PROCEEDINGS

OF THE

ROYAL SOCIETY OF LONDON.

From May 1, 1890, to December 1, 1890.

VOL. XLVIII.

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CONTENTS.

VOL. XLVIII.

No. 292.—May 1, 1890.

Magnetic Properties of Alloys of Nickel and Iron. By J. Hopkinson, D.Sc., F.R.S. ................................................................. 1

Photographic Determination of the Time-relations of the Changes which take place in Muscle during the Period of so-called “Latent Stimulation.” By J. Burdon Sanderson, F.R.S. ......................................................... 14

The Development of the Sympathetic Nervous System in Mammals. By A. M. Paterson, M.D. ......................................................... 19

A Note on an Experimental Investigation into the Pathology of Cancer. By Charles A. Ballance and Samuel G. Shattock .......................... 23

List of Presents............................................................................. 23

May 8, 1890.

On certain Ternary Alloys. Part II. By C. R. Alder Wright, D.Sc., F.R.S., Lecturer on Chemistry and Physics, and C. Thompson, F.C.S., F.I.C., Demonstrator of Chemistry, in St. Mary’s Hospital Medical School ................................................................. 25

Experiments on Vapour-density. By E. P. Perman, B.Sc., Clothworkers’ Exhibitioner at University College, London ............................................. 45

On Barometric Oscillations during Thunderstorms, and on the Brontometer, an Instrument designed to facilitate their Study. By G. J. Symons, F.R.S. .................................................................................. 59

On the Heating Effects of Electric Currents. No. IV. By William Henry Preece, F.R.S. ........................................................................ 68

List of Presents............................................................................. 68

May 22, 1890.

A Contribution to the Etiology of Diphtheria. By E. Klein, M.D., F.R.S. .................................................................................... 71

The Chemical Products of the Growth of Bacillus anthracis and their Physiological Action. By Sidney Martin, M.D., Pathologist to the Middlesex Hospital ................................................................. 78
On the Development of the Atrial Chamber of Amphioxus. By Arthur Willey, Student of University College, London ........................................ 80

On a Method of determining the Value of Rapid Variations of a Difference of Potential by means of the Capillary Electrometer. By George J. Burch, B.A. .................................................................................. 89

A Bacteria-killing Globulin. By E. H. Hankin, B.A., St. John's College, Cambridge, Junior George Henry Lewes Student ......................................................... 93

List of Presents ...................................................................................... 101

No. 293.—June 5, 1890.

Election of Fellows .................................................................................. 104

Account of recent Pendulum Operations for determining the relative Force of Gravity at the Kew and Greenwich Observatories. By General Walker, C.B., F.R.S., LL.D. ................................................................. 105


On the Superficial Viscosity of Water. By Lord Rayleigh, Sec. R.S. .... 127

Experiments with Lord Rayleigh's Colour Box. By Arthur Schuster, F.R.S................................................................................................. 140

List of Presents ...................................................................................... 149

June 12, 1890.

On a Re-determination of the principal Line in the Spectrum of the Nebula in Orion, and on the Character of the Line. By William Huggins, D.C.L., LL.D., F.R.S., and Mrs. Huggins ..................... 151


On a new Group of Lines in the Photographic Spectrum of Sirius. By William Huggins, D.C.L., LL.D., F.R.S., and Mrs. Huggins ......... 152

Preliminary Note on the Development of the Tuatara (Sphenodon punctatum). By Professor A. P. W. Thomas, M.A., F.L.S., F.G.S., University College, Auckland, N.Z. .................................................... 152

On the Position of the Vocal Cords in Quiet Respiration of Man, and on the Reflex-Tonus of their Abductor Muscles. By Felix Semon, M.D., F.R.C.P., Assistant Physician in charge of the Throat Depart- ment of St. Thomas's Hospital, and Laryngologist to the National Hospital for Epilepsy and Paralysis, Queen Square .......... 156

