LETTERS TO THE EDITOR.

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Secondary Sexual Characters.

IN his article on "Antelopes and their Recognition Marks" in the number of NATURE dated October 11, Mr. R. I. Pocock suggests that the darker colour of the males in certain species is the outcome or accompaniment of "male katabolism." As generally used, this term seems to denote some peculiarity universally associated with the male sex and giving rise to male peculiarities, so that a character which is the outcome of male katabolism does not require to be explained by the theory of sexual or that of natural selection. This is the sense in which Geddes and Thomson use the term in their "Evolution of Sex": "So brilliancy of colour, exuberance of hair and feathers, activity of scent glands, and even the development of weapons, are not and cannot be explained by sexual selection, but in origin and continued development are outcrops of a male as opposed to a female constitution." But if male katabolism is always associated with the male sex, how is it that there are so many species in which there are no secondary differences between male and female, no outcrops of male katabolism? Either male katabolism, as something different from female katabolism, does *not* exist in the males of all species, or it sometimes exists without producing any visible effect.

It is therefore evident that male katabolism in the kinetic, and not merely the potential, state occurs only in the males of those species which exhibit sexual dimorphism. After all, katabolism is only a name for certain phases of physiological activity, and we thus arrive at the hypothesis that male sexual peculiarities are the result of the peculiar katabolism of the males that possess them. Now we have a reason for such peculiar katabolism, or metabolism, in the special nervous and muscular activity which is observed in the sexual habits of those males which possess secondary sexual characters. This excitement and muscular exertion involves an increase of the metabolism, which goes far to explain, among other things, an increased production of pigment, and the consequent darker or more intense colouring of the males in many instances. The special metabolism is thus due to the habits of life, to external conditions, not to any quality necessarily associated with male sexuality.

It seems to me that, regarding the subject from the point of view I have indicated, we may arrive at the explanation of the darker colour of certain male antelopes, and also of the presence of horns in the males only. If the peculiarities of the male, in particular its colour, are thus the necessary results of physiological processes, they are sufficiently explained, without the additional suggestion that the hornless female has been compelled to adhere to the normal protective colouring of the group, while the males, by reason of their horns and superior strength, have been able to dispense with that advantage. Moreover, Mr. Pocock maintains, in other cases in which horns are developed in the male only, that the markings of the male are protective, for instance, in the kudu. J. T. CUNNINGHAM.

Penzance, October 27.

The Value of the Cylinder Function of the Second Kind for Small Arguments.

IN investigating the propagation of electrical oscillations along cylindrical conductors, the "K_0" function, which satisfies the Bessel's equation and vanishes at infinity, is used to express the vectors outside the wire. Under the conditions of the problem the approximate value of this function for very small arguments is needed. I wish to point out an error in this value, which occurs in all three important memoirs in which the subject has been discussed—viz. those of Prof. J. J. Thomson ("Recent Researches," p. 263), Sommerfeld (*Wied. Ann.*, lxvii. p. 245, 1899) and Mie (*Ann. d. Physik*, ii. p. 211, 1900), an error which can, I think, be traced to a misprint in Heine's "Kugelfunctionen."

The formula given by Heine (vol. i. p. 245) yields as the approximate value $K_0(x) = \log \frac{2}{x} - C + \frac{1}{2}\pi i$.

C is Euler's constant 0·5772 . . . but in the statement of its value which follows – C is printed for C. This mistake, which is not corrected in the errata, is pointed out in the "Treatise" of Gray and Mathews (p. 88, footnote).

If we put $e^{\gamma} = 1{\cdot}7720$, we have $K_0(x) = \log \frac{2i}{\gamma x}$. In the papers referred to, the γ appears in the numerator, which would correspond to the alteration in the sign of C. In Prof. Thomson's work the i in the numerator is omitted.

The error has no effect on the theoretical conclusions reached in the papers. The numerical results given by Sommerfeld and Mie are subject to corrections, which will not, however, affect the order of magnitude. For example, the attenuation constants worked out by Sommerfeld are something like 10 per cent. too small. W. B. MORTON.

Queen's College, Belfast, October 25.

Mosquitoes and Diseases.

AT p. 627 of your issue of October 25, while noticing Profs. Grassi and Noè's observations on *Filaria immitis*, you say "Malaria is not the only disease which is propagated by mosquitoes." May I remind your readers of Dr. Patrick Manson's important observations on *Filaria sanguinis-hominis*, originally communicated to the Linnean Society by Dr. Cobbold, on March 7, 1878 ("On the Development of *Filaria sanguinis-hominis*, and on the Mosquito considered as a Nurse": *Journ. Linn. Soc. Zool.*, xiv., pp. 304–311), and amplified later in a paper communicated on March 6, 1884 ("The Metamorphosis of *Filaria sanguinis-hominis* in the Mosquito": *Trans. Linn. Soc. Zool.*, ser. 2, vol. ii., pp. 367–388, pl. xxxix.)? W. F. KIRBY.

British Museum (Natural History), London, S.W., October 30.

OUR STELLAR SYSTEM.

IN a recently published volume[1] I endeavoured to bring together the facts relating not only to the distribution of stars generally, but to those which the spectroscope has more recently brought before us touching the distribution of the various chemical groups of stars. One of the interesting results of the inquiry was that the Milky Way, which dominates the general distribution, is also the region of the heavens in which undoubted nebulæ giving us bright-line spectra most do congregate. Nor is this all. Those so-called "stars," in the spectra of which bright lines are seen, "bright-line stars" and "new stars," which I have elsewhere shown are nebulæ or stars associated with nebulæ, are also almost entirely confined to the Milky Way. The new spectroscopic knowledge, although so priceless to the student of the chemistry of space, tells us, however, nothing as to the distances of the bodies from us; it only tells us that they lie in the galactic plane. If, however, we combine with the chemical facts the results obtained by Monck, Kapteyn and others touching the proper motions of the various kinds of stars as defined by their spectra, the results we obtain are most definite.

Dealing with the stars generally, it may be stated that the latest inquiries have suggested the following very general classification of stars depending upon temperature:—

Highest Temperature.

Gaseous stars { Proto-hydrogen stars. / Cleveite-gas stars.

Proto-metallic stars.

Metallic stars.

Stars with fluted spectra.

Lowest Temperature.

Now to make the most general statement, we find that the gaseous stars are not only confined to the Milky Way, but they are the most remote in every direction, in every galactic longitude; all of them have the smallest proper motion. The metallic stars are nearest to us, but they are *not* confined to the Milky Way. The proto-metallic stars are intermediate between these two great groups,

[1] "Inorganic Evolution," pp. 124–143.