VI: THE PURE LINE (Walter 97)

10. Pure Lines and Natural Selection (Walter 118)

[contd] From the foregoing statements it appears that

by means of selection within a population, such as occurs normally in nature,

it is not possible to get anything out that was not already there to begin with.

If this is so,

the origin of species cannot have come about, as Darwin thought,

through natural selection by a gradual accumulation of slight favorable variations.

The best that selection can do is to isolate pure lines. Within pure lines it is quite powerless to change the genotypical characters. In other words,

natural selection can only maintain and strengthen the frontier posts that are already established.

XII: "PURE LINE" INHERITANCE

"PURE LINES" AND NATURAL SELECTION

12:2.1 It would appear, from the preceding paragraphs, that

in applying the principle of natural selection in a natural way to large populations,

we could not hope to get anything out that was not already there to start with.

Now, if this is true,

if Johannsen's experiments really demonstrate this to be a fact,

then the origin of species could hardly have come about

through unaided natural selection as the result of the gradual accumulation of small and favorable variations, as Darwin originally taught.

In other words,

it seems the province of natural selection to preserve and strengthen the new and unusual things which may appear on the biological frontiers,

It cannot break into the wilderness and create new centers (W 118).

rather than to originate new characters or give rise to new species.

12:2.2 It seems to be a genetic fact, established by many experimenters, that

[contd] Since the extreme members of a pure line, having the same genotypical constitution, always tend to backslide to mediocrity within the limits of the line in question,

the unusual members of a pure line unerringly backslide toward a mediocrity characteristic and average for their ancestral type.

the crucial question is: How can the critical step from one genotype to another, a step indispensable in the evolutionary derivation of species, ever occur? That it has repeatedly occurred in the course of time is amply proven by the fact that somehow or other we have gone from Ameba to man (W 118).

So, then, if there has been a progress in evolution, it must have been due to causes other than, or supplemental to, natural selection. This conclusion drives us, then, to an acceptance of one or two other teachings:

[contd] At present the only loophole of escape seems to lie either in the unlikely inheritance of acquired characters,

either acquired characteristics must be inherited,

or in mutations

or else new species must arise by mutation,

in accordance with De Vries' doctrine,

which make the leap from one character to another, and so eventually from one type to another,

making large leaps from one character or one species to another,

without the aid of selection (W 118).

quite independent of Darwin's doctrine of natural selection.

SOURCE

[contd] It is interesting to note that Johannsen himself,

who has been so prominently concerned in erecting this barrier in the way of the evolutionary derivation of species by natural selection, has recently reported mutations arising within his pure lines of beans.

It must be admitted that to the skeptical there is a vicious circle here, for when a variation fails to reappear in a subsequent generation, it may be explained as the failure of natural selection to act within a pure line, but when a variation *does* reappear it is hailed as a mutation! In any event

the way of experiment lies open,

and the evidence of investigators in this critical field will be awaited with keen interest (W 119).

12: THE TRUTH OF HEREDITY

12:2.3 And it is instructive to observe, in this connection, that Johannsen

has recently reported the appearance of mutations within this original nineteen pure lines of beans.

At any rate,

whatever the answer to this puzzle of heredity is, no one has completely solved it up to the present.

The whole subject is still open

and we must look to the experimental workers of the future for further help in clearing up the doubtful points.