McCLINTOCK, BARBARA, Cornell University, Ithaca, N. Y.: *The production of maize plants mosaic for homozygous deficiencies: Simulation of the bm_1 phenotype through loss of the Bm_1 locus.*——In two separate cases, two mitotically functional chromosomes, a deficient rod-shaped chromosome and its reciprocal, a small ring-shaped chromosome, were produced from a single chromosome-V by means of X-ray treatment (RHOADES and McCLINTOCK, 1935). Beginning at the spindle fiber attachment region, the section of the short arm composing the ring and inversely the piece lost from the rod was 1/20 and 1/7 the length of the normal chromosome respectively and included the locus of the Bm_1 gene (allele of bm_1, brown mid-rib, producing a brown color in the lignified cell walls). The larger ring-chromosome is characterized by frequent losses from the nuclei during mitotic cycles and less frequently by changes in size resulting in duplications and deficiencies. When two deficient rod-chromosomes, the smaller and the larger, plus the larger ring-chromosome which covers both deficiencies, are present in a plant, loss of the ring will give rise to tissues homozygous deficient for the region represented by the smaller deficiency. Changes in size of the ring should produce tissues homozygous deficient for sections within the limits of the smaller deficiency. Five types of homozygous deficient tissue have been distinguished. Through total loss of the ring: brown cell walls, colorless plastids, poor growth capacity. Through changes in size of the ring: (1) brown cells walls, green plastids, good growth; similar in detail to tissue produced by the normal bm_1 gene. (2) Colorless cell walls, colorless plastids, normal sized cells, good growth capacity. (3) Colorless cell walls, colorless plastids, small cells, excessive proliferation at external surfaces. (4) Same as (3) but with brown cell walls.