A Record of the Results obtained by Electrical Excitation of the so-called Motor Cortex and Internal Capsule in an Orang Outang (Simia satyrus). By Charles E. Beevor, M.D., F.R.C.P., and Victor Horsley, B.S., F.R.S. (From the Laboratory of the Brown Institution.) ....... 159
A further Note on the Influence of Bile and its Constituents on Pancreatic Digestion. By Sidney Martin, M.D., Pathologist to the Middlesex Hospital, British Medical Association Research Scholar, and Dawson Williams, M.D., Assistant Physician to the East London Hospital for Children, Shadwell .................................................................. 160


List of Presents.................................................................................................................. 165

On the Chief Line in the Spectrum of the Nebulæ. By J. Norman Lockyer, F.R.S. .......................................................... 167

Note on the Spectrum of the Nebula of Orion. By J. Norman Lockyer, F.R.S. .......................................................... 198

Preliminary Note on Photographs of the Spectrum of the Nebula in Orion. By J. Norman Lockyer, F.R.S. .......................................................... 199

No. 294.

On a Re-determination of the Principal Line in the Spectrum of the Nebula in Orion, and on the Character of the Line. By William Huggins, D.C.L., LL.D., F.R.S., and Mrs. Huggins .................................................. 202


On a new Group of Lines in the Photographic Spectrum of Sirius. By William Huggins, D.C.L., LL.D., F.R.S., and Mrs. Huggins .................................................. 216


June 19, 1890.


On the Alleged Slipping at the Boundary of a Liquid in Motion. By W. C. Dampier Whetham, B.A., Coutts Trotter Student of Trinity College, Cambridge .................................................. 225

Re-determination of the True Weight of a Cubic Inch of Distilled Water. By H. J. Chaney .................................................. 230

On Wind Pressure upon an Inclined Surface. By W. H. Dines, B.A. .................................................. 233


On the Plasticity of an Ice Crystal. (Preliminary Note.) By James C. McConnel, M.A. .................................................. 259

Preliminary Note on a New Magnetometer. By Professor W. Stroud, D.Sc. .................................................. 260
On the Course of the Fibres of the Cingulum and the Posterior Parts of the Corpus Callosum and of the Fornix in the Marmoset Monkey. By Charles E. Beevor, M.D., F.R.C.P. ...................................................... 271

On the Changes produced in the Circulation and Respiration by Increase of the Intracranial Pressure or Tension. By Walter Spencer, M.S., Assistant-Surgeon to Westminster Hospital, and Victor Horsley, B.S., F.R.S. ................................................................. 273

On the British Earthquakes of 1889. By Charles Davison, M.A., Mathematical Master at King Edward’s High School, Birmingham .... 275

On the Harmonic Analysis of Tidal Observations of High and Low Water. By G. H. Darwin, F.R.S., Plumian Professor and Fellow of Trinity College, Cambridge ................................................................. 278


Contributions to the Molecular Theory of Induced Magnetism. By J. A. Ewing, F.R.S., Professor of Engineering in University College, Dundee .................................................................................. 342


On the Causes of the Phenomena of Terrestrial Magnetism, and on some Electro-mechanism for exhibiting the Secular Changes in its Horizontal and Vertical Components. By H. Wilde, F.R.S. .............. 358

List of Presents .................................................................................. 359

On the Germination of the Seed of the Castor-Oil Plant (Ricinus communis). By J. R. Green, M.A., B.Sc., F.L.S., Professor of Botany to the Pharmaceutical Society of Great Britain ........................................ 370

A Note on an Experimental Investigation into the Pathology of Cancer. By Charles A. Ballance and Samuel G. Shattock ...................... 392

On the Position of the Vocal Cords in Quiet Respiration in Man, and on the Reflex-Tonus of their Abductor Muscles. By Felix Semon, M.D., F.R.C.P., Assistant Physician in charge of the Throat Department of St. Thomas’s Hospital, and Laryngologist to the National Hospital for Epilepsy and Paralysis, Queen Square ........................................ 403

No. 295.—November 20, 1890.

