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From November 15, 1888, to April 11, 1889.

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**Fig. 5.**—The photograph shows the rhythmical (clonic) effect only. The recording surface was made to travel more rapidly past the slit, a marked rhythmical change having been first evoked by excitation of the cortex. The plate was not allowed to commence its passage past the slit until six seconds after the excitation had ceased. The rhythm is thus seen to great advantage. As before, the upward movement of the mercury, as indicated by the elevations of the more darkly toned parts, are due to electromotive changes in the cord such that the longitudinal surface of the cord becomes negative to the transverse section.

**Fig. 6.**—Photograph showing the effect obtained when, with the spinal cord connected as in the preceding with the electrometer, the cortex cerebri is removed and the corona radiata excited by faradisation. The excitation commenced at $a$ and ceased at $c$. It is accompanied by an upward persistent movement of the mercury, shown in the photograph as an alteration of level, and corresponding in character to the (tonic) effect produced during the excitation of the cortex. On the cessation of the stimulus the effect subsides and is not followed by any rhythmical effect.

*Transactions.*


The University.


The Institute.


The Society.


The Association.

Transactions (continued).


Buffalo:—The Buffalo Library and its Building. 4to. Buffalo, N.Y. 1887. The Library.


Europe:—Congrès Géologique International. Compte Rendu. 3me Session. Berlin 1885. 8vo. Berlin 1888; Explications des Excursions. 4me Session. Londres 1888. 8vo. Londres; Reports of the British Sub-Committees on Classification and Nomenclature. 2nd edit. 8vo. Cambridge 1888; Carte Géologique Internationale de l'Europe. Feuille 24 (C. IV.).

Dr. W. Hauhecorne and Mr. Topley, F.R.S.


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The Academy.

University. Calendar. 1888. 8vo. Sydney. The University.

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Observations and Reports.


The Commission.


The Observatory.


The Observatory.


The Survey.


The Observatory.


The Office.

Greenwich:—Royal Observatory. Observations. 1886. 4to. London 1888; Spectroscopic and Photographic Results, 1886–87. 4to. London; Astronomical Results, 1886. 4to. London; Magnetic and Meteorological Observations, 1886. 4to. London; Rates of Chronometers on Trial for Purchase by the Board of Admiralty, 1887, July 2, to 1888, January 21. 4to. London 1888.

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Observations, &c. (continued).


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The Meteorological Office.


London:—Army Medical Department. Report, 1886. 8vo. London 1888. The Department.


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Assier (A. d’) Note sur le Transformisme. 8vo. Foix [1888].

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Brandis (Sir D.), F.R.S. Notes on Forest management in Germany. Folio. London 1888.

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Carruthers (Rev. G. T.)  The Planets upon Cardioides. [Six copies.]  
4to. Roorkee 1888.  The Author.


Colenso (W.), F.R.S.  Papers contributed to the Transactions of the New Zealand Institute. Vol. XX, 1887.  8vo. [Wellington]; Anniversary Address to the Hawke's Bay Philosophical Institute. 8vo. Napier 1888.  The Author.


Lawes (Sir J. B.), F.R.S.  Memoranda of the Field and other Experiments at Rothamsted, June, 1888. 4to. London.

Sir J. B. Lawes, Bart., F.R.S.

Lemoine (E.) and Vigarié (E.)  Note sur les Éléments Brocardiens.
Mann (H.) Features of Society in Old and New England. Sm. 4to. Providence 1885. The Author.
Sylvester (J. J.), F.R.S. Lectures on the Theory of Reciprocants, delivered before the University of Oxford, 1886. 4to. [Baltimore.] The Author.
Symons (G. J.), F.R.S. British Rainfall, 1887. 8vo. London 1888. Mr. Symons, F.R.S.

The Original Illustrations to Hewson’s work on the Lymphatic System. Folio. Dr. Addinell Hewson, Philadelphia.
Bronze Medal, awarded by the Amsterdam Academy in Latin Verse competition. The Academy.
The effects of such a body in destroying the equilibrium of the spheroid when the forced tide coincides with one of the free tides form the conclusion of this paper.

Present, November 22, 1888.

Transactions.


The Academy.


The School.


The Society.


The Institute.


The Society.


The Society.


The Institute.


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The Society.


The Society.


The Society.


The Institute.

Journals.


L’École des Mines.
Journals (continued).


La Société Hollandaise des Sciences.


Dr. Richardson, F.R.S.


Astronomische Gesellschaft, Kiel.


Physikalische Gesellschaft, Berlin.

Mittheilungen aus der Zoologischen Station zu Neapel. Bd. VIII. Heft 2. 8vo. Berlin 1888.

Dr. Dohrn.


The Editors.


Prof. Pasquale Freda.

Brongniart (C.), and E. Sauvage. Études sur le Terrain Houiller de Commentry. Livre troisième.—Faunes Ichthyologique et Entomologique. 4to. Saint-Étienne 1888. M. Brongniart.


