INDIANA UNIVERSITY
BLOOMINGTON, INDIANA

DEPARTMENT OF BACTERIOLOGY

January 26, 1949

Dr. J. Lederberg
Department of Genetics
University of Wisconsin
Madison, Wisconsin

Dear Lederberg:

In the first place, I have agreed to collect the material for the Section on "Genetics of Microorganisms" in the "Methods in Medical Research". Can I hold you to your promise to prepare the part on Procedures for the Study of Biochemical Genetics and Recombination Phenomena? You told me you could have this in July. As you know, the main thing is a detailed description of the methods used in those typical experiments that are likely to be used by new people working in the field.

In the second place, a poor experiment of Miss Kann gave me an idea which we have been unable to prove, but which you may easily disprove.

Suppose K-12 cells are all of mating type A, but give rise to a few mutants of type a. In a mixed culture, these could mate with other types of cells and give recombination. This "mutation" theory would account for the frequency of recombinants in a plate goes up slower than with the square of the number of parents, for the increase in recombination by Wyss and Hoard, for the fact that the number of recombinants depends very little on time of contact. We tried to test that by seeing if presence or absence of prototrophs in liquid was a matter of the number of parent cells (same number in different volumes). It does not work: there are more prototrophs in smaller volume, although the frequency is not dependent on concentration only. Other kinetics tests, like fluctuations, would be tiresome. You can test the possibility using your recombinants and back-crossing them. Even if my suggestion were correct, you may not find equal numbers of prototrophs of both mating types, since the prototrophs of type "a" may have a chance to outcross again after being formed, and become deficient again. In agar, however, this may be rare. Also, you can devise experiments with suitable stocks to get both recombinants from a cross, particularly with the heterozygate. This should be the answer to the question. Let me know if you already have pertinent evidence; if not, can you test for it?

Best regards to you and Esther.

Yours,

Luria

SEL:VB

S. E. Luria