CAMBRIDGE PHILOSOPHICAL SOCIETY

STATEMENT OF ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 1978

Year ended 31.12.77 — GENERAL INCOME AND EXPENDITURE ACCOUNT

£	£	*Income*		£
19,507		Dividends and interest (gross)		21,092
2,069		Members subscriptions		1,956
63		Transfer from Compounders' Fund for life members		57
114		Sales, of *Arcturus Atlas*, etc.		68
	14,402	Xerox copier: Income	17,927	
		Less: Expenses		
		4,436 Wages	4,793	
		7,876 Meter rent & copy charges	9,028	
		1,878 Materials	2,742	
212	*14,190*	— Maintenance	939	17,502
				425
		Add: Estimated adjustment for additional stocks at 31.12.77	1,500	1,925
21,965				25,098

		Expenditure		
	3,828	Executive secretary's salary		4,201
	1,042	Printing and stationery		1,469
	504	Postages		395
	674	Audit fee and accountancy charges		800
	166	Sundry expenses		349
	54	Insurances		24
	672	Expenses of meetings including honoraria		690
		Cost of copies for Scientific Periodicals Library:		
	1,245	*Mathematical Proceedings*		1,425
	670	*Biological Reviews*		756
	543	Grants to translation service		320
	550	Miscellaneous grants and donations		200
		Interest credited to:		
	486	Compounders' Fund		539
	59	Sir Joseph Larmor's Fund		33
		Transfers to:		
	3,000	Research Studentships Fund		3,500
	500	Working Parties Fund		700
	1,300	Travel Grants Fund		1,500
	27	William Hopkins Prize Fund		26
	67	William Bate Hardy Prize Fund		67
	8	Sir Joseph Larmor's Fund		40
	51	Depreciation of office equipment		44
15,446				17,078
£6,519		Excess of income over expenditure for the year		£8,020

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

ACCUMULATED FUND

Year ended 31.12.77 £	£		£	£
179,108		Balance 1 January 1978		177,470
6,519		Excess of income over expenditure for the year		8,020
(8,157)		Net profit/(loss) on sale of investments		8,212
£177,470		Balance 31 December 1978		£193,702

PUBLICATION FUND

Mathematical Proceedings (Volumes 83 and 84)

Income

36,309		Sales	40,299
228		Sales of separates	335
1,227		Members' subscriptions	1,216
250		Grant from Cambridge University	250
178		Transfer from Compounders' Fund for life members	182
38,192			42,282

Expenditure

	27,223	Printing	29,415	
	1,615	Printing of separates	1,826	
	6,226	Commission on sales	7,028	
	1,331	Editorial expenses	1,379	
	2,131	Carriage	2,291	
	38,526		41,939	
		Less:		
	(788)	Cost of unsold copies transferred to Publication Reserve Fund	(830)	
	(1,245)	Cost of copies for the Scientific Periodicals Library transferred to General Income and Expenditure Account	(1,425)	
36,493				39,684
1,699		Net surplus for year		2,598
(3,468)		Fund balance 1 January 1978		(1,769)
£(1,769)		Fund balance 31 December 1978		£829

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

Year ended 31.12.77				
£	£		£	£
		Income		
20,817		Sales		19,169
377		Sales of separates		388
910		Members' subscriptions		940
250		Grant from Cambridge University		250
38		Transfer from Compounders' Fund for life members ...		50
22,392				20,797
		Expenditure		
	12,200	Printing	15,066	
	862	Printing of separates	914	
	5,212	Commission on sales	5,397	
	826	Editorial expenses	901	
	1,733	Carriage	1,774	
	20,833		24,052	
		Less:		
	(370)	Cost of unsold copies transferred to Publication Reserve Fund	(350)	
	(670)	Cost of copies for the Scientific Periodicals Library transferred to General Income and Expenditure Account	(756)	
19,793				22,946
2,599		Net surplus/(deficit) for year		(2,149)
24,500		Fund balance 1 January 1978		27,099
£27,099		Fund balance 31 January 1978		24,950

PUBLICATION RESERVE FUND

		Mathematical Proceedings		
2,208		Sales		2,726
		Less:		
	788	Cost of unsold copies of Volumes transferred from Publication Fund	830	
	118	Carriage	182	
	42	Clerical fees	—	
948				1,012
1,260		Net surplus for year		1,714
14,858		Fund balance 1 January 1978		16,118
16,118		Fund balance 31 December 1978...		17,832
		Biological Reviews		
944		Sales		604
		Less:		
	370	Cost of unsold copies of Volumes transferred from Publication Fund	350	
	59	Carriage	42	
	41	Clerical fees	—	
470				392
474		Net surplus for year		212
16,776		Fund balance 1 January 1978		17,250
£17,250		Fund Balance 31 December 1978...		£17,462

