

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 Philozoa, 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 Ayloffé, 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 Crellé.)—*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 symétrique, 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 binôme réel de la forme $\sqrt{a \pm \sqrt{b}}$, 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, 1834, 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. | Of 68 Meteors seen from 8 h . to 14 h ., by one observer, moon nearly full. | Of 103 Meteors seen after setting of moon, at 14 h ., 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. |
|------------------------------|---|--|--|---|----------------------------------|----------------------------------|
| Thrice that of Jupiter | 1 | 1 | 0 | 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 | 14 | 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 formulæ 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 13h., 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 conver- gence. | Apparent Dec. of the point of conver- gence. | No. of Observa- tions. | Probable Error of single result. | Probable Error of final result. |
|--|---|--|------------------------------|-------------------------------------|------------------------------------|
| 1837. Berlin, Aug. 10 | 217 ^o .18 | —57 ^o .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 than 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.*"

* 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-