PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY,

HELD AT PHILADELPHIA,

FOR

PROMOTING USEFUL KNOWLEDGE.

VOL. I.

FOR THE YEARS 1838, 1839 & 1840.

PHILADELPHIA:
1840.

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PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. I. JAN. FEB. & MAR. 1838. No. 1.

Stated Meeting, January 5.

Present, fourteen members.

Mr. DU PONCEAU, President, in the Chair.

The result of the annual election for officers, held this day, was reported by the judges and clerks as follows:—

President.

Peter S. Du Ponceau, LL. D.

Vice Presidents.

Nathaniel Chapman, M. D.,
Joseph Hopkinson, LL. D.,
Robert M. Patterson, M. D.

Secretaries.

Franklin Bache, M. D.,
John K. Kane,
Alexander D. Bache, LL. D.,
J. Francis Fisher.

Counsellors for Three Years.

Robert Hare, M. D.,
William Meredith,
William Hembel, Jun.,
Charles D. Meigs, M. D.

Curators.

Isaac Lea,
Isaac Hays, M. D.,
Franklin Peale.

Treasurer.

John Vaughan.

The following donations were received:—

FOR THE LIBRARY.

Annual Discourse delivered before the Ohio Historical and Philosophical Society, at Columbus, December 23, 1837. By Timothy Walker. Cincinnati, 1838.—*From the Author.*

Address delivered before the Phi Beta Kappa Society, Alpha of Maine. By J. R. Ingersoll. Brunswick, Me., 1837.—*From the Author.*

Logic, or the Art of Reasoning simplified. By S. E. Parker. Published by Robert Davis. Philadelphia, 1837.—*From the Publisher.*

Essay on the Veterinary Art, giving an Account of the Veterinary Colleges of France and England, &c. By P. A. Browne. Philadelphia, 1837.—*From the Author.*

Researches on the Cheiroptera of the United States. By William Cooper. New York, 1837.—*From the Author.*

FOR THE CABINET.

Neptune's punch bowl (Gigantia Alcyonia), from Singapore.—*From Captain Story, through Messrs. Eyre & Massey.*

Two specimens of a new mineral from the neighbourhood of Charlotte, N. C., proposed by Mr. Featherstonhaugh to be called leopardalite.—*From Mr. Franklin Peale.*

A specimen of augite in steatite, from Oxford, N. H.—*From Dr. James Mease.*

Mr. Lea read a paper in continuation of his Memoir on fresh water and land shells, which was referred.

Stated Meeting, January 19.

Present, thirty-two members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

The Philadelphia Practice of Midwifery. By Charles D. Meigs, M. D. Philadelphia, 1838.—*From the Author.*

Congressional Documents of the First Session of the Twenty-fifth Congress. 4 vols. Washington, 1837–8.—*From the Hon. John Forsyth, Secretary of State.*

Transactions of the Zoological Society of London, Vol. II. Part I. London, 1836.—*From the Society.*

A Comprehensive Minute, commemorative of Philip Syng Physick, M. D., Emer. Prof. of Anatomy and Surgery in the University of Pennsylvania. Prepared by direction of the Trustees. Philadelphia, 1838.—*From William Meredith, Esq.*

Journal für die Baukunst. Herausgegeben von Dr. A. L. Crelle. Vols. I. & II. Berlin, 1829–30.—*From Prof. Henry Vethake.*

Journal für die reine und angewandte Mathematik. Herausgegeben von Dr. A. L. Crelle. 5 vols. Berlin, 1826 to 1830.—*From the same.*

A Catalogue of Plants, native and naturalized, in the vicinity of Newbern, N. C. By H. B. Croom. New York, 1837.—*From Dr. John Torrey.*

Introductory Lecture on the Dignity of the Law. Delivered before the Cincinnati College, November, 1837. By Timothy Walker. Cincinnati, 1837.—*From the Author.*

Annales des Mines. Vol. XI. Paris, 1837.—*From the Engineers of Mines.*

Mr. Lea read a paper in further continuation of his Memoir on fresh water and land shells, which was referred.

Mr. Walker presented to the notice of the Society, the drawings of a self-registering anemometer and rain gauge, invented by Mr. Follett Osler, of Birmingham, England, of which he explained the character and advantages.

The Society elected John Vaughan librarian.

Mr. Vaughan announced the death of Joshua Humphreys, a member of the Society, aged 86.

The following candidates were elected members:—

Captain Andrew Talcott, late of the U. S. Engineers.
Thomas W. Griffith, Esq., of Baltimore.
Charles G. B. Daubeny, M. D., of the Univ. of Oxford.
Henry Reed, Esq., of the University of Pennsylvania.
William Norris, of Philadelphia County.
William Sullivan, Esq., of Boston.

Stated Meeting, February 2.

Present, twenty-three members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

The Laws of Wages, Profits, and Rents investigated. By George Tucker, Professor of Political Economy in the University of Virginia. Philadelphia, 1837.—*From the Author.*

The Select Medical Library. Edited by John Bell, M. D. Nos. 13, 14, 15. Philadelphia, 1837–8.—*From the Editor.*

History of the Indian Tribes of North America, with Biographical Sketches, &c. By Thomas L. M'Kenney & James Hall, Esq. Nos. 1 to 9. Philadelphia, 1838.—*From Messrs. E. C. Biddle and F. W. Greenough.*

Life and Services of Commodore William Bainbridge, of the United States Navy. By Thomas Harris, M. D. Philadelphia, 1837.—*From the Author.*

FOR THE CABINET.

Theodolite which belonged to William Penn, and was used in laying out the City of Philadelphia.—*From Mr. Philip Physick.*

Press used in making impressions from the Great Seal of Pennsylvania under the Proprietary Government.—*From the same.*

A letter was read from John K. Townsend, dated January 20th, 1838, announcing the transmission of the Indian Vocabularies collected for the Society, and of certain shells and geological specimens, selected for its use by Mr. Peale.

A communication from the late Joshua Humphreys, Esq., dated December 23d, 1837, was read, on the subject of the early history of the naval construction of the United States, tending to correct an erroneous impression as to the opinions and wishes of President Washington on the subject of the navy, which had found place in Professor Tucker's Biography of Mr. Jefferson, and which had been the subject of remark by Dr. Harris in his Life of Bainbridge. This communication was referred to the Historical Committee.

The president communicated a letter to him from Mr. Ty-

son, of the House of Representatives of Pennsylvania, dated Jan. 29th, 1838, giving intelligence in relation to the ancient records of the State, and of the proposed publication of them at the public expense.

Stated Meeting, February 16.

Present, sixteen members.

Dr. PATTERSON, Vice President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Patologio Generale di Lorenzo Martini. 2 vols. Capolago, 1834.—*From the Author.*

Polizia Medica di Lorenzo Martini. Capolago, 1834.—*From the Author.*

Constitution of the United States, Rules of the Two Houses of Congress, and Jefferson's Manual. Printed by C. Sherman & Co. Philadelphia, 1837.—*From Mr. C. Sherman.*

Familiar Letters on Public Characters and Public Events. By William Sullivan. Boston, 1834.—*From the Author.*

The Political Class-book, intended for the Higher Classes in Schools. By William Sullivan. With an Appendix upon the Studies of Practical Men. By G. R. Emerson. Boston, 1837.—*From the Author.*

Historical Causes and Effects, from the Fall of the Roman Empire in 476, to the Reformation in 1517. By William Sullivan. Boston, 1838.—*From the Author.*

A View of the Land Laws of Pennsylvania, with Notices of its early History and Legislation. By Thomas Sergeant. Philadelphia, 1838.—*From the Author.*

Transactions of the Royal Academy of Berlin for 1835. Berlin, 1837.—*From the Academy.*

Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Preuss. Akademie der Wissenschaften zü Berlin. Berlin, 1836–7.—*From the same.*

Weekly Register. Edited by William O. Niles. Vol. LI. Baltimore, 1836–7.—*From the Editor.*

Original Notes of M. de la Palun on Father Morrone's Cochinchinese Vocabulary.—*From P. S. Du Ponceau, Esq.*

Dissertation on the Nature and Character of the Chinese System of Writing. Being Vol. II. of the Historical Transactions of the Society. By P. S. Du Ponceau. Philadelphia, 1838.—*From the Author.*

FOR THE CABINET.

A Collection of South American copper coins.—*From Mr. Condy Raguet.*

Professor Henry, of Princeton, made a verbal communication on the lateral discharge of electricity, while passing along a wire as in the Leyden experiment, or communicated directly to an insulated wire, or to a wire connected with the earth; and detailed various experiments, proving that free electricity is not, under any circumstances, conducted silently to the earth.

Dr. Bache announced the death of Dr. John Eberle, a member of the Society, who died at Lexington, Ky., on the 2d of February, aged 54.

Stated Meeting, March 2.

Present, twenty-three members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Atlas of Europe, executed at the Geographical Establishment of Brussels in 1833. Containing 165 Maps. By Vandemaden. Brussels, 1833.—*From Mr. H. S. Tanner, and twenty-one other members of the Society.*

Autographs of the Members of the Pennsylvania Convention for amending the Constitution. 1837-8.—*From J. K. Kane, Esq.*

The Principles of Political Economy. By Henry Vethake. Philadelphia, 1838.—*From the Author.*

Magazine of Natural History. Edited by Edward Charlesworth. Vol. I. Nos. 10, 11, & 12. London, 1837.—*From the Editor.*

American Journal of the Medical Sciences. Edited by Isaac Hays, M. D. No. 42, for February. Philadelphia, 1838.—*From the Editor.*

Etats Unis d'Amerique. Par M. Roux de Rochelle. Paris, 1837. *From the Author.*

The Historical Committee announced that they had completed the publication of Mr. Du Ponceau's Dissertation on the Nature and Character of the Chinese System of Writing, forming volume second of the Historical Transactions of the Society.

Mr. Walker read a paper, entitled "Determination of the Longitude of several Stations near the Southern Boundary of Michigan; calculated from Transits of the Moon and of moon culminating Stars, observed in 1835 by Andrew Talcott, late Captain of United States Engineers."

The longitude of places in the United States, north of the Ohio, had hitherto depended on the observations of Ellicott and De Ferrer, made at points on the banks of the Ohio river, and on meridian lines drawn from this river, several hundred miles northward, by the deputy surveyors. From Mr. Walker's computations, it appears that *Turtle Island*, *Lake Erie*, has been placed only 1.7 geographical miles too far east on Tanner's Map. Its true place is 41° 45′ 9″ N. latitude; and 5 hours, 33 min. 34.3 sec. W. longitude from Greenwich. Also, *South Bend Lake*, *Michigan*, has been placed 3.9 miles too far east; its true place being N. 41° 37′ 6″; W. 5 hours, 49 min. 15.3 sec. These observations of Capt. Talcott will prove highly useful to geographers, by furnishing standard points of reference in the northernmost part of the United States.

Mr. Vaughan announced the death of Benjamin Dearborn, of Boston, a member of the Society, who died on the 22d of February, 1838, aged 83.

Stated Meeting, March 16.

Present, seventeen members.

Dr. PATTERSON, Vice President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

The Statutes at Large of South Carolina. Edited under the Authority of the Legislature. By Thomas Cooper. Vol. II. Columbia, S. C., 1837.—*From Dr. Philip Tidyman.*

Speech on the Bill to suspend the Payment of the Fourth Instalment of the Surplus Revenue of the United States. By Charles F. Mercer. Washington, 1837.—*From the Author.*

Statistical Tables, exhibiting the Condition and Product of certain Branches of Industry in Massachusetts, for the Year ending the 1st of April, 1837. By John P. Bigelow, Secretary of the Commonwealth. Boston, 1838.—*From Josiah Quincy, Jun., Esq.*

Reports of the Engineers of the Western Rail Road Corporation, made to the Directors in 1836–7.—*From the same.*

Fourth Annual Report on the Common Schools, Academies, and Colleges of Pennsylvania. By T. H. Burrowes, Secretary of the Commonwealth. Harrisburg, 1838.—*From the Author.*

Mr. Lea invited the attention of the Society to certain facts, mentioned in a "Memoire sur quelques Acephales d'eau douce du Senegal," by Mr. Rang, in relation to the torpidity of the Anadonta Chaiziana.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. I. APRIL, MAY, & JUNE, 1838. No. 2.

Stated Meeting, April 6.

Present, twenty-one members.

Mr. DU PONCEAU, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Form of Prayers, according to the Customs of the Spanish and Portuguese Jews. Edited by Isaac Leeser. Six Vols. Printed by Haswell, Barrington, and Haswell. Philadelphia, 1838.—*From the Printers.*

Elementary Treatise on the Strength of Materials, being the Substance of Lectures delivered in the School of Engineers of the University of Virginia. By W. B. Rogers. Charlottesville, Va., 1838.—*From the Author.*

Proyecto del primer Camino de Hierro de la Republica, desde el Puerto de Veracruz a la Capital de Mexico. Mexico, 1837.——*From M. Ygnatio Cumplido.*

Calendano Portatif por año 1838. Mexico, 1837.—*From the same.*

Calendano de Madrid y Guia de Forasteros, para el año de 1835. Madrid, 1835.—*From M. Chacon, Consul General of Spain.*

Esquisse Générale de l'Afrique. Par D'Avezac. Paris, 1837.—*From the Author.*

Notice des Travaux de la Société Géographique de Paris, et du Progrès des Sciences Géographiques pendant 1836. Par D'Avezac. Paris, 1836.—*From the Author.*

Mémoires de la Societe des Antiquaires de France. Tome XIII. Paris, 1837.—*From the Society.*

Second Annual Report on the Geological Exploration of Pennsylvania. By H. D. Rogers, State Geologist. Harrisburg, 1838. —*From the Author.*

Writings of George Washington. Vols. I. & XII. Edited by Jared Sparks. Boston, 1837.—*From the Editor.*

Remarks on Literary Property. By P. H. Nicklin. Philadelphia, 1838.—*From the Author.*

Magazine of Natural History. Edited by Edward Charlesworth. For 1837, complete; and Nos. 1 & 2, for 1838. London, 1837–8. —*From the Editor.*

Oration at the Celebration of the First Centennial Anniversary of the South Carolina Society, in Charleston, March 28th, 1837. By Joshua W. Toomer. Charleston, 1837.—*From Mr. Josiah Taylor.*

Discovery of Vauquelinite, a rare ore of Chromium. Also an Account of several new Genera and Species of N. A. Plants. By John Torrey, M. D. New York.—*From the Author.*

Transactions of the Cambridge Philosophical Society. Vols. III. IV. V. & VI. Cambridge, 1833–5–7.—*From the Society.*

Laws and By-Laws of the Cambridge Philosophical Society. Cambridge, 1837.—*From the same.*

Catalogue of the Collection of British Quadrupeds and Birds in the Museum of the Cambridge Philosophical Society, &c. Cambridge, 1836.—*From the same.*

First Report on the Agriculture of Massachusetts, County of Essex, 1837. By Henry Coleman. Boston, 1838.—*From the Author.*

Dr. Patterson announced the death of Dr. Nathaniel Bowditch, a member of the Society, who died on the 16th of March last, aged 63. Dr. Patterson was appointed to prepare a necrological notice of the deceased.

Mr. Du Ponceau mentioned the death, not heretofore reported, of Mr. Adet, a member of the Society, who died in March, 1834.

Stated Meeting, April 20.

Present, thirty-four members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Flora Batava. Nos. 111, 112, & 113. Amsterdam, 1838.—*From the King of the Netherlands.*

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie. Uitgegeven door J. Van der Hoeven, M. D., en W. H. de Vriese, M. D. Vol. IV. Part I. & II. Leyden, 1837.—*From the same.*

Asiatic Researches of the Asiatic Society of Bengal. Vol. XIX. Part I., and Vol. XX. Part I. Calcutta, 1836.—*From the Society.*

Journal of the Asiatic Society. Edited by James Prinseps, Secretary. Vol. V. Calcutta, 1836.—*From the Editor.*

Useful Tables, forming an Appendix to the Journal of the Asiatic Society. By H. Piddington. Part IV. Calcutta, 1836.—*From James Prinseps, Esq.*

Useful Tables. Part II. Indian Chronological and Genealogical Tables. Calcutta, 1836.—*From the same.*

Mr. Kane deposited with the Society the writing chair used by Mr. Jefferson at his lodgings, during the Congressional Session of 1776.

Mr. Lea read a Note supplementary to his Memoir, now in the Society's press, on the subject of the Uniones, and permission was given to add the same to the principal communication.

The following candidates were elected members:—

William Harris, M. D., of Philadelphia.
Robert Treat Paine, of Boston.
John P. Emmet, M. D., of the University of Virginia.
Hugh S. Legare, of Charleston, S. C.
Samuel Breck, of Philadelphia.
Col. Sylvanus Thayer, U. S. Engineers.
Francis Wayland, D. D., of Brown University.
Henry Baldwin, of Pennsylvania.
William H. Prescott, of Boston.

Stated Meeting, May 4.

Present, twenty-one members.

Dr. Patterson, Vice President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

O Auxiliador da Industria Nacional. Rio Janeiro, 1837.—*From Mr. J. S. Rebello.*

Journal of the Asiatic Society. Edited by James Prinseps, Sec. Nos. 61 to 67. Calcutta, 1837.—*From the Society.*

Address to the Royal Society, at its Anniversary Meeting, November 30, 1837. By the Duke of Sussex, President. London, 1837. *From Mr. William Vaughan.*

Transactions of the Royal Society. Parts I. & II. for 1837. London, 1838.—*From the Society.*

Catalogue of Members of the Royal Society, November 30, 1837. London, 1837.—*From the same.*

Astronomical Observations, made at the Royal Observatory, Greenwich, in the year 1836. By George Biddel Airy, Astron. Roy. London, 1837.—*From the same.*

Appendix to the above. London, 1837. *From the same.*

Proceedings of the Royal Society, Nos. 29 & 30. London, 1837.—*From the same.*

Abstract of Papers in the Transactions of the Royal Society. Vol. III. From 1830 to 1837. London, 1838.—*From the same.*

Defence of the Resolution for omitting Panizzi's Bibliographical Notes from the Catalogue of the Library of the Royal Society. London, 1838. *From the same.*

Memoires couronnés par l'Academie Royale des Sciences et Belles Lettres de Bruxelles. Tome XI. Brussels, 1837.—*From the Academy.*

Nouveaux Memoires de l'Academie Royale des Sciences et Belles Lettres de Bruxelles. Tome XIV. Brussels, 1837.—*From the same.*

Annales de l'Observatoire de Bruxelles. Par le Directeur A. Quetelet. Tome I. Deuxième Partie. Brussels, 1837.—*From the same.*

Bulletin de la Science Générale, Nos. 5 to 9. Brussels, 1837.—*From the same.*

Report of the Sixth Meeting of the British Association for the Advancement of Science, held at Bristol in August 1836. London, 1837.—*From the Association.*

Speech on the Judicial Tenure, delivered in the Convention of Pennsylvania for revising the Constitution. By J. Hopkinson. Philadelphia, 1838.—*From the Author.*

Speech in the Convention on the same subject. By Charles Chauncey. Philadelphia, 1838.—*From the Hon. J. Hopkinson.*

Speech in the Convention on Banks and Currency. By Thomas P. Cope. Philadelphia, 1838.—*From J. R. Tyson, Esq.*

Tenth Report of the House of Refuge, with an Appendix. Philadelphia, 1838.—*From J. J. Barclay, Esq.*

Le Sourd-Muet et l'Aveugle. Journal Mensuel, par l'Abbe Carton. Brussels, 1837.—*From the Editor.*

Lucani Pharsalia, cum Notis Hugonis Grotii et Ricardi Bentleii. Glasgow, 1816. *From J. F. Fisher, Esq.*

M. Valerii Martialis Epigrammata. Leipsic. No date.—*From the same.*

C. Crispus Sallustius. No imprint.—*From the same.*

Antiquities of Greece. By John Robinson. London, 1807.—*From Mr. John Vaughan.*

Roman Antiquities. By Alexander Adam. With Notes by P. Wilson. New York, 1819.—*From the same.*

Compendium of Ancient Geography. By M. D'Anville. Translated from the French, with Maps, &c., by John Horsley. Two Vols. New York, 1814. *From the same.*

Formula for the Announcement of the principal Phases of the Annular Eclipse of the Sun, September 18, 1838. By E. O. Kendal. Philadelphia, 1838.—*From Mr. S. C. Walker.*

Arte de los Metales, &c. Por Alv. Alonso Barba. Lima, 1817.—*From Mr. J. B. Quinby.*

Essai sur la Vie et les Ouvrages de M. S. F. Schoell. Par A. P. de la Forest. Paris, 1835.—*From the Author.*

Catalogue de Plantes cultivées par J. Sisley-Vandael et Cie. Paris, 1838.—*From the Publishers.*

Pursuant to appointment, Dr. Horner read a necrological notice of Dr. Philip Syng Physick, late a member of the Society. Dr. Horner having expressed a wish to make the same

public, permission was granted to him to withdraw it from the files of the Society for publication.

Dr. Patterson read a letter from Professor Henry, of Princeton, dated May 4, 1838, announcing that, in recent experiments, he has produced directly from ordinary electricity, currents by induction analogous to those obtained from galvanism; and that he has ascertained that these currents possess some peculiar properties, that they may be increased in intensity to an indefinite degree, so that if a discharge from a Leyden jar be sent through a good conductor, a shock may be obtained from a contiguous but perfectly insulated conductor, more intense than one directly from the jar. Professor Henry remarks that he has also found that all conducting substances screen the inductive action, and that he has succeeded in referring this screening process to currents induced for a moment in the interposed body.

Dr. Hare exhibited to the Society fourteen and a half ounces of platinum, fused by his hydro-oxygen blowpipe, and a specimen of pure platinum, freed from iridium by the process of Berzelius.

Dr. Patterson submitted to the Society's inspection the log-book of the steam-ship Savannah, Capt. Moses Rogers, launched at New York on the 22d of August, 1818; from which it appears that, after repeated voyages between New York, Savannah, and Charleston, this vessel left Savannah on the 24th or 25th of May 1819 for Liverpool, saw Land's End on the 17th of June, and arrived at Liverpool on the 20th of June, having used steam thirteen days, and having exhausted her fuel (coal) three days before arrival. It also appears from the log-book that she left Liverpool on the 23d of July, arrived at Elsineur on the 9th of August, left Elsineur on the 14th of August, arrived at Stockholm on the 22d of August, left Stockholm on the 5th of September, arrived at Cronstadt on the 9th of September, and after several excursions between Cronstadt, &c., and Copenhagen, &c., left Arundel, Copenhagen, on the 23d of October, and arrived at Savannah on the 30th of November; that she subsequently arrived at Washington from Savannah on the 16th of December, after a passage of eleven days; that she was sold at Washington in September,

1820, and her engine taken out, after which she sailed as a packet, from New York to Savannah, until September, 1822, when she was lost. This log-book was supposed to derive additional interest from the recent arrival of the Sirius and Great Western, steam-ships, at New York, from England.

Dr. Mitchell repeated before the Society Thilorier's process for solidifying carbonic acid, with an apparatus, made under his direction in Philadelphia, somewhat modified from that employed by Thilorier, and froze a quarter of a pound of mercury by the admixture of the solidified acid with nitrous ether.

Stated Meeting, May 18.

Present, fifteen members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Transactions of the Geological Society of London. Vol. V. Part I. London, 1838.—*From the Society.*

A Catalogue of the Circumpolar Stars, deduced from the Observations of Stephen Groombridge. Edited by Sir George B. Airy. London, 1838.—*From the Lords Commissioners of the Admiralty.*

Journal of the Royal Asiatic Society of Great Britain and Ireland. Part VIII. London, 1837.—*From the Society.*

American Journal of the Medical Sciences. Edited by Isaac Hays, M. D. No. 43, for May. Philadelphia, 1838.—*From the Editor.*

Fables and Phrases in the Seneca Language. 1836.—*From Nathaniel J. Strong, a Seneca Chief.*

Report of the Directors of the Little Schuylkill and Susquehanna Rail Road Company. Philadelphia, 1838.—*From J. C. Montgomery, Esq.*

C. Hugenii Aliorumque Seculi XVII Virorum Celebrium Exercitationes Mathematicæ et Philosophicæ. Ex MSS. in Bibliothecâ Academiæ Lugduno-Batavæ servatis edidit P. J. Uylenbroek. Fasc. I. & II. Hague, 1833.—*From the Leyden Academy.*

The Librarian read the translation of a letter from Pierre de Goetz to Mr. Du Ponceau, dated St. Petersburg, August 17th (29th) 1837, on behalf of the Imperial Russian Academy, announcing the transmission to the Society of the works which have been published by the Academy, numbering fifty-seven volumes, and also of a donation of several volumes from himself personally.

Dr. Bache announced the death of Thomas Bradford, the latest survivor of the original members of the Society, who died on the 7th of May, 1838, aged 93 years and 3 days.

Dr. Hare communicated orally, that he has found that when the elements of water are exploded in contact with certain gases or essential oils, the aqueous elements, instead of condensing, combine with the hydrogen and carbon, and form a permanent gas.

On motion of Dr. Bache, a committee was appointed to consider the expediency of publishing, from time to time, a brief abstract of the proceedings of the Society. Committee, Dr. Bache, Dr. Dunglison, and Mr. Kane.

Stated Meeting, June 15.

Present, seventeen members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Coleccion de obras y documentos relativos a la Historia antigua y moderna de las Provincias del Rio de la Plata. Por Pedro de Angelis. Vols. III. IV. & V. Buenos Ayres, 1836.—*From the Author.*

Bulletin de la Société Géographique de Paris. Deuxième Série. Vol. VIII. Paris, 1837.—*From the Society.*

Annales des Mines. Vol. XII. No. 5. Paris, 1837.—*From the Engineers of Mines.*

Magazine of Natural History. Edited by Edward Charlesworth. Nos. 3 & 4. for 1838. London, 1838.—*From the Editor.*

Jahrbuch für 1837, von H. C. Schumacher. Stuttgart und Tübingen, 1838.—*From President A. D. Bache.*

Academical Lectures on the Jewish Scriptures and Antiquities. By John Gorham Palfrey, D. D. Vol. I. Boston, 1838.—*From Mr. M. Burns.*

Memoir of the Life and Writings of the Rev. Jonathan Mayhew, D. D. By Alden Bradford. Boston, 1838.—*From the Author.*

Catalogue and Specimen Book of Oxford and Polyglot Bibles, and Theological Works. By Bagster and Marshall. London and Philadelphia, 1838.—*From the Publishers.*

Popular Essay on subjects of Penal Law, Solitary Confinement with Labour, and Joint Labour by day. By Francis Lieber. Philadelphia, 1838.—*From the Author.*

Annual Report of the Geologist of Maryland. By J. T. Ducatel, M. D. Annapolis, 1837.—*From the Author.*

First Report on the Agriculture of Massachusetts, County of Essex, 1837. By Henry Coleman. Boston, 1837.—*From T. G. Bradford, Esq.*

Report and Resolves of the Joint Committee of the Legislature of Massachusetts on Public Lands, in relation to the North-eastern Boundary. Boston, 1838.—*From the same.*

First Annual Report of the American Board of Education of Massachusetts. Boston, 1838.—*From the same.*

St. Luke in the Chippewa Language. By George Copway and S. Hall. Boston, 1837.—*From John Pickering, Esq.*

Choctaw Arithmetic. Boston, 1835.—*From the same.*

Choctaw Spelling Book. Third Edition revised. Boston, 1835.—*From the same.*

Journals of the Select and Common Councils of Philadelphia, for 1835–6 & 1836–7. Philadelphia, 1836–7.—*From Mr. J. P. Wetherill.*

Third Annual Report of the Directors of the Ohio Lunatic Asylum. Columbus, 1837.—*From Mr. William M. Awl.*

American Medical Library and Intelligencer. Edited by R. Dunglison, M. D. Vol. I. Nos. 19 to 24; and Vol. II. Nos. 1 to 7. Philadelphia, 1837–8. (Presented at various times since the beginning of the year).—*From the Editor.*

Report to the Secretary of War on the Harbour of Provincetown, Cape Cod, Mass. By Col. J. J. Abert, Topog. Engineer. Washington, 1838.—*From the Author.*

Report of the Secretary of the Treasury on the Light Houses of the United States. With Communications from the Messrs. Blunt of New York, pointing out Defects. Washington, 1838.—*From Messrs. E. & G. W. Blunt.*

Bulletin de la Société Impériale des Naturalistes de Moscou. Nos. 1, 2, & 3. Moscow, 1837.—*From the Society.*

Report to the Senate of the United States, by Senator Linn, on the Memorial of Dr. Henry Perrine, applying for a tract of land in Florida for the cultivation of Tropical Plants. Washington, 1838.—*From Dr. Henry Perrine.*

Mémoire sur le Système Grammatical des Langues de quelques Nations Indiennes de l'Amèrique. Ouvrage qui a remporté le prix Volney adjugé par l'Institut de France. Par P. S. Duponceau. Paris, 1838.—*From the Author.*

Exposé Sommaire de la Constitution des Etats Unis de l'Amèrique. Par P. S. Du Ponceau. Traduit de l'Anglois par M. d'Homergue. Paris, 1837.—*From the Author.*

Atlas Classica. By H. S. Tanner. Nos. 4 to 7. Philadelphia, 1838. *From the Author.*

Boston Journal of Natural History. Published by the Boston Society of Natural History.—Vol. II. No. 1. Boston, 1838.—*From the Society.*

The Committee appointed at the last meeting to consider the expediency of publishing from time to time, a brief abstract of the proceedings of the Society, reported in favour of its expediency, and in order to carry the measure into effect, proposed the following resolutions, which were adopted.

1. That the Secretaries be authorized to choose one of their number as Reporter of the Society, whose duty it shall be to prepare and print, from time to time, a brief abstract of its proceedings.

2. That the Reports shall commence with the first proceedings of the present year.

3. That the Librarian be charged with the duty of their distribution.

And it was directed that the Reports be published at least once in every three months, if the state of the materials shall permit.

Dr. Hays, from the Committee of Publication, announced

that Vol. VI. Part I., N. S., of the Society's Transactions, has been printed, and is now ready for distribution.

A communication was read, dated Cincinnati, May 7th, 1838, from Dr. John Locke, on the subject of Magnetic Observations, which was referred.

Dr. Dunglison announced the death of Thomas W. Griffith, of Baltimore, a member of the Society.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. I. JULY & AUGUST, 1838. No. 3.

Stated Meeting, July 20.

Present, thirteen members.

Mr. DU PONCEAU, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Memorias da Academia R. das Sciencias de Lisboa. Tomo XII. Parte I. Lisbon, 1837.—*From the Academy.*

Roteiro geral dos Mares, Costas, Ilhas, &c. Por Antonio Lopes da Costa Almeida. Tomo I. Parte III. Lisbon, 1837.—*From the same.*

Compendio de Botanica do Doutor Felix de Avellar Brotero. Tomo I. Lisbon, 1837.—*From the same.*

Principios geraes de Castrametação, applicados ao Acampamento das Tropas Portuguezas. Por F. J. Barreiros. Lisbon, 1838.—*From the same.*

Manual de Instrucções praticas sobre a Sementeira, Cultura e Corte dos Pinheiros, &c. Por F. L. G. de Varnhagen. Lisbon, 1836.—*From the same.*

Glossario de Vocabulos Portuguezes derivados das Linguas Orientaes e Africanas, excepto a Arabe. Por D. F. de S. Luiz. Lisbon, 1837.—*From the same.*

Ensaio sobre os Principios geraes de Strategia, e de Grande Tactica. Por F. J. Barreiros. Lisbon, 1837.—*From the same.*

Collecção de Noticias para a Historia e Geografia das Naçōes Ultramarinas, que vivem nos Dominios Portuguezes. Tomo V. Lisbon, 1836.—*From the same.*

Mémoires de l'Academie Royale des Sciences Morales et Politiques de l'Institut de France. Tome I. Deuxième Série. Paris, 1837.—*From the French Institute and Academy.*

North American Herpetology. By J. E. Holbrook, M. D. Philadelphia, 1836.—*From the Author.*

Atlas Classica. By H. S. Tanner. No. 8. Philadelphia, 1838.—*From the Author.*

Illustrations of the Atmospherical Origin of Epidemic Diseases. By T. Forster. Chelmsford, 1829.—*From the Author.*

Medicina Simplex; or the Pilgrims Waybook. By T. Forster. London, 1832.—*From the Author.*

Observations sur l'Influence des Comètes sur les Phénomènes de l'Atmosphère. Addressés a M. Arago. Par T. Forster. Aix-la-Chapelle, 1836.—*From the Author.*

Recueil de ma Vie, mes Ouvrages et mes Pensées. Opuscule Philosophique. Par T. Forster. Brussels, 1837.—*From the Author.*

The Credit System of France, Great Britain, and the United States. By H. C. Carey. Philadelphia, 1838.—*From the Author.*

Darlegung des Verfahrens der Preussischen Regierung gegen den Erzbischof von Cöln. Berlin, 1837.—*From the Berlin Academy.*

Beilagen zu der Darlegung des Verfahrens der Preussischen Regierung gegen den Erzbischof von Cöln. Berlin, 1837.—*From the same.*

Ueber die Berechnung der Sonnenfinsternisse, von C. Rümker. Hamburg, 1837.—*From President A. D. Bache.*

Förenta Staterna och Canada, Aren 1832, 1833 och 1834, af C. D. Arfwedson. Two Vols. Stockholm, 1835.—*From the Author.*

Scener i Nord-Amerika, af C. D. Arfwedson. Stockholm, 1836.—*From the Author.*

Minnen från Europa och Amerika, af C. D. Arfwedson. Stockholm, 1837.—*From the Author.*

The Transylvania Journal of Medicine. Vol. XI. No. I. For January, February, and March. Lexington, Ky., 1838.—*From the Editors.*

Periodical Collection, published by the Imperial Academy of St. Petersburg. Four Vols. (In Russian.) St. Petersburg, 1829–32.—*From the Academy, transmitted by Mr. P. von Goetze through the Russian Minister.*

Memoirs of the Russian Academy. Twelve Vols. (In Russian.) St. Petersburg, 1815 to 1828.—*From the same.*

Continuation of the Memoirs of the Russian Academy. Three Vols. (In Russian.) St. Petersburg, 1834–5.—*From the same.*

Works and Translations, published by the Russian Academy. Seven Vols. (In Russian.) St. Petersburg, 1805 to 1823.—*From the same.*

Dictionary of the Russian Academy. Six Vols. (In Russian.) St. Petersburg, 1806 to 1822.—*From the same.*

Complete Works of Admiral Schischkoff, President of the Academy. Sixteen Vols. (In Russian.) St. Petersburg, 1818 to 1834.—*From the same.*

On the Affinity of the Russian and Greek Languages. Three Vols. (In Russian.) St. Petersburg, 1828.—*From the same.*

Recherches sur les Racines des Idiomes Slavons. Par l'Amiral Chichekof. Traduit du Russe. Part I. St. Petersburg, 1832.—*From the same.*

Relation of the Maritime War between Russia and Sweden, in the years 1788, 89, & 90. By Admiral Schischkoff. (In Russian.) St. Petersburg, 1826.—*From the same.*

Popular Songs of the Greeks. (In Russian.) St. Petersburg, 1825.—*From the same.*

Memoirs of Admiral Schischkoff for the year 1812. (In Russian.) St. Petersburg, 1831.—*From the same.*

A brief and true Relation of Napoleon. (In Russian.) St. Petersburg, 1814.—*From the same.*

Proceedings of the Russian Academy at their Sitting, January 18th, 1836, for the Reception of the Prince of Oldenburg as an Honorary Member. (In Russian.) St. Petersburg, 1836.—*From the same.*

Untersuchungen über die Sprache, mitgetheilt in den Nachrichten der Russischen Akademie, von Alexander Schischkow. Aus dem Russischen übersetzt von P. von Goetze. Three Vols. St. Petersburg, 1826–7 & 1837.—*From the same.*

Serbische Volkslieder, in's Deutsche übertragen von P. von Goetze. St. Petersburg, 1827.—*From the Translator.*

Stimmen des Russischen Volks in Liedern. Gesammelt und übersetzt von P. von Goetze. Stuttgart, 1828.—*From the Translator.*

Reports of the Trustees of the Philadelphia Gas Works. Philadelphia, 1838.—*From the Trustees.*

Observations Météorologiques et Magnétiques, faites dans l'Empire de Russie, redigées et publiées par A. T. Kupffer. No. 1. St. Petersburg, 1837.—*From the Russian Academy.*

Plaza Universal de Todas Ciencias, y Artes. Por el Doctor C. Suarez de Figueroa. Perpignan, 1630.—*From Mr. E. C. Wines.*

Weekly Register. Edited by William O. Niles. Vol. LII.—*From the Editor.*

Necrological Notice of Dr. Philip Syng Physick; delivered before the American Philosophical Society, May 4, 1838. By W. E. Horner, M. D. Philadelphia, 1838.—*From the Author.*

Mr. Kane, from the Secretaries, reported that they had chosen Dr. Franklin Bache to be the Reporter of the Society.

The Committee, appointed on the Communication of Dr. John Locke, of Cincinnati, read at the last meeting, made the following Report, which was adopted.

"The Committee to whom was referred the Communication of Professor John Locke, of Cincinnati, report that it gives the details of a series of experiments, made for the purpose of determining the magnetic intensity and dip for certain positions in Ohio. For these experiments he had furnished himself, in London, with the best apparatus, and had vibrated there two needles of the form recommended by Hansteen, and one in the form of a small flat bar. Five months afterwards, namely on the 17th of January, 1838, he again vibrated these needles at Cincinnati, and found the ratio of horizontal intensity at the former place to that at the latter, as follows: by needle No. 1, as 1 to 1.1624; by needle No. 2, as 1 to 1.1639; by No. 3, as 1 to 1.2037. Of these results, the author prefers the last; inasmuch as the magnetism of needles is liable to decrease, but not to increase.

"On the 20th of August, 1837, he made experiments with his dipping needle, to determine the dip at Westbourn Green, near London, the mean of which gives 69° 23′.3.

"On the 26th of Nov. 1837, the mean of a series of experiments made at Cincinnati, in lat. 39° 6′ N., and long. 84° 27′ W., gave the dip = 70° 45′.75.

"At Dayton, Ohio, in lat. 39° 44′ N., and long. 84° 11′ W., the dip was found to be 71° 22′.75, on the 26th of March, 1838.

"At Springfield, Ohio, in lat. 39° 53′ N., and long. 83° 46′ W., the dip was found, on the 29th of March, 1838, to be 71° 27′.375.

"At Urbana, lat. 40° 03′ N., long. 83° 44′ W., March 30, 1838, the dip was found = 71° 29′.94.

"At Columbus, the seat of government of Ohio, lat. 39° 57′ N., long. 83° W., April 3d, 1838, the dip was found = 71° 04′.875.

"The interest of this paper is much increased by the circumstance that no accurate experiments on the intensity and dip of the needle have heretofore been made in the United States, west of the Alleghany mountains.

"The Committee conclude their Report by recommending that Professor Locke's Communication be printed in the Society's Transactions."

"Peter S. Du Ponceau,
R. M. Patterson,
J. Saxton."

Dr. Patterson laid before the Society, copies of a Memorial presented to Congress by Dr. Henry Hall Sherwood, and of a Report thereon by the Committee on Naval Affairs of the Senate, in which are set forth Dr. Sherwood's "claims to have made new and important discoveries in magnetism generally, and more particularly in the magnetism of the earth; and to be the inventor of an instrument called the geometer, whereby, without the aid of the quadrant or sextant, or chronometer, and without taking a celestial observation, it is practicable and easy, at sea and on land, and in all weathers, to determine, merely by the dip of the needle, the variation of the needle, and the latitude and longitude of any place on the surface of the globe."

Dr. Patterson called the attention of the Society to some further extracts from the Report of the Naval Committee, in which it is stated that from the opinions obtained from scientific men, "as well as from their own examination, they are fully persuaded that the discoveries and invention of Dr. Sherwood are entitled to the most serious consideration of the public, and to the encouragement and patronage of Congress;" that they "regard them as highly interesting and important to the navigation and commerce of the United States, and as bidding fair to open a new era in the history of the science of magnetism." Of this Report 5000 additional copies were ordered to be printed by Congress.

Dr. Patterson remarked that the imposing circumstances under which Dr. Sherwood's extraordinary claims were brought forward, might make a brief review of them worthy of the Society's attention.

1. The first of Dr. Sherwood's asserted discoveries is the

communication of magnetism to a steel plate or ring, which he supposes others had failed to do. Dr. Patterson observed that, on the contrary, nothing is better known in experimental science than that magnetic polarity can be given to steel in any form, and with as many poles as the operator pleases. In illustration of this remark, he exhibited to the Society a steel plate, prepared some years ago by Mr. Saxton, who was then in London, according to an experiment first made by Chladni, on which polar lines were traced, so as to mark on one side the word '*magnet*,' and on the other the date '*24th of February*, 1836;' the position of the lines being made apparent by strewing steel filings over the plate.

2. Dr. Sherwood asserts that, if a steel ring, marked in two opposite points, have magnetism communicated to it by passing it over a magnet from one of those points to the other, in a way which he describes, the magnetic poles will be found to reside, not in the marked points which he styles the poles of the ring, but in other points distant from them 23° 28′, thus exhibiting a correspondence with the obliquity of the ecliptic. On this fact he founds his theory of the magnetism of the earth. Dr. Patterson mentioned that Mr. Saxton and himself had carefully repeated this experiment, and had found, without surprise, that the assertion of Dr. Sherwood was entirely erroneous. When the magnetism was communicated in the awkward manner used by Dr. Sherwood, the poles were not indeed at the points of the first and last contact of the magnet; but the deviation was irregular, was different at the different poles, and bore no relation to the obliquity of the ecliptic. When the magnetism was communicated to the ring by carefully setting two opposite points on the poles of a horse-shoe magnet, the *magnetic* poles of the ring coincided exactly with those points. This fact was shown in an experiment made before the society.

3. As to the hypothetical deductions of Dr. Sherwood, "that the magnetic poles of the earth are 23° 28′ from its poles, and of course within the polar circles," "that the magnetic and polar axes cross each other at the same angle of 23° 28′," "that the magnetic and terrestrial meridians of every place cross each other at angles dependent on the angles of the two

axes," and "that the line of no variation is a great circle of the earth, and is that magnetic meridian which, after cutting the magnetic pole, passes at the distance of 6° 28′ from the pole of the earth,"—Dr. Patterson remarked that these notions were directly contradicted by well observed facts, that there are more than two magnetic poles, that the magnetic poles are not in the polar circles, that there are several lines of no variation, and that those lines are not great circles, but are altogether irregular in their course.

4. The practical applications of Dr. Sherwood's theory are announced in these terms: "With the correct dip given him, observed at a given time, he works out either or all of the following results: the variation of the needle, the distance of the circle of no variation from the place, and its angle with the meridian, and the latitude and the longitude. With the variation given him, in the same manner, he determines the dip and the other results. He must know, however, if the dip be given, whether the place of observation is east or west of the circle of no variation; and if the variation be given, whether it is north or south of the magnetic equator, and near the arctic or antarctic semicircle of no variation."

It is sufficient to remark, said Dr. Patterson, on this train of assertions, that they necessarily assume the truth, within the limits which are stated, of two positions; 1st, that the same dip will always correspond with the same variation, and 2d, that every place on the earth's surface has a different dip from all others,—both of which are notoriously untrue. The various examples, contained in the Report, of calculations made from the single datum of the dip or the variation, and which give for results all the other particulars with an accuracy extending not to seconds merely, but to thirds, must be regarded as illusory.

Mr. Walker also made a verbal communication on the subject of Dr. Sherwood's alleged discoveries. He remarked that even admitting the correctness of the Doctor's hypothesis, as stated in his Memorial to Congress, still his method would be of no use for nautical or geographical purposes, for the following reasons:—

1. The apparatus for determining the dip and variation of

the compass is more costly than a common sextant and mercurial horizon.

2. The observations of the dip and variation of the compass are more difficult to be made with accuracy than a common lunar observation.

3. The reduction of these magnetic observations, on the Doctor's hypothesis, would be more laborious than the working of a lunar observation.

4. Mr. Walker proceeded to show, in conformity with the remarks of Dr. Patterson, that Dr. Sherwood's assertion that he can determine the latitude and longitude from the dip alone, or from the variation alone, was contrary to the first principles of the geometry of position; since a point, in order to be determined in space, must be referred to three given surfaces. If one of them is the surface of the spheroid as in geography, then the point must be referred to two other given surfaces; whereas, by the dip alone, or the variation of the compass alone, a point can only be referred to one of these two surfaces, and the resulting locus is a line and not a point. Hence, if latitude and longitude are determined by magnetic observations, it must be by both the dip and variation. Dr. Sherwood's method, therefore, could be of no use for *nautical purposes*, from the impossibility of observing the variation of the compass at sea with any tolerable degree of accuracy.

5. Dr. Sherwood's assertion that the magnetic method could be used in cloudy weather is inaccurate; since the variation of the compass cannot be ascertained without astronomical observations.

6. Restricting then the use of magnetic observations to those made on land in fair weather, still, owing to local perturbations, the probable discrepancy of the mean of many observations at one place from the theoretic dip and variation, may, at a low estimate, be assumed to be ten minutes of space, and, as the resulting errors of *latitude* are of the same order, we should have ten miles for its probable error, which is *twenty times* that of a common sextant and mercurial horizon.

7. Owing to the proximity of the north pole to Dr. Sherwood's assumed magnetic pole, the probable error in the resulting *longitude* would far exceed that of the dip and variation

themselves, and would amount to *forty* miles on the average, and between the tropics, near the line of greatest variation, to *several degrees;* whereas it is well known that by the lunar method, the probable error in longitude is less than *six* miles, and may be reduced to *four* by means of half a dozen observed eclipses of Jupiter's first satellite.

Mr. Walker concluded by remarking that although, in stating the practical objections to the method, he had taken Dr. Sherwood's postulates for granted, yet he considered every one of them as contrary to facts, observation, and experience.

Dr. Bache announced the death of Charles Maurice Talleyrand, Prince of Benevento, a member of the Society, who died on the 17th of May, 1838, aged 83.

Stated Meeting, August 17.

Present, eighteen members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Communication from Governor Marcy to the Legislature of New York, relative to the Geological Survey of the State, for the year 1837. With Plates. Albany, 1838.—*From Messrs. L. Vanuxem and T. A. Conrad.*

The same work.—*From William Meredith, Esq.*

The Light-Houses, Beacons, and Floating Lights of the United States, for 1838. Prepared by order of Stephen Pleasonton, Fifth Auditor. Washington, 1838.—*From Stephen Pleasonton, Esq.*

The American Journal of the Medical Sciences. Edited by Isaac Hays, M. D. No. XLIV, for August. Philadelphia, 1838.—*From the Editor.*

The American Medical Library and Intelligencer. Edited by R. Dunglison, M. D. Vol. II. Nos. 8, 9, & 10. Philadelphia, 1838.—*From the Editor.*

American Quarterly Register. Conducted by B. B. Edwards and W. Cogswell. Vol. X., and Vol. XI. No. 1. Boston, 1838.—*From Mr. W. Cogswell.*

Twenty-second Annual Report of the Directors of the American Education Society. May, 1838. Boston, 1838.—*From the same.*

Notes respecting certain Indian Mounds and Earthworks, chiefly in the Wisconsin Territory, U. S. By Richard C. Taylor, Esq. Philadelphia, 1838.—*From the Author.*

Alphabetical and Analytical Catalogue of the New York Society Library. New York, 1838.—*From Mr. Philip I. Forbes.*

An Eulogy on the Life and Character of Nathaniel Bowditch, LL. D., F.R.S. By Daniel Appleton White. Salem, 1838.—*From the Author.*

A Discourse on the Life and Character of the Hon. Nathaniel Bowditch, LL. D., F.R.S. By Alexander Young. Boston, 1838.—*From the Author.*

Atlas Classica. By H. S. Tanner. No. 9. Philadelphia, 1838.—*From the Author.*

Twentieth Annual Report of the American Bible Society. New York, 1836.—*From J. J. Barclay, Esq.*

Journal of the Proceedings of the Fifty-fourth Convention of the Protestant Episcopal Church in the State of Pennsylvania. Philadelphia, 1838.—*From the same.*

Annual Report of the Regents of the University of the State of New York. Made to the Legislature, March 1, 1838. Albany, 1838.—*From the Albany Institute.*

Journal of the Senate of Pennsylvania, Session 1837–38. Vols. I. & II., and Appendix to Vol. II. Harrisburg, 1837–8.—*From the State of Pennsylvania.*

Journal of the Forty-eighth House of Representatives of Pennsylvania. Vols. I. & II., and Appendix to Vol. II. Harrisburg, 1837–8.—*From the same.*

Report of the State Treasurer, showing the Receipts and Expenditures of Pennsylvania for the year ending on the thirty-first of October, 1837. Harrisburg, 1837.—*From the same.*

Letter from the Secretary of War, transmitting a Report of a Survey around the Falls of Niagara, with a view to a Ship Canal, made, in 1835, under the direction of Capt. W. G. Williams, of the U. S. Topog. Engineers. With numerous Maps. Washington, 1836.—*From Col. J. J. Abert.*

Report from the Secretary of War, transmitting the Report of Lieut. R. E. Lee, U. S. Engineers, on the Rock River and Des Moines Rapids of the Mississippi River, and on the Harbour of St. Louis. With Maps. Washington, 1838.—*From the same.*

Maps of the Kennebeck and Androscoggin Rivers, and of Wilson's and Winthrop Ponds, &c. Washington, 1838.—*From the same.*

Report from the Secretary of War, transmitting Reports of the Surveys of the Mouths of Milwaukie, Root, Manitowoc, Sheboygan, and Kewaunee Rivers, and of Havre Bay. Washington, 1838.—*From the same.*

Map of Cape May Roads, including Crow Shoal, Delaware Bay. By Hartman Bache, Major of Topog. Engineers. September, 1836.—*From the Author.*

Chart of the Entrance of Sandusky Bay. By Lieut. C. Graham. 1826.—*From Major Hartman Bache.*

Map of the Mouth of the Connecticut River and Saybrook Harbour. Reduced from the original Survey of J. W. Adams. Washington, 1838.—*From the same.*

The American Journal of Science and Arts. Conducted by Benjamin Silliman, M. D., LL. D., aided by Benjamin Silliman, Jr., A. B. Vol. XXXIII. No. 2, and Vol. XXXIV. Nos. 1 & 2.—*From the Conductors.*

On motion of Dr. Patterson, a Committee was appointed to observe the eclipse of the Sun of the 18th of September next. Committee, Dr. Patterson, Mr. Walker, Mr. Paine, and Capt. Talcott.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. I. SEPTEMBER & OCTOBER, 1838. No. 4.

Stated Meeting, September 21.

Present, nineteen members.

Mr. DU PONCEAU, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Archaeologia: or Miscellaneous Tracts relating to Antiquity. Published by the Society of Antiquaries of London. Vol. XXVII. London, 1838.—*From the Society.*

The Transactions of the Royal Irish Academy. Vol. XVIII. Part 1. Dublin, 1838.—*From the Academy.*

The Magazine of Natural History. New Series. Conducted by Edward Charlesworth, F. G. S., &c. Vol. II. Nos. 17 & 18. For May and June. London, 1838.—*From the Conductor.*

Almanacco della Real Casa e Corte per l'anno bisestile 1832. Naples, 1832.—*From the Chev. Morelli.*

The American Medical Library and Intelligencer. Edited by R. Dunglison, M. D. Vol. II. Nos. 11 & 12. Philadelphia, 1838.—*From the Editor.*

Observations relative to Lymphatic Hearts. By Joseph J. Allison, M. D. Philadelphia, 1838.—*From the Author.*

Transylvania Catalogue of Medical Graduates, with an Appendix, containing a concise History of the School. By Thomas D. Mitchell, M. D. Lexington, 1838.—*From the Author.*

Journal of the Asiatic Society of Bengal. Nos. 68 & 69. For August and September. Calcutta, 1837.—*From the Society.*

A Genicida. Poema filosotico, e allegorico sobre a Lucta da Liberdade contra a Tyrannia. Composto por Joaõ de Souza Pacheco Leitaõ. Two Vols. Lisbon, 1835-6.—*From the Author.*

The Anglo-Arabic Primer and Vocabulary. Malta, 1832.—*From Lieut. P. Drayton, U. S. Navy.*

A Complete Collection of all the Protests made in the House of Lords, from their Original in the Year 1641 to the present Year 1745. London, 1745.—*From Mr. John Penington.*

Observations on the Winds and Monsoons. By James Capper. London, 1801.—*From Mr. John Vaughan.*

Bija Ganita: or the Algebra of the Hindus. By Edward Strachey. London, 1812.—*From the same.*

Algebra, with Arithmetic and Mensuration, from the Sanscrit. Translated by Henry Thomas Colebrooke, Esq. London, 1817.—*From the same.*

Grammaire des Grammaires, ou Analyse Raisonnée des meilleurs Traités sur la Langue Françoise. Par Girault Duvivier. Two Vols. Paris, 1822.—*From the same.*

A Catalogue of American Minerals, with their Localities. By Samuel Robinson, M. D. Boston, 1825.—*From the same.*

An History of the Parliament of Great Britain, from the Death of Queen Anne, to the Death of King George II. London, 1764.—*From the same.*

The Poetical Works of John Trumbull, LL. D. Two Vols. Hartford, 1820.—*From the same.*

The Reign of Doctor de Francia in Paraguay; being an Account of a Six Years' Residence in that Republic, from July 1819, to May 1825. By Messrs. Rengger and Longchamps. Translated from the French. London, 1827.—*From the same.*

Memoir on the Topography, Weather, and Diseases of the Bahama Islands. By P. S. Townsend, M. D. New York, 1826.—*From the same.*

The Campaign of 1781 in the Carolinas. By H. Lee. Philadelphia, 1824.—*From the same.*

A Historical Sketch of the Formation of the Confederacy, &c. By Joseph Blunt. New York, 1825.—*From the same.*

A View of the Constitution of the United States of America. By William Rawle. Philadelphia, 1825.—*From the same.*

An Analysis of the Galic Language. By William Shaw, A. M. Edinburgh, 1778.—*From the same.*

The Charter, granted by his Majesty, King Charles II. to the Governor and Company of the English Colony of Rhode-Island and Providence-Plantations, in New England. Newport, 1767.—*From the same.*

The New Testament, translated into the Greenland Language by the Missionaries of the Unitas Fratrum. London, 1822.—*From the same.*

Description Géographique des Isles Antilles possédées par les Anglois. Paris, 1758.—*From the same.*

The Select Medical Library. Edited by John Bell, M. D. Vol. II. Nos. 1 to 11. Philadelphia, 1837–8.—*From the Editor.*

Memorial of Facts connected with the History of Medallic Engraving and the Process of M. Collas. By V. Nolte. London, 1838.—*From Mr. Thomas Sully.*

FOR THE CABINET.

A mummy of the Ibis, in an earthen jar, taken from one of the catacombs of Egypt.—*From Lieut. P. Drayton, U. S. Navy.*

Four small models of human mummies; two of wood, and two of baked clay.—*From the same.*

Several suites of minerals, comprising 33 specimens. Nos. 1 to 18, rocks and ores from the Island of Cuba; Nos. 19 to 31, minerals from the mineral region of Missouri; No. 32, sulphuret of copper, from Flemington, N. J.; No. 33, bituminous coal, from the banks of the Black Warrior river, Alabama.—*From Mr. Thomas G. Clemson.*

The Committee on the solar eclipse of the 18th of September made a Report in part, comprising the Observations made at Philadelphia, the principal results of which are as follows:

The observations made at Philadelphia are fifteen in number. A list of observers, telescopes, &c., is given in the following table. The correction in the third column is to be added algebraically to the latitude of the place of observation, to obtain that of the State House, + 39° 56′ 58″. The correction in the fourth column is likewise to be added to the local longitude in time, to obtain that of the State House, — 5*h* 0*m* 39.2*s*.

No.	OBSERVER.	Reduction to Latitude of State House.	Reduction to Longitude of State House.	Focal length in Feet.	Maker of Telescope.	Description.	Screen Glass.	Estimated Power.
			s					
1	E. J. Beans	— 70.0	+ 1.70	2.5	Unknown	Spy-glass	Smok'd	15
2	W. A. Penn Cresson	— 1.8	+ 5.20	2.5	Jones	Achromatic	Red	30
3	Prof. W. R. Johnson	— 1.8	+ 5.20	3.5	Dollond	do.	do.	100
4	George M. Justice	— 10.0	+ 2.86	2.5	Jones	Gregorian	do.	80
5	E. O. Kendall	— 10.0	+ 2.86	2.5	Plössl	Dialytic	Green	50
6	Joseph Knox	— 21.0	— 1.39	3.5	Dollond	Achromatic	Red	80
7	Jacob Lukens	— 9.0	+ 0.86	1.8	Plössl	Dialytic	Yellow	20
8	Thomas McEuen	+ 0.4	+ 2.33	2.5	Dollond	Achromatic	Red	60
9	Prof. Roswell Park	— 6.5	+ 1.30	2.5	do.	Gregorian	do.	50
10	Dr. R. M. Patterson	— 1.1	+ 1.20	5.0	do.	Equatorial	do.	100
11	Wm. H. C. Riggs	+ 0.4	+ 2.33	3.5	do.	Achromatic	do.	50
12	Samuel Sellers	— 7.5	+ 0.05	2.5	Jones	do.	do.	40
13	Tobias Wagner	— 10.0	+ 2.86	3.5	Dollond	do.	do.	80
14	Silas C. Walker	— 10.0	+ 2.86	5.0	Tulley	do.	do.	100
15	William Young	+ 21.0	— 1.39	7.0	Holcomb	Herschelian	do.	200

Phases Observed, in Mean Times of the Places of Observation.

No.	A. h m 3 13	B. h m 4 3	C. h m 4 31	D. h m 4 31	E. h m 4 31	H. h m 4 35	I. h m 4 35	K. h m 4 35	L. h m 4 35	M. h m 4 41	N. h m 5 45	O. h m 5 45	P. h m 5 45
1			s 3.3			s 28.4							
2	s		7.0		s	27.8	s	s			s	s	
3	10.7		10.5	s	15.5	23.5	27.5	29.0			4.2	12.2	
4	7.1		6.3	12.8		27.3						11.3	
5	8.3			10.9		28.4						12.9	
6	12.8												
7				21.7				36.2					
8	3.0			18.1		29.1						13.2	
9		s		19.1		29.1				s			s
10	7.0	3.0		19.1		30.1				23.1		16.1	19.1
11	7.3	3.2	2.3	16.3		29.4		36.3				7.8	
12	6.0			16.0		31.0						16.0	
13	6.1								s				
14	5.6	36.7		15.6	23.0	28.0	29.5	37.0	42.0		10.0	13.0	16.0
15				12.9				38.9				15.0	

A. *Beginning.* Prof. Johnson noticed dark indentations for eight seconds after the first disturbance of the limb.

B. Arch of faint light, with speck or brush in centre, round the moon's limb beyond the cusps; brush or blaze in centre, between cusps, extending outwards about two digits. One cusp broken at end, presenting a bright bead.

C. Arch of light much increased in brightness; the brush or blaze, at first in the centre, now extends from cusp to cusp; radiation outwards, nearly three digits; cusps distant 30° on sun's limb, a

s Doubtful.

broken point or bead at each end. This phase noted as that of the formation of the ring by Nos. 1, 2, 3, 4, and 11.

D. *Formation of ring, or instant of osculation of limbs.* This phase noticed as the approach of two sharp well defined points to a contact by Nos. 5 and 15. It was observed at the instant when the cusps, apparently 20° of the sun's limb apart, suddenly united by the extension of four or five luminous beads, or rounded portions of the sun's disc, by Nos. 3, 4, 8, 9, 10, 11, 13, and 14.

E. Omitted in the table. This letter refers to the time when the dark lines, described by Van Swinden and Bailey, should have appeared. They were not seen by any observer, though carefully searched for.

F. Perfect ring, the beads of light having united, or run into each other suddenly.

G. Counterpart of E, not observed though looked for.

H. *Rupture of ring*, counterpart of D. Took place at a point, and so noted by all the observers.

I. Appearance of beads, five or six in number, extending from cusp to cusp.

K. Counterpart of C in every respect.

L. Counterpart of appearance just preceding C. Brush or blaze of light, narrowed down to a small space, 3° or 4° on the moon's border, extending outwards 2½ digits; cusps still broken, as seen by most of the observers. Nos. 5 and 15, however, saw no irregularity of cusps, no beads of light.

M. Final disappearance of arch of faint light, with brush of light extending beyond the middle, having previously become very faint. This phenomenon observed with great care and certainty by No. 10.

N. Appearance of dark lines extending into the sun's disc, noticed by Nos. 3, 4, 10, and 14. The time noted by Nos. 3 and 14 as the end of the eclipse.

O. *End of eclipse*, inferred by each observer from his notes.

P. Final disappearance of the dark lines, the sun's disc having resumed its natural shape. Nos. 3, 4, 10, and 14 inferred the time of O as at some instant intermediate between N and P. The time of external contact difficult to determine, on account of this irregularity.

For the convenience of computers, the local times above given have been reduced to their corresponding value for the State House by E. O. Kendall, by means of his formulæ, in Vol. XX. of the Journal of

the Franklin Institute, p. 125, which gives the following values for the variation of the local times of the several phases, for a small variation of terrestrial latitude or longitude, as follows:—

	Beginning.	*Ring.*	*End.*
	s	*s*	*s*
Variation for + or north 1″ terr. lat.	= − 0.0397	− 0.0382	− 0.0343
Do. + or east 1*s* of terr. lon. in time	= + 1.2600	+ 1.1400	+ 0.9925

The means of his results for the State House, giving to each observation its proper weight, in mean time of the State House, are,

	h	*m*	*s*
Beginning,	3	13	10.06
Formation of ring,	4	31	18.76
Rupture of ring,	4	35	31.35
End,	5	45	15.46
Duration of eclipse,	2	32	5.40
Duration of ring,		4	12.59

Mr. Du Ponceau presented a communication, entitled "A Vocabulary of the Language of the Valiente Indians, who inhabit the State of Costa Rica, in Central America, by Col. D. Juan Galindo, of Guatemala." Referred to the Historical and Literary Committee.

Mr. Nulty read a mathematical paper, entitled "New Formulæ relative to Comets, by E. Nulty, of Philadelphia." Referred to Dr. Patterson, Mr. Walker, and Capt. Talcott.

The subject of this paper was the component velocities of a comet, observed at three consecutive and moderately small intervals of time. In a preliminary notice of his subject and the means employed in its development, the author mentioned some advantages which he conceived to be attached to his peculiar mode of investigation. He alluded to different results already known, and, with several novel and general formulæ comprised in his paper, he announced two new sets of expressions which he represented as being directly applicable to the exceptive cases, in which particular observations render the forms hitherto given, doubtful or indeterminate. He also noticed a numerical application which he made of his formulæ and of others connected with the method of Laplace, to the data of the comet of 1803; and he intimated that a comparison of the results obtained by him in that and other instances, had led him to some remarks, which he inserted towards the close of his paper, from his opinion of their analytical and practical importance.

Dr. Patterson read a paper by Professor Charles Bonnycastle, of the University of Virginia, containing "Notes of Experiments, made August 22d to 25th, 1838, with the view of determining the Depth of the Sea by the Echo."

This paper, which was not offered for publication in the Society's Transactions, states that the generally received notions in regard to the intensity of sound in water, and the distance to which it is conveyed, had suggested to Mr. Bonnycastle, some years ago, the idea that an audible echo might be returned from the bottom of the sea, and the depth be thus ascertained from the known velocity of sound in water. The probability of this view was deemed at least sufficient to justify an experiment; and accordingly the Navy Commissioners authorized the construction of the necessary apparatus, and Captain Gedney, of the U. S. Brig Washington, attached to the coast survey, volunteered his services and the use of his vessel, and authority to this effect was liberally granted by the Secretary of the Treasury, Mr. Woodbury.

The apparatus, which is fully described in Mr. Bonnycastle's paper, consisted, first, of a petard or chamber of cast iron, $2\frac{1}{2}$ inches in diameter and $5\frac{1}{4}$ inches long, with suitable arrangements for firing gunpowder in it under water; secondly, of a tin tube, 8 feet long and $1\frac{1}{4}$ inches in diameter, terminated at one end by a conical trumpet-mouth, of which the diameter of the base was 20 inches, and the height of the axis 10 inches; thirdly, of a very sensible instrument for measuring small intervals of time, made by J. Montandon of Washington, and which was capable of indicating the sixtieth part of a second. Besides these, an apparatus for hearing was roughly made on board the vessel, in imitation of that used by Colladon in the Lake of Geneva, and consisted of a stove-pipe, $4\frac{1}{2}$ inches in diameter, closed at one end, and capable of being plunged four feet in the water. The ship's bell was also unhung, and an arrangement made for ringing it under water.

On the 22d of August, the brig left New York, and in the evening the experiments were commenced. In these, Mr. Bonnycastle was assisted by the commander and officers of the vessel, and by Dr. Robert M. Patterson, who had been invited to make one of the party.

In the first experiments, the bell was plunged about a fathom under water and kept ringing, while the operation of the two hearing instruments was tested at the distance of about a quarter of a mile. Both instruments performed less perfectly than was expected; the

noise of the waves greatly interfering, in both, with the powers of hearing. In the trumpet-shaped apparatus, the ringing of the metal, from the blow of the waves, was partly guarded against by a wooden casing; but, as it was open at both ends, the oscillation of the water in the tube was found to be a still greater inconvenience, so that the sound of the bell was better heard with the cylindrical tube. At the distance of a quarter of a mile this sound was a sharp tap, about the loudness of that occasioned by striking the back of a penknife against an iron wire: at the distance of a mile the sound was no longer audible.

In the second experiments, the mouth of the cone, in the trumpet apparatus, was closed with a plate of thick tin, and both instruments were protected by a parcelling of old canvas and rope-yarn, at the part in contact with the surface of the water. In these experiments the cone was placed at right angles to the stem, and the mouth directed toward the sound. The distances were measured by the interval elapsed between the observed flash and report of a pistol. At the distance of 1400 feet, the conical instrument was found considerably superior to the cylindrical, and at greater distances the superiority became so decided, that the latter was abandoned in all subsequent experiments. At the distance of 5270 feet, the bell was heard with such distinctness as left no doubt that it could have been heard half a mile further.

The sounds are stated in the paper to have been less intense than those in air, and seemed to be conveyed to less distances. The character of the sound was also wholly changed, and, from other experiments, it appeared that the blow of a watchmaker's hammer against a small bar of iron gave the same sharp tick as a heavy blow against the large ship's bell. It is well known that Franklin heard the sound of two stones struck together under water at half a mile distance; yet two of the boat's crew, who plunged their heads below the water, when at a somewhat less distance from the bell, were unable to hear its sound.

On the 24th of August, the vessel having proceeded to the Gulf Stream, experiments were made with the view for which the voyage was undertaken; that is, to ascertain whether an echo would be returned, through water, from the bottom of the sea. Some difficulties were at first presented in exploding the gun under water, but these were at length overcome. The hearing-tube was ballasted so as to sink vertically in the water. The observers then went, with this in-

strument, to a distance of about 150 yards from the vessel, and the petard was lowered over the stern, about three fathoms under water, and fired. The sound of the explosion, as heard by Mr. Bonnycastle, was two sharp distinct taps, at an interval of about one-third of a second. Two sounds, with the same interval, were also clearly heard on board the brig; but the character of the sounds was different, and each was accompanied by a slight shock. Supposing the second sound to be the echo of the first from the bottom of the sea, the depth should have been about 160 fathoms.

To ascertain the real depth, the sounding was made by the ordinary method, but with a lead of 75 pounds weight, and bottom was distinctly felt at 550 fathoms, or five furlongs. The second sound could not, therefore, have been the echo of the first; and this was proved, on the following day, by repeating the experiment in four fathom water, when the double sound was heard as before, and with the same interval.

The conclusion from these experiments is, either that an echo cannot be heard from the bottom of the sea, or that some more effectual means of producing it must be employed.

Dr. Hare suggested the expediency of employing the Galvanic fluid to fire gunpowder below the surface of water, in experiments similar to those of Professor Bonnycastle.

The President laid on the table for the inspection of the members, an English and Japanese, and Japanese and English Vocabulary, by the Rev. W. H. Medhurst, late of Batavia, now in London, and a "Translation of a comparative Vocabulary of the Chinese, Corean, and Japanese Languages, to which are added the thousand Characters classic, in Chinese and Corean; the whole accompanied by copious Indexes of all the Chinese and English Words occurring in the Work," by the same author, under the name of Philo-Sinensis.

These two books, the President said, throw considerable light on the various graphic systems of the Indo-Chinese nations; they had been communicated to him by our associate, Mr. Pickering, of Boston, to whom they must be returned: he, therefore, recommended to the society to take measures to procure them for the library.

The recommendation of the President was then adopted, and the books referred to, ordered by the society.

Dr. Hare laid before the society a specimen of platinum, weighing between twenty-two and twenty-three ounces, being part of a mass of twenty-five ounces, fused by him in May last, by means of his compound blowpipe.

Dr. Hare also mentioned that he had observed, during a recent tornado at Somerset, Mass. various circumstances, which he detailed, all leading to the conclusion that a hiatus or place of rest exists at the centre of motion of the tornado.

Stated Meeting, October 5.

Present, twenty-nine members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Inquisitionum in Officio Rotulorum Cancellariæ Hiberniæ asservatarum, Repertorium. Dublin. Vol. I., 1826; Vol. II., 1829.—*From the Honourable Board of Commissioners on the Public Records of Great Britain.*

Rotulorum Patentium et Clausorum Cancellariæ Hiberniæ Calendarium. Vol. I. Part I. Dublin, 1828.—*From the Same.*

Rotuli de Oblatis et Finibus in Turri Londinensi asservati, Tempore Regis Johannis. London, 1835.—*From the same.*

Proceedings and Ordinances of the Privy Council of England. London. Vol. V., 1835; Vol. VI. & VII., 1837.—*From the same.*

Excerpta è Rotulis Finium in Turri Londinensi asservatis, Henrico Tertio Rege. Vol. II. London, 1836.—*From the same.*

The Ancient Kalendars and Inventories of his Majesty's Exchequer. Three Vols. London, 1836.—*From the same.*

Documents and Records illustrating the History of Scotland. Vol. I. London, 1837.—*From the same.*

Rotuli Chartarum in Turri Londinensi asservati. Vol. I. Part. I. London, 1837.—*From the same.*

General Report to the King in Council from the Honourable Board of Commissioners on the Public Records. London, 1837.—*From the same.*

Registrum vulgariter nuncupatum "The Record of Caernarvon;" è Codice Mstº. Harleiano 696. descriptum. London, 1838.—*From the same.*

The American Almanac and Repository of Useful Knowledge, for the year 1839. Boston, 1838.—*From Mr. J. E. Worcester.*

Collections of the Massachusetts Historical Society. Vol. VII. of the third Series. Boston, 1838.—*From the Society.*

History of the Reign of Ferdinand and Isabella, the Catholic. By William H. Prescott. Three Vols. Third Edition. Boston, 1838.—*From the Author.*

Human Physiology; illustrated by Engravings. By Robley Dunglison, M. D. Two Vols. Third Edition. Philadelphia, 1838.—*From the Author.*

The Magazine of Natural History. New Series. Conducted by Edward Charlesworth, F. G. S. &c. Vol. II. Nos. 19 & 20, for July and August. London, 1838.—*From the Conductor.*

The Transactions of the Linnean Society of London. Vol. XVIII. Part the First. London, 1838.—*From the Society.*

New Testament in the Chippewa Language. Albany, 1833. *From the Hon. William C. Frazer.*

North American Herpetology; or, a Description of the Reptiles inhabiting the United States. By John Edwards Holbrook, M. D. Vol. II. Philadelphia, 1838.—*From the Author.*

Proceedings of the Royal Irish Academy, for the year 1837–8. Part II. Dublin, 1838.—*From the Academy.*

Note on the Solar Eclipse of May, 15, 1836. By Sears C. Walker. (From the Journal of the Franklin Institute.) Philadelphia, 1836.—*From the Author.*

Note sur le Magnétisme Terrestre, suivie des Résultats des Observations Horaires, faites à l'Equinoxe du Printemps de 1838, par A. Quetelet. Brussels, 1838.—*From the Author.*

Note sur le Magnétisme Terrestre, par A. Quetelet. Suivie des Résultats des Observations Horaires, faites a l'E'poque du dernier Solstice d'E'té, en 1838. Brussels, 1838.—*From the Author.*

A Collection of Interesting French Pamphlets.—*From D. B. Warden, Esq.*

Catalogue of the Hungarian Academy of Sciences, with a Calendar prefixed. (In Hungarian.) Buda, 1838.—*From Mr. Charles Nagy.*

FOR THE CABINET.

Three hundred copper coins, medals, and tokens, and other articles of interest.—*From Mr. James Linah, of Charleston, S. C.*

The Committee on Mr. Nulty's paper, read at the last meeting, recommended that it be printed in the Society's Transactions; and its publication was ordered accordingly.

The Committee on the solar eclipse of the 18th of September, made a further Report in part.

This portion of the report embraced the observations made in the vicinity of Philadelphia, of which the following are the principal results, arranged in the order in which they were received, and, with one exception, in mean time of the place of observation; the longitudes being reckoned from Greenwich.

No. 16, by Robert Treat Paine, Esq., at the west front of the Capitol, Washington. Latitude 38° 53′ 23″, as determined by Mr. Paine, with his Troughton's sextant. Longitude *5h 8m 8s* west. With 3½ feet equatorial, green screen glass. Time by three chronometers, regulated by eastern and western altitudes of sun and stars, with his Troughton's sextant.

	h	*m*	*s*
Beginning, - - - -	3	6	9.58
Formation of ring, - -	4	24	28.15
Rupture of ring, - - -	4	30	18.55
End, - - - - -	5	39	54.89
Duration of eclipse, - -	2	33	45.31
Do. of ring, - - -		5	50.40

"The ring formed instantaneously, and broke nearly so. No beads were seen, nor the dark lines mentioned by Mr. Bailey, nor the light round the moon, although all were looked for. No distortion of the moon's limb could be seen, and the cusps of the sun, before the ring formed, were as sharp as needles."

No. 17, by Lieut. Gilliss, U. S. N., at the Marine Observatory, Washington City, N. 8″, W. 0.08*s* in time, from the Capitol, with a 3½ feet achromatic, green screen glass, power 50. Astronomical clock regulated by a five feet transit instrument.

	h	*m*	*s*
Beginning, - - - -	3	6	10.4
Formation of ring, - -	4	24	28.4
Rupture of ring, - - -	4	30	18.9
End, - - - - -	5	39	56.4
Duration of eclipse, - -	2	33	46.0
Do. of ring, - - -		5	50.5

"At beginning of eclipse, limbs sharp and well defined. The same at formation and rupture of the ring, only in the former the light seemed to flash round the moon's limb." Two detached arched portions of the ring were seen separated from the cusps, "while the space between presented points of light (beads) only."

No. 18, by Prof. Elias Loomis, at the Observatory of the Western Reserve College, Ohio. Latitude 41° 14′ 42″ N. Longitude 5*h* 25*m* 35*s* W. With a five feet equatorial, mounted on a stone pier under a revolving dome, with yellow screen glass, power 150, nearly. Astronomical clock regulated by a 30 inch transit circle by Simms.

Beginning 14*h* 27*m* 26.7*s* siderial time.

Other phases lost by clouds.

Nos. 19 and 20, by J. Gummere and his son S. J. Gummere, at the Haverford School Observatory, Chester County, Pa. Latitude 41° 1′ 12″ N. Longitude 5*h*. 1*m*. 16*s*. W. With two 3½ feet telescopes by Tulley, with red screen glasses, powers 75, nearly. Astronomical clock regulated by a Dollond's portable transit instrument.

	h	*m*	*s*
Beginning,	3	12	17.2
Formation of ring,	4	30	29.2
Rupture of ring,	4	34	44.8
End,	5	44	28.7
Duration of eclipse,	2	32	11.5
Do. of ring,		4	15.6

Arch of faint light, with brush in centre, seen before the formation of the ring. Arch seen after rupture, brush of light not recollected. Formation and rupture of the ring, by broken portions of the sun's border, several in number, not round like beads, but arched portions of the ring. These continued several seconds, and then suddenly united in the first instance, and separated in the last, without, however, exhibiting the dark lines figured by Bailey.

Nos. 21 and 22, by Charles Wister and his son Caspar E. Wister, at the Observatory of the former, Germantown. Latitude 40° 1′ 59″. Longitude 2.7*s* in time west of the State House. With 2½ and 2 feet Gregorian reflectors. Astronomical clock regulated by a 3 feet transit instrument.

	C. Wister.			*C. E. Wister.*		
	h	*m*	*s*	*h*	*m*	*s*
Beginning,	3	12	55.4	3	12	54.4
Formation of ring,	4	31	9.4	4	31	8.4
Rupture of ring,	4	35	18.4	4	35	18.4
End,	5	45	8.4	5	45	7.4
Duration of eclipse,	2	32	13.0	2	32	13.0
Do. of ring,		4	9.0		4	10.0

"The lucid points and dark intervening spaces corresponded closely to Bailey's description."

No. 23, by John Griscom. Latitude 9.7″ N. Longitude 0.3*s* in time west of the Observatory of Haverford School. With a 3½ feet Dollond achromatic, power 80.

	h	*m*	*s*
Beginning, - - - - -	3	12	18.6
Formation of ring, - -	4	30	31.6
Rupture of ring, (not reported.)			
End, - - - - - -	5	44	26.6
Duration of eclipse - -	2	32	8.6
Do. of ring, (not reported.)			

No. 24, by Prof. James Hamilton, of Burlington, New Jersey. Latitude 40° 5′ 10″ N., 69.1*s* in time east of State House, Philada. With a five feet achromatic, power 80. Clock regulated by equal altitudes with a sextant.

	h	*m*	*s*
Beginning, - - - -	3	14	23.7
Formation of ring, - -	4	32	32.6
Rupture of ring, - - -	4	36	19.6
End, - - - - - -	5	46	8.5
Duration of eclipse, - -	2	31	44.8
Do. of ring, - - -		3	47.0

"The phases of the ring are the perfect formation and perfect rupture, without reference to beads. No dark lines seen."

