Eight of the nine cultures proved to yield cells with only the normal diploid 20 chromosomes. In such a population of chromosome counts cells are found with chromosome number estimates other than twenty (18, 19, 21, 22); these are rare and are found also in intact root cells scored as controls. The one exception to the diploid genome which has been encountered is a presumed diploid-tetraploid chimera, in that cells from the same culture yielded 20 and 35-40 chromosome counts.

Again at twelve months after initiation of the cultures chromosome counts were made on part of the material assessed at nine months. The same diploid chromosome number was found. The diploid-tetraploid chimera culture was not re-evaluated due to its poor rate of growth at that time and since. It is not, however, the only culture we have been experiencing growth rate problems with.

As far as can be determined by comparative observation between chromosome squashes of callus and intact root cells, no intrachromosomal aberrations are apparent.

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1. Two rings of 10 chromosomes each.

Plants having $2^{\circ}10$ were obtained from the cross of 1-5-6-7-8 by 3-2-4-9-10/3-2-4-9. A few seeds were obtained by backcrossing these as ♀ with pollen of 1-5-6-7-8. The plan is to establish a stock that is homozygous for both groups of interchanges. This will be irradiated to combine the two rings.

2. Chromosome identification set of interchanges.

Interchanges: 1-2a, 2-4d, 3-7c, 5-7c, 8-9a and 8-10b, backcrossed to the A188 inbred; but segregating 1 heterozygous:1 homozygous interchange are available.

3. Crosses between interchanges involving the same chromosomes.

Preliminary results have been obtained. In 2-6(8786) x 2-6c(2S.90, 6S.77 x 2L.37, 6L.25). There were 61 cells with an association of four at diakinesis and 10 with 10 pairs. In all cells with 10II, only one was associated with the nucleolus. This indicates that the end segments of the "pairs" from the interchange complex are paired homologously; the mid-segments in these same "pairs" are non-homologous. This agrees with the observation by Tabata (Cytologia 28:278-292, 1963).

In 2-6f x 2-6(8786) (2L.79, 6L.87 x 2S.90, 6S.77) there were 28 cells with an association of four chromosomes and 10 with 10 "pairs." In the latter, there were either two nucleoli, each associated with a "pair" of chromosomes, or a single nucleolus with two "pairs" attached. In these "pairs" the mid-segments are homologous, and the end segments are non-homologous. In this cross the total mid-segment length was about 5 times that of the end segments. In the cross described in the first paragraph the two were about equal.

Other combinations of 2-6 and 1-5 interchanges will be grown for further studies.

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1. Tetrasporic embryo sac development in trisomic sectors.

A reconsideration of the apparent grouped crossovers and trisomics from the heterozygote $\underline{\alpha}$ $\underline{a}$ $\underline{sh}/\underline{a}^{m}$ $\underline{Sh}$ reported in the Maize News Letter No. 31 has revealed an interesting explanation. When the above heterozygote which was prepared with 4 different alleles in the $\underline{a}^{m}$ position was crossed by an $\underline{a}^{s}$-$\underline{sh}$, $\underline{Dt}$ pollen parent, a number of crossover types occurred as would be expected if $\underline{a}^{m}$ paired with either $\underline{\alpha}$ or $\underline{a}$ and normal exchange took place. The frequencies were low therefore the cases as expected usually occurred as single seeds; however, there were a few in groups of two or more including one with 5 dilute dotted nonshrunken seeds arranged so that there was little likelihood of their being due to coincident occurrence of single rare events. Hence, the earlier conclusion of groups of crossovers. On test it was discovered that the dilute nonshrunken cases ($\underline{\alpha}$ $\underline{a}^{m}$ $\underline{Sh}$, $\underline{\alpha}$ $\underline{a}$ $\underline{Sh}$ and $\underline{\alpha}$-$\underline{Sh}$) included in addition to the usual crossovers some that had trisomic or parental type embryos. Furthermore the 5 seeds in the sector described above had some of both. The number of these noncrossovers (Table 1) was 48 trisomics, 40 $\underline{\alpha}$ $\underline{a}$ $\underline{sh}$ parentals, and 42 $\underline{a}^{m}$ $\underline{Sh}$ parentals or roughly 1:1:1.

Explaining the occurrence of dilute nonshrunken endosperms with trisomic embryos is easy if we invoke nondisjunction and the production of trisomic and monosomic daughter cells in the germ line. However, this will not explain noncorresponding embryos unless we admit further nondisjunction in the embryo sac developed from an n + 1 megaspore. If this does occur it provides at best 2 tetrasomic : 1 $\underline{\alpha}$ parental : 1 $\underline{a}^{m}$ parental embryo which is not what we observed.

If we assume occasional trisomic megasporocytes with an extra chromosome 3 we can explain the noncorresponding embryos by further assuming