

*Proceedings of the*  
**CAMBRIDGE PHILOSOPHICAL  
SOCIETY**

**VOLUME 46**

**PART 4**

**CAMBRIDGE UNIVERSITY PRESS**  
**LONDON: BENTLEY HOUSE, N.W.1**  
**NEW YORK: 51 MADISON AVENUE**

*Price Fifteen Shillings Net*

**October 1950**



# CAMBRIDGE PHILOSOPHICAL SOCIETY

FOUNDED 1819; ROYAL CHARTER 1882

Session 1949–1950

*President:* W. B. R. KING.

*Vice-Presidents:* W. L. BRAGG, F. T. BROOKS, W. V. D. HODGE.

*Treasurer:* M. V. WILKES, St John's College.

*Secretaries:* (Mathematical) R. A. RANKIN, Clare College.

(Physical) R. C. EVANS, St Catharine's College.

(Biological) J. E. SMITH, Jesus College.

The publications of the Society consist of the *Proceedings* and of the *Biological Reviews*. The publication of separate *Transactions* was suspended at the end of Volume XXII.

Orders should be sent to: THE MANAGER, CAMBRIDGE UNIVERSITY PRESS, BENTLEY HOUSE, 200 EUSTON ROAD, LONDON, N.W.1. Enquiries from the U.S.A., should be addressed to the Cambridge University Press, American Branch, 51 Madison Avenue, New York 10, U.S.A.

For the purchase of early parts of the *Transactions* and *Proceedings* applications should be made to the Secretaries. The current price for these early parts is the original selling price, plus 50 %.

*Fellows of the Society are particularly requested to inform the Secretaries of any change of postal address.*

---

## PROCEEDINGS of the CAMBRIDGE PHILOSOPHICAL SOCIETY

*Editorial Committee:*

R. C. EVANS

A. B. PIPPARD

D. R. HARTREE

R. A. RANKIN (*Editor*)

W. V. D. HODGE

F. SMITHIES

N. KEMMER

D. H. WILKINSON

1. Communications for the *Proceedings* should be sent to one of the above, or to *The Philosophical Library, Cambridge*.

2. Four parts of the *Proceedings* are issued during the year.

3. Papers occupying more than twenty pages of print can only very rarely be accepted.

4. Authors of papers are informed that the Illustrations and Diagrams are executed as far as possible by photographic 'process' work; drawings should be on a large scale and on smooth white Bristol board in Indian Ink.

Authors may receive on request, fifty offprints of a paper in the *Proceedings* without charge.

5. It is recommended that each paper be prefaced by a short abstract. Authors may find it useful to consult the *Guide for the preparation of synopses* which has been prepared by the Abstracting Services Consultative Committee and is issued by the Royal Society. Copies may be obtained from the Librarian.

6. Authors are particularly requested to prepare their manuscripts in a form suitable for printing. A pamphlet containing Directions to Authors may be obtained from the Editor or the Librarian. In the event of a large number of corrections being necessary in the proofs, the Council reserves the right to make a charge towards the cost of revision.



*Proceedings of the*  
CAMBRIDGE PHILOSOPHICAL  
SOCIETY

VOLUME 46

CAMBRIDGE  
AT THE UNIVERSITY PRESS  
1950

*Printed in Great Britain at the University Press, Cambridge  
(Brooke Crutchley, University Printer)  
and published by the Cambridge University Press  
London : Bentley House, N.W. 1  
American Branch : New York  
Agents for Canada, India, and Pakistan : Macmillan*

