March 4, 1958

Miss Marla J. Schneider
66 East 78th Street
New York 21, New York

Finch College

Dear Miss Schneider:

Thank you for sending me your report, which obviously represents a great deal of thought and care on your part.

I sense a certain amount of bewilderment on your part, but I am not surprised. I think that much of the confusion and apparent contradiction in the literature, which is reflected in your assimilation of it, is simply a historical process. The information you summarized is at the very frontier of discover, and we find out new things every day which change some details of our thinking and help to enlarge our understanding. The transition from ignorance to knowledge is always halting and tentative, one step at a time here and there, and likewise it takes time for any scientist to educate himself on current progress in every field.

More explicitly, I do not think there is any longer a serious doubt of the occurrence of sexuality in E. coli strain K-12, and possibly in some few other bacteria. Transduction is another mechanism, which has a number of different forms, and has been discovered to occur in quite a few organisms. Just as different organisms have evolved different techniques of locomotion, swimming, flying, crawling, walking, these are different techniques of genetic recombination. And if they overlap in distribution, well birds can walk and I trust you can swim. What we have been describing are the occasions and limitations of these techniques and we can only report what we find. Fortunately, it is not difficult to tell experimentally when a bacterial species is using its various techniques: in practice they are used under different circumstances that this causes no trouble. For example, recombination between a pair of lysogenic E. coli strains, both F^-, usually turns out to be transductive (and we have more detailed tests to verify this conclusion). If they are nonlysogenic, but one or both is F^+, they are probably mating.

Good luck to you,

Yours sincerely,

Joshua Lederberg
Professor of Medical Genetics

JL/ew