3. The effect of B chromosomes (continued).

In a previous report (MGCNL 37), it was noted that the effect of B chromosomes could be evaluated by studying the variances of pollen grain size. In comparisons of B and non-B containing lines, differences could be detected at the 10% level of significance with the increased variance in the B-chromosome containing lines. Subsequent analyses have confirmed this result and at the 5% level of significance. This would confirm the previous result that B-chromosomes can affect the physiology of pollen grain growth.

Peter A. Peterson

IOWA STATE UNIVERSITY
Ames, Iowa
Department of Genetics

1. A dormant allele of vp1.

Viviparous-1 is a premature germinating mutant which is located in the distal nine-tenths of the long arm of chromosome 3 (the region translocated in TB-3a). It is probably located just distal to the break point of TB-3a since it shows close linkage with T3-9a (3L.19) and T3-9c (3L.15) and very little or no linkage with a1.

The viviparous seedlings of this mutant are green and they grow into normal plants. Seeds that are of the genotype vp1 vp1 are not only viviparous but they also produce little or no aleurone color in stocks that are otherwise homozygous for the genes responsible for colored aleurone. Frequently, the color inhibition is not complete, resulting in seeds with a slight tinge of color similar to that seen in seeds of the constitution $C^{I}CC$.

In 1961 crosses were made between heterozygous vp1 plants which were homozygous for purple aleurone and a stock obtained from K. S. McWhirter, then at the Univ. of Wisconsin. The McWhirter stock was supposed to be homozygous purple aleurone but was segregating for a non-purple mutant which showed a tendency to be viviparous. The segregating F_1 ears of this cross produced 3 purple : 1 non-purple seeds. No viviparous seeds were observed on these ears. In 1962 fifteen

non-purple seeds from these F_1 ears were planted and the resulting plants were self pollinated. All of these ears were non-purple and with approximately 1/4 of the seeds viviparous. In every case the ears had some seeds with the slight tinge of purple associated with homozygous $\underline{vp_1}$ seeds in an otherwise purple genotype. In 1963 twelve more non-purple F_1 seeds were grown with the same results as in 1962.

The F_1 plants from non-purple seeds grown in 1963 were at the same time crossed to heterozygous $\underline{vp_1}$ plants (homozygous purple aleurone) and plants heterozygous for the McWhirter allele. The backcrosses to $\underline{vp_1}$ stocks gave ears with half the seeds purple and half non-purple. Approximately 1/2 of the non-purple seeds were viviparous. The backcrosses to plants heterozygous for the McWhirter allele gave ears that had approximately 1/2 purple and 1/2 non-purple seeds. Only an occasional viviparous seed was observed on these ears.

Also in 1963 self pollination of 11 plants from purple seeds of the original F_1 ears gave 7 plants that were segregating 3 purple : 1 non-purple viviparous seeds and 4 plants that were segregating 3 purple : 1 non-purple dormant seeds.

These F_1 plants were at the same time crossed to heterozygous $\underline{vp_1}$ plants (homozygous purple aleurone) and plants heterozygous for the McWhirter allele. In the backcrosses to the $\underline{vp_1}$ stock, viviparous seeds were observed on the backcross ears if the F_1 plants segregated for vivipary but no viviparous seeds were observed on backcross ears if the F_1 plants were segregating for non-purple dormant seeds. In the backcrosses to plants with the McWhirter allele all segregating backcross ears had non-purple dormant seeds whether or not the F_1 parents were segregating for vivipary.

These results are consistent with the hypothesis that the McWhirter mutant was allelic to $\underline{vp_1}$ and that the McWhirter allele is much less likely to be viviparous. In the crosses outlined in this report only occasional seeds which were carrying the McWhirter allele would be observed to germinate prematurely. The marked propensity for dormancy of the McWhirter allele is dominant to the strong viviparous tendency of the $\underline{vp_1}$ allele.

Crosses of non-purple segregants to $\underline{a_1}$, $\underline{a_2}$, $\underline{c_1}$, $\underline{c_2}$, and $\underline{r}$ testers confirmed that these stocks were homozygous for the dominant alleles at these loci and thus the lack of color was due to the $\underline{vp_1}$ and McWhirter alleles.

Donald S. Robertson