The President presented a letter from Mr. S. P. Hullihen, dated Wheeling, Sep. 27, 1838, addressed to Dr. Harlan, giving an account of an inscription on a stone, found in a tumulus at Grave Creek, near that place. Referred to the President, Dr. Dunglison, and Dr. Emerson.

The President communicated a MS. book, entitled "Vocabularies of the Languages of the Indians inhabiting the N. W. Coast of America." Collected by John K. Townsend during the years 1834, '35, and '36. Referred to the Historical and Literary Committee.

The President also communicated a MS. book, entitled "A Grammar of the Iroquois Language. By Eleazer Williams." Referred to the same Committee.

Mr. Strickland presented a specimen of the asphaltic rock from the mines of Seyssel, in France, and a disc or tablet of

Mosaic work made of the same mineral, and briefly explained the process of its manufacture.

Dr. Mitchell presented to the notice of the society, Jeffrey's oral respirator, and explained its structure and uses.

Stated Meeting, October 19.

Present, seventeen members

Dr. Chapman, Vice President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Principles of Political Economy. Part the Second. By H. C. Carey. Philadelphia, 1838.—*From the Author.*

Supplemental Annotations to the Book of the New Covenant. London, 1838.—*From Granville Penn, Esq.*

Letters from the English Kings and Queens to the Governors of the Colony of Connecticut, from 1635 to 1749. By R. R. Hinman, A. M. Hartford, 1836.—*From A. Winthrop, Esq.*

The Blue Laws of New Haven Colony, usually called Blue Laws of Connecticut; Quaker Laws of Plymouth and Massachusetts, &c. Hartford, 1838.—*From the same.*

Arte de la Lengva Moxa. Compuesto por el M. R. P. Pedro Marban. Lima, 1702.—*From W. B. Hodgson, Esq.*

Views on the Improvement of the Maltese Language. By the Rev. C. F. Schlienz. Malta, 1838.—*From W. W. Andrews, Esq.*

Svensk Botanik, utgifven af J. W. Palmstruch. Vols. II. III. IV. V. & VI. Stockholm, 1803-4-5-7-9.—*From Mr. John Vaughan.*

Svenska Lafvarnas Färghistoria. Af Joh. P. Westring. Vol. I. Stockholm, 1805.—*From the same.*

E'lémens de Philosophie Chimique, par H. Davy. Traduit de l'Anglais, avec des Additions, par J.-B. Van Mons. Two Vols. Paris, 1826.—*From the same.*

Essai sur la Théorie des Proportions Chimiques. Par J. J. Berzelius. Paris, 1819.—*From the same.*

The History of Kentucky. By H. Marshall. Two Vols. Frankfort, 1824.—*From the same.*

Personal Narrative of the First Voyage of Columbus. Boston, 1827.—*From the same.*

The Select Medical Library. Edited by John Bell, M. D. Vol. II. No. 12. Philadelphia, 1838.—*From the Editor.*

The American Medical Library and Intelligencer. By Robley Dunglison, M. D. Vol. II. Nos. 13 & 14. Philadelphia, 1838.—*From the Editor.*

Transactions of the Society of Arts, Manufactures, and Commerce. Vol. LI. Part II. London, 1838.—*From the Society.*

The Committee on the solar eclipse of the 18th of September, made a further Report in part, comprising the following observation:—

No. 25, by F. R. Hassler, Esq., at Weasel Mountain, N. J., latitude 40° 52′ 35″, approximate longitude 4*h* 57*m* 25.7*s* W., being one of the stations of the coast survey, with telescopes of the large theodolite, powers 116 and 151.

	h	*m*	*s*
First contact, - - -	3	15	56.98
Inner contact, - - -	4	35	57.09
End, - - - - -	5	47	13.10
Duration of eclipse, - -	2	31	16.12
Do. of ring, - -			1.00

From a drawing, accompanying Mr. Hassler's communication, it appears that several broken portions of the ring, or beads of light, for a second only, extended from cusp to cusp, presenting a most beautiful appearance. During the rest of the eclipse, except this single second, the cusps were dull and rounded off at the end.

Dr. Hare read a paper on the Tornado which passed over a suburb of Providence, R. I., in August last; accompanied by a description of the phenomenon, by Mr. Z. Allen, of Providence. Referred to President Bache, Dr. Patterson, and Mr. Espy.

President Bache reported the decease of M. Stainsby, Professor of Natural Philosophy at Prague, and of Dr. Martinus Van Marum, of Haarlem, both members of the Society.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. I. NOVEMBER & DECEMBER, 1838. No. 5.

Stated Meeting, November 2.

Present, twenty-eight members.

Mr. DU PONCEAU, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Nieuwe Verhandelingen der Eersteklasse van het Koninklijk-Nederlandsche Instituut te Amsterdam. Vols. VI. & VII. Amsterdam, 1837 & 1838.—*From the Institute.*

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie. Uitgegeven door J. van der Hoeven, M. D. en W. H. de Vriese, M. D. Vol. IV. Leyden, 1837 & 1838.—*From the Minister of the Interior of the Netherlands.*

Flora Batava. Nos. 108 & 114. Amsterdam.—*From the same.*

The American Journal of Science and Arts. Conducted by Benjamin Silliman, M. D., aided by Benjamin Silliman, Jr., A. B. Vol. XXXV. No. 1. New Haven, 1838.—*From the Conductors.*

Annals of the Lyceum of Natural History of New York. Vol. IV. Nos. 1, 2, 3 & 4. New York, 1837.—*From the Lyceum.*

A View of the Commerce between the United States and Rio de Janeiro, Brazil. By John M. Baker, late U. S. Consul for Rio de Janeiro. Washington, 1838.—*From Mr. John Vaughan.*

Museum Ichthyologicum, sistens Piscium qui in Museo L. T. Gronovii adservantur, Descriptiones. Amsterdam, 1754.—*From the same.*

Eulogy on Nathaniel Bowditch, LL. D. Delivered before the American Academy of Arts and Sciences, May 29, 1838. By John Pickering, Cor. Secretary of the Academy. Boston, 1838.—*From the Author.*

Nouveau Procédé pour la Conservation des Grains; par M. le général Demarçay.—*From M. Hersant, French Consul.*

A Bibliographical Account and Collation of la Description de l'Egypte, presented to the Library of the London Institution, by Sir Thomas Baring, Baronet, President. London, 1838.—*From Mr. William Vaughan.*

FOR THE CABINET.

A collection of shells from the Island of Malta; also four images cut from Malta stone, taken from "St. Paul's Cave," at Citta Vecchia.—*From William Winthrop Andrews, Esq., U. S. Consul at Malta.*

The Committee on the solar eclipse of the 18th of September, made a further Report in part, comprising the following observations:—

Nos. 26 and 27. Observations of Professors Alexander and Henry, at the house of the latter, (lat. 40° 20′ 50″, lon. 4*h* 58*m* 37.2*s* W. of Greenwich, being 0.1*s* in time W. of Nassau Hall), Princeton College, New Jersey; with a five feet Fraunhofer, yellow screen glass, power 60 for beginning and end, and 40 for the ring, and with a three and a half feet Dollond, dark red screen glass, power 80.

	h	*m*	*s*	
Beginning, - -	3	14	42.71	Henry.
Do. - -	3	14	43.31	Alexander.
Formation of ring, -	4	33	11.27	Both observers.
Rupture of ring, -	(not observed.)			
End, - - -	5	46	38.54	Henry.
Do. - - -	5	46	39.24	Alexander.
Mean duration of eclipse,	2	31	54.88	
Do. of ring, (not observed) less than tabular duration.				

About two minutes before the formation of the ring, Prof. Henry saw, in the Dollond telescope with a red screen glass, an arch of

faint light between the cusps, and shortly afterwards a brush of greater intensity, projecting from near the lower cusp. This phenomenon was not seen by Prof. Alexander in the Fraunhofer with green screen glass, till 61 seconds before the formation of the ring, and then only as a luminous spot. This difference could not have been the result of any oversight on the part of Prof. Alexander; as Prof. Henry, immediately on seeing it, called out to Prof. Alexander, and described its appearance. The optical capacity of the Fraunhofer is superior to that of the Dollond. Prof. Alexander is well known for his nice observations of the annular eclipse of the 13th February, 1831, and of the total eclipse of the 30th November, 1834. Its explanation must be sought for in the nature of the rays of which this arch and brush of light are composed; rays absorbed by the green screen glass, and transmitted by the red. The moon's limb became brightly illuminated at $4h\ 32m\ 53.28s$. "An appearance, similar to a row of beads, was regarded as the formation of the ring." "The drops endured for a second or two." Expecting a longer duration of the ring, the attention of the observers was not directed to the sun's limb at the instant of the rupture. The light succeeding the rupture of the ring was visible in the Dollond telescope till $4h\ 41m\ 16.27s$, (the minute uncertain, perhaps a minute earlier), having disappeared several minutes earlier in the Fraunhofer refractor.

No. 28. The beginning of the eclipse was observed by William Cranch Bond, at his private Observatory, with a two feet Gregorian, power 44; latitude 45° 19′ 15″, longitude $4h\ 44m\ 17.29s$ west of Greenwich, (or $0.69s$ in time west of Boston State House by Mr. Paine's trigonometrical survey) as follows:—

Beginning, $3h\ 28m\ 10.90s$ mean time of place of observation.
End, lost by clouds.

No. 29. The beginning was observed at $3h\ 28m\ 11.6s$ at the State House, Boston, by Mr. Borden, with a $3\frac{1}{2}$ feet refractor. Clouds prevented its observation at Cambridge.

The Committee also reported the following observations of R. T. Paine, Esq., on the occasion of his journey to Washington to observe the eclipse. These were made with his sextant, constructed by Troughton for the chronometrical survey of Massachusetts, and carefully corrected by that artist for all sensible error of eccentricity; and with three excellent chronometers used by Mr. Paine in the survey.

Latitude of the Capitol.

Sep. 17th, by 21 observed altitudes of both limbs				of the sun,	38° 53′ 23.39″
,,	,,	16	do.	β ceti,	22.75
,,	,,	22	do.	Polaris,	21.77
,,	22d	12	do.	both limbs of the sun,	22.31
,,	,,	12	do.	Polaris,	22.70
,,	,,	7	do.	β ceti,	24.89
By mean of 56 altitudes of sun and southern stars,					23.16
Do.	of 34	do.		Polaris,	22.24
				Latitude of the Capitol,	38° 53′ 22.7″

The corrections of the chronometers were determined by Mr. Paine for Boston State House, from transit observations of Mr. Bond, at Dorchester; those for Philadelphia State House, by eastern and western altitudes of stars, observed at the High School Observatory, by Messrs. Paine, Riggs, Walker, and Kendall, with the Troughton's sextant, circle, a Pistor's sextant, and a sextant (maker's name unknown) reading to 10″. Those for Washington were made by Mr. Paine. The daily rates of the chronometers for Washington were on mean time,

		s
151	Barraud	— 14.27
682	do.	+ 1.67
1678	Arnold	+ 8.46.

With these rates, the condition of the chronometers at the beginning of the eclipse was as follows:—

151 Barraud.	682 Barraud.	1678 Arnold.			
m *s*	*m* *s*	*m* *s*			
+ 19 31.59	+ 25 11.27	+ 31 46.21	by 8 W.	alt's of sun,	Sep. 17.
31.18	11.52	46.43	9 E. ,,	α Tauri,	,,
30.96	11.61	46.34	4 E. ,,	α Orionis,	,,
31.70	11.20	46.12	12 E. ,,	sun,	,,
32.65	12.13	47.14	8 E. ,,	α Androm,	18.
31.70	11.38	46.34	12 E. ,,	sun,	,,
+ 19 31.68	+ 25 11.48	+ 31 46.41	Mean of 53 altitudes.		

The longitude of the State House, Boston, is stated by Mr. Paine

to be $4h\ 44m\ 16.6s$, as the result of all the observations yet made. It is the same as that which Dr. Bowditch had deduced from those of 1811 and previous. The longitude of the State House, Philadelphia, obtained by Mr. Walker from the principal observations made at Philadelphia to this time, is $5h\ 0m\ 39.2s$. With these longitudes as standards, Mr. Paine's chronometric observations give,

			m	s	
Boston—Philadelphia by	151	Barraud	16	24.27	going from Boston to Phila.
	682	do.		22.30	do.
	1678	Arnold		24.03	do.
	151	Barraud		23.33	returning from Phila. to Boston.
	682	do.		23.60	do.
	1678	Arnold		23.76	do.
Philadelphia—Capitol by	151, 682, 1678	Mean	7	26.43	going from Phila. to Capitol.
	151, 682, 1678	Mean	7	26.50	returning from Capitol to Phila.

	h	m	s		m	s	h	m	s
Hence, longitude of Capitol	$=4$	44	16.6	+	23	50.01	$=5$	8	6.61
	$=5$	0	39.2	+	7	26.46	$=5$	8	5.66
							Mean $=5$	8	6.14

Mr. Walker, in a paper read before the Society, March 2, 1838, from a discussion of all the observations then made at Washington, finds the longitude of the Capitol $5h\ 8m\ 7s$, a value which is probably not far from the truth.

Thus we have an additional proof, if any were needed, of the error of 25 seconds in time of Lambert's longitude of the Capitol, reported to Congress and adopted by that body.

The coincidence between the interval from Boston to Philadelphia, viz.

	m	s
By celestial phenomena,	16	22.60
By chronometers,	16	23.55

shows that the error of either is reduced within narrow limits.

The Mansion House, Northampton, Mass., lat. 42° 19′ 4.6″ by 327 altitudes of northern and southern stars, has the following longitude:—

	m	s	
Boston—Northampton,	6	17.72	by 74 chronometers.
Do.	6	17.89	by immersion τ Sagittarii.
Northampton—Philad.	10	4.06	by do.

This immersion of τ Sagittarii was observed, Aug. 22d, 1836, as follows:—

	h	*m*	*s*	
By R. T. Paine,	at 10	14	57.46	at Mansion House, Northampton.
By W. C. Bond,	at 10	23	20.90	at his Observatory.
By S. C. Walker,	at 10	1	7.30	at N. 4.4″, W. 1.06*s* of S. House, Ph.

Again, for the longitude of Brown University, Providence, Mr. Paine finds,

	m	*s*	
Boston—Providence,	1	22.64	by 40 chronometers.
Do.	1	22.29	by eclipse of May 15th, 1836.

Mr. Paine's observations of the eclipse of Sep. 18th have already been reported. Those for latitude and regulation of chronometers have been stated more at length, in order to furnish examples of the method pursued by that gentleman in the chronometric survey of Massachusetts, the only work of the kind of much extent hitherto performed in this country. Some idea of the labours of Mr. Paine may be formed from the fact, that, during its progress, he has been under the necessity of making and reducing more than 100,000 observations of altitudes of the sun and stars, without any assistance.

It is proper to add that Mr. Gilliss' observations, already reported, appear to require a subtractive correction of 1.95*s*. Thus Mr. Paine's observations give,

	h	*m*		*m*	*s*
Sep. 18th,	21	25,	Barraud 151 fast by its own rate +	19	20.80
			by comparison with 682 Barraud,		20.91
			1678 Arnold,		20.89
			by mean of three chronometers,	19	20.87
			by Mr. Gilliss' transit observations,	19	22.82
			Discrepancy,		1.95

Professor Henry read a paper entitled "Contributions to Electricity and Magnetism, No. 3. On the Phenomena of Electro-dynamic Induction." Referred to Prof. A. D. Bache, Dr. Patterson, and Dr. Hare.

The primary object of the investigation undertaken by the author, was the discovery of induced currents from ordinary electricity, similar to those produced by galvanism. Preparatory to this, a new investigation was instituted of the phenomena of galvanic induction, and the result of this forms, perhaps, the most important part of the communication.

The first section of the paper refers to the conditions which influence the induction of a current on itself, as in the case of a long wire and a spiral conductor. These are shown to depend on the intensity and quantity of the battery current, and on the length, thickness, and form of the conductor.

The next section examines the conditions necessary to the production of powerful secondary currents, and also the changes which take place in the same, when the form of the battery, and the size and form of the conductor are varied. The important fact is shown, that not only a current of intensity can be induced by one of quantity, but also the converse, that a current of quantity can be produced by one of intensity.

The third section relates to the effect of interposing different substances between the conductor which transmits the current from the battery, and that which is arranged to receive the induced current. All good conducting substances are found to screen the inducing action, and this screening effect is shown, by the detail of a variety of experiments, to be the result of the neutralizing action of a current, induced in the interposed body. This neutralizing current is separately examined, and its direction found to be the same as that of the battery current. The question is then raised, how two currents in the same direction can counteract each other? An answer to this question is given in a subsequent part of the paper.

The fourth section relates to the discovery of induced currents of the third, fourth, and fifth orders;—that is, to the fact that the second current is found capable of inducing a third current, and this latter again another, and so on. The properties of these new currents are next examined, and the screening influence is found to take place between them; quantity is induced from intensity, and conversely; magnetism is developed in soft iron; decomposition is effected, and intense shocks are obtained, even from the current of the fourth order. A remarkable and important fact is stated in reference to the direction of these currents. If the direction of the battery current and that of the second be called *plus*, then the direction of the third current will be *minus*, of the fourth current *plus*, of the fifth *minus*, and so on. The application of the fact of these alternations is made to the explanation of the phenomenon of screening before mentioned, and also to the improvement of the magneto-electrical machine.

The last part of the paper relates to the discovery of secondary currents, and of currents of the several orders, in the discharge of

ordinary electricity. Shocks are obtained from these; the screening influence of good conductors is shown to take place; magnetism is developed: and the alternations in the direction are found to exist as in the currents from galvanic induction. Some remarkable results are given in reference to the great distance at which the induction takes place. Experiments are detailed in which needles were made magnetic, when the conductors were removed to the distance of twelve feet from each other.

Prof. Henry made a verbal communication, during the course of which he illustrated, experimentally, the phenomena developed in his paper.

Stated Meeting, November 16.

Present, twenty-four members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

The Good Fellow, by Paul de Kock. Translated from the French by a Philadelphian. Two Volumes. Philadelphia, 1837.—*From Daniel J. Desmond, Esq.*

Allgemeiner Hand-Atlas der Ganzen Erde. Weimar, 1811.—*From the same.*

Kongl. Vetenskaps-Academiens Handlingar, för Aor 1836. Stockholm, 1838.—*From the Academy.*

Aorsberättelse om Framstegen i Fysik och Kemi afgifven den 31 Mars 1836; af Jac. Berzelius. Stockholm, 1836.—*From the Royal Swedish Academy.*

Aorsberättelse om Technologiens Framsteg afgifven den 31 Mars 1836; af C. E. Pasch. Stockholm, 1836.—*From the same.*

Aorsberättelse i Astronomien af S. A. Cronstrand. Den 31 Mart. 1836. Stockholm, 1836.—*From the same.*

Aorsberättelser om Nyare Zoologiska Arbeten och Upptäckter, afgifne den 31 Mars 1835 och 1836, af B. Fr. Fries. Stockholm, 1837. —*From the same.*

Aorsberättelse om Botaniska Arbeten och Upptäckter för Aor 1835. Afgifven den 31 Mars 1836. Af Joh. Em. Wikström. Stockholm, 1837.—*From the same.*

Tal om Hydraulikens närvarande tillstand m. m. Af P. Lagerhjelm. Stockholm, 1837.—*From the same.*

Aminnelse-Tal öfver Kongl. Vetenskaps-Academiens Framlidne Ledamot Friherre Lars A. Mannerheim, af A. G. Mörner. Stockholm, 1837.—*From the same.*

Abhandlungen der Königlichen Akademie der Wissenschaften zu Berlin. Aus dem Jahre, 1836. Berlin, 1838.—*From the Academy.*

Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Preuss. Akademie der Wissenschaften zu Berlin. For July, Aug. Sept. Oct. Nov. & Dec. 1837; and Jan. Feb. March, April, May, & June, 1838. Berlin, 1837-38.—*From the same.*

Essai sur le Madar, (Calotropis Madarii Indico-Orientalis) contenant l'Histoire naturelle de cette Plante, ses propriétés physiques, chimiques, et médicinales. Par J. N. Casanova, C. M. D. Traduit de l'Anglais par L. A. Richy. Calcutta, 1833.—*From the Author.*

General Observations respecting Cholera Morbus. By J. N. Casanova, C. M. D. Philadelphia, 1834. *From the Author.*

A Lecture on the Social and Moral Influences of the American Revolution. By Job R. Tyson. Philadelphia, 1838.—*From the Author.*

The American Journal of the Medical Sciences. Edited by Isaac Hays, M. D. No. XLV, for November. Philadelphia, 1838.—*From the Editor.*

Transactions of the Agricultural and Horticultural Society of India. Vol. V. Serampore, 1838. *From the Society.*

Agricultural Society of India. Proceedings. Four numbers. From Jan. to April. Calcutta, 1838.—*From the same.*

FOR THE CABINET.

Three specimens of quicksilver ores, eight of silver ores, and fourteen of copper ores, from different localities in Chili; six specimens of various ores and minerals, also from Chili; eight fossils from the Cordillera; an ostrich egg from the Pampas of Buenos Ayres.—*From Dr. J. N. Casanova.*

The Committee on the solar eclipse of the 18th of September, made a further Report in part, comprising the following observations:—

No. 30. Observation of A. Holcomb, at his Observatory, Southwick, Mass., with a seven feet Herschelian of his own construction, power 225, with red screen glass. Southwick is in latitude 42° 0′ 41″ north; longitude $4h$ $51m$ $12s$, by Mr. Holcomb's triangulation with Springfield Court House, one of the points determined by Mr. Paine. Mr. S. C. Walker finds, from Mr. Holcomb's observation of the solar eclipse of 1836, for this longitude $4h$ $51m$ $13.2s$. Mean value $4h$ $51m$ $12.6s$.

	h	m	s		
Beginning,	3	20	19	Mean time.	Observation satisfactory.
End,	5	50	27	Do.	Doubtful one second. Sun's limb
Duration,	2	30	8		tremulous, and near horizon.

No. 31. Observation of Prof. Albert Hopkins, at the Observatory of Williamstown College, Mass. Latitude, 42° 42′ 44″, longitude $4h$ $52m$ $52s$. Astronomical clock regulated by a four feet transit instrument.

	h	m	s		
Beginning,	3	17	19.9	Mean time.	Good observation.
End,	(not observed)				Sun too near the horizon.

The Committee on Dr. Hare's paper on the Tornado which passed over a suburb of Providence, R. I., in August last, reported in favour of publication, and the Report was adopted.

The phenomena and facts, stated in this paper, are quite consistent with those mentioned upon the authority of Prof. Bache, Mr. Espy, and other observers, relative to the Tornado which took place in New Jersey, at or near New Brunswick, in June, 1835, and of which an account will be found in the last volume of the Transactions of the Society. This paper embraced a letter from Zachariah Allen, Esq., a highly respectable gentleman of Providence, who was an eye-witness of the Tornado, having been quite as near to it as was consistent with safety. One of the facts noticed by Mr. Allen, Dr. Hare considers as tending to justify his opinion, that the exciting cause of these meteors is electrical attraction. Mr. Allen alleged that, as soon as the Tornado came into contact with the surface of the river, the water rose in a foam; that, under these circumstances, two flashes of lightning passed between the water and the overhanging clouds;

and that, after each flash, there was a perceptible subsidence of the foam. This result is precisely what Dr. Hare conceives would ensue, if the foam arose from an attraction between the water and the stratum of air above, caused by opposite states of electrical excitement. In such case, the passage of sparks always necessarily tends to restore the equilibrium between the electrified masses, and consequently to lessen their reciprocal attraction.

Dr. Hare made a verbal communication in relation to his compound blowpipe. He stated that, having, in a letter to the chemical section of the British Association, mentioned the fusion of twenty-five ounces of platinum, of which he had already informed the Society, a Mr. Maugham, who is employed at the Adelaide Gallery in London to exhibit the hydro-oxygen microscope, had asserted that the fusion in question had been accomplished by a blowpipe of a kind which he had contrived, and of which one had been bought by Dr. Hare when in London.

Dr. Hare said he would not have considered this ridiculous and groundless allegation worthy of notice, had it not been made before the chemical section of the British Association, and had not the individual, by whom it was made, been honoured by a British society with a premium for the instrument which he miscalled *his* blowpipe. This blowpipe differed immaterially from one of which he, Dr. Hare, had published an engraving and description in Silliman's American Journal of Science for 1820, (Vol. II., page 298, fig. 3;) being a modification of his blowpipe described in Vol. XIV. of Tilloch's Philosophical Magazine for 1802.

The only difference between the instruments described and represented in those publications, and that employed by Maugham, was that the latter formed near the apex an acute angle, so as to be convenient for directing the flame upon a cylinder of lime for producing the lime-light.

With a view to show this method of illumination, agreeably to the process in which a revolving cylinder of lime is employed, Dr. Hare stated that he had purchased one of the crooked blowpipes alluded to; *but he had never used it for any purpose,* having found his own blowpipe abovementioned preferable, when the jet was directed obliquely upwards.

Unless cured of the crookedness, which was its only essential distinguishing attribute, the blowpipe used by Maugham was evidently unfit for the fusion of any metal. Dr. Hare stated that he would not undertake the fusion with it of an ounce of platinum; and concluded by saying, that, whenever the process by which he had lately extended the power of his blowpipe should be published, it would be seen, that, however it might differ from those which he had previously contrived, it differed still more from that which Maugham had appropriated to himself.

Prof. Bache informed the Society, that, in conjunction with Prof. Rogers and Mr. Saxton on the nights of the 12th and 13th of November, and with Prof. Rogers and Mr. Walker on the 13th and 14th, he had observed the number of meteors or shooting stars. The first night was clear for only about an hour, viz., between three-quarters past one and two, when but one meteor was seen. The second was clear until half past two; but not even an ordinary average number of meteors was seen.

On the authority of a letter from Mr. Levett Harris, Dr. Bache reported the decease of Mr. F. H. Le Comte, of Paris, a member of the Society.

Stated Meeting, December 7.

Present, twenty-seven members.

Dr. Patterson, Vice President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Mémoires Couronnés par l'Académie Royale des Sciences et Belles-Lettres de Bruxelles. Vol. XII. Brussels, 1837.—*From the Academy.*

Bulletin de l'Académie Royale de Bruxelles. Nos. 10, 11, & 12. Brussels, 1837.—*From the same.*

Annuaire de l'Académie Royale des Sciences et Belles-Lettres de Bruxelles. Quatrième Année. Brussels, 1838.—*From the same.*

Notes sur la Structure des Hydatides et de l'Epiderme dans quelques Animaux; par M. Gluge. Brussels, 1838.—*From the Author.*

Note sur la Terminaison des Nerfs et sur les Canaux Nerveux dans les Moignons des Amputés; par M. Gluge. Brussels, 1838.—*From the Author.*

Annuaire de l'Observatoire de Bruxelles, pour l'An 1838, par le Directeur A. Quetelet. Brussels, 1838.—*From the Director.*

Observations Horaires faites au dernier Solstice d'Hiver (1837), à Bruxelles, Louvain, Alost et Londres, &c. Brussels, 1838.—*From A. Quetelet.*

Bulletin de la Société de Géographie. Deuxième Série. Vol. IX. Paris, 1838.—*From the Society.*

Annales des Mines. Troisième Série. Vol. XIII. Parts 1 & 2 of 1838. Paris, 1838.—*From the Engineers of Mines.*

The Journal of the Royal Asiatic Society of Great Britain and Ireland. No. 9. London, 1838.—*From the Society.*

Catalogue of the Chinese Library of the Royal Asiatic Society. By the Rev. S. Kidd. London, 1838.—*From the same.*

Journal of the Asiatic Society of Bengal. Nos. 73, 74, 75, & 76. Calcutta, 1838.—*From the Society.*

An Account of the Experiments made in the French Navy for the Trial of Bomb Cannon, etc. By H. J. Paixhans, Lieut. Col. of Artillery. Translated from the French, by John A. Dahlgren, Lieut. U. S. Navy. Philadelphia, 1838.—*From the Translator.*

American Quarterly Register. Conducted by B. B. Edwards and W. Cogswell. Vol. XI. No. 2. For November. Boston, 1838. —*From Mr. W. Cogswell.*

Dr. Hare presented several papers on subjects relating to Chemistry and Galvanism. Referred to Dr. Bache, Professor Bache, and Mr. Lukens.

Mr. Raguet read, with concluding remarks by himself, an Obituary Notice of the late Chevalier Lorich, Chargé d'Affaires of Sweden to the United States, which had been communicated to Mr. Vaughan by the brother of the deceased.

Mr. C. J. Ingersoll read an Obituary Notice of the late president Madison.

Mr. Raguet reported the death of Don José Bonifacio de

Andrada e Silva, of Brazil, and Dr. Bache, the decease of Dr. Alexander Pearson, formerly of Canton, both members of the Society.

Stated Meeting, December 21.

Present, twenty-eight members.

Dr. PATTERSON, Vice President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Malay Bible. Serampore, 1821.—*From Mr. L. B. Stone.*

Part of a Malay MS., entitled "History of the Prophets."—*From the same.*

A MS. copy, in Malay, of the Credentials, called the "*Tromba Menangcarbowe*," carried by the Prince Raja Laboo, last deputed by the States of Sumatra to the Court of the Sultan on the Peninsula.—*From the same.*

Gospel of St. John, in Malay. Press of the American Missionaries. Singapore, 1837.—*From the same.*

The Gospels and Acts, in Malay. Revised Edition. Printed at the Mission Press, for the British and Foreign Bible Society. Singapore, 1831.—*From the same.*

Story of Abdullah and Sabat, in Malay. Singapore, 1837.—*From the same.*

Romans. Chapters 1 to 16, in Tamul.—*From the same.*

Gospel of St. John, in Hindustani.—*From the same.*

Mr. Bruckner's Version of St. John, in Javanese.—*From the same.*

Acts of the Apostles, in Arabic.—*From the same.*

Acts of the Apostles, in Hinduwee.—*From the same.*

Proverbs, in Oordoo.—*From the same.*

Book of Genesis, in Bengalee. Calcutta, 1833.—*From the same.*

Three Missionary Tracts in Chinese.—*From the same.*

Chinese Almanac.—*From the same.*

Chinese Testament.—*From the same.*

The Gospels and Epistles of St. John, in Japanese.—*From the same.*

Gospel of St. John, in Siamese.—*From the same.*

A Tract in Bugis, a language of Celebes.—*From the same.*

Annals and Memoirs of the Royal Society of Northern Antiquaries. First Series, 1836–37. Copenhagen, 1837.—*From the Society.*

Mémoire sur la Découverte de l'Amérique au Dixième Siècle. Par C. C. Rafn. Traduit par Xavier Marmier. Paris, 1838.—*From the Author.*

Journal of the Select Council of Philadelphia. 1837–8. Philadelphia, 1838.—*From Mr. J. P. Wetherill.*

Report of the Committee on Prison Discipline, to the Governor General of India in Council, dated the Eighth of January, 1838. Calcutta, 1838.—*From Mr. William Adam.*

Second Report on the State of Education in Bengal. District of Rajshahi. Calcutta, 1836.—*From the same.*

Third Report on the State of Education in Bengal, &c. By William Adam. Calcutta, 1838.—*From the Author.*

The Magazine of Natural History. New Series. Conducted by Edward Charlesworth, F. G. S., &c. No. XXI. For September. London, 1838.—*From the Conductor.*

Caspari Frederici Wegener, D. de Aula Atalica Literarum Artiumque Fautrice Libri Sex. Volumen I. Copenhagen, 1836.—*From the Author.*

The Elements of Arithmology; being a Treatise on Arithmetic. By Charles Nagy. (In Hungarian.) Bécs, 1835.—*From the Author.*

The Elements of Arithmography; being a Treatise on Algebra. By Charles Nagy. (In Hungarian.) Bécs, 1837.—*From the Author.*

A Treatise on Arithmetic. (In Hungarian.) Bécs, 1837.—*From Mr. Charles Nagy.*

A Treatise on Geometry. (In Hungarian.) Bécs, 1838. *From the same.*

Bibliotheca Numismatica. Collecta et Indice Rerum Instructa a Joh. Christ. Hirsch. Nuremberg, 1760.—*From Mr. John Vaughan.*

Storia Naturale e Generale Dell'Etna del Canonico Giuseppe Recupero. Two Volumes. Catania, 1815.—*From the same.*

The American Medical Library and Intelligencer. By Robley Dunglison, M. D. Vol. II. Nos. 15 to 18. (Presented at this and preceding meetings.) Philadelphia, 1838.—*From the Editor.*

FOR THE CABINET.

A Specimen of pine-apple hemp, made from the stalk of the pine-apple.—*From Mr. L. B. Stone.*

A brush from Japan, made of the fibres of the cocoa-nut.—*From the same.*

The Committee on the solar eclipse of the 18th of September, made a further Report in part, comprising the following observations, received through the attentions of their correspondent, Prof. S. Alexander, of Princeton College, New Jersey:—

No. 32, by Prof. Augustus A. Smith, of the Wesleyan University, Middletown, Con. Latitude 41° 33′ 8″; longitude, as deduced by himself from this observation, by the method of Woolhouse, in the Nautical Almanac for 1837, $4h\ 50m\ 2s$.

	h	m	s	
Beginning, - -	3	22	0.81	Mean time.
End, - - -	5	52	1.46	Mean time.

His telescope was a Herschelian, by Holcomb, seven feet in length, six inches in aperture, with a deep red screen glass, power 150. "There was nothing unusual in the appearance, except, perhaps, about the time of greatest obscuration. At first were seen two or three brushes or pencils of light, streaming out from that border of the moon, which was not projected on the sun's disc, about equidistant from each other, and from the higher cusp of the sun. These soon disappeared, and were succeeded by a faint diffuse light, bordering two-thirds of the lower part of the sun's limb. The duration of this appearance was not noted."

Prof. Smith also noticed an indentation in the sun's limb, which he attributes to the protrusion of a lunar mountain, before any other portion of the moon was visible on the sun's disc. The Committee are of opinion that this appearance should be referred to that class of phenomena which usually precede and follow a central eclipse, and which are to be ascribed to some optical cause rather than to the protrusion of lunar mountains.

No. 33, by Mr. I. N. Z. Blaney, at New Castle, Del., latitude 39° 40′, longitude $5h\ 2m\ 8s$, W.; observation of the duration of the ring with a spy-glass, with smoked glass screen.

	m	s
From the appearance of the drops to the rupture of the ring,	4	47
From the perfect formation of the ring to the perfect rupture,	4	45

Prof. Alexander remarks that the luminous arch round the moon's

dark limb, and the brush of light were only partially visible in his 4 feet Fraunhofer, with a yellow screen glass, having a slight tint of green. He saw them distinctly in the 3½ feet Dollond, with a red screen glass, used by Prof. Henry, for some four minutes after the rupture of the ring, though none was visible in the Fraunhofer telescope; at least none is recollected to have been seen, though he examined the sun in the direction in which the ring broke. The testimony of so experienced an observer, who, in examining this arch and brush of light, used, interchangeably, the yellow and red screen glasses, in favour of their far greater visibility through the red screen glass, appears to be conclusive on the subject. This remarkable circumstance, not hitherto noticed in European observations, and first suggested by Robert Treat Paine, Esq., from his observations at Washington, appears to be now confirmed. It is one of great importance; as it seems to furnish evidence of the existence of a lunar atmosphere, through which, as through our own, the red rays have the greatest penetrative power. It also leads to new views concerning the cause of the remarkable appearances of the beads of light, and the dark lines frequently noticed; since it shows that their appearance may be completely modified by a change in the colour, and, consequently, in the absorbing power of the screen glass through which they are observed.

The fact, noticed by most of the observers, that before the formation and after the breaking of the ring, the edge of the moon *off* the sun was distinctly visible, and illuminated for some distance within the moon's surface, is just such as would be presented by a *twilight* caused by a lunar atmosphere; nor does there seem to be any other plausible explanation of this phenomenon.

The Committee on Prof. Henry's paper, entitled "Contributions to Electricity and Magnetism, No. 3. On Electro-dynamic Induction," reported in favour of publication, and the Report was adopted.

The Committee on Dr. Hare's papers, entitled, 1. "Rotary Multiplier or Galvano-motive needle;" 2. "Apparatus for showing on a large scale the Decomposition and Recomposition of Water by Galvanism;" 3. "Improved Process for Potassium," reported in favour of publication, and the Report was adopted.

Mr. Lea submitted the following description of a new shell, recently taken in the vicinity of Cincinnati by Mr. T. G. Lea.

MELANIA CINCINNATIENSIS.

"Testâ valde depressâ, inferné compressâ, fuscâ, trifasciatâ, bicarinatâ, apice acuminatâ; anfractibus quaternis; aperturâ subrotundâ."

This is a very minute species, and very remarkable for its roof-shaped spire, and two carinæ which are coloured.

On motion of Dr. Patterson, the Committee appointed on the late eclipse, were instructed to make and collect observations in relation to the occultation of stars in the constellation of the Pleiades, which will occur on the 27th instant.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. I. JAN. FEB. & MAR. 1839. No. 6.

Stated Meeting, January 4.

Present, fifteen members.

Dr. PATTERSON, Vice President, in the chair.

The result of the annual election for officers, held this day, was reported as follows:—

President.

Peter S. Du Ponceau, LL. D.

Vice Presidents.

Nathaniel Chapman, M. D.,
Joseph Hopkinson, LL. D.,
Robert M. Patterson, M. D.

Secretaries.

Franklin Bache, M. D.,
John K. Kane,
Alexander D. Bache, LL. D.,
J. Francis Fisher.

Counsellors for Three Years.

William Short,
William H. Keating,
George Ord,
C. C. Biddle.

Curators.

J. P. Wetherill,
Isaac Hays, M. D.,
Franklin Peale.

Treasurer.

John Vaughan.

The following donations were received:—

FOR THE LIBRARY.

On the Functions of the Cerebellum, by Drs. Gall, Vimont, and Broussais. Translated from the French, by George Combe: also answers to the objections urged against Phrenology by Drs. Roget, Rudolphi, Prichard, and Tiedemann. By George Combe and Dr. A. Combe. Edinburgh, 1838.—*From Mr. George Combe.*

Magazine of Natural History. Edited by Edward Charlesworth. Vol. II. New Series. Nos. 22, 23, & 24. London, 1838.—*From the Editor.*

The American Medical Library and Intelligencer. By Robley Dunglison, M. D. Vol. II. Nos. 19, 20, & 21. Philadelphia, 1839.—*From the Editor.*

Railway Map of England and Wales. London, 1838.—*From Mr. William Vaughan.*

Chart of George's Shoal and Bank. Surveyed by Charles Wilkes, Lieut. Commandant, and the officers of the U. S. Brig Porpoise, and of the Schooners Maria and Hadassah, by order of the Hon. Mahlon Dickerson, Secretary of the Navy.—*From the Athenæum.*

Panorama and Views of Philadelphia, and its vicinity. From Paintings by J. C. Wild. With poetical illustrations by Andrew M'Makin. Philadelphia, 1838.—*From the Publisher.*

FOR THE CABINET.

An Ibis from Egypt.—*From V. L. Godon, M. D.*

Dr. Dunglison made a verbal communication on the subject of the vaccine virus and its alleged liability to lose its protective character under certain circumstances.

He stated that, in consequence of severe epidemic small-pox having recently occurred in England, from which many who had been previously vaccinated had suffered severely, it had been a matter of solicitude with many medical practitioners to revert to the original source for vaccine virus. Mr. Estlin, of Bristol, having succeeded in obtaining some lymph from a cow labouring under cow-pox, inserted it in the arm of a young lady, in August last, and from her the disease was subsequently propagated. Some of the virus, obtained at ten removes, was sent to Dr. Dunglison by Messrs. Estlin and Car-

penter, of Bristol. This has been used in several cases, and the disease produced by it appeared to him to be more satisfactory than that which results from the old virus.

Dr. Dunglison stated that there was reason to believe that a sufficient supply of the new virus would soon be obtained for distribution through the country.

Professor A. D. Bache stated to the Society that observations had been made on the night of the 12th—13th of November last, by Professor Henry, at Princeton, Professor W. B. Rogers, at the University of Virginia, and Professor R. P. Smith, at Kenyon College, Ohio, neither of whom had noted an unusual number of the meteors commonly called "shooting stars."

The Committee on the paper entitled Contributions to the Geology of the tertiary formations of Virginia, by Professor William B. Rogers, and Professor Henry D. Rogers, reported in favour of its publication, and the publication was ordered accordingly.

The resolutions presented on the 16th of November last, by Mr. Kane, relative to the distribution of the Society's Proceedings, were adopted as follows:—

That the Librarian be instructed to retain twenty copies of the Society's Proceedings, for the use of the Society; and that as soon as published he transmit one copy,

1. To each subscriber to the Transactions.

2. To each of the Societies in correspondence with this Society.

3. To each of the principal Colleges, Athenæums, and public libraries in the United States.

4. To the editors of each of the Scientific Journals in the United States, and of the principal Scientific Journals elsewhere;

That he transmit to all donors to, and correspondents of, this Society, copies of the numbers in which their donations or communications are noticed;

And that he distribute the remaining copies, at his discretion, to such members as may apply for them.

Stated Meeting, January 18.

Present, twenty-two members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie. Uitgegeven door J. Van der Hoeven, M. D. Prof. te Leiden en W. H. de Vriese, M. D. Prof. te Amsterdam. Leyden, 1838.—*From the Minister of the Interior of the Netherlands.*

Flora Batava, of afbeelding en beschrijving van Nederlandsche Gewassen, door Jan Kops, en H. C. Van Hall. No. 115. Amsterdam.—*From the same.*

Verzeichniss der Königlich Sächsischen Gemälde-Galerie zu Dresden, von Friedrich Matthäi, Director etc. Dresden, 1837.—*From Mr. Thomas Sully.*

Letter from the Secretary of War, the Hon. Lewis Cass, transmitting Captain Turnbull's Report on the Survey and Construction of the Alexandria Aqueduct. Document of the House of Representatives, No. 459. 1838.—*From. Col. J. J. Abert.*

The Committee appointed to describe the Coins and Medals presented by Colonel Linah, reported and was discharged.

Professor A. D. Bache and Mr. Walker were added to the Committee on the Observatory.

Mr. John Vaughan was elected Librarian.

The Standing Committees for the year were appointed.

Professor A. D. Bache made a verbal communication relative to an extraordinary instance of the rapid corrosion of a chain cable in sea-water, reported to him by Lieutenant George M. Bache, of the United States Navy, and showed the Society a link from a portion of the cable.

The chain cable, of which this was a part, was used to anchor the Light-boat off Bartlett's reef, near New-London, Connecticut. The portion between the hawse-hole and the bridle of the anchors, about eleven fathoms in length, is particularly exposed to corrosion. In a

few months the links, or the keys of the shackles attaching the chain to the bridle, become so much oxidated as to lose the requisite tenacity.

The link, presented as a sample of the chain, is irregularly oxidated and worn, presenting semi-spheroidal cavities, and the fibrous structure of the iron is very distinctly developed. While this is the case with the wrought iron part of the link, the cast iron stud which strengthens it is not materially acted on. The raised letters upon the stud are perfect.

The circumstances in which this chain is differently situated from others, used in similar situations, result from the peculiar construction of the Light-boat, by which the copper sheathing rises above, and is in contact with, the cast-iron hawse-pipe, through which the cable passes. This cast-iron pipe has on its exterior a lead pipe. The copper sheathing is bright.

This action being attributed by Lieutenant Bache, to the contact of the copper and iron in presence of sea-water, he had ordered the copper to be removed from around the hawse-hole, the result of which experiment would test the truth of the supposition.

Professor Bache stated his wish to call special attention to the entire soundness of the cast-iron, while the wrought-iron was corroded; as if the latter had acted as a protector to the former. He believed that some general laws of interest would be made out by the Committee of the British Association engaged in investigating the subject to which this fact appeared to belong.

The Committee on making and collecting observations of Celestial Phenomena, reported in part, that they had received the following observations of Lunar Occultations of the fixed stars, in mean time of the places of observation.

	1838.				h	m	s			
1.	Nov. 2,	*d*	Pleiadum,	Em.	13	53	11.10	d. l.	Phila. Obs'y,	W. and K.
2.		"		Im.	13	18	12.10	b. l.	,,	,,
3.				Em.	14	34	50.60	d. l.	,,	,,
4.		*f*		Im.	14	9	53.60	b. l.	,,	,,
5.				Em.	15	19	25.10	d. l.	,,	,,
6.		*h*		Em.	15	26	34.40	d. l.	,,	,,
7.	,, 21,	58 ω	Sagittarii,	Im.	6	1	24.30	d. l.	,,	,,
8.			,,	Em.	7	13	20 00	b. l.	,,	,,
9.		* 8th mag.	,,	Im.	6	9	12.30	d. l.	,,	,,
10.		60 α	Sagittarii,	Im.	7	43	5.10	d. l.	,,	J. and F.
11.	Dec. 27,	"	Pleiadum,	Im.	8	0	34 70	d. l.	,,	R. and W.
12.				Em.	9	17	33.80	b. l.	,,	,,

	1838.				h	m	s			
13.	Dec. 27,	*f*		Im.	8	53	56.70	d. l.	Philad. Obs'y.	P. and W.
14.							57.60	d. l.	,,	K. and R.
15.		*h*		Im.	8	54	10.80	d. l.	,,	P. and W.
16.							12.20	d. l.	,,	K. and R.
17.	Nov. 2,	*d*	Pleiadum,	Im.	12	34	26.10	b. l.	Wagner's House,	T. Wagner.
18.				Em.	13	53	28.80	d. l.	,,	,,
19.		,,		Im.	13	18	48.80	b. l.	,,	,,
20.				Em.	14	34	38.60	d. l.	,,	,,
21.		*f*		Em.	15	19	24.40	d. l.	,,	,,
22.		*h*		Em.	15	26	32.40	d. l.	,,	,,
23.	Dec. 27,	*d*	Pleiadum,	Em.	8	34	35.00	b. l.	,,	,,
24.		*f*		Im.	8	54	0.00	d. l.	,,	,,
25.				Em.	10	1	17.90	b. l.	,,	,,
26.		*h*		Em.	10	11	59.90	b. l.	,,	,,
27.	Nov. 21,	58 α	Sagittarii,	Im.	6	3	57.35	d. l.	Princeton Coll'e.	Alexander.
28.		60 α	Sagittarii,	Im.	7	44	37.49	d. l.	,,	,,
29.	Dec. 24,	ϵ	Piscium,	Im.	9	35	30.80	d. l.	,,	,,
30.	,, 26,	47	Arietis,	Im.	14	20	54.50	d. l.	,,	,,
31.	,, 27,	,,	Pleiadum,	Im.	8	4	0.35	d. l.	,,	,,
32.				Em.	9	21	30.40	b. l.	,,	A. and B.
33.		*d*		Im.	7	21	33.50	d. l.	,,	,,
34.				Em.	8	38	38.00	b. l.	,,	,,
35.		*p*?		Im.	7	59	20.10	d. l.	,,	A.
36.		*f*		Im.	8	57	7.85	d. l.	,,	A.
37.				Im.			8.15	d. l.	,,	B.
38.				Em.	10	6	11.30	b. l.	,,	A.
39.		*h*		Im.	8	57	32.76	d. l.	,,	A. and B.
40.				Em.	10	21	31.55	b. l.	,,	A.
41.	Nov. 13,	α	Virginis,	Im.	20	32	38.40	b. l.	Dorchester Obs'y.	Bond.
42.	Dec. 2,	*c*	Aurigæ,	Em.	17	32	19.00	d. l.	Paine's House, Boston.	Paine.
43.	,, 24,	ϵ	Piscium,	Im.	9	53	16.81	d. l.	,,	,,
44.	,, 27,	*f*	Pleiadum,	Im.	9	18	43.28	d. l.	,,	,,
45.	Nov. 21,	58 α	Sagittarii,	Im.	6	12	33.20	d. l.	Holcomb's Obs'y.	Holcomb.
46.	Dec. 24,	ϵ	Piscium,	Im.	9	44	29.50	d. l.	,,	,,
47.	,, 27,	,,	Pleiadum,	Im.	8	16	43.10	d. l.	,,	,,

No. 1, at the Philadelphia Observatory of the Central High School. Lat. 39° 57′ 8″; longitude 5*h* 0*m* 42*s* west of Greenwich.

No. 2, good observation. No. 3, doubtful, eye not directed to the exact place of emersion. Nos. 4, 5, 6, 7, 9, 11, 13, 14 and 15, good observations. No. 10, doubtful. No. 12, star reappeared in contact with bright limb.

No. 16, doubtful 1*s*.

No. 17, at T. Wagner's house, 2·16*s* in time, east of the Philadelphia Observatory, with 5 feet equatorial. No. 18, probably too late several seconds.

No. 19, doubtful. No. 20, good observation, preferable to No. 3. Nos. 21, 22 and 24, good observations. Nos. 23, 25 and 26, uncertain, from brightness of moon's limb

No. 27, at Prof. Stephen Alexander's house, 6″ north, 0.3*s* in time, east of Nassau Hall, Princeton College, New Jersey.

Nos. 27, 28, 29, 30, 31, 32, 33, 36, 37 and 39, satisfactory observations.

Nos. 34, 38 and 40, uncertain from brightness of moon's limb.

No. 35, doubtful 1*s*. Nos. 33 and 36 appeared to be followed by a slight brush of light.

No. 41, at William Cranch Bond's observatory, Dorchester, Mass. Lat. 42° 19′ 15″; longitude 4*h* 44*m* 17.3*s* W. of Greenwich.

No. 42, at R. T. Paine's house, Boston. Lat. 42° 20′ 56″; long. 4*h* 44*m* 16.3*s*. Observation uncertain. Nos. 43 and 44, very good observations.

No. 45, at A. Holcomb's observatory, Southwick, Mass. Lat. 42° 0′ 41″; long. 4*h* 51*m* 15.5*s*.

The initials denote respectively,

W. Sears C. Walker.
K. E. O. Kendall.
J. George M. Justice.
R. William H. C. Riggs.
P. Robert M. Patterson.
A. Stephen Alexander.
B. J. V. Z. Blaney.

b. l. and d. l. denote respectively the bright and dark limbs of the moon.

The following candidates were elected members of the Society:—

James Prinsep, of Calcutta.
John Edwards Holbrook, M. D., of Charleston, S. C.
John C. Cresson, of Philadelphia.
James C. Booth, of Philadelphia.
Edward Coles, of Philadelphia.
J. F. Encke, of Berlin.
A. Quetelet, of Brussels.

Stated Meeting, February 1.

Present, twenty members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

L'Art de vérifier les dates, depuis l'année 1770, jusqu'à nos jours. Publié par M. le Marquis de Fortia, membre de l'Institut. Paris, 1837.—*From Mr. D. B. Warden.*

Extrait d'un Mémoire sur la distribution Géographique des Crustacés; par M. Milne-Edwards. 1838.—*From the same.*

Explication de la pierre de Taunton, dans l'Amérique Septentrionale; par Moreau de Dammartin, membre de l'Institut Historique. Paris. —*From the same.*

Notice nécrologique de M. le Professeur Rask, de Copenhague. Paris, 1838.—*From the same.*

The American Journal of Science and Arts. Conducted by Benjamin Silliman, M. D., LL. D., aided by Benjamin Silliman, Jr., A. B. Vol. XXV. No. 2. New Haven.—*From the Conductors.*

Caroli Francisci Joseph Bellingeri è S. Agatha Derthonensi Philosophiæ et Medicinæ Doctoris, amplissimi Medicorum Collegii Candidati, Dissertatio inauguralis. Turin, 1818.—*From the Author.*

Ragionamenti, Sperienze ed Osservazioni Patologiche comprovanti l'Antagonismo Nervoso esposti, e raccolte da Carlo Francesco Bellingeri. Turin, 1833.—*From the same.*

Memorie della Reale Accademia delle Scienze di Torino. Tomo XL. Turin, 1838.—*From the Academy.*

Catalogue and collection of Political Tracts relating to the History of the Colony of Pennsylvania, from 1681 to 1770.—*From Mr. J. Francis Fisher.*

Mr. Vaughan announced the decease, on the 14th of March, 1837, of Count Prospero Balbo, of Turin, a member of the Society.

Dr. Bache announced the decease of Mr. John Wickham, of Richmond, Virginia, also a member of the Society.

Dr. Bache's resignation as Reporter of the proceedings of the Society, was announced by the Secretaries, and the appointment, in his place, of Professor A. D. Bache.

Stated Meeting, February 15.

Present, twenty-three members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

The Journal of the Royal Geographical Society of London. Vols. I, II, III, IV, V, VI, VII, & VIII. London.—*From the Society.*

Mémoires couronnés par l'Académie Royale des Sciences et Belles Lettres de Bruxelles. Vol. XIII. Brussels, 1838.—*From the Academy.*

Bulletin de l'Académie Royale des Sciences et Belles Lettres de Bruxelles. Nos. 1 to 8, inclusive. Brussels, 1838.—*From the same.*

Annuaire de l'Académie Royale des Sciences et Belles Lettres de Bruxelles. Quatrième Année. Brussels, 1838.—*From the same.*

De l'Influence des Saisons sur la Mortalité aux différens Ages dans la Belgique, par A. Quetelet. Brussels, 1838.—*From Mr. Quetelet.*

American Quarterly Register. Conducted by B. B. Edwards and W. Cogswell. Vol. XI. No. 3, for February. Boston, 1839.—*From Mr. W. Cogswell.*

The American Journal of the Medical Sciences. Edited by Isaac Hays, M. D. No. XLVI, for February. Philadelphia, 1839.—*From the Editor.*

Journal of the Asiatic Society of Bengal. Edited by the Secretary. No. 78, for June. Calcutta, 1838.—*From the Society.*

Journal of the Proceedings of the Bishops, Clergy and Laity of the Protestant Episcopal Church in the United States of America, in a General Convention, held in the City of Philadelphia, A. D. 1838, together with the Constitution and Canons for the government of the Protestant Episcopal Church. New York, 1838.—*From the Rev. Mr. Dorr.*

Sermon preached at the opening of the General Convention of the Protestant Episcopal Church, in Philadelphia, September the 5th, 1838. By the Right Rev. William Meade, D. D. Philadelphia.—*From the same.*

Twenty-seventh Annual Report of the Trustees of the Society of the

Protestant Episcopal Church, for the advancement of Christianity in Pennsylvania. Philadelphia, 1839.—*From the same.*

Proceedings of the Board of Missions of the Protestant Episcopal Church in the United States of America, at their third Annual Meeting, etc. New York, 1838.—*From the same.*

On the courses of Hurricanes; with notices of the Tyfoons of the China sea, and other storms. By W. C. Redfield.—*From the Author.*

A Treatise on Mechanics, by Francis Joseph, Chevalier de Gerstner; edited and considerably augmented by Francis Antony, Chevalier de Gerstner. The commencement of the first chapter. Vienna, 1834.—*From the Editor.*

First Russian Rail Road from St. Petersburg to Zarscoe, Selo and Pawlowsk. By Francis Antony de Gerstner. London.—*From the same.*

An Appeal to the People of Pennsylvania on the subject of an Asylum for the Insane Poor. Philadelphia, 1838.—*From Dr. Dunglison.*

Navigation Made Easy, or Mariner's Complete Guide. By Francis Hoskins. (M. S.) 1803.—*From Mr. W. J. Duane.*

Mémoires de l'Académie Impériale des Sciences de Saint Pétersbourg. VIme. Série. Sciences Mathématiques, Physiques et Naturelles. Vol. III, part fourth, and Vol. IV, part third. St. Petersburg, 1835 & 1836.—*From the Academy.*

Mémoires de l'Académie Impériale des Sciences de Saint Pétersbourg. VIme. Série. Sciences Politiques, Histoire, Philologie. Vol. III, part sixth, and Vol. IV, part second. St. Petersburg, 1836 & 1837.—*From the same.*

Recueil des Actes de la Séance Publique de l'Academie Impériale des Sciences de Saint Pétersbourg, tenue le 30 Decembre, 1836. St. Petersburg, 1837.—*From the same.*

Etwas über die Natur Wunder in Nord America. Zusammen getragen, von Charles Cramer. St. Petersburg, 1837.—*From the Author.*

Narrative of an Expedition to the East Coast of Greenland, sent by order of the King of Denmark, in search of the lost colonies, under the command of Capt. W. A. Graah, of the Danish Royal Navy. Translated for the Royal Geographical Society of London. London, 1837.—*From the Society.*

The Indian Tribes of North America. Nos. 10 & 11. Philadelphia.—*From Mr. F. W. Greenough.*

The officers and council to whom was referred the letter of Doctor Warren, of Boston, inclosing a circular from a meeting of gentlemen at Boston, on the subject of the formation of an American Association for the Promotion of Science, submitted the following resolution, which was adopted by the Society.

Resolved, That the American Philosophical Society, having given the most respectful attention to the letters laid before them by Doctor W. E. Horner, and to the circular letter from the Committee of gentlemen of Boston, by referring the first letter to a Special Committee, and the second, with the circular, to the Board of Officers, are of the opinion, founded on the Reports of the Committee and of the Officers, that it is inexpedient for this Society to undertake the organization of an Association, such as is alluded to in these communications.

Doctor Patterson read an extract from a letter from Mr. T. R. Peale, dated November 13th, 1838.

In this letter Mr. Peale states, that observations had been made on the night of the 12th—13th of November, on board of the exploring vessel, the Peacock, (place not given,) relating to the number of meteors. The greatest number supposed to have been observed in any one hour was seventy-one. Mr. Peale expresses his doubts whether, from the motion of the vessel on the night in question, it was possible to be accurate on this point, and believes the number to have been much overrated.

A display of the Aurora Australis had been witnessed a few weeks before the date of the letter.

Professor A. D. Bache called the attention of the Society to a very convenient method for determining the magnetic dip and intensity, by one instrument, proposed by Professor Lloyd, of Dublin, and used by him, Major Sabine, and Captain James Ross, in the recent magnetic surveys in Great Britain.

The approximate dip is observed without disturbing the magnetism of the needle. The angle with the horizon, when the centre of gravity of the needle is removed from the axis by a small weight, is also observed, the needle being in the plane of the magnetic meridian.

To the first observation, a correction is applied, from observation at a station where the dip is accurately known, to obtain the true dip. The second being repeated at different places, the elements necessary to determine the relative intensities are known; and the approximate formula, connecting these observed elements with the relative intensities of the magnetism of the places where the change of intensity is not great, is very simple.

Prof. Bache showed an instrument, made by Robinson, of London, of the usual construction, for determining the magnetic dip, with needles for the employment of Professor Lloyd's method. He also referred to a method proposed by Professor Christie, of Woolwich, similar in principle, but differing in detail, and showed the needles for applying this method.

Prof. Bache further stated, that he had caused the method of heating these needles to the temperature of boiling water, to bring them to a permanent magnetic condition, as proposed by Prof. Christie, to be tried by Mr. Robinson. It had not proved successful.

Mr. S. C. Walker made a verbal communication on the parallax of the star, 61 Cygni, recently investigated by Mr. Bessel, and described the nature of the researches by which this important point had been established.

Stated Meeting, March 1.

Present, eighteen members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

The Life of George Washington. By Jared Sparks. Boston, 1839.—*From Mr. Sparks.*

The Library of American Biography, conducted by Jared Sparks. Vols. VIII, IX, & X. Boston, 1837 & 1838.—*From the same.*

The Transylvania Journal of Medicine. Vol. XI. No. 2. For April, May, and June. Lexington, Kentucky, 1838.—*From the Editors.*

The American Medical Library and Intelligencer. Edited by Robley Dunglison, M. D. Vol. II. No. 22. Philadelphia, 1839.—*From the Editor.*

Annual Report of the Watering Committee, for the year 1836, to the Select and Common Councils of the City of Philadelphia: to which are prefixed the Report for the year 1822, and an extract from the Report for 1823. Philadelphia, 1837.—*From Mr. Frederick Graff.*

Annual Reports of the Watering Committee, for the years 1837 & 1838, to the Select and Common Councils of the City of Philadelphia. Philadelphia, 1838 & 1839.—*From the same.*

Proceedings of the Zoological Society of London. Part V. London, 1837.—*From the Society.*

Transactions of the Zoological Society of London. Vol. II. Parts 2 & 3. London, 1838 & 1839.—*From the same.*

Proceedings of the Conventions of the Province of Maryland, held at the City of Annapolis in 1774, 1775 & 1776. Baltimore, 1836.—*From the State of Maryland.*

The History of Maryland, from its first settlement in 1633, to the restoration in 1660. By John Leeds Bozman. Vols. I. & II. Baltimore, 1837.—*From the same.*

Kongl. Vetenskaps-Academiens Handlingar. For 1835. Stockholm, 1836.—*From the Academy.*

Aorsberättelser om Vetenskapernas Framsteg, afgifne af Kongl. Vetenskaps-Academiens Embetsmän. Stockholm, 1835.—*From the same.*

Second Annual Report of the Board of Education, together with the Second Annual Report of the Secretary of the Board. Boston, 1839.—*From Mr. I. P. Davis.*

Second Annual Report of the Geology of the Public Lands belonging to the States of Maine and Massachusetts. By C. T. Jackson. Boston, 1838.—*From the same.*

Letters on the Internal Improvements and Commerce of the West. By Hon. David Henshaw. Boston, 1839.—*From the same.*

Sixth Annual Report of the Trustees of the State Lunatic Asylum, at Worcester, Massachusetts. Boston, 1838.—*From the same.*

Address of the Duke of Sussex, the President, read at the Anniversary Meeting of the Royal Society, 1838. London.—*From Mr. William Vaughan.*

The Light-Houses of the British Islands. Corrected to July 1836. Hydrographic Office, Admiralty. London, 1836.—*From the same.*

French Light-Houses: translated from the "Description Sommaire des Phares et Fanaux, &c." Corrected to 1836.—*From the same.*

Letters to denote the State of the Weather, and Figures to denote the Force of the Wind. Proposed as a convenient mode of registry in the Log-book of a ship. By F. B. London.—*From the same.*

Draft of a Revised Common School Law, and of a Law relative to the preparation of Common School Teachers; with explanatory remarks, and a set of District Regulations. Prepared by Thomas H. Burrowes, Superintendent. Harrisburgh, 1839.—*From Mr. Frederick Fraley.*

A deposite for the Library was made by Mr. B. F. Mendenhall, being an illuminated manuscript in the Pali language.

Professor H. D. Rogers read a paper entitled "Contributions to the Geology of the Tertiary formation of Virginia. Second Series. By William B. Rogers, Professor of Natural Philosophy in the University of Virginia, and H. D. Rogers, Professor of Geology and Mineralogy in the University of Pennsylvania." Referred to a Committee consisting of Mr. Lea, Dr. Hays, and Dr. Patterson.

On motion of Dr. Patterson, the President of the Society was directed to unite with the Presidents of the City Councils, and with the President of the Board of Controllers of the Public Schools, in an application to the State Legislature to authorize the appointment by the Controllers, in conjunction with the American Philosophical Society, of a Director of the Philadelphia Observatory, at the Central High School.

The purchase of the bust of Doctor Nathaniel Bowditch, executed by Mr. Ball Hughes, was ordered for the Society.

Stated Meeting, March 15.

Present, twenty-five members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

The Statutes at Large of South Carolina, edited, under authority of the Legislature, by Thomas Cooper, M.D. LL. D. Vols. III. & IV. Columbia, 1838.—*From Dr. Tidyman.*

Laws of Maryland at large, with proper Indexes. To which is prefixed the Charter, with an English translation. By Thomas Bacon. Annapolis, 1765.—*From Mr. M. Carey.*

Laws of Maryland, made and passed at a Session of Assembly, in the year of our Lord, 1783. Annapolis.—*From the same.*

Congressional Documents for 1826. Two volumes. Washington, 1826.—*From the same.*

Discourse delivered before the Law Academy of Philadelphia, at the opening of the Session, September 5, 1838. By P. M'Call, Esq. Philadelphia, 1838.—*From the Author.*

On the relative strength and other mechanical properties of Cast Iron, obtained by hot and cold blast. By Eaton Hodgkinson, Esq. London, 1838.—*From the Author.*

On the strength and other properties of Cast Iron obtained from the hot and cold blast. By W. Fairbairn, Esq. London, 1838.—*From the Author.*

Address of the General Secretaries at the Eighth Meeting of the British Association for the advancement of Science. 1838.—*From Professor A. D. Bache.*

Catalogue of the Philosophical Instruments, Models of Inventions, Products of National Industry, &c. &c., contained in the first exhibition of the British Association for the Advancement of Science. Newcastle upon Tyne, 1838.—*From the same.*

Catalogue of the Officers and Students of the Medical Institute of the city of Louisville. 1839.—*From Dr. C. W. Short.*

Report of the Legislature of Pennsylvania, containing a description of the Swatara Mining District, illustrated by diagrams. Harrisburg, 1839.—*From Mr. F. Fraley.*

Report of the Superintendent of Common Schools, accompanied with Bills relating to the Common School System. Harrisburg, 1839.—*From Mr. Joseph C. Fisher.*

Reports relative to the Geological Survey of the State of New-York, for 1837. Albany.—*From Mr. Seabury Brewster.*

Transactions of the Maryland Academy of Science and Literature. Vol. I. Part I. Baltimore, 1837.—*From the Academy.*

Anales de Ciencias Naturales. Vols. I, II, III, IV, V, & VI. Madrid, 1799 to 1803.—*From Mr. John Vaughan.*

Descripcion de las Plantas que D. Antonio Josef Cavanilles demostrò en las Lecciones Públicas del Año 1801, precedida de los principios elementales de la Botánica. Madrid, 1802.—*From the same.*

Curso elemental de Botánica, dispuesto para la enseñanza del real Jardin de Madrid, por el Dr. Don Casimiro Gomez de Ortega. Madrid, 1795.—*From the same.*

Voyage de l'Ambassade de la Compagnie des Indes Orientales Hollandaises, vers l'Empereur de la Chine, dans les années 1794 et 1795. Vols. I, & II. Philadelphia, 1798.—*From the same.*

Memoirs comprising the navigation to and from China, by the China Sea and through the various Straits and Channels in the Indian Archipelago; also the navigation of Bombay Harbour. London, 1805.—*From the same.*

A journal of Natural Philosophy, Chemistry, and the Arts. By William Nicholson. Vols I, II, & III. London, 1797 to 1800.—*From the same.*

Calculations relating to the Equipment, Displacement, etc. of Ships and Vessels of War. By John Edye. London, 1832.—*From Mr. William Strickland.*

Professor Henry, of Princeton, made a verbal communication relating to a phenomenon of capillary action which had fallen under his notice.

A lead tube, of about half an inch in diameter, and eight inches long, happened to be left with one end immersed in a cup of mercury; and on inspection a few days afterwards it was observed that the mercury had disappeared from the cup, and was found on the floor at the other end of the tube. Struck with the phenomenon, the cup was again filled with mercury: the next morning the same effect was exhibited. The mercury had again passed over through the

tube, apparently like water through a capillary siphon, and was again found on the floor.

On cutting the tube into pieces, it was evident that the mercury had not passed along the hollow axis, but had, apparently, been transmitted through the pores of the solid metal. To determine this, a lead rod of about seven inches long and a quarter of an inch in diameter, was bent into the form of a siphon. The shorter leg was immersed in a watch-glass filled with mercury, and a similar glass placed under the end of the longer leg, to receive the metal which might pass over. At the end of twenty-four hours, a globule of mercury was perceived at the lower end; and in the course of five or six days, all the mercury passed over, leaving a crop of beautiful arborescent crystals, of an amalgam of lead, in the upper glass.

The mercury did not pass along the surface of the wire, since the lead exhibited, externally, but little change of appearance; although the progress of the penetration could be traced by a slight variation of the colour of the oxide on the surface.

The action is much influenced by the texture of the lead. When a rod of cast lead, of the same size and form, was substituted for the one before described, the globule of mercury did not make its appearance at the lower end until about forty days; and all the mercury of the upper glass had not yet (after three months) entirely disappeared.

The penetration takes place much more readily in the direction of the laminæ of the metal than across them A plate of thick sheet lead was formed into a cup, and mercury poured into this; and it was found that before a drop had passed directly through, the mercury oozed out all around the edge of the plate.

Professor Henry stated that he had in progress a variety of experiments to investigate this action; and if any results of importance were obtained he would communicate them to the Society.

Dr. Hare made a verbal communication to the Society, by which it appears that he has obtained brilliant metallic spangles of calcium.

His processes have been the deflagration of the phosphuret of calcium in an atmosphere of hydrogen; the exposure of the anhydrous iodide of calcium to a current of hydrogen,* or ammonia in an incan-

* By a deflagrator of one hundred pairs of plates, fourteen inches long by eight broad.

descent tube; the ignition of the pure earth or its carbonate or nitrate with sugar; or of the tartrate and acetate per se. Hence resulted carburets, which, after washing with acetic acid and rubbing on a porcelain tile, display the lustre of plumbago, intermingled with metallic spangles, of a brilliancy rivalling that of the perfect metals. The carburets, or the spangles thus obtained, are insoluble in acetic or chlorohydric acid, but yield to aqua regia. The carburets are excellent conductors of the voltaic fluid, as evolved by a series of 100 pairs; and, by deflagration in a receiver filled with hydrogen, yield metallic particles, which, rubbed on a porcelain tile, form spangles of a metallic brilliancy. By igniting antimony with tartrate of lime, Dr. Hare had procured an alloy of that metal with calcium, and expected by analogous means to alloy the metals of the earths with various metals proper. He believed that no effort to obtain calcium prior to his, had been more successful than the abortive experiment of Sir H. Davy, in which the tube broke before the distillation of the mercury was completed, with which the calcium had been amalgamated in the voltaic circuit, agreeably to the process previously employed by Berzelius. Dr. Hare had produced amalgams by exposing the chloride, or sulphide of calcium to the circuit; and, by distillation in an iron alembic, under the protection of a current of desiccated hydrogen, had isolated a portion of calcium, not however endowed with the whiteness or the lustre of that metal, as when otherwise fairly evolved. When distilled in glass tubes or retorts, he had found the amalgam to leave only a film upon the glass, devoid of any metallic attribute; although in one instance, to secure the absence of oxygen, he had mixed an amalgam of ammonium with that of calcium. Hence he inferred, that even though the tube of Davy had remained unbroken, that distinguished chemist would not have found a residue of calcium, uncombined with the elements of the glass. That the spangles obtained by Dr. Hare from lime, were calcium, was ascertained by their solution in aqua regia, and the successive subsequent addition of ammonia and oxalic acid; the resulting precipitate being ignited, then redissolved and again precipitated as at first. No precipitate ensued from the addition of ammonia prior to that of the oxalic acid. Sulphydric acid produced a slight discoloration, but gave no precipitate. That the substances, resulting from the ignition of the carbonate with sugar, and washing with acetic acid, contained calcium in the metallic state, combined with carbon, was evident from their being insoluble in acetic or chlorohydric acid; from the deposi-

tion of carbon, and giving a precipitate of oxalate of lime on being subjected to aqua regia, ammonia, and oxalic acid; from their metallic brilliancy, when burnished, and from their being excellent conductors of the voltaic fluid. By the ignition of the carbonates of baryta and strontia severally with sugar, Dr. Hare had attained analogous results to those abovementioned in the case of the similar ignition of carbonate of lime.

The extreme avidity of calcium for iron was quite striking; since, when a crucible was inclosed in a clean iron case without a cover, the mass, swelling up so as to reach the iron, became slightly imbued with it. By intensely igniting the carburet of calcium, obtained from the carbonate and sugar, with an equal weight of dry tanno-gallate of iron, the whole of the aggregate became so magnetic that every particle was transferred from one vessel to another by means of a magnet. The mass was filled with minute metallic globules, which yielded only partially to chlorohydric acid, and which, when dissolved in aqua regia, gave, after adding ammonia and filtration, a precipitate with oxalic acid.

Dr. Hare was aware that it did not seem consistent that spangles of calcium, burnished upon porcelain, should retain their lustre; as, under other circumstances, and especially when amalgamated, that metal was found to oxidize as soon as exposed to the air. He had, however, through the kindness of Mr. Booth, a pupil of Wöhler, procured a specimen of magnesium evolved by that celebrated chemist. This specimen yielded, under the burnisher, spangles of a lustre as enduring as that observed by Dr. Hare in the case of calcium. It should be recollected that slight causes may affect the oxidability of substances, as has been lately seen in the case of the reaction of iron with nitric acid; and it is well known that silicon, boron, and some other substances have two distinct states, in one of which there is a greater susceptibility of combination with other bodies than in the other.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. 1. APRIL, MAY, JUNE, JULY & AUG. 1839. No. 7.

Stated Meeting, April 5.

Present, nineteen members.

Mr. DU PONCEAU, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Diccionario de la Lengua Castellana por la Academia Española. Eighth edition. Madrid, 1837.—*From the Academy.*

Derrotero de las Islas Antillas de las Costas de Tierra-Firme, y de las del Seno Mejicano. Third edition. Madrid, 1837.—*From the Hydrographical Depôt of the Spanish Navy.*

Coleccion de los Viages y Descubrimientos que hicieron por mar los Españoles desde fines del Siglo xv. Por Don Martin Fernandez de Navarrete. Vols. I., II., III., IV., & V. Madrid, 1825 to 1837.—*From the same.*

Discurso leido à la Academia de la Historia, por su Director el Excmo Señor D. Martin Fernandez de Navarrete, en Junta de 24 de Noviembre, de 1837. Madrid, 1838.—*From the Author.*

Essays on unexplained Phenomena. By Graham Hutchinson. Glasgow, 1838.—*From the Author.*

Observations on the Justificative Memorial of the Court of London. Translated from the French original, by Peter S. Du Ponceau. Philadelphia, 1781.—*From the Translator.*

An Alphabetical Catalogue of Shells, Fossils, Minerals, and Zoophites, in the Cabinet of Joseph Sullivant. Columbus, Ohio, 1838.—*From Mr. Sullivant.*

The Magazine of Natural History. New Series. Edited by Edward Charlesworth. Vol. II., No. 25. London, 1839.—*From the Editor.*

Communication relative to the West Branch and Alleghany Canal. By B. Ayerigg. Harrisburg, 1839.—*From the Author.*

The American Medical Library and Intelligencer. By Robley Dunglison, M. D. Vol. II. No. 24, and Vol. III., No. 1. Philadelphia, 1839.—*From the Editor.*

The Augustan Age. A Lecture before the Athenian Institute. By Charles D. Meigs, M. D. Philadelphia, 1839.—*From the Author.*

Statistical Tables, exhibiting the Condition and Products of certain branches of Industry in Massachusetts, for the year ending April 1, 1837. By John P. Bigelow. Boston, 1838.—*From Mr. Elliot Cresson.*

Real Museo Borbonico. Nos. 37 to 47. Naples, 1833 to 1836.—*From the King of the Two Sicilies.*

Vocabolario Universale della Lingua Italiana. Nos. 31 to 35. Naples, 1837 and 1838.—*From the Cheralier Morelli.*

The Committee to whom was referred a paper, entitled "Contributions to the Geology of the Tertiary Formations of Virginia. Second Series. By Professor William B. Rogers, and Professor Henry D. Rogers," reported in favour of the publication of the Memoir, which was ordered accordingly.

The object of this communication is to describe the Geology of the Peninsula embraced between the Potomac and Rappahannock rivers, extending from the Chesapeake Bay to the limit of tide water, near Fredericksburg.

This area consists almost exclusively of the two great divisions of the Tertiary Deposites of Virginia, namely, the *Eocene* and *Miocene* formations.

The paper commences with a sketch of the topographical features of the peninsula, making allusion, among other points, to the interesting *terraced* configuration of the land bordering the valleys of the two rivers. It then proceeds to delineate the boundaries of the *Eocene* and *Miocene* formations. The *Eocene* is shown to occupy the western part of the peninsula, overlapping at its western edge the secondary sandstone of Fredericksburg, and extending eastward with a very gentle eastern dip beneath the overlying Miocene deposites,

until it finally disappears below the level of the tide near the mouth of Chingoteague creek on the Rappahannock, and Mathias's Point on the Potomac. The *Miocene* spreads eastward from the line connecting these two localities to the termination of the peninsula; while some of its lower beds extend west of the same line into the Eocene district, where they are confined, however, to the highest portions of the land.

After offering numerous details relating to the range and limits of these two divisions of the Tertiary Deposites, the paper treats in the next place of the arrangement and composition of the *Miocene* strata, which are shown to possess a close general analogy in these respects to the *Miocene* beds of the peninsula of the York and James rivers, described in a former communication. The two most interesting points of agreement are the occurrence of the blue marls low down in the series, and the presence of the thin band of ferruginous rock separating the *Miocene* from the overlying *diluvium*.

In general the blue marl at the base of the Miocene, is the most replete in fossils, though towards the eastern extremity of the peninsula, shells, &c., abound in the upper sands and clays. Usually the *upper* beds of the *Miocene* in this district are destitute of fossils, though full of their casts and impressions.

These strata consist generally of light coloured sandy clays, distinguished by a sulphurous smell, and an acid and styptic flavour. Carbonate of lime is not abundant, but the sulphate of lime occurs sometimes in valuable proportion. Sulphate of iron, sulphate of alumina, free sulphuric acid, sulphur, and even an appreciable amount of sulphate of magnesia are also met with.

The fossil impressions in these beds are beautifully distinct, and appertain to all the species of shells which are found in perfect condition in the subjacent strata. In the blue clayey marl beneath, there often occurs a notable proportion of green sand, which is also found in some of the other Miocene strata, mixed pretty largely with common sand and clay, in beds destitute of fossils.

The paper treats in detail of many of the more interesting localities in the *Miocene* district, describing the stratification, and presenting evidence of the relative fertilizing agency of the several beds.

The fossil species which characterize the *Miocene* strata, are next enumerated.

In the next section, an account is given of the arrangement and composition of the *Eocene* strata of the peninsula.

In general, the lowest bed of the series is a dark greenish-blue mass, composed of clay, fine sand, and a little green sand; while above it, the strata are of various shades, yellow, greenish-gray, and brown. Little uniformity prevails in their arrangement at different localities.

A thin band of ferruginous gravel frequently overlies the *Eocene* strata, and forms a distinct line of demarcation between them and the bottom of the *Miocene*.

The stratification of the Eocene at various localities is exhibited in detail, and the characteristic fossils specified, while the curious chemical changes which these have undergone, are also discussed.

Professor Bache presented the printed number of the Society's proceedings for the past three months, No. 6.

Dr. Hays stated that he had received through a friend some of the vaccine virus, recently obtained by Mr. Estlin, of Bristol, from the cow, and had used it with the most satisfactory results. He exhibited a scab, which presented all the characters described by Jenner, as appertaining to the genuine vaccine scab.

