9th. September, 1929.

Dr Sewall Wright,
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        The University,
            CHICAGO,
                Ill., U.S.A.

Dear Sewall Wright,

Many thanks for your letter of August 28th, which is
not only exceedingly interesting in itself, but helps me to
understand the larger paper, which I have been puzzling over
occasionally to some time.

I have so far published nothing on the diffusion problem,
but have in the Press a book on 'The Genetic Theory of Natural
Selection', which has part of a chapter on the cohesion of
species in relation to the problem of their fission.   I
think it must be generally true that the ancestry of all
individuals of a species is practically the same except for
the last 100 or perhaps 10,000 generations, and that a gene
frequency gradient is maintained by selection between
different parts of a species' range.   So that well marked
local variations may or may not be incipient species, according
as real fission, cessation of diffusion, ultimately supervenes.
My discussion of this point is necessarily superficial and

qualitative, but may have some points to interest you.

Haldane has brought up <u>Apotettix</u> and its allies
<u>in re</u> the dominance problem, and I fancy that discussion
of the group may in the end be fruitful. Do you know
Nabours? and if he has, or would be willing to obtain the
relative frequencies in nature of his dominant types. I am
inclined to suggest that they must be great enough to imply
a selective stability of gene ratio due to heterozygous
advantage.

By the way, here is a case in which $_\wedge^a$ small selective
advantage seems to be totally ineffective. Suppose there
is only one (haploid) chromosome with no crossing over.
Occasionally, advantageous mutations arise giving advantage a;
it will take something of the order of $\frac{1}{a}$ generations for
one of these to establish itself effectively, and it will
fail to do so if in the mean time a better mutation occurs
elsewhere, i.e. in the unimpeded part of the population, for the
improvements have to "queue up" to pass through a single door,
and the more valuable press the less valuable aside.
If $v\,da$ is the frequency of mutation as good as a,
there will be a value of a (say b) given by something like

$$b \leqslant \int_b^\infty v\,da$$

such that mutations giving advantage $> b$ have a reasonable
chance, while those giving advantage $< b$ will certainly fail

to establish themselves.

With several chromosomes and crossing over there are many and wider doors, and I do not know how low the qualification may become, but the point is relevant owing to the small amount of crossing over in <u>Apotettix</u>, <u>Lebistes</u>, <u>Helix</u> etc., all I think, polymorphic forms in nature.

Yours sincerely,

R. A. Fisher