

PROCEEDINGS  
OF  
THE ROYAL SOCIETY  
OF  
EDINBURGH.

VOL. XXV.  
*(IN TWO PARTS.)*

PART I.  
(Containing pages 1-592.)

NOVEMBER 1903 to MARCH 1905.

EDINBURGH:  
PRINTED BY NEILL AND COMPANY, LIMITED.

MDCCCXVI.

## CONTENTS.

	PAGE
Election of Office-Bearers, Session 1903-4, . . . . .	1
The People of the Faroes. By Nelson Annandale, B.A. (Oxon.). <i>Communicated by Professor D. J. Cunningham, F.R.S. Issued separately November 30, 1903, . . . . .</i>	2
Seiches observed in Loch Ness. By E. Maclagan-Wedderburn. <i>Communicated by Professor Chrystal. Issued separately January 15, 1904, . . . . .</i>	25
The Bull Trout of the Tay and of Tweed. By W. L. Calderwood. (With a Plate.) Issued separately January 30, 1904, . . . . .	27
The Relative Efficiency of certain Methods of performing Artificial Respiration in Man. By E. A. Schäfer, F.R.S. (With a Plate.) Issued separately January 29, 1904, . . . . .	39
Physico-Chemical Investigations in the Amide Group. By Charles E. Fawsitt, Ph.D., B.Sc. (Edin. and Lond.). <i>Communicated by Professor Crum Brown. Issued separately February 6, 1904, . . . . .</i>	51
The Theory of General Determinants in the Historical Order of Development up to 1846. By Thomas Muir, LL.D. Issued separately February 12, 1904, . . . . .	61
Man as Artist and Sportsman in the Palæolithic Period. By Robert Munro, M.A., M.D., LL.D. (With Eleven Plates.) Issued separately February 13, 1904, . . . . .	92
The Theory of Continuants in the Historical Order of its Development up to 1870. By Thomas Muir, LL.D. Issued separately February 26, 1904, . . . . .	129
On the Origin of the Epiphysis Cerebri as a Bilateral Structure in the Chick. By John Cameron, M.B. (Edin.), M.R.C.S. (Eng.), Carnegie Fellow, Demonstrator of Anatomy, United College, University of St Andrews. <i>Communicated by Dr W. G. Aitchison Robertson. Issued separately March 17, 1904, . . . . .</i>	160
Theorem regarding the Orthogonal Transformation of a Quadric. By Thomas Muir, LL.D. Issued separately March 17, 1904, . . . . .	168
Ocean Temperatures and Solar Radiation. By Professor C. G. Knott. Issued separately April 4, 1904, . . . . .	173
On Deep-water Two-dimensional Waves produced by any given Initiating Disturbance. By Lord Kelvin. Issued separately April 4, 1904, . . . . .	185

	PAGE
Some Field Evidence relating to the Modes of Occurrence of Intrusive Rocks, with some Remarks upon the Origin of Eruptive Rocks in general. By J. G. Goodchild, of the Geological Survey, F.G.S., F.Z.S., Curator of the Collection of Scottish Mineralogy in the Edinburgh Museum of Science and Art. <i>Communicated by</i> R. H. Traquair, LL.D., M.D., F.R.S. Issued separately May 20, 1904,	197
Note on the Standard of Relative Viscosity, and on "Negative Viscosity." By W. W. Taylor, M.A., D.Sc. <i>Communicated by</i> Professor Crum Brown. Issued separately June 16, 1904,	227
The Viscosity of Aqueous Solutions of Chlorides, Bromides, and Iodides. By W. W. Taylor, M.A., D.Sc., and Clerk Ranken, B.Sc. <i>Communicated by</i> Professor Crum Brown. Issued separately June 16, 1904,	231
On the Date of the Upheaval which caused the 25-feet Raised Beaches in Central Scotland. By Robert Munro, M.A., M.D., LL.D. Issued separately June 18, 1904,	242
The Complete Solution of the Differential Equation of $J_m$ . By the Rev. F. H. Jackson, H.M.S. "Irresistible." <i>Communicated by</i> Dr Wm. Peddie. Issued separately August 15, 1904,	273
A Differentiating Machine. By J. Erskine Murray, D.Sc. Issued separately August 15, 1904,	277
On the Thermal Expansion of Dilute Solutions of certain Hydroxides. By George A. Carse, M.A., B.Sc. <i>Communicated by</i> Professor MacGregor. Issued separately August 15, 1904,	281
Effect of Transverse Magnetization on the Resistance of Nickel at High Temperatures. By Professor C. G. Knott. Issued separately July 30, 1904,	292
Observations on some Aged Specimens of <i>Sagartia troglodytes</i> , and on the Duration of Life in Cœlenterates. By J. H. Ashworth, D.Sc., Lecturer in Invertebrate Zoology in the University of Edinburgh, and Nelson Annandale, B.A., Deputy-Superintendent of the Indian Museum, Calcutta. <i>Communicated by</i> Professor J. C. Ewart, M.D., F.R.S. Issued separately July 21, 1904,	295
Note on the Molecular Condition of Nickel (and Iron) demagnetised by decreasing Reversals. By James Russell. Issued separately August 22, 1904,	309
On the Front and Rear of a Free Progression of Waves in Deep Water. ( <i>Continued from</i> Proc. R.S.E., Feb. 1st, 1904.) By Lord Kelvin. Issued separately August 22, 1904,	311
Some Results in the Mathematical Theory of Seiches. By Professor Chrystal. Issued separately October 6, 1904,	328
A New Form of Spectrophotometer. By J. R. Milne, B.Sc., Carnegie Scholar in Natural Philosophy, Edinburgh University. Issued separately November 5, 1904,	338
A New Form of Juxtapositor to bring into Accurate Contact the Edges of the two Beams of Light used in Spectrophotometry, with an application to Polarimetry. By J. R. Milne, B.Sc., Carnegie Scholar in Natural Philosophy. Issued separately January 17, 1905,	355

