

29th May, 1935

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Dear Cochran.

Many thanks for giving thought to the rather subtle point about the extended interpretation of an observed value s . If you remember, I had the thing printed in two paragraphs of which the first developed the argument in your letter, that the ratio of the true variance of the treatment means to that of the true variance due to error does not, at the 1% level of significance, fall short of a calculable quantity. In the second paragraph, I inserted the estimate obtained from the data for the error variance, and inferred a probable error limit for the different treatment variance, then adding that, apart from the inappropriateness of considering a normal distribution of treatment means, the test departs from strict rigour in making this substitution without allowing for the fact that s is only an estimate based on 20% of freedom.

It does seem, however, relevant that the value of s originally chosen in assigning a fiducial limit did take full account of the fact that s was only an estimate.

The inexactitude, in fact, seems only to arise when we pass from one multiple, about 8, to a lower multiple, about 7 of this estimate, ^{and} though I am, or have been whenever I have thought about it, fairly convinced that the argument is not wholly rigorous, it may be that, practically, it is so near the mark that in emphasising its lack of rigour, I am giving disproportionate importance to a small point, or, as I put it, being over-cautious.

In case you would like to probe the question further and I think it is one which will certainly require discussion later - I am sending the two galley pages in which the point is discussed.

Yours sincerely,