

June 28, 1940

My Dear Ford,

Thanks for your letter about Callimorpha dominata<sup>ul</sup>. It is good that the brood you have got so clearly confirms your first genetical interpretation. Modification of the heterozygote during spread would be of very great interest, since I was at first so convinced of the slowness of dominance manifestation that I scarcely thought it could make much progress until the gene replacement was complete, after which it would have to rely on back mutations. However, the numbers of heterozygotes during spread are so very large compared with those arising from mutation rates that I should now guess that I had at first misjudged the situation - thereby following in the footsteps of Darwin - by assuming that the process was must always act as slowly as it seems often to have done. As a foundation for this comparison your four old specimens of medio-nigra are particularly precious, and I imagine you will set aside a few of your new brood as exhibits of the 1940 model.

I am growing here six progenies of Lythrum salicaria comprising about 1400 plants, and these have done fairly well, though they have been held back a little by lack of rain. I do not expect

to be able to score any number to matter before mid-July. These are all progenies of randomly chosen short-style plants crossed with long, and are meant to find one or more such shorts carrying a gene or genes determining mid-style length. Two years ago I tested ~~ten~~<sup>four</sup> and found one such short; this year we are testing eight, two of the progenies being grown at Merton.

Our most interesting progenies, however, grown this year are reciprocal crosses between a short mother and mid daughter from the material examined in 1938. As these must have the same mid gene, the question whether such a gene is lethal should appear now in about a month, by seeing whether the progenies segregate 1 Long, 3 Mid, 4 Short, or 1 Long, 2 Mid, 3 Short. I hope the distinction may be clear, as we have about 250 plants in each of the reciprocal progenies. If the former occurs, East's theory of lethal falls down, and we shall have to test a number of short offspring with a view to finding homozygotes; which have so far, apart from one questionable case, eluded the geneticists who have worked with Lythrum. What may make the interpretation difficult, if we get about twice as many Mids as Longs, is that this might be brought about by a lethal linked with the Mid gene. The elaborate cross-fertilization mechanism in Lythrum certainly suggests that deleterious homozygotes may be ~~followed~~<sup>found</sup> when inbreeding is practised, even though we work only with legitimate fertilizations.

Yours sincerely,