# CONTENTS

	PAGE
<b>Allen, K. W., Livesey, D. L. and Wilkinson, D. H.</b> A comparison of some absolute methods of measuring fast neutron flux . . . . .	339
<b>Binnie, A. M.</b> Notes on gas flow through a nozzle . . . . .	492
<b>Blaney, Hugh.</b> Some asymmetric inequalities . . . . .	359
<b>Bonsall, F. F.</b> On generalized subharmonic functions . . . . .	387
<b>Brickell, F.</b> On the existence of metric differential geometries based on the notion of area . . . . .	67
<b>Carlson, B. C. and Rushbrooke, G. S.</b> On the expansion of a Coulomb potential in spherical harmonics . . . . .	626
<b>Cassels, J. W. S.</b> Some metrical theorems in Diophantine approximation. I . . . . .	209
<b>Cassels, J. W. S.</b> Some metrical theorems in Diophantine approximation. III . . . . .	219
<b>Cassels, J. W. S.</b> A theorem of Vinogradoff on uniform distribution. ( <i>Research note</i> ) . . . . .	642
<b>Cherry, T. M.</b> Summation of slowly convergent series . . . . .	436
<b>Cooke, J. C.</b> The boundary layer of a class of infinite yawed cylinders. ( <i>Research note</i> ) . . . . .	645
<b>Coombs, A.</b> The translation of two bodies under the free surface of a heavy fluid . . . . .	453
<b>Cooper, J. L. B.</b> The characterization of quantum mechanical operators . . . . .	614
<b>Cooper, J. L. B.</b> The paradox of separated systems in quantum theory . . . . .	620
<b>Cooper, R.</b> The extremal values of Legendre polynomials . . . . .	549
<b>Coulson, C. A.</b> Notes on the secular determinant in molecular orbital theory. ( <i>Research note</i> ) . . . . .	202
<b>Davies, D. R.</b> The lateral diffusion of a cloud of falling droplets . . . . .	500
<b>Dean, W. R.</b> Note on the motion of liquid near a position of separation . . . . .	293
<b>Delange, Hubert.</b> On two theorems of S. Verblunsky . . . . .	57
<b>De Wet, J. S.</b> A note on the relativistic invariance of quantized field theories . . . . .	316
<b>De Wet, J. S.</b> ( <i>Joint author</i> ). The minors of a determinant in terms of Pfaffians . . . . .	519
<b>Domb, C.</b> Some probability distributions connected with recording apparatus. II . . . . .	429
<b>Dungeo, J. W.</b> A note on magnetic fields in conducting materials. ( <i>Research note</i> ) . . . . .	651
<b>Edmonds, Sheila M.</b> The Parseval formulæ for monotonic functions. II . . . . .	231
<b>Edmonds, Sheila M.</b> The Parseval formulæ for monotonic functions. III . . . . .	249
<b>Eggleston, H. G.</b> The Besicovitch dimension of Cartesian product sets . . . . .	383
<b>Eliezer, C. Jayaratnam.</b> A note on electron theory. ( <i>Research note</i> ) . . . . .	199
<b>Friedlander, F. G.</b> On the asymptotic behaviour of the solutions of a class of non-linear differential equations . . . . .	406
<b>Friedlander, F. G.</b> On the iteration of a continuous mapping of a compact space into itself . . . . .	46
<b>Good, I. J.</b> A proof of Liapounoff's inequality. ( <i>Research note</i> ) . . . . .	353
<b>Goodwin, E. T.</b> Note on the evaluation of complex determinants . . . . .	451
<b>Green, A. E. and Sneddon, I. N.</b> The distribution of stress in the neighbourhood of a flat elliptical crack in an elastic solid . . . . .	159
<b>Guersy, Feza.</b> Classical statistical mechanics of a rectilinear assembly . . . . .	182
<b>Guinand, A. P.</b> A note on repeated general transformations. ( <i>Research note</i> ) . . . . .	354
<b>Gupta, S. N.</b> On the iteration of vector mesons with nucleons. ( <i>Research note</i> ) . . . . .	649
<b>Hammersley, J. M.</b> Further results for the counterfeit coin problems . . . . .	226
<b>Hartley, E. M.</b> A sextic primal in five dimensions . . . . .	91
<b>Hartley, E. M.</b> Two maximal subgroups of a collineation group in five dimensions . . . . .	555
<b>Hartree, D. R.</b> A method for the numerical integration of first-order differential equations. ( <i>Research note</i> ) . . . . .	523
<b>Heilbronn, H.</b> On Euclid's algorithm in cubic self-conjugate fields . . . . .	377
<b>Heins, Albert E.</b> A note on a singular integral equation . . . . .	268
<b>Henstock, R.</b> Sets of uniqueness for trigonometric series and integrals . . . . .	538
<b>Hopkins, H. G.</b> Elastic deformations of infinite strips . . . . .	164
<b>Howarth, L.</b> Rayleigh's problem for a semi-infinite plate . . . . .	127
<b>Huzurbazar, V. S.</b> Probability distributions and orthogonal parameters . . . . .	281

