

HARVARD UNIVERSITY
BUSSEY INSTITUTION FOR RESEARCH IN
APPLIED BIOLOGY
FOREST HILLS, BOSTON, MASSACHUSETTS

May 28, 1932

Mr. R. A. Fisher
Rothamsted Experimental Station
Harpenden, Herts.

Dear Mr. Fisher:

Your very interesting letter of May 17 has just arrived. I am mighty glad to have the stable population figures, as I figured no more than four generations. I assumed that the reader would see that there was an excess of Longs over Mids and that the tendency was to reduce to a small percentage the Mids and Shorts of the balanced lethal condition.

You may be interested to know that when my 1927 paper was written, I accepted the idea that $M_{1a} \times M_{1A}$ gave 1 Long : 2 Mids : 3 Shorts; and that $M_{1a} \times M_{2A}$ gave 1 Long : 3 Mids : 4 Shorts, because of the assumed death of the homozygous Mid $M_{1a}M_{1a}$. I thought of making the comparison. But after having selfed some of the assumed single heterozygous Mids and having obtained Mids which gave no Longs when crossed with Longs, I felt justified in abandoning the idea that these single homozygous Mids were lethal. If that idea is abandoned, then both types of crosses give 1 Long : 3 Mids.

I do not feel, as you do, that the apparently homozygous Mid plant which gave 1 Long to about 500 Mids is necessarily of any particular interest. It was a characteristic Long, though no genetic tests were made with it, as I had then planned to abandon the *Lythrum* experiments as too tedious and unsatisfactory. But I think no plant geneticist would attach very much importance to a single rare exception of this kind, though if tests of the right type presented themselves, he would test it out. We deal with gardeners, and though we try to guard mistakes, one out of five hundred mistaken labels, misplaced plants, etc., is about the best we can do. I have checked this experimental error several times, and some years get it down to one out of a thousand. I am not particularly attracted by the suggestion that it is merely a M/M with exceptionally close linkage. To accept it as a mistake seems to me preferable, since, in dealing with the populations where supposedly homozygous Mids threw Longs, the suggested linkage was really about ten

5/28/32

per cent without any exceptional variation. You may not agree with this last statement, since my Table I could be taken to show rather extreme variation by the application of mathematical criteria, but I am really basing these conclusions on certain populations where the numbers were rather large.

In answer to your question a under paragraph iii, let me say that I did not intend to suggest that there were other species of plants which behave in the manner of the *Lythrum*. I only meant that, taking all the data together, it seemed to me that they were consistent with the idea expressed in the two-lethal theory, but in no sense gave it critical support. The theory is attractive, as you say, and it may be that better evidence can be obtained, for or against it, with other material; but variation in germination, the indications of selective elimination of gametes and zygotes, the tendency towards self-sterility, and the difficulty of manipulation in *Lythrum*, have led me to abandon further work. At the same time I am very much interested in your idea of following out the mathematics of these and similar cases, for it seems to me that we must have such work done to know what types of evolution to expect in cases like these, even if the cases are only plausible.

Sincerely yours,

Em. East

EME:R