

PROCEEDINGS
OF THE
AMERICAN PHILOSOPHICAL SOCIETY.

VOL. IV.

APRIL—JUNE, 1844.

No. 30.

Stated Meeting, April, 5.

Present twenty-two members.

Dr. PATTERSON, Vice-President, in the Chair.

Mr. Hubbard of New Haven, a visiter, was introduced by Mr. Walker.

Letters were announced and read:—

1. From Major Graham, dated N. York, March 28, 1844, in relation to copies, presented by him to the Society, of a profile or vertical section, with the spirit level, of the country traversed by the due north line from the monument at the source of the river St. Croix to the river St. John; derived from surveys executed under his direction in the years 1840 and 1841, while serving as United States' Commissioner for the survey of the territory on the N. E. frontier of the United States, then in dispute with the government of Great Britain.

In presenting this document, Major Graham called the attention of the Society to the strong contrast which appeared on a comparison between the aspect of the country traversed by this due north line, as there developed, and that exhibited by the profile of Col. Bouchette, the British surveyor, under the fifth article of the treaty of Ghent, derived from his surveys of that line, and his barometric measurements upon it, in the years 1817 and 1818.

The direction of the meridian line, whose profile or vertical line was now offered to the notice of the Society, was obtained from nu-

merous astronomical observations, fully verified with a transit instrument, having a telescope of forty-three inches focal length. The meridian, thus traced, does not meet with any high land or elevation whatever in passing Mars Hill; but, on the contrary, it passes the base of that eminence considerably to the eastward, and at a *depression* no where less than twelve feet below the level of the base of the monument, which was erected to mark the source of the river St. Croix, by the commissioners appointed under the fifth article of the treaty of 1794, to ascertain and mark the true St. Croix, &c. The base of this monument is surrounded, unless at seasons of extreme drought, by the water constituting the extreme source of that river.

The profile of Col. Bouchette shows an elevation of the surface of the ground upon the meridian line, as it passes Mars Hill, of five hundred and sixty feet above the level of the monument at the source of the St. Croix; whereas by the survey of Major Graham, the true meridian from the monument passes the hill at an actual depression of twelve feet below the level of the base of the monument. The direction of the true meridian, as shown upon the profile presented by Major Graham, was derived from numerous astronomical observations made with the above mentioned transit instrument; and the elevations exhibited upon it were derived from a line traced with two spirit levels, the one following as a check upon the other, from the level of mean tide at Calais, Me. to the monument at the source of the St. Croix, and thence along the meridian line to its intersection with the river St. John.

2. From Sir Wm. Jardine, dated Jardine Hall, by Lockerbie, Feb. 15, 1844, acknowledging the receipt of Transactions of the Society, and stating that he had forwarded to the Society certain numbers of his Annals of Natural History; transmitting a prospectus of the Ray Club, and asking if it might not hope for support from this country.

The Ray Club was commenced by Sir William, and other friends, to advance the facility with which works on Natural History, not always accessible, may be procured. Names and addresses to be forwarded to Dr. George Johnston, Berwick-upon-Tweed, who has consented to act as Secretary until the feasibility of the project has been ascertained, and a council appointed.

Every subscriber of one guinea annually, payable in advance, to be members of the club.

The following donations were announced:—

FOR THE LIBRARY.

