

and inheritable, and the latter as abnormal, and therefore acquired and non-inheritable. If almost all men laboured as blacksmiths the positions would be reversed; that which to-day is normal and inborn would become abnormal and acquired. I regret, however, I am still unable to follow the line of thought which connects normality with innateness and inheritability, and abnormality with acquiredness and non-inheritability. In what respects is the normal character more innate and inheritable than the abnormal trait? If Lamarck's words, or the words of those who controverted him, had any meaning, what was that meaning?

Sir Ray Lankester objects also to my use of the word "stimulus." It seems, for example, that I express myself wrongly when I say that a muscle grows under the stimulus of use. I fear, if he is right, I do not know the meaning of the word. Here again, however, the point is immaterial. His own word "influence" will serve. The substitution does not affect the argument.

Darwin's theory of evolution through the natural selection of favourable variations—or at any rate what is known as the neo-Darwinian theory—is intelligible. It separates *likenesses and differences* between individuals (e.g. parent and offspring) into those which are inborn and inheritable and those which are acquired and non-inheritable. An inborn likeness or difference is one which depends on a likeness or difference in germinal potentiality; an acquired likeness or difference is one which depends on a likeness or difference in the action of the environment. On the other hand, the Lamarckian hypothesis, founded as it is on the notion that some *characters* (e.g. heads) are inborn, and others (e.g. scars) acquired, is not intelligible. The terms used are meaningless in the connection in which they are employed. Obviously, all characters depend equally on an interaction between germinal potentiality and external stimulus. They are all, therefore, as inborn and acquired, as blastogenic and somatogenic as they can possibly be. No such things are conceivable as purely blastogenic and somatogenic characters, or characters which are more blastogenic or somatogenic than others. The whole "historical discussion," therefore, is of the same order as would be one in which physicists discussed whether gravitation was blue or yellow.

The Lamarckian controversy is, in effect, ended. The great majority of biologists reject the hypothesis that acquirements are transmissible. The next step, I think, will be a rejection of the very notion that some characters are inborn and others acquired, and an acceptance of the reality that the different classes of characters are distinguishable from one another because they are responses to different kinds of stimuli—nutriment, use, injury, and the like. Doubtless we shall then have a discussion as to what characters, in the different species, develop under this stimulus, and what under that, and ultimately a general recognition of the immensely important truth that the peculiar characteristic of the higher animals is that the individual develops after birth more under the influence of use than under any other stimulus—hence the fact that man, the highest animal of all, is, as Sir Ray Lankester has often insisted, pre-eminently the educable animal both in mind and in body.

G. ARCHDALL REID.

Southsea, March 29.

Red Water.

A SAMPLE of red water from a crater lake in Uganda, which "looks like blood at times," sent by Dr. R. van Someren presents some features of interest.

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The colour was separated by filtration through a Berkefeld filter, but not through filter paper. It disappeared on the addition of a mineral acid or caustic alkali, and was not extracted by ether. The red deposit on the Berkefeld filter consisted of disintegrated organic remains. From the water itself mixed with nutrient agar a bacterial culture was obtained, which did not develop either in an artificial brine or in ordinary culture media.

A litre of the red water contained 247 g. sodium chloride, 96.8 g. sodium carbonate, 53.8 g. sodium sulphate, 10.5 g. potassium chloride, 5.1 g. sodium bicarbonate, and 2.4 g. sodium phosphate.

As the chemical composition of the water gives no clue to the colouring matter, it is probably due to an organism capable of growing in a practically saturated alkaline brine.

We should be glad to know of the occurrence of similar red brines and the causes of coloration.

JOHN E. MACKENZIE.

T. M. FINLAY.

Chemistry Department, University of
Edinburgh, March 28.

April Meteor-showers.

THE following are the most important meteor-showers that become due between April 5 and the end of the month:—

Epoch April 6, 20h. (G.M.T.), 1st order of magnitude. Principal maximum, April 7, 12h. 45m.; secondary maximum, April 8, 5h. 30m.

Epoch April 9, 3h., 11th order of magnitude. Principal maximum, April 7, 16h. 15m.; secondary maximum, April 8, 14h.

Epoch April 7, 14h. 30m., 10th order of magnitude. Principal maximum, April 8, 5h.; secondary maximum, April 10, 10h. 40m.

Epoch April 14, 12h. 30m., approximately 16th order of magnitude. Principal maximum, April 14, 4h. 10m.; secondary maxima, April 13, 6h. 30m. and 10h. 30m.

Epoch April 13, 22h., 3rd order of magnitude. Principal maximum, April 15, 13h. 30m.; secondary maximum, April 15, 16h. 30m.

Epoch April 16, 17h., approximately 10th order of magnitude. Principal maximum, April 17, 4h.; secondary maximum, April 19, 0h. 45m.

Epoch April 21, 4h., 1st order of magnitude. Principal maximum, April 20, 21h. 30m.; secondary maxima, April 20, 10h. 20m., and April 21, 11h. 30m.

Epoch April 23, 6h., approximately 10th order of magnitude. Principal maximum, April 24, 10h. 55m.; secondary maxima, April 23, 11h. 50m., and April 25, 10h.

Epoch April 26, 6h., approximately 4th order of magnitude. Principal maximum, April 26, 11h. 50m.; secondary maxima, April 26, 7h. 40m., April 27, 10h. 50m., and April 28, 0h. 55m.

Epoch April 29, 14h., 7th order of magnitude. Principal maximum, April 28, 2h. 15m.; secondary maximum, April 28, 8h. 35m.

The maxima about April 20–21, though belonging to an epoch of the first order of magnitude, are not so strong as they might be, the night maxima especially being rather weak. The maxima have been so computed that when observations are possible shooting stars should be seen within a few minutes from the predicted times. The heaviest maxima of the month are the principal maxima that occur on April 17 and April 24 respectively.

JOHN R. HENRY.

Dublin.