

2nd November 1933.

Dr. F. Yates, B.A.
Harpenden,
Herts.

My dear Yates,

Mainland seems to have got on to an interesting point about χ^2 . In getting Pearson to fill up your form for the Statistical Society, I lent him a copy of your sampling * experiment with Eden, and you may be amused to see his reaction. To see the thing in perspective one must remember that the appropriateness of the normal distribution in hypothesis to be tested by tests of significance, was never questioned, as long as the inexact tests were in use which T and Z later replaced. That the critics did not enquire why, or in what circumstances the normal hypothesis were appropriate, but insinuated that the T and Z distributions were inaccurate, although both in Student's writings and in mine the normal hypothesis has always been explicitly stated. That such inaccuracy was never ascribed to χ^2 mildly to T on which nearly all experiments were made, and strongly to Z, before any had been made on it, and in consequence the experiments that were made, were rather inept and futile for the purpose of judging when the normal hypothesis were appropriate because of the defects you point out.

* [T. Eden and F. Yates (1933) *J. Agric. Sci.*, 23, 6-17]

As to a the artificiality of the distributions chosen, b the extreme smallness of the samples in many cases, c the inadequate extent of sampling, and d the absence of consideration of the effect of ^{randomisation}, which your experiment so well brings out.

The general effect of these criticisms in so far as they have percolated through to men actually engaged in research, seems to have been practically nil, but their effect in ^{disuading} Mathematical departments from teaching the simple applications of these tests, may have been considerable, and indirectly this may lead a good many departments to whom ^{students} go, to take a much less useful part than they might in Scientific work of their colleagues. It looks as though a good deal of hammering away would be necessary before all the mischief of this sort has been undone.

The Ministry have asked me to continue on the Crop Weather Committee, but I assume they have asked you too

Yours sincerely,