

15-1941

only slightly above the lower limit of visibility of the photomicroscope. On the basis of this classification there can be no additional new types of still smaller B-chromosome derivatives, at least not until the electron microscope is utilized in the study of chromosomes. (Incidentally, this series of chromosome types from B to P, if interpreted in the reverse order, makes a very convincing demonstration of the diverse origin of chromosomes.) In the meiotic prophase, morphological distinctions within these two groups can be detected and may be classified accordingly.

The B-chromosome derivatives are proving very useful in studies of the relative genetic potential of different parts of the B-chromosome. Data are available at the present time which suggest that the sterility-inducing effects of the B-chromosome are not attributed to localized effects, but rather in the proximal, acentromeric region of the chromosome. There is some evidence that other mutant derivatives of the typical B-chromosome, such as extensions of the long arm or additions to the rudimentary short arm, occur from time to time, but these are less easily detected in somatic figures because of their greater similarity to the shorter chromosomes.

The occurrence of distally diploid B-type chromosomes in maize has been described from somatic figures by Darlington and others in recent years. But in these cases the position of the centromere has very probably been misinterpreted. The typical B-chromosome when viewed in somatic metaphase often exhibits what appears to be a centromeric constriction, especially after fixation with fluids that shrink the chromosome. This is not a true centromeric constriction but is actually the distal-heterochromatic region between the proximal knob and the distal-heterochromatic region. This interpretation is quite obvious if one familiar with the pachytene structure of the B-chromosome and follows the translocation accompanying the shortening of the B-chromosome during the late prophase and early metaphase of the first meiotic division where the distinction between acentromeric and heterochromatic in these stages is clearly apparent in good preparations. Many pachytene figures of the typical B-chromosome do, however, show the presence of a rudimentary short arm consisting of a very few small chromosomes. This arm is often folded back against the proximal knob on the opposite side of the centromere, thus making the centromere appear truly terminal.

L. H. R. R. R. R.

MAIZE LINKAGE MAPS WITH TENTATIVE ASSIGNMENTS OF CENTROMERE POSITIONS



