

# SCIENCE.

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FRIDAY, APRIL 26, 1895.

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## NATIONAL ACADEMY OF SCIENCES.

THE *National Academy of Sciences* met at Washington on April 16, 17, 18 and 19, Professor O. C. Marsh, president, in the chair. The following members were reported as present :

Professor C. Abbe, Gen. Henry L. Abbot, U. S. A., Professor Alexander Agassiz, Professor George F. Barker, Professor Carl Barus, Dr. John S. Billings, Professor H. P. Bowditch, Mr. Lewis Boss, Professor W. K. Brooks, General Thomas L. Casey, U. S. A., Professor Charles F. Chandler, Professor S. C. Chandler, General Cyrus B. Comstock, Professor E. D. Cope, Professor Russel H. Chittenden, Professor Theodore N. Gill, Professor Wolcott Gibbs, Mr. G. K. Gilbert, Professor G. Brown Goode, Professor Benjamin A. Gould, Professor Arnold Hague, Professor Asaph Hall, Professor Charles S. Hastings, Mr. George W. Hill, Professor O. C. Marsh, Professor T. C. Mendenhall, Dr. S. Weir Mitchell, Professor A. A. Michelson, Mr. Edward S. Morse, Professor Simon Newcomb, U. S. N., Professor Ira Remsen, Professor Henry A. Rowland, Professor Charles A. Schott, Professor John Trowbridge, General Francis A. Walker, Professor Charles A. White.

The papers entered to be read were as follows :

1. *On Some Variations in the Genus Encope*: A. AGASSIZ and W. McM. WOODWORTH.
2. *Notes on the Florida Reef*: A. AGASSIZ.
3. *The Progress of the Publications on the Expedition of 1891 of the U. S. Fish Commission Steamer 'Albatross,' Lieut. Commander Z. L. Tanner, commanding*: A. AGASSIZ.
4. *On Soil Bacteria*: M. P. RAVENEL. (Introduced by J. S. BILLINGS.)

5. *A. Linkage Showing the Laws of the Refraction of Light*: A. M. MAYER.
6. *On the Color Relations of the Atoms, Ions and Molecules*: M. CAREY LEA.
7. *Mechanical Interpretations of the Variations of Latitude*: R. S. WOODWARD. (Introduced by S. C. CHANDLER.)
8. *On a New Determination of the Nutation-Constant, and some allied topics*: S. C. CHANDLER.
9. *On the Secular Motion of a Free Magnetic Needle*: L. A. BAUER. (Introduced by C. ABBE.)
10. *On the Composition of Expired Air, and Its Effect Upon Animal Life*: J. S. BILLINGS.
11. *Systematic Catalogue of European Fishes*: TH. GILL.
12. *The Extinct Cetacea of North America*: E. D. COPE.
13. *On the Application of a Percentage Method in the Study of the Distribution of Oceanic Fishes.*  
*A. Definition of Eleven Faunas and Two Sub-faunas of Deep Sea Fishes.*  
*B. The Relationships and Origin of the Carribeo-Mexican and Mediterranean Sub-faunas*: G. BROWN GOODE.
14. *On the Two Isomeric Chlorides of Orthosulpho-benzoic Acid*: IRA REMSEN.
15. *On Some Compounds Containing two Halogen Atoms in Combination with Nitrogen*: IRA REMSEN.
16. *Presentation of the Watson Medal to Mr. Seth C. Chandler, for his Researches on the Variation of Latitudes, on Variable Stars, and for his other works in Astronomy.*
17. *Biographical Memoir of Dr. Lewis M. Rutherford*: B. A. GOULD.
18. *Relation of Jupiter's Orbit to the Mean Plane of Four Hundred and One Minor Planet Orbits*: H. A. NEWTON.
19. *Orbit of Miss Mitchell's Comet, 1847, VI*: H. A. NEWTON.

The officers elected were as follows: President, Prof. Wolcott Gibbs; Vice-president, Gen. F. A. Walker; Home Secretary, Prof. Asaph Hall; Foreign Secretary, Prof. A.

Agassiz; Treasurer, Dr. John S. Billings; additional members of the Council, Prof. George J. Brush, Prof. George L. Goodale, Dr. B. A. Gould, Prof. O. C. Marsh, Prof. Simon Newcomb and Prof. Ira Remsen.

The new members elected were Prof. W. L. Elkin, professor of astronomy in Yale Observatory; Prof. C. S. Sargent, professor of botany in Harvard University; Dr. W. H. Welch, professor of pathology in Johns Hopkins University, and Prof. C. O. Whitman, professor of biology in the University of Chicago. The foreign associates elected were Prof. Rudolph Leuckart, professor of zoölogy in the University of Leipsic; Prof. Julius von Sachs, professor of botany in the University of Würzburg, and Prof. Sophus Lie, professor of mathematics in the University of Leipsic.

The Barnard Medal was awarded to Lord Rayleigh for his discovery of argon, and the Watson Medal to Professor S. C. Chandler for his researches on the variation of latitude and other subjects.

The autumn meeting of the Academy will be held at Philadelphia, beginning October 29.

#### ARTHUR CAYLEY.

How Professor Cayley touched everything mathematical, and touched nothing which he did not adorn, may be illustrated by the following unpublished letters, which were the first expression of discoveries that have since taken their permanent place in our best text-books. They are both the outcome of the sudden and fruitful interest in *linkage*, dating from Sylvester's interview with Tchébychev, when, leaving behind him the diagram of the now celebrated Peaucellier's Cell, the illustrious Russian gave in parting the characteristic advice: "Take to kinematics; it will repay you; it is more fecund than geometry; it adds a fourth dimension to space."

I will transcribe the letters exactly, not