

the late Sir Julius von Haast, the bones of numerous species of birds besides moas were found. Their occurrence in the situations where they were discovered, and the way in which they were lying — entire bodies with their sterna covering crop-stones *in situ* — have been explained by the supposition that the moas were overtaken by a fierce and sudden storm, and their entire carcasses piled by wind and flood into vast heaps, an explanation against which the presence here also of the same powerful buzzard and other flying birds rises as an objection. Yet there is nothing either in the situation or the disposition of the bones to make it impossible; still I cannot help feeling that that cannot be the true explanation which satisfies only one instance out of so many assemblages of dead birds of nearly always the same species in situations almost similar. I hope, however, that when I have made a thorough examination of all the localities where, and the conditions under which, moa remains have been found, in the light of the personal experience gained in the exhumation of the present deposit, and when I have completed the identification (on which I am now engaged) of the smaller bird bones associated in them with the moa bones, some light may have been gained on this at present mysterious episode in the history of the ancient Avians of New Zealand.

HENRY O. FORBES.

Christchurch, New Zealand.

LETTERS TO THE EDITOR.

****.** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

Need of Physiology and Anatomy in Psychological Training.

In a recent article in *Science*, by Dr. E. W. Scripture of Clark University, some valuable and practical ideas are advanced concerning "the need of psychological training," in which the necessity of a practical knowledge of physics is made clear. But no less necessary is a like knowledge of physiology and anatomy.

Physiological psychology is no misnomer for modern psychology, because it is as much if not more physiological than psychological. That, consequently, a somewhat extensive knowledge of physiology is a *sine qua non* for the thoroughly trained modern psychologist goes without saying; and this is as true whether there be sympathy or not with the modern view, for, in the latter case, the psychologist can hardly avoid discussing some of the results of physiology; and such discussions, to be trustworthy and valuable, must be based upon knowledge. And here is not meant mere book knowledge, but experimental knowledge gained in the physiological laboratory, otherwise when one speaks of sensations, reflex action, afferent and efferent nerves, etc., it is difficult to understand how he can have any adequate insight into the objective reality of these phenomena. It is not intended that any large amount of time be required for purely physiological laboratory work. A term's course, say of six hours a week, might be the minimum; in this case it is assumed that the student has a general knowledge of human and comparative physiology.

If the above requirements are necessary for one who proposes to study physio-psychological questions, it may be inquired further as to anatomical knowledge. That a proper conception of physiology is not possible without anatomy is so obvious as to be commonplace, and yet there are some who are serious students of physiological psychology who have no practical knowledge of anatomy. A general dissection of the body and special dissection of the sense-organs and brain, while it would require more time than the physiological course, would be well worth the extra

trouble, since it is preliminary foundation-work, and is also necessary for the investigation of pathological clinical cases, some of which are of the highest importance for the physiological psychologist. For this and other reasons an elementary course in practical histology is necessary. Thus it is not clear how any student without practical knowledge of coarser and finer anatomy can study and discuss intelligently questions concerning cerebral localization, cranial and spinal nerves, spinal column, medulla oblongata, etc.

It may be objected that many of the facts learned in such a course of study would not be of direct utility, but this could be urged against almost any course of study. The value of such negative knowledge consists in serving as a sort of ballast in aiding the student in avoiding mistakes.

It may be said that if practical courses in anatomy and histology are requisites, why not also similar courses in pathology and psychiatry. It is true that these would be valuable; but there must be a limit; perhaps the student could take up individual pathological cases as they came in the course of his work, provided he has the physiological and anatomical knowledge of normal man before mentioned. It is assumed that the specialist in physiological psychology will read the writings of specialists in physiology, anatomy, and pathology when they treat of topics that bear directly on his own studies. To read such literature, appreciate the points of discussion, and make decisions as to weight of evidence, requires at least a practical elementary knowledge of the subjects.

