YALE UNIVERSITY OSBORN BOTANICAL LABORATORY NEW HAVEN, CONNECTICUT

February 8, 1947.

Dear Mather-

It was very gratifying indeed to receive your recent letter; Your discussions with me have had a very beneficent effect in clarifying what I must do, and I hope your interest in this problem will continue. The results so far have satisfied the criteria a, b, and c which you mentioned. I had just completed my own analysis of the data which I had sent you with substantially the same results. In addition, I have estimated the homogeneity of the various samples. Parts of Sets 2 and 4 give 'p's of .04 and .06 respectively, for reasons which I am at a loss to assign, so that it is if anything remarkable how well the data for 'coupling' and repulsion phases fit; for sets 1-4 respectively (with some new data) the 'p's are .005, 0.3, 0.18, .02, which are commensurate with the homogeneity of the data.

While the 4 sets were chosen from the point of view of the cycle: BM, BØC, TP, TLB₁, I had been so pessimistic about the possibility of an effect of both BØC/BM and TP/TLB₁ that I had not gotten to sit down and analyse the data. The lack of effect of the first substitution is surprising, but seems to be authenticated by the data; thank you very much for pointing this out to me, and for showing how the frequency of the 4th rare recombination class can be used to estimate the absolute distance(although inefficiently) On the basis of the comparison of the number of colonies which appear on minimal and and TL agar in the BMTLB₁ cross, I had come to the conclusion that the distance BM--TL was from 70-90 units.

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It is symprising that only one linkage group has been uncovered, but that seems to be the situation. I think the possibility of spurious linkages (like B....M) in your notation has been covered.

There is one interpretation with which I should like to take issue: '..we must assume that T_1 is linked to L and P rather than to T.... T..must be further from T_1 than L and P are.' If P,T and L are in linear order (not necessarily this one), **T**-P-T would show a smaller recombination frequency than **T**-TL, regardless of the order of T and L. In assense, P masks whatever is beyond it. On this theory the map should be

The question of the relationship between T and L can be best examined in the cross $B-T-V^T \times L-B_1-V^S$, simply by studying the segregation of V into the prototrophs. I hope to have more definite information in a few weeks. Till then, with best regards,

i.e., (to stick uny nucle out): (calculated roughly) Yours sincerely, 1. hpidotiple: -K, 85 + K, 08 + 5, 03 - 5, 2. h, B, -, the same; B, - 8, + 8, - 8, + 5, - 5, 3. $B^- > B^+$; -R, 30 + R, 50 + 5, 15 - 5,

The diffume between to - and B' double particularly sticking