Stated Meeting, April 19.

Present, thirty-eight members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Mémoires de l'Académie Impériale des Sciences de Saint-Pétersbourg. VIme. Série. Sciences Mathématiques, Physiques et Naturelles. Vol. IV. Première Partie: Sciences Mathématiques et Physiques. Vol. II. Parts first and second. St. Petersburg, 1838.—*From the Academy.*

Mémoires de l'Academie Impériale des Sciences de Saint-Pétersbourg. VIme. Série. Sciences Mathématiques, Physiques et

Naturelles. Vol. IV. Seconde Partie: Sciences Naturelles. Vol. II. St. Petersburg, 1838.—*From the same.*

Mémoires de l'Académie Impériale des Sciences de Saint-Pétersbourg. VIme. Série. Sciences Politiques, Histoire, Philologie. Vol. IV. Part third. St. Petersburg, 1838.—*From the same.*

Mémoires présentées à l'Académie Impériale des Sciences de Saint-Pétersbourg par divers Savans, et lues dans ses Assemblées. Vol. III. Parts third to sixth, and Vol. IV. Parts first and second. St. Petersburg, 1837.—*From the same.*

Recueil des Actes de la Séance Publique de l'Académie Impériale des Sciences de Saint-Pétersbourg tenue le 29 Décembre, 1837. St. Petersburg, 1838.—*From the same.*

Second Report on the Agriculture of Massachusetts. By Henry Colman, Commissioner for the Agricultural Survey of the State. County of Berkshire, 1838. Boston, 1839.—*From the Author.*

Copy of the Acts incorporating the Sandusky, Toledo, and Michigan City Rail Road Company, with the Report of the Survey of the Road. By John Hopkins, Esq. Also, the Report of the Survey of the Buffalo and Mississippi Rail Road, through the State of Indiana. By James Seymour, Esq. To which is added, the Circular of the Directors, and the Company's Charter. Toledo, 1839.—*From Mr. Elisha Whittlesey.*

The Charter and By-Laws of the Ohio Life Insurance and Trust Company. Cincinnati, 1838.—*From the same.*

An Essay on the Development and Modifications of the External Organs of Plants, &c. By William Darlington, M. D. West Chester, 1839.—*From the Author.*

O Auxiliador da Industria Nacional, ou Collecção de Memorias e Noticias interessantes aos Faziendeiros, Fabricantes, etc. Periodico Mensal publicado pela Sociedade Auxiliadora da Industria Nacional, estabelecida no Rio de Janeiro. VIth. Year. No. 7. Rio Janeiro, 1838.—*From the Society.*

Reports and other Documents relating to the State Lunatic Hospital, at Worcester, Mass. Printed by order of the Senate. Boston, 1837.—*From Mr. I. P. Davis.*

Draft of a revised Common School Law, and of a Law relative to the Preparation of Common School Teachers; with explanatory Remarks, and a set of District Regulations. Prepared by Thomas H. Burrowes, Superintendent. Harrisburg, 1839.—*From Mr. R. Conyngham.*

Report on Elementary Public Instruction in Europe, made to the thirty-sixth General Assembly of the State of Ohio, December 19, 1837. By C. E. Stowe. Reprinted by order of the House of Representatives of Pennsylvania. Harrisburg, 1838.—*From the same.*

Berichten über die Verhandlungen der Naturforschenden Gesellschaft in Basel, vom August, 1834, bis Juli, 1838. Nos. 1, 2, and 3. Basel, 1835 to 1838.—*From L. de Wette.*

Annual Report of the Geologist of Maryland, 1838. Annapolis, 1839.—*From the Author.*

A Further Report on the Survey of a Rail Road from Chambersburg to Pittsburg. By Charles De Hass, Engineer. Harrisburg, 1838.—*From Mr. R. Conyngham.*

Geology of Upper Illinois. By Charles U. Shepard, M. D. New Haven, 1838.—*From Mr. E. Whittlesey.*

First Report of Edward Miller, Engineer in Chief of the Sunbury and Erie Rail Road. Philadelphia, 1839.—*From Mr. F. Fraley.*

The Committee of Publication, reported the publication of Part Second, Vol. VI., of the Society's Transactions.

Professor Bache communicated at the request of the Committee on the Observatory, the following translation of a letter addressed to him by Professor Encke, Director of the Observatory of Berlin.

The nature of the operations of an Observatory must depend more upon the individual taste and qualifications of the Director than those of any other scientific establishment. There is still so much to be done in every department of Astronomy, in any one of which there is sufficient employment, that if the Director shows a particular disposition for certain lines of research, it would be most profitable for science that he should be allowed to follow them, and not be tied down to other observations. It would be best, therefore, that the Director should be allowed to regulate his own establishment.

Large Observatories, like those of Greenwich, Königsberg, and Dorpat, require, in the present state of science, large telescopes, the art of dividing having been carried so far, that small instruments will not answer. The necessity for large telescopes for the meridian instruments, as well as for other uses, renders such an establishment very costly, and requires that it shall be independent of others. It

appears not to be the intention, at present, to erect such an Observatory in the United States, and details in regard to it are therefore unnecessary.

But smaller Observatories may also be useful to science, especially for geographical purposes. Such a one, for example, as would be furnished by a room with a solid foundation, connected with a second having a free horizon. The first to have cuts north and south and east and west, the second to have a turning dome. The following named instruments would be suitable for such an Observatory.

1. A meridian circle with a 42 inch telescope and 20 inch circle, - - -	1,000	Rix Dolls.
2. A telescope of 72 inches focal length, -	900	,,
3. An astronomical clock, - -	400	,,
4. A chronometer, - - -	500	,,
5. Small transit instrument, - -	350	,,
6. Small telescopes, barometers, thermometers, &c., a theodolite, &c. - -	750	,,
	3,900	,,
	or about	$3,000.

A small Observatory would thus be furnished for about three thousand dollars.

Determinations of the places of stars and planets, and even of the asteroids may be made with the circle as far as the power of the telescope permits. Director Hansen, at Seeberg, and Professor Schwerdt, at Spire, have made excellent observations with a similar instrument. Observations of moon culminating stars for longitude may be also made with it.

Observations of more difficult objects, except perhaps the nearest double stars, of comets, for the exterior of the planets, &c., may be made with the larger telescope.

The small transit instrument, placed east and west, will give the latitude within limits depending upon the accuracy to which the declinations of the stars is determined, and in conjunction with the chronometer, will serve to determine the geographical positions of places which may be selected. For longitude, observations are made of the moon culminating stars, which are observed at the same time with the meridian circle. For latitude the transit is placed east and west.

The Altona Observatory may serve as a model of such a small

Observatory, and the yearly journeys of the Russian Astronomers from Dorpat, as models for the use of the instruments in determining geographical positions. The observations of Professor Schwerdt, of Spire, will be found useful in the application of the meridian circle.

Such a small Observatory will be well adapted to form observers; as the art of handling instruments so as to obtain accurate results is only to be acquired by practice.

Dr. Patterson made the following verbal communication:—

That the use of the wax tablet written on with an iron stylus, as practised by the ancient Romans, had been tried, for the first time, this day, at the Pennsylvania Institution for the Instruction of the Blind, and that the success had been perfectly satisfactory. The blind read, with ease, the words written, traced geometrical figures, &c. It is confidently believed that the Roman tablet will prove of great importance in the instruction of the blind.

Professor H. D. Rogers made a verbal communication, in which he called the attention of the Society to a new compound of platinum, discovered by himself and his friend, Martin H. Boyé; upon the further investigation of which they are at present occupied.

It is a well characterized salt, composed of the deutochloride of platinum, and the binoxide of nitrogen, in which the former may be conceived, in accordance with the views of Professor Hare, to act the part of an acid, while the binoxide of nitrogen is in the relation of a base. It is of a bright gamboge yellow, is distinctly crystalline, though, in consequence of the minuteness of the crystals, their form has not been determined. It is highly deliquescent, absorbing water at ordinary temperatures, with great avidity, from the atmosphere.

It is rapidly decomposed by the mere addition of water, which causes an active effervescence; the binoxide of nitrogen being copiously evolved, and the deutochloride of platinum remaining in solution.

This interesting compound is best procured by evaporating a solution of platinum in *aqua regia* nearly to dryness, and then adding a large excess of fresh nitro-muriatic acid by small quantities at a time. The compound may thus be readily procured by filtering and pressing the powder between folds of bibulous paper. Should the concentration of the liquid be carried too far, it is requisite to add a little

water, just sufficient in quantity to preserve the mass in a semifluid condition, and to prevent the precipitation of any deutochloride of platinum.

Specimens of the salt were exhibited, together with the apparatus employed in the qualitative examination of the compound, the constitution of which was made manifest by proper chemical re-agents.

Dr. Patterson called up the amendment to the by-laws proposed by him on the 15th of March last, and in regard to which due notice had been given. The amendment was adopted as follows:—

If any member shall pay into the hands of the treasurer the sum of fifty dollars, he shall thenceforward be exempted from all annual contributions.

The following candidates were elected Members of the Society:—

Humphrey Lloyd, A. M., of Trinity College, Dublin.

J. K. Paulding, Secretary of the Navy of the United States.

John Ludlow, D. D. Provost of the University of Pennsylvania.

Benjamin W. Richards, of Philadelphia.

George W. Bethune, D. D. of Philadelphia.

George M. Justice, of Philadelphia.

Stated Meeting, May 3.

Present, twenty-two members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Memoirs of the Royal Astronomical Society. Vol. X. London, 1838.—*From the Society.*

Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce. During the session of 1837–8. Vol. LII. Part first. London, 1838.—*From the Society.*

Transactions of the Albany Institute. Vol. II. Nos. 3 and 4. Albany.—*From the Institute.*

Collections of the Rhode Island Historical Society. Vol. IV. Providence, 1838.—*From the Society.*

Elements of Civil Engineering: for the use of Students, and those who may be about to embark in the profession. By John Millington, Civil Engineer, &c. Philadelphia, 1839.—*From Mr. Judah Dobson.*

A Geographical, Commercial, and Agricultural View of the United States of America, forming a complete Emigrants' Directory, &c. By Daniel Blowe. Liverpool, 1820.—*From Mr. John Vaughan.*

Remarks on the Statistics and Political Institutions of the United States, with some Observations on the Ecclesiastical System of America, her Sources of Revenue, &c. By William G. Ouseley, Esq. Philadelphia, 1832.—*From the same.*

Sketches, Historical and Topographical, of the Floridas. By James Grant Forbes. New York.—*From the same.*

Remarks during a Journey through North America, in the years 1819, 1820, and 1821. By Adam Hodgson, Esq. New York, 1823.—*From the same.*

Statistics of South Carolina, including a View of its Natural, Civil, and Military History, general and particular. By Robert Miles. Charleston, 1826.—*From the same.*

Correspondencia que ha Mediado entre la Legacion Extraordinaria de Mexico y el Departamento de Estado de los Estados Unidos sobre el Paso del Sabina por las Tropaz que mandaba el General Gaines. Philadelphia, 1836.—*From Mr. Gorostiza.*

Tables of the Self-registering Anemometer and Rain Gauge, with drawings, and a description. By Mr. Follett Ostler.—*From Mr. C. M. Justice.*

A Peep at China in Mr. Dunn's Chinese Collection: with Miscellaneous Notices relating to the Institutions and Customs of the Chinese, and our Commercial Intercourse with them. By E. C. Wines. Philadelphia, 1839.—*From Mr. Nathan Dunn.*

FOR THE CABINET.

Models of a regular dodecahedron and of a triangular pyramid, in which the planes of cleavage upon the solid angles are shown, executed in mica. By Professor Stephen Alexander, of Princeton. *From the Maker.*

Professor Bache called the attention of the Society to the donation of transparent models of crystals, presented to the Cabinet by Professor Alexander.

He stated that these models had all the advantages of those made from glass, with greater convenience in the construction of them. The thin plates of mica are readily marked with a sharp instrument, and easily cut. The parts are put together with diamond cement, it having been found that this is a much better method of connecting the pieces composing the model, than by cutting the sheets partly through and using the mica as a hinge, which renders the sheets liable to split. The forms resulting from the cleavage of crystals, &c., may be represented in these models as in those of glass.

Dr. Hays made a verbal communication relative to the catoptric examination of the eye, as a means of distinguishing the morbid conditions of the transparent tissues of that organ.

He stated that when a lighted candle is held before an eye, the pupil of which is dilated, and in which there is no obscurity of the transparent tissues, three distinct images of the flame is visible; two upright and one inverted, the latter appearing between the two former.

Experiments made to determine the causes of these reflected images, and the changes which occur in their number, position, &c. have shown that if a light be placed before the convex face of a single watch glass, or of several of them superimposed, one or more upright images of the flame will be seen, according to the number of glasses employed.* Now in the eye there are two superimposed convex surfaces, viz.—1st. the cornea; and 2d. the anterior capsule of the crystalline lens. Thus the formation of the two upright images is explained. Again, if a light be placed before the concave surface of a watch glass, an inverted image is seen. Such a surface exists in the eye, in the posterior capsule of the lens; and thus the third image is accounted for.

M. Sanson, a distinguished French surgeon, has taken advantage of the above facts, to distinguish cataract from amaurosis, and has

* To be strictly accurate, it should be said that each of these images is double, for one is reflected from each surface of the glass, and these images are the more distinctly double, the thicker the glass.

been enabled to determine by this means some cases of supposed amaurosis to be in fact cataract, and has treated them successfully by operation.

Dr. Mackenzie, an eminent ophthalmologist of Glasgow, has also employed this means to determine the condition of the eye in glaucoma. Dr. Hays remarked that he had resorted to the catoptric examination of the eye in many cases, and believed that it would prove as valuable a means of diagnosis in some of the diseases of the eye, as auscultation is in those of the chest.

Dr. Hays exhibited and explained several models, designed and constructed by Dr. John Neill, resident surgeon at Wills' Hospital, for the purpose of illustrating the catoptric phenomena just explained.

Dr. Patterson communicated verbally a method of using thin sheets of lead by the blind, in writing, reading, and musical notation, invented by Mr. Joseph Saxton. The sheets of lead are three thousandths of an inch in thickness. Dr. Patterson presented specimens of the writing and musical notation.

Dr. Bache communicated the decease of Mr. George Pollok, a member of the Society, who died in April last.

Stated Meeting, May 17.

Present, twenty members.

Mr. Du Ponceau, President, in the Chair.

Letters were received from Mr. Thomas Townsend, and Mr. G. Riboni, and referred to committees.

The following donations were received:—

FOR THE LIBRARY.

Proceedings of the Committee of Agriculture and Commerce of the Royal Asiatic Society, from April, 1837, to November, 1838. London, 1837–38.—*From the Society.*

The Journal of the Royal Geographical Society of London. Vol. IX. Parts first and second. London, 1839.—*From the Society.*

Experimental Researches in Electricity. Eleventh, Twelfth, Thirteenth and Fourteenth series. By Michael Farady, Esq., D.C.L. London, 1838.—*From the Author.*

The History of the Navy of the United States of America. By J. Fenimore Cooper. Two Vols. Philadelphia, 1839.—*From the Author.*

A Memoir of the Life and Character of Philip Syng Physick, M.D. By J. Randolph, M. D. Philadelphia, 1839.—*From the Author.*

Experimental and Theoretical Researches in Electricity. First Memoir. By William Sturgeon, Esq. London, 1839.—*From the Author.*

Facts and Inquiries respecting the source of Epidemic. By T. Forster, M. B. London, 1832.—*From the Author.*

Observations on the Brumal Retreat of the Swallow. By Thomas Forster. London, 1817.—*From the Author.*

Third Annual Report on the Geological Survey of the State of Pennsylvania. By Henry D. Rogers, State Geologist. Harrisburg, 1839.—*From the Author.*

A Catalogue of the Shells arranged according to the Lamarckian System, together with descriptions of new or rare species, contained in the collection of John C. Jay, M.D. New York, 1839. *From the Author.*

Mécanique Céleste. By the Marquis de la Place. Translated, with a Commentary, by Nathaniel Bowditch, LL. D. Vol. IV. With a Memoir of the Translator, by his son, N. Ingersoll Bowditch. Boston, 1839.—*From the Children of the Translator.*

Report on the Variations of the Magnetic Intensity observed at different points on the Earth's Surface. By Major Edward Sabine, R.A. London, 1838.—*From the Author.*

Dr. Hare made the following verbal communication relative to the blasting of rocks, by the aid of galvanic ignition in firing the charge.

The Doctor called the attention of the Society to the fact, that he had, so long ago as the summer of 1831, demonstrated the safety, certainty, and facility, which would arise in rock-blasting, whether

under water or otherwise, from a resort to galvanic apparatus as the means of igniting the gunpowder employed. His efforts had been incited originally by those of a person named Shaw, who had procured a patent for employing mechanical electricity for the purpose; but who, finding that method of operating too precarious to be useful, had applied to Dr. Hare to acquire a knowledge of more effectual means. This led to the experiments of which the result has been published, both in the newspapers, and in the Journal of the Franklin Institute. The subject was now referred to, in consequence of the recent publication of analogous experiments by his friend, Professor Daniell, of King's College, London, who, in the case in point, no doubt as in that in which he had "*reinvented*" Dr. Hare's concentric blow pipe, was ignorant of the results previously obtained in this country. Professor Daniell had, in blasting, used the highly ingenious apparatus known as "*Daniell's sustaining battery*," the contrivance of which had done him great honour; but Dr. Hare conceived that however preferable might be a battery of that kind, in processes requiring a permanent current; for a transient energetic ignition, such, as is most suitable for blasting, the calorimotors which he had contrived, would be decidedly more efficacious.

Dr. Hare further communicated the results of his recent experiments to obtain calcium, as follows:—

By igniting an equivalent weight of lime with an equivalent and a half of crystallized bicyanide of mercury, in two successive experiments, residual masses were obtained, which, within a small fraction, had the weight which would have resulted from the union of an equivalent of calcium, with an equivalent of cyanogen. A portion of the compound thus made, was placed between electrodes of charcoal, the lower piece being excavated slightly to receive it, and the upper one being so shaped as to enter the cavity. The electrodes were severally supported by copper rods passing through stuffing boxes, so as to be included within a glass receiver, ground to fit air tight upon an extra air-pump plate. In consequence of this arrangement, the receiver could be exhausted of air, and the electrodes consequently situated in vacuo, or in an atmosphere of hydrogen, as might be deemed preferable. The lower electrode formed the cathode, the upper the anode, of two hundred pairs, each comprising one hundred square inches of zinc surface. Under these circumstances, when the circuit was completed, by throwing the usual charge of acid upon the plates, the most intense

ignition ensued. The supposed compound of cyanogen appears to be an excellent conductor, and nothing could exceed the splendour of the purple light emitted during its deflagration. It was too vivid, however, for more than a transient endurance by an eye unprotected by deep coloured glasses. After the compound was adjudged to be sufficiently deflagrated, and time had been allowed for refrigeration, on lifting the receiver, masses were found upon the coal, which had a metallic appearance, and which, when moistened, produced an effluvium, of which the smell was like that which had been observed to be generated under like circumstances, by the siliciuret of potassium.

Similar results had been attained by the deflagration, in a like manner, of a compound procured by passing cyanogen over quicklime, enclosed in a porcelain tube heated to incandescence.

Phosphuret of calcium, when carefully prepared, and subsequently well heated, was found to be an excellent conductor of the voltaic current, evolved from the apparatus abovementioned. Hence it was thought expedient to expose it in the circuit of the deflagrator, both in an atmosphere of hydrogen, and in vacuo. The volatilization of phosphorus was so copious as to coat throughout the inner surface of the glass receiver, with an opake film, in colour resembling that of the oxide of phosphorus, generated by exposing this substance under hot water, to a current of oxygen.

The phosphuret at first contracted in bulk, and finally was for the most part volatilized. On the surface of the charcoal adjoining the cavity in which the phosphuret had been deflagrated, there was a light pulverulent matter, which, thrown into water, effervesced, and when rubbed upon a porcelain tile, appeared to contain metallic spangles, which were oxidized by the consequent exposure to atmospheric oxygen.

In one of Dr. Hare's experiments with the apparatus described, portions of the carbon forming the anode appeared to have undergone complete fusion, and to have dropped in globules upon the cathode.

When rubbed, these globules had the colour and lustre of plumbago, and by friction on paper, left traces resembling those produced by that substance. They were insusceptible of reaction with chlorohydric or nitric acid, or with aqua regia. They were not, in the slightest degree, magnetic.

About 1822, Professor Silliman had obtained globules which were by him considered as fused carbon, by others were deemed to be de-

positions of carbon carried from one electrode to the other. Professor Silliman had at that time sent Dr. Hare several nodules for examination, of which none, agreeably to his recollection, appeared so much like products of fusion as those lately obtained.

Formerly, plumbago had been considered as a carburet of iron, but latterly, agreeably to the high authority of Berzelius, should be viewed as carbon holding iron in a state of mixture, and not in that of chemical combination. It would not then be surprising, if the globules in question furnished an instance of the conversion of charcoal into plumbago.

Since the abovementioned experiments were made, Dr. Hare has had reason to believe that the compound obtained as above described, by heating lime with bicyanide of mercury, contains fulminic acid, or an analogous substance. The compound being dissolved in acetic acid, and the filtered solution subjected to nitrate of mercury, a copious white precipitate resulted. This being desiccated, proves to be a fulminating powder. It explodes between a hammer and anvil like fulminating mercury, or rather with the sharp sound of fulminating silver.

Dr. Hays made a verbal communication of a case of the application of the catoptric method of examining the eye, by which he had detected the destruction of the lens and of its capsule, under circumstances which would not otherwise have led to the conclusion that they had been destroyed, and where vision had been obtained by the use of a cataract lens.

Stated Meeting, June 21.

Present, twenty-four members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Proceedings of the Royal Astronomical Society. Vol. IV. Nos. 1 to 21, and No. 23. London, 1839.—*From the Society.*

Reports of the Geological Survey of the State of New York. Albany, 1839.—*From Mr. Z. Barton Stout.*

Notice Historique sur la Vie et les Voyages de Réné Caillié. Par M. Jomard. Paris, 1839.—*From the Author.*

Remarks upon the North American Insects belonging to the Genus Cychrus of Fabricius; with descriptions of some newly detected species. By T. W. Harris, M. D. Boston, 1839.—*From the Author.*

Political Sketches of Eight Years in Washington. By Robert Mayo, M. D. Baltimore, 1839.—*From the Author.*

Minutes of the Provincial Council of Pennsylvania. From the Organization to the Termination of the Proprietary Government. Vols. I. and II., containing the Proceedings of Council from 1683 to 1717. Harrisburg, 1838.—*From the State of Pennsylvania.*

Die Werke des Flavius Josephus und Das Leben des Josephus von ihm selbst geschrieben. Das Ganze von Neuem nach dem Griechischen bearbeitet; mit erklärenden Anmerkungen, durch C. R. Demme. Philadelphia, 1839.—*From the Editor.*

Annales des Mines. Troisième Série. Vol. XIV., parts fourth and sixth. Paris, 1838.—*From the Council of Mines.*

Storia della Scultura del Conte Cicognara. Vols. I. to VII. Prato, 1824.—*From Mr. John Vaughan.*

Recherches sur l'Histoire Naturelle et l'Anatomie des Limules, par J. Van Der Hoeven. Leyden, 1838.—*From the Minister of the Interior of the Netherlands.*

Flora Batava, of afbeelding en beschrijving van Nederlandsche Gewassen, door Jan Kops, en H. C. Van Hall. Nos. 116 and 117. Amsterdam.—*From the same.*

Essay on Meteorological Observations. By J. N. Nicollet, Esq. Printed by order of the War Department. Washington, 1839.—*From Col. Abert, U. S. Topographical Engineers.*

Les Trois Ages ou les Jeux Olympiques, l'Amphithéatre, et la Chevalerie. Par Roux de Rochelle. Paris, 1838.—*From the Author.*

Fernand Cortès, Poëme. Par Roux de Rochelle. Paris, 1838.—*From the same.*

Chinese Magazine, edited by the Rev. Charles Guzlaff. Canton.—*From the Editor.*

Missionary Tracts in Chinese. Canton.—*From the same.*

Bulletin de la Société de Géographie. Deuxième Série. Vol. X. Paris, 1838.—*From the Society.*

The Oxford University Calendar. Oxford, 1838.—*From Mr. John Vaughan.*

The Cambridge University Calendar. Cambridge, 1838.—*From the same.*

Memorie e Lettere di Galileo Galilei, dal Cav. Giambatista Venturi. Vols. I. and II. Modena, 1821.—*From the same.*

An Inquiry into the Origin of the Antiquities of America. By John Delafield, Jr., with an Appendix, by James Lakey, M. D. of Ohio. New York, 1839.—*From Mr. M. T. Williams.*

The librarian was authorized to take order in relation to an exchange of the transactions of the Society, for the Journal of the Boston Natural Historical Society.

The committee on the letters of Mr. J. P. Hulliken and Dr. Townsend reported, and was discharged.

The committee to whom was referred the publication of certain meteorological tables, accidentally omitted in their place in the Transactions, and the journal of Dr. Thomas Hewson, reported in favour of the publication of certain of the former and of the latter.

Dr. Bache presented a translation of an obituary notice of Professor Rask of Copenhagen, late a member of the Society, to be deposited in the archives of the Society.

Mr. Vaughan informed the Society of the decease of Doctor Thomas Cooper, a member of the Society, who died on the eleventh of May last.

Dr. Hays communicated verbally the case of a woman labouring under an affection of the optic nerve, in which a defect in the recognition of colours was developed, according to her statement, at the same time with the affection of the general vision, and in which a partial recovery of the power of vision had been attended with the recovery of the power to distinguish colours.

Dr. Hare laid before the Society portions of barium, strontium and calcium, and stated the considerations which led him to attempt their extrication, and the means by which he had

succeeded. These communications it is not deemed expedient to insert, as the whole process will soon be presented for publication in the Transactions of the Society, when an abstract will be given. Meanwhile, a notice of the results will appear in Silliman's Journal.

One of the copies of the Colonial Records, presented to the Society by the Legislature of the State, was offered to the acceptance of the President, Mr. Du Ponceau.

The thanks of the Society were returned to Mr. George Ord, for his attention to their request in relation to the purchase of books while abroad.

Stated Meeting, July 17.

Present, twenty-two members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Proceedings of the Geological Society of London. Vol. II. and Vol. III. Nos. 59 to 62 inclusive. London, 1838 and 1839. *From the Society.*

Proceedings of the Numismatic Society. 1836–37. London, 1837. *From the Society.*

The Institutes of the Numismatic Society of London. London, 1838. *From the same.*

A Discourse on the Life and Services of Stephen Van Rensselaer. By Daniel D. Barnard. Albany, 1839.—*From the Albany Institute.*

Mémoires de la Société Royale des Antiquaires de France. Vol. XIV. Paris, 1838.—*From the Society.*

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie. Uitgegeven door J. Van der Hoeven, M. D. Prof. te Leiden en W. H. de Vriese, M. D. Prof. te Amsterdam. Vol. V. No. 4. Leyden, 1839.—*From the Minister of the Interior of the Netherlands.*

Sur les Avantages qu'on pourrait tirer de la Lecture des Anciens Écrivains Français. Par Théod. Lorin. Cambray, 1839.—*From the Author.*

Épitres, Fables et Poésies Fugitives. Par Théodore Lorin. Paris, 1839.—*From the same.*

A Report upon the Military and Hydrographical Chart of the Extremity of Cape Cod. By James D. Graham, Major U. S. Corps of Topographical Engineers.—*From the Author.*

Chronometer Accuracy. Verification of the Longitude of Paris. London, 1839.—*From Dr. Lee.*

Letter to the Secretary of the Treasury on the History and Causes of Steamboat Explosions and the means of prevention. By W. C. Redfield. New York, 1839.—*From the Author.*

The English Instructor. In the Burman Language.—*From the Rev. J. P. Engles.*

Jeremiah, in the Persian Language.—*From the same.*

Harmony of the Gospels, in the Choctaw Language. Utica, 1831. *From the same.*

Novum Testamentum ad Exemplar Millianum. Editionem Primam Americanam recensuit Josephus P. Engles, A. M. Philadelphia, 1839.—*From the same.*

Sermones Pomerii fratris Adelbarti de Themeswar. Hagenau, 1498. *From the same.*

Observations Météorologiques et Magnétiques faites dans l'Étendue de l'Empire de Russie, rédigées et publiées par A. T. Kupffer. St. Petersburg, 1837.—*From the Author.*

Documents of the Kentucky Legislature. Session of 1837–38.—*From Mr. Edward Jarvis.*

Report of the Board of Internal Improvement of Kentucky, 1837.—*From Mr. E. Whittlesey.*

The Statutes of Ohio and of the North Western Territory. Vols. I., II., and III. Edited by Salmon P. Chase. Cincinnati, 1833. *From Mr. M. T. Williams.*

An Account of the Receipts and Expenditures of the United States, for the Year 1837. Washington, 1838.—*From the Treasurer of the United States.*

Boston Journal of Natural History. Vol. II. Nos. 1 and 2. Boston, 1838 and 1839.—*From the Boston Society of Natural History.*

The American Medical Library and Intelligencer. Edited by Robley

Dunglison, M. D. Vol. III. Nos. 2 to 8. Philadelphia, 1839. *From the Editor.*

The American Journal of Science and Arts. Conducted by Benjamin Silliman, M. D. LL. D., aided by Benjamin Silliman, Jr., A. B. January to July, 1839. Vol. XXVI. New Haven, 1839.—*From the Conductors.*

The Transylvania Journal of Medicine and the Associate Sciences. Vol. XII. No. 1. Lexington, 1839.—*From the Conductors.*

The Committee on the observations of the Solar Eclipse of May 14–15, 1836, reported, and their report was ordered for publication.

The American observations, 28 in number, were given at length. At the invitation of Mr. C. Rumker, Director of the Hamburg Observatory, conveyed through Prof. A. D. Bache, 21 of these observations had been forwarded by Mr. John Vaughan to that distinguished Astronomer, for comparison with those which had been made in Europe. The report contained a letter from Mr. Rumker, in which the time of ecliptic conjunction, with its variations for the small errors of the tables, was deduced from each of the European and American observations. Mr. Rumker remarks, that the corrections of this time for the corrections of the moon's declination and parallax, appearing with opposite signs in the observations on the two continents, afford unusual facilities for determining these corrections, particularly the latter. Mr. Rumker's letter not having given the final results deducible from his equations of condition, the committee appended a letter from Mr. Sears C. Walker, in which he deduces from Mr. Rumker's equations, the following corrections of the solar and lunar elements, as given in the N. Almanac.

$d(\odot + \mathbb{D}) = -2''.279$ = correction of sum of semidiameters.
$d(\odot - \mathbb{D}) = -1''.750$ = ,, difference of semidiameters.
$d\beta = -6''.736$ = ,, moon's latitude.
$d\pi = +1''.516$ = ,, moon's parallax.
$d\lambda = -2''.276$ = ,, moon's longitude.

These corrections being referred to the moon's orbit and its secondaries, give, after Bessel's notation (Astr. Nachr. 320.)

$\epsilon = -2''.934$ = cor. moon's place in true orbit.
$\zeta = -7''.198$ = ,, on secondary to do.

Mr. Peters, (Astr. Nachr. 326) without the American observations, had obtained.

$\epsilon = -3''.C50.$
$\zeta = -5''.472.$

Mr. Walker having previously reduced the American observations with Peters's co-ordinates and corrections, furnishes a comparison of the longitudes from Greenwich, derived by different computers from this eclipse.

	Walker from Rumker's equations.			Walker from Peters' co-ordinates.		
	h.	m.	s.	h.	m.	s.
Washington (Capitol,) - - - - - -	5	8	13.83	5	8	13.45
Haverford School, Delaware Co., Pa. - -	5	1	16.53	5	1	15.05
Germantown, C. Wister's private Observatory,	5	0	40.61	5	0	40.94
Philadelphia, (State House) - - - - -	5	0	38.89	5	0	39.60
West Hills, (Coast Survey,) - - - - -	4	53	41.11	4	53	42.05
Southwick, Mass., A. Holcombe's p. Obs. -	4	51	12.89	4	51	13.25
Providence, Brown University, - - -	not reduced.			4	45	38.33
Dorchester, Mass., Wm. C. Bond's p. Obs. -	„			4	44	16.92

Mr. Walker finds from the resolution of Rumker's equations of condition, + 1″.516 for the correction of Burckhardt's constant of the moon's equatorial parallax. In the Memoirs of the Astronomical Society, Vol. X., Mr. Henderson gives + 1″.5 as the value of this correction, derived from Plana's *Théorie de la Lune*, and + 1″.3 as the value of the same, derived from a discussion of all the meridian observations of the moon made in 1832 and 1833, with the mural circles at Greenwich, Cambridge, and the Cape of Good Hope. This correction had hitherto been derived chiefly from theory and meridian observations. It is seldom that an eclipse or occultation has been so extensively observed as to furnish a determination of this element. In the present instance, the results by the three independent methods, present a close agreement.

Dr. Chapman, one of the Vice-Presidents of the Society, stated that he had received a letter from the Prince of Musignano, informing him that a meeting of the scientific men of Italy would be held at Pisa, in October next, and inviting the Society to send a delegate to the meeting.

Dr. Patterson communicated the decease of Mr. Francis Nichols, a member of the Society, on the 7th of July.

Dr. Bache also announced the decease of Dr. John Newnam, formerly of Salisbury, N. Carolina, a member of the Society.

The following candidates were declared duly elected members of the Society:—

Theod. Romeyn Beck, M. D., of Albany.

Richard C. Taylor, of Philadelphia.

Stated Meeting, August 16.

Present, sixteen members.

Dr. PATTERSON, Vice-President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Documents of the Second Session of the Twenty-fifth Congress, 1837–38. Twenty-four volumes. Washington, 1838.—*From John Forsyth, Secretary of State of the United States.*

Chart of Georges Shoal and Bank. Surveyed by Charles Wilkes, Lieutenant Commandant, 1837.—*From the same.*

A Narration of the Mission of the United Brethren among the Delaware and Mohegan Indians, from 1740 to 1808. By John Heckewelder. Philadelphia, 1820.—*From Mr. P. S. Du Ponceau.*

Johann Heckewelder's Nachricht von der Geschichte, der Sitten, und Gebräuchen der Indianischen Völkerschaften. Aus den Englischen übersetzt, von Fr. Hesse. Nebst einem Zusatze von G. E. Schulze. Göttingen, 1821.—*From the same.*

A Report on the Geological Survey of Connecticut. By Charles U. Shepard, M.D. New Haven, 1837.—*From Professor Silliman.*

Suggestions relative to the Philosophy of Geology. By Professor B. Silliman. New Haven, 1839.—*From the same.*

Catalogus Senatûs Academici, in Collegio Yalensi. New Haven, 1838.—*From the same.*

Catalogue of the Library belonging to the Society of Brothers in Unity of Yale College. New Haven, 1838.—*From the same.*

Catalogue of the Library of the Linonian Society, Yale College. New Haven, 1837.—*From the same.*

Catalogue of Books in the Library of Yale College. New Haven, 1823.—*From the same.*

A New Dictionary of Medical Science, second edition. By Robley Dunglison, M. D. Philadelphia, 1839.—*From the Author.*

A Manual of Conchology. By Thomas Wyatt, M.A. New York, 1838.—*From the Author.*

Sur la Possibilité de Mesurer l'Influence des Causes qui modifient les Élémens Sociaux. Par A. Quetelet. Brussels, 1832.—*From the Author.*

Observations horaires faites au dernier Solstice d'Hiver, 1837. Par M. Quetelet.—*From the same.*

Note sur le Magnétisme terrestre, suivie des Résultats des Observations Météorologiques horaires faites à Bruxelles à l'Équinoxe du Printemps de 1838, et à l'Époque du Solstice d'Été de 1838. Par A. Quetelet.—*From the same.*

A Universal History, in Chinese, accompanied by a Map of both Hemispheres. By the Rev. Charles Guzlaff. Canton, 1838.—*From the Author.*

Jahrbücher der Literatur. Vols. 77 to 80 inclusive. Vienna, 1837. *From Baron von Hammer Purgstall.*

Moral Reflections on the actual Condition of the Animal Kingdom. By T. Forster. Brussels, 1839.—*From the Author.*

Outlines of Physiology, with an Appendix on Phrenology. Philadelphia, 1839.—*From Dr. Dunglison.*

The Colonial Policy of Great Britain. London, 1816.—*From Mr. John Vaughan.*

Notes on the Medical Topography of the interior of Ceylon. By Henry Marshall. London, 1821.—*From the same.*

Jay's Treaty, with an Appendix. Philadelphia, 1795.—*From the same.*

A Practical Treatise on Rail Roads and Carriages. By Thomas Tredgold. New York, 1825.—*From the same.*

Memoirs of the Rev. David Brainerd, Missionary to the Indians. By S. E. Dwight. New Haven, 1822.—*From the same.*

Compendio das Eras da Provincia di Para. Por A. L. M. Baena. Para, 1838.—*From the Author.*

Magazine of Natural History. Edited by Edward Charlesworth. Vol. II. New Series. Nos. 26, 27, 29, and 30. London, 1838.—*From the Editor.*

The American Journal of the Medical Sciences. Edited by Isaac Hays, M.D. No. XLVIII, for August. Philadelphia, 1839.—*From the Editor.*

A communication from the Academy of Natural Sciences, was received, under date of the 23d of July, relating to a pro-

posed National Museum in connexion with the Smithsonian legacy. Whereupon it was

Resolved, That the Academy of Natural Sciences be respectfully informed that their communication has been carefully considered by the American Philosophical Society, and that the Society has to regret that in view of the indirect and unofficial manner in which the wishes of one of the members of the Government at Washington has been conveyed to them, respecting the disposition of the Smithsonian legacy, the Society does not feel at liberty, at the present time, to take action upon this subject.

A communication from the foreign Secretary of the Royal Society of London, in relation to magnetic observations was referred to the astronomical committee.

Dr. Dunglison described the appearances which he had witnessed, in company with Professor Silliman, after the tornado of the 31st ultimo, at New Haven. The evidences appeared to him to favour the idea of a gyratory motion. The direction of the storm was from south-west to north-east.

Mr. Justice described a similar tornado which had occurred on the same day, fifteen miles north of Philadelphia, showing evidence, in his opinion, of a similar movement of gyration.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. 1. SEPTEMBER & OCTOBER, 1839. No. 8.

Stated Meeting, September 20.

Present, twenty-eight members.

Mr. DU PONCEAU, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Mémoires couronnés par l'Académie Royale des Sciences et Belles Lettres de Bruxelles. Vol. XIV. Part I. Brussels, 1838.—*From the Academy.*

Nouveaux Mémoires de l'Académie Royale des Sciences et Belles Lettres de Bruxelles. Vol. XI. Brussels, 1838.—*From the same.*

Annuaire de l'Académie Royale des Sciences et Belles Lettres de Bruxelles. Cinquième Année. Brussels, 1839.—*From the same.*

Bulletin de l'Académie Royale des Sciences et Belles Lettres de Bruxelles. Nos. 9 to 12. Brussels, 1838.—*From the same.*

Philosophical Transactions of the Royal Society of London, for the year 1838. Two parts. London, 1838.—*From the Society.*

Proceedings of the Royal Society of London. Nos. 32 to 36 inclusive, and No. 38.—*From the same.*

List of the Council, Scientific Committees, Fellows, and Foreign Members, of the Royal Society of London, 1839.—*From the same.*

Astronomical Observations made at the Royal Observatory, Greenwich, in the year 1837. London, 1838.—*From the same.*

Appendix to the Greenwich Observations, 1837. London, 1838.—*From the same.*

The Journal of the Royal Geographical Society of London. Vol. IX. Part II. London, 1839.—*From the Society.*

Transactions of the Royal Geological Society of Cornwall. Vols. I. to IV., inclusive. London, 1818, and Penzance, 1822, 1828, and 1832.—*From the Society.*

Proceedings of the Botanical Society of London. London, 1839.—*From the Society.*

Bulletin de la Société Impériale des Naturalistes de Moscou. No. IV. Moscow, 1837.—*From the Society.*

Catalogue of the officers and students of the Medical Institute of the City of Louisville. Louisville, 1839.—*From Dr. C. W. Short.*

Periodical Accounts relating to the Missions of the Church of the United Brethren, established among the Heathen. Vol. XIV. Nos. 156 to 160 inclusive. London, 1837.—*From Mr. James J. Barclay.*

The twentieth Report of the Committee of the London Association, in aid of the Missions of the United Brethren, commonly called Moravians. For the year 1837. London, 1838.—*From the same.*

Particulars of recent Intelligence respecting the Missions of the United Brethren. Nos. 36 and 37. London, 1837 and 1838.—*From the same.*

Proceedings of the Church Missionary Society for Africa and the East. Thirty-eighth year. London, 1838.—*From the same.*

Thirty-fourth Report of the British and Foreign Bible Society. London, 1838.—*From the same.*

Proceedings of the Prayer Book and Homily Society, during its twenty-fifth year. London, 1837.—*From the same.*

Report of the Proceedings of the Naval and Military Bible Society. London, 1838.—*From the same.*

Extracts from the Second and Third Reports of the Inspectors of Prisons for the Home District. Two Vols. London, 1837 and 1838.—*From the same.*

Seventh Annual Report of the Trustees of the New England Institution for the Education of the Blind. Boston, 1839.—*From Dr. Howe.*

Second Annual Report of the Geological Survey of the State of Ohio. By W. W. Mather. Columbus, 1838.—*From the Author.*

Documents relating to the Improvement of the Navigation of the Mississippi River. New Orleans, 1837.—*From Mr. Lewis Troost.*

The Indian Tribes of North America. No. 13. Philadelphia, 1839. *From Mr. F. W. Greenough, Publisher.*

Some Account of the Art of Photoginic Drawing. By Henry Fox Talbot, Esq. F.R.S. London, 1839.—*From the Author.*

Vocabolario Universale della Lingua Italiana. Vol. VI. Part XXXVI. Naples, 1839.—*From the Chev. Morelli.*

Di Quattordici Vasi d'Argento discotterati in Pompei nel 1835. Discorso del Cavalier Bernardo Quaranta. Naples, 1837.—*From Mr. Du Ponceau.*

Di un Vaso Greco Dipinto che si conserva nel Real Museo Borbonico. Discorso del Cavalier Bernardo Quaranta. Naples.—*From the Author.*

Försök til en Flora Oeconomica Sveciæ. Af A. J. Retzius. Two Parts. Lund, 1806.—*From Mr. John Vaughan.*

Life of Arthur Lee, LL. D. By Richard Henry Lee, A. M. Boston, 1839.—*From the same.*

Rapport fait à l'Académie des Sciences, par M. Arago, sur des Appareils de Filtrage de M. Henri de Fonvielle. Paris, 1837.—*From Professor A. D. Bache.*

Statistique de la Peine Capitale en Belgique, en France, en Angleterre et en Prusse, par Ed. Ducpétiaux. Brussels.—*From the same.*

A Grammar and Vocabulary of the Language of New Zealand. London, 1820.—*From the Rev. J. P. Engles.*

Directions for rightly offering up Secret Prayer. (In Armenian.)—*From the same.*

Proverbs in Hinduwee.—*From the same.*

A Spelling Book written in the Chahta (Choctaw) Language, with an English Translation. Cincinnati, 1827.—*From the same.*

L'Exercise du Microscope, par François Watkins. London, 1754. *From the same.*

West Port Murders. Report of the Trial of Burke and M'Dougal. Edinburgh, 1829.—*From the same.*

Bibliotheca Sanscrita. Literatur der Sanskrit Sprache von Friedrich Adelung. St. Petersburg, 1837.—*From the Author.*

O Kind! Die berühmte ethische Abhandlung Ghasalis. Von Hammer-Purgstall. (Arabisch und Deutsch.) Vienna, 1838.—*From the Author.*

Facts and Reasons in support of Mr. Rowland Hill's plan of a Universal Penny Postage. By W. H. Ashurst.—*From Mr. Wm. Brown.*

An Elementary Treatise on the Tides. By J. W. Lubbock, Esq. Treas. R. S. etc. London, 1839.—*From the Author.*

Note sur les Étoiles Filantes du 12 Novembre, 1838, par M. A. Quetelet. Brussels, 1839.—*From the Author.*

Note sur les Tableaux Météorologiques pour l'Année 1838, à Bruxelles, par M. A. Quetelet. Brussels.—*From the same.*

Experimental Researches in Electricity. By Michael Faraday, D. C. L. &c. Fifteenth series, and Index to series I. to XIV. inclusive. London, 1839.—*From the Author.*

An Inquiry into the Nature of the Numerical Contractions, found in a passage on the Abacus, in some MSS. of the Geometry of Anicius Manlius Torquatus Severinus Boetius, and Notes on Early Calendars. By James O. Halliwell, Esq. London, 1839.—*From the Author.*

Tracts on Docks and Commerce, with an Introduction, Memoir, and Miscellaneous Pieces. By William Vaughan, Esq. F. R. S. London, 1839.—*From the Author.*

Narrative of a Journey across the Rocky Mountains to the Columbia River. By John R. Townsend. Philadelphia, 1839.—*From the Author.*

The American Journal of Science and the Arts. Conducted by Benjamin Silliman, M. D., LL. D., aided by Benjamin Silliman, Jr., A. B. Vol. XXVII. No. 1. New Haven, 1839.—*From the Conductors.*

Professor Bache, on behalf of the Committee appointed on the paper of Professor Elias Loomis, of Western Reserve College, Ohio, entitled "Observations to determine the Magnetic Dip at various places in Ohio and Michigan," reported in favour of publication, and the Report was adopted.

The observations recorded in this paper were made with a dipping needle by Gambey. The results are contained in the following table.

Place.	Latitude.	Longitude.	Date.	Magnetic Dip.
Hudson, Ohio,	41° 15′ N.	81° 21′ W.	September, 1838.	72° 48′.2
Do.	,, ,,	,, ,,	April, May, 1839.	72 46.8
Cleveland, Ohio,	43 30	81 51	May, ,,	73 26.0
Detroit, Michigan,	42 19	83 03	,, ,,	73 42.6
Ann Arbor, ,,	42 18	83 45	,, ,,	73 13.9
Ypsilanti, ,,	42 14	83 38	,, ,,	73 18.0
Monroe, ,,	41 55	83 28	,, ,,	73 32.3
Toledo, Ohio,	41 41	83 33	,, ,,	73 06.1
Maumee City, Ohio,	41 34	83 38	,, ,,	72 49.1
Sandusky, ,,	41 29	82 48	,, ,,	72 57.8

Professor Loomis infers from a comparison of these observations with others made in the eastern part of the United States, that the lines of equal dip intersect the parallels of latitude, their direction being from about N. 82° W. to S. 82° E.

Dr. Chapman, from the Committee appointed to apply to Mrs. Madison, for certain meteorological observations made by the late President Madison, reported that a number of documents had been received, and presented them to the Society. The Secretaries were directed to return thanks to Mrs. Madison for this donation.

A necrological notice of the late Bishop White, prepared in pursuance of the request of the Society, by Bishop De Lancey, was read.

Dr. Chapman announced the death of Matthew Carey, of Philadelphia, a member of the Society, and Mr. Lea was requested to prepare an obituary notice of the deceased.

Dr. Bache announced the decease of Dr. Robert Perceval, of Dublin, a member of the Society.

The Librarian of the Society was authorized to furnish to the family of the late Dr. Bowditch, to be placed in the library of the deceased, any volumes of the Transactions which may be deficient in the set belonging to Dr. Bowditch, and the future volumes, so long as the library shall be kept open for public use.

Dr. Hays presented a table, compiled by him, of the peculiarities in various cases of individuals not able properly to distinguish colours. Mr. Kane added the comparisons which he had made, in the case of a friend, with the specimens named by Dr. Dalton, of Manchester, in the possession of Professor Bache.

Professor Bache made a verbal communication of the measures taken by the British government, on the recommendation of the British Association, and under the advice of the Royal Society, for obtaining a series of magnetic observations in different quarters of the globe, in conjunction with a naval expedition in the southern hemisphere, under the command of Capt. James Clark Ross, and read extracts from letters of

Professor Lloyd and Major Sabine, relating to the preparation for the undertaking.

Professor Bache further stated, that on submitting the circular addressed to him by the Foreign Secretary of the Royal Society, with extracts from the letters before referred to, and other information as to the nature and importance of the results to be obtained by this combined system of magnetic observations, to the Building Committee of the Girard College, through their Architect, they had, with creditable liberality, given orders for the erection of an observatory suited to the observations contemplated, and to the instruments already in the possession of the Trustees of the College.

Professor Bache submitted the plans of the observatory, drawn by Thos. U. Walter, Esq. Architect.

Mr. Justice made some remarks in continuation of those offered at the last meeting of the Society, in support of his opinion of a gyratory motion in the tornado of the 31st July, the destructive effects of which were felt about seventeen miles north of Philadelphia.

Stated Meeting, October 4.

Present, twenty-one members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Mémoires de l'Académie Royale des Sciences Morales et Politiques de l'Institut de France. Vol. II. Second series. Paris, 1839.—*From the Academy.*

Institut Royal de France. Séance Publique Annuelle des Cinq Académies, 1839. Paris, 1839.—*From Mr. D. B. Warden.*

Institut Royal de France. Séance Publique Annuelle de l'Académie des Sciences Morales et Politiques, 1839. Paris, 1839.—*From the same.*

Recueil de Voyages et de Mémoires publié par la Société de Géographie. Vol. IV. Paris, 1839.—*From the Society.*

Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce, for the Session 1831–32. Vol. XLIX. Part I. London, 1832.—*From the Society.*

The Transactions of the Linnean Society of London. Vol. XVII. Part IV., and Vol. XVIII., part II. London, 1837 and 1839.—*From the Society.*

List of the Linnean Society of London, 1839. London, 1839.—*From the same.*

Transactions of the Horticultural Society of London. Second series. Vol. II. Part III. and IV. London.—*From the Society.*

Proceedings of the Horticultural Society of London. Nos. 1 to 6 inclusive. London 1838 and 1839.—*From the same.*

Proceedings of the Committee of Commerce and Agriculture of the Royal Asiatic Society of Great Britain and Ireland. London, 1839.—*From the Society.*

Proceedings of the Zoological Society of London. Part VI. London, 1838.—*From the Society.*

Reports of the Council and Auditors of the Zoological Society of London, 1839. London, 1839.—*From the same.*

Histoire du Régiment de Champagne, par Roux de Rochelle. Paris, 1839.—*From the Author.*

Elements of Geology, by Charles Lyell, F.R.S. First American from the first London edition. Philadelphia, 1839.—*From James Kay, Jr. and Brother.*

A Bengalee Almanac.—*From the Rev. J. P. Engles.*

Maps to illustrate the Easy Introduction to Astronomy in Hindustáni. *From the same.*

Assolements et Culture des Plantes de l'Alsace, par J. N. Schwerz. Traduit de l'Allemand et annoté par Victor Rendu. Paris, 1839. *From Mr. D. B. Warden.*

L'Art de vérifier les Dates, depuis l'Année 1770, jusqu'a nos jours. Vol. XVII. (Vol. IX. of the series relating to America.) Paris, 1837.—*From the same.*

Fragments sur l'Histoire Politique et Littéraire de l'ancienne République de Raguse et sur la Langue Slave. Par le Comte Duc de Sorgo. Paris, 1839.—*From the same.*

Chemical Diagrams, or Concise Views of many interesting Changes produced by Chemical Affinity. By Jacob Green, M.D. Philadelphia, 1837.—*From the Author.*

Remarks on the Trilobite, and Description of a New Trilobite. By Jacob Green, M.D. New Haven, 1839.—*From the same.*

London Catalogues of Books for 1839. Two Vols.—*From Mr. Edward D. Ingraham.*

Popular Lectures on Geology, by R. C. Von Leonhard. Translated by the Rev. J. G. Morris, A.M., and edited by Professor F. Hall, M.D. Baltimore, 1839.—*From the Editor.*

The American Almanac and Repository of Useful Knowledge, for the year 1840. Boston, 1839.—*From the Editor.*

FOR THE CABINET.

A specimen of Iron Ore from the Island of Cuba.—*From Mr. R. C. Taylor.*

The Committee, consisting of Dr. Dunglison, Mr. Kane, and Mr. Lea, to whom were referred a letter of the Rev. Charles Gutzlaff to John Vaughan, Esq. dated Macao, January 2, 1839, and the letter of Peter S. Du Ponceau, Esq. to the same gentleman, dated Philadelphia, September 20, 1839, made their report, which was read and accepted.

The communication of Mr. Gutzlaff was suggested by the dissertation of Mr. Du Ponceau, "On the nature and character of the Chinese system of writing." As the results of his reflection and observation, Mr. Gutzlaff affirms, that China was the great centre of civilization, whence it diverged to all the countries of Eastern and Southern Asia; the colonists from China driving the autochthonous tribes into the mountains, and incorporating the country itself, including Tunkin and Annam, with the central kingdom. A constant influx of Chinese also took place into Korea, but the emigration to Japan and the Loo Choo Islands was less extensive.

Chinese words, and the Chinese art of writing, were thus introduced into these countries: Chinese books became their literature; and, like the Latin in the middle ages, the Chinese was the language of the learned. Yet all the nations that have adopted the Chinese mode of writing, speak a language more or less distinct from the written idiom. The different nations, too, who employ the Chinese characters, call them differently, using their own language to designate them, and they, as well as the Chinese themselves, have to learn the meaning of the characters from teachers, who explain them in the dialect spoken amongst the people. The dialects spoken by the different nations,

who use the Chinese character, are very distinct from the language of China proper. The Koreans and Japanese, whilst they transact all important business in the Chinese character, have a syllabary with which they write their own language. The Cochin Chinese occasionally use the Chinese in a contracted form, without any reference to its meaning, to express sound, but they have no syllabary.

It is not strictly true that sound is not inherent in the Chinese character. A majority of the signs are not pronounced by the Chinese at random, nor do the nations abandon all analogy in reading them, although they vary much. Mr. Gutzlaff has been struck with the ease with which communication may be held with the Cochin Chinese, Japanese and Koreans, by means of the Chinese character, even without comprehending a word of their idiom. This, he says, does not refer to the learned classes only, but to the very fishermen and peasants, with some exceptions only. In the Loo Choo Islands, men of distinction talk Chinese with great fluency, but the mass of the people speak a dialect of the Japanese, and employ the Chinese character as well as the Japanese syllabary. Mr. Gutzlaff considers it certain, that the nations who have adopted the Chinese character, attach the same meaning to it as the natives from whom it was originally derived, and that its construction is likewise retained with scarcely any alterations.

The communication of Mr. Du Ponceau is a rejoinder to that of Mr. Gutzlaff. Mr. Du Ponceau repeatedly combats the notion entertained by some, that the superiority of the Chinese alphabet is such, that it forms a kind of pasigraphic system, which may be adapted to every language. He admits, to a certain extent, what he was disposed at one time to doubt, that the Chinese characters do actually serve as a means of communication between different nations, who can neither speak nor understand each other's oral language, and he investigates, at some length, the causes by which this effect is induced; but he expresses himself at a loss to understand how the fishermen and peasants of Japan, Korea and Cochin China, "with only some exceptions," can be readily communicated with by means of Chinese characters, even by a person who does not understand a single word of their spoken language. The remark of Mr. Gutzlaff, he conceives, cannot be meant to imply that all, or nearly all the fishermen and peasants of the countries referred to, can read and write the Chinese; for, on the authority of Mr. Medhurst, there are villages, even on the coast of China, where few, if any, of the inhabitants can either read or write. If, however, the assertion of Mr. Gutzlaff be assumed to

be rigorously accurate, it will have to be explained by the circumstance, that as the Chinese is esteemed a universal medium of communication between the people referred to, it is more extensively taught amongst them than even amongst the Chinese themselves.

Mr. Du Ponceau enters, at some length, into the nature of the four languages, or classes of languages which are embraced in the communication of Mr. Gutzlaff. 1. Of the various dialects of the Chinese. 2. Of the Annamitic languages. 3. Of the languages of Japan and the Loochoo Islands; and 4. Of the Korean; the two first of which are monosyllabic, the two last polysyllabic; and from all the facts and reflections, he concludes, that the circumstance of the Chinese characters being understood so extensively amongst these people, is not owing to any thing inherent in the Chinese characters, in their shape or greater perspicuity, but to their connexion with the languages from which they were formed, and to the mode in which they have been adapted to them. The vernacular languages of Japan, the Loochoo Islands, and Korea, are so different from the Chinese, that it was found impossible to apply to them the Chinese system of writing; consequently, when the people of these countries read the Chinese characters, they do not read them in their native language, but in the Chinese, which they have acquired, but pronounce differently from the Chinese themselves. This is not the case with the people of Tunkin and Cochin China—the Annamites: their language or languages being formed on the model of that of China, with some variations, which they learn, in their schools, to correct, and to employ the proper characters as a superior orthography, by which they are enabled to read the Chinese as well as their own language.

The Committee recommended that the interesting communications of Mr. Gutzlaff and Mr. Du Ponceau, tending as they do, to elucidate a contested topic of Oriental Philology, be published in the transactions of the Society.

Dr. Hare made a verbal communication on the subject of tornadoes, and on his electrical theory of their formation, supporting his views by reading an extract from a Memoir by M. Peltier, describing a destructive tornado which occurred near Paris, in June last.

Dr. Hare stated that agreeably to a publication in the Journal des Débats for the 19th of July, some losers by this tornado having effected insurance against damage from thunder gusts, applied to the insurers

for indemnity, which was refused, upon the plea that a tornado was not a thunder gust (orage). The question having been submitted to Arago, it was by him referred to Peltier.

Peltier, after due investigation, came to the conclusion that a tornado is a modification of the thunder gust, in which, in lieu of passing in the form of lightning, electricity passes through a cloud, acting as a conductor between the terrestrial surface and the sky. It will be perceived that this view of the subject differs but little from that which, in a memoir in the transactions of the Society, had been presented by Dr. Hare, in the following language:—"A tornado is the effect of an electrified blast of air, superseding the more usual means of discharge between the earth and clouds, in the sparks and flashes which we call lightning. I conceive that the effect of such a current would be to counteract, within its sphere, the pressure of the atmosphere, and thus to enable this fluid, in obedience to its elasticity, to rush into the rarer medium above."

Dr. Hare went on to say, that the only difference arises from the omission of the Parisian philosopher to call in the electricity of the air in aid of the electrical forces, and his assigning to a cloud the agency which Dr. Hare had attributed to a vertical blast of electrified air, mingled with every species of moveable matter coming within the grasp of the meteor; and that it would seem, from a subsequent communication made by Peltier to the Institute, that he had so entirely misapprehended Dr. Hare's theory, as to ascribe to it deficiencies for which it was not amenable, but which had existed in his own explanation, as stated in his report.

The fault of Dr. Hare's explanation was, according to him, "*en ne tenant pas compte des forces nouvelles que la première*, (that is to say, the electric attraction,) *acquiert par le mouvement gyratoire qui accompagne souvent la coulonne de nuages et d'eau qu'on appelle trombe.*"

As the most appropriate refutation of this mistatement, Dr. Hare stated that he would quote a paragraph from his Memoir.

"*When once a vertical current is established, and a vortex produced, I conceive that it may continue after the exciting cause may have ceased.*

"*The effect of a vortex in protecting a space about which it is formed, from the pressure of the fluid in which it has been induced, must be familiar to every observer. In fact, Franklin ascribed the water spout to a whirlwind.*

"*His hypothesis was, I conceive, unsatisfactory, because it did not assign any cause for the concentration of the wind, or for the hiatus presumed to be the cause. This deficiency is supplied, if my suggestions be correct.*"

On reading this passage, after previously hearing or reading the allegation above quoted, that Dr. Hare's hypothesis was defective in not appealing to a gyratory movement, it was presumed that it would be perfectly evident to every one, that, from ignorance of English, or inattention, Mr. Peltier's statement was the reverse of the reality.

In proof of a gyratory force having been exercised during the New Brunswick tornado, Dr. Hare referred to his having, in his Memoir, cited the case of a chimney, of which the upper portion had been so twisted upon the lower portion, as to have its corners projecting over the sides of the latter; but he had now taken a different view of that fact, which had since struck him as being of much higher importance than he had formerly considered it.

During an examination of the track of the tornado which lately ravaged the suburbs of New Haven, Dr. Hare had been led to infer that the electrical discharge is concentrated upon particular bodies, according to their character, or the conducting nature of the soil; so that the vertical force arising from electrical reaction, and the elasticity of the air, acts upon them with peculiar force. Hence, while some trees were borne aloft, others, which were situated very near them, on either side, remained rooted in the soil. In two instances at New Haven, wagons were especially the victims of the electro-aërial conflict. In the case of one of these, the axletree was broken, and while one wheel was carried into an adjoining field, the other was driven with so much force against the weather-boarding of a barn, as to leave both a mark of the projecting hub, and of the greater portion of the periphery. The plates of the elliptical springs were separated from each other. During the tornado at New Brunswick, the injury done to some wagons in the shop of a coach-maker, appeared, at the time, inexplicable. It was now inferred, that the four iron wheel tires, caused, by their immense conducting power, a confluence of the electric fluid, producing a transient explosive rarefaction, and a subsequent afflux of air with a local gyration of extreme violence.

It may be reasonably surmised, that the excessive injury done to trees results, not from the general whirl, but from a local gyration to

which they are subjected, in consequence of the multiplicity of points which their twigs and leaves furnish for the emission of the electrical fluid. The fact that the leaves of trees thus injured, appear afterwards as if they had been partially scorched, seems to countenance this idea. The twisting of the chimney at New Brunswick, as above mentioned, seems difficult to explain, agreeably to the idea of a general whirl throughout the whole area of the tornado track. The chances are infinitely against any chimney having its axis to coincide with that of a great whirlwind, forming a tornado; and it must be evident, that in any other position, it could only be subjected to the rotary force on one side at a time. But if this were adequate to twist the upper upon the residual portion, the former would necessarily be overthrown. Evidently, it could not be left, as was the chimney which called forth these remarks.

During the tornado at New Haven, chimneys seemed to be especially affected. One, after being lifted, was allowed to fall upon a portion of the roof of the house to which it belonged, at a distance from its previous situation too great to have been reached, had it been merely overthrown. In the case of a church which was demolished, a portion of the chimney was carried to a distance greater than it could have reached without being lifted by a vertical force.

It appeared quite consistent that chimneys should be particularly assailed, since that rarefaction, which, by operating upon the roofs of houses, carries them away, must previously cause a great rush of air through the chimney flues. But this concentration of the air must tend to facilitate the "convective"* discharge in that direction; since an electrical discharge by a blast of air, is always promoted by any mechanical peculiarities favouring an aërial current, or jet.

That during a recent tornado in France, articles were carried from the inside of a locked chamber to a distance without, when no opening existed besides that afforded by a chimney, seemed to justify the suggestion that there must be a great rush of air through such openings.†

* A "convective" discharge, or a discharge by "convection," in the very appropriate language of the celebrated Faraday, is a process by which electricity is conveyed by the transfer of electrified bodies from one excited surface to another in an opposite state. This is conceived to be a good definition of the discharge which produces a tornado.

† Dr. Hare did not conceive it proper to trespass upon the time of the Society, to make any allusion to that part of his Memoir, in which the three enormous concentric spaces occupied by the earth, the denser non-conducting atmosphere, and the rare conducting medium beyond the denser atmosphere,

Dr. Hare also made some remarks on the aurora which occurred on the third of September, in which he suggested that the electric fluid, producing the phenomena then observed, might have been derived from remote parts of space.

Stated Meeting, October 18.

Present, thirty-one members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Nova Acta Regiæ Societatis Scientiarum Upsaliensis. Vol. X. Upsala, 1832.—*From the Society.*

Mémoires publiés par la Société Royale et Centrale d'Agriculture. Année, 1838. Paris, 1838.—*From Mr. D. B. Warden.*

Extraits des Procès-Verbaux de la Société Philomathique de Paris, 1836, 1837, 1838.—*From the same.*

Académie Royale des Sciences de Turin. Classe des Sciences Physique et Mathématiques. Question de Physique, pour l'année 1841. Turin, 1839.—*From the Academy.*

Triennial Catalogue of the Theological Seminary, Andover, Massachusetts. Andover, 1839.—*From the Rev. Oliver A. Taylor.*

Report on the Magnetic Isoclinal and Isodynamic Lines in the British Islands. By Major Edward Sabine, R. A. F. R. S. London, 1839.—*From the Author.*

Allgemeines Bibligraphisches Lexikon. Von Friedrich Adolf Ebert. Leipsic, 1821.—*From Mr. John Penington.*

are represented as competent to perform a most important part in the production of electrical storms; nor did he feel at liberty to make any remarks in support of an opinion which he had recently formed, that a hurricane is a gigantic tornado. Neither had he time to cite the evidence furnished by Reid's work upon storms, in favour of a local force or gyration, like that of which he had seen proofs, arising from the New Haven tornado.

A System of Anatomy for the Use of Students of Medicine. By Caspar Wistar, M. D. With Notes and Additions by William E. Horner, M. D. Seventh Edition. By J. Pancoast, M. D. Two Vols. Philadelphia, 1839.—*From the Editor.*

A Sketch of Chinese History, Ancient and Modern. By the Rev. Charles Gutzlaff. Two Vols. New York, 1834.—*From Mr. John Vaughan.*

Catalogue of the Library of the Theological Seminary in Andover, Massachusetts. By Oliver A. Taylor, M. A. Andover, 1838.—*From the Trustees of the Seminary.*

Rapport sur les travaux dans la vue de déterminer la marche du temps dans les principales localités du Royaume de Belgique, par A. Quetelet, Directeur de l'Observatoire de Bruxelles. Brussels, 1839.—*From the Author.*

Synopsis Reptilium Sardiniæ Indigenorum. Auctore Josepho Géné. Turin, 1839.—*From the Author.*

Osservazioni Mineralogiche e Geologiche per servire alla Formazione della Carta Geologica del Piemonte di Angelo Sismonda. Turin, 1839—*From Prof. A. D. Bache.*

Historical Account of Massachusetts Currency. By Joseph B. Felt. Boston, 1839.—*From Mr. T. L. Winthrop.*

Institut Royal de France. Funérailles de M. Langlois. Discours de M. Le Bas. Paris, 1839.—*From Mr. D. B. Warden.*

Institut Royal de France. Académie Française. Translation des Restes de la Harpe. Discours de M. Tissot. Paris, 1839.—*From the same.*

L'Echo du Monde Savant. Nos. 450 and 451. Paris, 1839.—*From the same.*

Description d'un Colorimètre a Double Lunette, par M. Collardeau. Paris, 1839.—*From the same.*

Discours de M. le Baron Thénard, a l'occasion des récompenses décernées le 28 Juillet, 1839. Paris, 1839.—*From the same.*

Description d'un nouveau Procédé pour prévenir les Explosions des Chaudières à Vapeur. Par M. Félix Passot. Paris.—*From the same.*

Filtrations Publiques. Réponse aux Détracteurs du Système Fonvielle. Paris, 1839.—*From the same.*

Notice sur les Embaumements, procédés de M. Gannal. Paris.—*From the same.*

Ostéographie ou Description Iconographique Comparée du Squelette et

du Système Dentaire des cinq Classes d'Animaux vertébrés récents et fossiles. Par M. H. M. Ducrotay de Blainville. (Prospectus.) Paris, 1839.—*From the same.*

Note sur l'Origine de nos Chiffres et sur l'Abacus des Pythagoriciens. Par. A. J. H. Vincent. Paris.—*From the same.*

Compte Rendu des travaux de la Société Royale et Centrale d'Agriculture. Année 1837–38. Par M. Soulange Bodin. Paris, 1838. *From the same.*

Histoire de l'Introduction et de la Propagation des Mérinos en France; ouvrage posthume de M. Tessier. Paris, 1839.—*From the same.*

Question des Sucres. Nouvelles Considérations. Par C. J. A. Mathieu de Dombasle. Paris, 1838.—*From the same.*

Société Royale et centrale d'Agriculture. Rapport sur le Concours pour les Ouvrages, Mémoires et Observations de Médécine Vétérinaire pratiques. M. Girard, rapporteur. Paris.—*From the same.*

Pamphlets relating to Agriculture and on Miscellaneous Subjects, (in French and English.) Paris.—*From the same.*

The National Portrait Gallery of Distinguished Americans. Part XLII. Biography of Charles Cotesworth Pinckney. Philadelphia, 1839.—*From the Author.*

Third Specimen of a New Method of Printing Music for the Blind, invented by M. Snider. Philadelphia, 1839.—*From the Inventor.*

Legenda Svecana Vetusta S. Magni Comitis Orcadensium. Upsala. *From President John Henry Schröder.*

Numi Ducum Reipublicae Venetae in Numophylacio Academico Upsaliensi. Upsala.—*From the same.*

Mahmud Schebisteri's Rosenflor des Geheimnisses. Persisch und Deutsch. Von Hammer-Purgstall. Pest, 1838.—*From the Author.*

Hindustani Atlas.—*From the Rev. J. P. Eagles.*

Biblical Apparatus, in four Parts: Designed to Assist in the Correction of Present, and the Preparation of Future Versions of the Sacred Scriptures. By the Rev. W. Yates. (Prospectus.) Calcutta, 1837.—*From the same.*

Jahrbücher der Literatur. Nos. 81 to 84, inclusive. Vienna, 1838.—*From Baron Von Hammer-Purgstall.*

Chinese Magazine. Edited by the Rev. Charles Gutzlaff. (Chinese.) Nos. 6 to 9, inclusive.—*From the Editor.*

The American Medical Library and Intelligencer. By Robley Dunglison, M.D. Nos. 11 to 14 Philadelphia, 1839.—*From the Editor.*

Specimen of the Transfer Process invented by Joseph Dixon of Taunton, Massachusetts. Boston, 1839.—*From the Author.*

Mr. S. C. Walker, in behalf of the Committee on the paper entitled, "Astronomical Observations made at Hudson Observatory, &c. by Elias Loomis, Professor of Nat. Philos., &c. in the Western Reserve College, Hudson, Ohio," made the following report:—

The memoir of Prof. Loomis contains a description of the Hudson Observatory, erected at the expense of the Western Reserve College, at Hudson, Ohio. The building consists of a central portion, fifteen feet square upon the inside. From a circular platform of ten feet diameter, rise twelve small cherry columns, that sustain a hemispheric dome of nine feet internal diameter, covering a five and a half feet equatorial of 3.8 inches aperture, by Simms. The dome rotates on ten lignumvitæ wheels of five inches diameter. The equatorial rests on an insulated pier, descending six feet below the surface of the ground, and rising three feet above the platform, which is, itself, about six feet above the surface of the ground.

The eastern wing is ten feet by twelve, and seven and a half feet high, and covers a Simms' transit circle of eighteen inches diameter, graduated on platinum to 5′, and reading to single seconds by three Troughton's microscopes. The telescope has a focal length of thirty inches and an aperture of 2.7 inches. The transit circle, and a clock by Molyneux are each mounted on separate insulated piers. The western wing contains no instruments; but serves for a lodging-room, computing-room, &c.

Prof. Loomis gives the following results for the latitude of the Hudson Observatory.

By u. c. Polaris,	Aug. 8,	Latitude	41°	14′	39.″8
	„ 10,				36.7
	„ 13,				36.8
	„ 14,				37.8
	„ 15,				40.8
	„ 17,				36.6
		mean	41	14	38.1

By u. c. δ ursæ minoris, Aug. 13, Latitude		41°	14′	35.″1
„ 17,				36.2
	mean	41	14	35.7

From which he concludes that the latitude is 41° 14′ 37.″ nearly.

The paper contains a series of fifty moon culminations, one eclipse, and six occultations, observed in 1838 and 1839. These furnish data for determining the longitude of the Hudson Observatory when corresponding European and American observations shall have been obtained. Prof. Loomis gives for the approximate longitude $5h\ 25m\ 42s$. It may be proper to add, that one of the undersigned, S. C. Walker, having reduced the six occultations contained in this paper, and compared them with four corresponding observations at the Philadelphia Observatory, four at the Dorchester Observatory, two at Mr. Paine's House, Boston, and one at Princeton College, New Jersey, finds for the longitude of the Hudson Observatory, $5h\ 25m\ 47s$.

The instruments for this observatory were selected by Professor Loomis during his late journey in Europe. This economical establishment appears to be more complete than any of the kind now known to be in operation in the United States, and the Committee cordially recommend the example of the Western Reserve College, as worthy of being followed by those Universities which are desirous, at moderate expense, of inculcating practical astronomy, of making observations highly useful for geographical purposes, and of prosecuting interesting researches connected with the progress and advancement of astronomy.

The Committee recommend the paper for publication.

Sears C. Walker,
R. M. Patterson,
Geo. M. Justice,
Committee.

The recommendation in favour of publication, was adopted.

Dr. Bache, on behalf of the Committee on Dr. Hare's paper, entitled "On the extrication of Barium, Strontium and Calcium," reported in favour of publication in the Society's Transactions, which was ordered accordingly.

In this paper Dr. Hare first calls attention to the following phenomenon observed by him almost twelve years since, and published.

When the circuit in a galvanic battery, the deflagrator of the author, was completed through a saturated solution of chloride of calcium, the anode being formed by a coarse, and the cathode by a fine platinum wire, the latter was rapidly fused, while, when the situation of the wires was reversed, the ignition was comparatively feeble. It having occurred, some months since, to Dr. Hare, that this phenomenon might be due to the evolution and combustion of calcium at the cathode, he proceeded to apply a galvanic deflagrator of three hundred and fifty pairs of plates, in the process of Berzelius and Pontin, for preparing the amalgams of the metallic radicals of the earths. The author gives a sketch of the present state of our knowledge in relation to the metallic bases of the alkaline earths, as derived from the experiments of Davy; adding his own observations, in confirmation of the declaration of Davy, that the substances obtained by him from baryta and strontia, were amalgams of their metallic bases, and not the bases themselves; and, further, that the process employed for obtaining calcium, by Davy, was really incompetent to effect the desired result. He then proceeds to describe the peculiar apparatus by which amalgams of barium, strontium and calcium were procured; the chlorides of the respective alkaline radicals being exposed to galvanic action, the cathode being mercury, and the anode a coil of platinum wire. The details of the apparatus cannot be properly understood without the figure which accompanies Dr. Hare's communication: its chief peculiarities are the following: 1st. It furnishes the means of keeping the mercury, forming the cathode, at a temperature nearly as low as 32° Fah. 2d. It prevents exposure of the amalgam of the radical, to the direct action of the chlorine from the chloride used. 3d. The alternate and successive, or the simultaneous action of two galvanic deflagrators, was conveniently obtained.

Dr. Hare states, that after operating with a series of two hundred pairs of plates of one hundred square inches each, for twenty minutes, unaided by these improvements, he had found the proportion of calcium to be but one six-hundredth part of the amalgamated mass.

An apparatus for distilling the amalgam is also described and figured in Dr. Hare's memoir. It consists of an iron alembic, connected with a glass receiver, and an adopter communicating with a reservoir of hydrogen, and containing chloride of calcium and quicklime. Within the alembic, an iron crucible, containing the amalgam, was placed, the crucible being closed by a capsule, in which was a portion of caoutchoucine, and by its cover. Naphtha was poured into

the alembic. The air from the apparatus was expelled by hydrogen, desiccated by passing through the chloride of calcium and quick-lime in the adopter. The distillation was conducted by applying heat principally to the upper part of the amalgam, to prevent an explosive ebullition. The mercury being distilled off, which requires a bright red heat in expelling the last portions, the metallic radical remained in the crucible.

The metals oxidize rapidly in water; are brittle, fixed, and require a good red heat for fusion. They sink in sulphuric acid. By keeping in naphtha, they acquire a coating which renders them less active when exposed to water.

Dr. Hare attempted to separate the mercury from the amalgams when solidified by the use of solid carbonic acid, by straining them through leather, but the result did not answer his expectations.

By using solid carbonic acid and hydric (sulphuric) ether, Dr. Hare solidified a mass of the amalgam of ammonium. He considers that in this case a portion of ether combines with the alloy, without impairing its metallic character.

Professor Bache, Reporter, informed the Society, that No. 7 of the Society's Proceedings, was now printed.

Professor Bache, in behalf of Professor Alexander, of Princeton, made a verbal communication of a description of the aurora borealis, of September 3d, 1839, as it appeared at Princeton.

At about ten or fifteen minutes past eight, P. M. an ill-defined, but considerably bright light was seen to extend for some distance above the horizon, in a direction nearly due east; it was similar, in intensity and appearance, to a lunar twilight. Soon after this, a continuous arch or zone of light was manifest, extending from the same spot to the opposite, or nearly opposite portion of the western horizon. This soon separated into two parts,* and, after a short interval, beams of light shot up from the eastern portion of the arch, which were speedily multiplied in every direction around the observer, except within about thirty degrees of the *true* (or, it might be, *magnetic*) south.

A corona was soon formed, which was at first quite indistinct, and was not continuous for any great length of time, during the existence

* Two arches, it is believed, were at this time formed, and either separated throughout their entire extent, or united only near their extremities; but this my notes do not explicitly state.

of the aurora, except at the period of its greatest brilliancy. At about twenty minutes past eight, this corona was situated in a line with, and about midway between α Aquilæ and α Lyræ. This may be considered as a very tolerable approximation to its position, though, from the apparent intersection, or, as it might almost be termed, interweaving of the beams which composed it, it was not often easy to fix upon the place of its centre with much precision, if indeed that which seemed its centre, did not really change its place; since, at times, it seemed to occupy a position very sensibly lower than that which the preceding observation would indicate.

At about half past eight, the appearance of the aurora was superb. The radiations which extended from the corona, nearly reached the horizon in every direction, with the exception of those which tended toward the southern space beforementioned, which, it is believed, was even at this time bounded by something like an arch, that was convex toward the zenith. The aurora was often party-coloured; frequently of a rose-red, especially in spots, in that portion of the sky which might be supposed to be near the plane of the dipping needle; and also about the centre of the corona. It was in the part of the heavens here described, that the arch of greatest intensity could most commonly, if not uniformly, be traced: though the crown of it frequently faded away, or became excessively faint.

Between the spots, of red light, or beams of the same tint, others were observed, which, either from the effect of the first mentioned colour, or something peculiar to themselves, appeared of a colour approaching to a bottle-green.

At times, again, when the corona was deficient, the appearance of what remained on each side of the vacant spot, was not unlike that of two immense comets; their heads some small distance asunder, and their tails turned eastward and westward.

