

3 July 1930.

Professor  
R. Ruggles Gates,  
King's College,  
Strand, W.C. 2.

Dear Ruggles Gates,

I suppose mutation rates are really very variable from mutation to mutation, but I think the frequency of repeated observations of the same mutation in Drosophila would have to be much higher than it is, if any large proportion of them had mutation rates much exceeding one in a million. The argument depends somewhat on the frequency of brother x sister matings since the great majority of cases are clear recessives, but such matings, or equivalent back crosses, are certainly very frequent in the routine work.

I am interested that you think the 2-factor theory of blood groups is still in the running. Which interpretation one adopts about this does not, however, affect the <sup>necessity</sup> recessives for either selection, or ethnographically limited high mutation rates. At least if one takes the view that A and B have arisen, say, since the first colonisation of America by modern Man; for this must be of the order of 1000, or at most 5000, generations ago.

Yours sincerely,