The Author.

Darwin (C.), F.R.S. Life and Letters. Edited by his son, Francis Darwin. 3 vols. 8vo. London 1888. Mr. F. Darwin, F.R.S.


The Author.

Favenc (E.) The History of Australian Exploration from 1788 to 1888. 8vo. Sydney 1888.

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The Author.


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The Author.
November 30, 1888.

ANNIVERSARY MEETING.

Professor G. G. STOKES, D.C.L., President, in the Chair.

The Report of the Auditors of the Treasurer’s Accounts on the part of the Society was presented, by which it appears that the total receipts during the past year, including balances carried from the preceding year, amounted to £25,125 18s. 6½d. on the General Account, and £17,884 0s. 7d. on account of Trust Funds, and that the total expenditure in the same period, including purchase of stock, amounted to £26,079 0s. 0½d. on the General Account, and £15,771 14s. 6d. on account of Trust Funds, leaving on the General Account an overdrawn balance of £953 1s. 6d., less £22 2s. 11d. petty cash in hand, and on account of Trust Funds a balance at the Bankers’ of £2,112 6s. 1d.

The thanks of the Society were voted to the Treasurer and Auditors.

The Secretary then read the following Lists:—

Fellows deceased since the last Anniversary (Nov. 30, 1887).

On the Home List.

Burrows, Sir George, Bart., M.D.
Curling, Thomas Blizard, F.R.C.S.
Farre, Arthur, M.D.
François de Chaumont, Francis Stephen Bennet, M.D.
Frere, George Edward.
Godwin, George, F.S.A.
Gosse, Philip Henry.

Greenhow, Edward Headlam, M.D.
Griess, John Peter, F.C.S.
Hoskins, Samuel Elliott, M.D.
Key, Sir Astley Cooper, Admiral, G.C.B.
Maine, Sir Henry Sumner, K.C.S.I.
Morgan, Octavius S., M.A.
Spratt, Thomas Abel Brimage, Vice-Admiral, C.B.
Stewart, Balfour, M.A.
The formation of a film of lower refractive index on the glass would account for the defect in the reflected light; but to account for the excess, it seems necessary to assume that the polishing has increased the optical density of the surface-layer, and the changes produced in the amount of light transmitted and in the angle of polarisation support this view.

After being polished, the surface of flint glass seems to alter somewhat readily, the amount of the reflected light decreasing, and the amount of the transmitted increasing, whilst with crown glass the change, if any, proceeds very slowly.

There is no evidence to show to what particular cause these changes are due.

The values of the transmission coefficients for light of mean refrangibility for the two particular kinds of glass are given, and show that for 1 cm. the loss by obstruction amounts to 2.62 per cent. with the crown glass and 1.15 per cent. with the flint glass.

IV. “The Specific Resistance and other Properties of Sulphur.”

By James Monckman, D.Sc. Communicated by Professor J. J. Thomson, F.R.S. Received November 10, 1888.

[Publication deferred.]
Transactions (continued).


The Society.


The Society.


The Society.


The Society.


The Society.


The Association.


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The Institution.


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Upsala:—Universitet. Årsskrift. 1887. 8vo. *Upsala* [1888].

The University.


The Society.


The Institute.


The Museum.


The Author.
Bristowe (J. S.), F.R.S. Diseases of the Nervous System. 8vo. 
London 1888.

Capellini (Prof.) Resti Fossili di Dioplodon e Mesoplodon. 4to. 
Bologna 1885; Ottavo Centenario dello Studio di Bologna. 8vo. 
Bologna 1888. With five Excerpts in addition. 4to. Bologna 
1873–88.

Palæozoic. 4to. London 1888.

London 1888.

Jones (T. R.), F.R.S., and H. Woodward, F.R.S. An Undescribed 
Carboniferous Fossil. 8vo. London 1888. With two other 
Excerpts in 8vo. Prof. Jones, F.R.S.

King (G.), F.R.S. The Species of Ficus of the Indo-Malayan and 

Lemoine (E.) De la Mesure de la Simplicité dans les Sciences 
Mathématiques. 8vo. Gand 1888. With two Excerpts in 8vo. 

Pitt-Rivers (A.), F.R.S. Excavations in Cranborne Chase. Vol. II. 
4to. [Privately Printed] 1888.

Smith (J. C.) The Culmination of the Science of Logic. 8vo. 
Brooklyn 1888.

Symons (G. J.), F.R.S. The Floating Island in Derwentwater, its 
History and Mystery. Sm. 4to. London 1888. The Author.

Turner (Sir W.), F.R.S. The Comparative Osteology of the Races 
of Men (and other papers, being certain Reports of the Voyage 
of H.M.S. "Challenger.") 4to. Edinburgh 1884–86.

The Author,
Transactions.


Glasgow 1888. The Society.


Gloucester 1888. The Club.

