CRIPPS'S CORNER,
FOREST ROW,
SUSSEX.

[August 1915 or earlier?] FAB

Problem

Imagine a species composed of a group of ~~races~~ genotypes, all of which breed perfectly true as regards their average descendents, or the parental Correlation coefficient being 1·0.

Imagine these ~~races~~ genotypes as regards any one character to be distributed about a central form according to the normal law of Error.

Then imagine these forms to begun to fluctuate, the fluctuations not being inherited.

What is the law of ancestral descent?

Does not the parental

correlation coefficient merely indicate a relationship between the standard deviation of the genotypes before they began to fluctuate and the standard deviation of the fluctuations?

Would not the regression be for one generation only?

Does not Galton's law of ancestral descent agree in this, that if you breed from a selected stock the regression does not affect the third generation, assuming all grand parents selected?

How does such an ancestral law of descent differ from what is found to exist?

2nd Problem

If there are mutations & fluctuations, in what conditions if any do the fluctuations have effect in the action of Natural Selection?

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P.S. on another point

I think what I said about birth intervals is correct, though the matter is not quite simple.

(1) If the age of parents decides the number of children, then widening the interval effects the long-lived (fit) and short lived (unfit) to an equal proportionate effect, & no eugenic effect is produced.

(2) If the number of children is fixed by nature independent of age (ie depends in any degree on the number already born) then the proportion of the fit who reach the maximum set by nature will be relatively greater than the proportion of the unfit.

(3) If the number of children is (or would be if they survived) fixed in advance by the parents, then the fit will reach the maximum more often than the unfit.

(4) If prudence makes the healthy and the unhealthy limit more in the earlier years, will not the eugenic effect on health be increased?

(5) Will not in all circumstances limitation continue to be dysgenic on the whole, though less dysgenic with limitation?

(6) I think (2) & (3) are sufficiently certain to justify the broad conclusion.

If ever you like to write a short note for Nature on this point, avoiding all pit-falls, please do - I feel too uncertain.

L-D

[August 1915 or earlier] JHB

CRIPPS'S CORNER,
FOREST ROW,
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Dear Fisher.

Thinking over your sexual selection point again, I see how an aesthetic taste is aroused through the desire to select the healthy; and I am not sure if this has been remarked on elsewhere. But further than that I as yet fail to follow. Take butterflies. No male beauty would on an average be more prolific than the ~~female~~ non-beauty. But this would be because he is sought after by

the female. But take a female who cares for male beauty less than the average. Would she not get a mate all the more easily, having the ugly to pick from? Would she not be more prolific than the average? This would only be harmful to her stock if it led her to prefer the unhealthy. If it made her take the male less exposed to danger it would benefit her stock. But possibly I don't quite see your point. Don't write on this. I am only writing because it comes into my head.

One word more about my problems. I am, as you see, building up ideal conditions & seeing how far they work like nature does work. You say the parental correlation = grandparental = $\frac{\sigma_1^2}{\sigma_2}$, on my suppositions. This is I presume an hypothesi. Next assume mendelian inheritance, but with blending to make it easier. The factors being immutable (except for fluctuations?), but – like the genotypes before – being groups round a centre as regards each character. Take such a relationship between the σ of the fluctuations, and the σ of the immutable characters

of the factors as will make the correlation coefficient between father & son = 0.5. Problem, what will be the C.C. between grandfather & grand children? If it works out at 0.3 we have as it were imitated nature. I have no doubt that if I was not stupid at mathematics I could answer this from what you have said. Don't trouble to write. I am only suggesting points that I should like to talk about.

We always imagine fluctuations as due to differences of environment. But I see no reason why the germ should not fluctuate in a uniform environment, somewhat like a pendulum may swing in a vacuum.

Yours sincerely
C. Darwin