On the Determination of the Specific Resistance of Mercury in Absolute Measure. By J. V. Jones, Principal and Professor of Physics in the University College of South Wales and Monmouthshire, Cardiff .................................................................................. 434

The Spectroscopic Properties of Dust. By G. D. Liveing, M.A., F.R.S., Professor of Chemistry, and J. Dewar, M.A., F.R.S., Jacksonian Professor, University of Cambridge .......................................................................... 437
Magnetism and Recalescence. By J. Hopkinson, D.Sc., F.R.S.......... 442
List of Presents............................................................... 446

November 27, 1890.
On the Homology between Genital Ducts and Nephridia in the Oligochaeta. By Frank E. Beddard, M.A., Prosector of the Zoological Society .............................................................. 452
The Patterns in Thumb and Finger Marks: on their Arrangement into naturally distinct Classes, the Permanence of the Papillary Ridges that make them, and the Resemblance of their Classes to ordinary Genera. By Francis Galton, F.R.S................................. 455
Preliminary Note on the Transplantation and Growth of Mammalian Ova within a Uterine Foster-Mother. By Walter Heape, M.A., Balfour Student at the University of Cambridge ....................... 457
The Conditions of Chemical Change between Nitric Acid and certain Metals. By V. H. Veley, M.A., the University Museum, Oxford...... 458
The Variations of Electromotive Force of Cells consisting of certain Metals, Platinum, and Nitric Acid. By G. J. Burgh, B.A., and V. H. Veley, M.A., the University Museum, Oxford .................. 460
List of Presents........................................................................ 461

December 1, 1890.
ANNIVERSARY MEETING.
Report of Auditors ..................................................................... 464
List of Fellows deceased since last Anniversary .............................. 464
________________________________________ elected ...................... 465
Address of the President ................................................................ 465
Election of Council and Officers ................................................... 475
Financial Statement................................................................. 477–480
Trust Funds .............................................................................. 481–485
Table showing Progress and present State of Society with regard to Fellows ................................................................. 486
Account of the appropriation of the sum of £4,000 (the Government Grant) annually voted by Parliament to the Royal Society, to be employed in aiding the Advancement of Science .......................... 486
Account of Grants from the Donation Fund .................................. 490
Report of the Kew Committee..................................................... 491

On the Relation between the Magnetic Permeability of Rocks and Regional Magnetic Disturbances. By A. W. Rücker, M.A., F.R.S.... 505
Obituary Notices:

<table>
<thead>
<tr>
<th>Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rudolf Julius Emmanuel Clausius</td>
<td>i</td>
</tr>
<tr>
<td>Sir William Gull</td>
<td>viii</td>
</tr>
<tr>
<td>Stephen Joseph Perry</td>
<td>xii</td>
</tr>
<tr>
<td>William Kitchen Parker</td>
<td>xv</td>
</tr>
<tr>
<td>Robert William Mylne</td>
<td>xx</td>
</tr>
<tr>
<td>Index</td>
<td>xxiii</td>
</tr>
</tbody>
</table>
Milnes Marshall, of Manchester, for his advice and criticism, and for many valuable suggestions made after reading the memoir of which this is a summary.

IV. "A Note on an Experimental Investigation into the Pathology of Cancer." By CHARLES A. BALLANCE and SAMUEL G. SHATTOCK. Communicated by Sir JAMES PAGET, Bart., F.R.S. Received April 15, 1890.

[Publication deferred.]

Transactions.


General Medical Council. The Medical Register. 1890. 8vo. London; The Dentists' Register. 1890. 8vo. London; List of Medical Students Registered during 1889. 8vo. London 1890. The Council.


The Smithsonian Institution.


The Trustees, Indian Museum, Calcutta.


The India Office.

Mensbrugghe (G. van der) Sur la Condensation de la Vapeur d'Eau dans les Espaces Capillaires. 8vo. Bruxelles 1890.

The Author.


The Author.

Todd (D. P.) Photographs of the Corona taken during the Total Eclipse of the Sun, January 1, 1889. 4to. Washington 1889.

The Smithsonian Institution.

Walker (Rev. F. A.) The Botany and Entomology of Iceland. 8vo. [London 1890.]

The Victoria Institute.
Presents.


