

Cripps's Corner. Forest Row. Sussex.

July 21. 30.

My dear Fisher.

I ought to have answered enclosed long ago, & I now return them so that you shall know readily what I am writing about.

I believe that you are in the right, but I confess I do not ^{quite} follow the connection between early migration and better nutritional conditions. Another example might make your meaning quite clear to your readers. But do not trouble to try to clear my foggy brain.

What you have to do, I think, is to show how beauty can, by favouring early mating, make the individual more prolific, and yet not make him less prolific by inducing too early mating. I will amuse myself by sketching my ideas a little fully.

Some birds of some species regularly migrate south in winter, whilst others do not; or, at all events, there is how migration began. The two groups must be multiplying equally quickly if equilibrium is being maintained. The ^{winter} death rates in the north and south must be the same therefore. The numbers migrating south must be such as to keep these death rates equal. If too many migrate south, and too few remain north, the death rate in the south will be abnormally

high and the death rate in the north abnormally low; and in this way equilibrium will be ^{by natural selection} regained, if the movements are instinctive. (Does not natural selection thus always make for a maximum population?) Much the same must occur with two competing species, one migrating and the other not; and the winter death rates will be the same, unless the summer birth rates are different. The date of ^{returning} north will be such as, taking competition with non-migrating species into account, ^{to} result in the maximum rate of multiplication. The migrating birds might, therefore, tend to arrive after the otherwise optimum time for breeding; in which case natural selection would ~~not~~ introduce a compromise date for the return north. But that date ^{of return} would still be later than the optimum breeding date; and then, ex hypothesi, the more quickly breeding takes place, the greater the probability of racial survival, ^{in the individual}.

~~And~~ Sexual selection cannot hurry up the date ^{in these circumstances} too much, and beauty will be felt favourably. Taking the other alternative, ^{viz} that the birds arrive after the optimum breeding date, migration dates and breeding dates will ^{then} be independently regulated. Natural selection will make ^{the} birds disinclined to breed before the optimum date; but the sooner ^{he} breeds after ^{his} instincts

was ^{him} ~~them~~ that at the time has come, they more
propitius will be the individual. Beauty won't
make him breed too early, because of their instinctive
objection; but it will be beneficial immediately the
deme is crowded; and the necessary condition for the
action of sexual selection is fulfilled.

Certainly both breeding and migration rates
are largely dependent on nutritional conditions,
but I see no more direct connection than that
sketched above.

I see that Salisbury - I think that is his
name - is at it again in Nature. His error
seems to me to boil down to the incapacity to
see that though a lower ^{or} death rate, if selective,
means a slowing down of the rate at which
natural selection acts; ~~not~~ ^{not}, as far as I can see,
however small the selective death rate may ^{be}, natural
selection must continue to operate. Every death has
an effect on the proportion of the genes remaining.
I suppose he has rather in mind big mutations,
which, I think, must be single factor changes. Here
he should remember that if a potential mutation occurs
in one in 1000000 seeds, it will occur in one in a
1000000 grown trees; and that will do the trick.

Yours sincerely

Leonard Darwin