

PROCEEDINGS
OF THE
ROYAL SOCIETY OF EDINBURGH.

SESSION 1924-25

Part III]

VOL. XLV.

[Pp. 225-321

CONTENTS.

NO.		PAGE
XVIII.	The Equation of Conduction of Heat. By MARION C. GRAY, M.A., J. E. Baxter Scholar of the University of Edinburgh, and Research Student of Bryn Mawr College, Pa. Communicated by Professor E. T. WHITTAKER, F.R.S., <i>(Issued separately June 10, 1925.)</i>	230
XIX.	Note on Professor Whittaker's Atomic Model. By JOHN A. ELDRIDGE, University of Wisconsin. Communicated by Professor E. T. WHITTAKER, F.R.S. With further Notes by Professor E. T. WHITTAKER and Professor H. S. ALLEN, <i>(Issued separately June 10, 1925.)</i>	245
XX.	Unilateral Vasoligation on the Senile Male of the Domestic Fowl. By F. A. E. CREW, <i>(Issued separately June 10, 1925.)</i>	249
XXI.	Rejuvenation of the Aged Fowl through Thyroid Medication. By F. A. E. CREW, <i>(Issued separately June 26, 1925.)</i>	252
XXII.	L'Entretien des Pendules au Moyen de Cellules Photo-électriques. Par M. le Général G. FERRIÉ, Membre de l'Académie des Sciences de Paris, L.L.G., C.M.G. Communicated by Professor R. A. SAMPSON, F.R.S., General Secretary, <i>(Issued separately June 26, 1925.)</i>	261
XXIII.	On the Cardinal Function of Interpolation-Theory. By W. L. FERRAR, M.A., <i>(Issued separately August 26, 1925.)</i>	269

[Continued on page iv of Cover.

EDINBURGH :

PUBLISHED BY ROBERT GRANT & SON, 126 PRINCES STREET, AND
WILLIAMS & NORGATE, 14 HENRIETTA STREET, COVENT GARDEN, LONDON, W.C. 2.

Price Eleven Shillings.

THE ROYAL SOCIETY OF EDINBURGH.

REGULATIONS REGARDING THE PUBLICATION OF PAPERS IN THE PROCEEDINGS AND TRANSACTIONS OF THE SOCIETY.

THE Council beg to direct the attention of authors of communications to the Society to the following Regulations, which have been drawn up in order to accelerate the publication of the Proceedings and Transactions, and to utilise as widely and as fairly as possible the funds which the Society devotes to the publication of Scientific and Literary Researches.

1. MANUSCRIPT OF PAPERS.—As soon as any paper has been passed for publication, either in its original or in any altered form, and has been made ready for publication by the author, it is sent to the printer.

2. METHOD OF PUBLICATION.—As soon as the final revise of a Transactions paper has been returned, or as soon as the sheet in which the last part of a Proceedings paper appears is ready for press, a certain number of separate copies or reprints, in covers bearing the title of the paper and the name of the author, are printed off and placed on sale. The date of such separate publication will be printed on each paper.

3. ADDITIONS TO A PAPER after it has been finally handed in for publication, if accepted by the Council, will be treated and dated as separate communications, and may, or may not, be printed immediately after the original paper.

4. BRIEF ABSTRACTS OF TRANSACTIONS PAPERS will be published in the Proceedings, provided they are sent along with the original paper.

5. SPECIAL DISCUSSION OF PAPERS ACCEPTED FOR PUBLICATION.—Where a paper has been accepted for publication, the Council may, with the consent of the author, select this paper for Special Discussion. In the case of such papers advanced proofs will be sent to the members of the Society desiring copies, and copies will be supplied to the author for distribution. A paper selected for Special Discussion will be marked with an asterisk (*) and placed first on the Billet for the day of reading. Any following papers for that day may be adjourned or held as read if the discussion prevents their being read.

6. COMMUNICATIONS NOT SUBMITTED FOR PUBLICATION, such as Demonstrations of Experiments, Statement of Scientific Problems, etc., may be received by the Council, and may also be selected for Special Discussion. The Council does not undertake to publish any notice of such communications in the Proceedings or Transactions of the Society.

[Continued on p. iii of Cover.]

PROCEEDINGS
OF THE
ROYAL SOCIETY OF EDINBURGH.

PROCEEDINGS
OF
THE ROYAL SOCIETY
OF
EDINBURGH

VOL. XLV.

1924-1925.

EDINBURGH:
PRINTED BY NEILL AND COMPANY, LIMITED.

MDCCCXXVI.

CONTENTS.

