

6 January 1931.

Major L. Darwin, Sc.D.,  
Cripps's Corner,  
Forest Row,  
Sussex.

Dear Major Darwin,

Thanks for your two letters, which I am answering together. I saw the very kind notice which "The Times" again gave me, but have not yet seen the "Journal of Heredity". I have asked Moore to send me the Eugenics Society Library copy; I wonder if it is Muller, or Wright, or someone else. I hope to see Chalmers Mitchell in a few weeks and ask him if it is he who was so kind to me in "The Times". By the way Eldon Moore thinks it was Hogben who gave the very stupid review of your big book. I mention this in the hope that Mitchell was innocent.

*Proportion*  
The ~~number~~ of recessives in a perfectly mixed population is  $\frac{1}{n^2}$ , and the effect of cutting off the offspring of defectives is to increase <sup>by</sup>  $n \log 1$  in each generation, so starting at about 3 per mille, we would have :

$$\frac{1}{18^2}, \frac{1}{19^2}, \frac{1}{20^2}, \frac{1}{21^2}$$

or 3.086, 2.770, 2.500, 2.268 per mille

the percentage decreases being

10.25, 9.75, 9.30.

At the higher level of incidence of 10 per mille, about the correct incidence in growing children, one has

10,000, 8.264, 6.944, 5.917 per mille

percentage decrease 17.36, 15.97, 14.79.

The additional effect produced in the next generation can ~~thus~~ <sup>not</sup> reasonably be described as comparatively little. It is quite untrue that selection "would have to be continued indefinitely to maintain even the ground gained". Of course selection in favour of the carriers might partly or wholly or more than wholly neutralise the selection against the defectives, but the "ground gained" by this latter selection, is the difference in incidence between that achieved and what it would have been without selection, and this gain <sup>this</sup> requires no continuance to <sup>maintain</sup> stress it.

Hill is good in saying that however little is achieved in this way it ought to be done.

The slight fall in the successive percentage decreases is wholly due to the defect, upon the theory of uniform diffusion, becoming less and less <sup>concentrated</sup> accentuated in its incidence as its frequency is diminished. Actually it is certainly not uniformly diffused at the moment, and the immediate effect of selection would doubtless be higher; my point here is

that concentration is itself affected by social <sup>changes</sup> contact;  
for example improved ascertainment ~~of~~, or the increased use of  
intelligence tests in vocational guidance might well lead to  
an increased concentration. You know what I think about  
ascertainment of heterozygotes.

I hope these notes may be of some help when you are  
writing a note on Hill.

Yours sincerely,