that time that there would probably be a corresponding agreement in their activity.

Digitalis drug is harvested twice each season, the first cutting being in late July and early August, the second in September. These experimental samples were gathered at the same time and in the same manner as the field crop except that the writer personally picked and mixed the leaves rather than have the farm men do it.

After the leaves were carefully dried and milled, U. S. P. tinctures were prepared. These were then tested physiologically, by the M. L. D. frog-heart method.[3] Results are given in the table below, in reading which it should be borne in mind that U. S. P. standard tincture represents 100 per cent.

First Crop

Treated group ..... 225 per cent. of Standard.
Control group ..... 185 per cent. of Standard.
Increase of Potency, 21.62 per cent.

Second Crop

Treated group ..... 350 per cent. of Standard.
Control group ..... 250 per cent. of Standard.
Increase of Potency, 40 per cent.

It should be noted here that in Michigan we had a severe hailstorm last August 8, which rather badly injured the plants of the first crop. This probably explains the relatively low potency of that cutting. Spread out in its first-year, rosette form of growth, digitalis offers a fair mark for damage by hail. Many leaves were badly beaten and perforated in as many as ten places; so it is surprising that they gave as high activity as they did. Several of the plants died; but most of them revived, and showed no effects at the time of the second cutting.

Judged by the results of the past two summers, it appears quite conclusive (a) that digitalis develops a higher potency under the influence of ultra-violet-transmitting glass, and (b) that solarization for one year does not appreciably affect the transmission of the particular portion of such rays as are responsible for such effect in digitalis.

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CHROMOSOME MORPHOLOGY IN ZEA MAYS

THE haploid number of chromosomes in *Zea mays* is ten. Several 2n+1 individuals (with twenty-one chromosomes) have arisen as the result of crosses between diploid and triploid individuals.[1] Since there are ten known linkage groups, it is desirable to determine what linkage group is represented by the extra chromosome in the several 2n+1 individuals. Because of the desirability of associating each linkage group with a specific chromosome of the complement, a study has been undertaken to determine to what extent the different members of the complement are identifiable cytologically. Studies have been made of the first division in the microspore where only the haploid complement is present.

A semi-diagrammatic representation of the haploid set is given in Fig. 1. One chromosome possesses

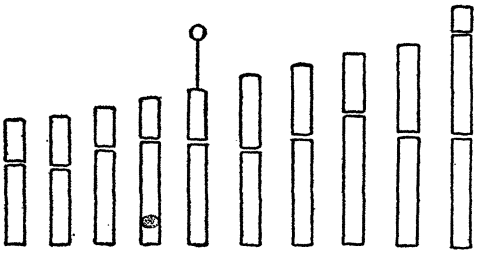

FIG. 1

a satellite.[2] During the prophase the satellite remains attached to the nucleolus until the latter disappears. The thread joining the satellite to the major part of the chromosome does not possess a constant relative length but varies in different figures. In the fourth from the smallest chromosome there is a deeply staining body which becomes very conspicuous during late prophase. Other chromosomes have less conspicuous bodies of this kind, but their exact position requires further study.

Besides the primary constrictions, with which spindle fiber attachment seems to be associated, there are secondary constrictions. Such a constriction is indicated near the end of the longest chromosome. The secondary constrictions, although always appearing in the same place in certain chromosomes, are not always evident in the observed figures.

Although only a preliminary study has been made, the author is convinced that every chromosome of the set is morphologically identifiable, differing from the others essentially as shown in the figure. It should be possible, therefore, after the extra chromosome in any 2n+1 individual has been associated with a certain linkage group, to determine from an examination of the eleven-chromosome microspores which chromosome of the haploid set carries this group of genes.

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[3] Houghton, E. M., *Jour. A. M. A.*, 31: 959, 1898.

[1] B. McClintock, *Genetics*, 14: 180–222.

[2] The satellite in *Zea* was first observed by L. F. Randolph.