

SCIENCE

EDITORIAL COMMITTEE: S. NEWCOMB, Mathematics; R. S. WOODWARD, Mechanics; E. C. PICKERING, Astronomy; T. C. MENDENHALL, Physics; R. H. THURSTON, Engineering; IRA REMSEN, Chemistry; J. LE CONTE, Geology; W. M. DAVIS, Physiography; O. C. MARSH, Paleontology; W. K. BROOKS, Invertebrate Zoölogy; C. HART MERRIAM, Vertebrate Zoölogy; S. H. SCUDDER, Entomology; N. L. BRITTON, Botany; HENRY F. OSBORN, General Biology; H. P. BOWDITCH, Physiology; J. S. BILLINGS, Hygiene; J. McKEEN CATTELL, Psychology; DANIEL G. BRINTON, J. W. POWELL, Anthropology; G. BROWN GOODE, Scientific Organization.

FRIDAY, FEBRUARY 28, 1896.

CONTENTS:

American Society of Naturalists:—

Report of the Fourteenth Annual Meeting: H. C. BUMPUS. *Presidential Address on 'The Formulation of the Natural Sciences:'* E. D. COPE. *Discussion on 'The Origin and Relations of the Floras and Faunas of the Antarctic and Adjacent Regions:'* ANGELO HEILPRIN, W. B. SCOTT, N. L. BRITTON, A. S. PACKARD, THEO. GILL, J. A. ALLEN297

Scientific Notes and News:—

*Astronomy; Extinction of the Buffalo; General....*320

*University and Educational News.....*323

Discussion and Correspondence:—

Kew's Dispersal of Shells: EDWARD S. MORSE. *Scientific Materialism:* D. G. BRINTON. *The Röntgen Rays:* J. MCK. C. *Cyclones and Anticyclones:* H. HELM CLAYTON.....323

Scientific Literature:—

Lydekker's Handbook to the British Mammalia: C. H. M. *The Cambridge Natural History, Vol. V.:* JOHN HENRY COMSTOCK. *Clerke on 'The Herschels and Modern Astronomy:'* G. C. C.....325

Scientific Journals:—

*The Journal of Neurology.....*329

Societies and Academies:—

Academy of Natural Sciences of Philadelphia: EDW. J. NOLAN. *Biological Society of Washington:* F. A. LUCAS. *Philosophical Society of Washington:* BERNARD R. GREEN. *New York Section of the American Chemical Society:* DURAND WOODMAN330

*New Books.....*332

REPORT OF THE FOURTEENTH ANNUAL MEETING OF THE AMERICAN SOCIETY OF NATURALISTS, PHILADELPHIA,

DECEMBER 26-27, 1895.

At the first session, Thursday, December 26, 2 P. M., President Cope called for the reports of committees appointed at the Baltimore meeting: It was reported that two microtomes had been purchased by the duly authorized committee and placed at the Naples Station for the use of American students under appointment of the Smithsonian Institution. The Committee on Bibliography announced that their report had, according to instructions, been published in *SCIENCE* and the *American Naturalist*. The Treasurer's report was read and, after being duly audited, received.

Dr. Stiles reported that the present term of control of a table at the Naples Station would cease on June 8, 1896; that during this term eight men had been appointed to the table, and that the table had not remained unoccupied for a single month. He presented a memorial, addressed to the Secretary of the Smithsonian Institution, asking that the control of the table be continued, and requested the Society to approve the steps already taken by him and authorize him to continue. It was so voted, and on motion of Dr. Morgan it was also voted that the President appoint a committee of two, which committee should communicate to the Secretary of the Smithsonian Institu-

MSS. intended for publication and books etc., intended for review should be sent to the responsible editor, Prof. J. McKeen Cattell, Garrison-on-Hudson, N. Y.

tion the action of the Society. Profs. Morgan and Conn were appointed on this committee.

Messrs. Lucas, Morgan, Gill, Stiles and Macloskie were appointed a committee to nominate officers for the ensuing year.

The Society then listened to the address of the President, 'The Formulation of the Natural Sciences,' and to the following paper:

Note on the Laboratory Teaching of Large Classes, by BURT G. WILDER, M. D., Professor of Physiology, Vertebrate Zoölogy, and Neurology, Cornell University.

To my great regret a year ago the simultaneous meeting of the Association of American Anatomists prevented my participation in the discussion of this topic. Our experience at Cornell has been both extensive and successful. In 1880 for vertebrate zoölogy, and in 1886 for physiology, was introduced the actual examination and dissection of representative forms and important organs by members of large classes of general students numbering from 40 to 181. For the sake of distinguishing these comparatively brief and superficial exercises from the laboratory work to which they serve as an introduction, the word *Practicum* is employed; but I first heard it from the lips of Prof. Shaler many years ago, and he perhaps got it from the Germans.

