Oct. 2. 29

CRIPPS'S CORNER,
FOREST ROW,
SUSSEX.

My dear Fisher.

I have not yet read your food paper, but intend to do so when I can give it quiet thought, which I see it will need. Now I want to amuse myself with another Evolution letter, this time to consider when evolution may, not must, be slow. But I want to begin irrelevantly about butterflies.

The Meadow Brown, and two closely allied species, have black spots — eyes — on the under sides of their wings, with little white marks on them. Look at any picture of an eye, and you will generally see it as a black disk with a white splash on it, the reflection of some light. Is it fanciful to think the white spot-

on the Meadow Brown's Eyes is to make it more protective? It may be. My point is, however, is that being found in 3 allied species, it is probable, but not certain, that it was evolved before these 3 bifurcated; and this may have been a very long time ago, considering the place in evolution occupied by insects. Being so long in existence, it hardly can be at all harmful. Here then is a case where, I suggest, Evolution can have acted with extraordinary slowness. If two butterflies were on the same flower, and some insect went to eat them, and ate the one without the marks in his eyes, because they were like eyes, that might cause a permanent change of mutual proportions in the proportion of sexes in the species. In fact when a selective

process does a very little good and no harm whatever, it may proceed with any degree of slowness. This pace MacBride, who, by the by, has been catching it in Nature.

What puzzles me about butterflies is this. There is no mimicry in England, I think, and to say that birds don't eat butterflies here is not to the point. But nearly all are duller colored on the under side, surely for protection. This I guess must be some disadvantage, as making them less conspicuous in the mating season. (The peacock's eye is, I guess, bright on the upper side, for display and not for protection. Pace MacBride again). Hence there must be active selection still going on to preserve the dull colors on the under side. Butterflies do not seem to mind showing off, as it were, on the ground or on flowers in the day time. They show little signs

of fear, and I have never heard of a bird going at them when sitting. From all this I quite think the underside protection is entirely for night use. I have seen an account of a white butterfly carefully selecting a white flower for its perch for the night. But what creatures attack sitting butterflies at night? I cannot think, unless it is bats. Has anyone examined this question? If you ever come across a wise bugologist, ask him this question.

Don't answer unless the spirit move you - I hesitate to put this question to Poulton, but have not!

Yours sincerely

Leonard Darwin

Haldane's letter in Nature was all right, I think - I do not know what wickedness he has committed to which you made allusion.