	PAGE
1. Lord Kelvin : A Centenary Tribute. By The President, Sir J. Alfred Ewing, K.C.B., F.R.S. Issued separately December 18, 1924	1
2. The Irreducible System of Concomitants of Two Double Binary (2, 1) Forms. By W. Saddler, M.A., Lecturer in the University of St Andrews. <i>Communicated by</i> Professor H. W. Turnbull, M.A. Issued separately December 18, 1924,	3
3. A Series Formula for the Roots of Algebraic and Transcendental Equations. By A. C. Aitken, M.A. (New Zealand). <i>Communicated by</i> Professor E. T. Whittaker, F.R.S. Issued separately December 19, 1924,	14
4. The Electrolysis of Salts of Alkyloxyacids. By David A. Fairweather, B.Sc., Ph.D., Chemistry Department, Edinburgh University. <i>Communicated by</i> Professor Sir James Walker, F.R.S. Issued separately December 24, 1924,	23
5. The Ionisation of Iodine Vapour by Ultra-Violet Light. By W. West, B.Sc., and E. B. Ludlam, M.A., D.Sc., Carnegie Teaching Fellow of the University of Edinburgh. (With Addendum.) Issued separately April 10, 1925,	34
6. Experiments and Observations on Crustacea. Part VI: The Mechanism of Massive Movement of the Operculum of <i>Balanus nubilis</i> . By John Tait, M.D., D.Sc., and W. F. Emmons, M.D., M.Sc. From the Biological Station, Nanaimo, Vancouver Island, and the Department of Physiology, McGill University, Montreal. Issued separately April 10, 1925,	42
7. An Investigation of the Absorption of Superposed X-radiations. By Wm. H. Watson, M.A. <i>Communicated by</i> Professor C. G. Barkla, F.R.S. Issued separately April 23, 1925,	
8. The Stability of Suspensions. I. The Rate of Sedimentation of Kaolin Suspensions by Salts at Varying Hydrogen Ion Concentrations. By William Ogilvy Kermack and William Turner Horace Williamson. From the Laboratory of the Royal College of Physicians, Edinburgh, and the Edinburgh and East of Scotland College of Agriculture. <i>Communicated by</i> Dr Alexander Lauder. Issued separately April 29, 1925,	59

	PAGE
9. The Influence of Gelatin on the Stability of a Colloidal Solution of Cholesterol, and on the Charge on the Particles. By William Ogilvy Kermack and Peter MacCallum. From the Research Laboratory of the Royal College of Physicians, Edinburgh, and the Pathological Department of the Royal Infirmary, Edinburgh. <i>Communicated by Dr Alexander Lauder.</i> Issued separately April 29, 1925,	71
10. The Action of Salts with Multivalent Cations on Colloidal Solutions of Gold and Gum Benzoin. By William Ogilvy Kermack and Cecil Innes Bothwell Voge. From the Research Laboratory of the Royal College of Physicians, Edinburgh. <i>Communicated by Dr Alexander Lauder.</i> Issued separately April 29, 1925,	90
11. The Modes of Vibration of a Stretched Membrane with a Particular Law of Density. By E. L. Ince, M.A., D.Sc. Issued separately May 15, 1925,	102
12. A Survey of Clyde Plankton. By Sheina M. Marshall, B.Sc., Assistant Naturalist, Millport Marine Biological Station. <i>Communicated by Professor J. Graham Kerr, F.R.S.</i> Issued separately May 15, 1925,	117
13. The Relation of Sea-Growth and Spawning Frequency in <i>Salmo salar</i> . By W. L. Calderwood, Inspector of Salmon Fisheries in Scotland. Issued separately May 8, 1925,	142
14. The Minimum System of Two Quadratic Forms in n Variables. By Professor H. W. Turnbull, M.A., and J. Williamson, M.A., Lecturer in the University of St Andrews. Issued separately May 14, 1925,	149
15. The Law of Blackening of the Photographic Plate at Low Densities. By E. A. Baker, B.Sc. <i>Communicated by Professor R. A. Sampson, F.R.S.</i> Issued separately May 14, 1925,	166
16. The Theory of Compound Determinants from 1900 to 1920. By Sir Thomas Muir, F.R.S. Issued separately May 18, 1925,	187
17. Discontinuities in the Atmosphere. By A. H. R. Goldie, M.A. (With Four Plates and Three Text-Figures.) Issued separately May 22, 1925,	213
18. The Equation of Conduction of Heat. By Marion C. Gray, M.A., J. E. Baxter Scholar of the University of Edinburgh, and Research Student of Bryn Mawr College, Pa. <i>Communicated by Professor E. T. Whittaker, F.R.S.</i> Issued separately June 10, 1925.	230
19. Note on Professor Whittaker's Atomic Model. By John A. Eldridge, University of Wisconsin. <i>Communicated by Professor E. T. Whittaker, F.R.S.</i> With further Notes by Professor E. T. Whittaker and Professor H. S. Allen. Issued separately June 10, 1925,	245
20. Unilateral Vasoligation on the Senile Male of the Domestic Fowl. By F. A. E. Crew. Issued separately June 10, 1925,	249

