TRANSACTIONS

OF THE

ROYAL SOCIETY OF EDINBURGH.

TRANSACTIONS

OF THE

ROYAL SOCIETY

0F

EDINBURGH.

VOL. XXXII.

EDINBURGH:

PUBLISHED BY ROBERT GRANT & SON, 107 PRINCES STREET, AND WILLIAMS & NORGATE, 14 HENRIETTA STREET, COVENT GARDEN, LONDON.

MDCCCLXXXVII.

| Part I. published | | • | Dec. 3, 1883. |
|-------------------|---|---|----------------|
| Part II. ,, | | | Nov. 29, 1884. |
| Part III. ", | • | | Feb. 13, 1886. |
| PART IV. ,, | | | July 9, 1887. |

CONTENTS.

PART I. (1882-83.)

| PAGI | The Pycnogonida dredged in the Faræ Channel during the Cruise of H.M.S. "Triton" (in August 1882). By Dr P. P. C. Hoek, Member of the Royal Academy of Science of the Netherlands. (Plate I.), | I. |
|------|---|------|
| 11 | Bright Clouds on a Dark Night Sky. By Professor C. Piazzi Smyth, Astronomer-Royal for Scotland. (Plates IIXIV.), | 11. |
| 37 | Note on the Little b Group of Lines in the Solar Spectrum and the New College Spectroscope. By C. Piazzi Smyth, Astronomer-Royal for Scotland. (Plate XV.), | III. |
| 45 | Observations on the Annual and Monthly Growth of Wood in Deciduous and Evergreen Trees. By the late Sir Robert Christison, Bart., and Dr Christison, | IV. |
| 67 | A Contribution to the Chemistry of Nitroglycerine. By MATTHEW HAY, M.D., Assistant to the Professor of Materia Medica in the University of Edinburgh, | V. |
| 78 | The Elementary Composition of Nitroglycerine. By Matthew Hay, M.D., and Orme Masson, M.A., B.Sc., | VI. |
| 98 | Report on the Tunicata collected during the Cruise of H.M.S. "Triton" in the Summer of 1882. By W. A. Herdman, D.Sc., Professor of Natural History in University College, Liverpool. (Plates XVIXX.), | VII. |
| 119 | Report on the Pennatulida dredged by H.M.S. "Triton." By A. MILNES MARSHALL, M.D., D.Sc., M.A., Fellow of St John's College, Beyer Professor of Zoology in Owens College. (Plates XXIXXV.), | ΉΙΙ. |

| H.M.S. "Triton" in | the Faeröe Channel during the Cruise of August 1882. By W. Percy Sladen, mmunicated by John Murray, F.R.S.E |
|--|---|
| of Proteles cristatus W. E. Hoyle, M.A | ntastomum (P. protelis) from the Mesentery; with an Account of its Anatomy. By A. (Oxon.), M.R.C.S., Naturalist to the aission. (Plates XXVII., XXVIII.), 165 |
| XI. On Superposed Magnet C. G. Knott, D.Sc. | tisms in Iron and Nickel. By Professor (Plate XXIX.), |
| Cast Metal, &c., in Se | Chemical Positions of Wrought Iron, Steels, wa Water and other Solutions. By Thomas C.E., F.C.S. (Plates XXX.–XXXIV.), 204 |
| | <u></u> |
| Pa | ART II. (1883–84.) |
| "Porcupine" and ". | A dredged during the Cruises of H.M.SS. Lightning" in the Summers of the Years 70. By Professor Herdman, F.R.S.E. EXVI.), |
| | vster's Line Y in the Infra-Red of the Solar ssor Piazzi Smyth, F.R.S.E., Astronomer- (Plate XXXVII.), |
| _ | nall Clear Spaces in Dusty Air. Ву Јони Plate XXXVIII.), 239 |
| · - | ropis, a New Trematode. By J. T. Cunte XXXIX.), |
| · · · · · · · · · · · · · · · · · · · | escription, and Construction of Knots of rossings. By Rev. T. P. KIRKMAN, F.R.S. |

