

PHILOSOPHICAL
TRANSACTIONS
OF THE
ROYAL SOCIETY OF LONDON.

SERIES A.

CONTAINING PAPERS OF A MATHEMATICAL OR PHYSICAL CHARACTER.

VOL. 221.

PRINTED AND PUBLISHED FOR THE ROYAL SOCIETY BY
HARRISON AND SONS, LTD., 44-47, ST. MARTIN'S LANE, LONDON. W.C. 2.

Printers in Ordinary to His Majesty.

MARCH, 1921.

*The Royal Society
of London*

VI. *The Phenomena of Rupture and Flow in Solids.* By A. A. GRIFFITH, *M. Eng.*
(of the Royal Aircraft Establishment). Communicated by G. I. TAYLOR,
F.R.S. page 163

VII. *Reduction of Error by Linear Compounding.* By W. F. SHEPPARD, *Sc.D.*,
LL.M. Communicated by E. T. WHITTAKER, *F.R.S.* 199

VIII. *Tidal Friction in Shallow Seas.* By HAROLD JEFFREYS, *M.A.*, *D.Sc.*,
Fellow of St. John's College, Cambridge. Communicated by Sir NAPIER
 SHAW, *F.R.S.* 239

IX. *Plane Stress and Plane Strain in Bipolar Co-ordinates.* By G. B. JEFFERY,
M.A., *D.Sc.*, *Fellow of University College, London.* Communicated by
 Prof. L. N. G. FILON, *F.R.S.* 265

X. *The Aerodynamics of a Spinning Shell.* By R. H. FOWLER, E. G. GALLOP,
 C. N. H. LOCK and H. W. RICHMOND, *F.R.S.* 295

XI. *A Selective Hot-Wire Microphone.* By W. S. TUCKER, *D.Sc.*, *A.R.C.Sc.*, and
 E. T. PARIS, *M.Sc. (Lond.)*. Communicated by Prof. H. L. CALLENDAR,
F.R.S. 389

Index to Volume. 431

LIST OF ILLUSTRATIONS.

Plate 1.—Mr. LEWIS F. RICHARDSON on Some Measurements of Atmospheric Turbulence.

Plates 2-5.—Mr. C. T. R. WILSON: Investigations on Lightning Discharges and on the Electric Field of Thunderstorms.

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 received them, are to be considered in no other light than as a matter of civility, in return for the respect shown 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 newspapers, 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.