The following practical points are to be noted:

1. The advantages of Japanese napkins over towels.

2. The convenience of placing the text and plates of directions upon a two-sided rack running lengthwise of the middle of a table and secured by a clamp at each end so as to be easily removed.

3. The cheerfulness with which these general students repay to the Treasurer of the University the cost of the material and supplies, amounting to about \$3.00 for each of the courses.

4. The almost uniform interest manifested in the work even by those who may shrink from it at first. Not more than one in five hundred has sought to be excused.

5. The possibility of preparing and storing the material for such large classes. For example, this fall each of the class of 186 has dissected the eye, brain and heart of the sheep and the viscera and certain muscles of a cat. For brains Dr. Fish's formalin mixture is satisfactory, but the hearts of cats are prepared with alcohol, as described by me before this Society in 1885 and 1890.

6. The desirability of requiring as much as is now done here at the practicums in both physiology and vertebrate zoölogy for admission to the University. Although elementary physiology has been an entrance requirement here since 1877, the extent of practical familiarity with organisms is very slight. Nevertheless I believe it can be increased by general and persistent effort.

After the reading of the above paper, Dr. Stiles requested that the Society elect a representative to meet with similar representatives appointed by the Smithsonian Institution and the American Ornithological Union, to consult with and advise the American member of the International Commission on Codes of Nomenclature. Prof. Cope was duly elected.

The President then announced to the Society the death, since the previous meeting, of James D. Dana and John A. Ryder.

The Society then adjourned.

SECOND SESSION, FRIDAY, DECEMBER 27,
9.30 A. M.

President Cope called for the report of the Nominating Committee, which was submitted, and the following officers were elected for the ensuing year: President, W. B.

Scott, of Princeton College, N. J.; Vice-Presidents, W. G. Farlow, of Harvard University; C. O. Whitman, of the University of Chicago; Theodore Gill, of the Smithsonian Institution; Secretary, H. C. Bumpus, of Brown University; Treasurer, John B. Smith, of Rutgers College; Executive Committee, Horace Jayne, of the University of Pennsylvania; William F. Ganong, of Smith College.

The business being finished, the Society listened to the annual discussion, which is printed below.

At the close of the discussion, on motion of Prof. Heilprin, it was voted that a committee of three be appointed by the President to inquire into the practicability and feasibility of the exploration of the Antarctic Continent and to report at the next meeting of the Society. The President appointed Professors Heilprin, Osborn and Goodale. The Society then adjourned.

H. C. BUMPUS,
Secretary.

THE FORMULATION OF THE NATURAL SCIENCES.*

FORMULATION is the method of presentation of the forms of our thoughts. Our observations of the facts of material nature are embodied in such classifications as we think best express their relations, and by means of these classifications expressed in language, we convey to others our conclusions in the premises. As the vehicle of presentation, formulation is one of the aspects of language, which as the medium of communication between men, enables them to accumulate knowledge. It is highly important then that the system of formulation should be uniform, so as to convey definite meaning and preserve the truth. The vast number of facts to be marshaled in orderly

array, which constitute the natural sciences, require a correspondingly complex and exact formulation. The advent of the doctrine of evolution into the organic sciences involves the necessity of making such readjustments of our method of formulation as may be called for. It is with reference to this condition and the present action of naturalists regarding it, that I address you to-day. The subject may be considered under the three heads of Taxonomy, Phylogeny, and Nomenclature.

I. TAXONOMY.

Taxonomy or classification is an orderly record of the structural characters of organic beings. The order observed is an order of values of these characters. Thus we have what we call specific or species value, generic value, family value, and so on. These values are not imaginary or artificial, as some would have us believe, but they are found in nature. Their recognition by the naturalist is a matter of experience, and the expression of them is a question of tact. Their recognition rests on a knowledge of morphology, or the knowledge of true identities and differences of the parts of which organic beings are composed. The formulation of these values in classification foreshadows the evolutionary explanation of their origin, and is always the first step necessary to the discovery of a phylogeny.

Taxonomy, then, is, and always has been, an arranging of organic beings in the order of their evolution. This accounts for the independence of the values of taxonomic characters, of any other test. Thus, no character can be alleged to be of high value because it has a physiological value, or because it has no physiological value. A physiological character may or may not have a taxonomic value. The practical taxonomist finds a different test of values, which is this. He first endeavors to dis-

* Presidential address delivered before the American Society of Naturalists in Philadelphia, December 26, 1895.