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

COMPOUNDERS' FUND

Year ended 31.12.77				
£	£		£	£
5,775		Balance 1 January 1978		6,328
486		Transfer from General Income and Expenditure Account		539
346		Life subscriptions received		187
6,607				7,054
		Less:		
		Transfer to Publication Fund:		
	178	*Mathematical Proceedings*	182	
	38	*Biological Reviews*	50	
	63	Transfer to General Income and Expenditure Account	57	
279				289
£6,328		Balance 31 December 1978		£6,765

RESEARCH STUDENTSHIPS FUND

63	Balance 1 January 1978		(12)
3,000	Transfer from General Income and Expenditure Account		3,500
3,063			3,488
	Less:		
3,075	Research Studentships awarded		3,484
(£12)	Balance 31 December 1978		£4

WORKING PARTIES FUND

92	Balance 1 January 1978	43
500	Transfer from General Income and Expenditure Account	700
592		743
	Less:	
549	Grants for Working Parties	200
£43	Balance 31 December 1978	£543

TRAVEL GRANTS FUND

22	Balance 1 January 1978	172
1,300	Transfer from General Income and Expenditure Account	1,500
1,322		1,672
	Less:	
1,150	Travel Grants awarded	1,530
£172	Balance 31 December 1978	£142

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

WILLIAM HOPKINS PRIZE FUND

Year ended 31.12.77 £	£		£	£
Nil		Balance 1 January 1978		67
40		Interest on £663 Surrey County 6% Redeemable Stock 1978/80		40
27		Transfer from General Income and Expenditure Account		26
67				133
		Less:		
—		Prize awarded during year		—
£67		Balance 31 December 1978		£133

Note: The Society is Trustee only of the investment held for this fund.

WILLIAM BATE HARDY PRIZE FUND

66		Balance 1 January 1978		133
67		Transfer from General Income and Expenditure Account		67
133				200
		Less:		
—		Prize awarded during year		200
£133		Balance 31 December 1978		—

SIR JOSEPH LARMOR'S FUND

697		Balance 1 January 1978		388
67		Interest and Transfer from General Income and Expenditure Account		73
764				461
		Less:		
	126	Lecture and expenses	73	
	250	Contribution towards Chemical Abstracts	—	
376				73
£388		Balance 31 December 1978		£388

G. I. TAYLOR TRUST FUND

—	Balance 1 January 1978		6,089
5,863	Donations to fund during year		274
201	Interest on 3580 Charifund Units		283
25	Profit on sale of investments		—
6,089			6,646
—	*Less:* Lecture expenses		213
£6,089			£6,433

Note: The Society is Trustee only of the investment held for this fund.

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

Year ended 31.12.77

BALANCE SHEET 31 DECEMBER 1978

£	£		£	£
		Fixed Assets:		
	341	Equipment as at 1 January 1978	290	
	—	Additions at cost	—	
	341		290	
	51	*Less:* Depreciation for year	44	
290				246
243,123		Investments at cost		259,282
		(market value: 31.12.77 £305,375)		
		(market value: 31.12.78 £340,312)		
		Current Assets		
	1,360	Stocks of Xerox materials at cost	3,022	
	6,343	Sundry debtors and income tax recoverable	5,454	
	—	Cash held by stockbrokers	122	
	2,887	Cash at Bank: Current Account	451	
	2,201	Deposit Account	9,689	
	179	Cash and postage stamps in hand	152	
	12,970		18,890	
		Less: Current Liabilities:		
	6,667	Sundry creditors	8,944	
	340	Subscriptions received in advance	291	
	7,007		9,235	
5,963		Net Current Assets		9,655
£249,376				£269,183
		Financed by:		
177,470		Accumulated Fund		193,702
		Publications Fund:		
	(1,769)	*Mathematical Proceedings*	829	
	27,099	*Biological Reviews*	24,950	
25,330				25,779
		Publication Reserve Fund:		
	16,118	*Mathematical Proceedings*	17,832	
	17,250	*Biological Reviews*	17,462	
33,368				35,294
6,328		Compounders' Fund		6,765
(12)		Research Studentships Fund		4
43		Working Parties Fund		543
172		Travel Grants Fund		142
67		William Hopkins Prize Fund		133
133		William Bate Hardy Prize Fund		—
388		Sir Joseph Larmor's Fund		388
6,089		G. I. Taylor Trust Fund		6,433
£249,376				£269,183

Note: Unsold copies of Publications have not been valued.

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

AUDITORS' REPORT

We have examined the foregoing Statement of Accounts, which have been prepared under the historical cost convention, and which in our opinion give a true and fair view of the state of affairs of the Society at 31 December 1978 and of its income and expenditure for the year ended on that date.