Assmann. [Interesting reproductions of the Magdeburg barograph curves are given in the 'Jahrbl. der Meteor. Beob. der Wetterwarte der Magdeburgischen Zeitung,' Jahr. 1—5, Magdeburg, 1883—87.]


Schönrock, A. “Über kleine unregelmässige Barometer-Schwankungen.” ‘Wild’s Repertorium,’ vol. 9 (1886), No. 8.


IV. “On the Heating Effects of Electric Currents. No. IV.” By William Henry Preece, F.R.S. Received April 22, 1890.

The Society adjourned over Ascension Day to Thursday, May 22.

Presents, May 8, 1890.

Transactions.


The Society.


The Academy.
Transactions (continued).
Cambridge, Mass.:—Museum of Comparative Zoology, Harvard
The Museum.
Glasgow:—Scottish Society of Literature and Art. Calendar.
1889–90. 8vo. Glasgow.
The Society.
Liége:—Société Géologique de Belgique. Annales. Tomes IV—V.
8vo. Liége 1877–78.
The Society.
London:—Institute of Chemistry of Great Britain and Ireland.
Register of Fellows and Associates, 1890. 8vo. London.
The Institute.
New Athenaeum Club. List of Members and Rules. 12mo.
London 1890.
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London 1890.
The Society.
Supplement. 8vo. New York 1889; Vol. XXII. No. 1. 8vo.
New York 1890.
The Society.
Orthopaedic Dispensary and Hospital. Annual Report. 1889.
The Trustees.
Odessa:—Société des Naturalistes de la Nouvelle-Russie.
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4to. Oxford 1890.
The Library.
Rome:—Accademia Pontificia de’ Nuovi Lincei. Atti. Anno XLIII.
Sessione 1–2. 4to. Roma 1889.
The Academy.

Observations and Reports.
Berlin:—K. Sternwarte. Berliner Astronomisches Jahrbuch für
1892. 8vo. Berlin 1890.
The Observatory.
Calcutta:—Archaeological Survey of India. The Sharqi Archi-
tecture of Jaunpur. 4to. Calcutta 1889.
The Survey.
8vo. Calcutta 1890.
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Canada:—Geological and Natural History Survey of Canada.
Contributions to the Micro-Palæontology of the Cambro-
Silurian Rocks of Canada. By A. H. Foord. 8vo. Ottawa
1883. With Two Maps to accompany the Annual Report,
1887.
The Survey.
Columbus:—Ohio Meteorological Bureau. Report. February, 1890.
8vo. Columbus.
The Bureau.
Observations, &c. (continued).

Vol. VII. Nos. 8–16, with Quarterly Summary. 4to. London, 1890; Appendices and Title to Weekly Weather Report, 1889. 4to. London; Summary of Observations made at the Stations included in the Daily and Weekly Weather Reports. August to December, 1889. 4to. London; Quarterly Weather Report. Part I. January—March, 1880. 4to. London 1889; Supplement to Charts showing the mean Barometrical Pressure over the Atlantic, Indian, and Pacific Oceans. [Sheet.] London [1889].

The Office.


The Commission.


The Observatory.


The Service.


The Survey.
curious appearance. They were surrounded by a transparent sheath, which was thickened at each junction between each two neighbouring bacilli. The chain of bacilli could be compared to a bamboo in which the nodes are swollen to nearly twice the diameter of the rest of the stick. A precisely similar appearance has been described and figured by Petruschky.* He found that anthrax bacilli undergo this change, which he regards as degenerative, when placed under the skin of frogs for several hours. Gamaleia† describes a somewhat similar condition as occasionally happening to anthrax vaccins in different organs of sheep and rabbits during the "vaccinal fever."

The above-described experiments would seem to lead to the following conclusions:—

1. That Halliburton's cell globulin-$\beta$ possesses a bacteria-killing power.
2. That this power appears to distinguish it from fibrin ferment.
3. That this bacteria-killing power is of the same nature as that possessed by blood serum, as described by Buchner, Nissen, and Nuttall.
4. That this power of the serum is probably due to the same or some allied substance.
5. That, inasmuch as it is possible to obtain from cells that are, or can become, phagocytes a substance having bacteria-killing powers, we may suppose that phagocytes can not only kill microbes that they have ingested, but also do this, or tend to do this, by breaking down and liberating their contents.

