An F test showed that the experimental error was not significant. A second F test yielded a highly significant difference between the variance of the longest and shortest chromosomes.

A table of the arm ratios of the 10 pairs is below. The measurements were done on enlarged photographs, and the arm ratios given are the averages from fourteen cells.

The arm ratios are not always the same as those observed in meiosis. Chromosomes 1, 2, 3, 4, 5, and 9 have ratios in mitotic metaphase similar to pachytene. No ratio has ever been observed greater than 2.8: 1.0 in any chromosome. The ratio of chromosome 6, 7, 8, and 10 varies from cell to cell. This variation of 6 might be accounted for by the degree of condensation of the satellite region.

Chromosome No.	Arm ratio
1	1.2
2	1.2
3	1.8
4	1.6
5	1.1
6	2.2
7	1.7
8	2.1
9	1.8
10	1.6

Our karyotype is routinely presented as follows:

Group A - chromosome 1
Group B - chromosome 2
Group C - chromosomes 3, 4, 5
Group D - chromosomes 6, 7, 8
Group E - chromosomes 9, 10

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4. Influence of temperature on pollen germination and tube growth.

The effect of temperature on the germination and growth of "Seneca 60" ($\underline{su}_1/\underline{su}_1$) hybrid corn pollen was investigated. The pollen was germinated in the concavities of well slides on a medium consisting of 12% sucrose, 100 ppm H_3BO_3, 300 ppm $CaCl_2.2H_2O$ and 1% methyl cellulose (MGCNL 39:169 and 40:147). Germination was allowed to proceed for varying times in a water-saturated atmosphere either within covered

glass dishes in incubators or on a Wild temperature controlled microscope stage. Both per cent germination and pollen tube lengths were measured from photomicrographs of random fields.

Optimum temperature for per cent germination was in the range 20-23°C. Germination was low and variable above 35°C and below 15°C. Much bursting occurred at the higher temperatures. No germination took place at 10°C and below; the grains remained intact and a small bubble formed at the germ pore. If the temperature of the stage was then raised by 5C° a tube formed from the bubble.

Temperature influences the average time for germ tubes to appear--the latent period of germination. The latent period is a hyperbolic function of temperature. As the temperature was lowered below 10°C the time for germination became infinite; at an infinitely high temperature the latent period approached zero, but bursting of the grains, of course, actually terminated the curve between 35°C and 40°C.

Rates of growth of several hundred pollen tubes over periods up to 60 minutes were determined at 9 temperatures between 10°C and 45°C. Periods of maximum growth rate varied with temperature and seldom exceeded 35 min. Maximum rates of growth increased linearly between 12°C and 30°C with a Q_{10} of 2.1 and fell off rapidly below 12°C and above 35°C.

The lengths of tubes after a measured period of germination are functions of the latent periods of germination, the growth rates, and the times at which these rates level off. The average tube growing at 30°C was 1.5 X as long when it began its plateau phase of growth as the average tube length at 38°C. No significant difference was observed between those at 20°C and 30°C.

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5. Tests for chemotropism in pollen tubes.

Two methods for testing the chemotropic response of "Seneca 60" ($\underline{su}_1/\underline{su}_1$) hybrid corn pollen were tried. The first used the method of Mascarenhas and Machlis (Nature, 196:292, 1962) in which pollen and test materials were placed in depressions in a 1% Noble agar medium containing 100 ppm boric acid and 12% sucrose but no added calcium. Directions of pollen tubes were observed under a microscope.

The second method consisted of soaking Whatman 3MM filter paper discs in test material and placing one disc in the centre of a slide well containing the methyl cellulose supplemented medium lacking calcium (MGCNL 39:169 and 40:147). Pollen was shaken onto the surface after a suitable diffusion period. The pollen grains and tubes were photographed and the distance of each grain from the edge of the disc and the direction of growth of the tube relative to the disc were measured. The quantitative data from the second experiment were subjected to regression analyses.