Innsbruck:—Ferdinandum für Tirol und Vorarlberg. Zeit- 


XVII. 8vo. Innsbruck 1888. The Verein.

Jena:—Medizinisch-Naturwissenschaftliche Gesellschaft. Jenaische 


Kharkoff:—Société des Sciences Expérimentales (Section Médicale). 


Kieff:—Society of Naturalists. Memoirs. [Russ.] Vol. IX. 


Vol. XXIV. No. 98. 8vo. Lausanne 1888. The Society.


Howard Association. Report, 1887, and general pamphlets. 8vo. 


8vo. London 1888. The Secretary of State for India.


Mr. Symons, F.R.S.


Paris 1888; Mémoires présentés par divers Savants. Sér. 2. 

Tomes XXVIII–XXIX. 4to. Paris 1884, 1887; Recueil de Mémoires, Rapports, et Documents relatifs à l’Observation du 

Passage de Vénus sur le Soleil. Tome III. Partie 2. 4to. 

Paris 1885; Bulletin du Comité International Permanent pour 

l’Exécution Photographique de la Carte du Ciel. Fasc. 1. 4to. 


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   The Society.

   The Academy.


   The Academy.

Observations and Reports.


Dun Echt:—Observatory. Circulars. Nos. 157–164. 4to. [Sheet.] The Earl of Crawford, F.R.S.


Meteorological Office. Observations at Stations of the Second
Observations, &c. (continued).

Order. 1884. 4to. London 1888; Daily Weather Reports. 1888. January to June. 4to. London.

December 20, 1888.

Professor G. G. STOKES, D.C.L., President, in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read:—

I. "Co-relations and their Measurement, chiefly from Anthropometric Data." By FRANCIS GALTON, F.R.S. Received December 5, 1888.

"Co-relation or correlation of structure" is a phrase much used in biology, and not least in that branch of it which refers to heredity, and the idea is even more frequently present than the phrase; but I am not aware of any previous attempt to define it clearly, to trace its mode of action in detail, or to show how to measure its degree.

Two variable organs are said to be co-related when the variation of the one is accompanied on the average by more or less variation of the other, and in the same direction. Thus the length of the arm is said to be co-related with that of the leg, because a person with a long arm has usually a long leg, and conversely. If the co-relation be close, then a person with a very long arm would usually have a very long leg; if it be moderately close, then the length of his leg would usually be only long, not very long; and if there were no co-relation at all then the length of his leg would on the average be mediocre. It is easy to see that co-relation must be the consequence of the variations of the two organs being partly due to common causes. If they were wholly due to common causes, the co-relation would be perfect, as is approximately the case with the symmetrically disposed parts of the body. If they were in no respect due to common causes, the co-relation would be nil. Between these two extremes are an endless number of intermediate cases, and it will be shown how the
VII. The shortest period observed intervening between the inoculation of the foetus in utero and parturition, after which the mother was found to be protected against the inoculation of virulent anthrax blood, was thirty-six hours.

VIII. For the protection of the surviving foetuses, or those other than the one primarily inoculated with anthrax in utero, a longer exposure is required than the minimum thirty-six hours observed to protect the mother. Or the surviving foetuses may have received protection, provided that a period of not less than six days have elapsed between the primary inoculation of the foetus in utero and parturition.

IX. In those cases where the mother died of anthrax contracted at the time of the inoculation of the foetus in utero, and excepting the last-mentioned one, the heart's blood of the other foetuses in utero was not found to contain any anthrax bacilli, as proved by cultivations when the examination was made, several hours after the death of the mother. But if the examination and cultivations were made some sixty or seventy hours later, then any or all of the foetuses, according to the temperature of the air prevailing, may have anthrax bacilli in their blood.

[X. The inoculation of a foetus in utero with anthrax may produce one of three results:—

(i.) If during the inoculation of a foetus the anthrax bacilli gain entrance into the tissues of the mother, owing to imperfect manipulation, the mother naturally succumbs to the disease.

(ii.) In some cases the organisms pass through from the foetal to the maternal vessels; this is probably due to some change taking place in the placental tissues, either inflammatory or traumatic in origin.

(iii.) Lastly, in those cases where the foetus alone is inoculated, the mother remains free from the bacillary disease, and at a later date is found to have acquired immunity.—Jan. 22, 1889.]

XI. In sections of the placenta of the foetus primarily inoculated with anthrax in utero, and through which the mother received protection, the anthrax bacilli, after staining with aniline dyes, are to be seen wholly in the foetal, while there is a total absence of them in the maternal portion.

The Society adjourned over the Christmas Recess to Thursday, January 10th, 1889.

Presents, December 20, 1888.

Transactions.
Transactions (continued).


Professor Capellini.


Magdeburg:—Naturwissenschaftlicher Verein. Jahresbericht und
Transactions (continued).

Observations and Reports.
The Government of India.

The Department.