The Society adjourned over the Whitsuntide Recess to Thursday, June 5th.

Presents, May 22, 1890.

Transactions.
Baltimore:—Johns Hopkins University. Studies (Historical and Political Science). Eighth Series. No. 4. 8vo. Baltimore 1890. The University.

* "Die Einwirkungen des lebenden Froschkörpers auf den Milzbrandbacillus," 'Zeitschrift für Hygiene,' vol. 7, 1889, p. 75.
† Loc. cit.
Transactions (continued).


University of London. Calendar. 1890–91. 8vo. London 1890.


Stockholm:—Kongl. Vetenskaps-Akademié. Öfversigt. Årg. 47. No. 2. 8vo. Stockholm 1890.


Journals.


Asclepiad (The) Vol. VII. No. 25. 8vo. London 1890.

Dr. Richardson, F.R.S.


The Editors.


British Horological Institute.


Medico-Legal Society, New York.


The Editors.


The Observatory, Rio de Janeiro.


The Editor.

Stazioni Sperimentali Agrarie Italiane (Le) Vol. XVIII. Fasc. 2–3. 8vo. Asti 1890.

R. Stazione Enologica Sperimentale di Asti.


Massachusetts Institute of Technology.


The Government of Victoria.


Heft 1–6. 8vo. Halle.

Naturwissenschaftlicher Verein, Halle.

Two Bronze Medallion Portraits of Sir Christopher Wren and Daniel Wray, Fellows of the Royal Society. Mr. Evans, Treas. R.S.
taken with two eyes agrees very well. In the case of one observer, number 30, although no difference could be traced on November 27, 1889, the difference was half a division on May 7, 1890, and sufficient for him to be satisfied that when he made a match with one eye it did not appear a match with the other.

*Presents, June 5, 1890.*

Transactions.

Baltimore:—Johns Hopkins University. Circulars. *Vol. IX.*

No. 80. 4to. *Baltimore 1890.*  The University.

Berkeley:—University of California. Library Contents-Index.


Transactions (continued).


Observations and Reports.


Meteorological Office. Meteorological Observations at the Foreign and Colonial Stations of the Royal Engineers and the Army Medical Department, 1852–86. 4to. London 1890. The Office.

Lyne Regis:—Rousdon Observatory. Meteorological Observations for the Year 1889. 4to. London 1890. Mr. Cuthbert E. Peek.


Turin:—Osservatorio della Regia Università. Bollettino. Anno XXII. Oblong 4to. Torino 1889; Effemeridi del Sole e della Luna per l’Anni 1889–90. 8vo. Torino 1888–89. And three excerpts. The Observatory.

Journals.
Canadian Record of Science. Vol. IV. No. 2. 8vo. Montreal 1890.
Natural History Society, Montreal.

The Editors.
Revista do Observatorio. Anno V. No. 4. 8vo. Río de Janeiro 1890.
The Observatory.
The Editor.
8vo. Asti 1890.
R. Stazione Enologica, Asti.

Thirty-six Carte de Visite Photographs of Fellows of the Royal Society.
Messrs. Maull and Fox.

June 12, 1890.

Sir G. GABRIEL STOKES, Bart., President, in the Chair.

Sir Benjamin Baker, Mr. R. H. M. Bosanquet, Mr. S. H. Burbury, Mr. W. Gardiner, Dr. A. S. Lea, Major P. A. MacMahon, Professor S. U. Pickering, Mr. I. Roberts, Mr. J. J. H. Teall, and Dr. R. T. Thorne were admitted into the Society.

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

The following Papers were read:—

I. "On a Re-determination of the principal Line in the Spectrum of the Nebula in Orion, and on the Character of the Line." By WILLIAM HUGGINS, D.C.L., LL.D., F.R.S., and Mrs. HUGGINS. Received March 20, 1890.

[Publication deferred.]

II. "Note on the Photographic Spectrum of the Great Nebula in Orion." By WILLIAM HUGGINS, D.C.L., LL.D., F.R.S., and Mrs. HUGGINS. Received April 16, 1890.

