

November 24, 1941

Dear Eliss,

I have left unanswered your letter of October 2nd, as during much of the time since then I have been actively concerned, with Yates, with the second edition of Statistical Tables.

As more and more different types of problems are referred to the standard tables of χ^2 , t and z , the use of these tables is inclined to become more indirect, and their original structure more or less inadequate. So far as my own experience of the z table goes, I think we have needed an increased number of levels of significance, rather than more values for n_1 and n_2 . You may be interested in this connection in the double entry table I have made, using six levels of significance: .10%, 5%, 2%, 1%, $\frac{1}{2}$ % and $\frac{1}{4}$ %, for the double tail in the problem of comparing two means where there is no justification for pooling the evidence in respect to error. This is a situation which rather seldom occurs in experimental work, but would clearly be the case, for example, when comparing the velocity of light estimated from the eclipses of the moons of Jupiter with the velocity estimated from experiments on the earth. In this table I have a number of degrees of freedom for which I use the harmonic series, 10, 12, 15, .. and an angle tabulated from 0 to 90 in 10 degree intervals.

I think it is a good idea to give the Greek alphabet with the names of the letters, somewhere, and the length of a rod I suppose would be useful to some workers in agriculture.

In respect to the type of varietal trial you have in mind, I think the varieties giving intermediate yields, although in fact they will be crowded together, have, properly speaking, the same precision as those with the highest and lowest yields. The function of Table XX is to make the best use of observations in which, as in a race, order may be recorded more easily than any numerical measure can be obtained. I had thought that the formula on p. 14 and the explanation starting on p. 13 gave the theory of the thing sufficiently.

With respect to your dosage mortality problem, I should certainly be inclined, if the value of \underline{b} were greater than that suggested by analogous experiments, to view the apparent precision with some suspicion, as you evidently do, and recalculate the precision on a value obtained from wider experience: but I should do so rather as a special resource, or additional caution, than as a routine procedure, for, in fact, the value of \underline{b} must really vary with different biological material.

Yours sincerely,