Meteorological Office. Meteorological Observations at Seven Stations in India. 1888. January to July. Folio. [Calcutta.] The Office.

The Observatory.


India:—Survey of India. Trigonometrical Branch. Spirit-
Observations, &c. (continued).

The Survey.
The Observatory.
The Department.
The Department.

The Bureau.
The Comité.
The Survey.
The Institute.

The Observatory.
The Observatory.
The Observatory.

The Survey.
The Survey.
The Office.
The Office.

The Office.
zeal and the intelligence with which their part of the work has been performed. I must also specially thank Mr. Fowler for his collaboration in the preparation of the paper itself, and for supervising in part the work of the other assistants.

In connexion with the diagrams, I have to thank Sergeant Kearney, R.E., for reducing the working drawings, and also for preparing the lantern slides exhibited during the reading of this paper.

*Presents, January 10, 1889.*

Transactions.


Transactions (continued).


Transactions (continued).


by sending a current through it; for this purpose a layer of sulphuric acid was placed between the primary and secondary coils of such thickness that it almost but not quite stopped the sparks in the latter; a current of about 2 ampères, which was reversed about 500 times a second, was then sent through the sulphuric acid, but the passage of the current did not seem to produce any effect whatever upon the sparks in the secondary. I conclude, therefore that the resistance of an electrolyte is not affected by the passage of a current.

I wish to express my thanks to my assistant, Mr. E. Everett, for the zeal and skill he has displayed in these experiments.

[Note added February 15, 1889.—I have recently tried the effect of a very high vacuum in stopping the sparks. The primary circuit consisted of two straight wires with spheres fastened to one end of each; these wires were connected with the poles of an induction coil, and the sparks passed between the spheres. The secondary consisted of two similar wires, with smaller balls at the ends, the distance between the balls being very small. The length of the wires of the secondary was altered until it was in resonance with the primary. The secondary was placed in a hollow cylinder formed of two coaxial glass tubes, sealed on to a mercury pump, by means of which a very high vacuum was obtained in the space between them, which surrounded the secondary. This vacuum, however, did not produce the slightest effect on the sparks.]

Transactions.
Hermannstadt:—Siebenbürgischer Verein für Naturwissenschaften.
Transactions (continued).

Journals.
Analyst (The) July to December, 1888. 8vo. London. The Editor.
Athenæum (The) July to December, 1888. 4to. London. The Editor.
Builder (The) July to December, 1888. Folio. London. The Editor.
Chemical News. July to December, 1888. 4to. London. Mr. W. Crookes, F.R.S.
Educational Times (The) July to December, 1888. 4to. London. The College of Preceptors.
Electrical Engineer (The) July to December, 1888. Folio. London. The Editor.
Electrician (The) July to December, 1888. Folio. London. The Editor.
Industries. July to December, 1888. 4to. London. The Editor.
Journals (continued).

Berlin.

Oesterreichische Gesellschaft für Meteorologie.


Compass Observatory, Cronstadt.


The Editor.

The Editor.

Notes and Queries. July to December, 1888. 4to. London.
The Editor.

The Sun's Surface as observed by James Nasmyth, June 5th, 1864.
Photographed from the original drawing. Mr. Nasmyth.

January 24, 1889.

Professor G. G. STOKES, D.C.L., President, in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read:—


In consequence of a paper which has appeared in the last number of the 'Zeitschrift für Hygiene,' by Dr. Carl Fränkel, entitled "Ueber die Einwirkung der Kohlensäure auf die Lebensfähigkeit der Mikroorganismen," I have been led to publish the results of some preliminary experiments on the same subject which I made in the spring of 1886, but which, owing to my attention being at that time devoted to investigations in other directions, I was obliged to put on one side. Although the methods which I adopted in my experiments are essentially different from those which Fränkel has employed, yet the results, so far as they can be compared with his, are on the whole concordant.
interesting points. In calculating this, the sagittal diameter of the
different vertebral bodies is taken as the standard and compared with
the axial vertical diameter. This index is observed to present a direct
relation to the proportion of bone and cartilage which enters into the
construction of the lumbar column. The higher the index the
smaller is the amount of intervertebral substance, and vice versâ.
This has been tested in the European, Australian, Chimpanzee,
Baboon, Macaque, and Orang. The European excels all these in the
amount of cartilage as compared with bone in the lumbar region of
the vertebral column. In the erect attitude of man this greater
amount of cartilage lessens the shocks transmitted upwards through
the column. In the prone or semi-prone position of the trunk the
same provision is not so necessary.*

Transactions.