But it may be objected that, with accurate book learning and good diagrams, one can gain sufficient insight without going to the trouble of taking the practical courses. This objection is more real practically than rationally, for many do not care for vivisection, and much less dissection. It is a well-known difficulty, common to medical schools, to obtain faithfulness in dissection. There seems to be a natural disinclination, not of the nature of dread or disgust that may appear on first entering the dissecting room, but quite another feeling, that is easier experienced than described. The physiological psychologist who has had no medical training is very liable to have a strong disinclination to practical work in anatomy, even if he believes in its utility and necessity. Then there is sometimes the feeling that it is so much easier and saves time to sit quietly in one's own room and study the books and diagrams.

It may be said that some good workers in physiological psychology have never had this preliminary training, but this is rather in spite of such training. As is well-known, many students of philosophy, having become dissatisfied with its methods and results, have turned their attention to experimental psychology, and have neither time nor opportunity to return to preliminary work, which they could have done had they known beforehand the subsequent direction of their studies.

The fact that the majority of leaders in the department of physiological psychology were previously physicians or students of medicine indicates the direction which the training in physiological psychology should take.

A. MACDONALD.

Washington, D.C.

Anthropology.

THE science of anthropology has so far progressed that it is desirable to keep a satisfactory account not only of its operations but of its resources. Under this head should be included: 1. Encyclopædic works, general treatises, annual addresses, courses of lectures, dictionaries, general discussions, and classifications of the science as a whole. 2. Societies, their organization, scope, history, enterprises, and publications, as well as annual assemblies, caucuses, congresses, national and international. 3. Periodicals, devoted as a whole or in part to anthropology. 4. Museums and laboratories, public and private, expositions and loan exhibitions. 5. Libraries, galleries, portfolios, etc., including instructions to collectors.

At this time it is desirable to know what is doing in each State along the line of anthropology. We all know pretty well the work doing in Massachusetts; but where should we look for the

archæological and anthropological resources of Maine, New Jersey, Kentucky, Oregon, etc. There are in all the States societies of natural history, and it would be pleasant to know whether they discuss anthropological topics. Many private collections of great value are to be found in the States; who knows about them? Now I shall be delighted to have the following questions answered with reference to every State in the Union: 1. Name of society, publication, or collection, public or private, devoted to the whole or a part of anthropology. 2. The nature of this relation to the science with lists of printed books or references in print to these. 3. The name and address of the person who will be glad to give information.

O. T. MASON.

Smithsonian Institution, Washington, D.C., Mar. 11.

The Aboriginal American Tea.

COMMENTING on my recent query as to any recent use of *Ceanothus Americanus* as a substitute for China tea, Professor W. J. McGee of the United States Geological Survey writes me:—

"Your little note in a current number of *Science* on aboriginal tea is before me. The eastern portion of the Great Plains, including Iowa, Illinois, and parts at least of Missouri, Minnesota, and Wisconsin, is a favorite habitat of the so-called "red root" or "red-root tea" (*Ceanothus Americanus*); and during war times, when the prices of tea and coffee were prohibitory, so far at least

as first settlers in that country were concerned, many substitutes were employed. The common substitute for tea was the red-root, and it was very largely used in this way. The commonest substitute for coffee was rye, usually mixed with a small quantity of the coffee berry, both roasted and browned in the usual way. I should say, perhaps, that the identification of *Ceanothus Americanus* is partly my own and may possibly be erroneous."

I hope we may have other such interesting and valuable replies.

Staunton, Va.

JED. HOTCHKISS.

The Date of Discovery of the Galapagos Islands.

I AM indebted to Dr. H. Wichmann, the editor of *Petermann's Mitteilungen*, for an answer to my question in *Science* of Jan. 15, 1892: "At what time were the Galapagos Islands discovered?" Dr. H. Wichmann kindly calls my attention to a paper on the history of discovery of the Galapagos Islands, by Timénez de la Espada, published in *Boletín de la Sociedad Geogr. de Madrid*, Oct.-Dec., 1891., XXXI., Nos. 4-6. From this it is evident, Dr. Wichmann writes, that the discovery of the islands, "Archipelago Encantado," was made the 10th of March, 1535, by Fray Tomás de Berlanga, Bishop of Castilla del Oro, whose report is printed in the paper.

