April 30, 1937

Dear Cochran,

I am glad ^you to have had a look at the contour integral, as the form of the result is likely to be of guidance in the other aspects of the problem you were discussing.

Very little seems known of the approximate validity of the analysis of variance when expectations are not linear in the adjustable parameters. It is clear that the procedure tends to be exact as the deviations from the fitted curve tend to zero, and, on the contrary, must be relatively inexact when these are larger. In the case of an harmonic curve, which is, of course, analogous to the exponental you have in mind, for the limit, when the whole observational variation is due to error, it appears that for larger samples the adjustment ^estimate of residual error is only slightly too small, but that the portion of the sum of squares ascribed to fitting may be much too large. This kind of result seems to me likely to be general.

In practice I should not myself hesitate to fit an exponential curve of the form you have by least squares form, especially with a view to detecting any effects of the theoretical inexactitude.

Yours sincerely