The light of the corona, when most perfect, was quite dense, not only at the central point, but also near to what seemed to be the outer limits of its radiations, at which the tint commonly exhibited the nearest approach to white.

Two meteors or shooting stars were seen, which in both cases ***appeared*** to pass ***between*** the aurora and the eye of the observer; one nearly in the direction of the arch of greatest intensity, and the other almost perpendicular to it. The precise times of their appearance were not noted, though they fell within that period in which the phenomena already described were exhibited.

The corona formed again at nine; and, though again broken, was imperfectly visible after that time.

At half past nine, the eastern portion of the sky became tinted with intense red and green; but at half past ten, little else remained than the appearance of bright horizontal beams of a white colour in the north.

If it be admitted that the centre of the aurora was precisely midway between α Aquilæ and α Lyræ, at twenty minutes past eight, its azimuth must have been 1° 14′ 42″ E. of S., and its altitude 73° 27′ 6″; the latitude of the observer being 40° 20′ 47″ N. The point thus designated, would be very nearly in the direction of the dipping needle; the dip being, by observation, 72° 47′ 6″ (72° 47.1′) and the variation (though not accurately determined,) some 4° W. or that of the S. end of the needle, of course, the same extent to the east. The degrees of azimuth, reckoned on a parallel to the horizon at an altitude of 72° and more, being small, the deviation from the direction of the dipping needle, measured on the arc of a great circle, would be scarcely more than 1° towards the N. W.

Professor Bache stated that his own observations near Philadelphia, of the altitude of the apparent converging point of the auroral beams, at nine, P. M. made it but about 69°. He had witnessed a case of the appearance of a dark spot of irregular shape, between two beams of light, which was certainly not a cloud, as the stars were not at all obscured by it, and which he supposed to be the phenomenon referred to recently by Professor Lloyd. No mottled clouds, such as usually attend the aurora, were visible during the period between nine and ten o'clock, when he had been able to observe. Professor Bache stated that he did not place much stress upon his measurements, as he had been prevented from sustained observation by indisposition. There had been, in the newspapers, an account of an auroral display visible at London, on the morning of the fourth of September, at about the same absolute time as at Princeton, according to Professor Alexander's observations. It was said to have been accompanied by a very unusual number of shooting stars, compared in one statement to the splendid display of November 13th, 1833.

Professor Henry had examined the light of this aurora by the polariscopes of Savart and Arago, but had not been able to detect the slightest trace of polarization.

The following extract from a letter, addressed by Professor Henry, of Princeton, to Professor Bache, was read, announc-

ing the discovery of two distinct kinds of dynamic induction, by a galvanic current.

"Since the publication of my last paper, I have received through the kindness of Dr. Faraday, a copy of his fourteenth series of experimental researches; and in this I was surprised to find a statement directly in opposition to one of the principal results given in my paper. It is stated in substance, in the 59th paragraph of my last communication to the American Philosophical Society, that when a plate of metal is interposed between a galvanic current and a conductor, the secondary shock is neutralized. Dr. Faraday finds, on the contrary, under apparently the same circumstances, that no effect is produced by the interposition of the metal. As the fact mentioned forms a very important part of my paper, and is connected with nearly all the phenomena described subsequently to it, I was anxious to investigate the cause of the discrepancy between the results obtained by Dr. Faraday and those found by myself. My experiments were on such a scale, and the results so decided, that there could be no room for doubt as to their character; a secondary current of such intensity as to paralize the arms having been so neutralized, by the interposition of a plate and riband of metal, as not to be perceptible through the tongue. I was led by a little reflection to conclude that there might exist a case of induction similar to that of magnetism, in which no neutralization would take place; and I thought it possible that Dr. Faraday's results might have been derived from this. I have now, however, found a solution to the difficulty in the remarkable fact, that an electrical current from a galvanic battery exerts *two* distinct kinds of dynamic induction: one of these produces, by means of a helix of long wire, intense secondary shocks at the moment of breaking the contact, and feeble shocks at the moment of making the contact. This kind of induction is capable, also, of being neutralized by the interposition of a plate of metal between the two conductors. The other kind of induction is produced at the same time from the same arrangement, and does not give shocks, but affects the needle of the galvanometer; it is of equal energy at the moment of making contact, and of breaking contact, and is not affected by the introduction of a plate of copper or zinc between the conductors.* The phenomena produced by the first

* Since writing the account of the two kinds of induction, I have found that the second kind, although not screened by a plate of copper or zinc, is affected by the introduction of a plate of iron. In the cases of the first kind of induction, iron acts as any other metal.

kind of induction form the subject of my last paper as well as that of the one before; while it would appear from the arrangement of Dr. Faraday's experiments, that the results detailed in his first series, and those in the fourteenth, were principally produced by the second kind of induction. Although I may be too sanguine in reference to the results of this discovery, yet I cannot refrain from adding that it appears to lead to a separation of the electrical induction of a galvanic current from the magnetical, and that it is a step of some importance towards a more precise knowledge of the phenomena of magneto-electricity."

Dr. Bache announced the death of William Sullivan, Esq., late a member of the Society, and Dr. Hare was requested to prepare an obituary notice of the deceased.

The following gentlemen were duly elected members of the Society:—

Thomas U. Walter, of Philadelphia.
John Penington, of Philadelphia.
Eugene A. Vail, of Paris.
Charles Rümker, of Hamburgh.
Charles Gutzlaff, of Macao.
John Washington, Captain R. B. N.
Elias Loomis, of the Western Reserve College, Ohio.
Stephen Alexander, of Princeton College, N. J.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. I. NOVEMBER & DECEMBER, 1839. No. 9.

Stated Meeting, November 1.

Present, twenty-two members.

Mr. DU PONCEAU, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Astronomical Observations, made at the Royal Observatory, Edinburgh. By Thomas Henderson, F.R.S.E., &c. Vol. II. For the year 1836. Edinburgh, 1839.—*From the Royal Society of London.*

Nieuwe Verhandelingen der Eerste Klasse van het Koninklijk-Nederlandsche Instituut van Wetenschappen, Letterkunde en Schoone Kunsten te Amsterdam. Vols. I. to V. inclusive. Amsterdam, 1827 to 1836. *From the Royal Institute.*

Proceedings and Debates of the Convention of the Commonwealth of Pennsylvania, to propose Amendments to the Constitution, commenced and held at Harrisburg, on the second of May, 1837. Thirteen Volumes. Harrisburg, 1837 to 1839.—*From Mr. C. J. Ingersoll.*

Journal of the Convention of the State of Pennsylvania, to propose Amendments to the Constitution, commenced and held at the state capitol in Harrisburg, on the second of May, 1837. Two Vols. Harrisburg, 1837, and Philadelphia, 1838.—*From the same.*

Third Annual Report on the Geology of the State of Maine. By Charles T. Jackson, M. D. Augusta, 1839.—*From Mr. John Sergeant.*

Reports on the Ichthyology and Herpetology of Massachusetts. By D. Humphreys Storer, M. D.—*From the Author.*

Carte Générale de l'Empire d'Allemagne, par M. Chauchard. Paris, 1791.—*From Mr. Du Ponceau.*

Carte de la Partie Septentrionale de l'Italie, par M. Chauchard. Paris, 1791.—*From the same.*

Renati Descartes Principia Philosophiæ. Amsterdam, 1692.—*From Mr. William Kintzing.*

Friderici Wilhelmi Pestel Commentarii de Republicâ Batavâ. Leyden, 1782.—*From Mr. John Vaughan.*

Meteorological Essays and Observations. By J. Frederic Daniell, F.R.S. London, 1827.—*From the same.*

New Remedies: the Method of preparing and administering them; their Effects on the healthy and diseased Economy, &c. By Robley Dunglison, M. D. Philadelphia, 1839.—*From the Author.*

The Select Medical Library. Six Volumes. Philadelphia, 1838 and 1839.—*From the Editor.*

The Eclectic Journal of Medicine. Edited by John Bell, M. D. Vol. III. Philadelphia, 1839.—*From the Editor.*

The American Journal of Science and Arts. Conducted by Benjamin Silliman, M. D., LL. D., aided by Benjamin Silliman, jr., A.B. Vol. XXXVII. Nos. 1 and 2. For July and October. New Haven, 1839.—*From the Conductors.*

A letter was read from the Secretary of the Geographical Society of Paris, announcing the purpose of that society to form a Geographical Museum, and inviting contributions from the members of this society.

The Committee, consisting of Dr. Bache, Dr. Patterson and Mr. Booth, to whom the paper of Doctor Hare, read at the last meeting of the society, was referred, entitled, "Description of an Apparatus for deflagrating carburets, phosphurets, or cyanides, in vacuo, or in an atmosphere of hydrogen, between electrodes of charcoal; with an account of the results obtained by these and other means, especially the isolation of calcium, and formation of a new fulminating compound. By R. Hare, M. D., Professor of Chemistry in the University of Pennsylvania," reported in favour of publication in the Society's Transactions. The publication was ordered accordingly.

The apparatus is of a convenient construction for the purposes designated in the title of the paper. The lower electrode or cathode is a parallelopipedon of charcoal, on which the body is placed, to be subjected to the influence of one or more batteries; and tubes, with valve-cocks, communicating with an air-pump, a barometer-gauge, and a reservoir of hydrogen, open into the interior of a ground plate, on which a bell-glass is fitted, air tight. In the experiments of the author, an equivalent of lime was heated with one equivalent and a half of bicyanide of mercury, in a porcelain crucible, enclosed in the alembic made for this purpose, and described in a former paper. (See p. 131 of these Proceedings.) The weight of the residue was such as would result from the union of an equivalent of calcium with an equivalent of cyanogen. This was then subjected to galvanic action on the cathode of the apparatus, the anode being brought in contact with it, and the result was the production of masses on the charcoal, having a metallic appearance.

Phosphuret of calcium, exposed in the same manner, in the galvanic circuit, left pulverulent matter which effervesced in water, and, when rubbed on porcelain, appeared to contain metallic spangles, which were rapidly oxidized in the air.

In one experiment, particles of charcoal, apparently fused or resembling plumbago, dropped from the anode.

After heating lime with bicyanide of mercury, the mass was dissolved in acetic acid, in which nitrate of mercury produced a copious white precipitate, that detonated under the hammer like fulminating silver.

Doctor Coates announced the formation of the Pathological Society of this City, and adverted to some of its labours.

Doctor Hare made some observations on the method of obtaining oxygen from nitre.

He stated that the usual opinion of chemists, that the residuum is a hyponitrite in case the process is stopped during the extrication of pure oxygen, is erroneous; as he found that it always contained, under these circumstances, a considerable portion of undecomposed nitre. If the heat was pushed in order fully to change the nitre into hyponitrite, there was always an extrication of nitrogen.

Stated Meeting, November 15.

Present, twenty-nine members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

The Journal of the Royal Asiatic Society of Great Britain and Ireland. Vol. V. No. 10. London, 1839.—*From the Society.*

Journal of the House of Representatives of Pennsylvania. Session of 1838–39. Three Volumes. Harrisburg, 1838–39.—*From the State of Pennsylvania.*

Journal of the Senate of Pennsylvania. Session of 1838–39. Two Volumes, with an Appendix in one Volume. Harrisburg, 1838–39.—*From the same.*

Report of the State Treasurer, showing the Receipts and Expenditures at the Treasury of Pennsylvania, from the first day of November, 1837, to the thirty-first day of October, 1838. Harrisburg, 1838.—*From the same.*

Obras Completas de Luis de Camões, correctas e emendadas pelo cuidado e diligencia de J. V. Barreto Feio e J. G. Monteiro. Three Volumes. Hamburg, 1834.—*From Mr. E. F. França, Minister from Brazil.*

Storia dei Progetti e delle Opere per la Navigazione-Interna del Milanese di Giuseppe Bruschetti. Two Volumes. Milan, 1830.—*From Mr. Lewis Tinelli.*

Catalogo delle Opere più o meno estese in otto diverse Lingue pubblicate dal Conte Cavaliere Jacopo Grâberg da Hemsö. Florence, 1837.—*From the Author.*

Various Tracts relating to the Inhabitants, Geography, Agriculture, and Commerce of Marocco, Algiers, Tripoli, and Tuscany, by Count Jacob Graberg da Hemsö.—*From the Author.*

Memoria sulla Scoperta dell'America nel Secolo Decimo dettata in Lingua Danese da Carlo Cristino Rafn e tradotta da Jacopo Grâberg da Hemsö. Pisa, 1839.—*From the Translator.*

L'Hivernage des Hollandais à la Nouvelle-Zemble, 1596, 1597, traduit de Tollens, par Auguste Clavareau. Maestricht, 1839.—*From M. Martini, Minister from Holland.*

Caspipina's Letters, to which are added the Life and Character of William Penn. By the Rev. Jacob Duché. Two Volumes. Bath, 1777.—*From Mr. Du Ponceau.*

Conjugation of the Verb "to hear," in its various forms in the Chippeway Language, by Dr. Edwin James, of Albany.—*From the same.*

Coleccion de los Tratados de Paz, Alianza, Comercio etc. ajustados por la Corona de España con las Potencias Estrangeras desde el Reynado del Señor Don Felipe Quinto hasta el Presente. Three Volumes. Madrid, 1796 to 1801.—*From the same.*

Translation of a Comparative Vocabulary of the Chinese, Corean, and Japanese Languages. Batavia, 1835.—*From Mr. W. H. Medhurst.*

An English and Japanese, and Japanese and English Vocabulary. Compiled from Native Works, by W. H. Medhurst. Batavia, 1830.—*From the same.*

Chinese Testament.—*From the same.*

Three Missionary Malay Tracts.—*From the Rev. Charles Gutzlaff.*

The Proceedings relative to calling the Conventions of 1776 and 1790. The Minutes of the Convention that formed the present Constitution of Pennsylvania, together with the Charter to William Penn, the Constitutions of 1776 and 1790, and a View of the Proceedings of the Convention of 1776, and the Council of Censors. Harrisburg, 1825.—*From Mr. John Vaughan.*

Enactments by the Rector and Visiters of the University of Virginia. Charlottesville, 1825.—*From Dr. Dunglison.*

Annales des Mines, ou Recueil de Mémoires sur l'Exploitation des Mines. Troisième série. Vol. XV. No. 2, for 1839. Paris, 1839.—*From the Council of Mines.*

The American Journal of the Medical Sciences. Edited by Isaac Hays, M. D. No. XLIX, for November, 1839. Philadelphia, 1839.—*From the Editor.*

The committee, consisting of Dr. Patterson, Mr. Justice, and Prof. A. D. Bache, on Mr. E. Otis Kendall's paper, read November 1, and entitled "On the longitude of several places in the United States, as deduced from the observations of the Solar Eclipse of September 18th, 1838. By E. Otis Kendall, Professor of Mathematics in the Central High School of Philadelphia," reported in favour of publication in the Society's

Transactions. The publication was ordered accordingly. The following abstract of the paper was contained in the report of the committee.

The paper contains the reductions of all the observations of the Annular Eclipse of the Sun, September 18th, 1838, yet reported to the Society: together with those of Mr. Hallowell at Alexandria, D.C.; of Messrs. Olmsted, Mason and Smith, at New Haven; and of Mr. J. Blickensderfer, jr. of Dover, Tuscarawas county, Ohio. The computations were made after Bessel's method.

The corrections of the elements in the Nautical Almanac as derived from eight equations of condition, from the durations of the ring, and twelve from that of the eclipse, were

$\epsilon = -14.''782$ = correction of moon's place on true orbit.
$\zeta = -7.''310$ = correction of do. on a secondary to do.
$\eta = -3.''198$ = correction of sum of semi-diameters.
$\eta' = +0.''515$ = correction of difference of do.

In which η and η' refer to Burckhardt's semidiameter of the moon and Bessel's semidiameter of the sun. The value of ϵ is obtained by assuming the longitude of the State House, Philadelphia, to be 5h 0m 39s, west of Greenwich. After applying these corrections of the elements, Mr. Kendall deduces the following longitudes of the places of observation.

The constant value of a was 2.2035 whence, $a\epsilon = -32\text{s}.571$. The values in the last column are, calling d' the resulting longitude, not corrected for the errors of the tables.

$d = d' + a\epsilon + b\zeta + c\eta$ for beginning or end.
$d = d' + a\epsilon + b\zeta + c\eta'$ for the annular phase.

Place of Observation.	Mean Time of Observation.	b	c	Longitude + East — West from Greenwich.
	h m s			h m s
Western Reserve College, Hudson, Ohio,	B. 2 38 17.02	−0.355	+2.332	−5 25 40.70
Dover, Tuscarawas County, Ohio,	B. 2 39 38.82	−0.372	+2.235	−5 25 52.71
	F. R. 4 0 25.71	−0.848	+2.361	45.44
	R. R. 4 6 9.63	+0.302	−2.224	59.60
	E. 5 18 3.64	−0.151	−2.209	59.45
Alexandria, D. C.	B. 3 5 52.00	−0.298	+2.223	−5 8 24.44
	F. R. 4 24 6.00	−0.093	+2.205	29.16
	R. R. 4 30 13.00	−0.345	−2.229	16.46
	E. 5 39 25.00	−0.131	−2.208	38.79
Washington Capitol,	B. 3 6 9.23	−0.294	+2.223	−5 8 3.25
	F. R. 4 24 27.61	−0.014	+2.204	2.72
	R. R. 4 30 18.05	−0.405	−2.240	2.73
	E. 5 39 54.76	−0.134	−2.208	1.96
Haverford School, Pa.	B. 3 12 17.59	−0.231	+2.216	−5 1 12.03
	F. R. 4 30 20.63	+1.412	+2.617	13.98
	R. R. 4 34 44.80	−1.961	−2.949	13.71
	E. 5 44 28.24	−0.165	−2.210	17.73
Philadelphia State House,	B. 3 13 10.06	−0.229	+2.215	−5 0 37.79
	F. R. 4 31 18.76	+1.420	+2.621	38.72
	R. R. 4 35 31.35	−1.965	−2.952	40.16
	E. 5 45 15.46	−0.164	−2.210	39.32
Germantown, Pa.	B. 3 12 54.90	−0.228	+2.215	−5 0 40.99
	F. R. 4 31 8.90	+1.501	+2.665	40.75
	R. R. 4 35 18.40	−2.070	−3.023	38.83
	E. 5 45 7.90	−0.166	−2.210	36.06
Burlington, N. J.	B. 3 14 23.70	−0.220	+2.214	−4 59 24.69
	F. R. 4 32 32.60	+1.743	+2.810	28.99
	R. R. 4 36 19.60	−2.350	−3.222	29.55
	E. 5 46 8.50	−0.168	−2.210	30.35
Princeton, N. J.	B. 3 14 43.01	−0.167	+2.213	−4 58 43.69
	F. R. 4 33 11.27	+2.245	+3.146	43.68
	E. 5 46 38.89	−0.174	−2.210	30.70
Weasel Mountain, N. J.	B. 3 15 56.98	−0.189	+2.211	−4 56 46.75
	F. R. 4 35 57.09	+6.875	+7.220	48.26
	R. R. 4 35 58.09	−6.912	−7.255	49.10
	E. 5 47 13.10	−0.187	−2.213	51.34
Brooklyn, N. Y.	B. 3 17 18.80	−0.189	+2.211	−4 56 0.02
	F. R. 4 36 47.30	+5.329	+5.766	0.80
	E. 5 48 23.63	−0.184	−2.211	2.31
New Haven,	B. 3 21 14.47	−0.155	+2.209	−4 51 47.65
	E. 5 51 17.00	−0.199	−2.213	56.82
Southwick, Mass.	B. 3 20 19.00	−0.139	+2.208	−4 51 16.92
	E. 5 50 27.00	−0.215	−2.214	20.16
Wesleyan University, Conn.	B. 3 22 0.81	−0.145	+2.208	−4 50 43.62
	E. 5 52 1.46	−0.205	−2.213	41.73
Williamstown College, Mass.	B. 3 17 19.90	−0.132	+2.206	−4 52 26.93
Dorchester Observatory,	B. 3 28 10.90	−0.099	+2.206	−4 44 22.76

The Committee, consisting of Prof. A. D. Bache, Dr. Patterson, and Mr. Walker, on Prof. Loomis's paper, read October 18th, and entitled "Additional Observations of the Magnetic Dip in the United States, by Elias Loomis, Prof. of Mathematics and Natural Philosophy in Western Reserve College," reported in favour of publication in the Transactions of the Society. The publication was ordered accordingly. The following abstract was given in the report of the Committee.

The paper of Prof. Loomis contains the result of his observations of the magnetic dip at twenty-two places in the United States. The stations, with the latitude and longitude of each, the date of the observations for dip, and the determinations resulting from them, are as follows: 1. Hudson, Ohio, lat. 41° 15′ N., long. 5h. 21m. W., August 16th and 19th, 1839, A. M. Dip 72° 48′.4. Buffalo, New York, lat. 42° 53′ N., long. 5h. 16m. W., August 31st, A. M. Dip 74° 40′.8. Oswego, New York, lat. 43° 26′ N., long. 5h. 6m. W., September 1st, A. M. Dip 75° 11′.3. Syracuse, New York, lat. 43° N., long. 5h. 5m. W., September 2d, A. M. Dip 74° 50′.9. Utica, New York, lat. 43° 9′ N., long. 5h. 1m. W., September 3d, P. M. Dip 74° 57′.2. Schenectady, New York, lat. 42° 48′ N., long. 4h. 56m. W., September 4th, P. M. Dip 74° 36′.1. Albany, New York, lat. 42° 39′ N., long. 4h. 55m. W., September 4th, noon. Dip 74° 51′.3. West Point, New York, lat. 41° 25′ N., long. 4h. 56m. W., September 5th, P. M. Dip 73° 27′.4. New York City, lat. 40° 43′ N., long. 4h. 56m. W., September 9th, A. M. Dip 72° 52′.2. New Haven, Connecticut, lat. 41° 18′ N., long. 4h. 52m. W., September 11th, A. M. Dip 73° 26′.7. Hartford, Connecticut, lat. 41° 46′ N., long. 4h. 51m. W., September 13th, A. M. Dip 73° 58′.1. Springfield, Massachusetts, lat. 42° 6′ N., long. 8h. 50m. W., September 14th, A. M. Dip 74° 06′.9. Longmeadow, Massachusetts, lat. 42° 2′ N., long. 4h. 50m. W., September 14th, P. M., 74° 05′.3. Worcester, Massachusetts, lat. 42° 16′ N., long. 4h. 47m. W., September 16th, P. M. Dip 74° 20′ .6. Cambridge, Massachusetts, lat. 42° 22′ N., long. 4h. 44m. W., September 17th, P. M. Dip 74° 20′.1. Providence, Rhode Island, lat. 41° 50′ N., long. 4h. 46m. W., September 19th, P. M., 73° 59′.6. Princeton, New Jersey, lat. 40° 22′ N., long. 4h. 58m. W., September 21st, A. M. Dip 72° 47′.1. Philadelphia, Pennsylvania, lat. 39° 57′ N., long. 5h.

1m. W., September 23d, A. M. Dip 72° 7′.1. Baltimore, Maryland, lat. 39° 17′ N., long. 5h. 7m. W., September 25th, A. M. Dip 71° 50′.3. Washington City, lat. 38° 53′ N., long. 5h. 8m. W., September 25th, P. M. Dip 71° 21′.4. Pittsburgh, Pennsylvania, lat. 40° 32′ N., long. 5h. 20m. W., September 30th, A. M. Dip 72° 38′.9. Beaver, Pennsylvania, lat. 40° 44′ N., long. 5h. 22m. W., October 1st, A. M. Dip 72° 40′.3. Hudson, Ohio, lat. 41° 15′ N., long. 5h. 26m. W., October 7th, P. M. Dip (observations repeated) 72° 45′.9.

These observations were made with the instrument by Gambey, with which the results contained in Prof. Loomis's former paper were obtained. The series is the most extensive yet made in the United States, with which the Committee are acquainted.

The Committee, consisting of Dr. Hare, Dr. Bache, and Mr. Booth, on a paper entitled "On a new compound of deutochloride of platinum, nitric oxide, and hydrochloric acid; by Henry D. Rogers, Professor of Geology in the University of Pennsylvania, and Martin H. Boyè, Graduate of the University of Copenhagen," reported in favour of publication in the Transactions of the Society. The publication was ordered accordingly.

This substance is procured by dissolving platinum in an excess of nitromuriatic acid, and evaporating nearly to dryness; after which it is treated with aqua regia, freshly prepared, from concentrated hydrochloric and nitric acids. A little water is afterwards added, drop by drop, just sufficient to keep the chloride of platinum dissolved, when the compound will remain in the form of a gamboge yellow powder. It is then separated by decanting and filtering, and pressed between the folds of bibulous paper, and dried *in vacuo* over sulphuric acid.

The precipitate is a yellow, minutely crystalline powder, which absorbs water with great avidity. It may be preserved, without decomposition, in dry air, or *in vacuo*. It is decomposed by water, alcohol, &c., with extrication of nitric oxide, chloride of platinum remaining in solution. A concentrated solution of chloride of platinum has, however, no action on it. Heated in an atmosphere of hydrogen, it gives off a large amount of chloride of ammonium, leaving a residuum of metallic platinum.

Analysis.—The salt analysed, was prepared and kept in the man-

ner described. Heated to the temperature of 212° F., it does not part with any of its water of combination. For estimating the amount of platinum and chlorine, the salt was fused with carbonate of potassa, &c., and the platinum, thus obtained, weighed by itself, and the chlorine precipitated from the solution by nitrate of silver.

The quantity of nitric oxide was determined by introducing a portion of the salt into a graduated tube, inverted over mercury, and decomposing it by letting up the requisite proportion of water.

The mean of a series of experiments, varied in different ways, gave

Platinum,	41.26	per cent.
Chlorine,	43.89	"
Nitric oxide,	4.98	"

The above results correspond to five atoms of bichloride of platinum; five atoms of hydrochloric acid, and two atoms of nitric oxide. The water was calculated from the loss, in the analysis, to be equivalent to ten atoms.

Respecting the chemical nature of this compound, it may be regarded, either as a chloride of platinum, with a muriate of nitric oxide, represented by the following formula, $(Pt\ Cl^2)^5 + [(Cl\ H)^5 + (NO^2)^2] + 10$ Aq, or as a double chlorosalt, a chloroplatinate of nitrogen, with a chloroplatinate of hydrogen, represented by the formula, $[(Pt\ Cl^2)^2 + N\ Cl^2]^2 + (Pt\ Cl^2 + H\ Cl) + 14$ Aq.

Professor A. D. Bache made a verbal communication in which he compared the observations on the magnetic dip by Professor Loomis, contained in his paper ordered this evening for publication, with those given in a paper by Professor Courtenay and himself, read before the Society in 1834.

Professor Bache remarked, that as some of the stations of a series of observations for magnetic dip made by Professor Courtenay and himself, and published in the fifth volume of the Society's Transactions in 1835, were the same as those of the series of Professor Loomis, about to be published, it might be of interest to compare the results. The annexed table was given as containing the places, dates, and results of observations in the two series.

Place.	*Series by Professors Bache and Courtenay.*		*Series by Professor Loomis.*	
	Magnetic Dip.	Date.	Magnetic Dip.	Date.
		1834.		1839.
Baltimore,	70° 58′.6	July 19, P. M.	71° 50.3	Sept. 25, A. M.
Philadelphia,	72 00 .2	July 25, August 4, P. M.	72 07.1	Sept. 23, A. M.
New York,	72 51.7	August 7, A. M.	72 52.2	Sept. 9, A. M.
West Point,	73 37 .2	April, May, June, July.	73 27.4	Sept. 5, P. M.
Providence,	74 02 .8	August 8, P. M.	73 59.6	Sept. 19, P. M.
Springfield, Mass.	74 10.7	August 10, A. M.	74 06.9	Sept. 14, A. M.
Albany,	74 40.1	August 11, P. M.	74 51.3	Sept. 4, noon.

Professor Bache further remarked, that in regard to the results for Baltimore, he had at first supposed that an error of a degree had occurred in recording or transcribing the observations of one or other series. The difference of dip between New York and Philadelphia was nearly fifty minutes; and it was, therefore, not probable that that between Philadelphia and Baltimore should be only seventeen minutes, according to the numbers of Professor Loomis as they now stand.

On the other hand, the dip reported by Professor Loomis agrees better with the determination of Professor Patterson at Charlottesville, and of Lieutenant Wilkes at Washington. The discrepancy thus not being easily reconciled, it is much to be desired that other observations should be made at Baltimore.

The agreement of the results for New York, Providence and Springfield, is reasonably close; though, if the diminution of dip in the interval of the two series be considered, the agreement at New York will not be so close. At Philadelphia, Professor Bache has ascertained by recent experiments made for the purpose, that the difference between Professor Loomis and himself might be explained by the difference in the stations used; there being considerable local attraction at one or the other, though he had not yet ascertained which represented most properly the dip due to the position of Philadelphia. The difference at West Point certainly, and that at Albany probably, resulted from using different stations for observation. Professor Courtenay had found the magnetic dip at the middle of the plain at West Point, to differ several minutes from that at his house to the west of the plain. Professor Loomis had used a station near the steamboat landing. At Albany, he had observed near the station formerly used by Professor Henry in the Academy Park; and as the dip found by him in 1839, was nearly the same as that found by Professor Henry in 1834, the discrepancy between them might be considered as amounting

to the diminution of dip in the interval. Professor Bache stated that it was so desirable that each succeeding observer in a given place should, when a well selected site had been employed for observations, use the same, that he had only left the position used by Professor Henry on account of changes which had been made by putting up an iron railing about the Park. In the case of the two series by Professor Loomis, and by Professor Courtenay and himself, the stations did not appear to have been generally in common.

Professor Bache further observed that the diminution of dip at New York, according to his observations, compared with those of Major Sabine, had been at the rate of nine minutes in twelve years, between 1822 and 1835; while those of Professor Loomis would give but eight minutes in seventeen years. Both results are probably too small.

Professor Bache concluded by stating, that the general tenor of the comparison between these two series of observations, indicates that the relative correction for the two pairs of needles was subtractive for those of Professor Loomis, and additive for those which he had used; but that as they had been furnished by the same maker, and were of similar dimensions, there was, until they had been compared with other needles, no just ground of preference for either.

The following resolutions in relation to combined magnetic observations were adopted:

Resolved, That in the opinion of the American Philosophical Society, it is highly desirable that the combined series of magnetic observations now in progress under the direction of the British government, should be extended to the United States, by the establishment of Magnetic Observatories at suitable places.

Resolved, That a Committee be appointed, with authority, on behalf of the Society, to invite the attention of one of the departments of the Government of the United States to the plan for combined magnetic observations, a sketch of which was presented in the documents from a Committee of the Royal Society of London, and to urge co-operation in the plan as a national undertaking, in every way worthy of the United States.

The Committee under the above resolution, consists of Professor Bache, Doctor Patterson, Professor Henry, Mr. Kane, and Colonel Totten.

Professor Bache, reporter, stated that No. 8 of the Proceed-

ings of the Society was in the hands of the Librarian for distribution.

Mr. Fisher reported the decease of Mr. Levett Harris, a member of this Society.

Stated Meeting, December 6.

Present, thirty-two members.

Dr. PATTERSON, Vice-President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

The Transactions of the Royal Irish Academy. Vol. XVIII. Part Second. Dublin, 1839.—*From the Royal Irish Academy.*

Abhandlungen der Königlichen Akademie der Wissenschaften zu Berlin. Aus dem Jahre, 1837. Berlin, 1838.—*From the Royal Academy of Sciences of Berlin.*

Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Preuss. Akademie der Wissenschaften zu Berlin, im Monat Juli, 1838. Berlin, 1838.—*From the same.*

Roteiro Geral dos Mares, Costas, Ilhas, e Baixos reconhecidos no Globo. Extractado per Ordem da Academia Real das Sciencias, por Antonio Lopes da Costa Almeida. Vol. II. Part Third. Lisbon, 1838.—*From the Royal Academy of Lisbon.*

Compendio de Botanica do Doutor Felix de Avellar Brotero. Apresentado á Academia Real das Sciencias. Vol. II. Lisbon, 1839.—*From the same.*

Astronomia Spherica e Nautica, por Mattheus Valente do Couto. Lisbon, 1839.—*From the same.*

Memoria sobre os Pesos e Medidas de Portugal, Espanha, Inglaterra, e França. Por Fortunato Jose Barreiros. Lisbon, 1838.—*From the same.*

Annaes da Marinha Portugueza. Por Ignacio da Costa Quintella. Vol. I. Lisbon, 1839.—*From the same.*

Reports on the Fishes, Reptiles, and Birds of Massachusetts. Boston, 1839.—*From Mr. G. B. Emerson.*

Histoire Militaire du Piémont par le Comte Alexandre de Saluces. Five volumes. Turin, 1818.—*From the Author.*

Tableau Statistique et Politique des Deux Canadas. Par M. Isidore Lebrun. Paris, 1833.—*From Mr. Du Ponceau.*

Memoirs of the Hon. Thomas Jefferson. Two volumes. New York, 1809.—*From the same.*

La Revue Américaine. Vols. I. II. & III. Paris, 1826 and 1827.—*From the same.*

Archives of Useful Knowledge. By James Mease, M. D. Philadelphia, 1813.—*From the Editor.*

Annals of Tryon County, or the Border Warfare of New York, during the Revolution. By William W. Campbell. New York, 1831.—*From the same.*

Memoir of Nathaniel Bowditch. By Nathaniel Ingersoll Bowditch. Boston, 1839.—*From the Author.*

A Descriptive Catalogue of the Chinese Collection in Philadelphia. Philadelphia, 1839.—*From Mr. Dunn.*

Discourse on the Integrity of the Legal Character. By Job R. Tyson, Esq. Philadelphia, 1839.—*From the Author.*

General Karte der sichtbaren Seite der Mondoberfläche. Von W. Beer und J. H. Mädler. Berlin, 1837.—*From Professor A. D. Bache.*

Sopra una Meteora luminosa osservata in Filadelfia dal Regio Console delle Due Sicilie negli Stati Uniti di America. Naples, 1839.—*From the Chev. Morelli.*

Magazine of Natural History. Edited by Edward Charlesworth. Vol. II. New Series. Nos. 31, 32, 33, 34 and 35. London, 1839.—*From the Editor.*

FOR THE CABINET.

A Bust of Simeon De Witt, late Surveyor General of the State of New York.—*From Mr. Richard V. De Witt.*

The Librarian presented to the Society, in the name of the Rev. James P. Engles, a manuscript Treatise on the Means of extending the Learning and Civilization of Europe to the English Empire in India. By C. E. Trevelyan, at Kotah, which was ordered to be deposited in the Archives of the Society.

The Committee of Publication reported, that the sixth volume of the Transactions of the Society was completed.

Professor A. D. Bache made a verbal communication, accompanied by a chart, showing the changes of magnetic variation on the last two terms of the German Magnetic Association; namely, the 30th of August and 30th of November, of the present year.

Professor Bache also presented, on behalf of the Committee on Magnetic Observations, appointed at the last meeting of the Society, a Memorial, addressed to the Secretary of War of the United States, inviting the establishment of Magnetic Observatories, and co-operation in the system of magnetic and meteorological observations now in progress under the direction of the British Government.

Hall of the American Philosophical Society,

PHILADELPHIA, *December*, 1839.

To the Hon. JOEL R. POINSETT, *Secretary of War, &c. &c.*

Sir:—The undersigned have been appointed a Committee of the American Philosophical Society, to call your attention to, and to invite, through the medium of your department, co-operation in, the extensive system of magnetic and meteorological observations about to be made under the direction of the British Government, and in connexion with their Antarctic expedition, particularly directed towards magnetic investigations.

The science of terrestrial magnetism has of late years made great advances, through the instrumentality of Humboldt, Hansteen, Gauss and others, and has now reached that point where a system of combined observations at widely distant points over the surface of the globe, appears to be necessary to its further progress: desultory effort has already done all that it is competent to effect. Such a series of systematic observations has now been set on foot by the British Government, directed to a better determination of the magnetic lines, for the use of navigators, and to the accurate investigation of the magnetic elements for theoretical purposes. The objects embraced are the measurement of the magnetic intensity, dip, and variation, at different stations, by a nautical expedition, and at fixed observatories, and especially the investigation of the variations of these elements at the latter points. As subsidiary to these objects, combined meteorolo-

gical observations are to be made, which cannot fail to elucidate some of the most important questions in this useful science.

The magnetic changes to be investigated are of three kinds: first, those which, depending upon a cause not yet satisfactorily explained, take place slowly but regularly, causing a general displacement of the lines of equal variation and dip; secondly, those which, depending upon the position of the sun, run through their period of change in a year or day, producing different values in the magnetic elements, according to the season or to the hour of the day; and thirdly, the small disturbances which appear to be constantly taking place, and which require for their measurement continued observation with the most accurate instruments.

The striking fact was proved in 1818, by the observations of Arago at Paris, and of M. Kupffer at Kasan, that the large changes which take place in the position of the horizontal needle during the day, are simultaneous at these places, so distant from each other; and a confirmation of the fact as applying to even more distant stations, resulted from the system of observations established by Humboldt and others in 1830, and extended, through the influence of the Imperial Academy of Sciences of St. Petersburg, to the most remote parts of the Russian empire, and even to Pekin. In 1834, the celebrated German philosopher Gauss, invented an instrument for measuring the variation of the needle and its changes, which introduced into these determinations an accuracy similar to that attainable in astronomical measurements. This instrument was soon furnished to different observatories, and a concerted system of observations of the minute changes of variation was introduced, which is now going on at no less than twenty-three places in Europe, the smaller and larger states having vied with each other in providing the means of executing them. The stations include Altona, Augsburg, Berlin, Bonn, Brunswick, Breda, Breslau, Cassel, Copenhagen, Cracow, Dublin, Freyberg, Göttingen, Greenwich, Halle, Kasan, Leipsic, Marburg, Milan, Munich, Naples, St. Petersburg, and Upsala.

The results already obtained and published by the German Magnetic Association, have proved satisfactorily that the minute changes in the direction of the needle, as well as the larger ones, are simultaneous at the different stations, varying however in amount, and the variation appearing to decrease in passing southward; but the influence of the position of the place, whether depending upon geographical or magnetic position, not having yet been fully determined, and being

probably determinable only by observations at places even more distant from each other than those now embraced in the German series.

The invention of an instrument by Gauss, for determining the changes in horizontal magnetic intensity with the same accuracy as those of the direction of the needle, will give rise to interesting developments in regard to them; and the changes of the three elements of horizontal direction, and horizontal and vertical intensity are all included by the two instruments before referred to, and a third invented by Professor Lloyd, of Dublin. It is the object of the series now projected, to embrace these three elements; to extend the number of stations with special reference to their distribution at points of the earth interesting in their magnetic relations; to keep up a constant series of simultaneous observations for three years; and thus to effect, on an extended scale, what the German Magnetic Association has so well begun. The execution of this plan, with observations of an appropriate kind, directed also to magnetic research, by a naval expedition, was recommended to the British Government by the members of the British Association, including men of science from different countries, in 1838. It subsequently received the sanction of the Royal Society of London, was adopted by the Government, and is now in course of execution. It may be considered, therefore, to have been approved by the highest scientific authorities. In pursuance of this plan, stationary observatories are to be established, and regular observations made, for the next three years, at Toronto in Upper Canada, at St. Helena, at the Cape of Good Hope, and at a station in Van Dieman's Land. The East India Company have also undertaken to furnish the means of observation at nine points in their dominions. European Governments, who have not hitherto joined in the German system, with which this will be in connexion, have also promised similar aid. It is this extended scheme, to which our attention has been specially invited by a circular from the Royal Society of London, and in which the American Philosophical Society desires that our country should co-operate. It is on a broad scale, worthy of all encouragement, and the magnitude of the scheme, the objects for which it is undertaken, and the possibility of its execution, all mark the character of the period in which we live.

The Society would propose, in furtherance of this plan, that five magnetic observatories should be established in the N. E., N. W., S. E., S. W., and at some central point of the United States, furnished with the instruments and observers necessary, fully to carry out the

proper plan of combined magnetic and meteorological observations. Should the proposition to make this co-operation truly national, be acceded to, the details in relation to it can easily be arranged, and the Society will, the undersigned confidently believe, feel proud to lend any aid in their power, in planning or executing them. It may perhaps be more satisfactory however, to state briefly, beforehand, the nature of the observations to be made, and the means required for their execution.

The magnetic observations to be undertaken at the fixed observatories are, first, of the variation (declination), absolute horizontal intensity and dip; second, of the changes of the variation of the horizontal intensity, and of the vertical intensity. The regular observations for changes in these elements, are to be made every two hours every day, (with the exception of Sundays,) for the next three years, beginning as soon as the several observatories can be arranged. To these are to be added more frequent observations on one day of each month, including the four terms during the year, fixed by the German Magnetic Association. At each station, a building of stone or wood will be required, in the construction of which no iron must be employed. The instruments adopted by the British observers are the following: A magnetometer for the declination, one for the horizontal force, one for the vertical force, a dipping needle, azimuthal transit, two reading telescopes, and two chronometers. The estimated cost of each set of these, is about fourteen hundred dollars. The cost of the observatory must vary with the place at which it is erected, and the material chosen for it, but may be estimated at from one thousand to fifteen hundred dollars. One principal and three assistants will suffice for making and reducing the observations at each station, and for carrying on a supplementary series of meteorological observations. The meteorological observations proposed, are on the pressure, temperature, and moisture of the air: on the direction and force of the wind; on the quantity of rain: on the temperature of the ground at different depths; on solar and terrestrial radiation; besides a few miscellaneous and occasional observations, not necessary to be here stated. Regular observations are to be made on these points, four times every day, and every hour on one day in each month. The instruments required at each station, are a barometer, a standard thermometer, a maximum and minimum thermometer, a hygrometer, an anemometer, several extra thermometers, an actinometer, and an apparatus for atmospheric electricity. The probable cost of each set of these would

not exceed two hundred and fifty dollars. The value of the results would be much increased, by providing a self-registering anemometer and rain-gauge, instead of the common ones, which would increase the cost of each set of instruments to five hundred and seventy dollars. The whole cost of erecting the five observatories, and providing them with excellent instruments, will probably not exceed sixteen thousand dollars; and if the observatory already existing at Philadelphia, and provided with the necessary instruments, should be adopted as one of the five, and four others be erected and furnished, the expense to the United States would not exceed twelve thousand dollars.

No estimate is made of the cost of the principal and assistants for the proposed observatories. In the organization of the new British stationary observatories, these persons are taken, in part, if not altogether, from the officers, non-commissioned officers, and privates of the artillery. The acquirements of the graduates of our Military Academy, admirably fit them for directing the observatories, which might be appropriately placed at military posts; so as to provide the officers and men necessary for making the observations, without additional expense. The direction thus given to the views of the Committee; the fact that you have long been enrolled as a member of the American Philosophical Society; and the interest which you have always manifested, both as an individual and in a public capacity, in all enterprises calculated to shed a lustre upon your country, have induced the Society to direct us to address ourselves particularly to you on this subject.

With the hope that your views may coincide with those of the Society, in regard to the plan now presented for your consideration, we are,

Very respectfully, yours,

A. D. Bache,
R. M. Patterson,
Joseph Henry,
J. K. Kane,
Jos. G. Totten,
} *Committee.*

Dr. Patterson laid before the Society a specimen of the Daguerreotype, by Mr. Robert Cornelius, of Philadelphia.

Dr. Hays communicated a case of perverted vision, in which all perpendicular lines appeared double, while horizontal ones

were seen accurately. This occurred in a gentleman who was labouring under catarrhal inflammation of the conjunctiva, and ceased with the removal of the disease.

Dr. Hare made the following verbal communications.

For effecting the congelation of water by the evaporation of ether, it had been usual to expose a bulb, containing water and moistened by the ether, to a current of air. Recently Dr. Hare had succeeded far more satisfactorily by exposing a quantity of water, twenty times as large as that usually employed, covered by ether in a capsule to a blast of air, proceeding from a vessel in which it had been condensed by a pressure equal to one or two atmospheres. By these means, the freezing of the water might be seen by five hundred spectators.

Having mentioned that the pure hyponitrous ether recently obtained, caused a cold of 15° by its evaporation, it would of course be inferred, as he had found to be the fact, that this last mentioned ether might be advantageously employed.

When hydric ether is employed, it should not exceed 730 in specific gravity.

Dr. Hare further said, that it would probably be remembered, that about two years since, he had published an account of a new process for freezing water by the evaporation of ether, caused by a diminution of atmospheric pressure. In the process then described, concentrated sulphuric acid was interposed between the retort holding the water and ether, and the air pump. Since that time he had rendered the process more rapid and interesting by interposing an iron mercury bottle, with two cocks between the receiver holding the acid and the pump. The ether and water were introduced into the retort. The beak of the retort, properly bent, entered the receiver, through the tubulure to which it was luted. The beak was of such a length and curvature, as to cause its orifice to be below the surface of the acid. The neck of the receiver communicated with the cavity of the bottle, that of the bottle with the pump. The apparatus being thus arranged, the bottle was exhausted, and the cock, communicating with the pump, closed. Under these circumstances, on opening a communication between the bottle and receiver, the pressure in that vessel and in the retort was so much reduced as to cause the instantaneous ebullition of the ether, so that little, if any subsequent aid, was required from the pump. But the

result which gave increased interest to the process, was the inconceivable rapidity with which the acid, under these circumstances, absorbed the ethereal vapour, which it appeared to do with greater avidity as the process advanced.

In fact, the water, in the act of congealing, flew all over the inner surface of the retort, in consequence of an explosive evolution of ethereal vapour, generated amid the aqueous particles. The congelation of the water was rendered evident to the ears as well to the eyes of his class of more than three hundred students.

Doctor Bache communicated the decease of the Hon. Jonathan Sewell, of Quebec, a member of the Society.

Stated Meeting, December 20.

Present, forty members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Appendix to Part V. of the Greenwich Observations, for the year 1834. (A missing number.) London, 1834.—*From the Royal Society of London.*

The Statutes at Large, of South Carolina. Edited under the authority of the Legislature. By Thomas Cooper, M. D., LL.D. Vol. V. Columbia, 1839.—*From Dr. Tidyman.*

A Map of the Extremity of Cape Cod. Executed under the direction of Major J. D. Graham, U. S. Top. Engrs.—*From the Author.*

Crania Americana; or a Comparative View of the Skulls of various Aboriginal Nations of North and South America. By Samuel George Morton, M. D. Philadelphia, 1839.—*From the Author.*

Medical and Topographical Observations upon the Mediterranean; and upon Portugal, Spain, and other Countries. By G. B. R. Horner, M. D., U. S. N. Philadelphia, 1839.—*From the Author.*

The State of the Prisons in England and Wales. By John Howard, F. R. S. Warrington, 1784.—*From Mr. John Vaughan.*

State of the Prisons in England, Scotland, and Wales. By James Neild, Esq. London, 1812.—*From the same.*

The Natural History of British Insects. By E. Donovan, F.L.S. Ten Volumes. London, 1793 to 1802.—*From the same.*

The Natural History of British Birds. By E. Donovan, F.L.S. London, 1794 to 1798. Five Volumes.—*From the same.*

The Natural History of British Fishes. By E. Donovan, F.L.S. Vol. I. London, 1802.—*From the same.*

Biographical Sketches of distinguished American Naval Heroes in the War of the Revolution. By S. Putnam Waldo, Esq. Hartford, 1823.—*From the same.*

An Account, Historical, Political, and Statistical, of the United Provinces of Rio de la Plata. Translated from the Spanish of Ignacio Nunes. London, 1825.—*From the same.*

Flora Caroliniensis, or an Historical, Medical, and Economical Display of the Vegetable Kingdom. By John L. E. W. Shecut. Vol. I. Charleston, 1806.—*From the same.*

Travels in Brazil, in the Years from 1809 to 1815. By Henry Koster. Two Vols. Philadelphia, 1817.—*From the same.*

History of Spain, from the establishment of the Colony of Gades, by the Phœnicians, to the death of Ferdinand, surnamed the Sage. Two Volumes. Dublin, 1793.—*From the same.*

History of the County of Worcester, in the Commonwealth of Massachusetts. By Peter Whitney, A. M. Worcester, 1793.—*From the same.*

The First Settlers of Virginia. New York, 1806.—*From the same.*

An Introduction to the Knowledge of Rare and Valuable Editions of the Greek and Latin Classics. By the Rev. Thomas Frognall Dibdin, F.S.A. Two Volumes. London, 1808.—*From the same.*

Repertorium Commentationum a Societatibus Litterariis Editarum. Secundum Disciplinarum Ordinem Digessit, J. D. Reuss. Historia, etc. Gottingen, 1810.—*From Mr. P. S. Du Ponceau.*

Historisch Statistische Darstellung des Nördlichen Englands. Von E. F. Rivinus. Leipsic, 1824.—*From the same.*

The Ruins of Pæstum and other Compositions, in verse. Salem, 1822.—*From the same.*

Athens, and other Poems. Salem, 1824.—*From the same.*

Academical Catalogues.—*From the same.*

The American Medical Library and Intelligencer. By Robley Dunglison, M. D. Nos. 15, 16, 17 and 18.—*From the Editor.*

The Committees of Finance and Publication, respectively made their Annual Reports, which were, on motion, accepted.

Doctor Hare made the following verbal communication relative to the application of radiant heat to glass.

Dr. Hare said, it did not appear to him that sufficient attention had been paid by artists or men of science, to the great difference which existed between the effect upon glass of heating it by radiation and by conduction. When exposed to radiant heat alone, unaccompanied by flame, or a current of hot air, glass is readily penetrated by it, and is heated, within and without, with commensurate rapidity; but, in the case of its exposure to an incandescent vapour or gas, the caloric could only penetrate by the process of conduction; and, consequently, from the inferior conducting power of glass, the temperature of the outer and inner portions of the mass would be so different, as by the consequent inequality of expansion to cause the fracture, which was well known, under such circumstances, to ensue.

The combustion of anthracite coal, in an open grate, in his laboratory, having four flues of about 4.12 by 2.12 inches each, in area, just above the level of the grate, (the upper stratum of the fire, having nothing between it and the ceiling,) had allowed him to perform some operations with success, which formerly he would have considered impracticable. The fire having attained to that state of incandescence to which it easily arrives when well managed, he had, on opening a hole by means of an iron rod, so as to have a perpendicular perforation extending to the bottom of the fire, repeatedly fused the beaks of retorts of any capacity, not being more than three gallons, causing them to draw out, by the force of gravity, into a tapering tube; so that, on lifting the beak from the fire, and holding the body of the retort upright, the fused portion would hang down so as to form an angle with the rest of the beak, or to have any desired obliquity. By these means, in a series of retorts, the beak of the first might be made to descend through the tubulure of a second; the beak of the second through that of a third, and so on; the beak of the last retort in the row being made, when requisite, to enter a tube passing through ice and water in an inverted bell-glass.

By means of the anthracite fire, as above described, thick rods, as

well as stout tubes, might, as he had found, be softened and extended, or bent into suitable forms.

The lower end of a green glass phial, such as is used usually for Cologne water, might be made to draw out into a trumpet-shaped extremity. A Florence flask might be heated, and made flat, so as to answer better for some purposes. The drawing out of tubes into a tapering form, suitable for introducing liquids through retort tubulures, was thus easily effected; and in all cases the sealing of large tubes was better commenced in this way, although the blowpipe might be necessary to close a capillary opening which could not be closed by the fire.

Dr. Hare further communicated a method of preparing pure chlorohydric acid, from the impure muriatic acid of commerce, by the action of sulphuric acid.

It is known, said Dr. Hare, that concentrated sulphuric acid, when added to liquid chlorohydric acid, expels more or less of it as a gas, in consequence of its superior affinity for water. At the present low price of the ordinary acid of commerce, Dr. Hare had found it advantageous to procure the latter in purity, by subjecting it to the former.

A tubulated glass retort, having been half-filled with chlorohydric acid, sulphuric acid was allowed to drop from a glass funnel, with a cock, into a tube descending into the acid in the retort through the tubulure, to which it was luted by strips of gum-elastic. The tube terminated in a very small bore. The beak of the retort, bent in the fire, as he had just described, descended through the tubulure into the body of a small retort containing water not refrigerated. The beak of the latter descended into a larger one, half full of water, to which ice was applied. Of course the beak of the third might, in like manner, enter the body of a fourth. After an equivalent weight of sulphuric acid had been introduced, and the evolution of gas was no longer sufficiently active, heat might be applied until nearly all the chlorohydric acid should come over.

The residual diluted sulphuric acid was, with the addition of nitrate of soda or potassa, or nitric acid, as serviceable for galvanic purposes, as if it had not been thus used.

Dr. Hare further communicated a method of preparing hydrochloric acid and chlorine in the self-regulating reservoir

invented by him, and spoke of some of the applications of the gases thus prepared.

Dr. Hare was under the impression that few chemists were aware of the great advantage of the self-regulating reservoirs of gas, to which he had resorted. He was enabled, by means of them, to keep hydrogen, carbonic acid, nitric oxide, chlorine, chlorohydric acid, sulphydric acid, and arseniuretted hydrogen, so as to use any of these gases at pleasure. He had kept these reservoirs in operation for months, without taking the constituent vessels apart.

By means of the reservoir of chlorohydric acid he had been encouraged to make an effort which proved successful; to form artificial camphor by the impregnation of oil of turpentine with that gas.

Subjecting an ingot of tin to a current from his reservoir of chlorine, it was rapidly converted into the bichloride, or fuming liquor of Libavius. To his surprise the ingot was fused by the heat generated. In the last mentioned reservoir the materials were manganese, in lumps, and concentrated chlorohydric acid, diluted sulphuric acid being also introduced; as the reaction of this last mentioned acid with the manganese was more active than that of the chlorohydric acid. In fact, sulphuric acid, diluted with its weight of water and common salt, might be used without chlorohydric acid. In the reservoir for chlorohydric acid, the materials were sal ammoniac and sulphuric acid, to which some water was added, but not so much as to prevent the chlorohydric acid from assuming the gaseous state.

He had found it preferable to keep the sulphydric acid reservoir in a flue, the gas being drawn, when wanted, through a globe of water, by means of a leaden tube, at a convenient place. It would be desirable that the reservoirs of chlorine and chlorohydric acid should be similarly situated.

Mr. Sears C. Walker made an oral communication on the subject of determining longitudes from corresponding observations of meteors.

It had been recently remarked by Prof. Schumacher, Astr. Nachr. No. 283, that, so far as his information extended, no trial had been made of the observation of meteors for determining longitude; though the subject had been proposed long since by Prof. Benzenberg. Accordingly, on the 11th of August, 1839, observations, chiefly of the instant of vanishing of meteors were made at the observatories of Altona, Bremen, Konigsberg, Breslaw, &c. with such success as to

lead Dr. Olbers to the conclusion announced in a succeeding No. (284) that observations of this kind are adequate for the complete determination of longitudes of places. By means of twelve coincidences on the same night, Prof. Boguslawski found the Breslaw Observatory to be 28m 22s.07 east of Altona, differing less than a second from that which had been previously adopted.

As the subject of priority in this inquiry might be considered important, Mr. Walker deemed it his duty to communicate the substance of a letter from Prof. Alexander, of Princeton College, New Jersey, dated January 14th 1839, in which is contained the result of seven coincidences of observations of meteors, made 25th Nov. 1835, by Messrs. A. D. Bache and J. P. Espy, at the house of Prof. Bache, in Philadelphia, and by Professors Henry and Alexander, at the Philosophical Hall, 0.1*s*. east of Nassau Hall, College of New Jersey, at Princeton. As the time referred to by the Philadelphia observers is that of the University of Pennsylvania, which is about 0.7*s*, west of the State House, Philadelphia, the differences of longitude, given by Prof. Alexander, have been diminished by 0.6*s*. to reduce them to the State House, Philadelphia, and Nassau Hall, Princeton. The results are contained in the table. The time of the disappearance of the meteors was noted.

Meteor.	N. Hall, East of State House.	Comparative Weight.	Observers.
a	+2m. 0 15sec.	1	Espy and Alexander.
b	+2 ,, 0.30 ,,	1	" and " and Henry,
c	+1 ,,59.20 ,,	0.5	" and Henry,
d	+2 ,, 0 20 ,,	1	" and "
e	+2 ,, 1.00 ,,	1	Bache and "
f	+2 ,, 0.80 ,,	1	" and Alexander,
g	+2 ,, 2.60 ,,	0.5	Espy and Henry.
	Mean according to weights	+ 2 *m* 0.61 *sec.*	
	S. House, W. of Greenwich	— 5*h*. 0 ,, 39.12 ,,	
	N. Hall, W. of Greenwich	— 4 ,, 58 ,, 38.51 ,,	No. 1.

In order to judge of the degree of precision of this result, an extract of a letter from Robert Treat Paine, Esq. dated June 10th, 1839, was read, giving his determination of the same by transportation of three chronometers in May last, from Princeton to Castle Garden, New York, and thence to Boston, as follows:

State House, Boston	— 4h.	41m.	16.60sec.
Castle Garden, West	—	11 ,,	46.33 ,,
Nassau Hall, W. of C. Garden	—	2 ,,	35.14 ,,
Nassau Hall, W. of Greenwich	— 4 ,,	58 ,,	38.07 ,, No. 2.

A further comparison was furnished from the observations of the solar eclipse of Sept. 18th, 1838, as reduced by Prof. Kendall, and from those of several occultations reduced by Mr. Walker.

Comparisons with the High School Observatory. Assumed longitude—5h. 0m. 42s. Resulting longitude of Nassau Hall,

		h.	m.	s.		
1838, Sept. 18th.	Solar Eclipse four phases,	— 4	58	37.64	weight	2.0
Nov. 21,	Im. ω Sagittarii,			34.62		1.0
Dec. 27,	Im. η Pleiadum,	— 4	58	39.42		
"	" f "			36.35	36.80	1.7
"	" h "			34.62		
1839, April 19,	" c Geminorum,			39.84		1.0
No. 3,	Mean according to weights,	— 4	58	37.25		5.7

Comparisons with the State House, Boston. Assumed longitude — 4h. 44m. 16.6s.

		h.	m.	s.		
1838, Dec. 24,	Im. ϵ Piscium,	— 4	58	39.56	weight	1.0
27,	Im. f Pleiadum,			36.35		1.0
1839, April 19,	Im. c Geminorum,	— 4	58	39.31		
	Do. at Dorchester Obs'y.			39.22	39.27	1.4
No. 4.	Mean according to weights	— 4	58	38.49		3.4

The Immersion of f Pleiadum was also observed by Prof. Boguslawski at the Breslaw Observatory, longitude + 1h. 8m. 10.4s., whence Nassau Hall — 4h. 58m. 41.15s. No. 5, weight 1. This result is somewhat uncertain, from the variation of the co-efficient of the unknown error ζ of the moon's tabular place on a secondary to its orbit; since we have for the longitude, $d = -$ 4h. 58m. 41.15s. $- 2.353 \times \zeta - 0.406 \times \pi$, according to Bessel's Notation.

The mean results taken with their weights gave,

	h.	m.	s.		
No. 1	— 4	58	38.51	weight	6.0
2			38.07		3.0
3			37.25		5.7
4			38.49		3.4
5			41.15		1.0
Mean according to weights	— 4	58	38.20		19.1

Thus it appears that the observations of the 25th November, 1835, lead to the same conclusion as that which was subsequently in 1839, obtained by the European astronomers.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. 1. JANUARY & FEBRUARY, 1840. No. 10.

Stated Meeting, January 3.

Present, twenty-seven members.

Mr. DU PONCEAU, President, in the Chair.

The Judges and Clerks of the Election, held this day, reported the appointment of the following officers:—

President.

Peter S. Du Ponceau, LL. D.

Vice Presidents.

Nathaniel Chapman, M. D.,
Joseph Hopkinson, LL. D.,
Robert M. Patterson, M. D.

Secretaries.

Franklin Bache, M. D.,
John K. Kane,
Alexander D. Bache, LL. D.,
Robley Dunglison, M. D.

Counsellors for Three Years.

Nicholas Biddle,
Thomas Biddle,
Gouverneur Emerson,
J. Francis Fisher.

Curators.

John P. Wetherill,
Isaac Hays, M. D.,
Franklin Peale.

Treasurer.

John Vaughan.

The following donations were received:—

FOR THE LIBRARY.

Gradmessung in Ostpreussen und ihre Verbindung mit Preussischen und Russischen Dreiecksketten; ausgeführt von F. W. Bessel, Director der Königsberger Sternwarte u. s. w.—*From the Author.*

Address at the Annual Meeting of the Pennsylvania Colonization Society, Nov. 11, 1839. By R. R. Gurley. Philadelphia, 1839. *From Mr. Elliot Cresson.*

FOR THE CABINET.

A Donation of Mastodon Bones, procured by a subscription of members of the Society;—the head perfect.

Drs. Horner and Hays were appointed a Committee to report a description of the same.

Mr. Henry Seybert, at the time in Paris, transmitted to the Society a specimen of the Daguerréotype.

Mr. Du Ponceau made a verbal communication respecting the publication of the Cochin Chinese Dictionary of the late Bishop of Adran, and also of a Latin and Cochin Chinese Dictionary by the Bishop of Isauropolis, and announced that the Grammar of the Berber language, by M. Venture, was about to be published.

Dr. Hare produced a remarkably beautiful specimen of potassium, in the globular form, assumed by falling into naphtha.

This specimen was a part of the product of one process which yielded him six ounces, two hundred and sixty-three grains, avoirdupois.

The process, and the apparatus by which this large amount of potassium was procured, had been described in the last volume of the Society's Transactions.

The quantity of materials employed, was 8 lbs. cream of tartar, reduced to 47 oz., by carbonization; and 3 oz. of coarsely powdered charcoal, from which the finer part had been sifted.

Notwithstanding the employment of a tube of two inches in diameter, it became choked with the potassium, carbon, and other volatile products, which were sublimed; and in the effort to open a passage, a steel rod, employed for this purpose, became so firmly fastened as to render its extrication impracticable by the force of two men.

In the effort to withdraw it, the tube was detached from the bottle. As the rod had been rendered smooth and cylindrical by the wire-drawing process, it could not have been thus held, upon any other view than that of its being soldered to the potassium.

The iron casing, used to protect the bottle, had been exposed to the fire during three processes; yet, excepting at the lower corner, it did not appear to be injured. With slight emendation, and with the protection of a stout disk of malleable iron, situate so as to form a basis, Dr. Hare had no doubt it might be used for several more operations.

In distilling the potassium from the tube, "per descensum," as described in his account of the process already referred to, the cap converging to a tapering tube was screwed on to that end of the receiver which was nearest the bottle; and, of course, this end was the lowermost in the distillatory process. This arrangement was preferable, as it prevented the loose deposition always found at the end of the tube farthest from the fire, from falling into the naphtha employed together with the potassium.

Dr. Hare hoped to lay before the Society a drawing of his apparatus, under the impression that it would be deemed worthy of being published among the Transactions of the Society.

The purchase of the Reports on Prisons, printed by order of the House of Commons of Great Britain, was directed by the Society.

Stated Meeting, January 17.

Present, thirty-three members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received.

FOR THE LIBRARY.

A History of the Heathen Mythology; or the Fables of the Ancients, elucidated from Historical Records, an Important Key to the Classics. To which is added, an Inquiry into the Religion of the first Inhabitants of Great Britain, and a particular Account of the

Ancient Druids. Translated from the French of M. l'Abbé de Tressan. By H. North. 2d Edition, embellished with 75 engravings. London, 1806.—*From Mr. Vaughan.*

The Life of John Jay, with Selections from his Correspondence, and Miscellaneous Papers. By his Son, William Jay. Two Vols. 8vo. New York, 1833.—*From the same.*

Vies des Peintres, Sculpteurs et Architectes les plus célèbres, par G. Vasari, Peintre et Architecte Arétin; traduites de l'Italien, avec des notes, particulièrement celles de Bottari, et les portraits de chaque artiste, gravés à l'eau forte par G. Boichot, correspond. de l'Institut National. Three Vols. 8vo. Paris, 1803.—*From the same.*

Scriptores Rerum Mythicarum Latini tres Romæ nuper reperti. Ad fidem Codicum MSS. Guelferbytanorum Gottingensis, Gothani et Parisiensis integriores edidit ac Scholiis illustravit Dr. Georgius Henricus Bode, ordinis Philos. Gotting. Assessor Societatis Litterar. quæ Cantabrigiæ Americanorum floret Socius. Two Vols. Celis, 1834.—*From Mr. Du Ponceau.*

Observations on the Sugar Beet and its Cultivation. Philadelphia, 1840.—*From Mr. James Ronaldson.*

Annuaire Magnétique et Météorologique du Corps des Ingénieurs des Mines de Russie ou Recueil d'Observations Magnétiques et Météorologiques faites dans l'étendue de l'empire de Russie et publiées par ordre de S. M. l'Empéreur Nicolas I., et sous les auspices de M. le Comte Cancrine, Ministre des Finances, par A. T. Kuptfer, membre de l'Académie des Sciences de St. Petersbourg. Année, 1837. 4to. St. Pétersbourg, 1839.—*From the Imperial Academy of Sciences of St. Petersburg.*

Catalogue of Columbia College in the City of New York; embracing the Names of its Trustees, Officers, and Graduates; together with a List of all Academical Honours conferred by the Institution, from A. D. 1758 to A. D. 1826, inclusive. New York, 1826.—*From Mr. Du Ponceau.*

Circular Letter addressed to the Trustees of the University of Pennsylvania, by the Professor of Botany, (Dr. W. P. C. Barton,) on the introduction of that Branch into the Curriculum of Study for a Medical Degree. Philadelphia, 1825.—*From the same.*

Sundry recent English Catalogues of Books.—*From Mr. E. D. Ingraham.*

Prof. Bache read extracts from a letter from Major Sabine, of England, describing the progress of measures for contemporaneous magnetic and meteorological observations for the next three years, urging a concert of observations in the United States, and stating that a magnetic survey of the British dominions north of the United States would be made, and suggesting a similar survey of the United States. Prof. Bache remarked, that steps had been taken some months since, by several gentlemen who have heretofore been engaged in magnetic researches, to procure such a survey, the result of which, however, was yet uncertain.

A circular relating to the term observations, proposed by the Royal Society, was also read.

Mr. John Vaughan was re-elected Librarian.

The following standing committees were appointed for the year.

Of Finance.—Mr. C. C. Biddle, Mr. George Ord, and Dr. R. M. Patterson.

Of Publication.—Mr. Lea, Dr. Hays, and Mr. J. F. Fisher.

On the Hall.—Mr. Strickland, Mr. Kane, Mr. Vaughan.

On the Library.—Mr. Ord, Dr. Hays, Mr. Geo. Campbell.

Agreeably to a provision of the by-laws, the list of surviving members of the Society was read. The number is 316; 216 of whom are residents of the United States, and 100 in foreign countries.

The following gentlemen were elected members of the Society:—

Judah Dobson, of Philadelphia.
John Forbes, M. D. F. R. S. of Chichester, England.
Michael Faraday, D. C. L. F. R. S. of London.
Rev. C. R. Demme', D. D. of Philadelphia.
John J. Vanderkemp, of Philadelphia.
Rev. Philip Milledoler, D. D. of New Jersey.
Don Pedro de Angelis, of Buenos Ayres.
Isaac Wayne, of Pennsylvania.
Samuel D. Ingham, of Pennsylvania.
George M. Dallas, of Philadelphia.
Martin Boye', of Philadelphia.

Stated Meeting, February 6.

Present twenty-five members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Kong. Vetenskaps-Academiens Handlingar, för Ar 1837. 8vo. Stockholm, 1838.—*From the Royal Swedish Academy.*

Aorsberättelse om Framstegen i Fysik och Kemi afgifven den 31 Mars, 1837; af Jac. Berzelius K. V. Acad. Secr. 8vo. Stockholm, 1837.—*From the same.*

Aorsberättelse om Technologiens Framsteg till Kongl. Vetenskaps-Academien afgifven den 31 Mars, 1837, af G. E. Pasch. 8vo. Stockholm, 1837.—*From the same.*

Aorsberättelse om Botaniska Arbeten och Upptäckter för Ar 1836, till Kongl. Vetenskaps-Academien afgifven den 31 Mars, 1837, af Joh. Em. Wikstrom. 8vo. Stockholm, 1838.—*From the same.*

Transactions of the Literary and Historical Society of Quebec, founded January 6, 1824. Vol. II. 8vo. Quebec, 1831.—*From Mr. C. D. Forbes, of Montreal.*

Proceedings of the Royal Irish Academy, for the Year 1837–38. Part II. 8vo. Dublin, 1838; and for the Year 1838–9. Part III. 8vo. Dublin, 1839.—*From the Royal Irish Academy.*

The Life of Daniel, the Prophet of God, with a Bengali Translation. By the Rev. Wm. Morton, of the London Missionary Society. 12mo. Calcutta, 1837.—*From the American Sunday School Union, of Philadelphia.*

O Auxiliador da Industria Nacional, ou Collecção de Memorias e Noticias interressantes aos Fazendeiros, Fabricantes, Artistas, e Classes industriosas no Brasil, tanto originaes, como traduzidas das melhores Obras que neste genero se publicão. Periodico Mensal, publicado pela Sociedade Auxiliadora da Industria Nacional, estabelecida no Rio de Janeiro. Anno. VII. No. i.—vi. Janeiro.—Junho de 1839. 8vo. Rio Janeiro, 1839.—*From Mr. J. S. Rebello.*

Discurso lido em 15 de Maio de 1838 na Sessão publica da Acade-

mia real das Sciencias de Lisboa por Joaquim José da Costa de Macedo, do Conselho de S. M. e Commendador da Ordem de N. Senhora da Conceição de Villa Viciosa, &c. &c. 8vo. Lisboa, 1838.—*From the Author.*

Answers to the Questions: What constitutes Currency? What are the Causes of Unsteadiness of the Currency? and What is the Remedy? By H. C. Carey, author of "Principles of Political Economy," &c. &c. 8vo. Philadelphia, 1840.—*From the Author.*

An Address to the Members of the Mississippi Legislature on the subject of the Geological Survey of the State. By C. G. Forshey.—*From the Author.*

The American Journal of Science and Arts. Conducted by Benjamin Silliman, M. D. LL. D., &c. &c. Aided by Benjamin Silliman, jr., A. B., &c. &c. Vol. xxxviii. No. 1. Jan. 1840.—*From the Editors.*

A Monograph of the Limniades and other fresh water Univalve Shells of North America. By S. Stehman Haldeman, Member of the Academy of Natural Sciences of Philadelphia, &c. &c. (Specimen number.) 8vo. Philadelphia, 1840.—*From the Author.*

Rapports à M. le Comte de Montalivet, Pair de France, Ministre Secrétaire d'État au Département de l'Intérieur, sur les Pénitenciers des États-Unis, par M. Demetz, Conseiller à la Cour Royale, Membre du Conseil Général du Département de Seine-et-Oise, et par M. G. Abel Blouet, Architecte du Gouvernement, Directeur de la Section des Beaux Arts de l'Expédition Scientifique de Morée. Folio. Paris, 1837.—*From Dr. Bache.*

Mr. Saxton laid before the Society several copies of medals, produced by the galvanic process of Prof. Jacobi, of St. Petersburg, and a small vase, obtained by a similar process, using a fusible metal matrix, which was removed when the form was obtained.

Mr. Lea exhibited nearly forty specimens of representations of plants and shells, by the photographic process of Talbot, modified by Mr. Mungo Ponton, of Edinburgh. They were prepared by his son, Mr. Carey Lea, and were entirely successful; the minute parts of the plants, and the outlines being perfect.

Stated Meeting, February 21.

Present, twenty-two members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Journal of the Academy of Natural Sciences of Philadelphia. Vol. VIII. P. I. 8vo. Philad. 1839.—*From the Academy of Nat. Sciences.*

The American Medical Library and Intelligencer, a concentrated Record of Medical Science and Literature. By Robley Dunglison, M. D., Sec. A. P. S., &c. &c. Vol. III. Nos. 21 & 22. Feb. 1 & 15, 1840. Philadelphia.—*From the Editor.*

The American Journal of the Medical Sciences. No. L. Feb. 1840. Philadelphia. Edited by Dr. Hays.—*From the Editor.*

Two Letters on the Chinese System of Writing. By the Rev. Charles Gutzlaff, Missionary at Canton, and Peter S. Du Ponceau, LL.D., President of the American Philosophical Society. Extracted from the 7th Vol. (New Series) of the Society's Transactions. 4to. Philadelphia, 1840.—*From Mr. Du Ponceau.*

A Condensed Geography and History of the Western States, or the Mississippi Valley. By Timothy Flint, Author of Recollections of the Last Ten Years in the Mississippi Valley. 2 vols. 8vo. Cincinnati, 1828.—*From Mr. Vaughan.*

Democracy in America. By Alexis de Tocqueville, Avocat à la Cour Royale de Paris, &c. &c. Translated by Henry Reeve, Esq. With an Original Preface and Notes. By John C. Spencer, Counsellor at Law. 8vo. New York, 1838.—*From the same.*

The Speeches of Henry Clay, delivered in the Congress of the United States; to which is prefixed, a Biographical Memoir; with an Appendix, containing his Speeches at Lexington and Lewisburg, and before the Colonization Society at Washington: together with his Address to his Constituents on the Subject of the late Presidential Election: with a Portrait. Philadelphia, 1827.—*From the same.*

Travels in the Central Portions of the Mississippi Valley: comprising Observations on its Mineral Geography, Internal Resources, and

Aboriginal Population (performed under the sanction of Government, in the year 1821). By Henry Schoolcraft, U. S. I. A., &c. 8vo. New York, 1825.—*From the same.*

A Collection of Original Papers relative to the History of the Colony of Massachusetts Bay. By Lieut. Gov. Thomas Hutchinson. Boston, 1769.—*From the same.*

A Complete Collection of Scottish Proverbs, explained and made intelligible to the English Reader. By James Kelly, M. A. London, 1721.—*From the same.*

The History of the Province of New York, from the First Discovery to the Year 1832; to which is annexed, a Description of the Country, with a Short Account of the Inhabitants, their Trade, Religious and Political State, and the Constitution of the Courts of Justice in that Colony. By William Smith, A. M. 4to. London, 1757.—*From the same.*

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie. Uitgiven door J. Van der Hoeven, M. D. Prof. te Leiden, en W. H. de Vriese, M. D. Prof. te Amsterdam. Zesde Deel 1e, 2e en 3e Stuk. Leiden, 1839.—*From the Minister of the Interior of the King of the Netherlands.*

Mr. Lea read a paper entitled, "Description of Nineteen New Species of Colimacea," from his Collection. These were recently received, and chiefly from Mr. W. W. Wood, now of Manilla.

Bulimus Woodianus. Testâ ovato-conicâ, crassâ, rufo-fuscâ, imperforatâ; anfractibus quinis, convexis; aperturâ magnâ, ovatâ; labro incrassato, reflexo, margine purpurato; columellâ incrassatâ, lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Bulimus Bicoloratus. Testâ turritâ, supra rufo-fuscâ, subtus viridi, imperforatâ, carinatâ; anfractibus septenis, subconvexis; aperturâ subrotundatâ; labro reflexo, margine subnigro; columellâ lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Bulimus Subglobosus. Testâ globoso-turbinatâ, subtenui, rufo-fuscâ, fasciatâ, imperforatâ; anfractibus quinis, ventricosis; aperturâ subrotundatâ; labro subreflexo, margine tenebroso; columellâ lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Bulimus Gracilis. Testâ ovato-conicâ, tenui, imperforatâ; anfractibus senis; subconvexis; aperturâ parvâ, subrotundatâ; labro subreflexo, acuto; columellâ lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Bulimus Carinatus. Testâ acuminato-conicâ, subtenui, rufo-fuscâ, imperforatâ, carinatâ; anfractibus septenis, subplanulatis; aperturâ ovatâ; labro reflexo, margine tenebroso; columellâ lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Bulimus Virido-Striatus. Testâ turbinato-conicâ, subcrassâ, viridi, albo fasciatâ, nitidâ, imperforatâ; anfractibus quinis, ventricosis; aperturâ subrotundâ; labro reflexo, margine albo; columellâ lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Bulimus Virgineus. Testâ ovato-conicâ, albidâ, tenui, tenuissimè striatâ, imperforatâ; anfractibus quinis, convexis; aperturâ ovatâ; labro simplici; columellâ lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Bulimus Liberianus. Testâ elevatâ, lacteâ, pellucidâ, nitidâ, minutè striatâ, perforatâ; anfractibus senis; aperturâ longulâ; labro incrassato, reflexo; columellâ lævi. Habitat. Liberia, Africa.—*Dr. Blanding.*

Cyclostoma Woodiana. Testâ orbiculatâ, subdepressâ, rufâ, albo maculatâ et cinctâ, striatâ, latè et profundè umbilicatâ; anfractibus quinis; apice acuminato; labro incrassato, reflexo, albo. Habitat. Philippine Islands.—*W. W. Wood.*

Carocolla Bifasciata. Testâ orbiculari, suprà convexâ, subtus sub-planulatâ, luteo-albâ, nitidâ, minutissimè longitudinaliter striatâ, viridi-bifasciatâ; anfractibus quaternis; labro acuto, reflexo. Habitat. Philippine Islands.—*W. W. Wood.*

Helix Cepoides. Testâ globosâ, conico turbinatâ, subtenui, longitudinaliter striatâ, suprà rufo-fuscâ, subtus luteo-fuscâ, infrà periphæriam fasciatâ, ad basim uniplicatâ, imperforatâ; anfractibus septenis, inflatis; aperturâ lunatâ; labro irregulariter reflexo, acuto, marginè rufo; columellâ lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Helix Blainvilliana. Testâ obtuso-convexâ, supernè granulatâ, infernè lævi, infra periphæriam unifasciatâ, minutè perforatâ; anfractibus senis, convexis; aperturâ parvâ, transversâ; labro acuto; columellâ lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Helix Lamarckiana. Testâ orbiculato-convexâ, subcarinatâ, rufo-fuscâ, subtenui, irregulariter striatâ, minutè perforatâ; anfractibus quaternis, supernè planulatis; aperturâ magnâ, transversâ; labro acuto; columellâ lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Helix Luteo-Fasciata. Testâ orbiculato-conoideâ, supernè minutè cancellatâ, infernè lævi, tenebroso-castaneâ, luteo-uni vittatâ, minutè perforatâ; anfractibus senis, convexis; aperturâ parvâ, transversâ; labro acuto; columellâ lævi. Habitat. Philippine Islands. —*W. W. Wood.*

Helix Ferruginea. Testâ globoso-conoideâ, ferrugineâ, transversim striatâ, solidâ, ventricosâ interdum vittatâ, imperforatâ; anfractibus quaternis, convexis; aperturâ magnâ, obliquâ; labro incrassato, reflexo; columellâ lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Helix Cuvieriana. Testâ orbiculato-convexâ, carinatâ, tenui, longitudinaliter minutè striatâ, infra periphæriam tenebrosâ, supernè pallidâ; minutè perforatâ; anfractibus quinis, subplanulatis, suprà suturis impressis; aperturâ parvâ, transversâ; labro acuto; columellâ lævi. Habitat. Philippine Islands.—*W. W. Wood.*

Helix Blandingiana. Testâ subglobosâ, corneâ, longitudinaliter striatâ, imperforatâ, obliquè depressâ; anfractibus senis; aperturâ obliquè rotundatâ; labro incrassato, reflexo; columellâ lævi. Habitat. Banks of the River St. Paul, Liberia, Africa.—*Dr. Blanding.*

Helix Humphreysiana. Testâ orbiculato-conoideâ, subtus convexâ, minutè rugosâ albido-fulvâ, ad periphæriam fasciatâ, latè umbilicatâ, profundè perforatâ; anfractibus senis, convexis; aperturâ submagnâ, obliquâ; labro acuto; columellâ lævi. Habitat. Specimens received of Mr. Humpheys were marked Pondicherry. Subsequently I received it from Mr. Balastier, of Singapore.