Baltimore:—Medical and Chirurgical Faculty of the State of
Maryland. Transactions. 90th Annual Session, 1888. 8vo.
Baltimore. The Faculty.
Frankfort-on-Main: — Seuckenbergsche Naturforschende Gesell-
schaft. Abhandlungen. Bd. XV. Heft 3. 4to. Frankfurt-am-
Main 1888. The Society.
Leipsic:— Königl. Sächs. Gesellschaft der Wissenschaften. Ab-
London: — British Pharmaceutical Conference. Year-Book of
The Society.
Institution of Mechanical Engineers. Proceedings. 1888. No. 3.
8vo. London. The Institution.
328–332. 8vo. London 1888; List of Members. 1888. 8vo.
[London.] The Society.
Odontological Society of Great Britain. Vol. XXI. No. 2. 8vo.
1888. The Society.

* The spine of the aboriginal Australian referred to in the foregoing abstract was
obtained from Professor T. P. Anderson Stuart, of Sydney University.
Transactions (continued).


Royal College of Surgeons. Calendar. 1888. 8vo. London. The College.


Journals.


Journals (continued).
Dr. Richardson, F.R.S.
The Prince Boncompagni.
Natural History Society, Montreal.
Chamber of Commerce Journal. July to December, 1888. 4to.
London.
The London Chamber of Commerce.
Observatory (The) July to December, 1888. 8vo. London.
The Editors.
The Editor.
The Editor.
Mr. Symons, F.R.S.
The Editors.
right leg extremely oedematous. Large hæmorrhages over upper part of leg and lower part of abdomen.

Dog II.—17 lbs. 12 c.c. of solution injected, but ten times diluted, and injection lasting five minutes. Femoral vein tied close to ligament. Dog killed next day. No trace whatever of clotting anywhere. Leg absolutely free from the slightest trace of oedema or hæmorrhage.

So far as my observations go, the tendency to oedema is the first symptom of fibrinogen intoxication, i.e., it is more easily produced than any other.

One of the most important features in these observations lies in their relationship to many important diseases. I have pointed out the conditions which must prevail to produce a fibrinogen intoxication. It is improbable that diseased conditions are often set up by a sudden large flow of lymph into the blood; but it is certain that the other conditions, the slowing of the circulation in the neighbourhood of the thoracic duct, is a common incident, particularly I may mention valvular disease of the heart and obstruction to the circulation through the lungs, as conditions which necessarily produce this result. It is a dogma of medicine that cardiac dropsy as a symptom of cardiac failure, is due to the mechanical obstruction of the circulation. My observations lead me to the conclusion that the danger in cardiac disease is fibrinogen intoxication; and that the symptoms of cardiac disease—e.g., dropsy, formation of intravascular clots, hemorrhagic infarction, fever, &c.—are largely dependent on this condition.

Transactions.


The Academy.


The Society.


The Academy.


Dr. Treub.


The Society.
Transactions (continued).
Transactions (continued).

Rotterdam:—Société Batave de Philosophie Expérimentale. Programme. 1888. 8vo. [Rotterdam.] The Society.


Journals.

adjustment, owing to a recent accident, I submit it to the Society because there appears to be evidence of bright lines in the photograph. It is altogether too early to announce this as an established fact, but I think it well to send in this note, in order that other observers with more powerful optical appliances and a better climate than that of London may investigate the question.

The photograph exhibited was taken on the 2nd instant by Mr. Porter, Computer to the Solar Physics Committee. The instrument employed was the 10-inch equatorial of the Science Schools, and a spectroscope of two prisms of 60°.

Other considerations point to the possibility that bright lines or bands may be found in the spectrum of Uranus.

**Transactions.**


**Pharmaceutical Society of Great Britain.** Calendar. 1889. 8vo. London. The Society.


Transactions (continued).


Observations and Reports.


International Polar Expeditions:—Expédition Suédoise, 1882–83. 2
Observations, &c. (continued).
Observations faites au Cap Thördsen, Spitzberg. Tome II. Fasc. 2-4. 4to. Stockholm 1887.


Lyne Regis:—Rousdon Observatory. Observations. 4to. [Sheet.] 1889. Mr. C. E. Peek.


February 14, 1889.

Professor G. G. STOKES, D.C.L., President, in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read:—

I. "Magnetisation of Iron at High Temperatures." (Preliminary Notice.) By J. HOPKINSON, F.R.S. Received January 30, 1889.

I have recently been making some determinations of the curves of magnetisation of iron at varying temperatures up to that at which the iron ceases to be magnetic. Although the experiments are still progressing, some of the results are of sufficient interest to be worth publishing briefly at once.

The method of experiment was identical with that which I used for a sample of nickel about a year ago. The temperatures are estimated by the resistance of a copper secondary coil, and as there may be some uncertainty as to what temperatures the several resistances correspond with, I give in the curves which follow the resistance observed as well as the temperature estimated.
Transactions.


Halle:—Verein für Erdkunde. Mitteilungen. 1888. 8vo. Halle.


Transactions (continued).


The Faculty.


The Society.


Colladon (D.), and C. Sturm. Mémoire sur la Compression des

Cudworth (W.) Life and Correspondence of Abraham Sharp. 8vo. London 1889.


