

Dear Fisher.

I want to put down my ideas, to get them out of my head; though I have a fear I shall talk nonsense. These questions get harder to tackle as years go by with me.

If the links of a chain begin to vary in length, + and - equally, the chain will vary in length also. The fewer the links the more it will vary. If there are an infinite number of links, it won't vary in length at all. This assumes that the variations are proportional to the size of the links in magnitude. Now if this is bosh, all I have to say is bosh also.

Take a giraffe's neck. ~~Its~~ Its length may depend on (A) a single factor regulating its length. (B) a number of factors all independently regulating its length, & (C) a number of factors each regulating the length of the different bones the which make up its length. (A) will be the plan which, assuming proportionate mutation, will produce the most rapid change of ~~its~~ length of neck, and the greatest scope for natural selection. Length is a specific character, and by a somewhat circular argument, I

believe that the length of the giraffe's neck is largely regulated by a small group of factors.

If the giraffe's neck depended on a great many bones, and if each ~~bone~~ ^{bone} mutated quite independently, then the field for the action of natural selection would be exceedingly slowly formed. Then it would not be likely to be a specific character.

Take the difference between being warm- and cold blooded in animals. Is not this somewhat similar to the giraffe's neck on the supposition that its length depended on a very large number of factors, all mutating independently? If so we see why such changes are very slowly brought about.

The less room for the action of natural selection in regard to the length of the neck of the giraffe, the more room for action in other directions. When dealing with cases like (C), and such fundamental qualities as those dividing between warm and cold bloodedness, a large number of such qualities or characters may be simultaneously changed, all exceedingly slowly.

Of course where mutation is slowly producing

change in a quality dependent on many independent factors - or in a correlated group of qualities - the variation in time might become great. But there would be longer for selection to act, and this is not a complete answer. If the effects of mutation, as in (C), are slowly produced, the results of selection must be slowly achieved.

If the size of the eye is of no moment to the animal, selection will not act on it. But then ~~the~~ the variability of its size will depend on the number of independent factors on which it depends. And we here have my old stumbling block - what does keep down its variability in such circumstances.

As I have said before, I have grave suspicions that I am blundering. So don't waste your time in pointing out the pit fall in which I am fairly comfortably residing

Yours sincerely,
J. Darwin