

# PROCEEDINGS

OF THE

## ROYAL SOCIETY OF EDINBURGH

Section **A** (Mathematical and Physical Sciences)

---

---

VOL. LXI]

1941

[PART I

---

---

### CONTENTS.

NO.	PAGE
I. On Hamilton's Principal Function in Quantum Mechanics. By E. T. WHITTAKER, F.R.S., P.R.S.E. . . . .	I
<i>(Issued separately February 18, 1941.)</i>	
II. The Van der Waals Force between a Proton and a Hydrogen Atom. By C. A. COULSON, M.A., Ph.D., University College, Dundee. <i>Communicated by</i> Professor E. T. COPSON, M.A., D.Sc. (With One Figure) . . . .	20
<i>(Issued separately February 18, 1941.)</i>	
III. Reciprocity. Part V: Reciprocal Spinor Functions. By KLAUS FUCHS, D.Sc., Carnegie Research Fellow, Uni- versity of Edinburgh. <i>Communicated by</i> Professor MAX BORN, F.R.S. . . . .	26
<i>(Issued separately February 17, 1941.)</i>	
IV. On an Elementary Solution of a Partial Differential Equation of Parabolic Type. Part I. By E. T. COPSON, University College, Dundee, in the University of St Andrews . . . .	37
<i>(Issued separately April 17, 1941.)</i>	

*[Continued on page iv of Cover*

---

PUBLISHED BY  
**OLIVER & BOYD**  
EDINBURGH: TWEEDDALE COURT  
LONDON: 98 GREAT RUSSELL STREET, W.C.1

# ROYAL SOCIETY OF EDINBURGH

22, 24 GEORGE STREET, EDINBURGH, 2

---

## THE PREPARATION FOR PUBLICATION OF PAPERS IN THE TRANSACTIONS AND IN THE PROCEEDINGS (SECTIONS "A" AND "B") OF THE SOCIETY.

IN view of the national necessity for exercising the strictest economy in paper and the high cost of publication, authors of papers are requested to write their communications in as concise a form as possible and to avoid excess of tables and illustrations.

An author is advised to retain a copy of his paper, as the Society cannot undertake any responsibility in relation to the custody of papers entrusted to it. The MS. must be easily legible, preferably typewritten on one side of quarto or foolscap paper and with pages numbered. *It must be absolutely in its final form for printing.* A short summary of the important points in the paper should be given. A table of contents (for a long paper), references to plates, etc., must be in their proper places, and positions indicated for the insertion of illustrations that are to appear in the text. Names of genera and species should be in italics. Footnotes should be avoided.

Additions to a paper after it has been finally handed in for publication will, if accepted by the Council, be treated and dated as separate communications, and may, or may not, be printed immediately after the original paper.

References to literature should be placed at the end of the paper, alphabetically arranged, under authors' names, with abridged titles of journals, thus:—

SANDEMAN, I., 1929. "The Fulcher Bands of Hydrogen," *Proc. Roy. Soc. Edin.*, vol. xlix, pp. 48–64.

WHITTAKER, E. T., and ROBINSON, G., 1923. *A Short Course in Interpolation*, London.

Titles of papers should be quoted exactly, and all references to literature should be carefully checked by the authors before submitting the paper. References to literature in the text should be made by quoting the author's name and the year of publication thus (Sandeman, 1929) or (Whittaker and Robinson, 1923), and adding the page when necessary.

All illustrations must be in a form immediately suitable for reproduction, preferably of a size to permit reduction to about two-thirds the linear dimensions of the original, and should be capable of reproduction by photographic processes. Drawings and diagrams to be reproduced as line blocks should be made with fixed Indian ink, preferably on fine white bristol board, free from folds or creases; smooth clean lines or sharp dots, but no washes or colours, should be used. Graphs should be on a squared paper ruled in *faint blue* lines, unless the lines are to be brought out. If the illustrations are on a large scale to be afterwards reduced by photography, any lettering must be on a corresponding scale.

INDEX SLIP

PROC. R.S.E., VOL. LXI, PART I

Section A (Mathematical and Physical Sciences)

---

- WHITTAKER, E. T.—On Hamilton's Principal Function in Quantum Mechanics.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 1–19.
- Hamilton's Principal Function in Quantum Mechanics.  
E. T. WHITTAKER.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 1–19.
- Quantum Mechanics, Hamilton's Principal Function in.  
E. T. WHITTAKER.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 1–19.
- Schrödinger's Wave-equation.  
E. T. WHITTAKER.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 1–19.
- COULSON, C. A.—The Van der Waals Force between a Proton and a Hydrogen Atom.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 20–25.
- Hydrogen Atom, Van der Waals Force between a Proton and.  
C. A. COULSON.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 20–25.
- Van der Waals Force between a Proton and a Hydrogen Atom.  
C. A. COULSON.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 20–25.
- FUCHS, KLAUS.—Reciprocity. Part V: Reciprocal Spinor Functions.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 26–36.
- Reciprocity. Part V: Reciprocal Spinor Functions.  
KLAUS FUCHS.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 26–36.
- Reciprocal Spinor Functions: Reciprocity. Part V.  
KLAUS FUCHS.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 26–36.

- COPSON, E. T.—On an Elementary Solution of a Partial Differential Equation of Parabolic Type. Part I. Part II. The Nature of the Singularity.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 37–60.
- Differential Equation, Partial, of Parabolic Type. Parts I and II.  
E. T. COPSON.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 37–60.
- Partial Differential Equation of Parabolic Type. Parts I and II.  
E. T. COPSON.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 37–60.
- Singularities of Partial Differential Equation. Part II.  
E. T. COPSON.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 54–60.
- ERDÉLYI, A.—Generating Functions of Certain Continuous Orthogonal Systems.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 61–70.
- Generating Functions of Certain Continuous Orthogonal Systems.  
A. ERDÉLYI.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 61–70.
- Orthogonal Systems, Generating Functions of.  
A. ERDÉLYI.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 61–70.
- TANNAHILL, T. R.—The Clear-Day Barometric Curve at Ben Nevis.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 71–76.
- Barometric Curve at Ben Nevis, Clear-Day.  
T. R. TANNAHILL.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 71–76.
- Ben Nevis, Clear-Day Barometric Curve at.  
T. R. TANNAHILL.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 71–76.
- Clear-Day Barometric Curve at Ben Nevis.  
T. R. TANNAHILL.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 71–76.
- SARGINSON, KATHLEEN.—Reciprocity. Part VI: The Wave Function of the Meson.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 77–92.
- Reciprocity. Part VI: The Wave Function of the Meson.  
KATHLEEN SARGINSON.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 77–92.

- Meson, Wave Function of the.  
KATHLEEN SARGINSON.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 77-92.
- Wave Function of the Meson.  
KATHLEEN SARGINSON.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 77-92.
- ROBINSOHN, A.—On a Certain Variation of the Distributive Law for a  
Commutative Algebraic Field.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 93-101.
- Algebraic Fields with Modified Distributive Law.  
A. ROBINSOHN.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 93-101.
- Fields, Algebraic, Non-distributive.  
A. ROBINSOHN.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 93-101.
- HOUSTOUN, R. A.—A New Way of Measuring the Velocity of Light.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 102-114.
- Light, New Way of Measuring the Velocity of.  
R. A. HOUSTOUN.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 102-114.
- Velocity of Light, A New Way of Measuring the.  
R. A. HOUSTOUN.  
Proc. Roy. Soc. Edin., vol. lxi, A, 1941, pp. 102-114.