Haviland (A.) The Spelling “Mann” or “Man.” 8vo. Douglas 1888.

Hooker (Sir J. D.), F.R.S. Flora of British India. Part 15. 8vo. London 1888.


The Inspector-General of Chinese Customs, Peking.

Conclusions.

The pulmonary vessels of the dog are supplied with vaso-motor fibres leading the cord through the roots of the uppermost dorsal nerves. No efferent vaso-motor fibres have been detected in the vagus nerve.

The pulmonary circulation is comparatively independent of the systemic, and alterations in the blood-pressure of the latter must be of large amount to affect the pulmonary blood-pressure. It is probable that no rise of aortic pressure can materially influence the pulmonary blood-pressure, unless it is so great in amount or duration that the heart muscle and valves are unable to cope with it, and so an actual regurgitation is produced.

It is possible that the pulmonary blood-pressure can also be affected by rises of systemic pressure causing venous distension, and hence an increased supply to the right side of the heart.

Finally, although it is undoubted from the results of this research that the mammalian pulmonary vessels receive vaso-motor nerves, yet it is probable that the vaso-motor mechanism is but poorly developed as compared with that regulating the systemic arteries.

In this respect it may be that the pulmonary system holds an intermediate position between the systemic arteries on the one hand and the veins on the other.

This question we hope to elucidate by a further research. We also hope that, shortly, we shall be able to give the results of our researches on the vaso-dilator nerves of the lungs.

Presentes, February 21, 1889.

Transactions.


The Society.


The Museum.


The University.


The Academy.


The Museum.
Transactions (continued).
Edinburgh:—Royal Society. List of Members. 1888. 4to. [Edinburgh.]
The Society.
Mr. D. Sharp.

Observations and Reports.
1889.]

Observations, &c. (continued).


The India Office.


The Comisión.


Académie Royale des Sciences de Suède.

Stonyhurst College Observatory:—Results of Observations. 1887. 8vo. Market Weighton 1888.

The Rev. S. J. Perry, F.R.S.


Commission Géodésique Suisse.


The Trustees.


The Department.

Observatory. Results of Meteorological Observations made in New South Wales, 1886. 8vo. Sydney 1888; Results of Rain, River, and Evaporation Observations during 1887. By H. C. Russell, F.R.S.

The Observatory.


The Observatory.


The Office.


Mr. Nursingrow.


The Bureau.


The Smithsonian Institution.
February 28, 1889.

Professor G. G. STOKES, D.C.L., President, in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read:—

I. "On the Spectra of Meteor-swarms (Group III)." By J. Norman Lockyer, F.R.S. Received February 14, 1889.

I. Introductory.

Up to the present time the prevailing idea has been that nebula, stars, and comets represent different orders of bodies in the cosmos, and all classifications have proceeded on the assumption not only that these bodies are variously constituted but that in the case of the "stars" all are becoming cooler. In a paper communicated to the Royal Society in 1865,* Dr. Huggins writes: "My observations, as far as they extend at present, seem to be in favour of the opinion that the nebula which give a gaseous spectrum are systems possessing a structure and a purpose in relation to the universe, altogether dis-

mental way were constructed. In the more satisfactory form of the apparatus an iron annulus surrounded by a coil of fine silk-covered copper wire is embedded in a layer of paraffin wax between two glass plates, and pieces of tinfoil are affixed on the outside surfaces of the plates to serve as the coatings of a condenser. The electric displacement passes through the aperture of the iron annulus. Any changes in that displacement set up magnetic forces acting round the iron annulus, which, thereby, is subjected to a varying magnetisation. The annulus in turn sets up induction currents in the copper wire that surrounds it, these induction currents being received and rendered audible in an ordinary telephone receiver. The condenser is connected to a Ruhmkorff coil which rapidly charges and discharges it. The sounds heard in the telephone receiver establish the reality of the magnetic action of the variations in the electric displacement.

The author points out that this device, which may be regarded as a new kind of proof plane for exploring varying electrostatic fields, is probably capable of other useful applications, such as the investigation of specific inductive capacities.

Transactions.


Professor D’Arcy Thompson.


Transactions (continued).


Nottingham:—University College. Calendar. 1888–89. 8vo. Nottingham. The College.


Observations and Reports.


Dun Echt:—Observatory. Circular. No. 168. 4to. [Sheet.] 1889. The Earl of Crawford, F.R.S.

Germany:—Königl. Preuss. Geodätisches Institut. Astronomisch-Geodätische Arbeiten I. Ordnung.—Telegraphische Längen-
Observations, &c. (continued).
bestimmungen im Jahre 1887. 4to. Berlin 1889; Das Märkisch-
Thüringische Dreiecksnetz. 4to. Berlin 1889.

The Institute.

