study supports my previous theory that synaptonemal complexes are the product of chromosome pairings, either homologously or non-homologously. Therefore whenever the chromosome pairings disappear, as at the middle diplonema of haploid maize, the complexes cease to exist.

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2. Staining maize chromosomes with a DNA-binding fluorescent agent.

In order to examine the genetic organization of maize chromosomes, a fluorescent agent, quinarine mustard dihydrochloride, was used to label pachytene chromosomes of maize. The techniques followed were about the same as those employed by Caspersson et al. (1970) to identify metaphase chromosomes of animals and plants, and also humans. It was found that the maize chromosomes were selectively labeled along their length. The heterochromatic regions, such as knobs, were strongly fluorescent. This demonstrates the genetic difference between heterochromatin and euchromatin of maize chromosomes. Through this study it is hoped that an insight into the genetical relationships among different races of maize as well as between maize and its relatives will be provided.

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