[Publication deferred.]
A ...... 0·625 gram.  B ...... 0·539 gram.  
C ...... 0·514  "  D ...... 0·541  "

These experiments show that the power of bile to hasten pancreatic digestion is not limited to amylolytic digestion, but that it is equally, if not more, marked in its influence on proteolytic digestion.

VIII. “On the Spectra of Comet a 1890 and the Nebula G.C. 4058.” By J. Norman Lockyer, F.R.S. Received June 12, 1890.

[Publication deferred.]

Transactions:


Gore (G.), F.R.S. On a New Method and Department of Chemical Research. 8vo. [London] 1890. With two other Excerpts in 8vo. The Author.


Reade (T. Mellard) Physiography of the Lower Trias. 8vo. Hertford 1889. With two other Excerpts. 8vo. The Author.


Timmins (S.) Dr. Priestley’s Laboratory, 1791. 8vo. 1890. [Reprinted from the “Birmingham Daily Post.”]

Mr. S. Timmins.

Warner (F.) A Course of Lectures on the Growth and Means of Training the Mental Faculty. 8vo. Cambridge 1890. The Author.


The Society adjourned over the Long Vacation to Thursday, November 20th.

*Presents*, June 19, 1890.

Transactions.


Baltimore:—Johns Hopkins University. Register for 1889–90. 8vo. *Baltimore* 1890. The University.


Transactions (continued).

The Director.

The Society.

Christiania:—Videnskabs-Selskab. Forhandlinger. 1888. 8vo.
Christiania 1889.
The Society.

Copenhagen:—Videnskabernes Selskab. Skrifter. 6te Række.
The Society.

Emden:—Naturforschende Gesellschaft. 74. Jahresbericht pro 1888–89. 8vo. Emden 1890.
The Society.

The Society.

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The Society.

Heidelberg:—Universität. Akademische Schriften. 8vo. 1888–89.
The University.

The Society.

The Society.

The Director.

The Section.

The Society.

The Society.
Transactions (continued).

1890.

The Society.
The Society.
Transactions (continued).

8vo. London.
The Society.

The Society.

Part 7. 8vo. London 1890.
The Society.

8vo. London.
The Society.

The Society.

Moscow:—Musée Public et Roumiantszow. Description Systéma-
tique des Collections du Musée. Livr. 1–2; Catalogue de la
Section des Gravures. Livr. 1–4; Recueil de Matériaux pour
l’Ethnographie. Livr. 3; Compte Rendu. 1886–88. [Russ.]
8vo. Moscou 1887–89.
The Museum.

Münster:—Königliche Akademie: Inaugural-Dissertationen, 1889.
8vo. Münster 1889.
The Academy.

Vol. IX. Nos. 1–2; Annals. Vol. V. Nos. 1–3. 8vo. New
York 1889.
The Academy.

Odessa:—Société des Naturalistes de la Nouvelle Russie.
Mémoires de la Section Mathématique. Tome IX. [Russ.]
8vo. Odessa 1889.
The Society.

8vo. Palermo 1889.
The Circolo.

Juin, 1890. 4to. Paris.
The Academy.

Congrès International de Bibliographie des Sciences Mathé-
The French Ministry of Commerce.

Congrès International de Zoologie, 1889. Compte Rendu des
Séances. 8vo. Paris 1890.
The Zoological Society of France.

École des Hautes Études. Bibliothèque. Sciences Philologiques
et Historiques. Fasc. 68 (Livr. 3), 72 (fasc. 2), 79, 80–81.
8vo. Paris 1889.
The School.

École Normale Supérieure. Annales. Tome VII. No. 3. 4to.
Paris.
The School.

Ministère de la Guerre. Catalogue de la Bibliothèque. Tome VI.
8vo. Paris 1888.
The French Ministry of War.

The Society.

Transactions (continued).

The Society.

The Society.


The Academy.

The Academy.
The Society.
The Institute.
The Institution.


The Academy.
Transactions (continued).


The Academy.


The Society.


The University.