International Geological Congress. Reports of the British Sub-
Committees on Classification and Nomenclature. Second
Edition. 8vo. Cambridge 1888. Mr. W. Topley, F.R.S.
London:—Meteorological Office. Report of the Meteorological
Council to the Royal Society for the Year ending 31st March,
1888. 8vo. London.
The Office.

Madras:—Observatory. Meridian Circle Observations. 1865, 1866,
and 1867. 4to. Madras 1888.
The Observatory.

Melbourne:—Department of Mines and Water Supply, Victoria.
The Department.

Melbourne.
The Observatory.

Mexico:—Observatorio Meteorológico-Magnético Central. Boletín
Mensual. Tomo I. Núm 5 (Suplemento), 6-10. 4to. [México]
1888.
The Observatory.

Moscou 1888.
The Observatory.

New Haven:—Yale Observatory. Reports. 1886–87, 1887–88. 8vo.
[New Haven.]
The Observatory.

Oxford:—Radcliffe Library. Catalogue of Books added during
1887. 4to. Oxford 1888.
The Library.

Two Photographs of Pencil Sketches of Gauss and Olbers, by the late
Professor Listing.

Sir G. B. Airy, F.R.S.
lengths obtained for the aurora line were 5595, 5586, and 5587. Unlike most observations, these place the aurora line on the less refrangible side of the manganese fluting. Hence, we have an additional reason for neglecting the difference between the wave-length of the brightest edge of the manganese fluting, and the commonly accepted wave-length of the aurora line, as given by Ångström.

. . . . These observations are the latest which have been published, and were obviously made with a full knowledge of all previous work, so that their importance must be strongly insisted upon.

I have already pointed out that Krafft's measures were not made under circumstances which assured to them a high degree of accuracy; and Krafft's own words, which I have quoted, disclaim expressly any special attempt on his part to redetermine the position of the principal line with a higher degree of accuracy than the observers who preceded him.—March 4.]

III. "On the Cranial Nerves of Elasmobranch Fishes. Preliminary Communication." By J. C. Ewart, M.D., Regius Professor of Natural History, University of Edinburgh. Communicated by Professor B. Sanderson, F.R.S. Received February 22, 1889.

[Publication deferred.]
Transactions (continued).


Observations and Reports.


or in terms of \( p, q, \) and with restoration of \( a, \)

\[
p^3 = \frac{q \mu^4 a^2}{2 \rho} \tag{37}
\]

This agrees with the usual formula* for the transverse vibrations of rods.—Added April 3.]

Present, March 14, 1889.

Transactions.

Transactions (continued).

Journals.
Asclepiad (The) Vol. VI. No. 21. 8vo. London 1889. Dr. Richardson, F.R.S.
Revue Médico-Pharmaceutique. 1888. Nos. 8–9, 11. 4to. Constantinople. The Editors.
University Studies. Vol. I. No. 2. 8vo. Lincoln (Nebraska) 1888. The University of Nebraska.
will be seen that the temperature coefficient of iron ranges from 0.0048 at the ordinary temperature to 0.018 at a temperature just short of 855° C.; it then suddenly changes to about 0.0067. The last coefficient can only be regarded as a somewhat rough estimate.

This temperature being a higher temperature than I had observed previously in any case as the temperature at which a sample of iron ceases to be magnetic, it appeared desirable to ascertain whether the iron wire differed from other samples in this respect. A ring was formed of the wire, and was wound with a primary and secondary coil, and the resistance of the secondary was determined when the magnetisability of the iron disappeared. It was found that this resistance was the resistance which corresponded to a temperature of 870° C.; this temperature agrees with that at which the discontinuity in the resistance curve occurs, within the limits of errors of observation.

*Transactions.*


Transactions (continued).


The Academy.


The Institute.


The Museum.


The Society.

Warwick:—Warwickshire Naturalists’ and Archaeologists’ Field Club. Proceedings. 1887. 8vo. Warwick [1888].

The Club.


The Society.


The Society.

Observations and Reports.


The Observatory.


The Office.

Calcutta:—Meteorological Office. Observations made at Seven Stations in India. August—September, 1888. Folio. [Calcutta].

The Office.


The Bureau.


The Survey.


The Comisión.


The Observatory.


The Survey.

Field. Part 2. 8vo. [Harrisburg 1888]; Atlas, Eastern Middle Anthracite Field. Part 2. 8vo. [Harrisburg 1888].

The Survey.


The Government of New Zealand.

Zürich:—Schweizerische Meteorologische Central-Anstalt. Annalen. 1886. 4to. Zürich [1887].

The Institute.

March 28, 1889.

Professor G. G. STOKES, D.C.L., President, in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read:—

I. "The Structural Arrangement of the Mineral Matters in Sedimentary and Crystalline Pearls." By GEORGE HARLEY, M.D., F.R.S. Received March 6, 1889.

[Publication deferred.]

II. "On the descending Degenerations which follow Lesions of the Gyrus marginalis and Gyrus fornicatus in Monkeys." By E. P. FRANCE. With an Introduction by Professor SCHÄFER, F.R.S (from the Physiological Laboratory, University College, London). Received March 9, 1889.

