

30th. September 1946.

My dear Henry,

Thanks for all your letters. I immediately had a go at the 1946 data using the methods you know about, and they contain a number of surprises.

The first point, since both Carter and yourself found the moths very abundant and as also the catches were very large, it was surprising to get estimates of only about 1500 in the central period July 18th. - 22nd., namely, 1324, 1358, 1657, 1500, 1405. These are so consistent and are based on so many recaptures that I think they must be substantially right; e.g. on 18th. there were 46 marked insects out of 158, nearly 30%, so that in the estimate of 1405 we should find 421 marked, which is really about as many as we can suppose to have remained alive from the previous markings.

Next, what has some slight bearing on the above, the death rate seems to be a little higher than in previous years. The total days interval of recapture is 371 days against 390.312 expected. Not a great difference, but I think it may mean that the average life was more like 5 days than 6. Perhaps the weather was bad.

As you know in the past I have taken the constant death rate as a sufficient approximation to the way they survive. This year for the first time I have evidence of the death rate increasing with age, as is eminently reasonable but rather troublesome, since the ages are all unknown, and any theory based on increasing death rate is bound to be hedged about with more uncertainty. The evidence is,

however, clear. Recaptures at interval one day number 53, where 49,336 were expected, from 2-6 days they are 105, against an expectation of 50,040, and more than 6 days there are only 2, with an expectation 10,625. That it should show up this year has doubtless been facilitated by the very abundant data gathered, but is none the less surprising in view of the shorter average life experienced this year. I imagine it has always been the fact in previous years and probably explains the curious circumstance that our estimates of highest frequency always came later than the direct estimates of abundance would suggest. The same thing occurs this year with estimates of 2937 on 24th. and 4245 on 26th. There was also this year an estimate 3153 based on one recapture on 16th. and infinities based on no recaptures on 12th., 15th. and 30th. I hope soon to make a recalculation with a life table showing an increasing death rate. At least it will be possible to see if the main conclusions from the days on which data are abundant are in any way modified.

It will be most enjoyable if I may stay the night of November 15th. with you. I am afraid it will have to be only the one night, but I hope you will be able to make a visit here some time in the winter.

Yours sincerely,