VIVISECTION.

EDITOR OF SCIENCE: I note with regret several errors in the report (SCIENCE, April 3d) of my paper on 'Vivisection; Its Objects and Results,' read before the Anthropological Society of Washington at its meeting on March 3d.

I shall only correct the one which first meets the eye and which makes me appear to have made a very ridiculous statement. The report commences as follows: "In the course of his paper Dr. Sternberg said that by dissection of dead plants and animals only can we determine the nature of their functions." The following quotation from my manuscript shows what I really said:

"By means of the experimental method the chemist has succeeded in analyzing air, earth and water, which were regarded by the ancients as elements, and has learned to manufacture in his laboratory, by synthetic processes, many of the complex organic substances found in nature. By experiment the physicist has demonstrated the persistence of force and the corelation of the various modes of motion known to us as heat, electricity, etc. He has learned to recognize the elements of the chemist in distant suns by means of the spectroscope and has recently shown us that certain ethereal vibrations may pass through wood and metal as light rays pass through glass.

"In like manner biologists and physicians have established the facts which constitute our knowledge of biology in all its branches. Used in its broadest sense, this term includes animal and vegetable physiology, animal and vegetable pathology, ætiology, morphology, embryology, psychology and sociology. Now, it is evident that all questions relating to these various branches of biological knowledge must be determined by the observation of *living* organisms and by experiments upon *living* plants and animals. To some extent the study of morphology and of pathology constitutes an exception to this general rule, inasmuch as these branches of biological science also call for the dissection of dead plants and animals. Our knowledge of animal and vegetable histology, of human anatomy and of the results of disease processes has been obtained in this way, and could not have been obtained in any other way. But *the dissection of dead plants and animals cannot determine the functions* of the various anatomical elements and organs revealed by such dissections, although aided by the microtome, differential staining methods, the microscope, etc."

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INSTINCT.

EDITOR OF SCIENCE: Prof. Lucas seems to me to have advanced this discussion on instinct by his reference to a letter in *Nature*, which appeared in Vol. 52, page 30. According to the writer, it is customary for the Asamese natives to 'teach' the young jungle fowls to peck.

If this be true, what then becomes of Prof. Morgan's distinction?

As a matter of fact, if one observes a good many chicks, he will find that a large proportion of the birds never peck without suggestion (the term 'teach' seems objectionable) from the hen or some substitute. The chief value of such facts grows out of their showing that instincts are never perfect and never of that type once believed in—the unalterable, inevitable and unvarying—like the rising and setting of the sun; and for such rigid notions the reports of some scientists are in part responsible. It sometimes happened that experimenters in biology, etc., omit the exceptions and report only 'good experiments,' so that a false view of the case must necessarily arise. Prof. Baldwin seems to adopt Prof. Morgan's views, for he refers to the observation that the chicks drank 'only after they had the taste of water by accident or by imitating the old fowl.' Granted—but they also peck only after *seeing* small objects under certain conditions, and there is no instinct that does not require some stimulus in the environment to bring it into action. The mechanism is ready, but it is useless without this stimulus.

If one knew but of those domestic chicks or those jungle chicks that peck only on seeing this act, one might speak of a certain imperfection in the instinct of pecking, as, if you will, in