(Abstract.)

This paper contains a minute account of the descending degenerations which have been observed to make their appearance in the lower portions of the central nervous system, as the result of artificially established lesions of parts of the cerebral cortex. The work has been carried out by Mr. France with material supplied by the researches of Professor Horsley, Dr. Sanger Brown, and Professor Schäfer,
investigation of the behaviour of gases through which electric discharges are passing.

It will be interesting to follow out the investigation, especially with a view of examining the influence of sun-spot variation. The question of magnetic disturbances is more complicated, but as magnetic observatories are being established in many countries, the time may not be far distant when we shall be able to bring the irregular disturbances within the reach of calculation.

In order to facilitate the necessarily long computations, the author makes an appeal to the heads of magnetic observatories to reduce the regular variation according to the method adopted by Wild at St. Petersburg, or that in use at Greenwich, the two being nearly identical. The variations should also be reduced to the geographical coordinates, instead of to magnetic coordinates.

The author acknowledges the help he has received from Mr. William Ellis in some of the reductions; he has also to thank his assistant, Mr. A. Stanton, for much labour bestowed on making and checking numerical calculations.

V. "On the Conditions for effective Scour in Drain-pipes of Circular Section." By HENRY HENNESSY, F.R.S., Professor of Applied Mathematics and Mechanism in the Royal College of Science for Ireland. Received March 1, 1889.

Transactions.


Transactions (continued).
Tokio:—Imperial University, College of Science. Journal. Vol. II. Part 4. 4to. Tōkyō 1888; Calendar of the University. 1888-89. 8vo. Tōkyō 1888. The University.

Observations and Reports.

"The Spinal Curvature in an Aboriginal Australian." By D. J. Cunningham, M.D. (Edin. and Dubl.), Professor of Anatomy in the University of Dublin. Communicated by Sir W. Turner, F.R.S. Received January 14,—Read January 24, 1889.

When the lumbar vertebrae of a native Australian, or of several other low races of man, are placed in apposition, the centra form a curved column, with the concavity directed to the front. In other words, the bodies of the lumbar vertebrae are not moulded as in the European, but are wedge-shaped in the opposite direction. This condition can be expressed and contrasted in the different races by formulating a lumbo-vertebral index. In calculating this index the anterior vertical diameter of the vertebral body is taken as the standard,

[Publication deferred.]

IV. "On the Limit of Solar and Stellar Light in the Ultra-violet Part of the Spectrum." By WILLIAM HUGGINS, D.C.L., LL.D., F.R.S. Received March 28, 1889.

[Publication deferred.]

Transactions.


Transactions (continued).


Allman (G. J.), F.R.S. Greek Geometry from Thales to Euclid. 8vo. Dublin 1889. The Author.
Burdett (H. C.) Burdett’s Official Intelligence. 1889. 4to. London. Mr. Burdett.
Dellingshausen (Baron N.) Grundzüge einer Vibrationstheorie der Natur. 8vo. Reval 1872. Dr. Brunton, F.R.S.
Hartig (R.) Ueber die Bedeutung der Reservestoffe für den Baum. 4to. Leipzig 1888. With one other Excerpt. The Author.
Hinde (G. J.) On Archaeocyathus (Billings), and on other Genera, allied to or associated with it, from the Cambrian Strata of North America, &c. (Excerpt.) 8vo. London 1889. The Author.
Mr. A. W. Rücker and Prof. T. E. Thorpe. [Apr. 11,


Photograph of the portrait of John Evelyn, F.R.S., in the possession of the Royal Society. Dr. Frankland, F.R.S.

April 11, 1889.

Professor G. G. STOKES, D.C.L., President, in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The Bakerian Lecture was delivered as follows:—


(Abstract.)

Two magnetic surveys of the British Isles have been made previous to that of which an account is given in this paper. The necessary observations were taken between the years 1834–38 and 1857–62, and the results were reduced to the epoch 1842.5 by Sir E. Sabine (‘Phil. Trans.,’ 1870, p. 265). The stations in these were very irregularly distributed over the area under investigation, the declination was determined at but few places, and the force in the earlier survey was only determined relatively to London.

In the five years 1884–88, both inclusive, the authors have made an
The Society then adjourned over the Easter Recess to Thursday, May 2nd.

Transactions.

Observations and Reports.
Observations, &c. (continued).

The Office.

Christiania:—Norwegisches Meteorologisches Institut. Jahrbuch. 1885-86. 4to. Christiania 1886-87.

Université Royale de Norvège.

Universitäts-Sternwarte. Zonenbeobachtungen der Sterne zwischen 64° 50' und 70° 10' Nördlicher Declination. 4to. Christiania 1888.
The Observatory.

The Survey.


The Office.


The Observatory.


The Observatory.

The Comité.


The Agent-General.