	PAGE
The Three-line Determinants of a Six-by-Three Array. By Thomas Muir, LL.D. Issued separately January 20, 1905, . . .	364
The Sum of the Signed Primary Minors of a Determinant. By Thomas Muir, LL.D. Issued separately January 20, 1905, . . .	372
Crystallographical Notes. By Hugh Marshall, D.Sc., F.R.S. Issued separately February 1, 1905, . . .	383
The Effect of Simultaneous Removal of Thymus and Spleen in young Guinea-pigs. By D. Noël Paton and Alexander Goodall. ( <i>From the Laboratory of the Royal College of Physicians, Edinburgh.</i> ) Issued separately February 1, 1905, . . .	389
Networks of the Plane in Absolute Geometry. By Duncan M. Y. Sommerville, M.A., B.Sc., University of St Andrews. ( <i>Abstract.</i> ) Communicated by Professor P. R. Scott Lang. Issued separately February 1, 1905, . . .	392
A Specimen of the Salmon in transition from the Smolt to the Grilse Stage. By W. L. Calderwood. (With Two Plates Issued separately February 1, 1905, . . .	
A Comparative Study of the Lakes of Scotland and Denmark. By Dr C. Wesenberg-Lund, of the Danish Fresh-water Biological Station, Frederiksdal, near K. Lyngby, Denmark. <i>Communicated by Sir John Murray, K.C.B., F.R.S. (From the Danish Fresh-water Biological Laboratory, Frederiksdal.)</i> (With Two Plates.) Issued separately March 3, 1905, . . .	401
Variations in the Crystallisation of Potassium Hydrogen Succinate due to the presence of other metallic compounds in the Solution. ( <i>Preliminary Notice.</i> ) By Alexander T. Cameron, M.A. <i>Communicated by Dr Hugh Marshall, F.R.S.</i> Issued separately February 4, 1905, . . .	449
A Laboratory Apparatus for Measuring the Lateral Strains in Tension and Compression Members, with some Applications to the Measurement of the Elastic Constants of Metals. By E. G. Coker, M.A. (Cantab.), D.Sc. (Edin.), F.R.S.E., Professor of Mechanical Engineering and Applied Mathematics, City and Guilds Technical College, Finsbury, London. (With a Plate.) Issued separately March 3, 1905, . . .	452
On Astronomical Seeing. By Dr J. Halm, Lecturer in Astronomy in the University of Edinburgh. Issued separately March 3, 1905, . . .	458
On the Graptolite-bearing Rocks of the South Orkneys. By J. H. Harvey Pirie, B.Sc., M.B., Ch.B. <i>Communicated by Dr Horne, F.R.S.</i> With a Note by Dr Peach on Specimens from the South Orkneys. Issued separately March 30, 1905, . . .	463
A Possible Explanation of the Formation of the Moon. By George Romanes, C.E. Issued separately March 30, 1905, . . .	471
On Pennella: a Crustacean parasitic on the Finner Whale ( <i>Balenoptera musculus</i> ). ( <i>Abstract.</i> ) By Sir William Turner, K.C.B., LL.D. Issued separately March 30, 1905, . . .	480
The Diameters of Twisted Threads, with an Account of the History of the Mathematical Setting of Cloths. By Thomas Oliver, B.Sc. (Lond. & Edin.). <i>Communicated by Dr C. G. Knott.</i> Issued separately April 8, 1905, . . .	481

	PAGE
A Study of Three Vegetarian Diets. By D. Noël Paton and J. C. Dunlop. ( <i>From the Research Laboratory of the Royal College of Physicians, Edinburgh.</i> ) Issued separately April 8, 1905, . . . . .	498
Continuants whose Main Diagonal is Univariational. By Thomas Muir, LL.D. Issued separately April 8, 1905, . . . . .	507
On Professor Seeliger's Theory of Temporary Stars. By J. Halm, Ph.D., Lecturer on Astronomy in the University of Edinburgh, and Assistant Astronomer at the Royal Observatory. Issued separately April 15, 1905, . . . . .	513
Some Suggestions on the Nebular Hypothesis. By J. Halm, Ph.D. Issued separately April 15, 1905, . . . . .	553
Deep Water Ship-Waves. ( <i>Continued from Proc. R.S.E., June 20th, 1904.</i> ) By Lord Kelvin. Issued separately April 18, 1905, . . . . .	562
On Two Liquid States of Sulphur $S_\lambda$ and $S_\mu$ and their Transition Point. By Alexander Smith. ( <i>Abstract.</i> ) Issued separately April 18, 1905, . . . . .	588
The Nature of Amorphous Sulphur, and Contributions to the Study of the Influence of Foreign Bodies on the Phenomena of Supercooling observed when Melted Sulphur is suddenly Chilled. By Alexander Smith. ( <i>Abstract.</i> ) Issued separately April 18, 1905, . . . . .	590

---

For Index to Part I. see end of Part II.