Contents.

vii

	PAGE
21. Rejuvenation of the Aged Fowl through Thyroid Medication. By F. A. E. Crew. Issued separately June 26, 1925,	252
22. L'Entretien des Pendules au Moyen de Cellules Photo-électriques. Par M. le Général G. Ferrié, Membre de l'Académie des Sciences de Paris, L.L.G., C.M.G. <i>Communicated by</i> Professor R. A. Sampson, F.R.S., General Secretary. Issued separately June 26, 1925,	261
23. On the Cardinal Function of Interpolation-Theory. By W. L. Ferrar, M.A. Issued separately August 26, 1925,	269
24. The Electrosynthesis of <i>n</i> -Duotriacontane Dicarboxylic Acid. By David A. Fairweather, B.Sc., Ph.D., Chemistry Department, Edinburgh University. <i>Communicated by</i> Professor Sir James Walker, F.R.S. Issued separately August 26, 1925,	283
25. Some Points in the Anatomy of Dicksonia, By Samuel Williams, M.Sc., Lecturer on Plant Morphology, Glasgow University. <i>Communicated by</i> Professor F. O. Bower, F.R.S. (With Two Plates and Four Text-Figures.) Issued separately September 24, 1925,	286
26. On the Vertical Force Changes during the "Sudden Commencement" of a Magnetic Storm. By A. Crichton Mitchell, D.Sc. (With One Plate.) Issued separately September 24, 1925,	297
27. A Colour-Vision Spectrometer. By Professor W. Peddie, D.Sc. Issued separately September 24, 1925,	302
28. A Ball-and-Tube Flowmeter. By Sir J. Alfred Ewing, K.C.B., F.R.S., President. (With Three Plates and Six Text-Figures.) Issued separately September 24, 1925,	308
29. The Precipitation of Sols by Polyvalent Ions. By W. W. Taylor, M.A., D.Sc. Issued separately January 11, 1926,	323
30. Salmon (<i>Salmo salar</i>) of the River Moisie (Eastern Canada). By W. J. M. Menzies. <i>Communicated by</i> W. L. Calderwood, I.S.O. (With Two Plates.) Issued separately January 11, 1926,	334
The Scientific Career of Sir Archibald Geikie, O.M., F.R.S. By Dr B. N. Peach, F.R.S., and Dr John Horne, F.R.S. (With One Plate),	346
OBITUARY NOTICES :—Sir W. F. Barrett ; Edwin Henry Barton ; Frank E. Beddard ; Frederick Hungerford Bowman ; J. J. Graham Brown ; John Young Buchanan ; Thomas Lowe Bunting ; James Angus Cameron ; Sir Francis Darwin ; John Fraser ; Sir Archibald Geikie ; Gio. Battista Grassi ; Andrew Gray ; John Robertson Henderson ; Sir William Peck ; Joseph MacGregor Robertson ; D. R. Steuart ; Sir Thomas Edward Thorpe ; Charles Tweedie ; George Young,	346-387

	PAGE
APPENDIX—	
Proceedings of the Statutory General Meeting, October 1924,	391
Proceedings of the Ordinary Meetings, Session 1924–1925,	394
Proceedings of the Statutory General Meeting, October 1925,	400
Regulations and Awards of the Keith, Makdougall-Brisbane, Neill, Gunning Victoria Jubilee, James Scott, and Bruce Prizes,	402
Accounts of the Society, Session 1924–1925,	411
Voluntary Contributors under Law VI (end of para. 3),	418
The Council of the Society at October 1925,	419
Alphabetical List of the Ordinary Fellows of the Society,	420
List of Honorary Fellows of the Society,	441
Changes in Fellowship during Session 1924–1925,	443
List of Ordinary Fellows of the Society elected during Session 1924–1925,	443
Additions to the Library—Presentations, etc.—1924–1925,	444
Laws of the Society,	448
Index,	455
Index, under Authors' Names, of Papers published in <i>Transactions</i> ,	458