28th April, 1955.

My dear Frank,

I have copied out on the enclosed sheet, and Payne has checked, the correction formulae for what seems to be genuinely fiducial limits of the mean estimated as the weighted mean of two ~~mean~~ samples with independent estimates of variance. The notation has been assimilated to that of my paper on the asymptotic approach, and the calculations have been carried to the second approximation and expressed in terms of multiples of the angle θ and first and second degree expressions in σ and δ, the sum and difference of the reciprocals of the number of degrees of freedom. By analogy with the other work, corrections carried to the second degree should be pretty nearly right in the second place of decimals of the normal deviate.

I have a vague notion that Cochran has considered a somewhat similar problem, probably ignoring the discrepancy measure d, and tailoring a compromise value of s, and a non-integral quasi-degree of freedom so as to fit perhaps the second and fourth moments, but I could not recall the details of this work.

It would seem to be useful not only to compare Cochran's adjusted ~~point~~ Student's significance, if he gives one, with the unadjusted, but to

see how much difference in particular cases the inclusion of the additional observable d actually makes. As d may certainly be as high as about two without contradicting the hypothesis that the means are the same, it would seem from the formulae that it might be one of the most important ingredients. They are, I am afraid, inevitably fairly messy formulae, though they could be tabulated for a few chosen values of x, and perhaps 25 different values of d to give values like those in my first numerical table.

Let me know if you are doing anything with it.

I am enclosing a note from Harold Jeffreys suggesting that Daniels should be put up for the R.S. I do not know much of Daniels' work, but I can well believe that it is more fruitful than Bartlett's. We have not put up George Barnard yet, and it may be that he and Daniels could be put up together this year. I notice that Irwin is still in, but Pearson and Maurice Kendall have dropped out. I fancy David Kendall may be put up. I think we must try to keep the pot boiling.

Sincerely yours,

Encs.