- Observations on Days of Unusual Magnetic Disturbance, made at the British Colonial Magnetic Observatories, under the Departments of the Ordnance and Admiralty. Printed by the British Government under the superintendence of Lieut. Col. Edward Sabine, of the Royal Artillery. Part I. 1840, 1841. London, 1843. 4to.—*From the British Government.*
- Transactions of the Society instituted at London for the Encouragement of Arts, Manufactures and Commerce; with the Premiums offered for the Sessions 1843–44, and 1844–45. Vol. LIV. London, 1843. 8vo.—*From the Society.*
- Boletin Enciclopédico de la Sociedad Economica de Amigos del Pais. Concluding Number of Vol. II. Valencia, 1843. 8vo.—*From the Society.*
- An Account of the Receipts and Expenditures of the United States, for the Year 1842. Prepared in the Office of the Register of the Treasury. Washington, 1843. 8vo.—*From the Treasury Department.*
- Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. II. Jan. Feb. 1844. No. 1.—*From the Academy.*
- Journal of the Franklin Institute. Third Series. Vol. VII. March, 1844. No. 3.—*From Dr. R. M. Patterson.*
- The African Repository and Colonial Journal. Vol. XX. No. 3. March, 1844. 8vo.—*From the Colonization Society.*
- The American Journal of Science and Arts. Conducted by Professor Silliman and R. Silliman, Jr. Vol. XLVI. No. 2. April, 1844. 8vo.—*From the Editors.*
- A Brief Account of the Society of the Friendly Sons of St. Patrick, with Biographical Notices of some of the Members, and Extracts from the Minutes. Philadelphia, 1844. 8vo.—*From the Hibernian Society.*
- The American Journal of the Medical Sciences. Edited by Isaac Hays, M. D. No. XIV. New Series, April, 1844. 8vo.—*From the Editor.*
- The Medical News and Library. Vol. II. April, 1844. No. 16. 8vo.—*From Lea & Blanchard.*
- Document of Congress, 1st Session 28th Congress, House of Representatives. No. 169.—*From Major J. D. Graham.*
- Profile with the Spirit Level, of the due North line from the Monu-

ment at the Source of the River St. Croix to the River St. John. Surveyed in 1840 and 1841, under the direction of Major J. D. Graham, U. S. Top. Engineers, &c. &c. Two Copies.—*From the same.*

Second Report of the Manufacture of Iron; addressed to the Governor of Maryland. By J. H. Alexander, late Topographical Engineer of the State. Printed by order of the Senate. Annapolis, 1844. 8vo.—*From the Author.*

Miscellanies. By Stephen Collins, M.D. Philadelphia, 1842. 12mo. *From the Author.*

ADDITION TO THE LIBRARY BY PURCHASE.

Astronomische Nachrichten. Nos. 493 and 494. Altona, January 6 and 13, 1844. 4to.

Mr. Kane announced the death of Professor Sanderson, a member of the Society, who died on the fifth of April, at the age of 58; and, on motion, Professor Hart was appointed to deliver an obituary notice of the deceased.

Professor Hart stated, for the information of the Society, that a Committee of the Controllers of the High School had resolved to mount the transit instrument in the Observatory of that Institution.

Dr. Hays, on the part of the Committee of Publication, presented the first part of the ninth volume of the Transactions of the Society, and drew attention to its important contents and improved appearance.

Professor Henry made a verbal communication relative to the cohesion of liquids.

He stated that very erroneous ideas are given as to the constitution of matter in the ordinary books on Natural Philosophy. The passage of a body from a solid to a liquid state is generally attributed to the neutralization of the attraction of cohesion by the repulsion of the increased quantity of heat; the liquid being supposed to retain a small portion of its original attraction, which is shown by the force necessary to separate a surface of water from water in the well known experiment of a plate suspended from a scale beam over a vessel of the liquid. It is, however, more in accordance with all the phenomena of cohesion to suppose, instead of the attraction of the liquid being neutralized by the heat, that the effect of this agent is merely to neu-

tralize the polarity of the molecules so as to give them perfect freedom of motion around every imaginable axis. The small amount of cohesion (53 grains to the square inch), exhibited in the foregoing experiment, is due, according to the theory of capillarity of Young and Poisson, to the tension of the exterior film of the surface of water drawn up by the elevation of the plate. This film gives way first, and the strain is thrown on an inner film, which, in turn, is ruptured; and so on until the plate is entirely separated; the whole effect being similar to that of tearing the water apart atom by atom.

Reflecting on this subject, Professor H. had thought that a more correct idea of the magnitude of the molecular attraction might be obtained by studying the tenacity of a more viscid liquid than water. For this purpose he had recourse to soap water, and attempted to measure the tenacity of this liquid by means of weighing the quantity of water which adhered to a bubble of this substance just before it burst, and by determining the thickness of the film from an observation of the colour it exhibited in comparison with Newton's scale of thin plates. Although experiments of this kind could only furnish approximate results, yet they showed that the molecular attraction of water for water, instead of being only about 53 grains to the square inch, is really several hundred pounds, and is probably equal to that of the attraction of ice for ice. The effect of dissolving the soap in the water is not, as might at first appear, to increase the molecular attraction, but to diminish the mobility of the molecules, and thus to render the liquid more viscid.