Helix Balasteriana. Testâ orbiculato-conoideâ, sinistrorsâ, subcarinatâ, subtenui, castaneâ, infernè inflatâ, propè periphæriam tenebrosiori, minutè rugoso-striatâ, perforatâ; anfractibus senis convexis; aperturâ parvâ; labro incrassato, subreflexo; columellâ lævi. Habitat. Philippine Islands.—*Mr. Balastier.*

Dr. Hare described a mode of procuring silicon by an easy process.

In the year 1833, Dr. Hare had published an engraving and description of an apparatus for evolving silicon or boron from their gaseous fluorides. In operating with the apparatus alluded to, a wire rendered incandescent by a calorimotor was made to ignite potassium while surrounded by fluosilicic or fluoboric acid gas. Consequently the potassium and fluorine entered in combination with pheno-

mena of combustion, while the silicon was deposited or left in combination with potassium and its fluoride.

Lately he had resorted with success to a much simpler process, by which the evolution of silicon or boron might be made easy to any person possessing a sufficiently large mercurial reservoir.

A bell glass, over mercury, was filled with fluo-silicic acid, and by means of a bent wire, a cage of wire gauze, containing a suitable quantity of potassium, was introduced through the mercury into the cavity of the bell, and supported in a position nearly in the centre of it. A knob of iron was made at the end of the rod, so recurved as to reach the cage with ease. The knob, having been heated nearly white hot, was passed through the mercury, so as to touch the cage, and cause the combustion of the potassium and evolution of the silicon. Of this, much remains attached to the cage, in combination with the fluoride of potassium, from which the silicon may be separated by washing in cold water and digestion in nitric acid.

Dr. Hare exhibited a specimen of the silicon obtained by the means above described, weighing seventeen grains.

Dr. Hare made some observations on certain products from the formation of hyponitrous or nitric ether, and its decomposition by various agents, one of which he exhibited to the Society.

This was an extremely acrid liquid, obtained from the last ethereal products of the distillation of hyponitrite of soda, with equivalent measures of alcohol, sulphuric acid and water. The products thus procured, being agitated with green sulphate of iron, until no further portion was absorbed, the aggregate was washed with hydric ether. The resulting ethereal solution, being separated by a funnel and the finger, was subjected to the air in an open vessel. The hydric ether soon evaporating, the residue was the acrid liquid in question, which might be inferred to be a peculiar ether. Its boiling point did not appear to be inferior to that of water. It was soluble in ether and alcohol, but insoluble in water. Caustic potash appeared to cause its decomposition.

As Dr. Hare had elsewhere stated, the effects of this liquid upon the organs of taste and smell, resembled those of mustard or horseradish: upon the eyes its influence was equally distressing. Dr. Hare believed this acrid principle might always be generated at the close of the process for obtaining sweet spirits of nitre by distilling

alcohol from sulphuric acid and nitrate of potassa,* if the process were continued beyond certain limits.

Mr. Lea exhibited a specimen of photographic representation of a plant which had been coloured, together with the original plant, and made some remarks on the useful purposes to which this art might be applied in facilitating the objects of the botanist, &c.

Dr. Patterson, from the committee appointed to correspond with the Secretary of War relative to a system of magnetic and meteorological observations, reported that the subject had been referred to a select committee of Congress, in consequence of the representations of the Secretary.

Mr. S. C. Walker communicated an extract from a letter received from Mr. Edmund Blunt, detailing his observations of the Solar Eclipses of May 14th, 1836, and September 18th, 1838.

These were made at his private Observatory, Brooklyn, New York. Latitude 40° 42′ 0″. Longitude 4h. 56m. 0s., nearly, west of Greenwich, being 4.36s. east of the City Hall, New York. They are given in mean time of the place of observation.

			h.	m.	s.	
Begin.	Solar Eclipse,	May 14th, 1836,	19	10	1.30	E. Blunt.
End	,,	,,	21	40	31.20	,,
Begin.	,,	Sept. 18th, 1838,	3	17	18.80	,,
Formation of Ring		,,	4	36	47.30	,,
End of Eclipse		,,	5	48	23.63	,,
,,		,,	5	48	17.63	T. I. Page.

Mr. Blunt used a five feet Dollond's achromatic belonging to the coast survey. Mr. Page saw the end of the eclipse of 1836 with another telescope, within half a second of the time stated by Mr. Blunt. In the eclipse of 1838, the time noted for the formation of the ring was when the cusps were separated only by a few dark intervening spaces. Of these, Mr. Blunt counted six in number. The instant of rupture of the ring was not noted. Mr. Blunt thinks that the luminous

* One of the members of the Society, J. Price Wetherill, Esq. whose knowledge and skill, as a manufacturing chemist, are well known, informed Dr. Hare that in the manufacture of sweet spirits of nitre upon a large scale, he had always been careful not to have the process continued after the products began to show a certain degree of acridity.

points connecting the cusps, continued twelve or fifteen seconds. Mr. Blunt did not see the dark lines described by Francis Bailey, Esq. though favourably circumstanced for such an observation. Mr. Walker had found for the longitude of Mr. Blunt's observatory, from the beginning of the eclipse of 1836, 4h. 55m. 52.95s. and 4h. 56m. 2.07s. from the end:—Mean result, 4h. 55m. 57.51s. Mr. E. O. Kendall had found from the eclipse of 1838, a mean result of 4h. 56m. 1.16s. The mean, by the two eclipses, was 4h. 55m. 59.34s.; which makes the longitude of the City Hall, New York, 4h. 56m. 3.7s. Mr. Paine, in the American Almanac, makes the same 4h. 56m. 4.5s.; and Mr. E. I. Dent, by transportation of four chronometers from the Greenwich Observatory to New York, and again to Greenwich, finds for the same 4h. 56m. 4.42s. The mean of the three determinations is 4h. 56m. 4.2s.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. I. MARCH & APRIL, 1840. No. 11.

Stated Meeting, March 6.

Present, thirty-one members.

Mr. DU PONCEAU, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Nouvelle Formule, pour trouver la hauteur des lieux par celles du Baromètre et du Thermomètre, avec laquelle on determine, pour la première fois, le degré du Thermomètre centigrade où le froid est absolu. Par M. Du Villard de Durand, Ancien Deputé, membre de la Société de Harlem, &c. 8vo. Paris, 1826.—*From Mr. Pennington.*

Vues Prophylactiques et Curatives sur la Fièvre Jaune, extraites d'un Mémoire en date de Decembre, 1823, intitulé; Topographie Physique et Médicale de Florence et d'une partie de la Toscane. Par le Chev. Foureau de Beauregard, Docteur en Médecine de la Faculté de Paris, &c. &c. Presentées à l'Académie Royale de Médecine, &c. &c. 8vo. Paris, 1826.—*From the same.*

A Collection of the Publications, relative to Slavery, Temperance, the Indian Natives of this Continent, &c. &c. of Anthony Benezet. 12mo. Philadelphia, 1762 to 1784.—*From Mr. J. F. Fisher.*

Tomb of Washington at Mount Vernon. By William Strickland. 8vo. Philadelphia, 1840.—*From Mr. J. Struthers.*

The History of Hindostan, translated from the Persian. Second edition. Revised, altered, corrected and greatly enlarged. By Alex. Dow, Esq. 2 vols. 4to. London, 1770.—*From Mr. Vaughan.*

Journal of a Residence in China, and the Neighbouring Countries, from 1829 to 1833. By David Abeel, a Minister of the Reformed Dutch Church in North America, &c. Small 8vo. New York, 1834.—*From the same.*

Flora Scotica, or a Systematic Arrangement, in the Linnean method, of the Native Plants of Scotland and the Hebrides. By John Lightfoot, A.M. Second edition. 2 vols. 8vo. London, 1789. *From the same.*

A Memoir of the Life of Daniel Webster. By Samuel L. Knapp. Small 8vo. Boston, 1831.—*From the same.*

A Sketch of the Laws relating to Slavery in the several States of the United States of America. By George M. Stroud. 8vo. Philadelphia, 1827.—*From the same.*

History of the late Polish Revolution, and the Events of the Campaign. By Joseph Hordynski, Major of the late Tenth Regiment of Lithuanian Lancers. Fourth edition. 8vo. Boston, 1833. *From the same.*

Essai Statistique sur le Royaume de Portugal et d'Algarve, comparé aux autres États de l'Europe, et suivi d'un Coup d'Œil sur l'État actuel des Sciences, des Lettres et des Beaux-Arts parmi les Portugais des Deux Hémisphères. Dédié à sa Majesté très-fidèle. Par Adrien Balbi, Ancien Professeur de Géographie, &c. &c. 2 vols. 8vo. Paris, 1822.—*From the same.*

The Lottery System in the United States. By Job R. Tyson, Esq. Third edition. 12mo. Philadelphia, 1837. *From the Author.*

Codex Juris Gentium recentissimi, è Tabulariorum Exemplorumque Fide Dignorum Monumentis Compositus. 3 vols. 8vo. 1735 et 1772. Leips. 1781 & 1795.—*From Mr. Du Ponceau.*

Tableau de l'Histoire Générale des Provinces-Unies. Par A. M. Cérisier. 10 vols. 12mo. Utrecht, 1777 et 1784.—*From the same.*

Constitution of the Spanish Monarchy. Promulgated at Cadiz on the 19th of March, 1812. 8vo. Philadelphia, 1814.—*From the same.*

Exposition d'une Nouvelle Méthode pour l'Enseignement de la Musique. Par P. Galin, Instituteur à l'École Royale des Sourds-muets de Bordeaux. 8vo. Paris, 1818.—*From the same.*

Fundamenta Jurisprudentiæ Naturalis à Fred. Gulielm. Pestel delineata, in usum auditorum. Edit. 3tia aucta. 4to. Lugd. Batav. 1777.—*From the same.*

The Magazine of Natural History. New Series. December, 1839. Conducted by Edward Charlesworth, F. G. S. &c.—*From the Editor.*

The Charge delivered (by Judge Logan,) from the Bench to the Grand Jury, at the Court of the Quarter Sessions, held for the County of Philadelphia, the second day of September, 1723. Published at the desire of the said Grand Jury. Together with their Address. 4to. Philadelphia, 1723.—*From J. J. Smith, Jun.*

Mr. Geo. M. Justice presented an original document containing William Penn's objections to the accounts of his steward, Philip Ford, which exhibited overcharges on Ford's part to the amount of 9697 pounds, and stating William Penn's reasons why he submitted himself to their "unnatural confinement of him to the Fleet."

Mr. Lea read a paper on the Patella Amæna of Say, which was referred to a Committee.

Professor Bache read a paper entitled "Observations of the Magnetic Intensity at twenty-one Stations in Europe," which was referred to a Committee.

A communication was read from Dr. Locke, of Cincinnati, containing an account of magnetic observations at several places in the north-west of the United States, which was referred to a Committee.

Dr. Patterson exhibited some specimens of the Heliographic Art (Daguerréotype) of a large size, executed by Mr. Robert Cornelius, of Philadelphia; and stated to the Society, that Mr. Cornelius had succeeded in obtaining beautiful representations upon highly polished silver plate.

Mr. Saxton exhibited additional medals obtained by the galvanic process of Professor Jacobi; and likewise pieces of charcoal and anthracite, which he had used as substitutes for the forms of fusible metal ordinarily employed. These were perfectly coated with copper, a fact which shows it to be but necessary, that the substance at the negative electrode should be a conductor of electricity.

Stated Meeting, March 20.

Present, twenty-seven members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

The Present State of Nova Scotia, with a Brief Account of Canada, and the British Islands on the Coast of North America. 2d edition. 8vo. Edinburg, 1787.—*From Mr. Vaughan.*

Reports of the Committee of the House of Assembly, on that part of the Speech of His Excellency the Governor in Chief, which relates to the Settlement of the Crown Lands, with the Minutes of Evidence taken before the Committee. 2 vols. 8vo. Quebec, 1821.—*From the same.*

The History of Hindostan; translated from the Persian: the second edition; revised, altered, corrected, and greatly enlarged. By Alexander Dow, Esq. 2 vols. 4to. London, 1770.—*From the same.*

The History of Hindostan, from the Death of Akbar to the Complete Settlement of the Empire under Aurungzebe. To which are prefixed, 1. A Dissertation on the Origin and Nature of Despotism in Hindostan. 2. An Inquiry into the State of Bengal; with a Plan for restoring that Kingdom to its former Prosperity and Splendour. By Alexander Dow, Esq. Lieut. Col. in the Company's Service. 4to. London, 1772.—*From the same.*

Motifs des Guerres et des Traités de Paix de la France, pendant les Règnes de Louis XIV., Louis XV., et Louis XVI., depuis la Paix de Westphalie, en 1648, jusqu'à celle de Versailles, en 1783. Par le Chev. Anquetil, &c. 12mo. Paris, An 6 de la République.—*From the same.*

Zoonomia, or the Laws of Organic Life. By Erasmus Darwin, M.D., F.R.S. 2 vols. 8vo. Dublin, 1800.—*From the same.*

Syllabus of a Course of Lectures on Natural and Experimental Philosophy. By Thomas Young, M.D., F.R.S. Professor of Natural Philosophy in the Royal Institution of Great Britain. 8vo. London, 1802.—*From the same.*

Journal Historique de la Révolution de la partie Française de Saint-Domingue, commencé le 10 Août 1808, avec des Notes Statistiques sur cette partie. Par Gilbert Guillermin, Chef d'Escadron attaché à l'État-major de l'Armée de Saint-Domingue. 8vo. Philadelphia, 1810.—*From the same.*

Guida da Milano a Ginevra pel Sempione; con 30 Vedute ed una Carta Geografica. 8vo. Milano, 1822.—*From the same.*

Dissertation Second: exhibiting a General View of the Progress of Mathematical and Physical Science, since the revival of Letters in Europe. By John Playfair, Late Professor of Natural Philosophy in the University of Edinburgh, &c. (From the Supplement to the Encyclopædia Britannica.) 8vo. 2 vols.—*From the same.*

Dissertation Third: exhibiting a General View of the Progress of Chemical Philosophy, from the Early Ages to the End of the Eighteenth Century. By William Thomas Brande, Secretary of the Royal Society of London, &c. (From the Supplement to the Encyclopædia Britannica.) 8vo.—*From the same.*

Original Papers, relating to the Expedition to Panama. 8vo. London, 1744.—*From the same.*

Le Conservateur de la Vue, suivi du Manuel de l'Ingénieur-opticien, 4ème édit. par l'Ingénieur Chevallier (le Chev.) Membre de la Société Royale Académique des Sciences de Paris, &c. 8vo. Paris, 1820.—*From the same.*

Abrégé d'un Cours Complet de Lexicologie a l'Usage des Élèves de la Quatrième Classe de l'École Polymathique: par P. R. F. Butet (de la Sarthe) Directeur de cette École, &c. 8vo. Paris, An. IX. 1801.—*From the same.*

Essai sur la Théorie des Proportions Chimiques et sur l'Influence Chimique de l'Électricité: par J. J. Berzelius, Membre de l'Académie des Sciences de Stockholm. Traduit du Suédois sous les yeux de l'Auteur, et publié par lui-même. 8vo. Paris, 1819.—*From the same.*

Dictionnaire Raisonné de Botanique, contenant les Termes Techniques, Anciens et Modernes, considérés sous le Rapport de la Botanique, de l'Agriculture, de la Médecine, des Arts, des Eaux et Forêts, &c., par Sébastien Gérardin (de Mirecourt), Ex Professeur a l'École Centrale du Departement des Vosges, &c. Publié, Revu et Augmenté de plus de Trois Mille Articles, par M.

N. A. Desvaux, Professeur de Botanique, &c. Nouvelle édition. 8vo. Paris, 1822.—*From the same.*

The Works of John Locke, Esq. Three vols. folio. Second edition. London, 1722.—*From Mr. Du Ponceau.*

A New Atlas of the Mundane System; or of Geography and Cosmography; describing the Heavens and the Earth, the Distances, Motions, and Magnitudes of the Celestial Bodies: the various Empires, Kingdoms, States, and Republics throughout the Known World: with the Particular Description of the Latest Discoveries. The whole elegantly engraved on Sixty-four Copperplates; with a General Introduction to Geography and Cosmography, in which the Elements of these Sciences are compendiously deduced from Original Principles, and traced from their Invention to the latest Improvements. The fourth edition, with Additions, Corrections, and very great Improvements. By the late Mr. Samuel Dunn, Mathematician and Member of the American Philosophical Society, at Philadelphia, &c. Folio. London, 1796.—*From the same.*

A' Kávé, Thé és Csokolade Történeti, Természethistóriai Diaeteticai és Orvosi Tekintetben. F. Almási Balogh pál által. 12mo. Pesten, 1831.—*From the Author.*

De Evolutione et Vitâ Encephali. Auctore Paulo Balogh de F. Almás. 8vo. Pestini, 1823.—*From the same.*

Philosophiai Pályamunkák. Kiadja A' Magyar Tudós Társaság. 8vo. Budán, 1835.—*From the same.*

Report by the Board of Directors of the Transactions, Affairs and Accounts of the New Orleans and Nashville Rail Road Company, from its Organization to the present Time. New Orleans, February 28, 1840.—*From Mr. Merrick.*

Manuel Général pour les Arbitrages de Changes, et pour beaucoup d'autres Calculs Nécessaires chez les Négocians, par Nombres fixes ou par Logarithmes, &c. Suivi de Logarithmes depuis 1 jusqu'à 10100, &c. Par Felix Reishammer. 8vo. Paris, An. VIII. (1800)—*From Mr. J. P. Engles.*

Message from the President of the United States, transmitting a Report from the Secretary of State upon the subject of the Law for taking the Sixth Census. December 31, 1839.—*From Dr. Patterson.*

Letter from the Secretary of the Treasury, transmitting a Report of F. R. Hassler, upon the subject of the Coast Survey, and the Pro-

gress of Preparing Standard Weights and Measures. December 30, 1839.—*From the same.*

A Bill to Provide for the Disposal and Management of the Fund bequeathed by James Smithson to the United States, for the Establishment of an Institution for the Increase and Diffusion of Knowledge among Men. Reported to Congress by Mr. Adams.—*From the same.*

FOR THE CABINET.

A Specimen of Native Platinum, from Russia, weighing one ounce and twenty grains.—*From Col. Melnikoff*, of the Russian Service.

The Committee, consisting of Professor Henry, Dr. Patterson, and Mr. Walker, to whom was referred a paper entitled, "Observations of the Magnetic Intensity at twenty-one Stations in Europe. By A. D. Bache, LL.D. President of the Girard College for Orphans, &c.," reported in favour of the publication of the paper in the Society's Transactions. The Report was adopted, and the publication ordered accordingly.

The stations at which the observations, recorded in this memoir, were made, were twenty-one in number: three in Great Britain, and the others on the continent of Europe. They include Edinburgh, Dublin, London, Brussels, Berlin, Paris, Vienna, the Flégière, Brientz, the Faulhorn, Geneva, Chamberi, Chamouni, Lyons, Milan, Venice, Trieste, Florence, Turin, Rome, and Naples. The author remarks, that the magnetic dip and intensity are so well known at some of these places, that he produces his results for them, in order that, by comparison with those of other observers, the value of his determinations for other places may be judged of. The observations were of the horizontal intensity and dip, except in the comparison of the intensities at London and Paris, where, in addition, the statical method devised by Prof. Lloyd was used. At three of the stations the dip was not observed. The horizontal intensities were generally compared by oscillating two different needles in a rarefied medium, according to the method described by the author in a former paper (Am. Philos. Society's Transactions, Vol. V). At London and Paris, two additional needles were employed. The dip was observed in the usual way, with an instrument by Robinson, by whom also the needles for Prof. Lloyd's method were made. The corrections required for temperature in the horizontal needles had been previously obtain-

ed. The correction, for loss of magnetism by the needles, was ascertained from observations at Philadelphia, London, and Paris, and curves traced representing the loss, from which the specific correction, to be applied at any epoch, was readily obtained. The curve for one of the needles, showed a tendency towards a permanent state, and for the other was nearly a straight line. Irregular changes took place in neither needle. The author's experience with these needles, induces him to give a preference to the method of placing the needles in pairs, over that which he has hitherto employed, of keeping each needle separate from the other. A suggestion also results in the use of the dipping needle, of the necessity of ascertaining that the needles have, in the reversal of the poles, been charged nearly, or quite, to saturation. The author takes occasion to correct his statement in regard to the inefficacy of heating needles in boiling water in producing an approach to a permanent magnetic state. The observations at each station, with the corrections employed, are given in tables; and the number observed for the dip, or calculated for the horizontal or total intensities, are compared with the results of other observers.

The Memoir concludes with the following Abstract of the numerical results.

No.	Places.	Latitude.	Long. from Paris.	Date.	Horizontal Intensity.	Dip.	Total Intensity.
		° ′	° ′		Paris = 1	° ′	Paris = 1
1	Edinburgh	55 57 N.	5 32 W.	Feb. 3, 1837	0.841	— —*	——
2	Dublin	53 23 „	8 41 „	Nov. 20, 1836	0.879	— —*	——
3	London	51 31 „	2 26 „	June 16, 1837	0.9389	69 16.0	1.021
4	Brussels	50 51 „	2 02 E.	July 25, 1838	0.969	— —*	——
5	Berlin	52 32 „	11 02 „	Dec. 16, 1837	0.979	68 08.5	1.014
6	Paris	48 50 „	0 00 „	Aug. 17, 1837	1.000	67 20.8	1.000
7	Vienna	48 13 „	14 02 „	March 23, 1838	1.090	64 49.7	0.989
8	The Flégière	— —	— —	Aug. 26, 1837	1.099	64 35.8	0.987
9	Brientz	— —	— —	Sept. 22, „	1.078	65 06.7	0.987
10	The Faulhorn	— —	— —	Sept. 20, „	1.082	65 01 7	0.987
11	Geneva	46 12 „	3 49 „	Aug. 25, „	1.086	64 49.8	0.984
12	Chamberi	— —	— —	June 21, 1838	1.089	64 35.0	0.979
13	Chamouni	— —	— —	Aug. 26, 1837	1.088	64 38.2	0.979
14	Lyons	45 46 „	2 29 „	June 25, 1838	1.078	64 49.0	0.978
15	Milan	45 28 „	6 51 „	June 10, „	1.111	63 54.7	0.972
16	Venice	45 26 „	10 10 „	April 11, „	1.120	63 21.9	0.971
17	Trieste	45 38 „	11 27 „	April 4, „	1.128	63 20.5	0.970
18	Florence	43 47 „	8 55 „	May 28, „	1.170	62 05.5	0.965
19	Turin	45 04 „	5 20 „	June 17, „	1.094	63 52.2	0.959
20	Rome	41 54 „	10 10 „	May 18, „	1.225	60 14.0	0.952
21	Naples	40 52 „	14 57 „	May 7, „	1.249	59 05.1	0.938

* Dip not observed.

† Mean of results in June, July and Aug. 1837, and in July and Aug. 1838.

The Committee, consisting of Mr. Nicklin, Prof. Bache, and Dr. Hays, to whom was referred a Paper entitled "On the Patella Amæna of Say, by Isaac Lea," reported in favour of publication, which was ordered accordingly.

In this Paper Mr. Lea gives a Synonymy, showing that the *Patella Amæna* of Say was first described by Müller, under the specific name of *Testudinalis:* Zool. Dan. p. 237; and Mr. Couthouy, having lately given an elaborate description of the animal, in the Boston Journal of Natural Science, showing that it belongs to the new genus *Patelloida*, recently established by Quoy and Gaimard; Mr. Lea argues that it should henceforth be called *Patelloida Testudinalis.*

A Communication was read, entitled, "On the Storm which was experienced throughout the United States, about the 20th of December, 1836; by Elias Loomis, Professor of Mathematics and Natural Philosophy in Western Reserve College," which was referred to a Committee.

Dr. Hare read a Communication, entitled, "1. The Well-known Features of the Climate of the Atlantic States. 2. On Certain Facts and Inferences respecting the Origin and the Effects of the Trade Winds, and the Westerly Breezes which they must induce, or into which they must be deflected. 3. Of Certain Facts or Laws of Electrical Reaction, which have been ascertained experimentally, and which render it irrational not to consider Electricity as the Principal Instrument of Nature in the Production of Storms."

The Paper was referred to a Committee.

Mr. Peale exhibited specimens of Medals, obtained by the process of Professor Jacobi. He stated, that Mr. Eckfeldt, of the Mint, had found the specific gravity of the copper, thus procured, to be as high as that of rolled copper; that is, 8.95.

Mr. Peale also exhibited a diaphragm of parchment, which had been used in the battery employed in the process; and upon which metallic copper had been precipitated. He farther exhibited specimens of Metallic Silver, reduced, by a similar process, from the chloride of silver: but remarked, that it was not likely to lead to any useful analogous result, owing to the silver being deposited in a granular state.

Mr. Sears C. Walker read an extract from a letter of Prof. S. Alexander, of Princeton, giving a Description, with Drawings, of two Appearances of Lateral and Vertical Mirage, noticed by him.

The thermometer, in both instances, was nearly at 0° Fahrenheit. The first was of the rising of the sun, seen in the winter of 1834–5, across the valley of Stony Brook, through which the Delaware and Raritan Canal passes. The distorted and ragged shape of the sun resembled a sketch, made by Mr. Head, of the moon's appearance several minutes before setting, Jan. 7th, 1825, at Port Bowen, in Captain Parry's third voyage. The other phenomenon was observed by Prof. Alexander, at sea, off Cape May, Dec. 15th, 1834. The preceding night had been severely cold, and the surface of the ocean was covered with a thin cloud, denominated by the Greenlanders, "Port Smoke." In the afternoon, as the sun approached the horizon, a brilliant and distinct image of himself arose to meet him. After the apparent contact of the two discs, the two centres approached and passed each other, leaving visible, however, only the lower segment of the image, and the upper segment of the sun's disc, which double segment became more and more narrow, till it vanished; thus presenting the phenomenon of sunset, at about 15′ above the horizon.

A similar appearance is described in Parry's second voyage, at Winter Island, Dec. 20th, 1821, when an inverted image of the moon appeared just after she had risen.

Dr. Bache reported the decease of John Frederick Blumenbach, on the 22d of January, 1840; and of Joseph Parrish, M. D., on the 18th of March, 1840—members of the Society.

Dr. Dunglison, Reporter, stated that No. 10, of the Bulletin was ready for distribution.

Stated Meeting, April 3.

Present, twenty-one members.

Judge Hopkinson, Vice President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Proceedings of the Royal Astronomical Society. Vol. II. No. 2.—*From the Society.*

Address of the Most Noble the Marquis of Northampton, &c. &c., the President, read at the Anniversary Meeting of the Royal Society, on Saturday, Nov. 30, 1839.—*From the Royal Society.*

Transactions of the Agricultural and Horticultural Society of India. Vol. VI. 8vo. Calcutta, 1839.—*From the Society.*

The Journal of the Royal Geographical Society of London. Vol. IX. 1839. Part 3. 8vo. London, 1839.—*From the Society.*

Notes, taken during Travels in Africa, by the late John Davidson, F.R.S. F.S.A., &c. Printed for private circulation only. 4to. London, 1839.—*From Capt. John Washington*, of London.

Voyages of the Dutch Brig of War Dourga, through the Southern and little-known Parts of the Mohiccan Archipelago, and along the previously unknown Southern Coast of New Guinea, performed during the Years 1825 and 1826. By D. H. Kolff, Jun. Lieutenant ter Zee, 1e Klasse, en Ridder van de Militaire Willems Orde. Translated from the Dutch, by George Windsor Earl, Author of the "Eastern Seas." 8vo. London, 1840.—*From the same.*

The Statutes at Large of South Carolina; Edited under Authority of the Legislature, by David J. M'Cord. Vol. VI. Containing the Acts from 1814, exclusive, to 1838, inclusive. 8vo. Columbia, 1839.—*From Dr. P. Tidyman.*

Select American Speeches, Forensic and Parliamentary, with Prefatory Remarks: being a Sequel to Dr. Chapman's "Select Speeches." By S. C. Carpenter. Two Vols. 8vo. Philadelphia, 1815.—*From Mr. Vaughan.*

Sermons, Orations, and Eulogiums, by Various Individuals, in 1799 and 1800. Two Vols. 8vo. Philadelphia, 1800.—*From the same.*

A Voyage Round the World; including an Embassy to Muscat and Siam, in 1835, 1836 and 1837. By W. S. W. Ruschenberger, M. D., Surgeon U. S. Navy, &c. 8vo. Philadelphia, 1838.—*From Mr. Lea.*

The Philadelphia Book; or Specimens of Metropolitan Literature. 12mo. 1836.—*From Mr. Du Ponceau.*

Praktische Deutsche Sprachlehre zum Selbstunterricht und für Schulen. 12mo. Leipzig, 1801.—*From the same.*

My Prisons, Memoirs of Silvio Pellico of Saluzzo. Two Vols. 12mo. Cambridge, 1836.—*From the same.*

Ethnological Extracts from the Monthly Chronicle; containing a Paper, by Dr. Prichard, on the Extinction of Human Races, &c., and a Communication on the Practicability of Civilizing Aboriginal Populations.—*From Dr. Hodgkin.*

The London Athenæum, for December 28, 1839, containing the Meteorological Observations at the Apartments of the Royal Society, for Twenty-five Successive Hours, commencing at 6 A. M. Dec. 21, 1839, and ending at 6 A. M. of the following day. By Mr. J. D. Roberton, Assistant Secretary Royal Society.—*From Mr. Wm. Vaughan.*

Address, delivered by the Actuary, (Mr. Morgan) to the General Court of the Equitable Society, on Thursday, the 5th Dec. 1839, with Tables and Statements of Insurance on Lives, by the Society.—*From the same.*

The American Medical Library and Intelligencer. By Robley Dunglison, M. D., &c. Vol. III. Nos. 23 and 24, (which conclude the year) March 1 & 15. Philadelphia, 1840.—*From the Editor.*

Lecture on the Advantages derived from Cultivating the Arts and Sciences. By G. Emerson, M.D. Delivered before the Philadelphia Mercantile Library Association. Dec. 8, 1839. 8vo. pp. 22. Philadelphia, 1840.

FOR THE CABINET.

A Musical Reed Instrument, consisting of fourteen Bamboo Reeds, invented at Laos, and described in Ruschenberger's Voyage Round the World.—*Presented by Dr. Ruschenberger.*

The Committee, consisting of Dr. Patterson, Dr. Hare, and Prof. Bache, to whom was referred a paper entitled "On a new Principle in regard to the Power of Fluids in Motion to

produce Rupture of the Vessels, which contain them, and on the Distinction between Accumulative and Instantaneous Pressures; by Charles Bonnycastle, Professor of Mathematics in the University of Virginia," reported in favour of its publication in the Transactions of the Society, which was ordered accordingly.

Mr. Bonnycastle's investigation was suggested by a paper read by Dr. Hare, and printed in the Transactions of the Society, entitled "On the Collapse of a Reservoir, whilst apparently subject within to great Pressure from a Head of Water." Dr. Hare pointed out the circumstances attendant upon this curious occurrence, and showed how the vessel might have been momentarily relieved from the pressure of the water within, so as to make that of the surrounding air efficient in producing the collapse. The principal object of Mr. Bonnycastle's paper is to investigate the precise nature and degree of the forces brought into action in this and similar cases.

The results at which Mr. Bonnycastle arrived, are stated by him as follows:—

1. It is convenient to distinguish between accumulative and instantaneous loads, or between those which are gradually increased until the deflection due to the ultimate load is obtained, and those which commence in full efficacy from the initial position of the support.

2. Within the limits of perfect elasticity, instantaneous pressure produces twice the effect of that which is accumulative, whether the result be to produce deflection or fracture.

3. In regard to supports perfectly elastic in one direction, and perfectly flexible in the other, instantaneous action, at right angles to the axis of elasticity, produces a deflection which is to that of accumulative action as $\sqrt{4}$ to 1, whilst the tendencies to fracture are as 4 to 1. But should any case occur when the law of elasticity follows an extremely high power of the deflection, then the singular result will follow, that the deflections are the same, whether the force be exerted from the initial state or the state of load, but that the tendency to fracture will be immensely greater in the former case, than in the latter.

4. In producing the fracture of natural substances, which all depart from the law of perfect elasticity as we approach the limit of

fracture, the ratio of the effect of instantaneous and accumulative action will vary with the nature of the substance, never being less, for elastic bodies, than 2 to 1, nor for flexible than 4 to 1, and more usually approaching 3 or 4 to 1 for the former case, and 5 or 6 to 1 for the latter.

5. Let a vase or conduit be acted upon by a load which is alone sufficient to break it, and let this load be partly balanced by a small exterior force: should the great interior force suddenly cease, the small exterior action may crush the vase or conduit inward; its energy in such case being the sum of the interior and exterior forces.

6. Should the interior force be a vibration of the kind already explained, and should the exterior action be extremely feeble, and act on a very great mass, this extremely feeble action may crush the vase inward, with a power that shall exceed in any degree the enormous action of the interior or explosive vibration. The comparison of the interior and exterior actions is best effected in this case, by finding the modulus of elasticity of a material spring that shall coincide most nearly in effect with the interior tremor. For putting e and e' respectively for the modulus of the spring and of the support, and σ and σ' for the deflections resulting from the tremor acting alone, and the reaction as it does act, we have $\frac{\sigma'}{\sigma} = \sqrt{\frac{e}{e'}}$, or, in other words, the deflection produced by the reaction, is to the deflection that would be produced by the interior tremor alone, in the inverse proportion of the square roots of the moduli of tremor and support.

7. Combining what is here said with the known laws of fluids moving in pipes, and whereby they necessarily produce hydraulic shocks, it follows, that any vessel connected with such a train of pipes, and plunged at some little depth in a considerable mass of water, or other heavy fluid, will occasionally be subject to a crushing and exterior force vastly greater than the interior strain due to the constant head of fluid.

In illustration of the principles thus developed, Mr. Bonnycastle details some experiments, and mentions a phenomenon which occurred under his own notice, and is analogous to the one described by Dr. Hare. In making experiments on the propagation of sound through water, he had occasion to cause an explosion of gunpowder within a hollow metallic cylinder, open at the lower end, and immersed under the liquid; and, although the strength of the cylinder

was abundantly sufficient to bear the statical pressure of the surrounding water, he found it crushed inward after the explosion.

Judge Hopkinson deposited with the Society, the Log Book of the first voyage in a steam vessel across the Atlantic, by Captain Rogers, in the year 1819; an account of which was given in the Proceedings of the Society, No. 2, p. 14.

In a written communication, Judge Hopkinson stated, amongst other matters in reference to Captain Rogers's priority, that he was on board the steam ship, lying at the City of Washington, after her return from the voyage. She was built and rigged like one of the Liverpool packets; and her wheels were made to fold up at her sides, when the wind permitted her sails to be used.

The Log Book states, among the occurrences usually noted, the days when the steam was used.

Dr. Hare made some observations on Professor Loomis's views of storms, read at the last meeting; also, on the mode in which storms may be induced by the meeting of opposite currents, and the ascent of an intervening mass of air; on the agency of electricity in their production, &c. &c.

Dr. Hare asked permission to withdraw his paper, presented at the last meeting of the Society, which was agreed to.

He stated that he was about to perform some experiments, the results of which it appeared to him desirable to publish with his essays, and he was fearful that the subject could not be described satisfactorily without quotations from previous publications, which might not be consistent with the limits allowed to articles published in the Transactions.

Stated Meeting, April 17.

Present, twenty-nine members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received.

FOR THE LIBRARY.

Sundry Chinese Works, consisting of 29 volumes, or pamphlets, 8vo. *From the Rev. Mr. Gutzlaff, Missionary at Canton.*

Flora Batava, of Afbeelding en Beschryving van Nederlandsche Gewassen, door Jan Kops, Hoogleeraar te Utrecht; en F. A. W. Miquel. 118 aflevering, 4to. Te Amsterdam, 1839.—*From His Majesty the King of the Netherlands.*

Bulletin de la Société de Géographie, Deuxième Serie. Tom. IIème. 8vo. Paris, 1839.—*From the Society of Geography of Paris.*

Charles d'Este, ou Trente Ans de la Vie d'un Souverain. 2 Tom. Paris, 1836—*From Mr. Du Ponceau.*

Considerations on the Principal Events of the French Revolution, Posthumous Work of the Baroness de Stael. Edited by the Duke de Broglie, and the Baron de Stael. 8vo. 2 vols. New York, 1818.—*From the same.*

The History of the Origin, Progress, and Termination of the American War. By C. Stedman, who served under Sir W. Howe, Sir H. Clinton, and the Marquis Cornwallis. 2 vols. 4to. London, 1794.—*From Mr. Vaughan.*

The American Journal of Science and Arts. Conducted by Benjamin Silliman, M.D., LL.D., aided by Benjamin Silliman, Jr., A. B., &c. &c. Vol. XXXVIII. No. 2. April, 1840.—*From the Editors.*

Annales des Mines, ou Recueil de Mémoires sur l'Exploitation des Mines, &c. &c. rédigées par les Ingénieurs des Mines, &c. &c. Tom. XVI. 5e Livraison de 1839. 8vo. Paris, 1839.—*From the Ingénieurs des Mines.*

Catalogue of the Library of the late Dr. Thomas Cooper. 8vo. Columbia, 1839.—*From Dr. Hays.*

A Report on the History and Causes of the Strangers', or Yellow Fever of Charleston, read before the Board of Health. By

Thomas Y. Simons, M. D., Chairman of the Board.—*From the same.*

The Committee, consisting of Professor Bache, Dr. Patterson, and Mr. Walker, to whom was referred a paper entitled "On the Storm which was experienced throughout the United States, about the 20th of December, 1836, by Elias Loomis, Professor of Mathematics and Natural Philosophy in Western Reserve College," reported in favour of publication in the Society's Transactions, which was ordered accordingly.

The memoir of Prof. Loomis first describes the sources of information to which he has had access, consisting of various published or private meteorological journals. The principal phenomena occurred in the eastern states, within the period recommended by Sir John Herschell for hourly meteorological observations; and were, of course, accurately noted at the stations where these observations were made. From various sources, Prof. Loomis has obtained observations of the barometer at twenty-seven different stations in the United States and the neighbouring British possessions, and records of the thermometer and weather from twenty-eight military stations of the United States, from forty-two academies of the state of New York, and from five other stations within the probable limits of the storm, besides others beyond it. In some cases two sets of observations were made at the same station.

The phenomena are discussed by the author under the following heads. 1. A remarkable oscillation of the barometer. 2. A sudden depression of the thermometer. 3. The amount, and the time of beginning and ending of the rain. 4. The direction and velocity of the wind.

1. The observations of the barometer show that during the storm there was a sudden depression of the barometer immediately succeeded by a sudden rise; that the minimum of pressure occurred first in the western states, and passed in a wave over the United States, moving eastwardly. The curves drawn to represent the heights of the barometer illustrate this fact in a very striking manner. Prof. Loomis has attempted to determine, from the observations, the amount of depression of the barometer, the form and velocity of the atmospheric wave, the progress of which, over the United States, he has represented upon a chart.

2. A comparison of the observations of the thermometer and barometer, shows that while the pressure was diminishing the temperature was increasing, and vice versa. The very remarkable diminution of temperature of 48° Fah. in six hours and a half, occurred at one station in the N. W. of the United States. The commencement of the diminution of temperature is shown to coincide with the minimum of the barometer, and hence is used when barometric observations were not made, to point out the probable time of the occurrence of this minimum. The average of the maxima of the thermometer at the eastern stations was about 3½° Fah. greater than at the western, and the average of the minima 14° Fah. greater.

3. Rain or snow fell during the storm within the limits of about latitude 28° N. to latitude 48° N., and from longitude 52° to 96° W. The average amount at fifty-nine stations was seven-eighths of an inch. The author is led to remark upon the great discrepancies in the statements of the fall of rain at places very near each other, and upon defects in the registers in not stating the time of beginning and ending of the rain.

4. The epoch of the minimum of pressure at the several places of observation was marked by a change of wind from a southern quarter, generally the south-east, to a northern quarter, almost uniformly the north-west. This sudden change of wind was every where one of the most prominent features of the storm, the wind having been violent both before and after the change; but more violent from the north-westerly direction, except perhaps at New York and in the north-eastern states.

The author sums up thus the characteristic of the storm. After a cold and clear interval, with the barometer high, the wind commenced blowing from a southerly quarter; the barometer fell rapidly, the thermometer rose, and rain fell in abundance. The wind subsequently veered suddenly to the north-west, and blew with great violence; the rain was succeeded by hail or snow, which continued but for a short time. The changes thus described occurred, not simultaneously, over the United States, but progressively from west to east.

The author next endeavours to determine the limits of the storm, using for this purpose other meteorological registers in addition to those before noticed, and of which he gives a particular account. From these, and theoretical considerations, he places the Rocky Mountains as the western limit, the parallel of 25° N. lat. as the southern limit, the middle of the Atlantic as the eastern limit, and the northern

as altogether conjectural, but probably as remote as the arctic circle, thus extending over 70° of longitude and 40° of latitude. The question whether the remarkable storm which occurred in Europe, about the 25th of December, was a continuation of this storm, is examined, and the author concludes, from a discussion of its peculiarities, that it was not—the progress of the barometric minimum in Europe being from north to south, inclining a little to the west.

The author next proceeds to generalize the deductions in regard to the circumstances of this storm, and to apply them as tests to the different theories of wind, rain, &c.

He first endeavours to show how far registered observations of the wind may be influenced by localities, and their accuracy affected by the mode of observing, and the transcribing of the registers; and concludes that it is indispensable to regard the average of directions at near stations, and not those at individual ones, and gives some examples of discrepancies at places near each other, in support of this opinion. The anomalies presented by the stations in the state of New York are very curious.

The causes assigned by theory for the production of winds are next enumerated and discussed. Recurring to the observations, the author traces a connexion between the direction of the surface wind on the 18th and 19th of December, and a maximum of the barometer existing on a line nearly north and south, moving eastwardly, and passing, on the morning of the 20th of December, nearly through the eastern extremity of the State of Maine. At this period a minimum of the barometer existed nearly on the line of the river Mississippi, and the winds blew towards this line. This minimum is traced in its motion eastward; and in connexion with it, the change of wind from the easterly to the westerly quarter. On the afternoon of the 21st, the line of minimum pressure had reached Boston; and on the 22d, the north-westerly wind now prevailed at nearly all the stations. The direction and approximate force of the wind, on the morning of the 21st, are represented upon a map of the United States, accompanying the memoir. From an examination of a phenomenon of the wind, Prof. Loomis concludes that the south-easterly current rose, so that the north-westerly wind thus became the lowermost current; and subsequently, from an examination of the phenomenon of the rain, snow, and hail, that the rising current was, in part at least, deflected back upon itself. The immediate cause of the south-easterly wind is

traced to the existence of a minimum of pressure, at some point north of the United States.

The author next examines the various causes which have been, or may be, in his opinion, assigned as producing rain, and infers that the most common cause of rain, in these latitudes, is the sudden lifting up of warm air into regions about the earth's surface, by its displacement by a cold current originally above it, and from an opposite direction; and that such was the actual cause of the rain in question, a warm current from the south having been displaced, and caused to rise to a considerable elevation by a cold current from the west. The mixture of the warm and cold air is inadequate, in the author's opinion, to account for the phenomena.

The author then explains the causes of the observed rise of the thermometer to be due to the warm south-east wind, and the subsequent depression to the cold north-west wind.

The author next examines the causes which have been assigned for the fluctuations of the barometer during this storm, selecting, as applicable to the present case, the following:—"The south-east wind, which accompanied the rain, moved with an accelerated velocity. The particles, therefore, of air, at one extremity of the current, must have left those of the other extremity at an increased distance. Hence a mechanical rarefaction, and, of course, diminished pressure. The reverse effect must have taken place after the storm had passed. A north-west wind sets in with great violence. A vast body of air is precipitated toward the south-east. The partial vacuum which at first existed, is very soon supplied: yet, though the first impelling cause has ceased to act, the momentum of the excited current still urges it onward, and a condensation results, which continues the rise of the barometer."

The author concludes by remarking, that he has availed himself in these discussions of the suggestions of writers on meteorology, and is especially indebted to the labours of Messrs. Redfield, Espy, and Reid.

Dr. Hare read a communication entitled "Engraving and description of an apparatus and process for the rapid congelation of water, by the explosive evolution of ethereal vapour, consequent to the combined influence of rarefaction and the absorbing power of sulphuric acid, by Robert Hare, M. D.," which was referred to a Committee.

Mr. Walker read a communication, entitled "Observations on Nebulæ with a fourteen feet Reflector, by H. L. Smith and E. P. Mason, during the year 1839, by E. P. Mason," which was referred to a Committee.

Dr. Hare made a verbal communication in reference to the extent at which the galvanic influence could be extended through a coil of wire.

Dr. Hare stated, that he had prepared a coil of copper wire, No. 26, nearly a mile in length, by means of which, and a strap of copper, three inches in width, and 196 feet in length, he had been enabled to repeat the experiment of Professor Henry, for exciting a Faradian current. The wire was covered with cotton, and was coiled upon a wooden sieve hoop. Being suspended over a pulley, and counterbalanced by a weight over the strap, when this was placed in the circuit of a calorimotor, so that the circuit might be broken by drawing one of the electrodes over a rasp or ratchet wheel, communicating with the coil, shocks were felt, when the distance of several feet intervened, and they became intolerable when the coil and strap were nearly in contact. Having this coil at command, it occurred to Dr. Hare, to ascertain how far it would be competent to act as a multiplier. It seemed to be a problem which was yet to be solved, how far the extension of the length of the coils employed would affect their efficacy. He had not heard of any one in which resort had been had to an extension so great as a mile. Actuated by these considerations, Dr. Hare supported his coil in a vertical plane, and placed upon the lower and under surface of the hoop, the magnetic needle of an ordinary multiplier. A five cent piece, and a disk of zinc of the same size, being separated by a piece of moistened paper, when one of the ends of the coil was made to touch the silver disk and the other the zinc, the needle moved nearly a quadrant at every contact. When the disk was divided into four parts, every one of them was adequate to produce a movement in the needle, when the coil was made the medium of discharge. That such minute portions of metal should be capable of creating an electrical current in so long a coil, and sufficiently copious to influence a magnetic needle, would have appeared incredible to him, had it not been thus proved experimentally.

Dr. Hare stated the general results of some experiments,

made since the last meeting of the Society, on the rarefaction of moist and dry air.

Prof. Bache presented a chart of the magnetic observations made on the 28th of February last, in which he was assisted by Mr. Walker and Mr. Kendall. He farther called the attention of the Society to the recent publication of Prof. Gauss, in regard to the simultaneous changes of magnetic intensity at places as far apart as Göttingen and Münich.

Dr. Dunglison read a letter from the Rev. James T. Dickinson, of Singapore, to Mr. Du Ponceau, dated Nov. 25, 1839, expressing his satisfaction with the views of Mr. Du Ponceau, as contained in his "Dissertation on the Chinese System of Writing."

When Mr. Dickinson commenced the study of the Chinese language, nearly four years ago, he attempted to learn the written language by the eye merely, without connecting sounds with the characters. To this course he was led by the fact, that the Hokkien dialect, the one he studies, differs very much, as *spoken*, from the sounds given to the characters as *read*. His plan was to learn the colloquial language by itself, and to defer the learning of the sounds given to the characters in reading, while, in the meantime, he endeavoured to learn to read the characters independently of all sounds. In this way he would have succeeded in learning to read Chinese books, had the common hypothesis, that the Chinese characters are addressed *directly* to the mind, and not to the mind through the medium of sounds, been correct. Mr. Dickinson, however, found himself always translating either into English or the colloquial Chinese. All his efforts to transfer the ideas represented in Chinese books to his own mind, without the help of words, either Chinese or English, were fruitless.

Mr. Dickinson considers the work of Mr. Du Ponceau "a most valuable gift to the world, and an honour to American learning."

Dr. Dunglison referred to a curious but not unique case, of a worm in the eye of a horse now in Baltimore.

The particulars were contained in a letter to him, from Dr. Joshua J. Cohen, of Baltimore. This entozoon is a species of filaria, (see *Filaria Papillosa*, Rudolphi, Synops. p. 213) probably from 3½ to 4 inches

in length, and situate in the aqueous humour, in which it moves about with great activity, but its motions are so constant, that it is difficult to appreciate its exact length. The great size of the anterior chamber of the horse's eye, affords it ample space; and through the transparent cornea, it can be observed as well as if it were in a glass vessel. The horse was sent up from Calvert county, Maryland.

Dr. Dunglison made some observations on the difficulty of accounting for its presence in this shut sack, and alluded to the different views of distinguished naturalists as to the generation of many of the lower tribes of the animal kingdom,—some presuming that they may be formed spontaneously, whilst others consider that the germs must always be received from without. The difficulty, he observed, applied to all the entozoa that infest the animal body; and this case was certainly not more difficult of explanation, than that of entozoa found in the intestines of the fœtus in utero.

Dr. Bache referred to a similar case, which was published in an early volume of the Transactions of the Society, (Vol. II. p. 183, by F. Hopkinson, Esq., and Ibid. p. 383, by Dr. Morgan.)

Mr. Walker referred to a letter which he had received from Prof. Loomis, containing two observations of Galle's second comet, and stated, that he (Mr. Walker) had been engaged in deducing the elements of the orbit of the comet, which accorded with results of European observers, but did not perfectly correspond with those of Prof. Loomis.

The following gentlemen were duly elected members of the Society:—

Paul Beck Goddard, M. D., of Philadelphia.

W. H. C. Bartlett, Professor of Natural and Experimental Philosophy, West Point.

Wm. R. Fisher, M. D., of Philadelphia.

George M. Wharton, of Philadelphia.

Friedr. Wilhelm Bessel, Director of the Observatory, Königsberg.

Rev. Wm. H. Furness, of Philadelphia.

Captain Francis Beaufort, R. N., Hydrographer to the Admiralty of Great Britain.

Hartman Kuhn, of Philadelphia.

George Washington Smith, of Philadelphia.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. I. MAY, JUNE & JULY, 1840. No. 12.

Stated Meeting, May 1.

Present, twenty-one members.

Mr. DU PONCEAU, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Archives du Muséum d'Histoire Naturelle, publiées par les Professeurs-Administrateurs de cet Établissement. Tom. I. 4to. Paris, 1839.—*From the Professors.*

Journal of the Asiatic Society of Bengal, edited by the Acting Secretaries, and circulated gratis to the Members of the Society. Nos. 88 and 89, for April and May, 1839.—*From the Society.*

Report of the Committee of Physics and Meteorology of the Royal Society, relative to the Observations to be made in the Antarctic Expedition, and in the Magnetic Observatories. 8vo. London, 1840.—*From the Royal Society.*

Fifty-third Annual Report of the Regents of the University of the State of New York, made to the Legislature, March 2, 1840. 8vo. Albany, 1840.—*From the Regents.*

Transactions of the Medical Society of the State of New York. Vol. IV. In Three Parts. 8vo. Albany, 1838–9–40.—*From the Society.*

C. Cornelii Taciti quæ extant, Marcus Zuerius Boxhornius recensuit, et Animadversionibus illustravit, &c. &c. 24mo. Amstelodam. 1664.—*From Mr. Du Ponceau.*

Joannis Seldeni Mare clausum, seu de Dominio Maris, Libri duo. 24mo. Londins. 1636.—*From the same.*

Juris et Judicii Fecialis sive Juris inter Gentes, et Quæstionum de eodem Explicatio, qua quæ ad Pacem et Bellum inter diversos Principes aut Populos spectant, ex Præcipuis Historico-jure-peritis exhibentur. Opera R. Z. (Ricard. Zouch) Auctoris Elementorum Jurisprudentiæ. 24mo. Hagæ Comitis, 1669.—*From the same.*

Kong Christian den Femtes Danske Lov paa nye oplagt ved Casper Peter Rothe, efter Kongl. Allernaadigst meddelt Privilegium, 1753. *From the same.*

Litteratur des gesammten sowohl natürlichen als positiven Völkerrechts. Von Diedr. Heinr. Ludw. Freyherrn von Ompteda, Königl. Grosbritt. Churfürstl. Braunschweig. Lüneb. Comitial-Gesandten bey der Reichsversammlung zu Regensburg, u. s. w. 2 Theil. 8vo. Regensburg, 1785.—*From the same.*

Saggio di Poesie Alemann erecate in versi Italiani da Antonio Bellati. Edizione nuovissima. 12mo. Milano, 1832.—*From the same.*

Minshæi Emendatio, vel à Mendis Expurgatio, seu Augmentatio sui Ductoris in Linguas. The Guide into Tongues. Cum illarum Harmonia et Etymologiis, Originationibus, Rationibus et Derivationibus in omnibus his novem Linguis, viz.—1. Anglica; 2. Belgica; 3. Germanica; 4. Gallica; 5. Italica; 6. Hispanica; 7. Latina; 8. Græca; 9. Hebræa, &c. &c. &c. Opera, Studio, Industria, Labore et Sumptibus Johannis Minshæi in lucem editum et impressum, 22 Julii, Anno, 1625. 2da Editio, folio. London, 1627.—*From Mr. Vaughan.*

A Memoir of William Rawle, LL.D., President of the Historical Society, &c. By T. I. Wharton, Esq. Read at a Meeting of the Council, held on the 22d day of February, 1837, and printed by order of the Society; with a Letter from Peter S. Duponceau, Esq., to the Author, containing his Recollections of Mr. Rawle's Life and Character. 8vo. Philadelphia, 1840.—*From Mr. Wharton.*

The Magazine of Natural History. New Series. Conducted by Edward Charlesworth, F. G. S. &c. Jan. and Feb. 1840. London.—*From the Editor.*

Fourteenth Annual Report of the Board of Managers of the Prison Discipline Society, Boston, May, 1839. 8vo. Boston, 1839.—*From Mr. J. P. Davis.*

Answer to the Whig Members of the Legislature of Massachusetts, constituting a Majority of both Branches, to the Address of His Excellency, Marcus Morton, delivered in the Convention of the

two Houses, Jan. 22, 1840. 8vo. Boston, 1840.—*From the same.*

Abstract of the Return of the Overseers of the Poor in Massachusetts, for 1839; prepared by the Secretary of the Commonwealth. 8vo. Boston, 1840.—*From the same.*

Third Annual Report of the Board of Education, together with the Third Annual Report of the Secretary of the Board. 8vo. Boston, 1840.—*From the same.*

Seventh Annual Report of the Trustees of the State Lunatic Hospital at Worcester, December, 1839. 8vo. Boston, 1840.—*From the same.*

Abstract of the Massachusetts School Returns for 1838–9. 8vo. Boston, 1840.—*From the same.*

Report of the Geologists of the State of New York. In Assembly. January 24, 1840. 8vo.—*From Mr. Vanuxem.*

Review of Morton's Crania Americana, from the American Journal of Science and Arts, No. 2, Vol. 38.—*From Prof. Silliman.*

The Farmer's Register, a monthly publication, devoted to the Improvement of the Practice and Support of the Interests of Agriculture. Edmund Ruffin, Editor and Proprietor. Vol. VII. 8vo. Petersburg, 1839.—*From the Editor.*

Supplement to the Farmer's Register, containing the Essay on Calcareous Manures. Second edition, greatly enlarged. 8vo. Prince George County, Va.—*From the same.*

Instruction sur la Fabrication du Sucre de Betteraves par le Procédé de Macération, à l'usage des Fabriques Rurales: par C. J. A. Mathieu de Dombasle. 12mo. Paris, 1839.—*From Mr. D. B. Warden.*

Question des Sucres. Indemnité aux Fabricans: par C. J. A. Mathieu de Dombasle.—*From the same.*

Société Royale et Centrale d'Agriculture. Coup d'œil sur l'Agriculture de la Sicile; par M. le Cte. de Gasparin, Pair de France. *From the same.*

Observations Météorologiques faites à Flacq, Ile Maurice, par M. Julien Desjardins, pendant les années, 1836, 1837, 1838.—*From the Author.*

Notice Historique sur Charles Telfair, Esq., Fondateur et Président de la Société d'Histoire Naturelle de l'Ile Maurice, &c. &c., lue à la 4me Séance Annuelle de la Société d'Histoire Naturelle de l'Ile Maurice, le Samedi, 24 Août, 1833, par M. Julien Desjar-

dins, Secrétaire et l'un des Membres Fondateurs de cette Société, &c. &c. 4to. Port-Louis, Ile Maurice, 1836.—*From the same.*

Liste des Membres qui composent la Société d'Histoire Naturelle de l'Ile Maurice. 1er September, 1836.—*From the same.*

Huitième Rapport Annuel sur les Travaux de la Société d'Histoire Naturelle de l'Ile Maurice, lu à la Seance Anniversaire du Jeudi, 24 Août, 1837, par M. Julien Desjardins, &c. &c. 8vo. Maurice, 1837.—*From the same.*

Proceedings of the Numismatic Society of London, 1837–8, containing the Address of the President, Dr. Lee. 8vo. London, 1838. *From Dr. Lee.*

Sir James Clark's Statement of the Case of the late Lady Flora Hastings, &c. &c.—*From Dr. Dunglison.*

The Works of Benjamin Franklin; containing several Political and Historical Tracts not included in any former edition, and many Letters, Official and Private, not hitherto published; with Notes, and a Life of the Author. By Jared Sparks. Vols. 1, 8, 9, and 10, which complete the Work. Royal 8vo. Boston, 1839–40.—*From Mr. Sparks.*

The Orderly Book of the American Army, under the immediate Command of Gen. Washington at Valley Forge. MS.—*From Col. Hugh Mercer, of Fredericksburg, Va., through Dr. Mease.*

Mr. Vaughan, on presenting a transfer of page 524 of Schaaf's Syriac Lexicon (Leyden edition, 1717), &c., by Mr. Joseph Dixon, of Taunton, Massachusetts, on the plan of the transfer process of Mr. Dixon's invention, read sundry extracts of letters from him on the subject.

A notice of this invention was first published in the Salem Gazette, by the editor of that paper, on the 25th day of May, 1832; but the inventor has not yet made the process public.

The Committee, consisting of Mr. Walker, Dr. Patterson, and Mr. Bache, to whom was referred a paper, entitled "Observations on Nebulæ, with a Fourteen Feet Reflector, by H. L. Smith and E. P. Mason, during the year 1839, by E. P. Mason," reported in favour of publication in the Society's Transactions, which was directed accordingly.

The object of Messrs. Smith and Mason was to furnish a minute description of some of the principal nebulæ in the heavens, in order

that future changes in their appearance, should any occur, may be detected. The process employed was—1st. To prepare an accurate chart of all the stars in and about the nebula, capable of micrometrical measurement. 2dly. To fill in with the smaller stars down to the *minimum visibile*, by estimation. 3dly. To lay down the nebula on this chart with such care and precision, that the errors of its delineation may not far exceed those of original vision. The author, Mr. Mason, states at length the expedients used to effect the latter purpose, viz.—the drawing of *lines of equal brightness*, as a guide to the engraver; the examination of each portion of the nebula by several persons; and, lastly, the repeated comparison of the drawings with the original, on successive evenings, till no further improvement seemed to be practicable.

The telescope, used by Messrs. Smith and Mason, was of their own construction. It was 14 feet in length, and had 12 inches clear aperture, being a Herschelian, mounted somewhat rudely on the plan of Mr. Ramage. The difficulties experienced by Messrs. Smith and Mason, as amateur artists in casting and polishing specula at New Haven, are stated in detail. The telescope was capable of separating ζ Orionis, μ^2 Bootis, γ Virginis in 1838, λ Ophiuchi, and others of a distance of less than 1″. For such purposes, however, the use of diaphragms was necessary, owing to an imperfection of the casting, and the full light of the telescope could not be employed. This circumstance directed their attention to the subject of this paper.

A cursory examination of the principal nebulæ described, and, in some instances, figured by the Herschels, pointed out discrepancies between their descriptions and present appearances, which must be attributed either to a change in the nebulæ themselves, or to the want of sufficient minuteness of examination on the part of the Herschels, whose object was rather the formation of a complete catalogue of the nebulæ in the heavens, than the full and perfect description of any of the individuals. Thus, the paper contains a drawing of the "nebula trifida," *h.* 1991: the triple star does not occupy the same position in the cleft as given in the figure in Sir J. F. W. Herschel's paper, Phil. Trans. 1833, but rather adheres to the left of the three divisions; and what is more remarkable, the small star about 30′ north of this triple star was surrounded with a nebula not much inferior in size and brilliancy to the "*nebula trifida.*" A drawing is also furnished of the nebula, *h.* 2008, (the shape of which resembles the

capital Greek Ω) with a critical examination of Herschel's figure of the same.

The most remarkable discovery of Messrs. Smith and Mason, was that of the junction of the two nebulæ, *h.* 2092 and 2093. These great nebulæ, or "*milky ways*," are described on several occasions by the elder Herschel, and are also described and figured by the younger. They are distant about two-thirds of a degree from each other. Messrs. Smith and Mason, however, distinctly saw the nebulous matter extending from one to the other, making the whole one conspicuous nebula of more than a degree in length, being among the most remarkable in the heavens, and inferior only to the great nebulæ of Orion and Andromeda.

Mr. Mason remarks, that it is difficult to conceive how the companion of the *nebula trifida*, and the junction of the two last mentioned, should have been overlooked by such observers as the Herschels, with instruments so far superior to his in optical capacity. The supposition that the nebulous space, noticed by Messrs. Smith and Mason, was not brought under the immediate inspection of the Herschels, seemed inadmissible. That the greater clearness of the atmosphere of New Haven should more than compensate for the inferior light of the telescope employed was hardly probable; the only remaining supposition was, that the nebulous matter, in the space examined by all these observers, has recently undergone a change in shape and brilliancy.

In making the chart of the stars to which the nebulous space is referred, Mr. Mason used the ten feet Dollond refractor, of five inches aperture, belonging to the Philosophical Department of Yale College, with a Dollond's illuminated line micrometer. With this he has determined the relative position of the stars down to the 16th magnitude, by repeated observations, and has furnished a catalogue of the correct places of 15 stars in the first chart, 30 in the second, and 182 in the third.

Dr. Dunglison stated, that the horse, with the filaria in the aqueous humour of the eye, to which allusion was made at the last meeting (See Proceedings, p. 200), was in the city, and that he had had an opportunity of verifying the statement then made. Dr. Dunglison referred to several similar cases,—most of the observers believing the entozoon to be a filaria papillosa, but some a lesser strongylus.

Dr. Hays referred to cases of entozoa found not only in the eye, but in other parts of the body, and alluded briefly to the practicability of the germs being received from without.

Dr. Chapman, as chairman of the Committee to collect documents connected with the political and historical state of the country, reported that he would be able to procure for the Society the Correspondence of Robert Morris. He farther stated his expectation to be able to present important documents from Virginia, calculated to throw valuable light on the history of the colony and the country.

Mr. Vaughan reported the death of Mr. Wm. Maclure, a member of the Society, who died in Mexico on the 23d of March last.

Dr. Dunglison, reporter, presented No. 11 of the printed Bulletin.

Stated Meeting, May 15.

Present, twenty-six members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Bulletin de la Société Impériale des Naturalistes de Moscou. Nos. 2 & 3. Année, 1838. 8vo. Moscou, 1838.—*From the Society.*

Communication from the Governor, transmitting several Reports relative to the Geological Survey of the State. 8vo. New York, 1840.—*From the State.*

Proceedings of the Royal Society. Nos. 41 and 42. December 5, 1839, to March 26, 1840, inclusive.—*From the Royal Society.*

Proceedings of the Royal Astronomical Society. Vol. V. No. 4. February 14, 1840. (Annual meeting).—*From the Society.*

Public Documents, printed by order of the Senate of the United States,

Third Session of the 25th Congress, begun and held at the City of Washington, December 3, 1838, &c. In 5 vols. 8vo. Washington, 1839.—*From the Secretary of State.*

Executive Documents, 25th Congress, 3d Session, 1838. In 6 Vols. 8vo.—*From the same.*

Reports of Committees, 25th Congress, 3d Session, 1838. In 2 Vols. 8vo.—*From the same.*

Journal of the Senate of the United States of America, 3d Session, 25th Congress, &c. &c. 8vo. Washington, 1838.—*From the same.*

Journal of the House of Representatives of the United States, 3d Session, 25th Congress, &c. &c. 8vo. Washington, 1839.—*From the same.*

Experimental Researches on Electricity. By Michael Faraday, D. C. L., F. R. S., Fullerian Professor of Chemistry in the Royal Institution, &c. &c. 8vo. London, 1839.—*From Mr. Bancker.*

De la Bienfaisance Publique: par M. le Baron de Gérando, Pair de France, Membre de l'Institut, &c. &c. 4 Vols. 8vo. Paris, 1839.—*From Dr. Harlan.*

L'Égypte et la Turquie de 1829 à 1836: par MM. Ed. de Cadalvene et J. de Breuvery, avec Cartes et Planches. 2 Vols. 8vo. Paris, 1836. Avec Atlas in fol.—*From Mr. Vaughan.*

A Treatise on the Mulberry Tree and Silkworm, and on the Production and Manufacture of Silk, embellished with appropriate Engravings. By John Clarke, Superintendent of the Morodendron Silk Company of Philadelphia. 12mo. Philadelphia, 1839.—*From Mr. Duponceau.*

A Manual, containing Information respecting the Growth of the Mulberry Tree, with suitable Directions for the Culture of Silk. In three parts. By J. H. Cobb, A. M. Originally published by direction of His Excellency, Governor Lincoln, agreeably to a Resolve of the Commonwealth. Fourth edition, enlarged. 12mo. Boston, 1839.—*From the same.*

A Manual, containing Directions for Sowing, Transplanting, and Raising the Mulberry Tree; together with proper Instructions for Propagating the same by Cuttings, Layers, &c. &c., as also Instructions for the Culture of Silk: to which is added, Calculations showing the Produce and probable Expense of Cultivating from one to ten Acres, as tested by actual Results. By Edward P.

Roberts, Editor, Farmer and Gardener. Third edition, with Improvements and Additions. 8vo. Baltimore, 1838.—*From the same.*

The History of the United States for 1796; including a Variety of Interesting Particulars relative to the Federal Government previous to that Period. 8vo. Philadelphia, 1797.—*From the same.*

The American Monthly Magazine, from January to June, 1824. Edited by James M'Henry. Vol. I. 8vo. Philadelphia, 1824.—*From the same.*

Tracts and other Papers relating principally to the Origin, Settlement and Progress of the Colonies in North America, from the Discovery of the Country to the Year 1776. Collected by Peter Force. Vol. I. Washington, 1836.—*From the same.*

The Original Letters written by the Rev. John Heckewelder, from the 3d of April, 1816, to the 5th of May, 1822, on the Indian Languages, &c. Collected by Peter S. Du Ponceau. 1840.—*From the same.*

Berichte aus den Vereinigten Staaten von Nord America, über Eisenbahnen, Dampfschiffahrten, Banken und Andere Oeffentliche Unternehmungen. Verfasst von Franz Anton Ritter von Gerstner, Landstand im Königreiche Böhmen, emer. Professor der Mathematik am K. K. Polytechnischen Institute in Wien, u. s. w.; wahrend dessen Aufenthaltes in Nord America, im Jahre, 1838 und 1839. 4to. Leipzig, 1839.—*From Dr. T. G. Flügel, U. S. Consul at Leipzig.*

North American Herpetology, or a Description of the Reptiles inhabiting the United States. By John Edward Holbrook, M. D. Professor of Anatomy in the Medical College of the State of South Carolina, &c. &c. Vol. 3. 4to. Philadelphia, 1838.—*From the Author.*

Report of a Geological, Mineralogical, and Topographical Examination of the Coal Field of Carbon Creek, the Property of the Towanda Rail Road and Coal Company, Bradford County, Pa. with an Analysis of the Minerals, accompanied by a Map of the Surveys, Profile of the Road, and Sections of the Mineral Ground. By Walter R. Johnson, A. M., Civ. and Min. Engineer, Professor of Chemistry and Natural Philosophy in Pennsylvania College, Philadelphia, &c. &c. 8vo. Philadelphia, 1840.—*From the Author.*

Pétrifications Recueillies en Amérique, par M. Alexandre de Hum-

boldt, et par M. Charles Degenhardt; décrites par Léopold de Buch. Fol. Berlin, 1839.—*From M. de Buch.*

Explication de Deux Planches de Spirifer et d'Orthis. Par Léopold de Buch. Fol.—*From the same.*

Explication de Trois Planches d'Ammonites. Par Léopold de Buch. 4to.—*From the same.*

Lecture on the Advantages derived from Cultivating the Arts and Sciences. By G. Emerson, M.D. Delivered before the Philadelphia Mercantile Library Association, &c. Dec. 8, 1839. 8vo. *From the Author.*

Synopsis of a Meteorological Journal, kept in the city of New York for the Years 1838 and 1839, including also the Mean Results of the last Seven Years. By W. C. Redfield.—*From the Author.*

New Zealand in 1839, or Four Letters to the Right Hon. Earl Durham, Governor of the New Zealand Land Company, &c. &c. on the Colonization of that Island, and on the Present Condition and Prospects of its Native Inhabitants. By John Dunmore Lang, D.D., Principal of the Australian College, and Senior Minister of the Church of Scotland in New South Wales. 8vo. London, 1839.—*From the Author.*

The American Journal of the Medical Sciences. No. LI. May, 1840.—*From the Editor, Dr. Hays.*

Report of the Directors of the Thames Tunnel Company to the General Assembly of Proprietors, held at the London Tavern, on the 3d day of March, 1840;—with a Plan.—*From Mr. William Vaughan.*

Sundry Pamphlets, 1. Exposition of the Plan and Objects of the Greenwood Cemetery, chartered by the State of New York. 8vo. New York, 1839. 2. Report of the Committee on the New Haven Burying Ground. 8vo. New Haven, 1839. 3. A Sermon, by Thomas F. Davies; published by request of the Congregational Society in Green's Farms. 8vo. New Haven, 1839. 4. Annual Address to the Candidates for Medical Degrees and Licenses in Yale College, Feb. 26, 1839. By Dr. Thomas Miner. Second edition. 8vo. New Haven, 1839. 5. Annual Address on a Similar Occasion, Jan. 21, 1840. By Dr. Dyar T. Brainard. 8vo. New Haven, 1840. 6. Report of a Committee on the State of the Prisons of Fairfield County. 8vo. Bridgeport, 1839. 7. The Completion of two Centuries, a Discourse preached in Fairfield, Nov. 28, 1839. By Lyman H. Atwater,

Pastor of the First Church in Fairfield. 8vo. Bridgeport, 1839.
8. Report of the Agricultural Meeting held in Boston, Jan. 13, 1840, containing the Remarks of Mr. Webster and Prof. Silliman, with Notes by Henry Colman, Commissioner for the Agricultural Survey of the State. 8vo. Salem, 1840. A Discourse delivered in Norfield, May, 29, 1836. By John Noyes, at the close of the 50th year of his Ministry. 8vo. New Haven, 1839.—*From Prof. Silliman.*

Tableau Théorique de la Succession et de la Disposition la plus générale en Europe des Terrains et Roches qui composent l'Écorce de la Terre; ou Exposition Graphique du Tableau des Terrains, publié en 1829; par M. Alexandre Brongniart, Professeur de Mineralogie au Museum d'Histoire Naturelle de Paris. *From the Author.*

Third Annual Report of the Board of Education, together with the Third Annual Report of the Secretary of the Board. 8vo. Boston, 1840.—*From Dr. Thomas H. Webb, of Boston.*

Original Journal of a Council of War, held at Perth Amboy, Sept. 17, 1776; General Mercer, President, in which he proposed an Attack on the British Posts at Staten Island. MS.—*From his Son, Col. Hugh Mercer.*

FOR THE CABINET.

A Plaster Bust of Alexander Hamilton.—*From Mrs. Astley.*

Specimens of Crystallized Carbonate of Lime and Pipe Iron Ore; found at the Iron Works of William Reed, Perrysville, Mifflin County, and by him deposited at the Bank of the United States, with N. Biddle, Esq.—*From Mr. Dunlap, with the assent of Mr. Biddle.*

Two Daguerrotype Portraits, the one of Mr. Du Ponceau, the other of Mr. Vaughan, taken by Mr. Cornelius.—*From Dr. Goddard.*

The Committee to whom was referred the paper of Dr. Hare, entitled "Engraving and description of an apparatus and process for the rapid congelation of water," &c. reported in favour of its publication in the Society's Transactions, which was ordered accordingly.

A communication was read from Professor Bonnycastle, of the University of Virginia, entitled "On the insufficiency of Taylor's Theorem, as commonly investigated, with objections

to the demonstrations of Poisson and Cauchy, and the assumed generalization of Mr. Peacock, to which is added a new investigation, and remarks on the development and continuity of functions;" which was referred to a Committee.

Mr. Lea read a paper, entitled "Notice of the Oolitic formation in America, with descriptions of some of its organic remains, by Isaac Lea;" which was referred to a Committee.

A communication was read from Prof. Locke, of Cincinnati, the objects of which are, "1. To determine more accurately the relation, magnetic dip and intensity at Cincinnati, and at Louisville, Ky., by making observations as near together, in point of time, as possible. 2. To determine the horary changes of horizontal intensity at Cincinnati, and 3. To ascertain more accurately the effect of changes of temperature on the needles used by the author, and to deduce a constant coefficient for each of them." The paper was referred to the same Committee to whom Professor Locke's previous paper on the same subject was referred, (proceedings of March 6, 1840.)

Mr. Du Ponceau made a verbal communication on the subject of the silk culture in India.

It appears from the sixth volume of the Transactions of the Agricultural and Horticultural Society of India, Calcutta, 1839, which is in the library of the Society, that the English are extending the culture of silk to the Deccan and the Western Coast of India, and have an establishment for that purpose, under the direction of Signor Mutti, an Italian gentleman, who resides at Bombay, and is styled "Superintendent of the Silk Culture in the Deccan." Two letters addressed by him to John Bell, Esq. Secretary of the Agricultural Society of India, Mr. Du Ponceau considered to be worthy of the attention of those who feel an interest in the promotion of the silk culture in this country. A treatise by that gentleman on the various branches of the silk culture, is subjoined to, and published with, his letters. The chapter or division concerning the art or method of reeling or winding silk from the cocoons, Mr. Du Ponceau regards as replete with valuable practical instruction.

On this last subject, (the art of reeling,) the correspondent at Paris of the National Intelligencer asserts, that an excellent Treatise has been lately published, in that capital, by Mons. Ferrier, which has been re-

published in the third volume of the Annals of the *Sericole Society*, specially instituted for the promotion of the culture of silk in France.

As instruction is much wanted in this country, on this particular subject, while the culture of silk engages the general attention, Mr. Du Ponceau expressed a hope that M. Ferrier's Treatise would be translated, and published for the benefit of his fellow citizens.

Mr. Du Ponceau farther stated, that from the volume of Transactions above cited, it appears that the English are making great exertions to introduce the culture of cotton into India. Specimens of the best soils for growing cotton in this country, particularly those of Georgia, have been sent to the Agricultural and Horticultural Society, and analyzed by them. The descriptions accompanying the specimens have not been found sufficiently particular, nor have their analyses yet led to any decided conclusions. They seem to think, that the abundance and fineness of good cotton depend on the quantity of *carbon* in the soil, *and the solubility of that carbon.* But with this theory they do not appear to be entirely satisfied. They find that all the American, the Mauritius, and the best Singapore soils, producing the finest cotton, contain a considerable per centage of vegetable matter under the form of peat or lignite, in a state of exceedingly minute division, and in many of them, some part of it is readily soluble in cold water. They find, again, that the Indian soils contain very little vegetable matter, and this wholly insoluble in water, but that the best contain a far larger proportion of carbonate of lime, and some of them the iron in a different state from the others. It would seem, however, that the plant is somewhat indifferent about the iron; yet, as it is not known what part the iron plays in soils (which may influence their electricity as well as their tenacity and relations to moisture), they consider it a matter to be borne in mind and to be subjected to farther inquiries.

The culture of the vine in India, Mr. Du Ponceau added, appears also to engage much of the attention of the Society; and, on the whole, the useful arts and sciences seem to be cultivated in that country to a degree which deserves to be particularly noticed.

Mr. Walker stated the results of Professor Loomis's farther observations on the subject of Galle's second comet, which Prof. L. intends hereafter to lay before the Society. He further stated, that Galle had discovered a third comet, which

was of great interest to the astronomer; as it was likely to add another to the number of comets of known period.

Mr. Walker mentioned the receipt of European observations of Galle's second comet, as late as the 21st of February, and those of Prof. Loomis of the 18th and 19th of March. From these, he had selected the observations made Jan. 25th and Feb. 21st. at the Berlin Observatory, and that of Prof. Loomis at the Hudson Observatory, on the 19th of March; and had computed the elements of its orbit.

The comet's observed geocentric longitude and latitude, cleared of aberration and parallax, and referred to the mean equinox of Jan. 1840, were as follows:—

M. T. Berlin.	*Longitude.*	*Latitude.*
$25.^d49021$	$2^\circ\ 57'\ 26.8''$	$+75^\circ\ 9'\ 42.1''$
52. 47442	28 44 0.6	+33 42 26.1
79. 59679	35 47 34.8	+ 9 22 20.4

from which he had obtained for the elements of the comet;—

Perihelion Pass. March $13.^d07523$ Berlin mean time.