Cambridge
16 July 1979

PETERS, ELWORTHY AND MOORE
Chartered Accountants

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

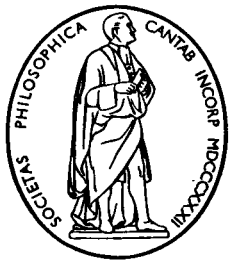
MATHEMATICAL PROCEEDINGS

(formerly Proceedings)

of the

Cambridge Philosophical Society

VOLUME 86



CAMBRIDGE UNIVERSITY PRESS
CAMBRIDGE
LONDON NEW YORK NEW ROCHELLE
MELBOURNE SYDNEY
1979

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

PUBLISHED BY
THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE
The Pitt Building, Trumpington Street, Cambridge CB2 1RP
32 East 57th Street, New York, N.Y. 10022

© The Cambridge Philosophical Society 1979

Printed in Great Britain at the University Press, Cambridge

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

INDEX

PAGE

Ahlswede, R. & Daykin, D. E. Integral inequalities for increasing functions . . 391

Archbold, R. J. On the Dixmier property of certain algebras 251

Atkinson, C. and Bouillet, J. E. Some qualitative properties of solutions of a generalised diffusion equation 495

Bachman, R. C. & Cohen, H. Wave propagation in elastic rods with multiple wave speeds 179

Baker, R. C. On numbers with many rational approximations 25

Barbour, A. D. On sequential versions of the generalized likelihood ratio test . . 85

Batty C. J. K. Fubini and martingale theorems in C* - algebras 57

Beem, J. K. & Ehrlich, P. E. Cut points, conjugate points and Lorentzian comparison theorems 365

Berrick A. J. The Smale invariants of an immersed projective space 401

Bouillet, J. E. and Atkinson, C. Some qualitative properties of solutions of a generalized diffusion equation. 495

Bramwell D. A note on k-3 caps in three dimensional Galois space 21

Britton, J. L. Integer solutions of systems of quadratic equations 385

Brodmann, M. The asymptotic nature of the analytic spread. 35

Carne, T. K. Not all B'-algebras are operator algebras 243

Cohen, F. R., May, J. P. & Taylor, L. R. Splitting of some more spaces . . . 227

Cohen, H. & Bachman, R. C. Wave propagation in elastic rods with multiple wave speeds 179

Cohen, J. E. Random evolutions and the spectral radius of a non-negative matrix . 345

Cohen, J. E. Contractive inhomogeneous products of non-negative matrices . . . 351

Cohen, J. M. On Hurwitz extensions by PSL_2 (7) 395

Cowan, R. Homogeneous line-segment processes 481

Daley, D. J. Lattice-valued random walks with Markov chain dependent steps. . . 115

Davies, E. B. Classical approximations to Gibbs states 521

Daykin, D. E. & Ahlswede, R. Integral inequalities for increasing functions . . 391

Denkel, N. & Fishel, B. Reducibility of differential operators: some examples . . 29

Dixon, P. G. Spectra of approximate identities in Banach algebras 271

Driessler, W. & Wilde, I. F. Stochastic independence in non-commutative probability theory 103

Edge, W. L. The scroll of tangents of an elliptic quartic curve 1

Ehrlich, P. E. & Beem, J. K. Cut points, conjugate points, and Lorentzian comparison theorems 365

Ezeilo, J. O. C. A further instability theorem for a certain fifth-order differential equation 491

Fink, J. P. The Pettis integration of a perturbed wave equation 145

Fishel, B. & Denkel, N. Reducibility of differential operators: some examples . . 29

Fitz-Gerald, G. F. & Grimshaw, R. H. J. A note on the uniqueness of small-amplitude water waves travelling in a region of varying depth. 511

Frydman, H. and Singer, B. Total positivity and the embedding problem for Markov chains. 339

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

PAGE

Garling, D. J. H. Subsequence principles for vector-valued random variables . . 301

Gillis, J. & Kleeman, J. A combinatorial proof of a positivity result . . . 13

Grimshaw, R. H. J. & Fitz-Gerald, G. F. A note on the uniqueness of small-amplitude water waves travelling in a region of varying depth. 511

Hall, P. On the relative stability of large order statistics 467

Hill, R. On the theory of plane strain in finitely deformed compressible materials . 161

Humphreys, J. F. Rational projective representations of finite groups 413

James, I. M. On fibre spaces and nilpotency. II 215

Kirby, D. Subrings of the first neighbourhood ring 205

Kirby, R. C. & Lickorish, W. B. R. Prime knots and concordance 437

Kleeman, J. & Gillis, J. A combinatorial proof of a positivity result 13

Lavoine, J. & Misra, O. P. Abelian theorems for the distributional Stieltjes transformation 287

