

February 15, 1937

Dear Ford,

Thanks for telling me of your idea about optimal conditions. I really think this may be extremely valuable. It is quite new to me and I have not yet thought about it at all sufficiently; the case of cross-over ^{in juvenis} seems particularly suggestive.

I have now put in some work on the Cara data. You will remember that butterflies recaptured are not dated as to the time of their release, so that the natural death-rate is a conjectural factor in the calculations. I tried first comparing the consequences of 0, 10 and 20% elimination every day, and in each case the calculated size of the population increased so as to be much greater at the end of the experiment than at the beginning, though less so the greater the rate of elimination postulated. Now, am I right in supposing that the experiment terminated with diminishing catches on the last two days because the numbers available for catching had become fewer than they had previously been? If so, it would seem that higher rates of elimination must be postulated, and at 50% per diem I find, though the apparent numbers still increase, they do not do so excessively.

Probably, of course, the death-rate is lower in the earlier period, and rises during the course of the observations, and this would tend to increase the estimates for the central period and decrease them at the ends compared with my figures. With some such modification the 50% series may be nearly right. It leads to numbers of the population of butterflies, with which the surviving marked individuals are mixed, of the order of 1,000. I hope this seems reasonable, though it is, of course, very roughly estimated. With 109 caught in one day it would seem that the whole population were fairly active.

You may think that 50% elimination daily is unreasonably high, and I shall be glad to get your opinion on this, and to discuss the figures with you more in detail. At the moment I seem to have left them at home.

Yours sincerely,