

16/2/52

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Dear Hayes,

Thank you for your letter of Feb. 10th and the enclosed note to Nature ; I am interested to see that UV stimulation agrees with, and perhaps follows from, fertility behaviour. I have a strain with a higher frequency of recombination that seems to have a higher sensitivity to UV stimulation than 5-161 (from which it was derived). As to Spicer's infertile strain - I think he sent me a subculture of it some time ago; I can recall writing him something about infertility of one of his strains - it is probably the fourth occurrence of the same event, viz. mutation to infertility. The first must have been in the building of TLB<sub>1</sub> - ; one occurred in a B<sub>2</sub>- strain which I treated with Ny in 1949; another to Mrs. Lederberg again in a B<sub>2</sub>- strain. I have a subculture of this, which was sent to me by Lederberg.

Re your experiments: I think I can predict the result of the experiment which you plan, of infecting an infertile strain with a fertile one. It was discovered by Lederberg a month ago, and I was reaching when I heard of it, exactly the same conclusion, that fertility (rather: self-fertility) is infective. It is very highly infective. In 4 hours contact (shorter exposures not tested) 90% of the cells of an infertile strain are infected. It is not easy to detach the transforming principle off the fertile cells; I hope however to confirm some experiments which were positive recently. Infection is more difficult in the presence of DNA-ase; and is enhanced by UV-stimulation, so that it may well be that the transforming principle be the same <sup>substance</sup> which makes your irradiated cultures viscid. However, the transforming principle must  
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be either insoluble or highly unstable in solution, since it cannot be recovered easily in filtrates.

When I suggested crossing two streptomycin-sterilised strains together, I meant of course using two fertile strains. I have some idea that gametes -if there are any such things - may be formed on both sides. On the present evidence, it may be that the ~~infertility~~ inability of streptomycin sterilised, infertile cells to cross with fertile strains is due to their incapacity of reacting to the fertility transforming principle by forming gametes. One fact ~~has~~ emerged however, which throws doubt on the whole recombination story: in the infection for fertility, infection between living cells occurs, but nothing is usually found in the filtrates. Does this not look like what happens for prototroph formation? I still believe there is a fundamental difference between the two phenomena, but I am not as sure about it as I was a month ago.

I shall be in London for a few days in the first week of March and shall ring you up; I shall take this opportunity for letting you have the strains which you demand. As to the meeting of European ~~micro-bio-geneticists~~, I think you will hear soon of it <sup>(from us)</sup> officially. It will be from 1-5 September, the place is not yet decided -except that it will be in Italy. Would you please keep this information private.

Yours sincerely

P. . I shall send a copy of this letter to Ledeberg.