July 4, 1941

Dear Peters,

.I have been looking through the proof of your paper on Phenothiazine, and I daresay you have seen my letter to Leiper about it. I wonder if there are a few more points you could let me have, with a view to getting my head clear before the Committee meets.

First, you may have calcuated, and if not probably have the materials convenient for letting me have two subdivisions of the entry in Table 7 opposite 214 degrees of freedom, namely the portions which refer to counters $\times$ sheep 68, and to counters $\times$ sheep $\times$ days 136, these being the two ingredients which affect the precision of the comparisons. What I am doing here is quite academic, for, in fact, these 214 degrees of freedom are not greatly inflated.

The second point is much more practical, and correspondingly more difficult. In designing an efficient experiment, what one is aiming at is maximum precision for a given expenditure of resources in available, or transferable, time and money. Consequently one needs at least a rough estimate of the amount of additional trouble in comparable terms which different modifications will cause. Ideally we need a formula of the form

$$E = \alpha s + \beta sd + \gamma sdc + \delta sdcp$$

where $\underline{s}$ is the number of sheep, $\underline{d}$ the number of days, or occasions, on which they are sampled, $\underline{c}$ the number of counters employed, and $\underline{p}$ the number of parallel slides which each counts on each occasion. α then would represent the overhead cost of maintaining a sheep in the experiment, β the cost of sampling one sheep, and so on.

I am sure that even roughly approximate values for the coefficients would be sufficient guidance for all practical decisions; but it may be extremely difficult to get even rough values.

Yours sincerely,