Friday - Sept. 25. [1931]

Dear Charlie -

Many thanks for your letter telling me about the microscope. Sharp has agreed that I should take the research scope & lamp I have with me now to Cal. Tech.

I am sorry that you are low in spirit - too much sunshine?

I got the dope from Rhoades. In $\square_4$ the break occurred between B & V_4 possibly ~~[illegible]~~ & between B & to_1 anyway. The interchange occurred about here ~~[illegible]~~ probably & about an equal distance in on the v_1-v_2 chromosome. (#5). I had one case of deficiency involving B which would place B toward the end of the long arm = ——— ——— deficient. If this means anything B is about ——— ——— ↓. Lg is at the end of the short arm from my deficiency stuff so possibly opposite ends are involved in $\square_4$ & $\square_7$. Here is Rhoades dope:

lg - $\square_4$ = 45% crossing-over
B - $\square_4$ = 21% " "
to_1 - $\square_4$ = 4% " "
B - to_1 = 27% crossing over ∴ break in lg-b chromosome probably between

B + b_1. Some F_2 data involving $\square_4$ + v_4 give no crossing over with v_4. This is o.k. since $B - v_4 = 17\%$ crossing over. Break is probably close to v_4 locus.

$pr - \square_4 = 18\%$ crossing-over.

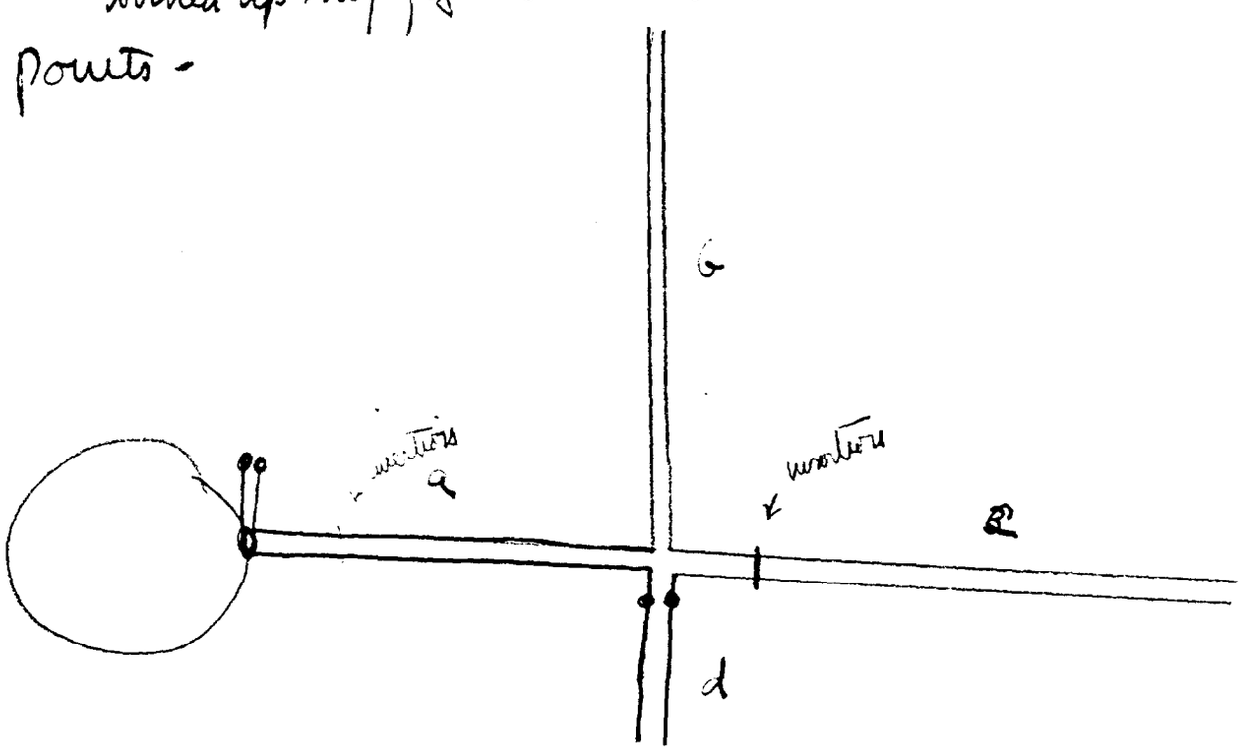
$v_2 - \square_4 = 50 \pm 9\%$ " "

$pr - v_2 = 43\%$ " "

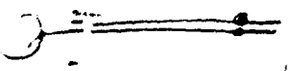
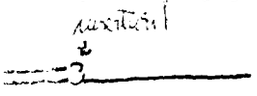
Cultures segregating for $\square_4$ - pr - B give $31 \pm 9\%$ crossing over between pr + B.

I had a quick glance at some figures which showed the extent of the interchange but I could not follow back each chr. They were from old slides that Harriet had made. Rhoades is going to finish up the cytology this fall.

Worked up my figures of $\square_5$ + dis a rue with loops on 2 points -



Cooper thinks that arm d belongs to S-Or. whereas I believe from the morph. of the satellite chr. & the 2 small knobs that it belongs to the satellite chr. He thinks that arm b is always longer than c whereas I believe they are almost equal, c being slightly longer than b. Anyway, I have seen no chromosome in the corn culture I have looked at that have a knob close to the insertion region on the short arm which would have to be if the chr. in d + c were the non-interchanged chromosome.

Work is slow - so much harvesting, counting etc. While home I made a number of photographs which I shall annoy you with when I arrive. I have very little slope except that a is probably out near the end of the long arm of the a-d-or chromosome & a few more deficiencies - one in satellite chr.  & one in 7-8. 

Examinations are over for a time now until Pasadena. I shall start west in about 2-3 weeks.

See you soon - regards to all,

Sincerely,

Bart