STRAND, W. C. 2.

30th June, 1930.

Dear Fisher:

I am still engaged at odd moments in delving into your book. Some of the mathematics is quite beyond me, but the theory of the evolution of dominance I do not feel sure about.

Have you considered the case of <u>Oenothera rubricalyx</u> ? This undoubtedly arose as a single gene mutation which was dominant from the start, the original plant being heterozygous; it has never occurred but once, and shows striking dominance when crossed with innumerable other varieties and species.

There is another connection in which your views interest me very much, and here I think you can help me. In my book "Heredity in Man" I wrote a chapter on the blood groups. A and B are both inherited as simple dominants; they are purely physiological differences and apparently neither of use or detriment to the organism. A has its highest frequency in the populations of Western Europe, and B in the orient (China and India). Isolated races such as the American Indians have no B and little or no A.

I gather from your mathematics that if A and B

originated as mutations, the mutations must have occurred repeatedly in order for the spread of these genes to have taken place. It is usually stated in general terms that the various percentages of A and B in different populations could be accounted for by (1) migration and (2) crossing of peoples. Of course the percentages of A and B have been determined in thousands of individuals from different races all over the world. Is there any mathematical method by which from the present percentages the rate of recurrent mutations could be deduced ?

Also, what do you think of the relative importance of hybridization and migration in distributing these genes ? On account of various effects in their racial distribution I, and others as well independently, have concluded that B arose considerably later than A.

Yours sincerely,

R. Ruggles Gates