

The Cause of Colour in Animals.

SIR,—I have just been reading Mr. Wallace's late book, "Natural Selection, &c.," and should like, with your permission, to make an observation or two on his theory of "Mimicry." Insects, birds, &c., escape their enemies by becoming coloured like their natural surroundings, or like other birds or insects which are "protected" in some way or other. Let me give one instance mentioned by Mr. Wallace. In the neighbourhood of Rio Janeiro, the bird-eating hawk imitates the colour of the insect-eating hawk, and by this means escapes destruction from other birds. All his progenitors were destroyed by their enemies except one or two that *happened* to be like the insect-eating hawk. These fortunate ones escaped, and, of course, handed down their colour to their posterity. This is what is called a "survival of the fittest," and it is thus that the theory of Natural Selection accounts for the survival of the bird-eating hawk. But then, unfortunately, this bird-eating hawk lives and flourishes in the neighbouring districts where there is no insect-eating hawk for it to imitate. It lives and prospers without the "protection" of "mimicry." Here, then, the theory of Natural Selection fails. It does not cover the whole ground, and, therefore, like the telepathy theory of the present day, or the Ptolemaic system of a past day, it must fail.

I would not, however, trouble you with this letter if I did not think that I can suggest a cause for these phenomena.

Whatever may be thought of the appearance of the "ringstraked, speckled, and spotted" cattle among the flocks of Laban the Syrian, it will at least be admitted by all that there existed a belief in those old days that the surroundings of the parents, at certain times of their lives, had an effect on the colouring of their offspring, and that this effect was produced through the eyes of the parents. Now it so happens that there is a case mentioned by Mr. Wallace in this book of his, which seems to prove that those old herdsmen had some grounds for their belief. The case I allude to is that of the Chameleon Shrimp, which changes its colour with that of the objects among which it is found, and of which Mr. Wallace informs us that when it is blinded this "change does not occur." Now, sir, I cannot help thinking that we have here a very significant piece of information. It is not a "kind of natural photography," observe, that produces the change of colour (as Mr. Wallace says it is in the case of a certain caterpillar that he mentions), for the loss of sight would not interfere with the photographic process. The change is produced through the eyes. It is the sight of the colour that produces the colour. It is a psychical process, therefore, and not a chemical one; or rather it is a case of the psychical using the chemical for its instrument. It is the living principle within, call it what we will, externalising the impressions produced on it by sight. Ought we not, therefore, to look in this direction for the cause of all those colours that follow on changes of

surroundings, many of which are not explained by Natural Selection, and pronounced by Mr. Wallace "inexplicable?"

A Darwinian doctrine about domestic pigeons of many colours is that if they are let run wild they will all revert to the dull colour of some remote ancestor. But if there be any truth in the theory I have here ventured to suggest, this doctrine will hold good only in certain cases. Let the pigeons be sent to some tropical forest where they can feast their eyes on greenery all the year round, and they, or rather their descendants, will all probably become green or greenish.

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GEORGE HARPUR.