The Academy.


The Society.


The Museum.


The Club.


The Institution.


The Government of Würtemberg.


The Society.


The Society.
Observations and Reports.

Albany:—Commissioners of the State Reservation at Niagara. Sixth Annual Report. 8vo. Albany 1890.


Dorpat:—Sternwarte. Meteorologische Beobachtungen. Juni—December, 1889. 8vo. [Dorpat.]


The Registrar-General for Ireland.


Ministère des Travaux Publics.


The Office.

Royal Observatory, Greenwich. Observations, 1887, with Appendices 1—3. 4to. London 1889; Results of the Astronomical Observations, 1887. 4to. London 1889; Results of
Observations, &c. (continued).

the Magnetical and Meteorological Observations, 1887. 4to. London 1889; Report of the Astronomer Royal to the Board of Visitors, 1890. 4to. [London.] The Observatory. Melbourne:—Department of Mines. Reports of the Mining Registrars for the quarters ended 30th September and 31st December, 1889. Folio. Melbourne.


The Observatory.
Observations, &c. (continued).


The Observatory.


The Office.

Windsor, New South Wales. Mr. Tebbutt’s Observatory. Reports, 1888-89. 8vo. Sydney 1889-90.

Mr. Tebbutt.

Journals.


The Editor.


The Editor.


The Editors.

Analyst (The) January to June, 1890. 8vo. London.

The Editor.


The Editor.


Dr. Richardson, F.R.S.

Astronomie (L’) Janvier–Avril, 1890. 8vo. Paris.

The Editor.


The Editor.


The Editor.

Athenaeum (The) January to June, 1890. 4to. London.

The Editor.

Boletín de Minas Industria y Construcciones. 1890. Núm. 1—2. 4to. Lima.

The Editor.

Builder (The) January to June, 1890. 8vo. London.

The Editor.

Chamber of Commerce Journal. January to June, 1890. 4to. London.

London Chamber of Commerce.


Mr. W. Crookes, F.R.S.


M. l’Abbé Valette.
Journals (continued).

Educational Times (The) January to June, 1890. 4to. London.
    The College of Preceptors.

Electrical Engineer (The) January to June, 1890. Folio. London.
    The Editor.

Electrical Review (The) January to June, 1890. Folio. London.
    The Editor.

Electrician (The) January to June, 1890. Folio. London.
    The Editor.

Epigraphia Indica, and Record of the Archaeological Survey of
India. Part 4. 4to. Calcutta 1889. The India Office.

Galilée (Le) Année 2. No. 5. 8vo. Paris 1890. The Editor.

    British Horological Institute.

Industries. January to June, 1890. 4to. London.
    The Editor.

    Oesterreichische Gesellschaft für Meteorologie.

Mittheilungen aus der Zoologischen Station zu Neapel. Bd. IX.
Heft 3. 8vo. Berlin 1890.
    Dr. Dohrn.

    St. Petersburg. Compass Observatory, Cronstadt.

Naturalist (The) No. 179. 8vo. London 1890. The Editors.

    The Editor.

New York Medical Journal. January to June, 1890. 4to. New
York.
    The Editor.

Notes and Queries. January to June, 1890. 4to. London.
    The Editor.

Observatory (The) January to June, 1890. 8vo. London.
    The Editors.

Revista do Observatorio. Anno V. Num. 5. 8vo. Rio de Janeiro
1890.
    The Observatory, Rio de Janeiro.

    The Editor.

    Paris.
    The Editor.

Revue Médico-Pharmaceutique. Année 3. No. 5. 4to. Constantin-
ople 1890.
    The Editor.

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Sbornik Materialov dlya Opisaniya Myestenostef i Plemen Kav- 
ka za. [Collection of Materials for the Description of the 
Localities and Races of the Caucasus—Russian.] 8vo. Tiflis 
1890.
    Curateur de l’Arrondissement Scolaire du Caucas.
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"On the Germination of the Seed of the Castor-oil Plant (*Ricinus communis*)." By J. R. Green, M.A., B.Sc., F.L.S., Professor of Botany to the Pharmaceutical Society of Great Britain. Communicated by Professor M. Foster, Sec. R.S. Received January 29,—Read January 30, 1890.