G. BAUR.

Clark University, Worcester, Mass., Mar. 14.

CALENDAR OF SOCIETIES.

Philosophical Society, Washington.

Mar. 12.—B. Pickman Mann, An Attempted Solution of a Social Problem; Alex. S. Christie, Remarks on the Diurnal Variation of the Barometer; G. M. Searle, On a Simple Form of a Double Image Micrometer.

Society of Natural History, Boston.

Mar. 16.—J. Walter Fewkes, The Moki Snake Dance.

Oriental Club, Philadelphia.

Mar. 17.—Cyrus Adler, An Account of his Recent Travels in the East.

Publications received at Editor's Office.

- COLBERT, E. *Humanity in its Origin and Early Growth*. Chicago, Open Court Pub. Co. 12°. 409 p. \$1.50.
- HOOGWERFF, J. A. *Magnetic Observations at the U. S. Naval Observatory*. Washington, Government. 4°. Paper. 99 p.
- MARSH, C. C. *Report upon some of the Magnetic Observatories of Europe*. Washington, Government. 4°. Paper. 37 p.
- U. S. NAVAL OBSERVATORY. *Meteorological Observations and Results, 1883-1887*. Washington, Government. 4°. Paper. 261 p.
- U. S. COAST AND GEODETIC SURVEY. *Results of Magnetic Observations at Los Angeles, California, 1882-1889. Part I*. Washington, Government. 4°. Paper. 42 p.
- Early Expeditions to the Region of Bering Sea and Strait*. Washington, Government. 4°. Paper. 14 p.
- International Geodetic Association, Ninth Conference*. Washington, Government. 4°. Paper. 12 p.
- Notes on an Early Chart of Long Island Sound*. Washington, Government. 4°. Paper. 4 p.
- On an Approximate Method of Computing Probable Error. On the Determination by Least Squares of the Relation between Two Variables*. Washington, Government. 4°. Paper. 16 p.
- On the Use of Observations of Currents for Prediction Purposes*. Washington, Government. 4°. Paper. 12 p.
- The National Prototypes of the Standard Metre and Kilogramme*. Washington, Government. 4°. Paper. 23 p.
- The Relation of the Yard to the Metre*. Washington, Government. 4°. Paper. 5 p.
- Tides at Sandy Hook. Observed and Predicted Times and Heights during the year 1889*. Washington, Government. 4°. Paper. 10 p.
- WHYMPER, EDWARD. *Travels amongst the Great Andes of the Equator, with Supplementary Appendix*. New York; Charles Scribner's Sons. 8°. 2 vols. Pp. 486, 175.

Business Department.

Geo. L. English & Co., mineralogists, 733 and 735 Broadway, New York, have just received a large lot of fine cut Opals, which were secured by Mr. Niven in Mexico, and they are prepared to supply customers at unprecedentedly low prices. Read Advertisement.

A Catalogue of an Exhibition of Studies, Drawings and Sketches by Turner, Gainsborough, Blake, and other contemporary English Masters just opened at the Keppel Gallery is published by Frederick Keppel & Co., 20 East Sixteenth Street, who will mail a copy to anyone mentioning *SCIENCE*. There are 145 drawings shown in pencil, ink and water-color memoranda, but little being finished work, and consequently more interesting to the student.

J. H. Goodwin's *Improved Bookkeeping and Business Manual*, advertised on title page of this number, is all that the author claims for it. That more practical information about bookkeeping can be obtained from this book than from any college or school course is abundantly confirmed by the experience of the writer with the earlier editions, as well as that of his sons, now successfully established in business, and who gladly acknowledge their indebtedness to this one publication for the help it has given them unaided by a teacher. The later editions contain many improvements which make the publication increasingly valuable.

