

H.K. Wiggenten del. et sc.

London 1845

*The Royal Society
of London*



PROCEEDINGS

OF THE

ROYAL SOCIETY OF LONDON

SERIES A

CONTAINING PAPERS OF A MATHEMATICAL AND
PHYSICAL CHARACTER.

VOL. XCIV.

LONDON:

PRINTED FOR THE ROYAL SOCIETY AND SOLD BY
HARRISON AND SONS, ST. MARTIN'S LANE,
PRINTERS IN ORDINARY TO HIS MAJESTY.

AUGUST, 1918.

LONDON
HARRISON AND SONS, PRINTERS IN ORDINARY TO HIS MAJESTY,
ST. MARTIN'S LANE.

CONTENTS.



SERIES A. VOL. XCIV.

No. A 656.—November 5, 1917.

	PAGE
The Fourth Colourless Sensation in the Three-Sensation Spectrum Curves when Measured on the Centre of the Retina. By Sir W. de W. Abney, K.C.B., F.R.S.; with a Note by Prof. S. W. J. Smith, F.R.S.	1
Periodic Disturbance of Level arising from the Load of Neighbouring Oceanic Tides. By K. Terazawa. Communicated by Sir Joseph Larmor, F.R.S. (Abstract)	13
Historical Note on a Relation between the Gravitational Attraction Exercised and the Elastic Depression caused by Load on the Plane Surface of an Isotropic Elastic Solid. By C. Chree, F.R.S.	14
Experiments on Tribo-Electricity. I.—The Tribo-Electric Series. By P. E. Shaw, B.A., D.Sc., University College, Nottingham. Communicated by Prof. E. H. Barton, F.R.S.	16
Revolving Fluid in the Atmosphere. By Sir Napier Shaw, F.R.S.	34
Investigation into the Imbibition Exhibited by some Shellac Derivatives. By A. P. Laurie and Clerk Ranken. Communicated by Prof. J. Walker, F.R.S....	53

No. A 657.—December 1, 1917.

Two Cases of Congenital Night-Blindness. By Sir W. de W. Abney, K.C.B., F.R.S.	59
A Contribution to the Study of the Magnetic Properties of Manganese and of some Special Manganese Steels. By Sir Robert Hadfield, F.R.S., C. Chéneveau, and Ch. Géneau	65
Duration of Luminosity of Electric Discharge in Gases and Vapours: Further Studies. By the Hon. R. J. Strutt, F.R.S. (Plate 1).....	88
Characteristic Frequency and Atomic Number. By H. Stanley Allen, M.A., D.Sc., University of London, King's College. Communicated by Prof. O. W. Richardson, F.R.S.	100

No. A 658.—January 1, 1918.

The Nature of the Ions produced by the Spraying of Water. By J. J. Nolan, M.A., D.Sc., University College, Dublin. Communicated by Prof. J. A. McClelland, F.R.S.	112
--	-----

	PAGE
Phenomena Connected with Turbulence in the Lower Atmosphere. By G. I. Taylor, M.A. Communicated by Sir Napier Shaw, F.R.S.....	137
The Discharge of Gases under High Pressures. By L. Hartshorn, B.Sc., A.R.C.S. Communicated by the Hon. R. J. Strutt, F.R.S.	155
On the Relation between Barometric Pressure and the Water-level in a Well at Kew Observatory, Richmond. By E. G. Bilham, A.R.C.Sc., D.I.C., B.Sc., F.R.Met.Soc. Communicated by Sir Napier Shaw, F.R.S.	165

No. A 659.—March 1, 1918.

Address of the President, Sir J. J. Thomson, O.M., at the Anniversary Meeting, November 30, 1917	182
The Zeros of Bessel Functions. By G. M. Watson, M.A., D.Sc., Assistant Professor of Pure Mathematics at University College, London. Communicated by Prof. J. W. Nicholson, F.R.S.	190
The Electrostatic Problem of a Conducting Sphere in a Spherical Cavity. By Alexander Russell, M.A., D.Sc., M.I.E.E. Communicated by Dr. C. Chree, F.R.S.	206
On a New Gyroscopic Phenomenon. By E. E. Tournay Hinde. Communicated by Arthur Schuster, Sec.R.S.	218
The Behaviour of Scattering Media in Fully Diffused Light. By H. J. Channon, F. F. Renwick, and B. V. Storr. Communicated by Dr. T. M. Lowry, F.R.S....	222
The Rankine Trochoidal Wave. By Sir George Greenhill, F.R.S.....	238

No. A 660.—April 2, 1918.

Revolving Fluid in the Atmosphere. By John Aitken, F.R.S.	250
Ultra-violet Transparency of the Lower Atmosphere, and its Relative Poverty in Ozone. By the Hon. R. J. Strutt, F.R.S. (Plate 2)	260
The Photo-electric Action of X-rays. By O. W. Richardson, F.R.S., Wheatstone Professor of Physics, University of London, King's College	269
Some Problems in the Theory of Radiation. By Arthur Schuster, Sec.R.S.	281
On the Series of Legendre. By W. H. Young, M.A., Sc.D., F.R.S.	292
On the Scattering of Light by Spherical Shells, and by Complete Spheres of Periodic Structure, when the Refractivity is small. By Lord Rayleigh, O.M., F.R.S.	296

No. A 661.—May 1, 1918.