The germination of those seeds in which the non-nitrogenous reserve material is found to be an oil and not a carbohydrate was first studied by Sachs, who, in a series of papers published in 1859,* put forward a hypothesis to explain the manner in which the oil becomes available for the nutrition of the young plant. He records as his starting point the observation that at the onset of germination the oil gradually disappears, just as starch disappears from the reservoirs when germination is started in a seed containing it, and he shows that the development of the young plant proceeds concurrently with this disappearance. From this it follows that the oil, like the starch, is a reserve material to be made use of by the embryo in its early growth. So far as he deals with the changes taking place in the oil, he puts forward the view that starch is directly formed from it, and that this conversion is the first step that may be traced. Subsequently, sugar arises from the starch, and thus, in all seeds alike, the non-nitrogenous reserves travel as sugar from their storehouses to the seat of growth.

Though putting forward the view of the conversion of fat directly into starch, he appears to be scarcely satisfied with it, speaking of it as being very surprising, and, indeed, admitting that in many seeds the greater portion of the disappearing oil gives rise immediately to sugar, and not through the intervention of starch.

Sachs's view that fat or oil is transformed into starch was soon

* 'Bot. Zeitg.,' 1859, col. 178 et seq.
creasing, and at the latter time that it finally disappears. The heat-
ing was continued to about 840° C., and the flame was then put out.
In cooling, heat is liberated at one point only, and in this case with
a distinct rise of temperature. The recalcence begins at time 3 h.
47 m., temperature 750° C., and it is precisely at this time that the
ring begins to be magnetisable. The recalcence continues to time
4 h. 8 m., and at this time, and not before it, the magnetisability
practically attains a maximum. Before the last portion of the curve
the ring was heated to 966° C. Here no observations were made
magnetically. This part of the curve, therefore, only shows the effect
of higher heating in lowering the temperature of recalcence.

These experiments show that the liberation and absorption of heat,
known as recalcence, and the change in magnetic condition, occur
simultaneously. Also that in the case of steel with 0.3 per cent. of
carbon both temperatures of liberation of heat are associated with
change of magnetic condition.

Present, November 20, 1890.

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M. Gaston Darboux.


The Italian Government, through the Foreign Office.


The Author.


The India Office.


The Author.


The Author.

Three bronze Medals, two bearing bust of Linnaeus, and one commemorative of Joseph Hume, F.R.S.

Mr. J. Evans, Treas. R.S.
Presents, November 27, 1890.

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December 1, 1890.

ANNIVERSARY MEETING.

Sir G. GABRIEL STOKES, Bart., 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, including balances carried from the preceding year, amounted to £7,665 9s. 10d. on the General Account, and £7,016 11s. 7d. on account of Trust Funds, and that the total expenditure in the same period amounted to £5,886 1s. 11d. on the General Account, and £4,457 7s. 8d. on account of Trust Funds, leaving a balance on the General Account of £1,753 9s. 5d. at the bankers’, and £25 18s. 6d. in the hands of the Treasurer, and, on account of Trust Funds, a balance at the bankers’ of £2,559 3s. 11d.

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, 1889).

On the Home List.

Beckles, Samuel Husbands, F.G.S.
Burt, T. Seymour, Maj., M.R.A.S.
Davis, Sir John Francis, Bart.
Duncan, James Matthews, M.D.
Ellis, Alexander John, B.A.
Fischer, William Lewis Ferdinand, M.A.
Gull, Sir William Withey, Bart., M.D.
Hood, Charles, F.R.A.S.
Jones, Charles Handfield, M.B.
Kane, Sir Robert, M.R.I.A.
Lefroy, Sir John Henry, General R.A.
Mylene, Robert William, F.R.S.E.
Napier of Magdala, Robert, Lord, G.C.B.
Parker, William Kitchen, F.Z.S.
Perry, Rev. Stephen Joseph, F.R.A.S.
Smyth, Sir Warington Wilkinson, F.G.S.
Talbot, Christopher Rice Mansel.