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

drinking; but what I must again object to is drawing radically different conclusions as to the nature of eating and drinking by chicks, and even building theories of evolution on them.

As I understand Prof. Cope is to reply to Prof. Baldwin's views on Consciousness and Evolution through the medium of the *American Naturalist*, I will only remark regarding his discussion in SCIENCE, p. 438, on Heredity and Instinct, that, while I find his views very interesting as illustrations of natural selection, the Lamarckian principle, the influence of environment, etc., they seem, in the main, to fall within the range of principles already recognized by the Darwinians and Lamarckians, though perhaps not adequately. But I fail to see that a single safe step can be taken in explaining evolution either in biology or psychology, if the effects of the environment and of use be ignored; indeed, Prof. Baldwin's very facts and illustrations are, to my mind, only comprehensible by the introduction of those factors; and why there should be such anxiety on the part of many to get rid of factors so obvious, and to substitute for them the biological fatalism and reasoning in a circle of Weismann, is a puzzle to me.

I trust Prof. Baldwin will not insist on coining many new terms, or favor their adoption as far as evolution is concerned. 'Social heredity' is about equivalent, is it not, to social environment, and the entire environment is one into which, as a rule, the animal is born, so why speak of 'social heredity?' Technicalities have their advantages, but they often conduce to mental myopia, and hamper the comprehension and progress of truth by binding it up in packages, so to speak—packages which all cannot readily undo.

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FOOTGEAR.

EDITOR OF SCIENCE: Apropos of the heel quarters or heel bands on the feet of men shown on Mexican and Maya sculpture and pottery Dr. Fewkes calls my attention to the fact that among the Tusayan Indians an embroidered heel band is worn over the moccasins in all dances. In the statuary shown by Maudslay and other authors the footgear looks as though a man were wearing a gaiter from which the vamp or front had been cut away. In this view the supposed sole is the pedestal; what appears to be a stocking is the moccasin, and the heel quarter is the decorated ceremonial heel band fastened across the instep with lacings.

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SCIENTIFIC LITERATURE.

Greenland Icefields and Life in the North Atlantic, with a New Discussion of the Causes of the Ice Age. By G. FREDERICK WRIGHT, D. D., LL. D., F. G. S. A., author of the *Ice Age in North America*, etc., and WARREN UPHAM, A. M., F. G. S. A., late of the Geological Surveys of New Hampshire, Minnesota and the United States. With numerous maps and illustrations. New York, D. Appleton & Co. 1896. 12mo. pp. xv+407.

The immediate impulse to the preparation of this volume arose in connection with a trip to Greenland taken on the unfortunate steamer Miranda in 1894. It will be remembered that this steamship of eleven hundred tons' burden started out with the intention of reaching Peary's headquarters in Inglefield gulf, with a complement of fifty-one passengers. Ten days out she collided with an iceberg off Labrador and returned to St. Johns for repairs. After reaching Sukkertoppen, the largest Eskimo settlement in Greenland, the steamer ran upon a reef and received serious injuries, compelling her to stop again for repairs and to start homeward as soon as possible. In less than two days' time she foundered, and the passengers and crew were safely transferred to the schooner Rigel. The senior author had an excellent opportunity to study icebergs in their legitimate work of producing geological changes, and had nearly a fortnight's time to explore the edge of the ice sheet close to the Arctic circle.

The authors have improved their opportunities by giving in this book an interesting resumé of what is known respecting the glaciers, ice fields, explorations, icebergs in action, the plants, animals, the Eskimo and the early Norsemen of Greenland. Mr. Upham prepared the chapters upon the plants, animals, explorations, and the lessons taught by the Greenland phenomena in the elucidation of the Ice Age. Besides the text several excellent maps of