

2. Progress on big rings in corn.

Two rings of 10 were observed in F_1 plants from crosses between stocks homozygous for interchanges involving 3-2-4-9-10 and 1-5-6-7-8. No pollen was shed, but open pollinated ears set 0 to 6 seeds (ears with about 600 ovules). Backcrosses were made to both parents as the first step in establishing a line homozygous for both groups of interchanges.

Lines homozygous for 3-2-4-8-6 were established also and crossed with a 5-7-1-9-10 stock.

C. R. Burnham
R. L. Phillips
J. Stout

3. Chromosome 3 linkage test.

Tests between the W7748 albino and ba_1 failed to give any indication of linkage.

C. R. Burnham

The following reports are based on studies supported by N.S.F. Grant GB 1586 and GB 5543, Renewal of GB 1586. Those assisting in the work were Dr. Ronald L. Phillips, Dr. Gary R. Stringam, Joseph N. Neubauer, John T. Stout, and during the summer, Alan Novak.

4. Notes on the 2-6 interchanges.

We now have all but two of the 24 stocks listed plus two additional ones not listed. The following stocks listed as 2-6 interchanges in the 1961 Crops Research ARS 34-16 list of interchange break points are shown by linkage tests with $lg\ gl\ B\ V_1$ not to involve chromosome 2: 4394, 6671, and 5648. The break points for three which do not have the breaks in 6L as listed are: 2-6 (027-4): 2L.1-6 org.; 2-6e:2S.18-6S.20; and 2-6 (5648): (not 2)-6S.19 .

C. R. Burnham
J. Stout
R. L. Phillips

5. Notes on the functioning of Dp-Df classes from interchange heterozygotes involving chromosome 6.

The following interchanges when heterozygous give a ratio of about 1 partially sterile: 2 fertile through the ♀, probably a result of the functioning of one Dp-Df class:

<u>Interchange</u>	<u>Probable Df-Dp</u>
listed as 2-6 (4394) but does not involve 2	2S-6L
2-6 (001-15)	2S-6 sat.

Of the three 2-6 interchanges with the break in the nucleolus organizer, two have been tested. Both give normal 1:1 ratios, indicating that the deficiency which includes at least part of the organizer of chromosome 6 does not function.

C. R. Burnham
R. L. Phillips

6. Notes on the 1-5 interchanges.

We now have all but 7 of the 40 stocks listed in the 1961 ARS 34-16 publication by Longley. Seven of the stocks have not been checked in intercrossovers or linkage tests. Multiple-point linkage tests that include bm_1 as one of the markers served as a test to determine genetically whether the break was in the short or the long arm of chromosome 5. The genetic data and the results of intercrossovers agree on the following changes in placement of the breaks in chromosome 5. Cytological observations alone are the basis for the changes in positions made for chromosome 1. Those with breaks found to be in a different arm from that listed:

6899 S.40 - L.10	not S-S
6197 S-S	not S-L
e S.01-S.12	not L-L
7219 S.20-L.42	not L-S
a L.64-L.49	not L-S
8041 L-S	not L-L

The information is not complete for 1-5 (6401).

J. Stout
C. R. Burnham

7. Chromosome pairing in intercrossovers between stocks of interchange that involve the same two chromosomes.

Type 2a, interchange points in opposite arms in both chromosomes. In the intercrossovers involving T1-5 interchanges, the frequencies of "pairs" at diakinesis ranged from 5 to 100%. When the interchange points in both chromosomes in both interchanges were at .4 or closer to the centromeres, the diakinesis configurations were all or mostly IOII. When one or more of the interchange points was at .5 or farther away from the centromeres, fewer of the configurations were pairs and more were chains, rings, or other types of associations of the 4 chromosomes. Complex configurations of 4 were observed which are probably the result of crossovers in both differential segments. Often these can be described only as a clump. Similar configurations in *Pisum* have been pictured by Lamm and Miravalle (1959, *Hereditas*). The frequencies