

July 23, 1940

Dear Jackson,

Thanks for your paper on Tsetse flies, which I am glad to have for the Annals, though, and I hope it may not be too late in suggesting this, I rather hoped you would take the opportunity of going into the problem of interpretation in more detail. I am particularly glad that you have included the actual primary data as well as tables of various derived statistics.

There is one quite salient fact, which I do not remember your mentioning, and which may bear on the evidence for rabbits; that is, that when you record of a batch of flies A, recovered in its own sub-square B <sup>in</sup> and the two neighbouring sub-squares, and C, in the opposite corner, your data show generally B<sup>2</sup> exceeding  $4AC$ , and this often quite significantly. I do not think you would expect this for squares set down at random in the country, but it would follow if a number of rabbits involved two adjacent sub-squares though none involved all four. The Club-house in the middle, as I fancy you said it was, not being placed in a seasonal marsh. Let me know if you see any sense in this, as of course at this end it is possible for me to get some of the facts inside out. The discrepancy I speak of is, however, too striking to be without some substantial cause.

The factor, I think about  $3/4$ , by which you find estimated fly densities should be reduced is really the average value for different flies caught in the square of the fraction of its time which it spends in the square. One can equally make the correction by regarding the fly population as estimated as inhabitants of an area larger than the square actually sampled, and this is a way of looking at it to which I have always been inclined. The additional area to be so included would be, I think, to a fair approximation a belt of fixed width surrounding the sample area. In saying this I am not concerned with geometrical niceties, such as whether if the width were one-third of a mile you should regard yourself as estimating the population of an area  $4 \frac{2}{3}$  miles square, or whether the corners should be rounded off, or even the additional area taken proportional to your actual perimeter. These differences in convention would give mathematically different laws connecting the size and shape of your sample area with the factor of adjustment, but I imagine no available or easily conceivable data could be accurate enough to make the fine distinctions between them.

In the cases of recapture curves showing an appreciable curvature I should have been tempted to use an extrapolation formula allowing for the curvature rather than to rely on only the first two weeks recaptures. However, these often contain a large proportion of the recaptured flies, and there may not be a great deal of precision to be gained by taking the later weeks into account. In any case I am sure the publication of your full data ought to stimulate others to try their hands at the problem of interpretation, and if I understand your paper right, you have already satisfied yourself on the main apparent discrepancies which were worrying you during your 1st stay in England.

Yours sincerely,