Exchanges.

[Free of charge to all, if of satisfactory character. Address N. D. C. Hodges, 874 Broadway, New York.]

For sale or exchange, Das Ausland, 10 vols., 1832 to 1891, including 6 vols. bound, 4 in numbers. Wheeler Suivy, vol. 1. Geog. Report; also vol. 6, Botany; Production of gold and silver in the United States, 1880, '1, '2, '3, '5; Selfridge Isthmus of Darien. Will sell at very low prices. J. F. James, 1443 Corcoran St., Washington, D. C.

Chemical Library for sale. Fresenius Zeitschrift für Analytische Chemie. Complete 30 volumes, bound, at \$4.50 per volume. Fehling's Handwörterbuch der Chemie, 5 volumes, bound, and 5 parts of Vol. 6 (not yet completed), at \$5 each for the bound volumes, and 40 cts. per part for the subsequent numbers. A list of other chemical and mineral-gal works will be furnished on application. Address P. O. Box 477, Wauwatosa, Wis.

For exchange.—A fine thirteen-keyed flute in leather covered case, for a photograph camera suitable for making lantern slides. Flute cost \$27, and is nearly new. U. O. COX, Mankato, Minn.

Wants.

Any person seeking a position for which he is qualified by his scientific attainments, or any person seeking some one to fill a position of this character, be it that of a teacher of science, chemist, draughtsman, or what not, can have the "Want" inserted under this head at 10 cents a count line. Nothing inserted at less than 50 cents a time prepaid by stamps, if most convenient.

TRANSLATOR wanted to read German architectural works at sight (no writing). One familiar with technical terms desired. Address "A," Box 149, New York Post Office.

WANTED.—A position in a manufacturing establishment by a manufacturing Chemist of inventive ability. Address M. W. B., care of *Science*, 874 Broadway, N. Y.

WANTED.—Books on Anatomy and Hypnotism. Will pay cash or give similar books in exchange. Also want medical battery and photo outfit. DR. ANDERSON, 182 State street, Chicago, Ill.

WANTED.—A college graduate with some normal training, to teach the sciences, at \$1800 per year, in a Southern college. A Baptist or a Methodist preferred. Must also be a first-class Latin scholar. A. H. Beals, Box K, Milledgeville, Ga.

A PROFESSORSHIP in Chemistry is wanted by one who has had five years' experience in that capacity. Would prefer to give instruction by lectures and experiments rather than by text-book methods. Would like a position in a college or university where there is a good student's laboratory. Special points of strength claimed are: (1) Thorough control of a class and good order during lectures and recitations. (2) Accuracy in experimenting with chemicals and skill in the manipulation of chemical apparatus. The permission of several distinguished educators has been given to refer to them if required. Would not care to accept a position paying less than \$1500. Address B. E., care of *Science*, Advertising Dept., 47 Lafayette Place, New York.

ADDRESS WANTED.—Will some one please send the address of the Secretary of the American Philological Society. Also that of Herbert Spencer. "ADDISON," Room 84, 164 Madison St., Chicago, Ill.

ADDRESSES of Old Book Dealers wanted.—Wishing to obtain a number of old books out of print. I very much desire the addresses or catalogues of rare second-hand book dealers. If there is a directory or list of such dealers I should like to obtain possession of one. W. A. BLAKELY, Chicago, Ill.

WANTED.—(1) A white man versed in wood and iron working, able to work from specifications and plans, suited for an instructor of boys; his business to have charge of shops of school, outline and direct the work for foremen and students; salary to be \$1,000 per annum (nine months). (2) A man (black preferred) to teach the colored, iron working and forging, subordinate to the preceding; salary, \$720. (3) A man (white) competent to take classes in engineering (assistant's position), but with the ability to perform any of the work required in any of the ordinary engineering courses of our universities; salary from \$1,000 to \$1,500. A. H. BEALS, Milledgeville, Ga.