

clusion. But the second part of the criticism is not quite just. Mr. Howorth, after stating the Darwinism theory, introduces us to an order of facts which is at variance with that theory as apprehended by him; and not only does he do so, but he places an interpretation upon these facts which is utterly irreconcilable with the Darwinian theory as understood by its most able expositors. It is true that Mr. Howorth does not bring his interpretation of the facts he adduces and the theory of natural selection into such juxtaposition as to show their mutual contradiction; but a little consideration will enable Mr. Wallace to supply the missing links, and to see that in any generous construction of Mr. Howorth's letter, the real questions at issue are the correctness of the facts he adduces and the validity of the generalisation he makes from these facts. My object in writing is to direct Mr. Howorth's attention to Mr. Herbert Spencer's profound discussion of this subject, as it appears to have escaped his notice. This is the more surprising, since, on p. 111, vol. ii. of "The Variation of Animals and Plants under Domestication," and to which Mr. Darwin refers him, there is the following marginal note:—"Since this MS. has been sent to press, a full discussion on the present subject has appeared in Mr. Herbert Spencer's 'Principles of Biology' vol. ii., 1867, p. 457, *et seq.*" He is a bold man who undertakes to enlighten the public on a subject which Mr. Spencer has fully discussed, without first ascertaining what view that profound and original thinker adopts; and most certainly a fresh writer coming into the field ought to take up the discussion where an author of such eminence has left it. If Mr. Howorth will look at Mr. Herbert Spencer's "Principles of Biology," he will find in sections 78 and 79, an explanation of the process adopted by gardeners of cutting the roots, and "ringing" the bark of fruit trees. Section 355 explains the fact that fatness is often accompanied by barrenness. In a footnote at p. 483, vol. ii., he will find Mr. Doubleday's doctrine specially noticed, and the fallacies upon which it is based exposed; while in the chapters "On the Laws of Multiplication," vol. ii., p. 391, *et seq.*, he will find the whole subject treated with a fullness and exhaustiveness which leaves little to be desired. Mr. Howorth will notice that Mr. Spencer does not deny Mr. Doubleday's facts, but that he places upon them an interpretation which brings them into harmony with the general theory of evolution, and with the special part of organic evolution which constitutes the Darwinian theory.

Newchurch, July 17

JAMES ROSS

I HOPE you will allow me a few lines to reply to Mr. Howorth. I had thought Mr. Doubleday's essay was among the things of the past. There can be no question that his conclusions are not the conclusions of accomplished naturalists like Mr. Wallace, whose assertions are certainly as good, if not far better, than those of Mr. Doubleday.

Quoting Mr. Chadwick, Mr. Howorth again puts cause for effect. There can be no doubt that the death rate increases in a crowded country *pari passu* with the crowding, and that the crowding is the result of fertility. It by no means follows that the crowding produces fertility.

There is one way in which poverty and overcrowding tend to increase the birth rate. Many of the children of the poor die during the first few months of life, and hence the mother, being relieved of her offspring, ceases to secrete milk, and soon again falls pregnant. It is the death of very young children in crowded districts which so largely increases the mortality, and this, as we have seen, may tend to increase the birth rate.

The large percentage of deaths in early life amongst the ill-nourished and weakly renders these less likely to bear children than the strong. With regard to the large families of the poor so often quoted, I have grave doubts of the fact. I have for many years seen hundreds of poor families every year in the exercise of my profession of surgeon, and although I know many instances of ten or fifteen children having been born of one mother, in the majority not more than two or three reached adult age, and hence these produced no offspring in the second generation.

The most remarkably prolific woman who has come under my notice has had twenty-two children in twenty years, and she is still continuing to present her husband with blessings. She is one of the fattest women I know.

Amongst the rich and the well-to-do it is no uncommon thing for eight or ten children to grow to man's and woman's estate and to rear families. I know as many well-to-do persons with large

families as poor people, and the living percentage is far greater in the former.

I am not aware that consumptive patients are so extremely prone to breed as Mr. Howorth thinks, certainly their children do not live to produce a second generation as a rule.

Examples of fecundity and barrenness amongst wild tribes are not much to the purpose, because there are so many disturbing influences. To take, however, Mr. Howorth's case, the Red Indian feeds ill enough and is thin enough, yet he is not fertile. The backwoodsman, with his vegetable diet, would be far more likely to grow fat, and is certainly far better fed and far stronger than the Indian, yet he is more fertile than the Indian, although by no means fertile. He has many hardships to undergo.

With regard to the Patagonian women and their belief that bleeding produces fertility, evidence is wanting as to the truth of their belief. We know many wide-spread beliefs are erroneous, for instance, most savages believe in rain-makers.

In conclusion, Mr. Howorth thinks that wild animals in captivity are sterile from over-feeding. If he will try and make them fertile by starving them, I think I may assert positively he will fail. Hence, I suspect, we must look for a deeper cause of barrenness in them.

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Recent Neologisms

IN using the word Mr. Ingleby objects to as hideous, I was not aware that I was coining a new one. If so, it was quite unconsciously on my part; but a word was wanted to express the property of being prolific, and if the choice lies between "prolificness" and "prolificacy," as I think it does, I am inclined to believe that the former will survive, as being the shorter, the easier to pronounce, and perhaps the less hideous, even though it may not be constructed on the best etymological principles. "Fertility" and "fecundity," which are often used, do not quite answer the purpose, although the latter has very nearly the same meaning. Our language must and will grow; and its growth will be determined by convenience rather than by grammatical rules.

ALFRED R. WALLACE

DR. INGLEBY is in error as to the recent introduction of "survival," "impolicy," and "prolificness." All these words will be found in Chalmers's abridgment of "Toild's Johnson" (1820); the first with a reference to Sir George Buck, the second with one to Bishop Horsley, and the third with one to Scott (not Sir Walter). "Indiscipline" does not occur, but "indisciplinable" does, Hales being cited as the authority.

R. G.

IN his excellent custom of "registering the first appearance of new words and new phrases," Dr. C. M. Ingleby is surely very careless or superficial. He quotes "survival" as a new word introduced, he thinks, by Darwin. I have been familiar with it as long as I remember, and my life of careful observation has exceeded a quarter of a century. "Impolicy" is equally familiar, having had currency at least twenty years before the Franco-Prussian war, to which Dr. Ingleby accredits it. He will find both words, as well as "indiscipline," in "Webster's Dictionary," edition 1852, and probably much earlier on careful search. "To telegram" is clearly a vulgarism, rarely heard I imagine, and never seen in print.

G. W. S.

Fertilisation of the Bee Orchis

MR. DARWIN, in his "Fertilisation of Orchids," states his belief that the Bee Orchis presents a physiological difference from all other British orchids, and is habitually self-fertilised. I had, yesterday, an opportunity of observing a number of these plants in one of its abundant localities in Surrey, and at a time when fertilisation must have been completed. In every plant almost all the capsules were considerably swollen, and were loaded with apparently fertilised ovules. In most of the withered flowers, the remains of the pollinia were still visible in the position described by Mr. Darwin, hanging down before the entrance to the nectary, in immediate proximity to the stigma, and rendering it almost impossible to believe that the flower had ever been