

Cripps's Corner. Forest Row. Sussex.

Aug 2. 28

My dear Fisher.

As to your letter of July 14, I fear I did not make myself quite clear as to what I intended to say about crossing the central line. I intended to reduce your figure of 700,000 to 600,000, or 300,000 males. I want to reduce it far enough, ^{for you} to give it your blessing in print, carefully safeguarded. Would it do to reduce to 500,000, or "half a million" in all and a "quarter of a million" males? This gives the idea of round figures. It may, I will send you exactly what I write, so that you can advise further reductions if need be. This won't be just yet, so don't trouble about it now.

You say "how can a beneficial mutation occur?". My idea is this, and I have little doubt it is yours also. A mutant form will give rise to ^{other} mutations with different frequency to the parent form, some ^{of such} mutations coming more frequently. When several mutations have occurred and been established, one on the top of the other, as it were, quite new mutations will.

[Subsequently

occur, some of which will be beneficial. This is what you describe as a change in the genotype of the species, I suppose.

You spoke somewhere of a beneficial mutation being quickly established. This I agree with in general. But when a mutation ~~occurs~~ occurs in the composition of the blood, for example, its tie to the composition of the brain, if that is an independent variable, will make the establishment of the mutation a slow process. And the establishment of a number of such mutations, one on the top of the other, ^{will be} extraordinarily slow.

I think I was a bit confused about Pearl. His argument, I take it, is that such cases as Rose x Pea producing walnut combs proves that in heredity "you never can tell". This case depends entirely on dominance, I suppose. If the total variance of any quality in a species is to a considerable extent free from dominance, does not Pearl's argument to that extent fall to the ground? Then again how could dominance of both rose and pea over single have arisen? Rose and single, for example, are

So different that they could not be found together in one species; or any similarly great difference in any race of man. ^{Therefore} ~~How~~ dominance could not have arisen in nature by the superiority of rose over single. I guess there was in nature some form slightly different from single, which was superior to it and thus acquired dominance over it. And then a large mutation occurred in this slightly superior type, which carried dominance over single with it, and took the form of rose — or 7-peta. But this is unlikely to occur in nature, for such big mutations are generally fatal. Thus Pearl founds his whole attack on a state of things which could not arise in a single race of human beings. He should give one single case where like does not produce like, in the sense in which we use these words, and then we might begin to listen to him.

This is an odd case, — the rose, pea, w about and single. I should have picked out single as the normal type, and therefore have suspected it to be dominant.

Enough — yours sincerely,

L. Darwin

under natural conditions