TELEPHONE:
TEMPLE BAR 5651.
(4 LINES)

STRAND, W. C. 2.

2nd July, 1930.

Dear Fisher:

I gathered from a passage in your book that you
probably regarded all mutations as having begun first as re-
cessives, and later become dominants, but evidently I was
mistaken in that. I, like you, am inclined to doubt if any
mutation is strictly completely dominant in the quantitative
sense.

As regards rubricalyx, it has the same chromosome
linkage (four pairs and a ring of six) as rubrinervis, from
which it arose, and all the evidence shows that it was ori-
ginally a simple gene mutation.

With regard to blood groups, of course Bernstein
and Furuhata have proposed a multiple allelomorph series, O,
A, B, but from later evidence I am rather inclined to favour
the view of two pairs of factors with linkage and crossing-
over. 10^6 generations certainly seems a long time, and it
seems impossible that the gene A arose, as much as 25,000,000
years ago. In your book, if I remember, you postulated mutation
rates of the order of one in one million. I do not quite
understand the basis of this estimate, which seems to me low,

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-2-

if Drosophila is any sort of criterion, but perhaps my mathe-
matics are astray !

I take it that as regards the dispersal of A and
B, crossing and migration of races alone without repeated
mutations would not be adequate to account for the present
frequencies.

Forgive me for troubling you, but it seems to me that
if anything can contribute to analysis of this kind, your
mathematics can.

Yours sincerely,

R. Ruggles Gates