

9th December, 1955.

My dear Frank,

Many thanks for the Kolmogoroff reference. I expect it is the paper that I am trying to get at, though I cannot be sure.

Payne's corrections will have triple entry for  $n_1$ ,  $n_2$ , and  $d$  for each level of significance, but it could certainly be done in about a dozen tables like Sukhatmé's. With such a project in view a bit of preliminary exploration would seem worth while. In fact I think the main importance of the corrections will always lie in comparisons between corrected and various types of approximate values which themselves will afford the ordinary practical means of testing significance, though owing their value to the facility with which their adequacy can be justified by a more exact approach.

I had in mind taking some of the comparisons which have emerged in your own department's experience with incomplete blocks, and comparing the approximate treatment used with what a more exact approach would give, e.g. you may be able to pick out single degrees of freedom ~~sensible in some cases~~, such as

phosphate versus no phosphate, in a factorial experiment with incomplete blocks. After making about a dozen such comparisons, I think we might know more what is wanted, e.g. possibly third correctional terms, probable precision required in tabulation, range of  $d$  probably required. How far will one want to go in pooling means ~~in~~<sup>for</sup> getting a weighted mean, when  $d$  is significant at some not negligible level?

On your last point, I suppose that when the differences between blocks are insignificant or subnormal the whole experiment is reported ignoring block differences, and for my part I do not see why it should not be. Of course it may be occasionally that this situation will arise by chance when block differences really do exist, and that in such cases the precision of the comparisons will be, though only to a small extent, over-estimated. I suppose if one's conscience gnaws one on a point like this, the right thing to do, after adequate experience has been gained, is to set someone to investigate exactly how great this over-estimation has been, so far as can be judged after the event, and thereafter to bear in mind, or put on record, how great a bias is to be expected from this cause if you were to continue to act as before.

Sincerely yours,