

pair and cross over often enough to show a higher frequency of crossing over than that occurring in an equivalent number of normal EMC's. Such an increase may be comparable to the increased crossing over in *Drosophila* when certain heterozygous inversions are present, and it is suggested that the introduction of one or more paracentric (to maintain fertility on female side) inversions which exhibit frequent asynapsis in pachytene figures may increase crossing over in other regions of maize chromosomes. It is hypothesized that the degree of coiling and/or crossing over is dependent on a substance which normally is limited in quantity in meiocytes and is competed for with differential success by all regions of the chromosomes. When the amount available is increased for uninvolved regions either by nonpairing within heterozygous inversions or by partial asynapsis in as plants, tighter torsion coiling and increased crossing over will result.

-- O. L. Miller, Jr.

#### 6. Persistent nucleolus.

The nucleolus in maize is described as disappearing at late diakinesis or prometaphase (Rhoades, J. Heredity 40). Sampayo (MNL 33) reported the persistence of a nucleolar remnant throughout meiosis in PMC's of plants heterozygous for abnormal 10. During a cytological study of asynaptic maize, a similar persistent nucleolus was discovered independently and at first was assumed to be an irregularity due to the as gene. Several normal stocks with and without the abnormal 10 chromosome subsequently were examined, however, and a persistent nucleolus was found in each. The remnant is about the size of a MI univalent of one of the longer chromosomes. It appears to be a passive body and its movement essentially is that described by Sampayo. Separating from the organizer region at prometaphase, it moves through the spindle and lies at or near one of the poles at MI. Further movement along the cell periphery brings it near the cell equator outside of the spindle at AI. The position of the remnant at Telo I and interphase appears to be random. The remnant is present in the cytoplasm of some microspores but its fate after that stage is unknown. It is presumed that with proper staining the persistent nucleolus can be demonstrated in all maize stocks and, if so, must be considered a normal cell component at meiosis. The significance of the remnant in cellular metabolism is obscure. It perhaps is a relatively insoluble waste product of nucleolar activity. Persistence of a remnant in somatic mitoses has not been investigated.

-- O. L. Miller, Jr.

#### 7. A hand scope for pollen examination.

The "Midguard" Pocket Microscope, similar to the Leitz hand scope, is available from the following source for about \$3.00 plus postage and duty. The scope is approximately 2" by 1" and has a magnification of 35X.

Nippon Microscope Works Co.  
35-2 Minami Cho  
Aoyama, Akasaka  
Tokyo, Japan

-- O. L. Miller, Jr.