

On the Large Advantage of Bi-parental over Uni-parental Generation

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On ^{the} ~~an~~ ^{the} ~~certains~~ large advantage of Bi-parental over Uni-parental generation.

An organism is presumably ^{grows} formed out of many ^{units, all of which are} necessary ^{to its development} units, any one of ^{them} which may be absent from a ^{single} Uni-parental germ, but is less likely to be absent from both of the two ^{whose combination} germs that form a ^{zygote} zygote. ^{the gain in} The gain in safety will now be shown to be enormous.

There are 2 stages to be considered, -

I. Let M be one of these ^{necessary} units & let it be absent on the average in one ^{out} of every R germs, the chance of its absence ^{in any one germ} will therefore be $\frac{1}{R}$. Let a zygote be represented by a couplet of letters, ^{in which m} which m be used to signify the presence of M, ^{in the germ} and μ its absence, ^{then} and if the first letter in the couplet refers to the male germ, and the second to the female germ, then the four varieties of ^{will} zygote take the form

so familiar to Mendelians of mm , $m\mu$, μm , $\mu\mu$, which ^{and they} will occur with equal frequency. In other words, the absence of M from a particular germ ^{will be} is three times as frequent as from a zygote, whatever the value of n may be.

II. We may be sure that units of many different kinds are necessary to ^{lay} the ^{formation} formation of the future animal. I do not venture to guess their number but ^{will} call it m . Then the chance of all ^{these units} ~~of them~~ being present in the zygote ^{will} be 3^m times ^{greater} ~~as~~ ^{than} in a single germ. This ^{increase of safety} value becomes enormous even when n is only ^{in value} moderate. Even if ^{we were} ~~it~~ were ~~only~~ $n = 10$, ^{3^{10}} ~~it~~ would exceed fifty-nine thousand.