☊	$236^\circ\ 49'\ 8.0''$
ι	59 15 8.9
π	80 14 52.8
log. q	0.086798

Motion retrograde.

Dr. Dunglison gave the particulars of a case, in which blood that flowed, on dissection, from the arteries of the brain, coagulated fifteen hours after the death of the individual.

The patient died after a severe agony, and after an illness of some duration, for which mercury had been administered so as to affect the system freely. On opening the head, the arteries of the brain were found turgid with blood; and on removing the brain, the blood flowed from them, and coagulated.

Dr. Dunglison made some remarks on the singularity of this phenomenon, and its relations to physiology and medical jurisprudence, and stated that it completely overthrew the views of those, who believe that the blood is either possessed of a vital influence, or receives some influence from the living vessels that contain it, which maintains its fluidity, and that so soon as it is removed from these

influences it coagulates or dies. In this case the blood remained fluid, and coagulation took place fifteen hours after the total cessation of respiration and circulation, and after the blood had become cold; circumstances showing that the phenomenon is wholly physical in its nature.

Mr. Vaughan reported the death of Benjamin Allen, LL. D., a member of the Society, who died on the 20th of July, 1836, aged 64 years.

On motion of Mr. Vaughan, it was *Resolved*, That Prince Maximilian of Neuwied should be presented with the volumes of the Transactions of the Society since the fourth volume.

Mr. Vaughan further stated, that Prince Maximilian had intimated his intention of presenting to the Society a copy of his Voyage to America, with accompanying Atlas, &c.

The Librarian, in accordance with a resolution of the Society,* presented, for approval, a list of Societies to whom it is proposed to send the proceedings of the Society.

* The resolutions, adopted at a recent meeting (April 3d, 1840,) for the distribution of the Society's proceedings, are as follows:—

First. Twenty copies to be furnished to the Librarian to be retained in the Library.

Secondly. A copy to be sent regularly

a. To members qualified to vote at elections, and to such other members as the Secretaries may think proper.

b. To each of the Societies in correspondence with this Society.

c. To the Editors of such Scientific Journals of the United States and of foreign countries as may be determined upon by the Secretaries.

d. To each subscriber to the Transactions of the Society, not otherwise entitled to a copy.

Thirdly. A copy of the number of the Bulletin, in which their communications are noticed, to be sent to correspondents, not members of the Society.

Fourthly. Any person to be permitted to subscribe for the year, with the Librarian, at such annual subscription price as shall be affixed by the Secretaries.

Fifthly. It shall be the duty of the Librarian to transmit regularly, and as early after the date of publication as practicable, the copies for the various Societies, at home and abroad, which copies shall be furnished him by the Secretaries, duly enveloped, according to a list sanctioned by the Society.

Sixthly. It shall be the duty of the Secretaries to attend to the conservation and distribution of the remainder, as above directed, and they shall be authorized to take such measures for this purpose as they may deem expedient.

The following list was sanctioned.

UNITED STATES.

Albany, Institute.
Boston, Bowditch Library.
,, Academy of Sciences.
,, Historical Society of Massachusetts.
,, Athenæum.
,, Society of Natural History.
,, Statistical Society.
Cambridge, Library of Harvard University.
Georgia Historical Society.
Harrisburg, Library of State of Pennsylvania.
Hartford, Society of Natural History.
,, Historical Society.
Philadelphia, Academy of Natural Sciences.
,, Athenæum.
,, Franklin Institute.
Providence, Rhode Island Historical Society.
Washington City, Library of Congress.
Worcester, Antiquarian Society.

EUROPE.—1. *Great Britain.*

Bath, Bath and West of England Society.
Cambridge, Philosophical Society.
Dublin, Royal Irish Academy.
,, Dublin Society.
Edinburgh Royal Society.
,, Society of Antiquaries.
London, Royal Society.
,, Astronomical Society.
,, Greenwich Observatory.
,, Horticultural Society.
,, Society of Arts, Manufactures and Commerce.
London, Geological Society.
,, Zoological Society.
,, Linnæan Society.
,, Royal Geographical Society.
,, Royal Asiatic Society.
,, Antiquarian Society.
,, London Institution.
,, Royal Institution.
,, British Association.
Manchester, Literary and Philosophical Society.
Penzance, Royal Cornwall Geological Society.

2. *Continent.*

Amsterdam, Netherlands Institute.
Haarlem, Hollandish Society of Sciences.
Rotterdam, Batavian Society of Sciences.
Brussels, Royal Academy of Sciences and Belles Lettres.
Berlin, Royal Academy of Sciences.
Copenhagen, Royal Academy of Sciences.
Göttingen, Royal Academy of Sciences.
Lisbon, Royal Academy of Sciences.
Madrid, Royal Academy of History.
Moscow, Imperial Society of Natural History.
St. Petersburg, Imperial Academy of Sciences.
Paris, Institute and Royal Academy of Sciences.
,, School of Mines.
,, Royal Asiatic Society.
,, Museum of Natural History.
,, Society of Antiquaries.
,, Geographical Society.
Pesth, Hungarian Academy of Sciences.
Stockholm, Royal Academy of Sciences.
Turin, Royal Academy of Sciences.
Upsal, Royal Academy of Sciences.

INDIA.

Calcutta, Asiatic Society of Bengal.
Calcutta, Horticultural and Agricultural Society.

Stated Meeting, June 19.

Present, twenty-four members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Transactions of the Geological Society of London. Second series. Vol. V. Part 2. 4to. London, 1840.—*From the Society.*

Proceedings of the Royal Astronomical Society. Vol. V. No. 5. March 13, 1840.—*From the Society.*

Bulletin de la Société de Geographie. Deuxième Serie. Tom. xii. 8vo. Paris, 1839.—*From the Society.*

Physicorum Aristotelis Libri. Argumenta in singulos Libros, ex Optimis Græcorum Commentariis conversa jam recens adjecimus. Catalogum verò Librorum in hoc Opere contentorum sequenti Pagellâ reperies. 8vo. Lugduni, 1554.—*From Mr. Penington.*

Lapis Philosophicus sive Commentarius in octo Libros Physicorum Aristot. in quo Arcana Physiologiæ examinantur. Auctore Joanne Caso, in Medicinâ Doctore Oxoniensi, &c. Accedit in Fine Ancilla Philosophiæ, seu Epitome in octo Libros Aristot. Physicorum, eodem Auctore, cum Indicibus Locupletissimis. 8vo. Francof. ad Mœnum. 1600.—*From the same.*

Fourth Annual Report on the Geological Survey of the State of Pennsylvania. By Henry D. Rogers, State Geologist. Read in the House of Representatives, Feb. 8, 1840. 8vo. Harrisburg, 1840.—*From Mr. Frederick Fraley.*

A Description of the Canals and Rail Roads of the United States, comprehending Notices of all the Works of Internal Improvement throughout the several States. By H. S. Tanner. 8vo. New York, 1840.—*From the Author.*

The American Traveller, or Guide through the United States: containing Brief Notices of the several States, Cities, principal Towns, Canals, and Rail Roads, &c., with Tables of Distances by Stage, Canal, and Steamboat Routes: the whole Alphabetically arranged, with direct reference to the accompanying Map of the Roads, Canals, and Railways of the United States. Sixth

Edition. By H. S. Tanner. 12mo. Philadelphia, 1840.—*From the Author.*

Sketch of the Geology of North America, being the Substance of a Memoir read before the Ashmolean Society, November 26, 1838. By Charles Daubeny, M. D., F. R. S., L. S., G. S., M. R. I. A., Member of the American Philosophical Society, &c. &c. 8vo. Oxford, 1839.—*From the Author.*

Fifth Geological Report to the Twenty-third General Assembly of Tennessee, made November, 1839. By G. Troost, M. D., Geologist to the State, &c. 8vo. Nashville, 1840.—*From the Author.*

Pamphlets. 1. Journal of a Voyage from Okkak, on the Coast of Labrador, to Ungana Bay, westward of Cape Chudleigh; undertaken to Explore the Coast, and Visit the Esquimaux in that Unknown Region. By Benjamin Kohlmeister and George Kmoch, Missionaries of the Church of the Unitas Fratrum or United Brethren. 8vo. London, 1814. 2. Authentische Relation von dem Anlass, Fortgang und Schlusse der am 1sten. und 2ten. Januarii, Anno 174½, im Germantown gehaltenen Versammlung einiger Arbeiter derer meisten Christlichen Religionen und vieler vor sich selbst GOTT-dienenden CHRISTEN-menschen in Pennsylvania: aufgesetzt in Germantown am Abend des 2ten. obigen Monats. 4to. Philadelphia. 3. Defensive War, in a Just Cause, Sinless: a Sermon preached by the Rev. David Jones, A. M. 8vo. Philadelphia, 1775. 4. A Lecture on the Excellence of the Gospel of Christ, &c. By John Stanford, M. A. 12mo. New York, 1791. 5. Report of the Preliminary Survey of the Route of the Hudson and Delaware Rail Road. By James B. Sargent, Esq., Civil Engineer, &c. 8vo. Newburgh, 1836.—*From Mr. John Jordan, Jr.*

Twelve Views of Churches, Schools, and other Buildings, erected by the United Brethren in America, with Descriptions, History, &c. New York, 1836.—*From the same.*

Frank; or Dialogues between a Father and Son, on the Subjects of Agriculture, Husbandry, and Rural Affairs. By the Author of "The Yellow Shoestrings." Small 8vo. Philadelphia, 1840.—*From the Author.*

View of the Origin and Migrations of the Polynesian Nation; demonstrating their Ancient Discovery and Progressive Settlement of

the Continent of America. By John Dunmore Lang, D. D., &c. &c. 8vo. London, 1834.—*From the Author.*

Transportation and Colonization; or the Causes of the Comparative Failure of the Transportation System in the Australian Colonies: with Suggestions for Insuring its Future Efficiency in Subserviency to Extensive Colonization. By John Dunmore Lang, D. D., Principal of the Australian College, &c. 12mo. London, 1837.—*From the same.*

Annual Report of the Geologist of Maryland (Dr. J. T. Ducatel). 8vo. 1839.—*From the Author.*

On the Mutual Action of Permanent Magnets, considered chiefly in Reference to their best Relative Position in an Observatory. By the Rev. Humphrey Lloyd, A. M., Fellow of Trinity College, Professor of Natural Philosophy in the University of Dublin, &c. &c., Honorary Member of the American Philosophical Society. (Published in the Transactions of the Royal Irish Academy, Vol. XIX. Part I.) 4to. Dublin, 1840.—*From the Author.*

A Discourse pronounced at Barnstable on the 3d of September, 1839, at the Celebration of the Second Centennial Anniversary of the Settlement of Cape Cod. By John Gorham Palfrey. 8vo. Boston, 1840.—*From the Author.*

The Study of the Celtic Languages. (From the New York Review for April, 1840.) By A. B. Chapin, M. A., Mem. Conn. Acad. Arts and Sciences, and Rector of St. James' Church, New Haven. 8vo. New York, 1840.—*From the Author.*

The Twenty-fourth Report of the Directors of the American Asylum at Hartford, for the Education and Instruction of the Deaf and Dumb. Exhibited to the Asylum, May 16, 1840. 8vo. Hartford, 1840.—*From Mr. Lewis Weld.*

Researches on the Gale and Hurricane in the Bay of Bengal on the 3d, 4th, and 5th of June, 1839. By Henry Peddington. (From the Journal of the Asiatic Society.) 8vo. Calcutta, 1839.—*From Dr. Harlan.*

The Bhăguăt-gēetā, or Dialogues of Krĕĕshnă and Arjŏŏn, in eighteen Lectures; with Notes. Translated from the Original in the Săn-skrĕĕt, or Ancient Language of the Brāhmăns. By Charles Wilkins, Senior Merchant in the Service of the Honourable East India Company, &c. 4to. London, 1785.—*From Mr. Vaughan.*

Memorials of Columbus: or a Collection of Authentic Documents of that Celebrated Navigator, now first published from the Original

Manuscripts, by Order of the Decurions of Genoa; preceded by a Memoir of his Life and Discoveries. Translated from the Spanish and Italian. 8vo. London, 1823.—*From the same.*

Necessity of Popular Education as a National Object; with Hints on the Treatment of Criminals, and Observations on Homicidal Insanity. By James Simpson. 12mo. New York, 1834.—*From the same.*

A Biographical Memoir of the late Commodore Joshua Barney, from Autographical Notes and Journals in Possession of his Family, and other Authentic Sources. Edited by Mary Barney. 8vo. Boston, 1832.—*From the same.*

The Universal Cambist and Commercial Instructor: being a Full and Accurate Treatise on the Exchanges, Moneys, Weights, and Measures of all Trading Nations and their Colonies; with an Account of their Banks, Public Funds, and Paper Currencies. By P. Kelly, LL.D., Master of the Finsbury Square Academy, London, &c. &c. 2 Vols. 4to. The Second Edition, including a Revision of Foreign Weights and Measures, from an Actual Comparison of their Standards, by the Order and Aid of the British Government. London, 1821.—*From the same.*

Description de l'Égypte, contenant plusieurs Remarques Curieuses sur la Géographie Ancienne et Moderne de ce Païs, sur ses Monumens Anciens, sur les Mœurs, les Coutumes, et la Religion des Habitans, sur le Gouvernement et le Commerce, sur les Animaux, les Arbres, les Plantes, &c. Composée sur les Mémoires de M. de Maillet, Ancien Consul de France au Caire, par M. l'Abbé le Maserier. Ouvrage enrichi de Cartes et de Figures. 4to. Paris, 1735.—*From Mr. Du Ponceau.*

Indian Biography, containing the Lives of more than Two Hundred Indian Chiefs; also such others of that Race as have rendered their Names conspicuous in the History of North America, from its first being known to Europeans, to the present Period; giving, at large, their most Celebrated Speeches, Memorable Sayings, Numerous Anecdotes, and a History of their Wars; much of which is taken from Manuscripts never before published. By Samuel G. Drake. 12mo. Boston, 1832.—*From the same.*

An Original Letter of William Smith, Secretary of the American Philosophical Society, before its Union with the Junto in 1769, to Governor Hamilton, October 18, 1768, relative to the Transit of Venus.—*From the same.*

A Discourse on the Life and Character of the Reverend John Thornton Kirkland, D. D., LL.D., formerly Pastor of the Church on Church Green, Boston, and late President of Harvard University; delivered in the Church on Church Green, May 3, 1840. By Alexander Young. 8vo. Boston, 1840.—*From the Author.*

Two Reports on the Coal Lands, Mines, and Improvements of the Dauphin and Susquehanna Coal Company, and of the Geological Examinations, Present Condition, and Prospects of the Stony Creek Coal Estate, in the Townships of Jackson, Rush, and Middle Paxtang, in the County of Dauphin, and of East Hanover Township, in the County of Lebanon, Pennsylvania: with an Appendix, containing numerous Tables and Statistical Information, and various Maps, Sections, and Diagrams, chiefly in Illustration of Coal and Iron. Addressed to the Board of Directors of the Dauphin and Susquehanna Coal Company, &c. &c. By Richard C. Taylor, President of the Board of Directors. 8vo. Philadelphia, 1840.—*From the Author.*

Index Monasticus; or the Abbeys and other Monasteries, Alien Priories, Friaries, Colleges, Collegiate Churches, and Hospitals, with their Dependencies, formerly established in the Diocese of Norwich and the Ancient Kingdom of East Anglia; systematically arranged and briefly described, according to the respective Orders and Denominations in each County, and Illustrated by Maps of Suffolk, Norfolk, and the City of Norwich, and the Arms of Religious Houses. By Richard Taylor, of Norwich. Folio. London, 1821.—*From the same.*

On the Geology of East Norfolk: with Remarks upon the Hypothesis of Mr. J. W. Robberds, respecting the former Level of the German Ocean. By Richard C. Taylor, F. G. S., Author of the Index Monasticus. 8vo. London, 1827.—*From the same.*

Pamphlets. 1. Notes respecting Certain Indian Mounds and Earthworks, in the Form of Animal Effigies, chiefly in the Wisconsin Territory, U. S. By Richard C. Taylor, Esq. 2. Sundry Communications.—*a.* The Natural History of the Alleghany Mountains. *b.* The American Fucoides. *c.* The Natural History of Cuba. *d.* The History and Progress of Geology. *e.* Reviews of Martin's Geological Memoir, and of Professor Buckland on the Formation of the Valley of Kingsclerc, &c. *f.* Introduction to Geology. *g.* Antediluvian Zoology and Botany. *h.* Illustrations of Antediluvian Zoology. *i.* Geological Arrangement of

Fossil Shells. *j.* On part of the Mineral Basin of South Wales. By R. C. Taylor.—*From the same.*

The American Medical Library and Intelligencer for May 15, and June 1, 1840. Vol. IV. Nos. 4 and 5.—*From the Editor, Dr. Dunglison.*

Pamphlets. 1. Notice of the Daguerreotype. By William E. A. Aikin, M. D., Professor of Chemistry and Pharmacy in the University of Maryland. 8vo. Baltimore, 1840. 2. Report of a Committee of the Medical Society of the State of New York, on the Subject of Medical Education. 8vo. Albany, 1840. 3. Philosophy of Mind, developing New Sources of Ideas, designating their Distinctive Classes, and Simplifying the Faculties and Operations of the whole Mind. By John Stearns, M. D., of the City of New York, late President of the Medical Society of the State. 8vo. New York, 1840. 4. A Letter to William E. Channing, D. D., in Reply to one addressed to him by R. R. Madden, on the Abuse of the Flag of the United States in the Island of Cuba, for Promoting the Slave Trade. By a Calm Observer. 8vo. Boston, 1840. 5. An Account of the Visit of the French Frigate L'Artemise to the Sandwich Islands, July, 1839. 8vo. Honolulu, 1839.—*From the same.*

Sundry Engravings. 1. James Madison. 2. Governor Strong. 3. Robert Morris. 4. Charles Dickens. 5. Rev. John Fletcher. 6. A Lady from Franca. 7. J. Rusling. 8. Rev. C. Wesley, by T. B. Welch. *From Mr. Welch.*

Report of the Select Committee of the House of Representatives of the United States (J. Q. Adams, Chairman), on the Smithsonian Bequest, March 5, 1840.—*From Mr. Sergeant.*

Memoir, Historical and Political, on the North-west Coast of America, and the adjacent Territories: Illustrated by a Map, and a Geographical View of those Countries. By Robert Greenhow, Translator and Librarian to the Department of State. (Submitted by Mr. Linn to the Senate of the United States.) 4to. Washington, 1840.—*From the same.*

The Prospects of Art in the United States: an Address before the Artists' Fund Society of Philadelphia, at the Opening of their Exhibition, May, 1840. By George W. Bethune. (By request.) 8vo. Philadelphia, 1840.—*From the Society.*

The History of the Royal Society of London, for the Improving of

Natural Knowledge. By Thomas Sprat. 4to. London, 1667.—*From Dr. Hare.*

Trois Planches d'Ammonites, par Léopold de Buch. Folio.—*From the Author.*

Observations of the Magnetic Intensity at Twenty-one Stations in Europe. By A. D. Bache, LL.D., President of the Girard College for Orphans, one of the Secretaries of the American Philosophical Society, &c. (From Vol. VII. of the Transactions of the Society.) 4to.—*From the Author.*

Boletin Enciclopedico de la Sociedad Economica de Amigos del Pais, &c. &c. &c. Número 1. Enero, 1840. 8vo. Valencia, 1840.—*From the Society.*

A Discourse on the Death of General Washington, late President of the United States; delivered on the 22d of February, 1800, in the Church in Williamsburg. By James Madison, D. D., Bishop of the Protestant Episcopal Church in Virginia, and President of William and Mary College. Third Edition, with Additions. 8vo. Philadelphia, 1831.—*From Col. Hugh Mercer, of Fredericksburg.*

Sundry Biographical Notices of Brigadier General H. Mercer, and Accounts of the Battle of Trenton.—*From the same.*

FOR THE CABINET.

Several Stones, worked by the Indians with Stone Hammers, found in an Indian workshop, five miles from Paradise, near Lancaster, Pennsylvania.—*From Mr. Redmond Conyngham.*

The Committee, consisting of Mr. Taylor, Mr. Booth, and Dr. Hays, to whom was referred a Communication, entitled "Notice of the Oolitic Formation in America, with Descriptions of some of its Organic Remains, by Isaac Lea," reported in favour of publication, which was ordered accordingly.

In this paper Mr. Lea describes a number of fossils from New Granada and Cuba, which he considers to belong properly to the forms resembling those well known to exist in the Oolites (Jura formation) of Europe. In a note Mr. Lea mentions, that after his paper was written, the work of the distinguished geologist, Von Buch, was received by him from the author. In this work, Von Buch describes and figures some of the fossils from the same formation in New Granada, taken by Humboldt nearly forty years since to Europe,

which that learned traveller, in his "Essay on the Superposition of Rocks," considered to belong to the Jura Formation. Von Buch takes a different view, and places them higher up in the series; that is, in the Chalk Formation. After a careful perusal of Von Buch's work, and a re-examination of the specimens, Mr. Lea still holds to his previous opinion, that these forms belong properly to the Oolitic series, and not to the Chalk. He is the more confirmed in this opinion from having since been enabled to examine Captain Grant's Memoir on the Geology of Cutch, recently published in the Geological Society's Transactions of London, Second Series, Vol. V. Part 2; where the forms represented have a strong alliance to those described by Mr. Lea. Captain Grant states, that the mineralogical character of the rock "greatly resembles the English Lias; but its fossils have been found, after a careful examination by Mr. James Sowerby, to assimilate very closely to those of the Oolitic beds," &c.

Mr. Lea's paper contains descriptions of the following species:—

Orthocera Humboldtiana. Testâ rectâ, elongato-conicâ, subcylindraceâ; articulis transversis, subdistantibus.

Ammonites Tocaimaensis. Testâ orbiculari; anfractibus planulatis, transversim costulatis; costis planulatis; periphæriâ minutè sulcatâ.

Ammonites Occidentalis. Testâ orbiculari, utrinque umbilicatâ; anfractibus rotundatis, transversim costulatis; periphæriâ rotundâ, sulco circulari destitutâ.

Ammonites Gibboniana. Testâ orbiculari; anfractibus compressis; costis elevatis, carinatis, remotiusculis ad peripheriam.

Ammonites Vanuxemensis. Testâ orbiculari, utrinque umbilicatâ; anfractibus convexo-cylindraceis, transversim crebrissimèque costulatis; periphæriâ rotundâ, sulco circulari destitutâ.

Ammonites Americana. Testâ orbiculari; anfractibus subplanis, obliquè costulatis; periphæriâ sulcatâ.

Trigonia Gibboniana. Testâ ovato-trigonâ, multicostatâ; costis transversis, subtuberculato-asperis; areâ posticâ carinatâ.

Trigonia Tocaimana. Testâ trigonâ, posticè productâ inflatâ; costis transversis lævibus.

Trigonia Houdaana. Testâ ovato-trigonâ, inflatâ, multicostatâ; costis transversis, tuberculato-nodosis; areâ posticâ elevatâ, crebrissimèque nodosâ.

Natica Gibboniana. Testâ ovatâ, ventricosâ; spirâ productiusculâ; anfractibus quinis, subplanulatis; aperturâ contractâ, elongatâ.

Spatangus Colombianus. Sp. ovato-cordatus, gibbus, convexus, anticè planulato; ambulacris quinis, lanceolatis, transversìm punctatis.

Terebratula Tayloriana. Testâ triangulari, sulcis longitudinalibus impressis; valvâ inferiore in superiorem reflexâ; margine biplicato.

Terebratula Poeyana. Testâ elongato-ovatâ, lævi, inflatâ; nate productâ, incurva; foramine submagno.

Tellina [?] *Humboldtiana.* Testâ scalenià, inflatâ, anticè truncatâ; striis transversis, elevatis, remotiusculis, rotundatis.

The Committee, consisting of Dr. Patterson, Prof. Bache, and Mr. Walker, to whom was referred a paper, entitled, "On the Insufficiency of Taylor's Theorem as commonly investigated, with Objections to the Demonstrations of Poisson and Cauchy, and the assumed Generalization of Mr. Peacock; to which is added, a New Investigation and Remarks on the Development and Continuity of Functions, by Charles Bonnycastle, Professor of Mathematics in the University of Virginia," reported in favour of its publication in the Transactions of the Society, which was ordered accordingly.

The paper of Professor Bonnycastle is composed of three sections. In the first, which is on the "Development of Functions," he points out and discusses what he considers to be "the errors and conflicting views resulting from the vague manner in which mathematical writers have usually conceived the ultimate object of their peculiar logic." The second section is on the "Continuity of Functions," and the division of this continuity into classes; a subject heretofore touched upon only incidentally by other writers. The principal object of the paper is presented in the third section, which treats of "Functions considered in the order of their magnitude," and particularly of "Taylor's Theorem;" and the author discusses this subject with the care demanded by a theorem which forms the basis of the differential and integral calculus, and which acts so important a part in all the higher mathematics.

Mr. Walker, from the Committee on making and collecting observations of Celestial Phenomena, reported, in part, that they had received observations of Lunar Occultations of the Fixed Stars, which are given in the mean time of the respec-

tive places of observation, being a continuation of the list published in No. 6, pages 71 and 72, of the Society's Proceedings; and, on motion, the Report was accepted.

	1838.				*h*	*m*	*s*			
48.	Nov. 13,		α Virginis,	Im.	19	31	8.55	d. l.	Hudson Obs'y.	Loomis.
49.	Dec. 25,	57	Mayer,	Im.	7	7	48.95	d. l.	Breslaw „	Boguslawski.
50.	„	102	π Piscium,	Im.	7	22	46.22	d. l.	„	„
51.*	„	„	„	Em.	7	34	37.10	b. l.	„	„
52.	26,	27	ψ Arietis,	Im.	6	15	46.34	d. l.	„	„
53.*	„	„	„	Em.	7	23	24.12	b. l.	„	„
54.	„	„	„	Im.	5	31	35.90	d. l.	Elberfeldt,	Hulsman.
55.	„	„	„	Im.	6	27	50.28	d. l.	Cracow Obs'y.	Weisse.
56.	27,		n Pleiadum,	Im.	7	29	19.80	d. l.	„	„
57.	„		f „	Im.	8	13	3.00	d. l.	„	„
58.	„	„	„	Im.	16	25	37.94	d. l.	Breslaw Obs.	Boguslawski.
59.	„		n „	Im.	7	29	19.80	d. l.	Dover,	Blickensderfer.
60.	„		f „	Im.	8	15	3.00	d. l.	„	„
	1839.									
61.	Jan. 10,		π Virginis,	Im.	18	19	19.00	d. l.	Southwick,	Holcomb.
62.	„	„	„	Em.	18	34	15.00	d. l.	„	„
63.	21,		π Piscium,	Im.	6	18	58.44	d. l.	Philad. Obs'y.	W. and K.
64.	„	„	„	Im.	6	31	44.00	d. l.	Southwick,	H.
65.	April 19,		c Geminorum,	Im.	7	17	35.38	d. l.	Hudson Obs'y.	L.
66.*	„	„	„	Em.	8	25	35.42	b. l.	„	„
67.	„	„	„	Im.	7	55	51.65	d. l.	Philad. Obs'y.	W. and K.
68.	„	„	„	Im.	7	58	46.10	d. l.	Princeton, N. J.	A.
69.*	„	„	„	Em.	8	57	43.20	b. l.	„	„
70.	„	„	„	Im.	8	9	42.90	d. l.	Southwick,	H.
71.	„	„	„	Im.	8	20	31.90	d. l.	Dorchester,	Bond.
72.	„	„	„	Im.	8	20	31.70	d. l.	„	„
73.	„	„	„	Im.	8	20	33.96	d. l.	Boston,	Paine.
74.	20,		γ Cancri	Im.	10	6	3.13	d. l.	Hudson Obs'y.	L.
75.*	„	„	„	Em.	10	53	51.08	b. l.	„	„
76.	„	„	„	Im.	10	44	24.80	d. l.	Dorchester,	B.
77.	„	„	„	Im.	10	44	24.70	d. l.	„	„
78.	„	„	„	Im.	10	44	21.70	d. l.	Boston,	P.
79.	25,	91	Virginis,	Im.	8	13	47.20	d. l.	Philad. Obs'y.	W. P. & K.
80.	„	50	Virginis,	Im.	8	25	59.50	d. l.	„	„
81.	June 20,	68	i Virginis,	Im.	7	46	28.80	d. l.	Washington,	Gilliss.
82.	„	„	„	Im.	7	57	42.88	d. l.	Philad. Obs'y.	W. and K.
83.	„	„	„	Im.	8	11	57.25	d. l.	Southwick,	H.
84.	June 23,		b Scorpii	Im.	8	39	53.90	d. l.	Washington,	G.
85.	„	„	„	Im.	8	50	52.07	d. l.	Philad. Obs'y.	W. and K.
86.	30,		D Aquarii	Im.	10	58	50.51	d. l.	„	„
87.	July 6,		h Pleiadum,	Im.	15	29	49.19	b. l.	„	W.
88.*	„	„	„	Im.	15	29	43.49	b. l.	„	R.
89.	„	„	„	Em.	16	21	6.99	d. l.	„	„

	1839.				h	m	s			
90.	July 6,		*b*	Pleiadum,	Em.	16	14	7.10	d. l. Washington,	G.
91.*	,,	Anony.	7th mag.		Im.	15	55	4.49	b. l. Philad. Obs'y.	W.
92.*	,,	,,	,,		Im.	15	55	4.07	b. l. ,,	R.
93.	,,		*d*	,,	Im.	16	0	21.49	b. l. ,,	W.
94.	,,	,,	,,		Im.	16	0	18.69	b. l. ,,	R.
95.	,,	,,	,,		Im.	15	32	34.56	b. l. Hudson Obs'y.	L.
96.	,,	,,	,,		Em.	16	22	28.85	b. l. ,,	,,
97.	,,		*c*	,,	Im.	16	14	45.29	b. l. Philad. Obs'y.	W.
98.	,,	,,	,,		Im.	16	14	44.29	b. l. ,,	R.
99.	,,	,,	,,		Im.	16	5	49.10	b. l. Washington,	G.
100.	,,	,,	,,		Em.	16	33	41.10	d. l. ,,	,,
101.	,,		*n*	,,	Im.	16	30	24.79	b. l. Philad. Obs'y.	W.
	,,	,,	,,		Im.	16	30	26.49		
102.	,,	,,	,,		Im.	16	30	24.49	b. l. ,,	R.
	,,	,,	,,		Im.	16	30	25.79		
103.	,,	,,	,,		Im.	16	20	17.40	b. l. Washington,	G.
104.	July 14,	59	*c*	Leonis,	Im.	8	2	44.25	d. l. Philad. Obs'y.	W.
105.	Sep. 14,		τ	Scorpii,	Im.	6	19	51.92	d. l. ,,	K.
106.	,,	,,	,,		Im.	6	19	51.72	d. l. ,,	W.
107.	,,	,,	,,		Em.	7	47	5.84	b. l. ,,	,,
108.	,,	,,	,,		Im.	6	42	13.71	d. l. Dorchester,	B.
109.	20,	42	Aquarii,		Im.	12	24	39.75	d. l. Philad. Obs'y.	K.
110.	,,	,,	,,		Im.	12	24	40.15	d. l. ,,	W.
111.	,,	,,	,,		Im.	12	45	12.40	d. l. Boston,	P.
112.	26,		*b*	Pleiadum,	Im.	9	41	49.68	b. l. Philad. Obs'y.	W.
113.	,,	,,	,,		Im.	9	41	49.18	b. l. ,,	M.
114.	,,	,,	,,		Em.	10	32	4.73	d. l. ,,	W.
115.	,,	,,	,,		Em.	10	32	7.97	d. l. ,,	K.
116.	,,	,,	,,		Em.	10	32	5.78	d. l. ,,	R.
117.	,,	,,	,,		Em.	10	32	5.13	d. l. ,,	M.
118.	,,	,,	,,		Im.	9	54	6.00	b. l. Southwick,	H.
119.	,,	,,	,,		Em.	10	53	6.90	d. l. Boston,	P.
120.	,,	,,	,,		Em.	10	22	52.60	d. l. Washington,	G.
121.	,,		*g*	,,	Im.	9	45	5.88	b. l. Philad. Obs'y.	M.
122.	,,	,,	,,		Em.	10	39	57.09	d. l. ,,	W.
123.	,,	,,	,,		Em.	10	39	57.67	d. l. ,,	K.
124.	,,	,,	,,		Em.	10	39	58.95	d. l. ,,	R.
125.	,,	,,	,,		Em.	10	39	57.04	d. l. ,,	M.
126.	,,	,,	,,		Em.	11	1	45.27	d. l. Boston,	P.
127.	,,	,,	,,		Em.	10	30	20.20	d. l. Washington,	G.
128.*	,,		*e*	,,	Im.	10	6	37.75	b. l. Philad. Obs'y.	K.
129.	,,	,,	,,		Im.	10	6	39.61	b. l. ,,	R.
130.	,,	,,	,,		Im.	10	6	42.35	b. l. ,,	M.
131.	,,	,,	,,		Em.	10	49	58.93	d. l. ,,	W.
132.	,,	,,	,,		Em.	10	49	59.52	d. l. ,,	K.
133.	,,	,,	,,		Em.	10	50	0.36	d. l. ,,	R.
134.	,,	,,	,,		Em.	10	49	59.33	d. l. ,,	M.

	1839				h	m	s			
135.	Sep. 26.		e	Pleiadum,	Em.	11	12	36.43	d. l.	Boston, P.
136.	,,	,,	,,		Im.	9	57	40.60	b. l.	Washington, G.
137.	,,	,,	,,		Em.	10	39	59.40	d. l.	,, ,,
138.*	,,	,,	,,		Im.	17	58	17.77	b. l.	Breslaw Obs'y.
139.	,,	c	,,		Im.	10	9	11.23	b. l.	Philad. Obs'y. W.
140.	,,	,,	,,		Im.	10	9	11.83	b. l.	,, M.
141.*	,,	,,	,,		Im.	10	9	7.40	b. l.	,, R.
142.	,,	,,	,,		Em.	11	6	34.69	d. l.	,, W.
143.	,,	,,	,,		Em.	11	6	35.04	d. l.	,, R.
144.	,,	,,	,,		Em.	11	6	35.29	d. l.	,, M.
145.	,,	,,	,,		Im.	10	22	2.00	b. l.	Southwick, H.
146.	,,	,,	,,		Em.	11	28	58.98	d. l.	Boston, P.
147.	,,	,,	,,		Im.	9	59	56.20	b. l.	Washington, G.
148.	,,	,,	,,		Em.	10	56	42.40	d. l.	,, ,,
149.*	,,	,,	,,		Im.	18	23	53.51	b. l.	Breslaw Obs. Boguslawski.
150.*	,,	66	Arietis,		Im.	9	55	48.14	b. l.	,, ,,
151.*	,,	,,	,,		Im.	9	55	56.85	b. l.	,, ,,
152.	,,	,,	,,		Em.	10	8	36.22	d. l.	,, ,,
153.	,,	,,	,,		Im.	9	22	21.03	b. l.	Hamburg Obs'y. Rumker.
154.*	,,	,,	,,		Em.	9	54	22.77	d. l.	,, ,,
155.	Oct. 14,		τ	Sagittarii,	Im.	8	21	56.26	d. l.	Roscoe. O. Blickensderfer.
156.	17,		δ	Capricorni,	Im.	8	28	11.50	d. l.	Philad. Obs'y. W.
157.*	,,	,,	,,		Im.	8	40	10.52	d. l.	New Haven, Mason.
158.*	,,	,,	,,		Em.	9	32	1.04	b. l.	,, ,,
159.	,,	,,	,,		Im.	8	18	19.10	d. l.	Washington, G.
160.	,,	?	Capricorni,		Im.	12	11	46.80	d. l.	Breslaw, B.
161.	18,	58	Aquarii,		Im.	12	5	44.71	d. l.	,, ,,
162.	25,	?	Caneri,		Im.	14	8	30.10	d. l.	Washington, G.
163.	Dec. 12,		λ	Aquarii,	Im.	9	22	24.02	b. l.	Philad. Obs'y. W.
164.	,,	,,	,,		Im.	9	22	24.45	b. l.	,, R.
165.	,,	,,	,,		Im.	8	25	48.24	b. l.	New Haven, Mason.
166.	,,	,,	,,		Im.	8	25	48.39	b. l.	,, Bradley.
167.	,,	,,	,,		Em.	9	31	57.38	d. l.	,, Mason.
168.	,,	,,	,,		Em.	9	31	57.78	d. l.	,, Bradley.
169.	,,	78	,,		Im.	9	33	36.20	d. l.	Philad. Obs'y. W.
170.	,,	,,	,,		Im.	9	33	38.45	d. l.	,, R.
171.	,,	,,	,,		Im.	9	43	26.84	d. l.	New Haven, Mason.
172.	,,	,,	,,		Im.	9	43	26.89	d. l.	,, Bradley.
173.	July 6.		h	Pleiadum,	Em.	15	56	22.65	d. l.	Hudson Obs'y. L.
174	,,	,,	,,		Im.	16	2	21.67	b. l.	,, ,,

The longitudes and latitudes of the American places of observation, as far as they can be determined from a reduction of these and former American observations, have been furnished by Messrs. Walker and Kendall, as follows:

Place of Observation.	N. Latitude.	Longitude from Philad. Obs'y.	Longitude west from Greenwich.
	° ′ ″	*m* *s*	*h* *m* *s*
Boston State House - -	42 21 22.7	E. 16 24.77	4 44 17.13
„ Paine's House - -	42 20 56	E. 16 25.10	4 44 16.80
Dorchester, Bond's private Obs.	42 19 15	E. 16 24.09	4 44 17.81
Southwick, Holcomb's „	42 0 41	E. 9 24.83	4 51 17.07
Yale College, New Haven -	41 17 58	E. 8 51.00	4 51 50.90
City Hall, New York - -	40 42 40	E. 4 37.54	4 56 4.36
Brooklyn, Blunt's private Obs'y	40 42 0	E. 4 41.90	4 56 0.00
Nassau Hall, Princeton College	40 20 50	E. 2 3.70	4 58 38.20
Alexander's House „	40 20 56	E. 2 4.00	4 58 37.90
Philadelphia High School Obs'y	39 57 8	0.	5 0 41.90
„ State House -	39 56 57.9	E. 2.86	5 0 39.04
Washington, Capitol - -	38 53 23	W. 7 24.10	5 8 6.00
„ Marine Obs'y -	38 53 31	W. 7 24.18	5 8 6.08
Hudson Observatory - -	41 14 37	W. 25 5.56	5 25 47.46
Dover, Ohio - - - -	40 30 52	W. 25 14.02	5 25 55.92

The details of the computations on which these results are based, are too extensive for the limits of this Report. The separate results for the longitude of the Capitol, on account of its importance as being our prime meridian, are here appended.

No.	Date.		Object Observed.	Compared with	Relative Weight	Resulting Lon. from Greenwich.
						h m s
1	1791.	April 3	Annular Eclipse	Corr. Obs. European Observatories	3.	5 8 5.38
2	1793.	Jan. 21	Occ'n. α Tauri	Merid. " " "	0.	5 7 53.08
3	1804.	Oct. 20	" " "	" " " "	1.	5 8 6.88
4	1811.	Sept. 17	Solar Eclipse	Corr. " Salem, Massachusetts	1.5	8.78
5	1813.	Jan. 12	Occ'n. γ Tauri	" " European Observatories	0.	27.48
6	1831.	Feb. 12	Solar Eclipse	" " Dorchester Observatory	2.	7.82
7	1836.	May 15	" "	" " European "	0.	13.64
8	1838.	Sept. 18	Annular Eclipse	" " Philadelphia, Princeton, Southwick and Brooklyn	3.	2.97
9	1839.	June 20	Im. 68 *i* Virginis	" " Philadelphia Obs'y.	1.	6.68
10	"	June 23	Im. 1 *b* Scorpii	" " " "	0.	12.99
11	"	July 6	Em. *b* Pleiadum	" " " " and Hudson Obs'y.	1.5	4.84
12	"	"	Im. *c* "	" " " " "	0.3	11.66
13	"	"	Im. *x* "	" " " " "	1.5	6.10
14	"	Sept. 26	Em. *b* "	" " " " and Boston	0.6	1.38
15	"	"	Im. *c* "	" " " " and Southwick & Breslaw Obs.	0.6	9.87
16	"	"	Em. " "	" " " " and Boston	1.5	4.00
17	"	"	Em. *g* "	" " " " "	1.5	5.86
18	"	"	Em. *c* "	" " " " "	1.5	6.71
19	"	Oct. 17	Im. δ Capricorni	" " " " "	1.0	5.02
20	1840.	April 19	Im. τ Scorpii	" " " "	0.7	3.10
"	"	"	Em. " "	" " " "	0.7	4.97
21	"	May 16	Im. μ Cancri	" " " "	1.0	8.47
					23.9	138.07

	h m s
Marine Obs. Mean of 21 results according to weights	5 8 5.78
Capitol	5.72
Marine Obs. Mean of 6 results by transport'n of chron's, by R. T. Paine, between Washington, Phila. and Boston	6.32
Whence longitude of the Capitol	5 8 6.0

NOTE BY THE COMMITTEE.

The observations at the Hudson Observatory are made by					Prof. E. Loomis.
,,	,,	Washington Marine Obs'y.			Lieut. S. M. Gilliss.
,,	,,	Boston,			R. T. Paine, Esq.
,,	,,	Dorchester Obs'y.			Wm. Cranch Bond
,,	,,	Southwick Mass.			Mr. A. Holcomb.
,,	,,	Princeton,			Prof. S. Alexander.
,,	,,	Dover, Ohio,			Mr. J. Blickensderfer, jr.
,,	,,	Brooklyn Obs'y.			Mr. E. Blunt.
,,	,,	New Haven,	Mr. E. P. Mason and Mr. Bradley.		
,,	,,	Philadelphia Obs'y.	W	is for	Mr. S. C. Walker.
,,	,,	,,	K	,,	Prof. E. O. Kendall.
,,	,,	,,	R	,,	Wm. H. C. Riggs.
,,	,,	,,	M	,,	Mr. E. P. Mason
,,	,,	,,	P	,,	R. T. Paine, Esq.

The numbers which have an asterisk (*) prefixed to them are considered by the observers as somewhat doubtful, from brightness of the moon's limb or other causes. The European observations have been selected from those published in Schumacher's Astronomische Nachrichten, on account of their coincidence in date with the American observations. The immersion and emersion of σ Piscium, January 10th, 1839, took place both at the moon's dark limb. At the immersion of η Pleiadum, July 6th, 1839, the star appeared to hang on the moon's bright limb about 1.7s; or rather, the star appeared to have a sensible disc taking that time to immerge.

Professor Henry presented a communication, entitled "Contributions to Electricity and Magnetism, Fourth Series.—On Electro-dynamic Induction, Magnetic Distribution, &c.,—by Joseph Henry, Professor of Natural Philosophy, College of New Jersey, Princeton;" and accompanied the presentation of the same with sundry verbal and graphic illustrations.

The communication was referred to a committee.

Mr. Du Ponceau presented a communication, entitled "An Historical Account of the Origin and Formation of the American Philosophical Society, held at Philadelphia, for promoting Useful Knowledge;" when, in consequence of the lateness of the hour and the amount of unfinished business, it was resolved, that the Society do adjourn to meet again on Friday evening next, and that due notice thereof be given in the public papers by the Librarian.

Adjourned Meeting, June 27.

Present, twenty-four members.

Mr. Du Ponceau, President, in the Chair.

The communication of Mr. Du Ponceau relative to the origin and formation of the Society, which was presented at the last meeting, was read, and referred to a committee.

A letter was read from Mr. Fisher to Mr. Kane, one of the Secretaries, in relation to the subject of Mr. Du Ponceau's communication, and explanatory of a communication on the same subject from Mr. Fisher, which was afterwards read. The letter and communication were referred to the committee who had charge of the communication of Mr. Du Ponceau.

On motion, it was resolved, that the Maryland Academy of Science and Literature, and the Sociedad Economica de Amigos del Pais de Valencia, should hereafter be furnished regularly with a copy of the published proceedings of this Society.

Mr. Vaughan announced the death of Mr. Wm. H. Keating, a member of the Society, which took place in London, on the 17th May; and, on motion of Mr. Kane, it was resolved, that a member of the Society be requested to prepare an Obituary Notice of the deceased. Dr. Hays was appointed to that office.

In consequence of unfinished business still remaining, it was resolved, that the Society should adjourn to meet again on Friday evening next, and that due notice thereof be given in the public papers by the Librarian.

Adjourned Meeting, July 3.

Present, twenty members.

Mr. Du Ponceau, President, in the Chair.

Professor Bache read a letter from Mr. Rumker, of Hamburg, acknowledging the honour of his election as a member

of the Society, and containing astronomical observations in reference to Galle's comets.

The communication was referred to the Committee on Astronomical Observations.

Mr. Breck, after some prefatory remarks, presented for the Library, and read, a Manuscript Essay, written by him for the Society, and entitled "Historical Sketch of the Continental Bills of Credit, from the year 1775 to 1781, with Specimens thereof;" which was referred to the Historical Committee.

Mr. Du Ponceau announced that the Society would receive at their next meeting, the Anamitic and Latin, and Latin and Anamitic Dictionaries, lately published by the Right Reverend Father Taberd, Bishop of Isauropolis, and Vicar General of Cochin China, which he had mentioned to the Society at a former meeting, as in course of publication.

This valuable work was printed at Serampore, under the auspices, and, it is understood, at the expense, of the British Government in India, and of the East India Company, to whom the learned world are already indebted for the publication of the important labours of the late Dr. Morrison, and other works, which have thrown considerable light on the Chinese language, and who are now, with the same liberality, extending the knowledge of the Indo-Chinese idioms, which, until lately, were entirely unknown in America and Europe. It will not be forgotten, Mr. Du Ponceau added, that this Society was the first to make known the Anamitic language, by the publication of Father Morrone's French and Cochin Chinese Vocabulary, and of the Latin and Cochin Chinese Dictionary, in use among the Missionaries in Cochin China, which works, though not so full and so complete as those published by Bishop Taberd, were the first to shed light on that branch of philological science.

Mr. Du Ponceau further observed, that these publications have settled a point, which has been warmly contested by travellers, and others who have contended (and the view has even gained belief among sinologists) that not only the Anamites, whose languages are monosyllabic, and formed on the model of that of China, but the Japanese and Loo Chooans, whose idioms are polysyllabic and formed on quite different principles, could converse with the Chinese and with each other, without knowing one word of each other's spoken language, by means of the Chinese characters, which presented (it was

affirmed) to their minds, ideas unconnected with words. Bishop Taberd asserts, on the contrary, that the Cochin Chinese and Chinese cannot understand each other, either orally or in writing; and that the Chinese is, in Cochin China, a learned language, which is studied by the better class, who, by that means, can communicate with the Chinese, but not by means of the vulgar language, spoken or written.*

The following extract contains a statement of these facts in Bishop Taberd's own words.

"Præcipuum nùnc nobis incumbit pauca de characteribus nec non de linguâ Anamiticâ delibare. Dubium non est quin Anamitarum lingua à Sinensi ortum ducat. Ipsorum enim characteres non tantum magnam habent affinitatem cum Sinensibus, sed vel integrè vel particulatìm ab ipsis mutuantur. Attamen utriusque gentis characteres seu hieroglyphi talem subiere commutationem, ut neque legendo, neque loquendo se invicem intelligant. Qui ex honestâ oriuntur familiâ Sinensibus characteribus dant operam, illi enim characteres in usu sunt apud Anamitas tùm in legibus tum in supplicibus libellis et aliis. Qui magna spectant, vel honoribus dignitatibusque inhiant, toto pectore animique impetu in characterum Sinensium studium incumbere debent, et hos scribendo characteres cum Sinensibus colloqui possunt, adeò diversus est pronunciationis modus inter utramque gentem, ut aliter sermonem mutuum habere nequeant. Undè duæ linguæ usurpantur in Cocincinâ; scilicet, lingua Doctorum, seu lingua Sinensis, et lingua communis quæ in usu quotidiano ab omnibus adhibetur et de quâ nùnc sermonem habemus." Monit. p. 1.

Dr. Hare presented copies of a French translation of a Communication, which he had made to the Society, on the subject of Tornadoes, and in reference to a Memoir, by M. Peltier, on the Cause of these Meteors. (See Proceedings of the Society for October 4, 1839, No. 8. p. 122.) The Communication had been translated by him into French, and sent to each member of the National Institute, with the object of showing that the view of M. Peltier, as contained in the *Journal des Débats* of the 17th of July last, was essentially the same as the one which he (Dr. Hare) had offered relative to these meteors; and also that the allegation made before the Academy,

* This, as the Transactions and Proceedings of the Society testify, has always been the opinion of Mr. Du Ponceau; but it has been much combated both in Asia and Europe.

by M. Peltier, that Dr. Hare's hypothesis was defective in not taking into account other co-operating forces, as well as those of electricity, was incorrect.

Dr. Hare made some observations on the effect of the rarefaction of air, on its desiccation and refrigeration, and on other phenomena connected with the presence of aqueous vapour in the atmosphere. He also detailed some experiments, showing that the phenomena of air, heated by re-entering a receiver partially exhausted, were more consistent, in some respects, with the idea that a vacuum has a capacity for heat, than that it is destitute of any appropriate portion of caloric.

Dr. Hare adverted to the fact, that in an essay, published in Silliman's Journal in 1822, he had, agreeably to the authority of Dalton and Davy, stated, that the cold consequent on the rarefaction of air in its ascent towards the upper strata of the atmosphere, was one of the causes of the formation of clouds; and in his text books he had soon after published an engraving of an apparatus, by means of which he was accustomed to illustrate, before his pupils, the transient cloud which arises from a diminution of pressure in air containing aqueous vapour.

In the essay above mentioned, Dr. Hare had alleged, that as much caloric was given out by aqueous vapour, during its conversion into snow, as would be yielded by twice the weight of red-hot powdered glass. But Mr. Espy, he considered, had the merit of being the first to suggest, that the heat, thus evolved, might be an important instrument in causing a buoyancy tending to accelerate any upward current of warm moist air.

Dr. Hare had been willing to admit, that this transfer of heat might co-operate with other causes in the production of storms, but could not concur with Mr. Espy in considering it competent to give rise to thunder gusts, tornadoes, or hurricanes. These he had considered, and still considers, to be mainly owing to electrical discharges between the earth and the sky; or between one mass of clouds and another.

With a view to a more accurate estimate of the comparative influence of rarefaction and condensation, in causing evolution of heat in dry air, and in air replete with aqueous vapour, Dr. Hare had performed a number of experiments, of which he proceeded to give a description.

Large globes, each containing about a cubic foot of space, furnished with thermometers and hygrometers, were made to communicate, respectively, with reservoirs of perfectly dry air, and of air replete with aqueous vapour.* The cold, ultimately acquired by any degree of rarefaction, appeared to be the same, whether the air was in the one state or the other; provided that the air, replete with aqueous vapour, was not in contact with liquid water in the vessel subjected to exhaustion. When water was present, in consequence of the formation of additional vapour, and a consequent absorption of caloric, the cold produced was nearly twice as great as when the air was not in contact with liquid water; being nearly as 9 to 5.

Under the circumstances last mentioned, the hygrometer was motionless; whereas, when no liquid water was accessible, the space, although previously saturated with vapour, by the removal of a portion of it together with the air which is withdrawn by the exhaustion, acquires a capacity for more vapour; and hence the hygrometer, by an abstraction of one-third of the air, revolved more than sixty degrees towards dryness. But when a smaller receiver (after being subjected to a diminution of pressure of about ten inches of mercury, so as to cause the index of the hygrometer to move about thirty-five degrees towards dryness) was surrounded by a freezing mixture, until a thermometer in the axis of the receiver stood at three degrees below freezing, the hygrometer revolved towards dampness, until it went about ten degrees beyond the point at which it rested when the process commenced.

It appears, therefore, that the dryness produced by the degree of rarefaction employed is more than counterbalanced by a freezing temperature.

As respects the heat imparted to the air above mentioned, the fact, that the ultimate refrigeration in the case of air replete with vapour, and in that of anhydrous air, was equally great, and that when water was present the cold was greater in the damp vessel, led to the idea, that the heat arising under such circumstances could not have much efficacy in augmenting the buoyancy of an ascending column of air: but when, by an appropriate mechanism, the refrigeration was measured by the difference of pressure at the moment when the exhaustion was arrested, and when the thermometer had become sta-

* The hygrometers were constructed by means of the beard of the avena sensitiva or wild oat, also called animated oat.

tionary, it was found cæteris paribus, that the reduction of pressure arising from cold was at least one-half greater in the anhydrous air, than in the air replete with vapour. This difference seems to be owing to a loan of latent heat made by the contained moisture, or transferred from the apparatus by its intervention, which checks the refrigeration; yet, ultimately, the whole of the moisture being converted into vapour, the aggregate refrigeration does not differ in the two cases.

Agreeably to Dalton's tables, at 70° the quantity of moisture in 31 grains or 100 cubic inches of air, is $\frac{551}{1000}$ of a grain. The space allotted to this weight of vapour being doubled, it would remain uncondensed at 45° F., being associated with the same weight, but double the volume, of air; but at 32°, notwithstanding the doubling of the space, only $\frac{356}{1000}$ of a grain would remain in the aëriform state; of course $551 - 356 = \frac{195}{1000}$, or nearly $\frac{2}{10}$ of a grain, would be precipitated.

The latent heat given out by the condensation of this vapour, would heat, as is well known, 1000 times its weight of water, or 195 grains, one degree; or 31 grains $\frac{195}{31} = 6.29$ degrees; and as the capacity of air for heat is only one-fourth of that of water, it would heat 31 grains of air $6.29 \times 4 = 25.16$, or nearly 25° F. As air, at 32° F., expands $\frac{1}{480}$ for each additional degree, the difference of bulk, arising from the heat received, as above calculated, would be $\frac{25}{480}$, or $\frac{1}{19}$ nearly.

When air, replete with aqueous vapour, was admitted into a receiver partially exhausted, and containing liquid water, a copious precipitation of moisture ensued, and a rise of temperature greater than when perfectly dry air was allowed to enter a vessel containing rarefied air in the same state. In the instance first mentioned, a portion of vapour rises into the place of that which is withdrawn during the partial exhaustion. Hence when the air, containing its full proportion of vapour, enters, there is an excess of vapour which must precipitate, causing a cloud, and an evolution of latent heat from the aqueous particles previously in the aëriform state. Dr. Hare conceives that as the enlargement of the space occupied by a sponge, allows, proportionably, a larger quantity of any liquid to enter its cells, so any rarefaction of the air when in contact with water, consequent on increase of heat or diminution of pressure, permits a proportionably larger volume of vapour to associate itself with a given weight of the air. When, subsequently, by the afflux of wind replete

with aqueous vapour, the density of the aggregate is increased, a portion of the vapour equivalent to the condensation must be condensed, giving out latent heat, excepting so far as the heat thus evolved, being retained by the air, raises the dew point.

Hence, whenever a diminution of density of the air inland causes an influx of sea air to restore the equilibrium, there may result a condensation of aqueous vapour, and evolution of heat, tending to promote an ascending current. This process being followed by that which Mr. Espy has pointed out, of the transfer of heat from vapour to air, during its ascent to the region of the clouds, and consequent precipitation of moisture, might, Dr. H. thought, be among the efficient causes of those *non*-electrical rain storms, during which the water of the Gulf of Mexico, or of the Atlantic, is transferred to the soil of the United States.

Dr. Hare proceeded to mention some additional experiments which he had made, respecting the increase of temperature resulting from the admission of dry air into an exhausted receiver. When the receiver was exhausted so as to reduce the interior pressure to one-fourth of that of the atmosphere, and one-fourth was suddenly admitted, so as to reduce a gage from about $22\frac{1}{2}$ inches to 15 inches, heat was produced; and however the ratio of the entering air to the residual portion was varied, still there was a similar result.

When the cavity of the receiver was supplied with the vapour of ether or with that of water, so as to form, according to the Daltonian hypothesis, a vacuum for the admitted air, still heat was produced by the latter, however small might be the quantity, or rapid the readmission. When the receiver was exhausted, until the tension was less than that of aqueous vapour at the existing temperature, so as to cause the water to boil, as in the Cryophorus, or Leslie's experiment, still the entrance of $\frac{6}{1000}$ of the quantity requisite to fill the receiver caused the thermometer to rise a tenth of a degree. An alternate motion of the key of the cock, through one-fourth of a circle, within one-third of a second of time, was adequate to produce the change last mentioned.

Dr. Hare considered the fact, that heat is produced, when to air, rarefied to one-fourth of the atmospheric density, another fourth is added, irreconcileable with the idea, that this result arises from the compression of the portion of air previously occupying the cavity, since the entering air must be as much expanded as the residual portion is condensed.

As, agreeably to Dalton, a cavity occupied by a vapour acts as a vacuum to any air which may be introduced, Dr. Hare argued, that when a receiver, after being supplied with ether or water, is exhausted so as to remove all the air and leave nothing besides aqueous or etherial vapour, the heat, acquired by air admitted, cannot be ascribed, consistently, to the condensation of the vapour.

The facts above stated, he added, are not reconcileable with the idea of De la Rive and Marcet, that the first portion of the entering air is productive of cold, although a subsequent condensation is productive of an opposite change. The effect upon the thermometer was too rapid, and the quantity of the entering air too minute, to allow it to be refrigerated by rarefaction in the first place, and yet afterwards to be so much condensed as to become warm by the evolution of caloric.

Notwithstanding the experiments of Gay Lussac and of those of De la Rive and Marcet, there appeared to Dr. Hare to be evidence in favour of the heat being due to the space, rather than to the air which it contained.

With respect to Gay Lussac's celebrated experiment with the Torricellian vacuum, supposing such a vacuum to be a pre-eminently good liberator of heat, as it ought in reason to be, the caloric would be absorbed by the mercury as rapidly as this metal could be made to encroach upon the space occupied by the calorific particles.

Admitting that, for equal weights, the specific heat of air is seven times as great as that of mercury, there could not have been a capacity greater than that of about 200 grains of the metal, whereas a very small stratum of this metal, equal to one-fourth of an inch, would, in the apparatus employed, amount to more than a pound.

The rapidity with which a mercurial thermometer is affected by the changes of temperature, in experiments like those which he had been describing, showed, in Dr. Hare's opinion, that there was something not yet understood respecting the transfer of heat in such cases. It was hardly reconcileable with the process of conduction or circulation, as ordinarily understood.

In the experiments of De la Rive and Marcet, in which the entering air being made to impinge upon the bulb of a thermometer, was productive of a fall in the thermometric column, it might be inferred, he conceived, that the bulb interfered with the access of caloric from the space. It was in fact the bulb upon which the air acted previous-

ly to its distribution in the space where it could have encountered the due proportion of caloric.

Professor Bache, from the Committee on magnetic observations, read an extract from a letter of Major Sabine, V. P. of the Royal Society of London, stating that the Council of the Society had, on the recommendation of the Committee of Physics, expressed their opinion of the importance to the plan of combined magnetic observations now in progress, that observatories should be established in the United States, and had instructed their President to bring this expression of opinion to the knowledge of the government of this country.

Professor Bache stated that the resolution just referred to had been adopted with a view to aid the efforts of this Society in procuring the erection of observatories, as recommended in their Memorial to the Secretary of War, which had been referred, by that officer, to Congress.

He also read an extract from a subsequent letter from Major Sabine, in reference to the progress of the combined magnetic observations, stating that the Emperor of Russia had ordered the erection of nine magnetic and meteorological observatories in his dominions, to conform, in respect to instruments and times of observations, to the system recommended by the Royal Society. One of these observatories is to be upon the N. W. coast of America.

Professor Bache stated that the regular system of bi-hourly magnetic and meteorological observations was now established in the observatory at the Girard College, and had been in progress since the close of the month of May. He intended, at a future day, to present to the Society the names of the gentlemen, chiefly members of the American Philosophical Society, by whose contributions a fund had been raised to defray the expense of employing the assistants required for these observations.

On the occasion of the May magnetic term day for observations at short intervals, a brilliant aurora had occurred, during which the magnetic instruments were very much disturbed. The details were reserved for future presentation, but it was perhaps proper now to state, that an auroral arch had been visible here a little after ten

o'clock. The same phenomenon was observed at Southwick, Mass., by Mr. Holcomb, at a much earlier hour.

Professor Bache read an extract of a letter addressed by Mr. Forshey, of Natchez, to Mr. Espy, in reference to the tornado which occurred there recently.

The writer stated that he had spent much time in examining the track of the storm in the vicinity of Natchez. He had ascertained its extent to have been not less than five or six miles below the city, and twenty miles beyond; its effects having been felt, but with less violence, for nearly one hundred and fifty miles. The track near Natchez was directed sixty degrees to the east of north. After describing the destruction of the city of Natchez, the writer states, that objects were every where blown towards the track of the storm; those directed most westwardly lying invariably below those directed more eastwardly. Mr. Forshey also describes the effect upon the houses as of an explosion outwards. In his view, these facts strongly confirm Mr. Espy's theory of this meteor.

Professor Bache referred to the conformity between the phenomena described by Mr. Forshey, and those which were ascertained by Mr. Espy and himself to have occurred at New Brunswick, N. J., in the tornado of June, 1825.

Stated Meeting, July 17.

Present, thirty-five members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Astronomical Observations made at the Royal Observatory, Greenwich, in the Year 1838, under the Direction of George Biddell Airy, Esq., M. A. Astronomer Royal, &c. &c. 4to. London, 1840.—*From the Royal Society.*

Philosophical Transactions of the Royal Society of London, for the Year 1839. Parts 1 and 2. 4to. London, 1839.—*From the same.*

List of the Members of the Royal Society, 30th November, 1839.—*From the same.*

Zenith Distances observed with the Mural Circle, at the Royal Observatory, Cape of Good Hope, and the Calculation of the Geocentric South Polar Distances. 4to. 1837.—*From the Lords Commissioners of the Admiralty of Great Britain.*

Transactions of the Cambridge Philosophical Society. Vol. VII. Part 1. 4to. Cambridge, 1839.—*From the Society.*

Monthly Notices of the Royal Astronomical Society, containing Abstracts of Papers, and Reports of the Proceedings of the Society, from June, 1833, to June, 1836. Vol. 3. 8vo. London, 1836.—*From the Society.*

Also, Notice No. 6, Vol. V., for April 10, 1840.—*From the same.*

Transactions of the Society instituted at London for the Encouragement of Arts, Manufactures, and Commerce; with the Premiums offered for the Years 1838-39 and 1839-40. Vol. 52. 8vo. London, 1839.—*From the Society.*

Collections of the Georgia Historical Society. Vol. I. 8vo. Savannah, 1840.—*From the Society.*

Bulletins de l'Académie Royale des Sciences et Belles Lettres de Bruxelles. Tom. I.—VII. 8vo. Bruxelles, 1832-39, et Nos. 1 & 2, Janvier et Février, 1840.—*From the Academy.*

Nouveaux Mémoires de l'Académie Royale des Sciences et Belles Lettres de Bruxelles. Tom. X. XI. XII. 4to. Bruxelles, 1837-38-39.—*From the same.*

Annuaire de l'Académie Royale des Sciences et Belles Lettres de Bruxelles. 2e, 3e, 4e, 5e, et 6e Années. 5 Vols. 12mo. Bruxelles, 1836-40.—*From the same.*

Annuaire de l'Observatoire de Bruxelles, pour l'an 1840. Par le Directeur A. Quetelet, Secrétaire Perpétuel de l'Académie Royale de Bruxelles, &c. &c. 12mo. Bruxelles, 1839.—*From the Author.*

Aperçu de l'État de l'Observatoire, pendant l'année 1839. Par le Directeur de cet Établissement. 8vo. Bruxelles, 1840.—*From the same.*

Catalogue des Principales Apparitions d'Étoiles Filantes. Par A. Quetelet, &c. &c. 4to. Bruxelles, 1839.—*From the same.*

Sur la Longitude de l'Observatoire Royal de Bruxelles, Mémoire lu à la Séance du 6 Juillet, 1839. Par A. Quetelet, &c. &c. 4to. Bruxelles, 1839.—*From the same.*

Observations Météorologiques faites à Maestricht, pendant les Années 1805—1812. Par M. le Professeur Minckelers. 4to.—*From the Author.*

On the Heat of Vapour, and on Astronomical Refractions. By John William Lubbock, Esq., Treas. R. S. &c. &c. 8vo. London, 1840.—*From the Author.*

A Comparative Vocabulary of Indian Languages. By Benjamin S. Barton, M. D. (extracted from his New Views) with Manuscript Additions by Peter S. Du Ponceau, and a German Review of Barton's "New Views." 8vo.—*From Mr. Du Ponceau.*

An Enquiry into the Origin of the Population of America, from the Old Continent. By John Severin Vater. Translated from the German, by Peter S. Du Ponceau. (In MS.) Folio.—*From the same.*

A Sketch of the Politics, Relations, and Statistics of the Western World, and of those Characteristics of European Policy which most immediately affect its Interests; intended to demonstrate the Necessity of a Grand American Confederation and Alliance. 8vo. Philadelphia, 1827.—*From the same.*

Hugonis Grotii Annales et Historiæ de Rebus Belgicis. 24mo. Amstelædam. 1658.—*From the same.*

De la Liberté des Mers. Par M. De Rayneval. 2 Vols. 8vo. Paris, 1811.—*From the same.*

On the Freedom of the Sea. By M. de Rayneval. Translated from the French, by Peter S. Du Ponceau. In 3 Vols. (MS.)—*From the same.*

Principles of Political Economy. Part the Third—Of the Causes which retard Increase in the Numbers of Mankind. Part the Fourth—Of the Causes which retard Improvement in the Political Condition of Man. By H. C. Carey, Author of an Essay on the Rate of Wages. 8vo. Philadelphia, 1840.—*From the Author.*

A Treatise on Currency and Banking. By Condy Raguet, LL.D., Member of the American Philosophical Society, &c. 2d edition. 8vo. Philadelphia, 1840.—*From the Author.*

Address delivered before the Philomathean Society of the University of Pennsylvania, Thursday, Nov. 1, A. D. 1838. By William B. Reed. 8vo. Philadelphia, 1838.—*From Prof. Henry Reed.*

The Infancy of the Union. A Discourse delivered before the New York Historical Society, Thursday, Dec. 19, 1839. By Wm. B. Reed. Published at the request of the Society. 8vo. Philadelphia, 1840.—*From the same.*

Proceedings of the Annual Meeting of the Western Rail Road Corporation, held, by adjournment, in the City of Boston, March 12, 1840, including the Report of the Committee of Investigation appointed by the Stockholders. 8vo. Boston, 1840.—*From Mr. Isaac P. Davis.*

Historia de la Revolucion Hispano-Americana. Por D. Mariano Corrente, Autor de la Geografia Universal. 3 Tom. 8vo. Madrid, 1829–30.—*From Mr. A. de Frias.*

Memorias de la Seccion de Historia de la Real Sociedad Patriotica. 8vo. Habana, 1830–31.—*From the same.*

La España Maritima. Serie de Articulos relativos á las Ciencias y Artes, proprias ó Auxiliares de la Marina, &c. &c. 8vo. Cuadern. 1–9. Madrid, 1838–9.—*From the same.*

Folletin Historico ó Coleccion de Historias Españolas. Su Autor, Don Juan Miguel de los Rios. 8vo. Cuadern. 1–3. Madrid, 1837.—*From the same.*

Fourth Report of the Inspectors appointed under the Provisions of the Act 5 and 6 Will. IV. c. 38, to Visit the different Prisons of Great Britain. 1. Home District. Presented to both Houses of Parliament, by Command of her Majesty. Fol. London, 1839.—*From Mr. Samuel R. Wood.*

Jahrbücher der Literatur, Band. 85, 86, 87, 88. 8vo. Wien, 1839.—*From the Editor, Von Hammer-Purgstall.*

Falknerklee, bestehend in drey ungedruckten Werken über die Falknerey, nähmlich. 1. Das Falkenbuch (Türkisch.) auf der Ambrosiana zu Mailand. 2. ΙΕΡΑΚΟΣΟΦΙΟΝ das ist: die Habichtslehre (auf der k. k. Hofbibliothek zu Wien). 3. Kaiser Maximilians Handschrift über die Falknerey (auf der k. k. Hofbibliothek zu Wien) aus dem Türkischen und Griechischen Verdeutscht, und in Text und Übersetzung herausgegeben von Hammer-Purgstall. (In Dreyhundert Abdrücken.) 8vo. Wien, 1840. *From the same.*

Wiener Zeitschrift fur Kunst, Literatur, Theater, und Mode; Donnerstag, den 23 Jänner, 1840. Enthaltend:—"Der Sänften Pallast der Beduinen auf der Insel Raudha." Von Hammer-Purgstall.—*From the same.*

Gemäldesaal der Lebensbechreibungen grosser Moslimischer Herrscher der ersten Sieben Jahrhunderte der Hidschret. Von Hammer-Purgstall. Band V. 8vo. Leipzig und Darmstadt, 1838.—*From the same.*

Catalogo dei Codici Arabi, Persiani e Turchi della Biblioteca Ambrosiana (per Giuseppe de-Hammer). 8vo. Milano, 1839.—*From the same.*

O Auxiliador da Industria Nacional, &c. &c., Periodico Mensal, publicado pela Sociedade auxiliadora da Industria Nacional, estabelecida no Rio de Janeiro. Anno VII. Nos. 7, 8, 9, 10, 11, e 12. (Julho—Dezembro, 1839.) 8vo. Rio de Janeiro, 1839.—*From Mr. J. S. Rebello.*

Naturhistorische Skizze von Lithauen, Volhynien und Podolien in geognostisch—mineralogischer, botanischer, und zoologischer Hinsicht, entworfen von Edward Eichwald, der Medizin Dr. u. Prof. der Kaiserl. Academie der Wissench. zu St. Petersb. u. s. w. 4to. Wilna, 1830.—*From the Author.*

The American Medical Library and Intelligencer. Vol. IV. Nos. 6 and 7, for June 15, and July 1, 1840. By Robley Dunglison, M. D., Sec. A. P. S.—*From the Editor.*

Minutes of the Provincial Council of Pennsylvania, from the Organization to the Termination of the Proprietary Government. Published by the State. Vol. 3, containing the Proceedings of Council from May 31st, 1717, to January 23d, 1735–6. 8vo. Harrisburg, 1840.—*From the State.*

Memoirs of the Historical Society of Pennsylvania. Vol. IV. Part 1. 8vo. Philadelphia, 1840.—*From the Society.*

FOR THE CABINET.

A beautiful and ingeniously contrived Balloting Box, of Mahogany, for the use of the Society.—*From Mr. T. U. Walter.*

The Astronomical Committee, consisting of Dr. R. M. Patterson, Mr. Sears C. Walker, and Prof. A. D. Bache, to whom was referred the communication of Mr. Rümker, of Hamburg, on the three comets discovered by Galle, of Berlin, reported in favour of its publication in the Society's Transactions, which was ordered accordingly.

Dr. Dunglison, as Secretary of the Historical and Literary

Committee, reported the minutes of the Committee in relation to several subjects referred to them. Whereupon, on motion of Mr. Kane, it was resolved, that so much of the proceedings of the Committee as refers to the Paper of Mr. Breck, entitled, "Historical Sketch of the Continental Bills of Credit, from the Year 1775 to 1781, with Specimens thereof," and contains a resolution, that the Paper is worthy of publication in the next volume of the Transactions of the Historical and Literary Committee, is approved by the Society, and the publication thereof ordered accordingly.

Immediately after the battle of Lexington, which took place in April, 1775, the colonial congress began to prepare for war. Having neither funds, nor the means of creating any for present use, either by taxation or loans, they adopted the plan of issuing paper money. Whereupon, even before the battle of Bunker's Hill, one million of dollars were emitted, in bills of various denominations, from one-third, one-half, and two-thirds of a dollar, to eight dollars; and subsequently of denominations varying from thirty to eighty dollars. These bills were made payable to bearer, and entitled him to receive Spanish milled dollars for them, or their value in gold or silver; and for their redemption, congress bound the thirteen Confederated Colonies. Contracts were made at Philadelphia for printing the bills; and thirty individuals of that city were appointed by congress, to divide the labour of signing them, so as to have commonly two names on each bill. Appropriate mottoes, in Latin, were placed on the obverse, and a rudely printed emblem on the reverse. Treasurers were named to administer these funds, at an annual salary of five hundred paper dollars.

The colonies were called upon to tax themselves for the repayment of this money; and the quota of each was determined, according to the number of its inhabitants, including negroes and mulattoes. Virginia ranked first, Massachusetts second, Pennsylvania third; and New York came in with Connecticut and North and South Carolina. When the treasurers happened to have gold or silver, they were directed to advertise their readiness to exchange the same for paper; and some individuals, ardently patriotic, sent large sums of metallic money to the treasury, and received bills of credit in return at par. In the course of the year 1775, ten millions of dollars were emitted.

The next year independence was declared, and some specie having

been imported, the credit of the bills was well sustained; and, in order to avoid interruption in striking them off, the printers were excused from military duty.

The press was now in permanent operation, and the sums emitted so large, that public confidence began to diminish, while ruinous fluctuations in the prices of every commodity took place. Upon this, congress gave new assurance of their intention to redeem every dollar; and availing themselves of the good effect of this promise, they issued this year (1776) in loan office certificates, lottery tickets and bills of credit, about twenty millions. Yet, fearful of a renewed depreciation, they authorized General Washington to take whatever he might want for the use of the army, whenever the inhabitants refused to sell, and to imprison and report the names of all those who rejected the continental currency. These harsh measures did not, however, strengthen the credit of the bills; and congress passed, in the beginning of 1777, vehement resolutions of accusation against the enemies of liberty, for impairing their credit, by raising the nominal value of gold and silver. The states were exhorted to pass laws to compel every one, under the penalty of forfeiture of goods, &c. to take them at specie value; to make them a tender in payment of debts; and the refusal to receive them *an extinguishment of such debts.*

About twenty-one millions had been raised in 1777, on loan and bills, when, on the 3d of December of that year, congress found themselves obliged to acknowledge that the quantity issued was too great.

A pause was resolved upon, and recourse had to France for a loan of two millions sterling. Meantime, the British at New York, and others elsewhere, counterfeited extensively; provisions and merchandise increased manifoldly in price, and the current money fell to four for one. Much of this unsteadiness was ascribed by congress "to a spirit of sharping and extortion."

In the year 1778, the press was again in full operation, and sixty-three millions were issued, at three and four for one; for, abused as this prolific source had been, and continued to be, it seemed to offer greater advantages than any other of the various means that congress had tried. Very little hard money circulated; for, while this large sum in paper was paid out in the single year of 1778, only seventy-eight thousand dollars in specie passed through the treasury.

Taxes were recommended as a sinking fund; but the credit of the

bills had fallen too low to be forced upon the public at the scale fixed by congress; it was, therefore, ordered by that body, on the 8th of October, 1778, "That all limitation of prices of silver and gold be taken off."

The appeal by congress, on asking for taxes, is clothed in stirring language. They think the redemption of the bills no difficult matter; and, upon this conviction, send forth fifty millions, giving this time an assurance to pay the whole, on or before the 1st of January, 1797.

During the following year, 1779, sixty-three millions were emitted; and now the amount abroad having reached the enormous sum of one hundred and sixty millions, congress resolved to stop the press, whenever the increase should extend to two hundred millions. This sum, with others due elsewhere, would swell the grand total at the end of the war, they supposed, to three hundred millions. Stupendous, says Mr. Breck, as this debt was for a community in its infancy, they thought the resources of the country equal to the payment of the whole. "There are at present," they say, "three millions of inhabitants in the thirteen states; and this sum divided, per head, would give but one hundred dollars for each to pay, in eighteen or twenty years; and if the debt be assessed in proportion to the wealth of the inhabitants, the poor man's share would not be more than ten dollars; and if twenty years be taken to pay the debt, our population will be nearly double, and our ability to pay increased more than two-fold." Again, they say: "This paper money has been eminently serviceable, and cannot 'make unto itself wings and fly away.' It remains with us; it will not forsake us; it is always ready for purposes of commerce or taxes; and every industrious man can find it. Having pledged our lives, fortunes and sacred honour for our independence, the same pledge is given for the redemption of these bills." "A bankrupt, faithless republic," adds this congressional address, "would be a novelty in the political world, and appear like a common prostitute among chaste and respectable matrons. It is impossible that America should think, without horror, of such an execrable deed."

The hopes of that patriotic body were not realized. These bills, which have never been paid, defrayed the chief expense of five years of active warfare, in which specie bore so small a share, that the official accounts of the years 1778 and 1779 show only one hundred and fifty-six thousand dollars, paid out of the treasury in hard money during those two years, against ONE HUNDRED AND THIRTY

MILLIONS in paper. This paper was suffered to depreciate to one thousand dollars for one in silver, and there it died without redemption—the vast sum of two hundred millions being extinguished by a gradual depreciation.

It was further resolved, that such part of the proceedings of the Historical Committee as refers to a MS. communication, entitled "A Grammar of the Mohawk Dialect of the Iroquois Language, or of the Five Ancient Confederated Nations; containing Rules and Exercises intended to Exemplify the Indian Syntax, according to the best Authorities, preceded by succinct Rules relative to the Pronunciation, by Eleazer Williams, Missionary of the Protestant Episcopal Church at Green Bay, Michigan;" and contains a resolution that the Paper is worthy of publication in the next volume of the Transactions of the Historical and Literary Committee, is approved by the Society, and its publication ordered accordingly.

Dr. Hare read a communication, entitled "On the Change effected in the Nitrates of Potash and Soda, by the limited application of Heat, with a view to obtain pure Oxygen: and, also, on a Liquid and a Gaseous Ethereal Compound, resulting from the reaction of Nascent Hyponitrous Acid on Alcohol," &c. which was referred to a committee.

Mr. Nicklin read the dedication to the Society, of a Memoir on the Geology of North America, by Dr. Daubeny of Oxford, and accompanied the same by some remarks.

Mr. Nicklin stated that he should not have brought Dr. Daubeny's dedication before the Society, had it been one of mere form and flattery; but as it was a paper of research, showing much depth of observation, and justness of conclusion, and was written in a spirit evincing the best feeling towards his brethren on this side of the Atlantic, he thought it due both to the Society and the author, that it should be read at a stated meeting.

