PHILOSOPHICAL
TRANSACTIONS,
OF THE
ROYAL SOCIETY
OF
LONDON.
FOR THE YEAR MDCCCLII.
PART I.
LONDON,
PRINTED BY W. BULMER AND CO. CLEVELAND-ROW, ST. JAMES'S;
AND SOLD BY G. AND W. NICOL, PALL-MALL, BOOKSELLERS TO HIS MAJESTY,
AND PRINTERS TO THE ROYAL SOCIETY.
MDCCCLII.
ADVERTISEMENT.

The Committee appointed by the Royal Society to direct the publication of the Philosophical Transactions, take this opportunity to acquaint the Public, that it fully appears, as well from the council-books and journals of the Society, as from repeated declarations which have been made in several former Transactions, that the printing of them was always, from time to time, the single act of the respective Secretaries, till the Forty-seventh Volume: the Society, as a Body, never interesting themselves any further in their publication, than by occasionally recommending the revival of them to some of their Secretaries, when, from the particular circumstances of their affairs, the Transactions had happened for any length of time to be intermitted. And this seems principally to have been done with a view to satisfy the Public, that their usual meetings were then continued, for the improvement of knowledge, and benefit of mankind, the great ends of their first institution by the Royal Charters, and which they have ever since steadily pursued.

But the Society being of late years greatly enlarged, and their communications more numerous, it was thought advisable, that a Committee of their members should be appointed, to reconsider the papers read before them, and select out of them such as they should judge most proper for publication in the future Transactions; which was accordingly done upon the 26th of March, 1752. And the grounds
of their choice are, and will continue to be, the importance and singularity of the subjects, or the advantageous manner of treating them; without pretending to answer for the certainty of the facts, or propriety of the reasonings, contained in the several papers so published, which must still rest on the credit or judgment of their respective authors.

It is likewise necessary on this occasion to remark, that it is an established rule of the Society, to which they will always adhere, never to give their opinion, as a Body, upon any subject, either of Nature or Art, that comes before them. And therefore the thanks which are frequently proposed from the Chair, to be given to the authors of such papers as are read at their accustomed meetings, or to the persons through whose hands they receive them, are to be considered in no other light than as a matter of civility, in return for the respect shewn to the Society by those communications. The like also is to be said with regard to the several projects, inventions, and curiosities of various kinds, which are often exhibited to the Society; the authors whereof, or those who exhibit them, frequently take the liberty to report, and even to certify in the public news-papers, that they have met with the highest applause and approbation. And therefore it is hoped, that no regard will hereafter be paid to such reports and public notices; which in some instances have been too lightly credited, to the dishonour of the Society.
CONTENTS.

I. The Bakerian Lecture. Observations on the Quantity of horizontal Refraction; with a Method of measuring the Dip at Sea. By William Hyde Wollaston, M. D. F. R. S. page 1

II. A chemical Analysis of some Calamines. By James Smithson, Esq. F. R. S. p. 12

III. Experiments on the Quantity of Gases absorbed by Water, at different Temperatures, and under different Pressures. By Mr. William Henry. Communicated by the Right Hon. Sir Joseph Banks, K. B. P. R. S. p. 29

IV. Experiments and Observations on the various Alloys, on the specific Gravity, and on the comparative Wear of Gold. Being the Substance of a Report made to the Right Honourable the Lords of the Committee of Privy Council, appointed to take into Consideration the State of the Coins of this Kingdom, and the present Establishment and Constitution of his Majesty's Mint. By Charles Hatchett, Esq. F. R. S. p. 43


VI. An Account of some Stones said to have fallen on the Earth in France; and of a Lump of native Iron, said to have fallen in India. By the Right Hon. Charles Greville, F. R. S. p. 200

VII. Observations on the Structure of the Tongue, illustrated by
Cases, in which a Portion of that Organ has been removed by Ligature. By Everard Home, Esq. F. R. S. p. 205

VIII. Observations of the Transit of Mercury over the Disk of the Sun; to which is added, an Investigation of the Causes which often prevent the proper Action of Mirrors. By William Herschel, LL. D. F. R. S. p. 214

IX. An Account of some Experiments and Observations on the constituent Parts of certain astringent Vegetables; and on their Operation in Tanning. By Humphry Davy, Esq. Professor of Chemistry in the Royal Institution. Communicated by the Right Hon. Sir Joseph Banks, Bart. K. B. P. R. S. p. 233

X. Appendix to Mr. William Henry’s Paper, on the Quantity of Gases absorbed by Water, at different Temperatures, and under different Pressures. p. 274

APPENDIX.

Meteorological Journal kept at the Apartments of the Royal Society, by Order of the President and Council.
THE PRESIDENT and COUNCIL of the ROYAL SOCIETY adjudged, for the year 1802, the Medal on Sir Godfrey Copley's Donation, to WILLIAM HYDE WOLLASTON, M. D. for his various Papers printed in the Philosophical Transactions.

And they adjudged the Gold and Silver Medals on the Donation of BENJAMIN COUNT OF RUMFORD, to COUNT RUMFORD himself, for his various Discoveries respecting Heat and Light.
PHILOSOPHICAL
TRANSACTIONS,
of the
ROYAL SOCIETY
of
LONDON.

FOR THE YEAR MDCCCIII.

PART II.

LONDON,

PRINTED BY W. BULMER AND CO. CLEVELAND-ROW, ST. JAMES'S;
AND SOLD BY G. AND W. NICOL, PALL-MALL, BOOKSELLERS TO HIS MAJESTY,
AND PRINTERS TO THE ROYAL SOCIETY.
MDCCCIII.
XI. Account of some Experiments on the Descent of the Sap in Trees. In a Letter from Thomas Andrew Knight, Esq. to the Right Hon. Sir Joseph Banks, Bart. K. B. P. R. S.

XII. Enquiries concerning the Nature of a metallic Substance lately sold in London, as a new Metal, under the Title of Palladium. By Richard Chenevix, Esq. F. R. S. and M. R. I. A.

XIII. An Account of the sinking of the Dutch Frigate Ambuscade, of 32 Guns, near the Great Nore; with the Mode used in recovering her. By Mr. Joseph Whidbey, Master Altenant in Sheerness Dock Yard. Communicated by the Right Hon. Sir Joseph Banks, Bart. K. B. P. R. S.

XIV. Observations on a new Species of hard Carbonate of Lime; also on a new Species of Oxide of Iron. By the Count de Bourron, F. R. S. and L. S.

XV. Account of the Changes that have happened, during the last Twenty-five Years, in the relative Situation of Double-stars; with an Investigation of the Cause to which they are owing. By William Herschel, LL. D. F. R. S.
XVI. An Account of the Measurement of an Arc of the Meridian, extending from Dunnose, in the Isle of Wight, Latitude 50° 37' 8'', to Clifton, in Yorkshire, Latitude 58° 27' 31'', in course of the Operations carried on for the Trigonometrical Survey of England, in the Years 1800, 1801, and 1802. By Major William Mudge, of the Royal Artillery, F. R. S.

Presents received by the Royal Society, from November 1802 to June 1803

Index.