9. Studies of chromosome pairing in crosses between translocations involving the same chromosomes.

A series of 2 - 6 translocations and a few others are being used. In combinations in which the break points are on opposite arms in both chromosomes 2 and 6, the pairing configuration in F_1 might be of two types, depending on whether homologous "between breaks" segments or homologous ends are paired. In T2-6a (2L.40; 6S.00 - 0.5) x T2-6b (2S.69; 6L.49), 81% of the spore-mother-cells had 10 pairs and 19% had a complex of four chromosomes. In T2-6a x T2-6 (6049)(2S.70; 6L.23), 58% had 10 bivalents and 42% had a complex of four.

At pachytene each of the two "bivalents" from the translocated chromosomes always includes the same chromosomes. In all configurations, whether "pairs" or a complex of 4, pairing in the terminal homologous regions is complete. In those with "bivalents" there are loops in the intercalary non-homologous regions, and unpaired centromeres. These observations suggest that pairing is initiated at the ends.

In T2-6b (2S.69; 6L.49) x T2-6c (2L.32; 6L.23), in which the two translocation breaks are on opposite arms in one chromosome, but in the same arm in the other chromosome, 6% of the P. M. C. at diakinesis had 10 "pairs" and 94% had an association of four. In all figures the homologous ends were paired. In the "complexes of four" the intercalary homologous "between breaks" segments are in reverse order with respect to each other but they remain unpaired.

In another combination of this type, T2-6c x T2-6(6049)(2S.70; 6L.23), an inversion loop was observed in the "between breaks" region in 5 of the 9 cells observed, while the other 4 showed non-homologous pairing.

All the observations indicate that pairing starts in the terminal regions, and then proceeds toward the centromere.

In T3-6a(3L.06; 6L.30) x T3-6b(3S.73; 6S. Sat.): in pachytene a cross-shaped configuration of four chromosomes is observed, in which the short terminal segments of chromosome 3 pair in many cases, thus resulting in a partly closed cross-configuration in which the distal end of the short arm of 3 is brought close to the nucleolus and paired with its homologous translocated segment. The translocated portion of the satellite was in no case paired with its partner.

Mamoru Tabata