Mr. Du Ponceau made a verbal communication in regard to certain interesting works, now in course of publication in Europe,—in reference to the discovery, geography and history of America—and especially to that of M. Ternaux Compans. He also referred to the conclusions of Don Alonzo Zurita, in regard to the Mexican Picture Writing.

Mr. Du Ponceau remarked, that the American hemisphere, its discovery, geography, and history, seem to engage the attention of the learned in Europe, as much as they did in the sixteenth century. The great work of Baron Humboldt, entitled, "Examen Critique de l'Histoire de la Géographie du Nouveau Continent, et des Progrès de l'Astronomie Nautique aux 15e & 16e siècles," has now reached its fifth volume, and only comes down to the third and fourth voyages of Amerigo Vespucci. Another work, less learned, but not less important, is now in course of publication at Paris, by M. Ternaux Compans, of which fourteen volumes have already appeared. It is entitled, "Voyages, Relations et Mémoires Originaux pour Servir à l'Histoire de la Découverte de l'Amérique, publiés pour la première fois en Français." The *Journal des Savants* considers this collection as of the "highest interest." It contains many rare works, now out of print, written in different languages, and difficult, if not impossible, to be obtained;—several of which have not appeared in any other compilation.

Among these is a "Report on the Different Classes of Chiefs in New Spain," by Alonzo Zurita. This work, says the *Journal des Savants*, contains the best, the fullest, and the most interesting account of the system of government, and of the laws, usages, manners and customs of the Mexicans before the Conquest, and proves them to have been by no means so barbarous and uncivilized a people as they have been represented by their conquerors, who, by degrading them, thought to justify their own barbarity. Zurita was employed in Mexico by the Emperor Charles the Fifth, and resided there nineteen years, with the power of a magistrate and the curiosity of a philosopher. The work has not yet made its way into this country; but the Journal des Savants for the month of January last contains an ample and very interesting notice of it, and a full account of its contents. Speaking of the Mexican picture writing, this author, who was in Mexico not long after the Conquest, and had opportunities which are lost to the present generation, says: "that those characters had a *cursive* form, or running hand, and were capable of representing all the *sounds*, and all the proper names." This would show that the characters were connected with the *spoken* language, which is the doctrine advanced by Mr. Du Ponceau in his Dissertation on the Chinese System of Writing.

Mr. Du Ponceau expressed a hope that this interesting subject might be further investigated.

Mr. Vaughan informed the Society that Mr. Charles P. Fox, who possessed a large collection of the original letters and papers of Benjamin Franklin, had deposited them with the Society.

The Franklin papers were bequeathed, by will, to George Fox, father of C. P. Fox, by Temple Franklin, grandson to Benjamin Franklin, and by him submitted to Mr. Sparks, to aid him in the completion of his edition of Franklin's works. Mr. Sparks recommended Mr. Fox to deposit them with the Society, of which Franklin was so long President.

Dr. Hare made a communication respecting an extensive voltaic apparatus, of the form which he had designated by the name of galvanic deflagrator. This apparatus had been constructed for the Lowell Institute of Boston, under his direction, by request of Professor Silliman.

It consists of four troughs, each containing 100 pairs within a space of about 30 inches in length. The pairs, severally, are of the Cruickshank pattern, and about $6\frac{1}{2}$ inches square, independently of the grooves, so as to expose about 42 inches of zinc surface. Every fifth plate is cemented into its groove by a compound of rosin and suet. The plates, intermediate between those thus cemented, are made to fit tightly into their grooves; but in consequence of a slight obliquity in their sides, can be extracted by the aid of forceps, so as to be cleansed, and, when expedient, scraped. The cementing of each fifth plate tends to prevent any injurious retrocession of the voltaic fluid; and yet when the intermediate four plates are removed, an interstice is vacated, sufficiently large to allow the stationary metallic surfaces to be reached by a scraper. The plates are all amalgamated, which not only renders them less susceptible of wasteful reaction with acid, but more susceptible of being cleaned. A strip of wood, 13 inches wide and 2 inches deep, is bored by a centre bit, so as to have eight vertical and cylindrical holes, which are all supplied with mercury. By means of ropes of copper wire, these holes are made to communicate severally with the poles of each of the troughs, so that every one of these has its corresponding mercurial receptacle. Arches of twisted copper wire are provided of such various lengths, that the receptacles may be connected in such manner as to cause the associated troughs to act either as one series of

400 pairs each of 42 inches of zinc surface; as a series of 200 pairs each of 84 inches of zinc surface; or as a series of 100 pairs each of 168 inches of zinc surface. In the usual mode of constructing the voltaic apparatus, the diversities of power that appertain to an apparatus in which the ratio of the size of the pairs to their number varies, as above described, can only be produced by changes in the arrangement, which are too inconvenient to be employed; but, according to the contrivance described, are attainable simply by shifting the connecting arches, so as to alter duly the mode in which the receptacles are connected with each other.

By means of this apparatus, the deflagration of metals, the arched flame between charcoal points, the fusion of platina by contact with the aqueous solution of chloride of calcium, the welding of iron wire to a rod of the same metal under water, were all accomplished with the most striking success.

In repeating Davy's experiment, in which the arched flame between charcoal points was subjected to the influence of a permanent magnet, the reaction between the voltaic and magnetic fluids was so violent, as to be productive of a noise like that of small bubbles of hydrogen inflamed in escaping from the generating liquid. This last mentioned experiment was performed by request of Prof. Henry, who manipulated in the performance of it.

Dr. Hare stated, that he had for many years endeavoured to draw the attention of men of science to the fact, that if, when a fine and a coarse wire of platina are made to form the electrodes or poles of a powerful voltaic series of not less than 300 pairs, the coarse wire, while forming the positive end or anode, be introduced into a concentrated solution of chloride of calcium, and the fine wire be made to touch the surface of the solution, fusion of the extremity into a globule will follow every contact. But when the polarity of the wires is reversed, the resulting ignition is comparatively feeble.

This experiment, Dr. Hare stated, was repeated to the satisfaction of Professors Silliman, Henry, and James Rogers, all of whom were present at the trial of the apparatus.

When the finer wire was plunged about an inch below the surface of the solution, it became luminous throughout, emitting rays of a brilliant purple hue.

For the fusion of the platina wire, in the experiment above described, it was found necessary to use the whole series consecutively as 400 pairs; showing, Dr. Hare remarked, that there are effects

which require a great number of pairs. He had, in previous experiments, found that fresh phosphuret of calcium was a conductor for 350 pairs of 7 × 3, but not for 100 pairs of $7\frac{1}{2}$ × 14.

The deflagration of an iron wire by contact with mercury, took place with phenomena which were never before witnessed by any of the spectators. At first the mercury was deflagrated with an intense silvery white light, after which there arose a vertical shower of red sparks, caused by the combustion of the iron. Lastly, a globule having accumulated at the end of the wire after a momentary stoppage of the reaction, an explosion took place, by which fragments of the globule, together with portions of the mercury, were projected to a great distance.

It would seem, said Dr. Hare, as if a globule of peroxide of iron, having formed at the end of the wire, caused a temporary arrestation of the voltaic current; but that the apparatus, gaining energy in consequence of a transient repose, was unable to break through the globule so as to disperse its particles with violence.

Mr. Walker made some remarks on the tornado, of limited extent, which visited Philadelphia on the 13th instant.

Mr. Walker's own observations, and those of several intelligent individuals, on different sides of the central path, led him to the conclusion, that the currents from without the borders of the tornado were directed, in every instance, towards its centre. This was manifest from the motion of the clouds, in the different strata of the atmosphere. The theory of the central tendency of the currents in tornadoes, usually ascribed to Mr. Espy, was, Mr. Walker remarked, of older date, having been advanced by Franklin in the middle of the last century. The whirl, on which so much stress is laid by Mr. Redfield and Colonel Reid, was distinctly seen in the lower current, where the condensed vapour, resembling spent steam, moved round in a spiral, making several turns downwards, each of smaller dimensions than the preceding, and resembling the motion of water in a common whirlpool. This circumstance seemed, to Mr. Walker, somewhat contradictory to part of Mr. Redfield's theory, that of the gradual enlargement of the periphery of the whirl, whereas the motion in the present instance was in a spiral tending inwards.

Mr. Lea confirmed, from his own observations, the central

tendency of the outer currents, and the spiral motion of the clouds in the lower stratum, near the centre of the tornado.

Dr. Hare made some remarks on the same atmospheric phenomenon, and especially on the bearing of the different facts upon his electrical theory of tornadoes.

Dr. Hare stated that he had not had his attention drawn to the meteor, until it had passed the zenith. But subsequently, seeing it distinctly from the top of his house, he had distinguished two clouds, one much above the other, between which there appeared to be an electrical reaction, tending to keep them at a distance, while the lower seemed to move from the south-west, and the upper one from the south-east. These features, together with the tremendous accompanying or preceding electrical discharges, as indicated by thunder and lightning, could not but demonstrate, in Dr. Hare's opinion, that electricity was the principal agent in the production of such phenomena. The fact mentioned in the public prints, that the iron chimney of a steamboat had been carried aloft, proved that a vertical force had been exerted; and the concentration of that force about a tall metallic cylinder was, Dr. Hare maintained, quite consistent with the idea, that the vertical force was the consequence of an electrical current, which would naturally concentrate the action about a prominent perfect conductor.

Dr. Hare could not reconcile the relative situation of the clouds, or their evident reaction and diversity of movement, with the theory of Mr. Espy.

The following gentlemen were duly elected members of the Society:—

Robert Were Fox, of Falmouth, England.

John Sanderson, of Philadelphia.

Francisco Martinez de la Rosa, of Madrid.

Major James D. Graham, U. S. Topographical Engineers.

J. B. B. Eyries, of Paris.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. I. AUGUST, SEPT. & OCT. 1840. No. 13.

Stated Meeting, August 21.

Present, twenty-six members.

Mr. DU PONCEAU, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Monthly Proceedings of the Royal Astronomical Society of London. Vol. V. Nos. 7 & 8, for May 8, and June 12. London, 1840. *From the Society.*

The Journal of the Royal Asiatic Society of Great Britain and Ireland. No. 11. London, May, 1840.—*From the Society.*

A'Magyar Tudós Társaság' Évkönyvei. Harmadik Kötet. 4to. Budán, 1837.—*From the Hungarian Society, Pesth.*

Archæologia, or Miscellaneous Tracts relating to Antiquity. Published by the Society of Antiquaries of London. Vol. XXVIII. 4to. London, 1840.—*From the Society.*

A Geological Map of England and Wales. By G. B. Greenough, Esq., F.R.S., President of the Geological Society, &c. &c. In 6 sheets.—*From the Geological Society.*

Memoir of a Geological Map of England; to which is added an Alphabetical Index to the Hills, and a List of the Hills, arranged according to Counties. By George Bellas Greenough, F.R.S. &c. &c. 2d Edition. 8vo. London, 1840.—*From the same.*

Society for the Encouragement of Arts, Manufactures and Commerce. Premiums for the Sessions 1840-41; 1841-42. 8vo. London, 1840.—*From the Society.*

A Catalogue of the Library of the London Institution; systematically classed. Preceded by an Historical and Bibliographical Account of the Tracts and Pamphlets. Vol. 2. (The Tracts and Pamphlets) 8vo. 1840.—*From the Institution.*

A new Collection of Laws, Charters, and Local Ordinances of the Governments of Great Britain, France and Spain, relating to the Concessions of Land in their respective Colonies; together with the Laws of Mexico and Texas on the same subject, &c. &c. By Joseph M. White, Counsellor at Law, &c. &c. Two vols. 8vo. Philadelphia, 1839.—*From the Publishers, Messrs. Johnson, of Philadelphia.*

Florilegium Nugarum Cantabrigensium—Pan, a Pastoral of the first age, together with some other Poems. By T. Forster, M.B., F. R.A.S., F.L.S., &c. &c. 8vo. Brussels, 1840.—*From the Author.*

Eulogy on Shargs, a favourite Dog, together with the Life of Loski, a Memoir in French, and other Miscellanies. A new edition with additions. By T. Forster, M.B., &c. &c. 8vo. Brussels, 1840.—*From the same.*

Éloge de Chiens favoris avec plusieurs Anecdotes sur l'Intelligence des Bêtes, par l'Auteur de Philozoia, traduit littéralement de l'Anglais. 24mo. Bruxelles, 1840.—*From the same.*

Del primo Scopritore del Continente de Nuovo Mondo e dei più antichi Storici che ne Scrissero ragionamento, &c. &c. Da Gianfrancisco Galeani Napione. 8vo. Firenze, 1809.—*From Dr. Joshua J. Cohen, of Baltimore.*

Esame Critico del primo Viaggio di Amerigo Vespucci al Nuovo Mondo, &c. &c. Da Gianfrancisco Galeani Napione. 8vo. Firenze, 1811.—*From the same.*

A Discourse on the Life and Character of the Honourable Thomas Lee, late Judge in the District Court of the United States; pronounced in the Unitarian Church, Charleston, S. C., Nov. 3, 1839. By Samuel Gilman, D.D., Pastor of the Church, &c. 8vo. Charleston, 1839.—*From the Author.*

Calendars of the Ancient Charters and of the Welch and Scottish Rolls, now remaining in the Tower of London, &c. &c. To which are added, Memoranda concerning the Affairs of Ireland, extracted from the Tower Records, &c. &c. By Sir Joseph Ayloffe, Bart., V.P.A.S. and F.R.S., &c. London, 1774.—*From Mr. John Vaughan.*

Index alter Plantarum quæ in Horto Academico Lugduno-Batavo aluntur, conscriptus ab Hermanno Boerhaave. 4to. Lugd. Bat. 1720.—*From the same.*

The Annual Address of the Philodemic Society of Georgetown College, delivered at the Annual Commencement, held on Thursday, July 28, 1831. By Daniel J. Desmond, Esq., of Philadelphia. 12mo. Philadelphia, 1831.—*From the Author.*

An Address delivered at the Consecration of the Harmony Grove Cemetery, in Salem, June 14, 1840. By Daniel Appleton White, with an Appendix. 8vo. Salem, 1840.—*From the Author.*

Experimental Researches in Electricity. 16th and 17th Series. On the Source of Power in the Voltaic Pile. By Michael Faraday, Esq., D.C.L., F.R.S., &c. &c. From the Philosophical Transactions, Part I. for 1840. 4to. London, 1840.—*From the Author.*

An Answer to Dr. Hare's Letter on certain Theoretical Opinions. By M. Faraday. (From the American Journal of Science and Arts.)—*From the same.*

A Treatise on the principal Mathematical Instruments employed in Surveying, Levelling, and Astronomy; explaining their Construction, Adjustment and Use, with Tables. By F. W. Simms, Assistant at the Royal Observatory, Greenwich. Revised, with Additions. By J. H. Alexander, Civil Engineer. 8vo. Baltimore, 1836.—*From Mr. Alexander.*

History of the Lehigh Coal and Navigation Company, &c. &c. 8vo. Philadelphia, 1840.—*From the Company.*

A Letter to Antonio Panizzi, Esq., Keeper of the Printed Books in the British Museum, on the reputed earliest Printed Newspaper, "The English Mercurie, 1588." By Thomas Watts, of the British Museum. 8vo. London, 1839.—*From Mr. Penington.*

The American Medical Library and Intelligencer. By Robley Dunglison, M.D., Sec. A. P. S., &c. &c. Nos. 8 & 9, for July 15, and August 1, 1840.—*From the Editor.*

Recherches Analytiques sur les Expressions du Rapport de la Circonférence au Diamètre trouvées par Wallis et Brounker; et sur la Théorie de l'Intégrale Eulérienne, &c. &c. par Mr. Jean Plana à Turin, &c. 4to. (Extrait du Journal de Crelle.)—*From the Author.*

Mémoire sur Trois Intégrales Définies, par Mr. J. Plana, Directeur de l'Observateur de Turin. 4to.—*From the same.*

Mémoire sur l'Expression Analytique de la surface totale de l'ellipsoïde dont les trois axes sont inégaux; et sur l'évaluation de la surface d'une voûte symmétrique, à la base rectangulaire, retranchée dans la moitié du même ellipsoïde, par Mr. J. Plana à Turin. 4to.—*From the same.*

Note ou l'on explique une remarquable objection faite par Euler en 1751, contre une règle donnée par Newton dans son Arithmétique Universelle, pour extraire la racine d'un binome réel de la forme $\surd a \pm \surd b$, quelque soit le degré impair de la racine demandée, si toutefois elle est possible, par Mr. J. Plana à Turin. 4to.—*From the same.*

Mémoire sur une nouvelle manière de déterminer les Intégrales définies, &c. &c. par M. J. Plana, &c. 8vo.—*From the same.*

Mémoire sur le Mouvement d'un Pendule dans un Milieu Résistant, par Jean Plana, &c. &c. 4to. Turin, 1835.—*From the same.*

A New Picture of Philadelphia, or the Stranger's Guide to the City and adjoining Districts, &c. &c., with a Plan of the City and Map of its Environs. By H. S. Tanner. 24mo. Philadelphia, 1840.—*From the Author.*

The Magazine of Natural History. New Series. March to June, 1840, inclusive. Conducted by Edward Charlesworth, F.G.S., &c. 8vo. London, 1840.—*From the Editor.*

The American Journal of the Medical Sciences. No. 52. August, 1840. 8vo. Philadelphia.—*From the Editor, Dr. Hays.*

Considerations on the Currency and Banking System of the United States. By Albert Gallatin. 8vo. Philadelphia, 1831.—*From the Author.*

Memorial of the Committee appointed by the "Free Trade Convention," held at Philadelphia in September and October, 1831, to prepare and present a Memorial to Congress, remonstrating against the existing Tariff of Duties; with an Appendix. (Mr. Gallatin, Reporter.) 8vo. New York, 1832.—*From the same.*

Report of the "Union Committee," appointed by the meeting of the Signers of the Memorial to Congress, held on the 11th day of February, 1831, at the Merchants' Exchange, in the City of New York. (Mr. Gallatin, Reporter.) 8vo. New York, 1834.—*From the same.*

Standard Weights and Measures. Letter from the Secretary of the Treasury transmitting a Report of F. R. Hassler, Superintendent

of the Works of Standard Weights and Measures. (Doc. No. 261. Ho. of Reps. Treas. Department.)—*From Mr. Hassler.*

FOR THE CABINET.

A Collection of Turkish Coins, commencing with those of Othman, founder of the present Dynasty.—*From John P. Brown, U. S. Dragoman, at Constantinople.*

A communication was read from Mr. Forshey, of Louisiana, entitled "Observations upon the Meteors of August, by C. G. Forshey," which was referred to a Committee.

Mr. Boyé stated, that Mr. Clarke Hare and he had succeeded in producing a perchloric ether.

It is a colourless liquid, heavier than water, and of a sweet, but afterwards acid taste, resembling that of the oil of cinnamon. Its most remarkable property is its explosiveness. Not only by ignition, but even by friction or percussion, it explodes with extreme violence, and cannot therefore be handled without the greatest precaution. When it is borne in mind, that perchloric acid, containing seven atoms of oxygen, loosely combined with chlorine, is in this substance, in contact with sufficient carbon and hydrogen to be converted into carbonic oxide and water, the violence of its explosion will easily be accounted for.

Mr. Boyé further stated, that he hoped to be soon able to give a farther account of this substance; of the way in which it is obtained, and of some other similar reactions, which they are now engaged in studying.

Mr. Vaughan exhibited from M. Alexandre Vattemare a fac simile of an original grant by Charles of England to William Penn; and also a fac simile of a deed of sale, by William Penn, of 20,000 acres of land, for 800 pounds sterling;—the original deed being in Penn's handwriting.

Mr. Walker made an oral communication on the subject of the August shower of meteors.

These meteors returned, this year on the 9th instant, and were observed at the High School Observatory, by Mr. Walker, as well as by Messrs. Forshey, of Louisiana, and Hamilton, of this city. The evenings of the 10th and 11th, being partly cloudy, and the

moon nearly full, no observations were made. The evening of the 9th, however, was distinguished by all the peculiarities hitherto noticed in the August period. The following table exhibits a classification of the meteors from memoranda, concerning each meteor, made at the time of its appearance.

Meteors of 9th August, 1840. Comparative Brilliancy.	Of 68 Meteors seen from 8h. to 14h., by one observer, moon nearly full.	Of 103 Meteors seen after setting of moon, at 14h., by one observer.	Visible path of Meteor in arc of great circle.	Duration of visibility of Meteor and Train.	Length of Train visible at once.	Duration of visibility of Train.
			°	s	°	s
Thrice that of Jupiter	1	1	40	4.5	20	1.7
Twice ,,	6	0	35	3.6	15	1.0
Equal to ,,	12	2	25	2.5	12	0.8
First magnitude	12	11	20	1.8	9	0.6
Second ,,	32	17	12	1.2	5	0.5
Third ,,	5	33	7	0.9	4	0.4
Below third ,,	none	36	6	0.6	4	0.4

From an inspection of the table, Mr. Walker remarked, it will readily appear, that these meteors differ from ordinary ***shooting stars***, in their greater brilliancy, longer apparent paths, and the greater duration of their trains. Their most important peculiarity, however, is the tendency of their apparent paths towards a common point of convergence in the celestial sphere, or in other words, their apparent divergence from a common radiant point near the head of Perseus.

The existence of a common radiant point near γ Leonis, for the great display of meteors, November 12th, 1833, was noticed by Messrs. Olmsted, Twining, Aiken, Riddle, and others. The same may be inferred from the descriptions of Humboldt and Ellicott, in 1799; of Briggs, and others, in 1832; and it has been manifest in every return of the November shower witnessed since.

The attention of observers, Mr. Walker observed, was first called to the August period, by Quetelet, in 1836; and in 1837, precise observations were made at the Berlin and Breslaw Observatories. These were reduced by the formula given by Mr. Erman, in No. 385 of Schumacher's *Astronomische Nachrichten*, and have determined with precision the common point of convergence for August 10th, 1837. In the same year, Mr. Forshey, then Professor of Mathematics in Jefferson College, Mississippi, noticed, about the middle of August, a great number of Meteors, originating chiefly about the region of Cassiopea. It appears, also, that Mr. Schaeffer,* of New York, searching for a radiant point on the 9th of August, 1837, placed the same near the north

* Silliman's Journal, Vol. 33, p. 134.

pole. Mr. Herrick,* at New Haven, who had previously invited attention to this period, in the United States, on the same evening, found this point farther north than in the November shower; but determined nothing farther. In 1838, these meteors were seen by Mr. Kreil, at the Milan Observatory, but no radiant point was deduced. In the United States, however, Professor Forshey, from 65 meteors seen in one hour, August 9th, at Rock Island, Iowa, concluded the radiant to be situate within a circle of 2° radius, centering in the sword cluster of Perseus. In 1839, Mr. Herrick,† with others, at New Haven, found the radiant point to be near the sword cluster, on the 9th and 10th, being nearly stationary. On the 10th, at 13*h*., they found it to be near θ Persei.

Mr. Forshey, in 1839, August 10th and 11th, at St. Louis, again noticed the radiant point in the same position as in 1838. But the position of this point or rather of the point of convergence of their apparent paths, has been computed with great precision from the observations at Berlin, August 9th, 10th and 11th, and at Königsberg, August 10th and 11th. The mode of observation adopted at the European observatories has been to mark on a map the points of origin and disappearance, and, subsequently, to compute, by Mr. Erman's formulæ, the common point of convergence. As the August meteors become visible chiefly in the northern zones, it was thought that greater precision would be attained by nothing, besides the point of origin and disappearance, also the part of Perseus or Cassiopea, intersected by the apparent path of the *conformable* meteors traced backwards through one of these constellations. The following table gives the point of convergence thus deduced from three separate groups of observations at Philadelphia, together with the position of this point, as determined at the European observatories, and the probable error of a single result, and of the final result computed in the usual manner. The general agreement in the positions will be seen. The smallness of the probable errors of the Philadelphia results is attributed to the method employed in observing; by which a greater proportion of the meteors seen was marked *unconformable*, and excluded from the general estimate.

August Meteors. Place of Observation and date.	Apparent R. A. of point of convergence.	Apparent Dec. of the point of convergence.	No. of Observations.	Probable Error of single result.	Probable Error of final result.
1837. Berlin, Aug. 10	217°.18	−57°.26	46	±20°.1	±2°.96
„ Breslaw, „	221.76	−51.41	200	±19.5	±1.38
1839. Berlin, 9	224.86	−50.18	50	±11.9	±1.68
„ „ 10	223.88	−52.39	48	±13.3	±1.92
„ „ 11	218.45	−51.05	43	±13.5	±2.06
„ Königsberg, 10	214.85	−55.59	75	±21.0	±2.42
„ „ 11	215.11	−55.29	74	±17.4	±2.02
1840. Phila. 9d 10h 57m	216.14	−55.76	12	± 2.3	±0.67
„ „ 9 13 4	214.71	−55.43	15	± 4.1	±1.05
„ „ 9 15 6	219.25	−55.12	29	± 1.2	±0.22

* Silliman's Journal, Vol. 33, p. 176 and 359.
† Ibid, Vol. 37, p. 328.

Mr. Walker referred to some of the analytical conclusions drawn by Mr. Erman* from the fact, which the Philadelphia observations of this year go to confirm, that these meteors appear to converge nearly to a common point in the heavens.

"1st. Mr. Erman concludes, that these bodies are of a *cosmical* origin; that they move in a continuous ring-formed stream of not less that 3° in breadth; that the plane of the centre of this stream is inclined at least 56°, probably more than 90°, and not exceeding 124° to the plane of the ecliptic,—an inclination which hitherto comets alone have been known to possess.

"2d. That their least velocity in space Aug. 10.5th, is 55 hundredths that of the earth in its orbit, giving them a period round the sun of 128 days; that their greatest velocity is 143 hundredths that of the earth, which would locate them at this time on the perihelion of a parabola or ellipse of period indefinitely great.

"3d. That to remove this uncertainty of their velocities, between 55 and 143 hundredths that of the earth, it is only necessary that two observers, at a distance apart, should trace with precision the apparent path of the same meteor, and one of them at least its duration. This condition had not yet been fulfilled in Europe, otherwise the entire elements of their orbit would have been approximately determined.

"4th. That their perihelion distances are not less than 2 hundredths nor more than 97 hundredths of the earth's mean distance from the sun.

"5th. That they are in their descending node when visible Aug. 10.5th, and that their distance from the sun, in the ascending node, is not less than 7 hundredths, and may be several times the earth's mean distance from the sun. Hence, even if they are a continuous ellipse-formed stream, it is only in one of these possible distances, viz. that of the earth from the sun; that this stream would be visible to a spectator on the earth, when traversing its ascending node. If, near the sun, their aggregate might appear as spots on the solar disc, or might intercept some of the solar light and heat: if far beyond the earth, no traces of them would be found.

"6th. That the earth traverses this meteor-stream from the 5.5th to the 7.5th of February. The fact that no such stream has of late years been noticed, shows that the first condition of No. 5, does not prevail. Mr. Erman thinks that the diminution of the normal increase of temperature at this date, as ascertained at several stations, for many years past, by Mr. Mädler, of Berlin, may possibly warrant the conclusion, that the second condition takes place, and that the meteor-stream at this time is between the earth and sun. That the first condition may have prevailed in 1206, and the second in 1208, seems not improbable from history. This apparent change in the appearance of the meteor-stream Mr. Erman ascribes to the secular variations of its elements; the possibility of which is admitted by Olbers and Bessel.

"7th. That the greatest possible apparent motion of the common point of convergence of their apparent paths, consistent with the existence and observed position of this point, is *one-tenth* of a degree of a great circle *westward, in an hour.*"

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* Astr. Nachr., Nos. 385, 390 and 404.

Mr. Walker remarked, that though much pains had been bestowed upon determining their apparent paths and duration, at the High School Observatory, he had as yet received no corresponding observations which could throw light on the third conclusion of Mr. Erman. The motion of the radiant—if any—according to Mr. Forshey's and his own observations, would seem to be in a *south-easterly* direction, of about *one half* of a degree of a great circle *per hour*, a phenomenon not reconcilable with the analysis of Mr. Erman.

In conclusion, Mr. Walker referred, for the details of the Philadelphia observations, to Mr. Forshey's paper read this evening.

Dr. Hays communicated the particulars of a case of inability to distinguish certain colours, occurring in a man, a patient in Wills' Hospital, under the care of Dr. Fox.

This case, Dr. Hays remarked, presented the following points of interest.

1st. It confirmed the correctness of the observation made by Dr. Hays, in a former communication, that no reliance can be placed on the account of their own cases, given by those who labour under this defect; and that their statements should never be received as accurate, until after careful and repeated examination.

The subject of the case under notice had been admitted into the hospital with partial amaurosis, and was not aware of his inability to distinguish colours until he was informed of the defect by Dr. Fox. He then maintained, very confidently, that it had come on since his loss of the power of seeing objects, and mentioned several circumstances to prove, that it was of recent occurrence. Nevertheless, on being minutely and closely questioned, it appeared beyond all doubt, and even the patient himself had to admit the fact, that the defect must have always existed.

Again, after being shown various coloured papers, which he was requested to name, and satisfying all who witnessed the experiment, that he could distinguish but two colours, viz. yellow and blue, he named correctly the colours of a red strawberry and green leaf, which were presented to him. This surprised all present. It occurred, however, to Dr. Hays, that the patient had learned the usual colour of these objects, and that his answers were dictated by this knowledge, and not from a real perception of colour. Experiments, made with a view of determining this point, most conclusively established the correctness of Dr. Hays's suspicion.

2dly. The case tends to confirm the accuracy of the laws announced by Dr. Hays on a former occasion, as governing the defect of vision under notice. This patient could perceive but two colours, yellow and blue. His perception of the former was perfect, of the latter somewhat less so.

Dr. Hays stated, that the laws just alluded to, so far as ascertained by his investigations, were the following:—

1st. *Entire inability of distinguishing colours may co-exist with a perfect ability of perceiving the forms of objects.*

This constitutes the highest grade of the defect. Individuals who labour under it can recognise differences of intensity of colour, so that whilst a diversity of colours of the same intensity appears to them to be a uniform colour, they accurately designate, as lighter or darker, different shades of the same colour, or of various colours. The rainbow appears to them as a band of a uniform colour, darker at one side, and gradually becoming lighter towards the other.

2dly. *The defect may extend to all but one colour, and in such case the colour recognised is always* YELLOW.

The perception of this colour may be perfect, or limited to some shades.

3dly. *The defect may extend to all but two colours, and in such case the colours recognised are always* YELLOW *and* BLUE.

In some of these cases, the perception of the latter colour is less perfect than of the former. Individuals who labour under this grade of the defect, though able to recognise, perfectly, yellow and blue, cannot distinguish them when combined, and forming green.

The laws which govern the other grades of this defect, Dr. Hays remarked, remain to be determined.

There are certain persons who can accurately recognise yellow and blue, and some who can recognise red, who cannot distinguish green; but whether or not there are individuals who can recognise the three primitive colours accurately, and are yet unable to distinguish the secondary colours, must be left, Dr. Hays remarked, to further observation to determine.

It also remains to be ascertained, whether any person, having an imperfect perception of yellow, can recognise blue; or with an imperfect perception of yellow and blue, or of the latter alone, can distinguish red.

Dr. Hays, from the Publication Committee, stated, that the

first part of the new volume of the Transactions of the Society, would be published in a few days.

Mr. Vaughan reported the death of Mr. Prinsep, of Calcutta, a member of the Society.

On motion, it was resolved, that a Committee be appointed to arrange the Franklin Papers deposited with the Society, (see Proceedings, No. XII, p. 253,) and to report a plan for the better preservation of the Manuscripts of the Society.

Dr. Dunglison, Reporter, presented No. 12 of the printed Bulletin of the Proceedings of the Society for May, June, and July, 1840.

Stated Meeting, September 18.

Present, twenty-six members.

Dr. Patterson, and subsequently Dr. Chapman, Vice Presidents, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Transactions of the Geological Society of London. Second Series. Vol. V. Part 3. 4to. London, 1840.—*From the Society.*

Transactions of the Zoological Society of London. Vol. II. Part 4. 4to. London, 1840.—*From the Society.*

Proceedings of the Zoological Society of London. Part VII. 1839. 8vo.—*From the same.*

Reports of the Council and Auditors of the Zoological Society of London; read at the annual general meeting, April 29, 1840. 8vo. London, 1840.—*From the same.*

Flora Batava of Afbeelding en Beschryving van Nederlandsche Gewassen, door Jan Kops, Hoogleeraar te Utrecht, u. s. w. en F. A. W. Miquel. 4to. 119 Aflevering. 5 Platen. 4to. Amsterdam.—*From his Majesty the King of the Netherlands.*

Medicinisches Schriftsteller-Lexicon der jetzt lebenden Aerzte, Wundärzte, Geburtshelfer, Apotheker, und Naturforscher aller gebil-

deten Völker. Von Adolph Carl Peter Callisen, Doctor der Medicin und Chirurgie, u. s. w. Bänd. 1–21. 8vo. Copenhagen, 1830–35. Die anonymischen Schriften, mit Einschluss der Cholera, der Homöopathie, der Pharmacopöen, Arzneitaxen und allgemeinen Medecinalordnungen, Zeitschriften, gesellschaftschriften und gesammelte Schriften mehrerer Verfasser. Bänd. 22–25. 8vo. Copenhagen, 1835, 1837. Nachtrag enthaltend: Berichtigungen, Ergänzungen, die neuere Literatur, und die seit 1830 verstorbenen medicinischen Schriftsteller, mit einigen Beiträgen von den Herren Doctoren: dem Hofrathe Choulant, dem Leibchirurgen Koberwein, dem Director der Königsbergschen Hebammen-Lehranstalt Richter, dem Archiater und Etatsrathe A. von Schönberg. Bänd. 26, 28. 8vo. Copenhagen, 1838–40.—*From the Author.*

A Dictionary of the Anglo-Saxon Language, &c. &c., with a preface on the Origin and Connexion of the Germanic Tongues; a Map of Languages, and the Essentials of Anglo-Saxon Grammar. By the Rev. J. Bosworth, LL.D., Dr. Phil. of Leyden, &c. &c. Royal 8vo. London, 1838.—*From the Author.*

Memoirs illustrating the History of Jacobinism. A Translation from the French of the Abbé Barruel. Part 1. Vol. 1. The Anti-Christian Conspiracy. Part 2. Vol. 2. The Anti-Monarchical Conspiracy. Part 3. Vol. 3. The Anti-Social Conspiracy. 8vo. Hartford and New York, 1799.—*From Mr. Du Ponceau.*

A Star in the West; or a Humble Attempt to Discover the long lost Ten Tribes of Israel, preparatory to their return to their beloved City, Jerusalem. By Elias Boudinot, LL.D. 8vo. Trenton, N. J., 1816.—*From the same.*

Biography and History of the Indians of North America; comprising a General Account of them, and Details in the Lives of all the most Distinguished Chiefs and others, who have been noted among the various Indian Nations upon the Continent; also a History of their Wars, &c. &c. By Samuel G. Drake, Member of the New Hampshire Historical Society. Third Edition, with large additions and corrections, and numerous engravings. 8vo. Boston, 1834.—*From the same.*

Études Physiologiques et Pathologiques sur les Organes de la Voix Humaine, Ouvrage auquel l'Académie Royale des Sciences a Décerné un des Prix de Médecine fondés par M. Montyon. Par

F. Bennati, Docteur en Médecine et en Chirurgie des Facultés de Vienne, &c. &c. 8vo. Paris, 1823.—*From the same.*

Memoirs of My Own Times. By General James Wilkinson. Three Vols. 8vo. Philadelphia, 1816.—*From the same.*

Traductor Ingles, ó Sistema Práctico i Teórico para aprender á traducir la Léngua Inglesa por Médio de la Española. Por Mariano Cubí i Soler, Catedratico de Idiomas Modernos en el Coléjio de la Louisiana, Segunda Edicion, Correjida i Mejorada. 8vo. Cambridge.—*From the Author.*

An Historical and Statistical Account of New South Wales, both as a Penal Settlement and British Colony. By John Dunmore Lang, D.D., Senior Minister of the Scots Church, &c. &c. Second Edition. 2 vols. 8vo. London, 1837.—*From the Author.*

A Treatise on the Yellow Fever, as it appeared in the Island of Dominica, in the Years 1793–4, 5, 6; to which are added, Observations on the Bilious Remittent Fever, on Intermittents, Dysentery, and some other West India Diseases; also the Chemical Analysis and Medical Properties of the Hot Mineral Waters on the same Island. By James Clark, M.D., F.R.S.E., &c. &c. 8vo. London, 1797.—*From Mr. Vaughan.*

The Possibility of Approaching the North Pole Asserted. By the Hon. D. Barrington. A new Edition, with an Appendix, containing Papers on the same subject, and on a Northwest Passage. By Colonel Beaufoy, F.R.S. Illustrated with a Map of the North Pole, according to the latest Discoveries. 8vo. New York. 1818.—*From the same.*

Besançon's Annual Register of the State of Mississippi, for the Year 1838, completed from Original Documents and Actual Surveys, &c. &c. Vol. 1. 12mo. Natchez, 1838.—*From Mr. C. G. Forshey.*

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie. Uitgegeven door J. Van der Hoeven, M.D., Prof. te Leiden, en W. H. Vriese, M.D., Prof. te Amsterdam. Zesde Deel. 4. Stuk. 1839.—*From the Editors.*

Mow Yih Tung Che. A Treatise on Commerce. (In Chinese.) 8vo. with a Map of the Southern Hemisphere. By Mr. Gutzlaff.
[This work is founded on M'Culloch's publication.]

Institut Royal de France, (État actuel, Liste et Adresses de MM. les Académiciens, &c.) 24mo. Pour l'année, 1840.—*From Mr. Warden.*

Pamphlets. 1. Institut Royal de France. Académie Royale des Sciences. *a.* Funérailles de M. Turpin; Discours de M. Le Baron de Silvestre, 5 Mai, 1840. *b.* Funérailles de M. Brochant de Villiers; Discours de M. Al. Brongniart, 19 Mai, 1840. *c.* Funérailles de M. le Lieutenant Général du Génie, Vicomte Rogniat; Discours de M. Becquerel, 11 Mai, 1840. *d.* Funérailles de M. Robiquet; Discours de M. Chevreul, Mai 2, 1840. *e.* Funérailles de M. Poisson; Discours de M. Arago, 30 Avril, 1840, et Discours de M. Cousin, 30 Avril, 1840. 2. Institut Royal de France. Académie des Sciences Morales et Politiques. Sujets de Prix et Programmes adoptés par l'Académie pour être mis au concours des Anneés, 1840–41 & 42. 3. Institut Royal de France. Séance Publique Annuelle des Cinq Académies, du Samedi, 2 Mai, 1840, &c. 4. Institut Royal de France. Académie Française; Séance Publique du Jeudi, 11 Juin, 1840. 5. Règlements de la Société Royale des Antiquaires de France, 1840. 6. Rapport sur les Opérations de la Campagne de la Corvette l'Astrolabe, depuis le départ de Rio Janeiro jusqu'a l'Arrivée à Valparaiso. 7. Rapport fait à la Société d'Encouragement pour l'Industrie Nationale, par M. le Vicomte Héricart de Thury, &c. sur le procéde proposé par M. C. P. Brard, &c. pour reconnôitre immédiatement les Pierres qui ne peuvent point résister á la Gelée, et que l'on désigne ordinairement par les Noms de *Pierres Gelives* ou *Pierres Gelisses.* 4to. Paris, 1824. 8. Société Asiatique; Discours et Rapport lus dans la Séance Générale annuelle du 28 Avril, 1825, &c. 8vo. Paris, 1825.—*From the same.*

A Monograph of the Limniades, and other fresh water Univalve Shells of North America. By S. Stehman Haldeman, Member of the Philadelphia Academy of Natural Sciences. No. 1. July, 1840. 8vo.—*From the Author.*

List of Optical Instruments to be found in the Optical Institute of Utzschneider and Frauenhofer, München; with the prices. (In French and German.)—*From Mr. Justice.*

The Committee, consisting of Dr. Bache, Prof. Bache, and Mr. Booth, to whom was referred a communication, by Dr. Hare, entitled "On the Change effected in the Nitrates of Potash and Soda, by the limited application of Heat, with a view to obtain pure Oxygen; and, also, on a Liquid and a

Gaseous Ethereal Compound, resulting from the reaction of Nascent Hyponitrous Acid on Alcohol," &c., reported in favour of publication in the Transactions of the Society, and the publication thereof was ordered accordingly.

The Committee, consisting of Dr. Patterson, Prof. Henry, and Mr. Walker, to whom was referred a letter, addressed by Dr. John Locke to Prof. Bache, containing observations to determine the Horizontal Magnetic Intensity and Dip, at Louisville, Kentucky, and Cincinnati, Ohio, reported certain extracts for publication.

After describing the apparatus used in these observations, Doctor Locke states, in detail, the results of two series of observations, each made with three horizontal needles, and concludes from the mean of them, that the relative horizontal intensities at Louisville and Cincinnati, are as 1 to 0.9727. The dates of the observations were March 7th, 10th, 11th, and 14th, 1840, at about noon of each day. The correction for temperature, in each of the three needles used, was obtained by experiments which are fully described, and which gave the following coefficients:—for needle No. 1, 0.000125, for No. 2, 0.000145, No. 3, 0.000058.

The magnetic dip at Cincinnati, as determined by two series of observations, each with two needles, in March, 1840, was 70° 25′.5, and by one series, in April, 70° 28′.8, and the dip at Louisville, by three series, at nearly the same date, in March, 69° 54′.9.

The relative total intensities thus deduced for a period corresponding to March 10th, 1840, are, Cincinnati, 1.000, Louisville, 1.003.

A communication was read from Mr. C. G. Forshey, of Louisiana, entitled "An Account of the Great Mound near Washington, Adams county, Mississippi," which was referred to a committee.

Mr. Du Ponceau presented to the Society a Manuscript by the late Mr. Heckewelder, containing the names of various trees, shrubs and plants, in the Lennape (Del.) language, which was referred to the Historical and Literary Committee.

Dr. Horner read a communication entitled "Note of the Remains of the Mastodon, and some other extinct Animals collected together in St. Louis, Missouri. By W. E. Horner,

M.D., Professor of Anatomy in the University of Pennsylvania," which was referred to a committee.

Mr. Ord directed the attention of the Society to the following passage in Audubon's "Birds of America." Article, *Small-headed Flycatcher.*

"When Alexander Wilson visited me at Louisville, he found, in my already large collection of drawings, a figure of the present species, which, being at that time unknown to him, he copied, and afterwards published in his great work, but without acknowledging the privilege that had thus been granted to him. I have more than once regretted this, not by any means so much on my own account, as for the sake of one to whom we are sd deeply indebted for his elucidation of our ornithology."

"This attack upon the reputation of a member of this Society," said Mr. Ord, "one who, during the long period that he dwelt amongst us, was noted for his integrity, ought not to be suffered to pass without examination."

Mr. Ord submitted to the inspection of the Society, Wilson's Autograph Diary of his journey from Philadelphia to New Orleans, viâ Pittsburg and Louisville, commencing on the 30th of January, 1810. From this diary it appears, that he arrived at Louisville on the evening of Sunday, the 18th of March; and departed thence for Frankford and Lexington, on the morning of Friday the 23d. During his stay at Louisville, he was occupied three days in soliciting subscribers, and endeavouring to get materials for his work, and one day he was employed in writing to his friends at home. Four days, consequently, were passed in Louisville, one afternoon of which was devoted to shooting, in company with Mr. Audubon; and a portion of a morning was appropriated to examining that gentleman's collection of crayon drawings; in which Wilson states he saw the figures of two new birds, both *Motacillæ* or Warblers; but he does not state that he saw a figure of a *Muscicapa* or Flycatcher. He does not say a word respecting the loan of Mr. Audubon's drawings, nor does he give the least reason to suppose that he made a copy of any of the drawings; on the contrary, he positively asserts that he did not get one *new* bird at Louisville.

Mr. Ord proceeded to examine the style of both Audubon's and Wilson's drawings, and pointed out the peculiarities of each author. He declared, that the figure of Wilson's Small-headed Flycatcher differs in no respect from his ordinary style; that it bears the signet of paternity on its very front. But, as it might be objected that this mode of reasoning is inconclusive, from the circumstance of several of Mr. Audubon's birds bearing a resemblance to those of Wilson, Mr. Ord obviated this objection, by stating that Mr. Audubon had not scrupled to appropriate the labours of Wilson to his own use; inasmuch as the figure of the female March Blackbird, (Birds of America, plate 67,) and that of the male Mississippi Kite, (same work, plate 117,) had both been copied from the American Ornithology, without the least acknowledgment of the source whence they had been derived. Mr. Ord thought that the charge of plagiarism came with an ill grace from one who had been guilty of it himself, as in the instances above mentioned.

Wilson states, that he shot the bird figured and described in his 6th volume,

page 62, in an orchard, on the 24th of April. Mr. Ord confirmed this statement, by declaring to the Society, that he himself was with Wilson on the day in question; that he saw and examined the specimen; and that Wilson assured him it was entirely new to him. Wilson was then residing at the Bartram Botanic Garden, near Philadelphia.

Mr. Ord farther read to the Society a letter addressed to him by the artist, Mr. Lawson, who engraved the plate in which the Small-headed Flycatcher is figured. This gentleman affirms, that all the plates, which he engraved for the American Ornithology, were from Wilson's own drawings; and that with respect to the plate in which the Small-headed Flycatcher appears, *specimens* of all the birds there represented accompanied the drawings; and he, after getting his outline, *worked from them.* Mr. Ord laid before the Society a proof of the etching of this plate, and remarked, that from the minuteness of the details, the *point* of the engraver had evidently a greater share in producing the desired result, than even the pencil of the ornithologist.

Mr. Lea, from the Publication Committee, reported, that the first part of the 7th volume of the Transactions of the Society was completed, and presented a copy thereof for the inspection of the members.

Mr. Vaughan stated, that agreeably to the instructions of the Society, he had purchased the Anamitic and Latin, and Latin and Anamitic Dictionaries, lately published by the Right Reverend Father Taberd, Bishop of Isauropolis, and Vicar General of Cochin China; in two volumes, 4to. Serampore, 1838. (See Proceedings of July 3.)

Dr. Hays made an oral communication relative to the operation recently devised for squinting, and to its effects in modifying the adjusting power of the eye for near and distant objects.

Dr. Hays stated, that certain phenomena which he had observed in one of the cases in which he had divided the internal rectus muscle, for the cure of squinting, seemed to favour the theory of the adjustment being made by an alteration in the form of the eye, under the conjoint action of the four recti muscles; a theory rejected by the best physiologists of the day.

The case, the details of which Dr. Hays related, was that of a gentleman thirty-six years of age, who had squinted with his left eye since the age of five years. Both the eyes were presbyopic; the left, however, was most so, and required for distinct vision a glass three Nos. higher than the other eye; the respective Nos. being 11 and 14. Vision with the left eye, even by the aid of a glass, was not

perfect, words printed in long primer being scarcely legible. After the division of the internal rectus muscle, vision not only improved, but the eye became less presbyopic, and at the present time, three weeks since the operation, said Dr. Hays, the glass (No. 14,) which had been before adapted to the patient's left eye, now magnifies so much, that it is unpleasant to read with it; and he is able to see best with glass, No. 11. On careful comparison, he is unable to perceive any difference in the size of objects viewed with either eye through this glass; and an opera glass, adjusted to one eye, seems equally well adapted for the other. These facts, Dr. Hays remarked, show, that a change has taken place in the left eye, and this probably consists in an elongation of its antero-posterior diameter, resulting from the operation.

Dr. Hays also made some observations on the mode in which squinting causes an impairment of the function of vision, and stated, that from a great number of cases which he had examined, it appeared to him to be a general rule, that the greater the degree of strabismus, the more imperfect is the sight of the affected eye. In all the cases in which he had operated, the sight had been improved.

Dr. Dunglison stated, that he was not prepared to admit, from this single observation, that the accommodating power of the eye is owing to the pressure of the four recti muscles on the eye ball; the division of any one of them not being likely, in his opinion, to rectify the results of compression, if it existed in the case in question. He was disposed to refer a great agency to the contraction and dilatation of the pupil in facilitating distinct vision at different distances, and he alluded to an experiment made on one of his own eyes whilst a student of medicine. This consisted in applying some freshly prepared extract of belladonna to the eyelids. The consequence was, that the pupil soon became so much dilated, that the iris was almost invisible. The focus of this eye was found to be at twice the distance of that of the sound organ; but in proportion as the effects of the belladonna passed off, and the pupil approached its natural size, vision became more and more distinct, and the focus nearer the natural. In the open air, all objects, except those near, were distinctly seen, but on entering a room, every thing was obscured.

Dr. Dunglison expressed the belief, that squinting is often owing to impairment of vision in one eye, in consequence of a want of correspondence in the sensibility of the two retinæ; the mind, therefore, acquires the habit of attending to the impression made on the sound eye only, and the other, being neglected, is drawn into a position to interfere, as little as possible, with the better vision of its fellow.

Professor Bache alluded to a case of strabismus, which seemed to him to favour a suggestion thrown out by Dr. Hays, that defective vision in the inverted or everted eye, might be owing to stretching of the optic nerve. In this case the eye became everted; and simultaneously, vision with it was impaired. Ultimately, indeed, the sight of both eyes was lost.

Professor Bache communicated the following observations made by Mr. Rümker, Director of the Observatory of Hamburg, on the second comet of Galle.

Longitude of the Observatory of Hamburg, 39*m*. 54*s*. E. of Greenwich.

Date. 1840.	Mean Time at Hamburg.			Apparent AR of Comet in Time.			Apparent Declinat. of Comet in Ascen.			Number of Observations.
	h	*m*	*s*	*h*	*m*	*s*	°	′	″	
January 29	9	55	28.89	21	17	51.900	62	18	59.15	13
,, 30	8	11	23.07	21	31	31.545	61	55	28.19	15
February 2	15	47	45.98	22	16	53.236	59	55	35.53	15
,, 3	8	58	46.24	22	25	51.671	59	23	38.57	12
,, 4	12	45	54.87	22	39	52.004	58	28	7.73	4
,, 8	8	38	19.30	23	19	35.128	55	1	12.81	14
,, 9	7	59	24.03	23	28	23.452	54	4	3.05	11
,, 11	8	30	24.43	23	45	9.317	52	2	24.91	14
,, 12	6	59	54.97	23	52	16.184	51	5	23.71	11
,, 13	6	37	19.04	23	59	19.388	50	4	58.17	4
,, 17	7	27	39.88	0	24	28.638	45	59	10.16	7
,, 20	10	24	44.96	0	40	30.642	42	54	50.14	9
,, 21	8	27	9.89	0	44	44.511	42	2	10.16	5
,, 22	7	36	19.92	0	49	0.566	41	7	51.14	8
,, 23	10	19	4.72	0	53	42.774	40	6	6.82	5
,, 24	7	21	20.47	0	57	13.625	39	18	17.17	9
,, 25	6	44	58.76	1	0	58.806	38	26	14.25	2
,, 28	7	44	8.40	1	11	43.889	35	50	13.13	11
,, 29	7	30	35.35	1	14	57.249	35	1	34.78	11
March 1	7	52	35.50	1	18	8.888	34	9	25.57	3
,, 3	7	30	17.55	1	24	1.221	32	40	4.76	10
,, 4	7	18	0.15	1	26	48.581	31	55	31.03	11
,, 5	7	36	57.85	1	29	32.423	31	10	41.80	10
,, 6	7	25	47.30	1	32	8.990	30	28	10.08	9
,, 7	7	41	29.37	1	34	42.030	29	45	41.59	7
,, 9	7	35	22.20	1	39	32.121	28	24	27.00	8
,, 11	7	45	35.77	1	44	5.870	27	6	18.05	7
,, 16	18	4	11.57	1	54	28.674	24	5	17.24	6
,, 17	8	5	25.47	1	56	24.191	23	31	20.68	2
,, 18	8	0	6.46	1	58	15.616	22	58	12.00	16
,, 20	8	26	38.67	2	1	52.951	21	53	17.10	3
,, 21	7	53	58.95	2	3	37.332	21	22	54.45	8
,, 22	7	52	56.85	2	5	19.245	20	52	0.14	4
,, 24	8	17	15.92	2	8	41.044	19	51	52.52	8

Mr. Justice stated to the Society, that the Astronomical Instruments ordered for the High School Observatory, from Münich, had arrived, and invited the members to inspect them. Whereupon, Professor Bache proposed the following resolutions, which were adopted by the Society.

Resolved, That the Committee on Astronomical Observations be requested to examine the instruments recently imported from Münich, for the Observatory of the Central High-School, by the Controllers of the Public Schools, and to report in relation to them to the Society.

Resolved, That the same Committee be requested to consider and report to the Society, the best application of the sum of money in the possession of the Society, which was collected for the erection of an Astronomical Observatory.

Mr. Vaughan reported the death of Lucien Bonaparte, Prince of Canino, a member of the Society, aged 66.

A letter was read by Mr. Vaughan from Mr. Charles P. Fox, presenting to the Society, in his own name, and that of his sisters, the collection of the original letters and papers of Benjamin Franklin. (See Proceedings, July 17.)

On motion of Mr. Ord, the Secretary was directed to transmit to Mr. Fox a special vote of thanks for his valuable donation.

Stated Meeting, October 2.

Present, twenty-nine members.

Dr. CHAPMAN, Vice President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Royal Society. Report of the Committee of Physics, including Meteorology, on the objects of Scientific Inquiry in those Sciences. Approved by the President and Council. 8vo. London, 1840.—*From Mr. Petty Vaughan.*

Monument de Yu, ou la plus Ancienne Inscription de la Chine, suivie de trente-deux formes d'Anciens Caractères Chinois, &c. Par Joseph Hager. Fol. Paris, 1802.—*From Mr. Du Ponceau.*

Discours sur les Revolutions de la Surface du Globe, &c. &c. Par M. Le Baron Cuvier, &c. &c. 5ème édit. 8vo. Paris, 1828.—*From the same.*

Des Caractères Physiologiques des Races Humaines considérés dans leurs Rapports avec l'Histoire, &c. &c. Par W. F. Edwards, D.M., &c. &c. 8vo. Paris, 1829.—*From the same.*

The American Almanac and Repository of Useful Knowledge, for the year 1841. 8vo. Boston, 1840.—*From Mr. J. E. Worcester.*

An Examination of Dr. Burnet's Theory of the Earth, with some remarks on Whiston's New Theory of the Earth, &c. &c. By J. Keill, A.M., &c. Second Edition. To the whole is annexed a Dissertation on the different Figures of Cœlestial Bodies, &c. By Mons. De Maupertuis, &c. &c. 8vo. Oxford, 1734.—*From Mr. Vaughan.*

Des Administrations Provinciales, Mémoire présenté au Roi par feu M. Turgot. 8vo. Lausanne, 1788.—*From the same.*

Lettres Amèricaines, dans lesquelles on examine l'Origine, l'État Civil, Politique, &c. &c. des Anciens Habitans de l'Amérique, &c. &c. pour servir de Suite aux Mémoires de D. Ulloa. Par M. le Comte J. R. Carli, &c. &c. 8vo. 2 vols. Boston, 1788.—*From the same.*

Ξενοφωντος Κυρου Παιδεια, βιβλια οκτω. Xenophontis de Cyri Institutione Libri octo, &c. &c. Curâ Thom. Hutchinson, A.M. Edit. 6ta. 8vo. London, 1765.—*From the same.*

Map of the Inland Navigation, Canals and Rail Roads, with the situations of the various Mineral Productions throughout Great Britain, from actual Surveys projected on the Basis of the Trigonometrical Survey made by order of the Honourable the Board of Ordnance, by J. Walker, &c. &c., accompanied by a Book of Reference, compiled by Joseph Priestley, Esq., &c. &c.; in six sheets. London, 1831.—*From the same.*

Lectures on the Theory and Practice of Physic. By William Stokes, M.D., &c. &c. Second American edition, with numerous Notes, and twelve additional Lectures, by John Bell, M.D., &c. &c. 8vo. Philadelphia, 1840.—*From Dr. Bell.*

Treatise on the Physiological and Moral Management of Infancy. By Andrew Combe, M.D., &c. &c., with Notes and a Supplementary Chapter, by John Bell, M.D., &c. &c. 12mo. Philadelphia, 1840.—*From the same.*

Ensaio Corografico sobre a Provincia do Pará, por Antonio Ladislau Monteiro Baena, &c. &c. 8vo. Pará, 1839.—*From the Author.*

FOR THE CABINET.

Sundry Specimens of Minerals, &c. from the southern and western parts of the Union, from Mr. C. G. Forshey, of Louisiana.

1. A coal recently found on the Arkansas river, about 300 miles beyond the capital of the State. The stratum crops out on the bank of the river, between high and low water mark, in a line of hills called "Spadra Bluffs," one of the Ozark range. A shaft has been sunk by John Walker, the discoverer, an enterprising citizen of Natchez, Miss. At the depth of 35 feet, he found the coal 4 to 5 feet thick. The following analysis is from Professor L. D. Gale, of Jefferson College, Mississippi.

"*Extracts from the Journal of the Laboratory.*

"Specimen of coal furnished by Prof. Forshey, of Natchez, February, 1840. 100 grs. of the coal, (Specific gravity = 1.336, and of jet black,) were put into a close vessel and heated to redness for two hours, and weighed while warm. Amount lost = 9.75 grs. The residuum, consisting of coal and earthy matters, was again heated, but in an open platinum crucible, until all the carbon was burned away. Loss by the combustion = 80.81 grs. The earthy matters left, removed from the crucible, weighed 9.44 grs. The specimen, then, is composed of volatile matter per cent. - - - - - - - 9.75

Carbon, per cent. - - - - 80.81

Earthy matters, - - - - 9.44

"The volatile matters were found to be composed chiefly of water and carburetted hydrogen, with a mere trace of sulphur.

"The coal belongs to the class called Bituminous Coal, but has not enough to admit of coking by heat. * * * * * It is richer in carbon than any of the four varieties of English Bituminous Coal."

It ignites easily without the aid of charcoal, and burns with a clear white blaze, without smoke, leaving a very small quantity of white ashes and earthy matter.

2. A Shell, Unio Asperrimus, Lake Concordia, La. 3. Two Shells, Unio Trapezoides, Lake St. Joseph, La. 4. One Shell, Unio Pustulatus, Lake Bruin, La. 5. Single valves of two Shells, U. Subrotundus, Lake St. Joseph. 6. Two Shells, Unio Parvus, Lake Concordia, La. 7. Five species of fossil Coralloides, from Jackson County, Iowa Territory, 1838. 8. Two Cyathphylla and an Orthocera, from the Chert, above the mountain limestone of Copper creek, Iowa, 1838. 9. Specimen of Alabaster, laminated sulphate of lime, from a cavern near Charleston, Iowa, 1838. 10. A cast, in Chalcedonic Quartz, of a Pentamiris, from the Chert of Iowa, 1838. 11. Three Iron Ores, Hematite, Crystallized Nodular Oxide, and Pipe Ore, Jackson County, Iowa, 1838. 12. A Cyathphyllum, and a Coralloides, from Calloway County, Missouri, 1839. 13. A specimen of Lignite, and the laminated Gypsum which enveloped it, in the form of a concretion. From the base of the Natchez

Bluff, 170 feet below the surface. When obtained, the specimen was rotten wood, so decayed as to be easily crushed between the fingers. The ligneous fibre was very palpable, and showed it to be *oak*. After twenty days exposure, it was covered with a fine frost of Copperas, (Sulph. Iron,) and was transformed into beautiful lignite. 14. A piece of Brick, from the Mounds on Lake St. Joseph, Louisiana. Its porousness, Mr. F. found from some specimens imperfectly burnt, arises from the entire combustion of the moss used to give the mortar consistency. 15. An Iron Ore, from the pudding stone forming at the base of the Natchez Bluffs. When first broken the cavity was filled with white potter's clay, coated with brown ochre at the surface. 16. A specimen of the Spanish Moss, Tillandsia Usneoides, from Natchez, Mississippi.

The Committee, consisting of Dr. Horner and Dr. Hays, appointed on the 3d of January last, to report to the Society a description of a donation of Mastodon Bones, made to the Society by a subscription of members, gave in their report, which was directed to be printed in the Transactions of the Society.

The Committee, consisting of Dr. Hays, Mr. Peale, and Dr. Dunglison, to whom was referred a paper entitled "Note of the Remains of the Mastodon, and some other extinct animals, collected together in St. Louis, Missouri; by W. E. Horner, M.D., Professor of Anatomy University of Pennsylvania," recommended that an abstract of the same should be inserted in the Bulletin of the Society's Proceedings; and on motion, the report was accepted, and the committee discharged.

The collection referred to, was made by Mr. Albert Koch—a German resident in St. Louis, for the last five years—and has been obtained principally from two localities, Rock Creek, twenty miles south of St. Louis, and Gasconade County, two hundred miles above the mouth of the Missouri river. It consists of two hundred or more Teeth of the Mastodon and of the American Elephant. A dozen or more Lower Jaws of the Mastodon, with very numerous specimens of other parts of the head and skeleton generally, though there is no perfect head.

The most remarkable specimen is a head of an animal, which Mr. Koch calls nondescript, and considers to have been from four to six times the size of an elephant, though Dr. Horner esteems it extremely difficult to establish this. In the present mode of exhibition, the head shows a central oblong amorphous part, which measures six feet in length by two or three in width. It is furnished with enormous

tusks, eleven and three-twelfths feet long from their roots, and nine or ten inches in diameter—one foot and three inches of their length being inserted into the sockets. These tusks are semicircular, and stand out horizontally, with the concavity backwards. Thus placed, they are fifteen feet in a straight line, from the tip of the one to the tip of the other. Notwithstanding they were found in this position, very just doubts, Dr. Horner thinks, may be entertained of its being the natural one, as, in a state of decay of the alveolus, they might readily gravitate outwards, so as to assume that direction subsequent to the death of the animal. This specimen was in fact very much decayed, when Mr. Koch found it, and appears to have been fractured by rocks falling on it from the bluff above. The means taken to preserve it obscure the surface of the bones, as well as their configuration, and in attaching the fragments together, some have been put very much out of their position. For example, the glenoid cavity of the right side is monstrously far from the hind tooth, and is laterally much beyond its line: the intermaxillary bones are too long, and on comparing the position of the posterior molar teeth of the upper jaw with that of the lower, the upper molar teeth are found to be ten inches or more in advance of the lower, a relation so false and so unsuited to mastication, that it is not at all probable nature formed them thus. The molar teeth are four in number in each jaw, two on a side; the posterior one is seven inches long by four wide; the anterior, four and a half inches long by four wide. The conformation of the teeth is exactly that of the Mastodon, and the ridges and denticules are scarcely worn at all, a proof that the animal was not old. The upper part of the cranium of this animal is defective. The general configuration of the head is so amorphous, the fragments of which it is composed have their position so imperfectly regulated, and the whole surface is so coated with glue and paint, to preserve it, that an exact examination was impracticable. Its length is so extraordinary, that Dr. Horner considers it can scarcely be received as natural, and he is inclined to the opinion, from its dental system, that it belongs to the Mastodon; that by some accident the remains of two heads were found in the same line; that if there be but one, it has been much fractured, and a large quantity of extraneous matter blended with it, which it is difficult to distinguish. The latter conjecture, Dr. Horner thinks, is rendered more probable by the admission of Mr. Koch, that these bones were cemented to a layer of gravel a foot and a half in thickness, with

such tenacity, that the separation was accomplished with the greatest difficulty.

In the same collection of fossil bones is to be found the skeleton, nearly complete, of a Mastodon of very large size: the ribs are wanting, and the upper part of the cranium. The transverse diameter of the head, on a line with the foramen magnum, is three feet. The os femoris, in a perpendicular line, stands three feet nine inches high, and all the other bones are in this proportion. An estimate of the altitude of the animal when living, founded upon careful observations, instituted with the same view on the skeleton from Bucyrus, Ohio, recently obtained by the Society, would leave the inference, that the former animal has reached a height of from twelve to thirteen feet at the shoulders. This animal, in a popular advertisement on the subject of the Museum by Mr. Koch, is rated at eighteen feet in height, an altitude so great as to exceed much the evidence derivable from a measurement of the longest bones of the extremities, and the inductive and comparative estimate thence obtained.

The internal table of the cranium, the brain case, is entire, with a small surface of the contiguous cellular structure of bone in another fragment of the Mastodon. This forms so complete an oval body, that, in Dr. Horner's opinion, it is somewhat difficult to conceive that its shape was the result of merely accidental causes; Dr. Horner indeed thinks it rather authorizes the inference, that it had been chiselled or hammered designedly into that shape by the human cotemporaries of the animal.

There is also a small head, eighteen or twenty inches long, with tusks ten or eleven inches long in the upper jaw, and four mastodon teeth on each side of each jaw. This head is somewhat broken. The os frontis and the face, so far as Dr. Horner could judge, are so placed in regard to their front surface as to form a deep circular concavity, approximating, in shape, a fragment in the cabinet of the Society. Whether it ought to be viewed merely as a young Mastodon Giganteum, or another species of the Mastodon, Dr. Horner considers to be at present doubtful.

There are two radii of the Mastodon with the epiphyses or articular ends detached, owing to the youth of the animal: these pass for the arm bones of a giant fourteen or fifteen feet high, when his skeleton was complete. A similar misapprehension exists in regard to the vertebræ of a quadruped, probably a buffalo or young mammoth,

which are strung together in a vertical position, and pass for the back bone of a giant of similar height.

Another interesting relic has been denominated by the proprietor, Missourium Kochii, the first name in commemoration of its locality, the second of himself, its discoverer. It belongs undoubtedly, Dr. Horner states, to the Mastodon race; was not much inferior in size to the Elephant, and was furnished with tusks and indications of a proboscis having been attached to it. The tusks are four and a half feet in length, and at the roots have a circumference of eighteen inches; they are only half an inch apart at the socket, and project right and left, with the concavity forward. The teeth have the mammillose or Mastodon shape and conformation, and are three and a half inches in length by two and a half in breadth. The lower jaw is wanting.

There is an os humeri, probably of a megalonyx, which measures in length one foot eight inches, the ulna of the same animal, and also other bones, probably the radii, with some of the last phalanges.

Dr. Horner stated, that his sketch of this rich accumulation of fossil remains, and their examination were very imperfect, and the less instructive to him, for the want of standards of comparison in perfect skeletons, and in plates, neither of which means of elucidation exist in St. Louis, and he expressed a hope, that "their diligent and deserving collector, would furnish the scientific world with exact plates of such as are rare or unknown."

A communication was read from Miss Margaretta H. Morris, on the subject of the Hessian Fly, and of the Seraphion Destructor,—a parasite of the same. The communication was referred to a committee.

Mr. Lea read a paper, entitled "Descriptions of New Fresh Water and Land Shells, by Isaac Lea," which was referred to a committee.

Mr. Nuttall read a communication, entitled "Descriptions of New Species and Genera of Plants in the Natural Order Compositæ, collected on a Tour across the Continent to the Pacific, a Residence in Oregon, and a Visit to the Sandwich Islands and Upper California, during the Years 1834 and 1835, by Thos. Nuttall," which was referred to a committee.

Dr. Hays made some remarks on a printed description of two fossil animals, by Mr. Koch, of Missouri; the one a Mas-

todon, and the other probably, Dr. Hays thought, a Tetracauledon; the latter denominated, by Mr. Koch, Missourium Kochii.

Stated Meeting, October 16.

Present, thirty-one members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Journal Asiatique, 3e Serie. No. 50 (February), 51 (March), 53 (April, May, and June), 1840; making the 9th Volume of the Series, except No. 49 (January), which is wanting.—*From the Asiatic Society of Paris.*

Commentationes Societatis Regiæ Scientiarum Gottingensis recensiores. Vol. VII. ad A. 1828—31. 4to. Gottingæ, 1832.—*From the Society.*

Transactions of the Linnean Society of London. Vol. XVIII. Part Third. 4to. London, 1840.—*From the Society.*

List of the Linnean Society of London. 4to. 1840.—*From the same.*

Proceedings of the Linnean Society of London to March 17, 1840, inclusive.—*From the same.*

Memorie della Reale Accademia delle Scienze di Torino. Serie Seconda. Tomo 1. 4to. Torino, 1839.—*From the Society.*

Fisica de' Corpi Ponderabili ossià Trattato della Costituzione generale de' Corpi, del Cavaliere Amedeo Avogadro, dell' Ordine civile di Savoia, &c. &c. Tomo 2. 8vo. Torino, 1838.—*From the Author.*

Public Documents of the 1st Session of the Twenty-sixth Congress. 1. On the Tobacco Trade. 2. On the National Defence and National Foundries. 3. On the Manufacture, &c. of Salt. 4. On the Receipts and Expenditures of the United States for the Year 1838.—*From Mr. James H. Caustin, of Washington.*

A Complete Treatise on Electricity, in Theory and Practice, with

Original Experiments. By Tiberius Cavallo, F.R.S. Fourth edition. 3 Vols. 8vo. London, 1795.—*From Mr. John Vaughan.*

C. Julii Cæsaris quæ extant, &c. &c. in usum Delphini. Edit. 11ma. 8vo. London, 1794.—*From the same.*

Corpus Juris Civilis Romani, &c. &c. cum notis integris Dionysii Gothofredi, &c. &c. 2 Vols. 4to. Lipsiæ, 1720.—*From the same.*

The Constitution and Laws of the Cherokee Nation: passed at Tah-le-quah, Cherokee Nation, 1839. Washington, 1840.—*From Mr. John Ross.*

Twenty-second Annual Report of the Controllers of the Public Schools of the City and County of Philadelphia, composing the First School District of Pennsylvania, &c. &c. 8vo. Philadelphia, 1840.—*From Mr. Justice.*

A Fourth Supplementary Catalogue of the Plants of Kentucky. By C. W. Short, M.D., Professor of Materia Medica and Medical Botany in the Medical Institute of Louisville.—*From Mr. Wm. Short.*

Chinese Maps. 1. Map of the Chinese Empire. 2. Map of Pekin. 3. Map of Canton.—*From Mr. J. S. Oakford.*

FOR THE CABINET.

Five Notes of Mr. Law's Bank. Paris, 1720.—*From Mr. Du Ponceau.*

The Committee, consisting of Mr. Lea, Dr. Wood, and Dr. Coates, on a communication, entitled "Descriptions of New Species and Genera of Plants, in the Natural Order Compositæ, collected on a Tour across the Continent to the Pacific, a Residence in Oregon, and a Visit to the Sandwich Islands and Upper California, during the Years 1834–5, by Thos. Nuttall," reported in favour of publication, which was ordered accordingly.

In this paper, Mr. Nuttall makes a large addition to the Flora of North America, consisting of fifty new genera, with numerous species of plants, in the order Compositæ.

The Committee, consisting of Mr. Nicklin, Prof. Bache, and Mr. Lukens, on a communication entitled "Descriptions of new Fresh Water and Land Shells, by Isaac Lea," reported in favour of publication, which was ordered accordingly.

Mr. Lea's communication furnishes new facts towards a geographical distribution of the Naïades. It contains descriptions of forty-six new species of that family, two Melaniæ, one Carocolla and one Cyclostoma.

Of the Naïades, eleven species are from the Chatahoochee river. The shells found in this river, seem to differ from those of the waters that fall into the Atlantic, as several of the species have folds; and also from those of the Ohio and its eastern tributaries, as none of them have tubercles;—facts which are curious, inasmuch as the head waters of the Chatahoochee are not far distant from those of some of the Atlantic rivers, on the one side; and, on the other, from some of the tributaries of the great river Tennessee, which falls into the Ohio.

Two interesting species are from New Holland, one of which has a double wing; and three are from Java.

The whole number of recent species of Naïades admitted by Mr. Lea, is 369; being 282 more than Lamarck described.

