In these circumstances it is not surprising to learn that Mr. Fox failed to obtain Dr. Kammerer's results, since he has tumbled into one of the most obvious pitfalls. It may surprise him very much to learn that *Dr. Kammerer got the same results as he did* when, like Mr. Fox, he cut off only the oral siphon. Since the anal siphon remains of normal length and the reaction is of the animal as a whole, the regenerated oral siphon is of normal length also. But *when both anal and oral siphons are amputated in a very young animal*, then long siphons are regenerated. I have a photograph which shows an operated Ciona and a normal one growing side by side in the same tank, and the contrast between the lengths of their siphons is obvious. When Dr. Kammerer returns from America I hope that Mr. Fox will communicate with him and repeat the experiments, observing Dr. Kammerer's precautions, when, I feel confident, he will obtain Kammerer's results.

My confidence is based on the following considerations. Curt Herbst in Germany tried to repeat Dr. Kammerer's experiments on *Salamandra maculosa*; he arrived at the conclusion that although the animal may change colour with environment, yet these changes are temporary, and that therefore it was useless to try to repeat Kammerer's work on the inheritability of these changes. Herbst worked principally on Salamander larvæ. Mr. E. Boulenger in 1919, however, began to repeat Kammerer's work on young metamorphosed Salamanders. I have been privileged to watch Mr. Boulenger's experiments from the beginning, and now in 1923, after four years' work, Mr. Boulenger and I are both convinced that Kammerer is perfectly right so far as the first generation is concerned. Our specimens are not yet, unfortunately, completely sexually ripe.

E. W. MACBRIDE.
Imperial College of Science and Technology
South Kensington, London, S.W.7.

Globular Lightning.

I AM much interested in the references to lightning in Dr. A. Russell's presidential address to the Institution of Electrical Engineers, and also in the article by Dr. G. C. Simpson in NATURE of November 17, especially where the latter mentions that "the only physical phenomenon yet produced in a laboratory at all approaching ball lightning is the active nitrogen studied by Lord Rayleigh."

It has occurred to me that possibly the ball may be a mass of concentrated nitrogen oxides, and I suggest this because the observations seem to fit in well with the formation and action of such gases.

We know that when air passes through high-tension arc flames in an electric furnace, the nitrogen and oxygen combine to make nitric oxide gas, and that as the gas cools down it takes up more oxygen to form nitrogen dioxide, the speed of combination increasing rapidly with the cooling.

In Norway, and elsewhere, for many years, electric furnaces have been running which aggregate over half a million horse-power and make nitrates from the air in the same way that lightning does. It has been estimated that 100 million tons of nitrogen fixed by lightning flashes fall annually on to the earth's surface.

The energy suddenly released by a flash is enormous, and the potential has to be many millions of volts to tear a way, or a hole, through the air dielectric. May it not be that a very high pressure is suddenly set up, followed by a sudden reaction and chilling effect? If so, then the conditions are extremely favourable to the production of a large amount of nitric oxide and nitrogen dioxide gas in a very concentrated and possibly liquid form.

Whilst moving through the air the outer layer of the gas will gradually oxidise to nitrogen dioxide, which will dissipate, and if the length of travel through the air is long enough it may all dissipate in that way. Occasionally, however, a ball of gas may start from a point so near the earth that some of it is still in concentrated form when it arrives at earth-level.

If a ball of such concentrated gas meets with organic material, such as a haystack or a tree, it would immediately nitrate it and a violent explosion take place. One of the worst accidental explosions that took place in Germany during the War is said to have been caused in that way.

The peculiar smell, which some observers have called "sulphury," may be nitrogen oxides or ozone.

Of course, the point most difficult of explanation is how the gas, if such it be, becomes concentrated into a ball. Perhaps a reader of NATURE can suggest an explanation of that point.

E. KILBURN SCOTT.

38 Claremont Square, London, N.1.

Principles of Psychology.

AN absence from London prevented me from seeing the review that appeared in NATURE of October 13, p. 535, under the heading "Mental Athleticism," of my work "Principles of Psychology"; but I desire now to enter my protest against the ill-usage offered to my book, and to science itself.

I do not speak from mere author's vanity, for I have written this book not for my own glorification, but by way of introducing something into the world of thought that will eventually impinge on every fibre of our civilisation and help to mould the life of man to greater purposes.

When as a young student I set forth with this purpose, *por mares nunca de antes navigados*, I resolved to stake my own intellectual life on the issue, and not to write a line until I had completed the exploration of my problem. That work occupied twenty years of secluded work and intense intellectual effort.

If I am confident now, it is as Pythagoras was confident, for the good reason that he had furnished the complete demonstration of what others had tentatively sought to know.

The review, published anonymously in NATURE, contains a series of statements so wide of the mark as to seem to be almost purposely misleading. My first book did not, as the reviewer suggests, fall still-born from the press; the whole edition has, in fact, been sold. It is true that by certain "authoritative teachers" here it was received with sneering comment, but it found the most gratifying acceptance in enlightened quarters. The *Revue Philosophique*, which is the most authoritative of all the philosophical magazines, broke its rule of allotting but one page to a review, and devoted to the book twelve times that space in a finely analytical study by Prof. Dugas, himself justly famous in Europe.

So far from finding with your critic, in his incomprehensible statement, that "the solution offered as new is certainly not novel," Prof. Dugas noted especially the "originality" as well as the "profundity" of the work. Of the present volume he says: "I live with your *Principles* just now. . . . I am more and more struck by the philosophic character of your psychology." Amongst many others Ribot and Boutroux, both world-renowned, expressed themselves in similar terms. Boutroux was "astonished"