The communication of Professor Henry gave occasion to further observations from him in reply to remarks made by Dr. Patterson.

Dr. Dunglison directed attention to the establishment of the Sydenham Society of London, instituted with objects similar to those of the Ray Club,—to facilitate the publication of medical works and the diffusion of medical literature; and detailed the plan which the Society intends to pursue in order to carry its objects into effect.

These objects will consist of a succession of publications, embracing, among others, 1. Reprints of standard English works, which are rare and expensive. 2. Miscellaneous selections from the ancient and from the earlier modern authors, reprinted or translated. 3. Digests of the works of old and voluminous authors, British and Fo-

reign, with occasional biographical and bibliographical notices. 4. Translations of the Greek and Latin medical authors, and of works in the Arabic and other Eastern tongues, accompanied, when it is thought desirable, by the original text. 5. Translations of recent foreign works of merit and original works of merit, which might prove valuable as books of reference, but which would not otherwise be published upon the slender chance of their meeting with a remunerating sale—such as bibliographies, alphabetical and digested indexes, and voluminous periodical publications, &c.

The subscription is one guinea, to be paid in advance, on the 25th day of March annually, for which the subscriber will be entitled to a copy of every work published by the Society for the year for which he subscribes.

Dr. Dunglison stated, that the Society was already very flourishing, and consisted of 1700 members. The officers are amongst the most eminent members of the medical profession in England. At the request of the Council he had consented to act as Honorary Local Secretary for Philadelphia; and to receive subscriptions. Two works have been already issued by the Society.

Mr. Walker communicated the elliptic elements of the Comet discovered in Orion on the 23d of November last by Mr. Fay, and re-discovered in this country by Mr. Joseph S. Hubbard, of New Haven, on the 27th of December.

These elements are derived from the Paris observation of Nov. 25th, the mean of the Hamburg and Berlin observations of December 17th, and the Philadelphia observations of Jan. 24th. They represent the comet's path in the heavens within about one minute of space. They had been computed by Prof. Kendall with the assistance of Messrs. Downes and Hubbard, and are as follows, the longitudes being referred to the mean equinox of December 17th.

Perihelion passage, October	26° 07' 49.55"	m. t. Greenwich.
Longitude of Perihelion	54° 48' 58."7	
Do. Ascending Node	208 6 36.3	
Inclination	11 5 50.0	
Perihelion distance	1,714,396	
Eccentricity	0.5247541	
Angle of do.	31° 30' 6."1	

Mean Distance	3.607384
Mean daily motion direct	517."8667

Mr. W. remarked that their general resemblance to those of Dr. Goldschmidt, seemed conclusive as to the short period of this heavenly body, which though cometary in its appearance in the telescope, resembled the asteroids in the shape of its orbit.

In reply to a question from Dr. Patterson—whether there was reason to believe, that the Comet had ever been seen before? Mr. Walker stated, that he had not yet the necessary elements for a decision.

Stated Meeting, April 19.

Present, twenty-nine members.

Dr. BACHE, Vice-President, in the Chair.

Letters were announced and read:—

1. From the Secretary of the Commonwealth of Massachusetts, dated Boston, Nov. 25th, 1844, offering to present to the Society certain works, the results of scientific surveys made under the direction of that Commonwealth:—

2. From the Royal Geographical Society, dated London, Dec. 14, 1843, acknowledging the receipt of the Society's Proceedings:—

3. From the American Academy of Arts and Sciences at Boston, dated April 10th, 1844, enclosing the following resolutions on the occasion of the death of the President of this Society:—

Resolved, That the American Academy of Arts and Sciences has received with pain the intelligence of the death of the learned President of the American Philosophical Society of Philadelphia, Peter S. Du Ponceau, Esq. LL.D., and deeply sympathizes with that Society on the loss of that eminent man, whose talents and patriotic services have shed lustre upon our country, and conferred honour upon the distinguished body over which he was selected to preside, as a wor-