Unio cucumoides. Testâ plicatâ, latissimâ, emarginatâ, subcylindraceâ; valvulis subcrassis; natibus vix prominentibus; epidermide nigrâ; dentibus cardinalibus parvis, tuberculatis; lateralibus longissimis rectisque; margaritâ albâ. *Hab.* Hunter's River, New South Wales.—*Dr. Jay.*

Unio delphinus. Testâ alatâ, latâ, compressâ, posticè biangulatâ, valdè inæquilaterali; alâ elevatâ, acuminatâ, duplici; valvulis subcrassis; natibus vix prominentibus; epidermide tenebroso-fuscâ; dentibus cardinalibus parvis, crenulatis; lateralibus longissimis rectisque; margaritâ albâ et iridescente. *Hab.* New Holland.—*G. Von den Busch, M.D.*

Unio orientalis. Testâ transversâ, subinflatâ, valdè inæquilaterali; valvulis subcrassis; natibus sub-prominentibus, ad apices undulatis; epidermide luteâ, nitidâ; dentibus cardinalibus longis; lateralibus longis subcurvisque; margaritâ albâ et iridescente. *Hab.* Java?—*G. Von den Busch. M.D.*

Unio Javanus. Testâ ovatâ, subinflatâ, valdè inæquilaterali, posticè subbiangulatâ; valvulis subcrassis; natibus vix prominentibus; epidermide lutco-fuscâ; dentibus cardinalibus minimis; lateralibus longis curvisque; margaritâ albâ et iridescente. *Hab.* Java.—*G. Von den Busch. M.D.*

Unio Cincinnatiensis. Testâ nodosa, quadratâ, inflatâ, emarginatâ, inæquilaterali; valvulis crassis; natibus elevatis; epidermide luteâ, valdè radiatâ; dentibus cardinalibus subgrandibus; lateralibus sublongis rectisque; margaritâ albâ. *Hab.* Ohio River, Cicinnati.—*T. G. Lea.*

Unio pilaris. Testâ rotundatâ, inflatâ; valvulis crassis; natibus elevatis; epidermide striatâ, tenebroso-fuscâ; dentibus cardinalibus subgrandibus; lateralibus longulis subrectisque; margaritâ albâ. *Hab.* French Broad and Holston Rivers, East Tenn.—*Mr. S. M. Edgar.*

Unio Geddingsianus. Testâ ovatâ, subinflata; valvulis subtenuibus; natibus prominulis; epidermide fuscâ, radiatâ; dentibus cardinalibus compressis

erectisque; lateralibus longis rectisque; margaritâ albâ vel salmonis colore tinctâ. *Hab.* Congaree River, So. Car.—*Prof. Ravenel.*

Unio tuberosus. Testâ nodosâ, triangulari, emarginatâ; valvulis crassis; natibus elevatis; epidermide luteâ, striatâ; dentibus cardinalibus magnis; lateralibus parvis rectisque; margaritâ albâ. *Hab.* Cany Fork and Cumberland Rivers, Middle Tenn.—*Mr. S. M. Edgar.*

Unio cuneolus.—Testâ triangulari, compressâ, valdè inæquilaterali; valvulis subcrassis; natibus elevatis; epidermide luteâ, striatâ, radiis maculatis; dentibus cardinalibus parvis; lateralibus longis rectisque; margaritâ albâ et iridescente. *Hab.* Holston River, Tenn.—*Mr. S. M. Edgar.*

Unio Lesueurianus. Testâ subrotundâ, subinflatâ; valvulis crassis; natibus prominentibus; epidermide fuscâ, striatâ, radios maculatos habente; dentibus cardinalibus subgrandibus; lateralibus parvis rectisque; margaritâ albâ et iridescente. *Hab.* Cany Fork and Holston Rivers, Tenn.—*Mr. S. M. Edgar.*

Unio Stonensis. Testâ ovatâ, valdè compressâ, planulatâ, valdè inæquilaterali; valvulis crassis; natibus prominulis, ad apices undulatis; epidermide luteo-fuscâ; dentibus cardinalibus parvis; lateralibus longis, crassis curvisque; margaritâ salmonis colore tinctâ et iridescente. *Hab.* Stone's River, Tenn.—*Mr. S. M. Edgar.*

Unio lenis. Testa obovatâ, inflatâ; valvulis tenuibus; natibus vix prominentibus, ad apices undulatis; epidermide luteâ, densissimè radiatâ; dentibus cardinalibus compressis; lateralibus parvis; margaritâ albâ et iridescente. *Hab.* Stone's River, Tenn.—*Mr. S M Edgar.*

Unio plenus. Testâ triangulari, inflatâ; valvulis crassissimis; natibus elevatis et crassis; epidermide luteo fuscâ, rugosâ; dentibus cardinalibus magnis; lateralibus brevibus subrectisque; margaritâ albâ et iridescente. *Hab.* Ohio River, near Cincinnati.—*T. G. Lea.*

Unio tener. Testâ ovatâ, valdè compressâ, valdè inæquilaterali; valvulis tenuibus; natibus sub-prominentibus; epidermide luteo-fuscâ; dentibus cardinalibus parvis; lateralibus longis subcurvisque; margaritâ albâ et iridescente. *Hab.* Big Pigeon River, Tenn.—*Mr. S. M. Edgar.*

Unio pusillus. Testa ovatâ, subcompressâ, posticè angulatâ; valvulis subtenuibus; natibus subprominentibus; epidermide tenebroso-fuscâ, nitidâ; dentibus cardinalibus minimis; lateralibus longis subcurvisque; margaritâ albâ et iridescente. *Hab.* Ogechee River, Geo.—*Major Le Conte.*

Unio amœnus. Testâ ovatâ, subcompressâ, valdè inæquilaterali; valvulis subcrassis; natibus sub-prominentibus; epidermide tenebrosâ, densè radiatâ; dentibus cardinalibus parvis erectisque; lateralibus longis subcurvisque; margaritâ albâ et iridescente. *Hab.* Holston River, Tenn.—*Mr. S M. Edgar.*

Unio incrassatus. Testâ plicatâ, triangulari, subinflatâ; valvulis crassis; natibus subprominentibus; epidermide subnigrâ; dentibus cardinalibus parvis; lateralibus longis subrectisque; margaritâ salmonis colore tinctâ, vel purpureâ vel albâ et iridescente. *Hab.* Chatahoochee River, near Columbus, Geo.—*Dr. Boykin*

Unio Boydianus. Testâ obovatâ, subinflatâ, valdè inæquilaterali; valvulis subtenuibus; natibus subprominentibus, ad apices undulatis, epidermide luteo fuscâ; dentibus cardinalibus compressis; lateralibus longis subrectisque;

margaritâ albâ et iridescente. *Hab.* Oak Orchard Creek, Orleans County, N. Y.—*Dr. Boyd.*

Unio Sloatianus. Testâ plicatâ, oblongâ, subcompressâ, valdè inæquilaterali; valvulis crassis; natibus subprominentibus; epidermide subnigrâ; dentibus cardinalibus subgrandibus; lateralibus crassis et longis; margaritâ albâ et purpureâ. *Hab.* Chatahoochee River, Geo.—*Mr. L. W. Sloat.*

Unio paulus. Testâ ovatâ, inflatâ, minimâ; valvulis crassis; natibus subprominentibus; epidermide subnigrâ; dentibus cardinalibus parvis, lateralibus longis curvisque; margaritâ albâ et iridescente. *Hab.* Chatahoochee River, Columbus, Geo.—*Dr. Boykin.*

Unio strigosus. Testâ transversâ, compressâ, valdè inæquilaterali; posticè triangulatâ; valvulis subtenuibus; natibus subprominentibus, compressis; epidermide tenebroso-fuscâ; dentibus cardinalibus parvulis, lateralibus longis subrectisque; margaritâ purpureâ et iridescente. *Hab.* Chatahoochee River, Columbus, Geo.—*Dr. Boykin.*

Unio lineatus. Testâ ovatâ inflatâ; valvulis tenuibus; natibus subprominentibus, ad apices undulatis; epidermide luteâ, radiatâ nitidâ; dentibus cardinalibus parvis, lamellatis; lateralibus parvis subcurvisque; margaritâ salmonis colore tinctâ et iridescente. *Hab.* Chatahoochee River, Columbus, Geo.—*Dr. Boykin.*

Unio exiguus. Testâ ovatâ subcompressâ; valvulis tenuibus; natibus subprominentibus; epidermide tenebrosâ, viride-radiatâ, nitidâ; dentibus cardinalibus lamellatis, lateralibus longis subcurvisque; margaritâ cæruleâ et iridescente. *Hab.* Chatahoochee River, Columbus, Geo.—*Dr. Boykin.*

Unio tortivus. Testâ ovatâ, compressâ, emarginatâ; valvulis subtenuibus; natibus subprominentibus, compressis; epidermide tenebroso-fuscâ, striatâ; dentibus cardinalibus parvulis, lateralibus longis curvisque; margaritâ purpureâ et iridescente. *Hab.* Chatahoochee River, Columbus, Geo.—*Dr. Boykin.*

Unio sub-angulatus. Testâ ovatâ, subinflatâ, posticè subangulata; valvulis tenuibus; natibus subprominentibus; epidermide lutcâ, radiatâ, politâ; dentibus cardinalibus subgrandibus erectisque, lateralibus sub-longis subrectisque; margaritâ salmonis colore tinctâ et iridescente. *Hab.* Chatahoochee River, Columbus, Geo.—*Dr. Boykin.*

Unio striatus. Testâ ovatâ, compressâ; valvulis tenuibus; natibus subprominentibus; epidermide striatâ, rubiginis colore; dentibus cardinalibus parvis; lateralibus sublongis subrectisque; margaritâ salmonis colore tinctâ et iridescente. *Hab.* Chatahoochee River, Columbus, Geo.—*Dr. Boykin.*

Unio fatuus. Testâ transversâ, compressâ, emarginatâ; valvulis subcrassis; natibus parvis; epidermide sub-viride, radiatâ; dentibus cardinalibus parvis, lateralibus longis subcurvisque; margaritâ albâ et iridescente. *Hab.* Holston River, Tenn.—*Dr. Currey.*

Unio dactylus. Testâ transversâ, subinflatâ; valvulis tenuibus; natibus prominulis; epidermide luteâ; dentibus cardinalibus minimis erectisque; lateralibus longis subcurvisque; margaritâ albâ et iridescente. *Hab.* Cany Fork River, Tenn.—*Mr. S. M. Edgar.*

Unio obtusus. Testâ obovatâ, inflatâ, posticè rotundatâ; valvulis subcrassis; natibus subprominentibus; epidermide luteâ, nitidâ; dentibus cardinalibus

subgrandibus: lateralibus longis subrectisque; margaritâ albâ et iridescente. *Hab.* Chatahoochee River, Columbus, Geo.—*Dr. Boykin.*

Unio Boykinianus. Testâ alatâ, plicatâ, triangulari, subcompressâ; valvulis crassis; natibus prominulis; epidermide tenebroso-fuscâ; dentibus cardinalibus parvis, lateralibus sublongis; margaritâ albâ et iridescente. *Hab.* Chatahoochee River, Columbus, Geo.—*Dr. Boykin.*

Unio Edgarianus. Testâ triangulari, compressâ, emarginatâ; valvulis crassis, natibus elevatis; epidermide luteâ, valdè radiatâ; dentibus cardinalibus magnis, lateralibus rectis; margaritâ albâ et iridescente.—*Hab.* Holston River, Tenn.—*Prof. Troost* and *Dr. Currey.* Tennessee River, at Florence, Ala.—*Mr. T. R. Dutton.*

Unio biangularis. Testâ obvatâ, inflatâ, posticè biangulari; valvulis tenuibus; natibus subprominentibus; epidermide tenebroso-fuscâ, radiatâ; dentibus cardinalibus subgrandibus elevatis, lateralibus subgrandibus, curvisque; margaritâ albâ et iridescente. *Hab.* Cany Fork River, Tenn.—*Prof. Troost* and *Mr. S. M. Edgar.*

Unio nitens. Testâ elliptică, transversâ, subinflatâ; valvulis subtenuibus; natibus subprominentibus; epidermide tenebroso-fuscâ; dentibus cardinalibus parvis elevatis; lateralibus longis subrectisque; margaritâ cupreâ, splendidissimâ, et iridescente. *Hab.* Long Creek, Cocke Co. Tenn.—*Mr. S. M. Edgar.*

Unio Holstonensis. Testâ triangulari, solidâ, inflatâ; valvulis crassis; natibus magnis, elevatis; epidermide tenebroso-fuscâ, radiatâ; dentibus cardinalibus subgrandibus, lateralibus crassis brevibusque; margaritâ albâ et iridescente. *Hab.* Holston River, Tenn.—*Mr. S. M. Edgar.*

Unio dolabelloides. Testâ sub-rotundâ, subinflatâ; valvulis crassissimis; natibus valdè elevatis; epidermide fuscâ, radiatâ; dentibus cardinalibus minimis, lateralibus brevibus rectisque; margaritâ albâ et iridescente. *Hab.* Holston River, Tenn.—*Mr. S. M. Edgar.*

Unio Tennesseensis. Testâ elliptică, transversâ, inflatâ; valvulis crassis; natibus subprominentibus; epidermide luteâ; dentibus cardinalibus magnis erectisque, lateralibus magnis subcurvisque; margaritâ albâ et iridescente. *Hab.* Stone's River, Tenn.—*Mr. S. M. Edgar.*

Unio atro-marginatus. Testa plicatâ, oblongâ, compressâ; valvulis subtenuibus; natibus prominulis; epidermide tenebrosâ; dentibus cardinalibus parvis, lateralibus longis subrectisque; margaritâ purpureâ et valdè iridescente. *Hab.* Chatahoochee River, Columbus Georgia.—*Dr. Boykin.*

Unio Bournianus. Testâ triangulari, compressâ; valvulis crassis; natibus elevatis incurvis, ad apices undulatis; epidermide luteâ, dense radiatâ; dentibus cardinalibus sub-grandibus, lateralibus subcurvis; margaritâ albâ et iridescente. *Hab.* Sciota River, near Chillicothe, Ohio.—*Mr. I. Bourne.*

Margaritana Vondenbuschiana. Testa obovata, compressâ, inequilaterali; valvulis tenuibus; natibus subprominentibus; epidermide luteo-fuscâ; dentibus cardinalibus parvis, tuberculatis; margaritâ albâ et iridescente. *Hab.* Java.—*G. Von den Busch, M. D.*

Margaritana Curreyiana. Testa triangulari, subcompressâ, emarginatâ, sulcatâ; valvulis crassis; natibus subprominentibus, ad apices undulatis; epider-

nide luteo-fuscâ; dentibus cardinalibus magnis; margaritâ albâ et iridescente. *Hab.* Stone's River, Tenn.—*Dr. Currey, of Nashville.*

Anodonta Harpethensis. Testâ ovatâ, inflatâ, carinatâ; valvulis tenuibus; natibus subprominentibus; apicibus undulatis; epidermide luteâ et viride; margaritâ salmonis colore tinctâ; margine lato. *Hab.* Harpeth River, Tenn. *Mr. S. M. Edgar.*

Anodonta argentea. Testâ ovatâ, inflatâ, transversâ; valvulis tenuibus; natibus prominulis; apicibus minutè undulatis; epidermide fuscâ, radiatâ; margaritâ argenteâ et iridescente. *Hab.* Stone's River, Tenn.—*Dr. Currey.*

Anodonta ferruginea. Testâ ovatâ, inflatâ; valvulis tenuibus; natibus prominentibus, ad apices minutè undulatis, ferrugineis; epidermide tenebroso-fuscâ, politâ; margaritâ cœruleo-albâ et iridescente. *Hab.* Simon's Creek, Indiana.—*T. G. Lea.*

Anodonta Cowperiana. Testâ ovatâ, valdè inflatâ, gibbosâ; valvulis tenuibus; natibus planulatis, undulatis; epidermide viride-luteâ, obsoletè radiatâ; margaritâ cœruleo-albâ et iridescente. *Hab.* Hopeton, near Darien, Geo.—*J. H. Cowper, Esq.*

Anodonta Maryattiana. Testâ transversâ, valdè inflatâ, gibbosâ, valdè inæquilaterali; natibus prominentibus, ad apices undulatis; epidermide virido-luteâ; margaritâ argenteâ et iridescente. *Hab.* Vicinity of Fort Winnebago.—*Capt. Maryatt, R. N.*

Anodonta Footiana. Testâ ovatâ, inflatâ, inæquilaterali; valvulis subtenuis; natibus subprominentibus, ad apices undulatis; epidermide luteo-fuscâ; margaritâ cœruleo-albâ et iridescente. *Hab.* Vicinity of Fort Winnebago.—*Dr. Foot.*

Melania catenaria. Testâ elevato-conoidea, granulatâ, lineatâ; apice plicatâ; suturis parvis aperturâ ovatâ. *Hab.* Chatahoochee River, Columbus, Geo. *Dr. Boykin.*

Melania Boykiniana. Testâ elevatâ; subturritâ, granulatâ, ad carinam tuberculatâ; suturis impressis; aperturâ elongato-ovatâ. *Hab.* Chatahoochee River, Columbus, Geo.—*Dr. Boykin.*

Carocolla Cumberlandiana. Testâ lenticulatâ, carinatâ, striatâ, albidâ, fusco-notatâ, latè umbilicatâ, ad carinam supernè et infernè impressâ; anfractibus quinis; aperturâ angulatâ, intus sulcatâ; labro acuto. *Hab.* Cumberland Mts., near Jasper, Tenn.—*Dr. Currey.*

Cyclostoma Cincinnatiensis. Testâ elevato-conicâ, lævi, nitidâ, diaphanâ, umbilicatâ; anfractibus senis; apice obtuso; labro margine reflexo. *Hab.* Vicinity of Cincinnati.—*T. G. Lea.*

Mr. Du Ponceau presented a MS. communication from Mr. Nicollet, entitled "Notions sur la Langue des Sioux," which was referred to the Historical and Literary Committee.

Mr. Lea read a communication from Mr. Nulty, in relation to some points connected with his "Magic Cyclovolute," which was referred to a Committee.

Dr. Patterson, from the Committee on Astronomical Observations, to whom was referred the consideration of the best application of the sum of money in possession of the Society, and collected for the erection of an Astronomical Observatory, reported progress, and exhibited certain designs for an observatory.

Mr. T. Biddle, from the Committee to whom the money had been entrusted, reported the amount in their hands.

The following gentlemen were elected members of the Society:—

Charles Bonnycastle, Professor of Mathematics, &c. in the University of Virginia.

M. François Pierre Guillaume Guizot, of Nismes, in France.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. I. NOVEMBER & DECEMBER, 1840. No. 14.

Stated Meeting, November 6.

Present, twenty-four members.

Mr. DU PONCEAU, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

The History of the late Province of New York, from its Discovery to the Appointment of Governor Colden in 1762. By the Hon. William Smith, formerly of New York, and late Chief Justice of Lower Canada. 2 Vols. 8vo. New York, 1830.—*From the New York Historical Society.*

A Full Report of the Case of Stacy Decow and Joseph Hendrickson *vs.* Thomas L. Shotwell; decided at a Special Term of the New Jersey Court of Appeals, held at Trenton in July and August, 1833, &c. &c. [This law case grew out of the division existing in the Society of Friends.] 8vo. Philadelphia, 1839.—*From Mr. Vaughan.*

The Case of the Seneca Indians in the State of New York, illustrated by Facts; printed for the Information of the Society of Friends, &c. &c. 8vo. Philadelphia, 1840.—*From Mr. Justice.*

Notice of the Oolitic Formation in America, with Descriptions of some of its Organic Remains. By Isaac Lea. Read before the American Philosophical Society, May 15, 1840.—*From the Author.*

L'Europa; Quadro Fisiografico facilmente inteso. Opera del Prof. J. C. Schow, Danese, notommizata da Jacopo Gråberg da Hemsö. 8vo. Milano, 1839.—*From J. Graoberg da Hemsö.*

Degli ultimi Progressi della Geografia. Sunto presentato al primo Consesso Scientifico Italiano, tenuto in Pisa nell' Ottobre dell' anno 1839, da Jacopo Grâberg da Hemsö, &c. &c.—*From the same.*

Statistica dell' Italia del Colonello Conte Luigi Serristori. Estratto dalla Rivista Europea del 30 Gennaio, 1840.—*From the same.*

Notation Hypsométrique ou Nouvelle Manière de noter les Altitudes, par M. Jomard, Membre de l'Institut: suivi de plusieurs fragments et de Nouvelles Récentes de la Nubie et de l'Abyssinie.—*From the Author.*

Extrait du Rapport fait à la Société de Géographie de Paris, à l'Assemblée Générale du 6 Décembre, 1839; par M. Sabin Berthelot, Secrétaire Général de la Commission Centrale. 8vo. Paris, 1840.—*From the same.*

Rapport fait (par M. Jomard) à l'Académie Royale des Inscriptions et Belles-Lettres dans sa Séance du 12 Juin, 1835. Sur un Pied Romain trouvé dans la Forêt de Maulevrier, &c. &c. 4to.—*From the same.*

China Opened: or a Display of the Topography, History, Customs, Manners, Arts, Manufactures, Commerce, Literature, Religion, Jurisprudence, &c., of the Chinese Empire. By the Rev. Charles Gutzlaff. Revised by Andrew Reed, D.D. 2 Vols. Small 8vo. London, 1838.—*From Mr. Dunn.*

Report of the Committee of the House of Representatives in the Case of N. P. Trist, American Consul at the Havana, with the Documents.—*From Dr. Dunglison.*

The American Journal of Science and Arts. Conducted by Benjamin Silliman, M.D., LL.D., &c. &c., aided by Benjamin Silliman, Jr., A.M. Vol. XXXIX. No. 2. October, 1840.—*From the Editors.*

Dr. Dunglison, Reporter, stated that No. 13 of the Proceedings of the Society was ready for distribution, and placed a copy thereof on the table.

The Committee, consisting of Mr. Walker, Dr. Patterson, and Prof. Bache, to whom was referred a paper, entitled "Observations upon the Meteors of August, by C. G. Forshey, &c. &c." reported in favour of publication in the Society's Transactions, which was ordered accordingly.

The principal points discussed in this paper are noticed in an oral communication made by Mr. Walker on the 21st of August. (See Proceedings, No. 13, p. 261.)

The Committee, consisting of Dr. Patterson, Prof. Bache, and Mr. Walker, to whom was referred a communication from Mr. Nulty to Mr. Lea, on a new property which he had found in his Magic Cyclovolute, described in the seventh article of the fifth volume of the Society's Transactions, reported that they had learned from the author, that his communication was not intended for the Transactions, and that he did not desire it to take that destination; they therefore requested to be discharged, which was ordered accordingly.

The new property is as follows:—"The eight volutes which originate at the extremities of the principal diameters, AA', BB', are divided by these diameters, so that every *four numbers* along each volute, both towards its origin and the centre of the interior circle, with half the *central number twelve*, make 180." This property, Mr. Nulty remarks, is analogous to the third, mentioned in his paper; distinguishes the particular set of numbers which he had selected from other sets possessing the properties already noticed, and renders his drawing more general, and the arrangement, there presented, *unique*.

A communication was read, entitled "Observations to determine the Magnetic Intensity at several Places in the United States, with some additional Observations of the Magnetic Dip, by Elias Loomis, Professor of Mathematics and Natural Philosophy in Western Reserve College," which was referred to a Committee.

Professor Bache submitted to the Society a Chart, representing the extraordinary variations of the magnetic declination during the term day, on the 29th of May last, prepared by W. C. Bond, Esq., from the observations at the Magnetic Observatory at Cambridge.

Dr. Horner read a paper on the dental system of the Mastodon, which was referred to a Committee.

Professor Bache read an extract of a letter from Lieut. Riddell, Director of the Magnetic Observatory at Toronto, U. C.,

which stated that an entire discordance had been found between the curve representing the changes of inclination, on the February magnetic term day, at Toronto, Dublin, Brussels, and Prague, whilst those at the last three named stations agreed very well together. This result, Professor B. stated, confirms the conclusions previously drawn from the observations at short intervals, of Prof. Lloyd and himself, in November last.

Mr. Walker made some observations in relation to the Observatory of the Harvard University, Cambridge, and stated that extensive arrangements had been made, and were in contemplation, for prosecuting magnetic observations and practical astronomy.

Professor Bache made a verbal communication of some recent determinations of the magnetic dip, made by him at Philadelphia and Baltimore.

He reminded the Society, that on a former occasion he had submitted a comparison of the observations for magnetic dip at various stations, common to the series of Professor Loomis (Am. Philos. Soc. Trans. Vol. VII. N. S.), and to that of Professor Courtenay and himself. The discrepancies at Philadelphia and Baltimore were among the most striking. Having satisfied himself that the dip given by his instrument at the station occupied by Prof. Loomis, near Philadelphia, was sensibly the same as that given by Prof. Loomis, his next step was to ascertain, by observations in a different position from those used in both the sets of observations formerly made, which probably represented more correctly the dip at Philadelphia. The result of two series of observations near the observatory at the Girard College (at a sufficient distance to be beyond sensible influence from the magnetic instruments), made with four different needles, was as follows:—

July 21, 1840. No. 1, 71° 51.7′. No. 2, 71° 51.7′. Mean of Lloyd, No. 1 and No. 3, 71° 55.8′.

November 2, 1840. No. 1, 71° 51.2′. No. 2, 71° 51.0′. Mean of Lloyd, No. 1 and No. 3, 71° 57.4′.

Mean, 71° 53.3′.

The needles, termed Lloyd No. 1 and No. 3, are used without reversing the poles; and a correction has been applied from the mean of sixteen comparisons, with the ordinary needles, at different places: as, however, this correction is obtained through Nos. 1 and 2, the

results merely add to the number of observations from which the mean is obtained.

Prof. Bache remarked that his former result was thus confirmed.

At Baltimore, the place of observation was in the second square, N. E. of the Washington Monument. The same needles were used.

Aug. 27, 1840. No. 1, 71° 31.7′. No. 2, 71° 39.1′. Mean of Lloyd, No. 1 and No. 3, 71° 32.4′. Mean 71° 34.4′, differing from the results of both the former series.

Prof. Bache stated, in continuation, that the geological formations at and near Baltimore, rendered it difficult to select an unexceptionable site for magnetic observations there, and was a sufficient explanation of the observed discrepancies. The results, which he had at present obtained, differed about 10′ from the mean of those of Professors Courtenay and Loomis.

Dr. Patterson announced the death of Prof. Charles Bonnycastle, a member of this Society (elected at the last meeting), which took place on the 31st of October.

Mr. Du Ponceau announced the death of Mr. Sylvanus Godon, a member of the Society, who died on the 17th of October.

The Observatory Committee submitted a report, in part, on the subject of the fund raised for the erection of an Observatory, and proposed the following resolutions, which were adopted.

Resolved, That if the City Councils shall grant to the Society the privilege of erecting an Observatory in Rittenhouse Square, the Society will pledge $5000 of the Astronomical Fund for this object, under such conditions as they shall hereafter prescribe.

Resolved, That when it shall be ascertained that the proposed Observatory can be erected, the Observatory Committee be authorized to solicit and receive subscriptions for such additions to the Astronomical Fund, as may be rendered necessary by the undertaking.

Stated Meeting, November 20.

Present, thirty-three members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Catalogue of the Scientific Books in the Library of the Royal Society. 8vo. London, 1839.—*From the Society.*

Philosophical Transactions of the Royal Society of London, for the Year 1840.—Part I. 4to. London, 1840.—*From the same.*

Proceedings of the Royal Society. Nos. 42, 43, and 44. Feb. 27 to June 18, 1840.—*From the same.*

List of Councils, Fellows, &c., of the Royal Society, Nov. 30, 1839. 4to.—*From the same.*

Report of the Committee of Physics, including Meteorology, on the Objects of Scientific Inquiry in those Sciences, &c. &c. 8vo. London, 1840.—*From the same.*

Report of the Seventh Meeting of the British Association for the Advancement of Science; held at Liverpool in September, 1837. Vol. VI. 8vo. London, 1838.—*From the Association.*

Report of the Ninth Meeting, &c. &c., held at Birmingham, August, 1839. 8vo. London, 1840.—*From the same.*

Constitution and By-Laws of the National Institution for the Promotion of Science, established at Washington, May, 1840. 8vo. pp. 14. Washington, 1840.—*From the National Institution.*

On the Diminution of Temperature with Height in the Atmosphere, at different Seasons of the Year. By James D. Forbes, Esq., F.R.SS. L. and E., F.G.S. &c. &c. (From the Transactions of the Royal Society of Edinburgh. Vol. XIV. Read April 1, 1839.) 4to. Edinburgh, 1840.—*From the Author.*

Account of some additional Experiments in Terrestrial Magnetism, made in different parts of Europe in 1837. By James D. Forbes, &c. &c.—*From the same.*

The Philosophical Transactions of the Royal Society of London, from their Commencement in 1665, to the Year 1800: abridged, with Notes and Illustrations. By Charles Hutton, LL.D., F.R.S.; George Shaw, M.D., F.R.S., F.L.S.; and Richard Pearson,

M.D., F.S.A. 19 Vols. 4to. London, 1809.—*From Mr. Thomas Gilpin.*

Lettres et Negotiations entre Mr. Jean De Witt, &c. &c., et Messrs. les Plenipotentiaires des Provinces Unies des Pais Bas. aux Cours de France, d'Angleterre, de Suède, de Danemarc, de Pologne, &c., depuis l'Année, 1652, jusqu'a l'An. 1669, inclus., &c. &c. 3 Vols. Traduites du Hollandois. 12mo. Amsterdam, 1725.—*From Mr. Du Ponceau.*

Resolutions Importantes de leurs Nobles et Grandes Puissances les États de Hollande et de West-Frise, pendant le Ministère de Mr. Jean De Witt, Conseiller-Pensionnaire, Traduites du Hollandois, &c. 12mo. Amsterdam, 1725.—*From the same.*

Miscellaneous Papers on Political and Commercial Subjects, &c. &c. By Noah Webster, Jun. 8vo. New York, 1802.—*From the same.*

Pamphlets. 1. First and Second Annual Reports of the Aborigines Protection Society, &c. &c. 8vo. London, 1838, 1839. 2. Extracts from the Papers and Proceedings of the Aborigines Protection Society, No. 1, May, 1839; No. 2, June, 1839. 3. Report on the Indians of Upper Canada. 4. The History, Antiquities, Topography, and Statistics of Eastern India, &c. &c. By Montgomery Martin, &c. London, 1838.—*From the same.*

Mémoire sur les Moyens qui ont amené le Grand Développement que l'Industrie Française a pris depuis vingt ans, &c. &c. Par Cl. Anthelme Costaz, &c. &c. 8vo. Paris, 1816.—*From Mr. Vaughan.*

Lettres sur l'Amérique du Nord, par Michel Chevalier avec une Carte des États-Unis d'Amérique. Édit. Speciale, revue, corrigée et augmentée de plusieurs Chapitres. 2 Vols. 8vo. Paris, 1837.—*From the same.*

Travels in Europe, viz.—in England, Ireland, Scotland, France, Italy, Switzerland, Germany, and the Netherlands. By Wilbur Fisk, D.D., &c. &c., with Engravings. Fourth Edition. 8vo. New York, 1838.—*From the same.*

M. Tullius Cicero, of the Nature of the Gods, in three Books; with Critical, Philosophical, and Explanatory Notes. By the Rev. Dr. Francklin. New Edition, &c. 8vo. London, 1775.—*From the same.*

A Grammar of the German Language, systematically arranged on a New Plan, Brief, Comprehensive, and Practical. By Caspar J.

Beleké, Professor of the German Language and Literature in Mount St. Mary's College, Emmetsburg, Md. 12mo. Philadelphia, 1840.—*From the Author.*

The War in Florida; being an Exposition of its Causes, and an Accurate History of the Campaigns of Generals Clinch, Gaines, and Scott. By a late Staff Officer. Small 8vo. Baltimore, 1836.—*From Col. Davenport.*

Eleven Annual Reports of the Inspectors of the Eastern State Penitentiary of Pennsylvania. 1831—1840.—*From Mr. George Thompson.*

Antiquarian Researches, comprising a History of the Indian Wars in the Country bordering Connecticut River and Parts adjacent, and other Interesting Events, from the First Landing of the Pilgrims, to the Conquest of Canada, by the English, in 1760, &c. &c. By E. Hoyt, Esq. 8vo. Greenfield, Mass. 1824.—*From Mr. Henry Williams.*

A Second Appeal to the People of Pennsylvania, on the Subject of an Asylum for the Insane Poor of the Commonwealth. 8vo. Philadelphia, 1840.—*From Dr. Dunglison.*

The American Medical Library and Intelligencer, &c. &c. By Robley Dunglison, M.D., Sec. A. P. S. No. 12 and 13. Sept. 15, Oct. 1, 1840.—*From the same.*

The Magazine of Natural History. New Series. No. 43, for July, 1840. Conducted by Edward Charlesworth, F.G.S., &c. No. 44, for Aug. 1840. By Richard Taylor, F.L.S., &c.—*From Mr. Taylor.*

A Selection of Church Music, printed for the Pennsylvania Institution for the Instruction of the Blind, with Type on an Improved Plan, invented by M. Snider, Printer to the Institution; arranged and figured for Thorough-base. By F. Rasche, Teacher of Music in the Institution. Vol. I. Folio. Philadelphia, 1840.—*From Mr. Snider.*

The State of the Science of Political Economy Investigated; wherein is shown the Defective Character of the Arguments which have hitherto been advanced for Elucidating the Laws of the Formation of Wealth. By Wm. Atkinson, &c. &c. London, 1838.—*From Mr. H. C. Carey.*

Letters addressed to the People of the United States, in Vindication of his Conduct. By Wm. J. Duane, late Secretary of the Treasury. 1834.—*From the same.*

Letters on the Factory Act, as it affects the Cotton Manufacture, &c. &c. By Nassau W. Senior, Esq., &c. &c. 8vo. London, 1837.—*From the same.*

A letter was read from Mr. F. Markoe, Jr., Corresponding Secretary of the National Institution for the Promotion of Science, recently established at Washington, addressed to the Secretaries of the Society, announcing, officially, to the Society, the fact of the foundation of the Institution at the seat of government, and the objects which it has in contemplation; and soliciting for the Institution the correspondence of the Society, and its co-operation and aid in promoting the objects with which the Institution was founded:—

Whereupon, the Secretaries were directed to reply, that the National Institution would be enrolled in the list of correspondents of the Society, and that the Transactions and Proceedings of the Society would be regularly transmitted to it.

Dr. Patterson, from the Observatory Committee, reported, that an ordinance had passed the City Councils, authorizing the erection of an Astronomical Observatory within Rittenhouse Square.

Professor Bache read a continuation of the paper of Professor Loomis on Magnetic Dip and Intensity, the reading of which was commenced at the last meeting. It was referred to the Committee which has the first portion under consideration.

Professor Henry read the sequel of his communication, entitled "Contributions to Electricity and Magnetism, by Joseph Henry, LL.D., &c. &c., Professor of Natural Philosophy in the College of New Jersey, Princeton. No. IV. On Electrodynamic Induction (continued)," which was referred to the same committee as the former "Contributions."

Mr. Cresson exhibited specimens of naphthaline, obtained by a kind of irregular crystallization from the liquid produced by the distillation of coal tar at a high temperature.

Prof. Bache stated, that along with Messrs. Walker, Kendall, Cresson, Frazer, and a pupil of the High School, he had watched for meteors or shooting stars, at the High School, on the nights of Nov. 12–13, and 13–14, and met with the

usual negative results of the observations before made in Philadelphia.

On the evening of the 11th, clouds came up from the E. N. E. soon after 9 o'clock, and finally covered the whole sky, which remained overcast during the night. On the nights of the 12th–13th, and 13th–14th, the sky was remarkably clear, except towards the horizon, on the morning of the 13th, and during a small part of the morning of the 14th.

From 11 to 12 on the night of the 12th, there were three observers; and the space embraced by their observations was that part of the visible heavens from the east round to the north, through the south. The moon was up, having passed the full about two days. During this hour six meteors were counted. From 12 until 4 A. M. of the 13th, there were two observers taking in a range of rather more than half the visible heavens. Eighteen meteors were counted, namely, nine between 12 and 1, three between 1 and 2, and six between 2 and 4 A. M. The paths of nine of these meteors were ascertained to converge to the region occupied by the head of the Lion, eight were variously directed, seven were doubtful or not ascertained. Of all the meteors seen, one appeared as large as Sirius seen by the naked eye, three as stars of the first magnitude, one of the second, three of the third, five of the fourth, and three of the fifth; the magnitudes of eight were not noted.

Two observers were on the watch on the evening of the 13th and morning of the 14th, from 11 o'clock until 4, except for half an hour at 2 A. M., the portion of the sky embraced in the observations being from the east to the west, through the south. The total number of meteors counted was seventeen. The paths of eight of these passed, when produced, towards the Lion's head, seven were in other directions, two not noted, or doubtful. Three were of the second magnitude, six of the third, five of the fourth, and one of the fifth; two were not noted.

The apparent velocities noticed of meteors having a common radiant, or nearly so, were as follows:—

Path of 8° described in .8″ from γ Pegasi, vertically downwards.

3° to 4° in .7″ from α Andromedæ, downwards.

17½° in .4″ obliquely from a point midway between the Pleiades and Aldebaran, on a line which, if produced, would pass through Castor.

Dr. Horner called attention to the noise and shock observed about 9 o'clock on Saturday evening last (Nov. 14), which were supposed by some to be those of an earthquake. Judge Hopkinson referred to a statement, that the phenomena were supposed to be produced by the explosion of a near meteor. Mr. Nicklin mentioned facts, which induced him to think there had been a slight shock of an earthquake at the time mentioned. Dr. Chapman and Mr. Cresson attributed the rumbling noise and shock to thunder. Dr. Chapman had noticed a flash of lightning near the horizon, which was followed by thunder. Mr. Cresson had noted an interval of nearly two minutes between the flash of lightning and the clap of thunder.

Prof. Henry described an apparatus for producing a reciprocating motion by the repulsion in the consecutive parts of a conductor, through which a galvanic current is passing; and made some remarks in reference to the electro-magnetic machine invented by him in 1829, and subsequently described by Dr. Ritchie, of London. The machine referred to had been applied recently by Prof. Henry in his experiments.

Mr. Fisher announced the death of Benjamin R. Morgan, a member of the Society, who died on Nov. 19.

Dr. Patterson stated on behalf of Mr. Gillies, of Washington—introduced at the meeting as a member of the National Institution of Washington—that he had watched for meteors at Washington on the nights of the 11th, 12th, 13th, and 14th of November, but had failed to observe any on these occasions.

Prof. Bache communicated an extract of a letter from Prof. Rümker, Director of the Observatory of Hamburg, which contained the results of his observations of Galle's first comet, and occultations observed in April, May, June, and August, 1840.

1839	Mean Time at Hamburg.	Apparent AR of Comet.	Apparent Declination of Comet.	Number of Observations.	Apparent Position of Compared Stars.	
					Stars' apparent AR.	Stars' apparent Declination.
10 December	16 23 39.93	13 52 37.457	+ 0 27 5.70	7	13 51 29.987	+ 0 36 41.69
	18 4 33.76	13 53 18.895	28 5.12	1	13 51 32.694	0 49 44.42
					13 54 22.953	0 49 10.05
14 December	16 22 7.34	14 31 59.396	+ 1 39 28.08	5	14 28 24.131	+ 1 45 19.39
					14 30 6.264	1 34 49.44
					14 37 20.656	1 23 41.84
					14 38 56.172	1 38 42.26
					16 14 12.633	+ 3 15 19.94
25 December	19 4 17.893	16 13 56.08	+ 3 22 6.28	8	16 14 17.976	3 27 56.03
28 December	18 36 30.58	16 37 37.126	+ 3 18 46.68	3	16 37 44.606	+ 3 11 29.95
	19 14 44.16	16 37 49.663	3 18 9.17	2	16 37 54.335	3 4 57.74
					16 40 17.438	3 1 30.22
29 December	17 4 13.93	16 44 42.317	+ 3 14 19.28	3	16 43 27.640	+ 3 12 16.89
					16 45 13.424	3 17 18.51
1840.					17 22 29.946	+ 2 9 22.17
4 January	17 49 15.85	17 26 17.213	+ 2 23 30.42	10	17 22 38.602	2 27 12.28
					17 23 49.909	2 22 29.20
					17 24 18.048	2 10 34.13
					17 24 22.025	2 31 52.69
					17 30 59.317	+ 2 8 55.01
5 January	17 41 29.78	17 32 31.084	+ 2 11 58.07	3	17 31 2.991	2 7 19.08
					17 31 50.266	2 6 38.84
					17 39 9.522	+ 1 53 20.01
6 January	17 56 29.89	17 38 40.337	+ 1 58 52.01	16	17 39 31.944	1 50 30.22
					17 40 39.371	1 49 1.42
					17 41 13.764	2 0 44.12
					17 44 27.507	1 45 0.75

8 January	18	18	9.53	17	50	28.758	+ 1	30	54.70	15	17	47	59.205	+ 1	27	31.08
											17	51	23.084	1	34	31.33
											17	52	13.499	1	37	16.71
											17	53	37.164	1	18	45.14
9 January	18	13	18.80	17	56	5.600	+ 1	16	21.12	10	17	53	37.184	+ 1	18	44.99
											17	56	23.938	1	13	54.69
10 January	18	19	49.87	18	1	36.743	+ 1	0	51.489	19	18	0	26.800	+ 0	41	44.89
											18	1	31.193	0	47	50.57
											18	2	15.637	0	46	3.82
											18	3	32.293	0	46	47.63
											18	5	33.517	0	38	37.75
11 January	18	52	4.70	18	7	4.540	+ 0	45	4.37	7	18	5	33.526	+ 0	38	37.66
											18	8	55.993		57	9.76
12 January	18	18	25.36	18	12	9.719	+ 0	29	35.40	16	18	9	57.366	+ 0	47	50.24
											18	10	29.575	0	41	40.95
											18	11	16.032	0	46	44.50
13 January	18	32	14.97	18	17	18.786	+ 0	13	1.21	14	18	19	0.541	+ 0	6	13.50
											18	19	37.832	+ 0	6	16.66
											18	21	4.867	+ 0	13	22.95
14 January	18	15	17.68	18	22	12.686	— 0	3	9.628	8	18	19	0.561	+ 0	6	13.31
											18	19	37.851	0	6	16.52
											18	21	4.885	0	13	22.81
											18	22	25.701	0	16	26.05
	17	48	49.85	18	36	21.422	— 0	53	20.42	4	18	38	12.035	— 1	7	38.56
17 January	18	26	33.84	18	36	28.285	— 0	53	41.99	3						
19 January	18	43	46.66	18	45	26.533	— 1	27	12.03	4	18	40	58.875	— 1	9	32.47
											18	43	21.286	— 1	13	50.53
21 January	18	37	1.19	18	53	58.738	— 1	59	42.44	2	18	57	0 326	— 1	45	3.59
22 January	18	38	58.60	18	58	6.639	— 2	16	22.92	1	18	58	37.939	— 1	58	41.10
2 February	18	16	33.06	19	38	28.796	— 5	0	40.85	1	19	33	20.046	— 4	39	35.04
											19	36	47.391	— 4	54	23.53
4 February	18	14	45.53	19	44	57.405	— 5	26	57.39	1	19	42	19.830	— 5	5	47.89
											19	45	45.551	— 5	27	34.24

The places of the stars are the apparent places for the time of comparison with the comet.

Prof. Bache also reported the following occultations of fixed stars by the Moon, observed by Prof. Rümker in Hamburg.

1840.	Star.	Phase.	Mean Time at Hamburg.
April 11	ν Leonis	Immers.	10 34 58.29
22	τ Sagittarii	Immers.	16 13 20.77
May 4	Anon.	Immers.	10 30 16.97
June 3	κ Cancri	Immers.	9 48 30.98
Aug. 24	^{2} Cancri	Immers.	16 43 35.8
	^{1} Cancri	Immers.	16 16 7.9

Stated Meeting, December 4.

Present, thirty members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

A History of the United States before the Revolution; with some Account of the Aborigines. By Ezekiel Sandford. 8vo. Philadelphia, 1819.—*From Mr. Du Ponceau.*

The Resources of the United States of America; or a View of the Agricultural, Commercial, Manufacturing, Financial, Political, Literary, Moral, and Religious Capacity and Character of the American People. By John Bristed, Counsellor at Law, &c. &c. 8vo. New York, 1818.—*From the same.*

History of the late Polish Revolution, and the Events of the Campaign. By Joseph Hordynski, Major of the late 10th Regiment of Lithuanian Lancers. 8vo. Boston, 1832.—*From the same.*

Memoirs of Goethe, written by himself. 8vo. New York, 1824.—*From the same.*

The History of the Administration of John Adams, Esq., late President of the United States. By John Wood, Author of the History of Switzerland, &c. 8vo. New York.—*From the same.*

The Political Mirror: or Review of Jacksonism. 12mo. New York, 1835.—*From the same.*

The Proceedings and Resolutions of the West India Body, including Copies of their various Communications with His Majesty's Government, relative to the Measures of the Session of 1833, for the Abolition of Slavery. Small Folio. 1833.—*From Mr. Petty Vaughan.*

A Pictorial Geography of the World, comprising a System of Universal Geography, Popular and Scientific, &c. &c., illustrated by more than One Thousand Engravings of Manners, Costumes, Curiosities, Cities, Edifices, Ruins, Beasts, Birds, &c. &c., with a Copious Index, answering the purpose of a Gazetteer. By S. G. Goodrich. Second Edition. 2 Vols. Large 8vo. Boston, 1840.—*From the Author.*

Specimens of an Improved Metrical Translation of the Psalms of David, intended for the Use of the Presbyterian Church in Australia and New Zealand, with a Preliminary Dissertation, and Notes Critical and Explanatory. By John Dunmore Lang, D.D., Senior Minister of the Presbyterian Church in Communion with the Church of Scotland in New South Wales.—*From the Author.*

Report from the Select Committee on Lighting the House (of Commons); together with the Minutes of Evidence, Appendix, and Index. Fol. Aug. 1839.—*From Mr. H. C. Carey.*

Report to the Controllers of the Public Schools, on the Reorganization of the Central High School of Philadelphia. By A. D. Bache, LL.D., President of the Girard College for Orphans. 8vo. Philadelphia, 1839–40.—*From the Author.*

Report on the Organization of a High School for Girls, and Seminary for Female Teachers. 8vo. Philadelphia, 1840.—*From the same.*

The Committee, consisting of Mr. Richards, Dr. Ludlow, and Mr. G. M. Wharton, on a communication of Professor Forshey, of Natchez, containing a description of the great Mound near Washington, Adams County, Mississippi, reported favourably of the same, and expressed the hope, that the author might be enabled to prosecute farther examinations, "the result of which, with his enlightened commentaries, would furnish a most acceptable addition to the Transactions of the Society."

The Mound, described by Professor Forshey, is found about nine miles north-east from the city of Natchez, Mississippi, upon the most elevated portion of that comparatively low and level region. It is approached on all sides by a slope. The elevation of its base above the mean level of the waters of the Mississippi, at Natchez, is estimated at 265 feet, and the greatest height of the Mound above the earth, 84 feet. The whole elevation above the waters of the river 348 feet, giving to the spectator a clear horizon of 150 degrees, embracing, in that flat region, a rich and extended prospect.

The Mound is an irregular artificial elevation of earth, varying, in its general line, from 40 to 46 feet in height, and encloses an area of about seven acres inclusive of the ground covered by its base. On the surface of the general Mound are erected, at irregular intervals, 15 smaller Mounds, one of which is 38 feet in height, and the remaining 14 varying from 4 to 12 feet in height. The Mound consists of clay, with some admixture of earth, and its sides seem to have been faced with rudely formed brick, made from the adjacent clay. The bricks are found after digging to the depth of some 12 or 15 inches into the embankment. The western front is ascended by two causeways, which are distinctly marked, and are found one at each angle of the Mound. At the eastern extremity is another causeway entrance to the enclosure, and near to this entrance, and outside the embankment, may be traced, for some distance, an ancient fosse. The three causeways are of easy ascent, and wide enough for the introduction of burthens. Upon the north and south sides of the great Mound, and at points nearly opposite to each other, covered entrances or archways were constructed, but they are now so obstructed as to be difficult of examination. Before the forest was cleared by civilized culture, tradition relates that extensive avenues reached north, south, east, and west, thus affording, from the elevation of the great Mound, a most attractive prospect.

The result, of the partial examinations made, shows that portions of the Mound were used as places of interment by the Indians. The cranium secured by Prof. Forshey was of the tribe of Flatheads.

Earthen vessels of rude construction, and probably used frequently as receptacles for the remains of those interred, or as mementos at their funeral obsequies, are found. Various objects from the Mound have reached the Lyceum at Natchez.

The Committee, consisting of Mr. Lea, Dr. Hays, and Mr. Ord, to whom was referred a communication, entitled "Re-

marks on the Dental System of the Mastodon, with an Account of some Lower Jaws in Mr. Koch's Collection, St. Louis, Missouri, where there is a Solitary Tusk on the Right Side, by William E. Horner, M.D., Professor of Anatomy in the University of Pennsylvania," reported in favour of the publication, which was directed accordingly.

Dr. Horner inquires into the mode of formation of the teeth of the Mastodon, and compares it with that of the elephant and of man. The teeth of the Mastodon are all formed upon one type of configuration, the number of denticules excepted; they therefore, like those of the elephant, do not admit of a division into incisors, cuspidati, and molares, as in some other animals. The teeth are all molars. The lower jaw itself resembles somewhat a human lower jaw cut off in front of the molar teeth, and then joined in the two posterior segments. These teeth invariably succeed each other from behind; the hindmost, as they emerge, pushing the others forward, and out of their places, until the latter all drop out, and a large solitary tooth is finally left on each side of each jaw.

Dr. Horner alludes to the erroneous nature of the early ideas of naturalists on the teeth of the Mastodon, and observes that we now know, with some degree of certainty, that the earliest teeth of this animal were not more than an inch and a half square, and that the three immediately succeeding were a gradual and successive enlargement on this and on each other's volume. In the Museum of Mr. Koch, at St. Louis, there is a young head, the long diameter of which is 18 or 20 inches, where the fact of four co-existent teeth on each side of each jaw is exhibited. This specimen, with a dozen lower jaws of different ages and sizes, enables us to trace, with some accuracy, the stages of dentition, until it reaches the large and solitary grinder of ten inches in length on each side. Judging from these phases of dentition, Dr. Horner infers that the entire amount of teeth was at least 24; he is disposed, indeed, to think that the number may have been greater than this; perhaps 28, and possibly 32.

Dr. Horner makes some observations on some specimens of lower jaws in Mr. Koch's Museum in St. Louis, in which there was a solitary tusk on the right side, and alludes to the embarrassments that their existence occasions in regard to the Tetracauledon of Godman; whether, for example, we are to consider them merely as abnormous types of that animal, as known Mastodons, or as still another species

to which, if such, the name Tetracauledon might be attached. Dr. Horner confesses himself unable to suggest a probable solution of these questions, and states, in connection with them, that Mr. Koch has the lower part of the head of a Mastodon of middling size, in which, from the intermaxillary bone, as usual, protrudes a tusk, which measures thirty inches long by four inches in diameter; but the tusk exists only on the left side, there being not even a vestige of alveolus on the right.

It is very far from being certain, Dr. Horner adds, that any example exists of the upper jaw of the Tetracauledon; the presence of tusks in both jaws at once has therefore to be yet proved.

The Committee, consisting of Prof. Bache, Dr. Patterson, and Mr. Lukens, to whom was referred the paper, entitled "Observations to determine the Magnetic Intensity at several Places in the United States, with some additional Observations of the Magnetic Dip, by Elias Loomis, Professor of Mathematics and Natural Philosophy in Western Reserve College," recommended the same for publication in the Society's Transactions, which was ordered accordingly.

The following is an abstract of the results of observations contained in this memoir.

1. *Magnetic Intensity.*—The horizontal intensity was observed by an apparatus similar to the one used by Professor Hansteen. Three small needles furnished to the author by Professor Renwick, and made under the direction, respectively, of Professor Hansteen, Major Sabine, and Professor Henry, were employed. The commencing semi-arc of vibration was, in every case, 30°, and each series included 320 oscillations, the instant of the completion of every tenth vibration being noted. No correction, therefore, is applied for the arc of vibration. The times were observed at Dorchester, Princeton, and Philadelphia, by a chronometer, and at the other stations by a lever watch, which, at Hudson, was compared with the observatory clock before and after the observations. The author remarks, that "at the remaining stations there is a little uncertainty with regard to the time, yet it is thought its influence upon the results will not be great."

The correction for temperature, for each of the needles, was obtained by direct experiment, and gave the following coefficients:—

For the Hansteen needle, .000191; for the Sabine needle, .000328; for the Henry needle, .000116. The results of observation are reduced to a standard temperature of 60° Fah.

The author gives the reasons which induce him to apply no correction for the change of magnetism in the needles. The observations for horizontal intensity were principally made in September and November, 1839.

The stations of observation at different places were the same as formerly described (Am. Phil. Soc. Trans.), except at Dorchester, which was near Mr. Bond's Observatory. The details of the observations are given, and from the mean of those for horizontal intensity, combined with the dips formerly observed, the author gives the total intensities, taking New York as 1.803, according to the determination of Major Sabine, and referring to the unit established by Humboldt, as follows:—

	Horizontal Intensity.	Dip.	Total Intensity.
New York,	.96707	72° 52.2′	1.803
New Haven,	.92364	73 26.7	1.780
Dorchester,	.88182	74 16.0	1.786
Providence,	.89830	73 59.6	1.789
Princeton,	.97414	72 47.1	1.807
Philadelphia,	1.00000	72 07.0	1.788
Hudson,	.97344	72 47.6	1.807

The author remarks that Hudson, Ohio, and New York, thus appear to have sensibly the same magnetic dip and intensity. He concludes this part of his memoir with a comparison of his intensity observations with those of Professors Bache and Courtenay.

2. *Magnetic Dip.*—This section commences with an account of observations of the magnetic dip, made at Hudson, Ohio, in different azimuths, to try the figure of the axles of the dipping needles. The results for needle No. 1 were quite satisfactory, and for needle No. 2, showed a difference in the extremes of 12.7′: upon a review of the whole, the author considers them as justifying confidence in the needles used.

The following determinations of the dip are next given:—

		Latitude.	Longitude.	Date.	Magnetic Dip.
Hudson,	Ohio,	41° 15′ N.	81° 26′ W.	April 15, 1840	72° 53.2′
Aurora,	„	41 20	81 20	Sept. 8, „	72 55.5
Windham,	„	41 15	81 03	„ 8, „	73 03.4

Bazetta,	„	41	20	80	45	Sept. 9, 1840,	72 59.7
Kinsman,	„	41	30	80	34	„ 10, „	73 08.1
Hartford,	„	41	19	80	34	„ 10, „	72 59.8
Warren,	„	41	16	80	49	„ 11, „	73 00.7
Cleveland,	„	41	30	81	42	„ 22, „	73 12.0
Bedford,	„	41	24	81	32	„ 23, „	72 58.0
Twinsburgh,	„	41	20	81	26	„ 23, „	72 51.3
Tallmadge,	„	41	06	81	26	„ 28, „	72 50.1
Shalersville,	„	41	15	81	13	Oct. 15, „	72 56.6
Streetsboro',	„	41	15	81	20	„ 16, „	72 53.0
Tallmadge,	„	41	06	81	26	„ 31, „	72 48.2

Dr. Patterson, from the Observatory Committee, laid before the Society the following Ordinance, passed by the City Councils on the 19th of November last.

"An Ordinance to authorize the American Philosophical Society to erect an Observatory in Rittenhouse Square.

SECT. 1. *Be it ordained and enacted by the Citizens of Philadelphia in Select and Common Councils assembled*, That the American Philosophical Society be and they are hereby authorized to erect, at their expense, an Observatory in Rittenhouse Square, the same to be built under the supervision of the Committee on City Property, and after a plan to be approved by them; subject, nevertheless, to the right of the Mayor, Aldermen, and Citizens of Philadelphia, to prescribe regulations for the government and management thereof, and at any time the Select and Common Councils may deem it expedient, to take possession of and remove the said building from the said square."

Signed by the Presidents of the Select and the Common Council.

Whereupon it was resolved, that the terms of the Ordinance be accepted by the Society, and that the Observatory Committee be instructed to take the necessary measures, under the powers given them, for carrying the objects of the Ordinance into effect.

Mr. Walker read a communication, entitled "Researches concerning the Periodical Meteors of August and November, by Sears C. Walker," which was referred to a Committee.

Prof. Bache brought before the Society an instrument for measuring the changes in the vertical components of the force

of terrestrial magnetism, which he described as combining the principles of the vertical force instrument of Prof. Lloyd, with that of reflection adopted in the magnetometers of Prof. Gauss, and which had been made for him by Mr. Saxton.

Prof. Bache stated, that having found difficulties in the use, especially by his assistants, of the vertical force instrument invented by Prof. Lloyd, and made for the Magnetic Observatory at the Girard College, by Robinson, of London, he had applied, in June last, to Mr. Saxton, to construct the instrument now presented to the notice of the Society. The details had been matured by conference with Mr. Saxton. The magnetic bar, placed and supported as in the instrument of Prof. Lloyd, carries a mirror upon its axis. The mode of adjusting the position of the centre of gravity of the needle does not differ materially from that adopted in the instrument referred to. The needle is raised off the agate planes by the action of a screw, raising a bar which supports two small cups adapted to receive two projecting pins on the arms of the magnet. This magnetometer is observed from a distance, like those of Prof. Gauss. Prof. Bache explained the mode of adjusting the instrument, and of placing the scale and telescopes.

Mr. Peale remarked, that in the November number of the "London, Edinburgh, and Dublin Philosophical Magazine," there were communications "On the Electricity of a Jet of Steam issuing from a Boiler," and stated that sparks, of the kind mentioned, had been observed in a steam-engine at Wilmington, North Carolina.

Mr. Boyé read a communication, entitled, "On the Perchlorate of the Oxide of Ethule, or Perchloric Ether, by Clark Hare and Martin H. Boyé," which was referred to a Committee.

Professors Rogers and Hare referred to circumstances connected with the discovery, mode of preparing, and preserving this highly explosive compound; of which a specimen, dissolved in alcohol, was presented by M. Boyé to the Society. Dr. Hare, amongst other matters, remarked, that this is the only ether which is explosive, *per se*, when transferred from one vessel to another.

Prof. Bache called the attention of the Society to a diagram

representing the changes of magnetic declination, as recorded at the Magnetic Observatory of Mr. Bond, at Cambridge, and at the Girard College, on the magnetic term day of May, 1840, and showing that the changes attending the aurora are not peculiar to one locality, but that, as observed at different places, they are parts of a great magnetic disturbance.

The two curves thus presented agreed remarkably in all their general features, showing, as a general result, similar motions of the needle at the two places in direction, though not always proportional in amount. They presented remarkable differences in the absolute times at which these movements had taken place at the two stations, the similar movements differing frequently five minutes (with opposite signs), and in a few cases as much as ten minutes in time; in other cases being simultaneous. The period at which the needle had attained, suddenly, its greatest deviation from the true meridian, was ten minutes earlier in absolute time at Cambridge, than at Philadelphia.

Mr. Justice reported, that during the last four or five evenings, he had tested the value of the telescope referred to at a former meeting of the Society (Proceedings, No. 13, p. 276), by observations on the Moon, and stated his opinion of its excellence, as deduced from those observations. Mr. Justice detailed the appearances presented by the Moon's surface through this instrument.

Dr. Demmé referred to the contents of a circular letter from Germany, in which it was stated, that a number of gentlemen of Stuttgart had united, under the name "Societas Bibliophilorum Stuttgartiæ," to publish historical and antiquarian works, which are either out of print, or have never been printed.

The Society at Stuttgart will begin to publish as soon as they have procured five hundred subscribers. The subscription is one pound sterling for which the subscriber will receive one copy: and no more copies will be printed than are subscribed for. The letter to Dr. Demmé, which accompanied it, requested the honour of enrolling the American Philosophical Society amongst the subscribers.

On motion, the Society resolved to subscribe to the undertaking.

Professor Bache read a letter from Major Sabine, giving the progress of the magnetic observations now making, and referring to the modes deemed advisable for the publication of the records of observatories. He referred also to the anomalous nature of the curves for the May term day at Toronto and at Greenwich, and to an instrument for observing vertical force by reflection, in the putting up of which Professor Airy was engaged.

Stated Meeting, December 18.

Present, thirty-eight members.

Mr. Du Ponceau, President, in the Chair.

The following donations were received:—

FOR THE LIBRARY.

Journal Asiatique. 3 Série. Tom. IX. No. 49. Paris. Janvier, 1840.—*From the Society.*

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie; uitgegeven door J. Van der Hoeven, M.D., Prof. te Leiden, en W. H. Vriese, M.D., Prof. te Amsterdam. Zevende Deel. 1ste en 2de Stuk. 8vo. Leiden, 1840.—*From the Editors.*

An Account of the Receipts and Expenditures of the United States, for the Year 1839. 8vo. Washington, 1840.—*From Mr. T. L. Smith, Register of the Treasury.*

A Commercial Dictionary, containing the Present State of Mercantile Law, Practice, and Custom. By Joshua Montefiore, &c. The first American Edition, with very considerable Additions relative to the Laws, Usages, and Practice of the United States. In three Volumes, 8vo. Philadelphia, 1804.—*From Mr. Du Ponceau.*

Sundry Pamphlets, Catalogues, &c., relating to the University of Pennsylvania. 8vo. (Bound.)—*From the same.*

Lettere sull' Indie Orientali. 8vo. Filadelfia, 1802. (2 Vols.)—*From the same.*

Des Crimes de la Presse, considérés comme Générateurs de tous les Autres. Dédié aux Souverains de la Sainte-Alliance. 8vo. Paris. (No date.)—*From the same.*

Traité des Tribunaux de Judicature, ou l'on examine ce que la Religion exige des Juges, des Plaideurs, des Avocats et des Témoins, &c. &c. Par P. Roques. Pasteur de l'Eglise Françoise de Basle. 4to. Basle, 1740.—*From the same.*

Alger sous la Domination Française; son État présent et son Avenir. Par M. le Baron Pichon, Conseiller d'État, ancien Intendant Civil d'Alger. 8vo. Paris, 1833.—*From the same.*

A New Spanish Grammar, adapted to every Class of Learners. By Mariano Cubí i Soler, Professor of Modern Languages in the College of Louisiana. Sixth Edition, with Corrections and Improvements.—*From the Author.*

The Natural History of the Fishes of the Firth of Forth, and Tributaries. By Richard Parnell, M.D. F.R.S. Edin., &c. &c. Private Copy: from the Memoirs of the Wernerian Natural History Society, Vol. VII. 8vo. Edinb. 1838.—*From the Author.*

Description of the Geology of the State of New Jersey, being a Final Report. By Henry D. Rogers, State Geologist, &c. &c. 8vo. Philadelphia, 1840.—*From the Author.*

Récit de l'Inauguration de la Statue de Gutenberg et des fêtes données par la Ville de Strasbourg, les 24, 25, et 26 Juin, 1840. Par Auguste Luchet, &c. 24mo. Paris, 1840.—*From Mr. D. B. Warden.*

Pamphlets.—1. Institut Royal de France. *a.* Académie des Sciences, Morales et Politiques: Séance publique du Samedi, 27 Juin, 1840. *b.* Académie Française: Séance publique du Jeudi, 11 Juin, 1840. *c.* Académie Royale des Sciences: Séance publique du Lundi, 13 Juillet, 1840. 2. Revue de l'Agriculture Universelle, publiée par la Société d'Agriculture Universelle, sous la direction de M. l'Abbé Theodore Perrin, &c. &c. Tom. 1er. 1re et 2e Livraison, Oct. 1839. 3. Société Royale et Centrale d'Agriculture. *a.* Mémoire sur la Culture de Chêne Liége, sur la Récolte et la Fabrication du Liége: par M. F. Jaubert, de Passa, &c. &c. Paris, 1836. *b.* De la Greffe du Murier blanc sur le Murier des Philippines, par M. Bonafous, &c. &c. Paris, 1835. *c.* Rapport sur une Herse-Rateau, de l'Invention de N. Lestournière, &c.—M. le Vte Héricart de Thury, Rapporteur. Paris, 1840. *d.* Archives d'Harcourt, 1ère Année. Paris, 1836. *e.* Premier Rapport fait au nom de la Commission d'Œnologie, composée de MM. le Comte de Rambuteau, Président; le Duc Decazes, de Mirbel, Morin de Sainte-Colombe,—O. Leclerc-Thouin, Rapporteur.

f. Second Rapport sur le même sujet. 4. Compte rendu des Travaux de la Société Philotechnique, par le Baron de Ladoucette, Sécrétaire perpetuel: Séances, de Dec. 1834; Juin, 1835; Mai, 1836; Dec. 1836; Juin, 1837 et Juin, 1838. Liste des Membres de la Société, &c. 5. Discours de M. de Ladouchette, député de la Moselle, dans la discussion sur la proposition de M. Anisson, relative au défrichement des Forêts. (Chambre des Députés: Séance du 5 Mars, 1838.) 6. Discours de M. le Baron de Morogues, Pair de France, dans la discussion du projet de Loi sur les Douanes. (Chambre des Pairs: Séance du 9 Juin, 1836.) 7. Note Historique sur les Bateaux à Vapeur, &c. par Mr. C. P. Molard, de l'Académie des Sciences. 8. Mémoire sur une Apoplexie Charbonneuse de la Rate qui a regné épizootiquement sur les Bêtes à Laine, dans les Départemens de l'Indre et du Cher, pendant l'Automne de 1834. Par J. Ch. Herpin, &c. 8vo. Paris, 1836. 9. Des Pertes qu'occasionerait á l'État la Continuation de l'application actuelle de notre Puissance amortissante: par A. Séguin, de l'Institut. Février, 1830. 10. Rapport sur l'Horlogerie de Paris, par M. Charles-Louis Le Roy, Horloger du Roi, 8vo. Paris, 1840.—*From the same.*

Memorial of Edmund Pendleton Gaines to the Senate and House of Representatives of the United States in Congress assembled. 8vo. Memphis, Tennessee. 1840.—*From General Gaines.*

Meteorological Register for the Years 1826, 1827, 1828, 1829, and 1830, from Observations made by the Surgeons of the Army, and others at the Military Posts of the United States. Prepared under the direction of Thomas Lawson, M.D., Surgeon-general United States Army. To which is appended, the Meteorological Register for the Years 1822, 1823, 1824, and 1825. Compiled under the direction of Joseph Lovell, M.D., late Surgeon-general of the United States Army. (Published for the use of the medical officers of the army.) 8vo. Philadelphia, 1840.—*From Dr. Dunglison.*

The Committee, consisting of Dr. Patterson, Prof. Bache, and Mr. Lukens, to whom was referred the communication of Prof. Henry, entitled "Contributions to Electricity, No. IV., on Electro-dynamic Induction," reported in favour of publication, which was directed accordingly.

In this paper Prof. Henry has collected such parts of his researches as particularly relate to the induction at the moment of making and breaking a galvanic circuit, and presents them as the continuation, and, in a measure, as the completion of this part of the general subject of his "Contributions."

The paper is divided into three sections: the first of these relates to the induction at the beginning of a galvanic current. It will be recollected that the arrangement of apparatus employed in the last series of experiments produced a powerful shock at the moment of the ending of the current; but a very feeble one at the beginning. In order, therefore, to study the induction in the latter case, the attention of Prof. Henry was first directed to the discovery of some means by which its intensity could be increased, and after some preliminary experiments, the desired result was obtained, by using a compound Daniel's battery, instead of the single battery before employed. It was also found, that the shock could be increased by diminishing, within certain limits, the length of the primary conductor.

After detailing a number of new facts relative to the induction at the beginning as well as at the ending of a galvanic current, an account is given of the production of currents, of different orders, from the beginning induction. These are found to be of the same nature as the several currents produced by the induction at the ending of the current, as described in Prof. Henry's last paper—each induced current possessing the property of inducing a current in an opposite direction to itself: and hence a series of alternating currents is exhibited in the case of this induction, similar to that described in Prof. Henry's last communication in reference to the ending induction. The same neutralizing effect is also produced by the interposition of a plate of metal between the conductors of the different orders.

The second section relates to a class of phenomena which at first sight would appear to indicate the existence of two kinds of electro-dynamic induction. A brief account of the principal part of these has been given in the Proceedings of the Society for Oct. 1839. The attention of Prof. Henry was directed to this part of his investigations, by a statement in the 14th series of Dr. Faraday's researches, which was apparently in contradiction to one of the most important facts given in the last number of his "Contributions." It is stated in substance, in Prof. Henry's last paper, that when a plate of metal is interposed between the coil, and a helix placed above it to receive the induction, the shock is almost entirely neutralized. Dr. Faraday, in

apparent opposition to this, found that not the least difference in effect is produced, whether the space between the conductors is occupied with a conductor of electricity or not, provided the interposed substance be not of the magnetic kind. A series of experiments was instituted to discover the cause of the discrepancy; and it was found, that in the case of induction produced by the motion of a helix towards a galvanic current, no screening influence was indicated by the deflections of the needle of a galvanometer; also, when the induction was effected by moving a battery up and down in the acid, and in the case of magnetic electricity produced by the motion of the keeper towards the poles of a magnet, the interposition of the plate of metal produced no change in the indications of the needle. The induced electricity—which is thus produced by motion, and is of such low intensity as only to affect the galvanometer, which does not cause shocks, and is not neutralized by a plate of metal—was at first thought to be of a different kind from that induced by the sudden ending of a galvanic current. In reference to this idea, a new examination was made of the phenomena of the screening influence of the plate, in the case of the induction at the making and breaking of a galvanic circuit, and it was found, that the neutralizing effects, described in Prof. Henry's last paper, only existed in reference to the shock, and the power of magnetizing steel needles, while the indications of the galvanometer were not at all influenced by the presence of the plate: also, that the shock and deflections of the needle appeared to depend on entirely different conditions, and gave, in almost every case, very different indications of the amount of inductive action. Thus, in the arrangement of an apparatus, which gave an intense shock at the breaking of a galvanic circuit, and a very feeble one at the making of the same, the deflections of the needle were as great in the latter case as in the former. It was also found, that although the shock, from the currents of the third and fourth orders, was very severe, yet the galvanometer was scarcely moved by them.

From all these results, Prof. Henry was at first inclined to believe, that there were two kinds of electro-dynamic induction, or that the induced current consisted of two parts, one of which could be neutralized by a plate, and the other not; but after an attentive study of the whole subject, he was led to conclude, that these facts, as well as all those belonging to galvanic induction, given in his former papers, could be referred to the simple laws of the induction in different directions at the moment of making and breaking a galvanic circuit.

The third section of the paper is occupied with these theoretical considerations, and in this Prof. Henry shows, that if the fact be granted, that the deflection of the needle is due to the whole amount of induced electricity, whatever may be its intensity, all the phenomena may be explained by the different degrees of rapidity with which a given amount of inductive action is expended.

When the development or the diminution of the quantity of a galvanic current is sufficiently rapid, a shock is produced; but if the same amount of development is produced more slowly, no shock perhaps will be obtained, although the deflection of the needle will be as great as before. The neutralizing effects of the interposed plate, in reference to the shock and not to the needle, are direct consequences of these principles, and most of the perplexing phenomena, described in Prof. Henry's last papers are referred to the same cause.

Prof. Henry illustrates his views by the artifice of a curve, the abscisses of which represent the time of the increase or diminution of the quantity of a current, and the ordinates the amount of inductive force produced by the same.

The Committee, consisting of Mr. Nuttall, Mr. Lea, and Dr. Coates, to whom was referred a communication by Miss Margaretta H. Morris, on the Cecidomyia Destructor or Hessian Fly, reported in favour of publication, which was ordered accordingly.

The Committee express the opinion, that should the observations of Miss Morris be ultimately proved correct, they will eventuate in considerable benefit to the agricultural community, and, through it, to the public. Miss Morris believes she has established, that the ovum of this destructive insect is deposited by the parent in the seed of the wheat, and not, as previously supposed, in the stalk or culm. She has watched the progress of the animal since June, 1836, and has satisfied herself that she has frequently seen the larva within the seed. She has also detected the larva, at various stages of its progress, from the seed to between the body of the stalk and the sheath of the leaves. In the latter situation it passes into the pupa or "flaxseed state." According to the observations of Miss Morris, the recently hatched larva penetrates to the centre of the straw, where it may be found of a pale greenish-white semi-transparent appearance, in form somewhat resembling a silk-worm. From one to six of these have

been found at various heights from the seed to the third joint: they would seem to enter the pupa state about the beginning of June.

This fly was not observed by Miss Morris to inhabit any other plant than wheat.

To prevent the ravages of this destroyer of the grain, it will be proper to obtain fresh seed from localities in which the fly has not made its appearance. By this means the crop of the following year will be uninjured; but in order to avoid the introduction of straggling insects of the kind from adjacent fields, it is requisite that a whole neighbourhood should persevere in this precaution for two or more years in succession. This result was obtained, in part, in the course of trials made by Mr. Kirk, of Bucks County, Pa., with some seed-wheat from the Mediterranean, in and since the year 1837. His first crop was free from the fly, but it was gradually introduced from adjacent fields; and in the present year the mischief has been considerable. As Miss Morris states that the fly has never made its appearance in Susquehanna and Bradford Counties, seed-wheat, free from the fly, might be obtained from these, and probably from other, localities.

The Committee recommend that the conclusion of Miss Morris "may be subjected to the only efficient test—repeated observations and effective trials of the precaution she advises."

The Committee, consisting of Prof. Rogers, Dr. Bache, and Mr. Booth, on a communication, entitled, "On the Perchlorate of Ethule or Perchloric Ether, by Clark Hare and Martin H. Boyé," reported in favour of publication, which was ordered accordingly.

In the above paper, the mode of obtaining the perchloric ether, by subjecting a mixture of sulphovinate of baryta and perchlorate of baryta to distillation, is first described. The authors next detail the precautions to be attended to in preparing and experimenting upon this highly explosive compound. They afterwards describe the appearance and properties of the substance which ranks in that class of organic salts, denominated *ethers*. It is a colourless, transparent liquid, heavier than water, and soluble in alcohol, from which it may be precipitated again, by the addition of water. An alcoholic solution of the hydrate of potassa has the power of decomposing it, forming perchlorate of potassa and alcohol. The most characteristic property of the compound is its tendency to explode from the slightest causes

Mr. Nuttall presented a continuation of his communication read at a former meeting (Proceedings, No. 13, p. 284), under the title, "On the Corymbiferæ, collected on a Tour across the Continent of North America," which was referred to the same Committee as its predecessor.

Mr. Vaughan read a letter from Mr. J. H. Alexander, of Baltimore, containing very favourable remarks on the construction adopted by Mr. James Green, of Baltimore, for the standard barometer made by him for the Maryland Academy of Science and Literature, and described in a Report of the Meteorological Committee of the Academy, in 1836.

Professor Bache laid before the Society a Report from Mr. Adams to the House of Representatives, on a Letter from the Secretary of War, of the 31st Dec. 1839; and a Memorial from a Committee of the American Philosophical Society, asking the aid of the government to carry on a series of magnetic and meteorological observations, and ending with a resolution,—

"That the sum of twenty thousand dollars ought to be appropriated for the establishment of five several stations, at suitable distances from each other, for making observations of terrestrial magnetism and meteorology, conformably to the invitation from the Royal Society of Great Britain to the American Philosophical Society at Philadelphia, and to other learned societies in the United States; that the said sum should be placed under the direction, and at the disposal, of the Secretary of War, for the fulfilment of these purposes; he to account for the expenditures, thus authorized, to the Treasury of the United States."

Professor Bache then offered the following resolution, which was adopted:—

Resolved, That the Committee by whom a memorial was addressed to the Secretary of War, in reference to the establishment of magnetic observations, be instructed again to call his attention to the system of combined observations on terrestrial magnetism and meteorology now in progress.

Dr. Patterson called the attention of the Society to the subject of the evolution of electricity from steam, mentioned at the last meeting, and stated that the experiments made lately in

England had been successfully repeated by Mr. Peale, Mr. Saxton, and himself, at the United States' Mint.

Dr. Patterson said, that their first attempts were to collect electricity from the steam as it issued from a gauge-cock, near the surface of the water, in the boiler; but in this case the steam was always accompanied by a spray of water, and the experiments failed. They also failed when the steam was of a low temperature, as it was then condensed immediately upon leaving the boiler, so as to form a cloud of vesicular vapour. In both these cases, the electricity, if evolved at all, would be led back to the boiler—the spray and the vesicular vapour being, as is well known, electrical conductors.

When, on the other hand, high steam was drawn off from a stop-cock far removed from the water in the boiler, it was observed to issue, for some distance, in the form of a transparent gaseous vapour, and, in this case, any insulated body on which it was condensed was always found to be charged with electricity. Thus, if the experimenter stood on an insulating stool, or even on a box or ladder of dry wood, and held an iron ladle, or any other conductor, in the issuing steam, the conductor and the operator became so fully charged with electricity, that thick sparks of a half, three-quarters, and in some instances a whole inch in length, were drawn off; the Leyden jar charged; the shock given to several persons holding hands, &c. The electricity thus produced was found to be always positive.

Dr. Patterson said, that one of the most important conclusions to which the experiments had led, was, that true gaseous steam is a non-conductor of electricity. If it had not been so, the apparatus would not have been insulated, and the electricity excited would have been carried back to the metallic boiler, and thence to the earth.

Dr. Patterson thought it most probable that the electricity, in these experiments, was evolved by the condensation of the steam—the phenomenon being analogous to the evolution of latent heat by the same condensation. He remarked, that as the steam within the boiler was surrounded by conductors, it could not be supposed to contain free electricity, and that on leaving the boiler, the only sources to which the electricity could be ascribed, seemed to be the condensation of the steam, the oxidation of the iron against which it impinges, or the friction of the steam against the air as it rushes through it.

To shew that oxidation was not the source of the electricity, the experimenters caused the steam to strike upon a large bar of fine gold

(400 oz. in weight,) and the generation of electricity was as abundant as when they employed an oxidizable metal. The electricity was also evolved by the insulated operator simply holding his hand in the steam as it issued; in which case the steam was condensed upon the hand, and the whole person became charged. Dr. Patterson stated, that this was, in fact, the experiment accidentally made near New Castle, in England, and which has attracted so much attention.

To show that the electricity was not caused by the rushing of the vapour through the air, Dr. Patterson said, that an apparatus was made, consisting of a pipe connected with the stop-cock on the boiler, a portion of about ten inches in length, near the upper end, being of glass, to produce insulation, and the remainder of lead, wound into a helix, like the worm of a still. This helix was immersed in a bucket of water and snow. When the steam was admitted, it became entirely condensed within the pipe, so that there was no rush through the air; yet the production of electricity was as abundant as with the former arrangements.

Dr. Patterson took notice of experiments made, half a century ago, by Volta and Saussure, and afterwards by Cavallo, which proved, to their satisfaction, that electricity was evolved during evaporation and condensation, but which have since been called in question by Pouillet and others, who assert, that a mere change of state, not accompanied by chemical change, never gives rise to electricity. He considered the experiments, now made on a large scale, as favouring, if not confirming, the first opinions entertained on this subject.

Dr. Patterson referred to the satisfactory manner in which these new experiments seem to explain the sources of electricity in the thunder storm, and in volcanic eruptions.

He then related an experiment in which an insulated iron ball, and afterwards a bar of gold, was heated, and a small stream of water poured on it, so as to be formed into steam at its surface. The first experiments seemed to show that the metal was charged with negative electricity, but subsequent trials threw doubts upon this conclusion.

Dr. Patterson also described experiments made to determine whether electricity was given off during the solidification of liquids,—the substances used being melted lead, silver and gold. In every case, however, the gold-leaf electroscope failed to exhibit the presence of any electricity.

Prof. Henry stated that he had not seen the sparks from steam; but

that he had obtained feeble electricity from a small ball, partly filled with water, and heated by a lamp. He agreed with Dr. Patterson in the opinion, that the source of the electricity was the change of state, but from water to vapour. There was, however, some doubt on the subject; Pouillet had denied the evolution of electricity from the evaporation of pure water. The facts were interesting, particularly on account of the great intensity of the electricity. The results, obtained by the philosophers, which had been mentioned, indicated electricity of very feeble tension, which could only be observed by the most delicate instruments, but here the sparks were an inch in length. If the vaporization of the water were shown to be the source of the electricity, Prof. Henry thought that the phenomena might be readily explained by the beautiful theory of Becquerel, in regard to the production of the great intensity of the electricity in the thunder cloud. According to this theory, each particle of the vapour carries up with it into the atmosphere the free electricity, which it receives at the moment of the change of state: this, being diffused through the whole capacity of the air, is of very feeble intensity, although of great quantity; but the condensation of the vapour into a cloud affords a continuous conductor, and consequently the electricity of all the particles of the interior, according to the well known principles of distribution, rushes to the surface of the cloud, and hence the great intensity of the lightning. According to this hypothesis, the insulated conductor, placed in the steam, would act not only as a collector, but also as a condenser of the free, but feeble, electricity of the vapour.

Prof. Henry farther stated, in connection with this subject, that he had been informed by several persons, that they had obtained sparks of electricity from a coal stove during the combustion of anthracite. A case had been stated to him several years ago, which he mentioned to his friend Professor Bache, who informed him that a similar one had fallen under his own notice, in which, however, Prof. Bache had succeeded in tracing the electricity to the silk shirt of the person who drew the spark. Another case had lately been reported to him by an intelligent gentleman, of a stove burning bituminous coal, on board of a steam-boat on the Ohio, which afforded amusement to all the passengers during the voyage, by giving sparks of electricity whenever it was touched.

In connection with the facts that had been stated of the production of electricity from steam, Prof. Henry observed that he was now inclined to believe that electricity may also be evolved during the combus-

tion of coal in a stove. But what, he asked, is the source of electricity in this case? Is it combustion, the evaporation of the moisture, or the friction of the hot air on the interior of the pipe?

Dr. Goddard stated, that in the case of a stove, pretty well insulated, his family had amused themselves with drawing sparks half an inch or three quarters of an inch long; and that similar sparks were obtained from the frame of a looking-glass over an open grate, in the house of Dr. Norris, of this city.

Professor Bache remarked, that in the case referred to by Prof. Henry, in which sparks of electricity were obtained from a stove, he had satisfied himself that these were owing to the experimenter wearing a silken shirt:—an experimenter, not similarly clad, being unsuccessful.

Dr. Hare ascribed the incredulity and the opinions which he had expressed, when this subject was brought before the Society by Mr. Peale, at the last meeting, to a misapprehension, on his part, as to the circumstances. He considered that the fact of electricity being developed in the case adduced was established. He alluded to the almost incredible case of a lady, who, agreeably to evidence mentioned in Silliman's Journal, gave off sparks of electricity. He stated also the result of an experiment to discover whether electricity was given off during the rapid evaporation of a saline solution. There was no evidence of excitement. The vessel was of glass.

Mr. Lea had frequently observed sparks from a common grate.

In reference to the results of experiments by Dr. Patterson, in which no evidence of the development of electricity was observed in metals, whilst undergoing a change from the liquid to the solid state, Dr. Goddard observed, that in cases of crystallization on the large scale, as of nitre, in the extensive chemical works of Mr. Wetherill, a beautiful flash of electrical light was apparent.

Professor Rogers suggested, that in ordinary combustion there may be a constant development of electricity, and that means may possibly be found to render it apparent by perfect insulation.

Professor Henry stated, that Pouillet had found that electricity is developed by the combustion of charcoal, and he offered some suggestions as to the mode of rendering the electricity, given off from a stove, apparent, by insulating it both above and below.

Dr. Emerson thought, that the change of state from solid to liquid, and from liquid to solid, might account for various electrical phenomena presented by the animal body. Dr. Hare suggested the diffi-

culty, that the human body is a good conductor; and that without a peculiar organization, analogous to that with which nature has endowed the Torpedo or Gymnotus, it is inconceivable that electrical discharges could arise from vital organization. He believed it was admitted by electricians, that there could be no electrical excitement without the existence of the opposite electricities. Agreeably to the published facts of the case to which he had alluded, the lady was permanently in one state of excitement, generating electricity, as animal heat is generated, and throwing off the excess in sparks.

In the case of the Gymnotus the intensity, Dr. Hare remarked, is so low that sparks are with difficulty rendered apparent at a kerf made by a knife in tinfoil; of course, the sparks alleged to be given by the lady were vastly more intense. From the Gymnotus, sparks could only be received by forming a circuit with a portion of the organic series situate parallel to the spine. Contact in a transverse direction was not productive of any discharge.

Mr. Vaughan stated that there had been no application for the Magellanic premium.

Dr. Patterson, from the Observatory Committee, moved that Mr. Justice be added to that committee. The motion was agreed to.

Mr. Vaughan announced the death of M. J. P. F. Deleuze, of Paris, a member of the Society.

FINIS.

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