Dear Esther & Joshua,

Merry Christmas. Hope you had a nice time in Australia. I had a very enjoyable trip and scientifically stimulating month in California. I saw Leroy on my return trip & we compared notes.

Thanks for the note about the origin of λ papa. All the markers ~~mutant~~ I am now using are ones which came from this stock (except 434 in 434 hybrid, of course.) I like Cold Spring Harbor very well and am getting about 10 X as much done per day as at Michigan.

I have no new mgos discoveries, but have written on the inside of the card some of the small facts about gal-duction which have come to light since I last saw you.

Regards, Allan

MAY CHRISTMAS AND THE NEW YEAR

BRING YOU EVERY HAPPINESS

Campbell* 1957

1.) Heterogenotes formed by transduction of lysogenic cells are mostly doubly lysogenic for markers in the immunity region. Gal⁻ segregants from these strains are mostly single lysogens

2.) 434 hybrid will give LFT. The transduction clones generally consist of heterogenotes which produce HF-T lysates like those of λ (giving i.e., the transduction of sensitive cells at low moi gives mostly defective heterogenotes, transducing particles apparently lacking markers from the h region.)

3.) If one transduces K(λ m₅ c) with λh, the proportion of gal⁺ recipients carrying h approaches 0 as the moi does. ∴ the "double lysogens" I obtain in my papers arise from multiple infection and are probably really triple lysogens with some kind of association between a prophage and a defective prophage which causes them to be lost together.

4) I want to study the segregation patterns of strains of the type K(λ dbf gal₁⁻)(434 dbf gal₂⁻) with other markers on the prophages, to determine the position of gal in the defective prophage. Such strains have been made by transduction of gal₁⁻ gal₂⁻ recipients with a mixture of lysates from homogenotes, but I have not yet completed the analysis.

5.) The system λ, 434 HFT is completely symmetrical with regard to all interactions studied; i.e., for any relation S, S(λ, 434) ⟺ S(434, λ). This includes the

genetic constitution of the transducing lines, their segregation patterns, and the "helping" phenomenon which gives rise to the multiplicity effect with sensitive recipients. The rule is that a non-transducing phage will help if and only if the recipient does not carry a prophage which is coimmune with it, irrespective of the immune specificity of the transducing "phage".