Graphical Solution for High-Angle Fire. By Prof. A. N. Whitehead, F.R.S., Imperial College of Science and Technology.....	301
The Lommel-Weber Ω Function and its Application to the Problem of Electric Waves on a Thin Anchor Ring. By J. R. Airey, M.A., D.Sc. Communicated by Prof. J. W. Nicholson, F.R.S.	307
Flocculation. By Spencer Umfreville Pickering, M.A., F.R.S.	315
On the Nature of Heat, as Directly Deducible from the Postulate of Carnot. By Sir Joseph Larmor, F.R.S., Cambridge	326

	PAGE
The Absorption of the Radiation emitted by a Palladium Anticathode in Rhodium, Palladium and Silver. By E. A. Owen, B.A. (Cantab.), M.Sc. (Wales), University College, London. Communicated by Prof. A. W. Porter, F.R.S. (Plate 3)	339
Selenic Acid and Iron.—Reduction of Selenic Acid by Nascent Hydrogen and Hydrogen Sulphide.—Preparation of Ferrous Selenate and Double Selenates of Iron Group. By A. E. H. Tutton, D.Sc., M.A., F.R.S.	352
Monoclinic Double Selenates of the Iron Group. By A. E. H. Tutton, D.Sc., M.A., F.R.S. (Abstract.)	362

No. A 662.—June 1, 1918.

On the Numerical Solution of Integral-Equations. By E. T. Whittaker, F.R.S. ...	367
The Parent of Actinium. By Frederick Soddy, F.R.S., and John A. Cranston, B.Sc., Carnegie Research Scholar in the University of Aberdeen	384
Critical Loading of Struts and Structures. By W. L. Cowley, A.R.C.Sc., D.I.C., Wh.Sc., and H. Levy, M.A., B.Sc., F.R.S.E. Communicated by Sir Richard Glazebrook, F.R.S.....	405
The Electromagnetic Inertia of the Lorentz Electron. By G. A. Schott, B.A., D.Sc., Professor of Applied Mathematics, University College of Wales, Aberystwyth. Communicated by Prof. J. W. Nicholson, F.R.S.	422
On an Expansion of the Point-Potential. By Arthur W. Conway, F.R.S.	436
Scattering of Light by Dust-free Air, with Artificial Reproduction of the Blue Sky.—Preliminary Note. By the Hon. R. J. Strutt, F.R.S., Professor of Physics, Imperial College, South Kensington. (Plate 4)	453

No. A 663.—July 1, 1918.

Investigations on Textile Fibres. By W. Harrison, M.Sc. Communicated by Prof. W. H. Bragg, F.R.S. (Plates 5 and 6)	460
The Ultra-Violet Band of Ammonia, and its Occurrence in the Solar Spectrum. By A. Fowler, F.R.S., and C. C. L. Gregory, B.A. (Abstract)	470
The Presence in the Solar Spectrum of the Water-vapour Band λ 3064. By A. Fowler, F.R.S.	472
The Lunar and Solar Diurnal Variations of Water-Level in a Well at Kew Observatory, Richmond. By E. G. Bilham, A.R.C.Sc., B.Sc., D.I.C., F.R.Met.Soc. Communicated by Sir Napier Shaw, F.R.S. (Abstract)	476
Internal Ballistics. By Lieut.-Colonel A. G. Hadcock. Communicated by Sir George Greenhill, F.R.S.	479

No. A 664.—August 1, 1918.

The Absorption of X-Rays. By E. A. Owen, B.A. (Cantab.), M.Sc. (Wales), University College, London. Communicated by Prof. A. W. Porter, F.R.S. ...	510
The Magnetic Storm of December 16–17, 1917, as Recorded at Kew and Eskdalemuir Observatories. By C. Chree, Sc.D., LL.D., F.R.S., Superintendent, Kew Observatory	525

	PAGE
A Method of Avoiding Collision at Sea. By J. Joly, Sc.D., F.R.S., a Commissioner of Irish Lights. (Parts I and II)	547
Note on Certain Coloured Interference Bands and the Colours of Tempered Steel. By A. Mallock, F.R.S.	561
On the Absorption of X-Rays in Copper and Aluminium. By C. M. Williams, B.Sc., Fellow of the University of Wales. Communicated by Principal E. H. Griffiths, Sc.D., F.R.S.	567
A Statistical Survey of Colour Vision. By R. A. Houstoun, M.A., Ph.D., D.Sc., Lecturer on Physical Optics in the University of Glasgow. Communicated by Prof. A. Gray, F.R.S.	576

OBITUARY NOTICES OF FELLOWS AND OTHERS DECEASED.

Sir Andrew Noble (with portrait); Silvanus Phillips Thompson (with portrait); Jöns Oskar Backlund; Prince Boris Galitzin; J. G. Darboux (with portrait); William du Bois Duddell (with portrait); Sir John Wolfe Barry (with portrait)	i—xxxviii
Index	xxxix