	PAGE
<b>Illingworth, C. R.</b> Some solutions of the equations of flow of a viscous compressible fluid	469
<b>Illingworth, C. R.</b> Unsteady laminar flow of gas near an infinite flat plate	603
<b>Ingham, A. E.</b> A further note on trigonometrical inequalities	535
<b>Jaeger, J. C.</b> Conduction of heat in a solid with a power law of heat transfer at its surface	634
<b>Ledermann, W.</b> On the asymptotic probability distribution for certain Markoff processes	581
<b>Levey, H. C.</b> High-speed flow of a gas past an approximately elliptic cylinder	479
<b>Lindley, D. V.</b> Grouping corrections and maximum likelihood equations	106
<b>Livesey, D. H.</b> ( <i>Joint author</i> ). A comparison of some absolute methods of measuring fast neutron flux	339
<b>Mack, C.</b> The expected number of aggregates in a random distribution of $n$ points	285
<b>March, N. H.</b> An improved approximate analytic solution of the Thomas-Fermi equation for atoms	356
<b>Mestel, L.</b> On the thermal conductivity in dense stars	331
<b>Moran, P. A. P.</b> The distribution of the multiple correlation coefficient. ( <i>Research note</i> )	521
<b>Moran, P. A. P.</b> Numerical integration by systematic sampling	111
<b>Moran, P. A. P.</b> The oscillatory behaviour of moving averages	272
<b>Mossaheb, G. H.</b> On differentiation and Denjoy-behaviour of functions of two real variables	28
<b>Müller, Cl.</b> ( <i>Joint author</i> ). Zur Verallgemeinerung des Schwarzschen Lemmas auf mehrere Dimensionen	396
<b>Münster, Arnold.</b> On the theory of grand partition functions	319
<b>Olver, F. W. J.</b> A new method for the evaluation of zeros of Bessel functions and of other solutions of second order differential equations	570
<b>Peschl, E. and Mueller, Cl.</b> Zur Verallgemeinerung des Schwarzschen Lemmas auf mehrere Dimensionen	396
<b>Pitt, H. R.</b> The definition of measure in function space	19
<b>Primrose, E. J. F.</b> Projective mutual invariants of a space cubic and a linear complex. ( <i>Research note</i> )	195
<b>Ramakrishnan, Alladi.</b> Stochastic processes relating to particles distributed in a continuous infinity of states	595
<b>Rees, D.</b> The nuclei on non-associative division algebras	1
<b>Reiz, Anders.</b> On quadrature formulae	119
<b>Roth, L.</b> On fourfolds with canonical curve sections	419
<b>Rushbrooke, G. S.</b> ( <i>Joint author</i> ). On the expansion of a Coulomb potential in spherical harmonics	626
<b>Schwartz, A. and De Wet, J. S.</b> The minors of a determinant in terms of Pfaffians. ( <i>Research note</i> )	519
<b>Slater, N. B.</b> The distribution of the integers $N$ for which $\{\theta N\} < \phi$	525
<b>Sneddon, I. N.</b> ( <i>Joint author</i> ). The distribution of stress in the neighbourhood of a flat elliptical crack in an elastic solid	159
<b>Stewartson, K.</b> Supersonic flow over an inclined wing of zero aspect ratio	307
<b>Todd, John.</b> The condition of a certain matrix	116
<b>Todd, J. A.</b> The invariants of a finite collineation group in five dimensions	73
<b>Ursell, F.</b> Surface waves on deep water in the presence of a submerged circular cylinder. I	141
<b>Ursell, F.</b> Surface waves on deep water in the presence of a submerged circular cylinder. II	163
<b>Wassermann, G. D.</b> A note on boundary perturbations. ( <i>Research note</i> )	206
<b>Wilkinson, D. H.</b> A stable ninety-nine channel pulse amplitude analyser for slow counting	508
<b>Wilkinson, D. H.</b> ( <i>Joint author</i> ). A comparison of some absolute methods of measuring fast neutron flux	339
<i>Proceedings at the Meetings held during the Session 1949-1950</i>	655
<i>Statement of Accounts for the Year ending 31 July 1949</i>	659