| CONTENTS. | vii |
|--------------|------|
| OOM THIN TO. | 4 11 |

| | PA | LC1 |
|---------|---|------------|
| XVIII. | On the Approximation to the Roots of Cubic Equations by help of Recurring Chain-Fractions. By Edward Sang, LL.D., F.R.S.E., | |
| XIX. | On Knots. Part II. By Professor Tait, Sec. R.S.E. (Plate XLIV.), | 27 |
| | Appendix.—Note on a Problem in Partitions. By Professor Tait, Sec. R.S.E., | 1 0 |
| XX. | On the Philosophy of Language. By Emeritus Professor Blackie, F.R.S.E., | 1 3 |
| XXI. | The Old Red Sandstone Volcanic Rocks of Shetland. By B. N. Peach, F.R.S.E., and John Horne, F.R.S.E. (Plates XLV., XLVI.), | 59 |
| XXII. | Observations on a Green Sun and Associated Phenomena. By Professor C. Michie Smith, F.R.S.E. (Plate XLVII.), . 38 | 39 |
| XXIII. | An Example of the Method of Deducing a Surface from a Plane Figure. By Professor L. Cremona, LL.D. Edin., Hon. F.R.SS. Lond. and Edin., | 11 |
| | PART III. (1884–85.) | |
| XXIV. | Micrometrical Measures of Gaseous Spectra under High Dis- persion. By Professor C. Piazzi Smyth, F.R.S.E., and Astro- nomer-Royal for Scotland. (Plates XLVIIILXXVIII.), 41 | 15 |
| XXV. | On Bipartite Functions. By Thomas Muir, LL.D., 46 | 31 |
| XXVI. | The 364 Unifilar Knots of Ten Crossings, Enumerated and Described. By Rev. Thomas P. Kirkman, M.A., F.R.S, 48 | 33 |
| XXVII. | On Knots. Part III. By Professor Tait. (Plates LXXIXLXXXI.), | 98 |
| XXVIII. | A New Graphic Analysis of the Kinematics of Mechanisms. By Professor Robert H. Smith, Mason College, Birmingham. (Plate LXXXII.), 50 |)7 |

| XXIX. The Visual, Grating and Glass-lens, Solar Spectrum (in By Professor C. Piazzi Smyth, F.R.S.E., and Astro Royal for Scotland. (Plates LXXXIIICXLIII.) | onomer- |
|---|-------------------|
| XXX. Observations on the Recent Calcareous Formations Solomon Group made during 1882–84. By H. B. M.B., F.G.S., Surgeon H.M.S. "Lark." Communic JOHN MURRAY, Ph.D. (Plates CXLIV., CXLV.), | GUPPY, |
| XXXI. Observations on Atmospheric Electricity. By Profe Michie Smith. (Plate CXLVI.), | essor C. . 588 |
| "XXXII. Note on Ectocarpus. By John Rattray, M.A., B.Sc., S. Marine Station, Granton, Edinburgh. Communication John Murray, Ph.D. (Plates CXLVII., CXLVII.) | ated by |
| XXXIII. Anatomy and Physiology of Patella vulgata. Part I. tomy. By R. J. Harvey Gibson, M.A. Communic Professor Herdman, D.Sc. (Plates CXLIXCLII | eated by |
| XXXIV. Detached Theorems on Circulants. By Thomas Muir, | LL.D., 639 |
| XXXV. On the Hessian. By Professor Chrystal, | . 645 |
| The Council of the Society, | . 654 |
| Alphabetical List of the Ordinary Fellows, | . 655 |
| List of Honorary Fellows, | . 668 |
| List of Ordinary Fellows Elected during Sessions 1883-85, | . 674 |
| Laws of the Society, | . 681 |
| The Keith, Brisbane, and Neill Prizes, | . 688 |
| Awards of the Keith, Makdougall-Brisbane, and Neill Pri | zes, . 690 |
| Proceedings of the Statutory General Meetings, | . 693 |
| List of Public Institutions and Individuals entitled to receive of the Proceedings and Transactions, | e Copies . 701 |
| Indon | 707 |