Lickorish, W. B. R. & Kirby, R. C. Prime knots and concordance 437

Lin, W-H. The Adams-Mahowald conjecture on real projective spaces 237

Magnus, R. Universal unfoldings in Banach spaces: reduction and stability . . 41

May, J. P., Taylor, L. R. & Cohen, F. R. Splitting of some more spaces . . . 227

McCrudden, M. On the nth-root set of an element in a corrected semisimple Lie group 219

Melzak, Z. A. Multi-indexing and multiple clustering 313

Milnes, P. Continuity properties of compact right topological groups 427

Mishra, B. P. & Srivastava, A. P. Strong and absolute summabilities of functions based on (D, α) summability methods 279

Misra, O. P. & Lavoine, J. Abelian theorems for the distributional Stieltjes transformation 287

Morton. H. R. Closed braids which are not prime knots 421

Nicholls, P. & Zarrow, R. Convex fundamental regions for Fuchsian groups II. . 295

Parry, G. P. On the comparison of stability criteria in anisotropic materials . . 529

Rankin, R. A. Subgroups of the unimodular group defined by a congruence . . . 451

Ronse, C. On centralizers of involutions in 2-groups 199

Scholl, A. J. On the algebra of modular forms on a congruence subgroup . . . 461

Singer, B. & Frydman, H. Total positivity and the embedding problem for Markov chains 339

Smith, J. Q. Mixture catastrophes and Bayes decision theory 91

Smith, R. R. On Banach algebra elements of thin numerical range 71

Srivastava, A. P. & Mishra, B. P. Strong and absolute summabilities of functions based on (D, α) summability methods 279

Steiner, R. A canonical operad pair 443

Takács, L. On an urn problem of Paul and Tatiana Ehrenfest 127

Taylor, L. R., Cohen, F. R. & May, J. P. Splitting of some more spaces . . . 227

Wilde, I. F. & Driessler, W. Stochastic independence in non-commutative probability theory 103

Wilson, G. Commuting flows and conservation laws for Lax equations 131

Wilson, J. R. Proof of the antithetic-variates theorem for unbounded functions . . 477

Wilson, J. S. Groups with many characteristically simple subgroups 193

Youngson, M. A. Equivalent norms on Banach Jordan algebras 261

Zarrow, R. & Nicholls, P. Convex fundamental regions for Fuchsian groups II . . 295

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

The attention of authors is particularly directed to the following requests.

1. Papers should be typed, double-spaced, on one side of white paper (of which A4, 210 by 297 mm, is a suitable size). The pages must be numbered. Margins of 30 mm should be left at the side, top and bottom of each page. The copy sent must be clear.

A cover page should give the title, the author's name and institution, with the address at which mail is to be sent.

The title, while brief, must be informative (e.g. *A new proof of the prime-number theorem*, whereas *Some applications of a theorem of G. H. Hardy* would be useless).

The first paragraph or two should form a summary of the main theme of the paper, providing an abstract intelligible to mathematicians.

For a typescript to be accepted for publication, it must accord with the standard requirements of publishers, and be presented in a form in which the author's intentions regarding symbols etc. are clear to a printer (who is not a mathematician).

The following notes are intended to help the author in preparing the typescript. New authors may well enlist the help of senior colleagues, both as to the substance of their work and the details of setting it out correctly and attractively.

2. *Notation*

Notation should be chosen carefully so that mathematical operations are expressed with all possible neatness, to lighten the task of the compositor and reduce the chance of error.

For instance n_k (n sub k) is common usage, but avoid if possible using c sub n sub k. Fractions are generally best expressed by a solidus. Complicated exponentials like

$$\exp\{z^2 \sin\theta/(1+y^2)\}$$

should be shown in this and no other way.

In the manuscript, italics, small capitals and capitals are specified by single, double and triple underlining. Bold-faced type is shown by wavy underlining; wavy will be printed **wavy**.

It helps if displayed equations or statements which will be quoted later are numbered in order on the right of their line. They can then be referred to by, for example, 'from (7)'.

The author must enable the printer (if necessary by pencilled notes in the margin) to distinguish between similar symbols such as o, O, o, O, 0; x, X, $\times$; ϕ, Φ, $\varnothing$; l, 1; ϵ, $\in$; κ, k.

Greek letters can be denoted by Gk in the margin.

If an author wishes to mark the end of the proof of a theorem, the sign ▮ may be used.

Footnotes should be avoided.

3. *Diagrams*

It is extremely helpful if diagrams are drawn in indian ink on white card, faintly blue or green-lined graph paper, or tracing cloth or paper. *Symbols, legends and captions should be given on a transparent overlay.* Each text figure must be numbered as Figure 1, Figure 2, ... and its intended position clearly indicated in the manuscript:

Figure 1 here

The author's name in pencil must be on all separate sheets of diagrams.

A figure is expensive to reproduce and should be included only when the subject matter demands it, or when it greatly clarifies the exposition.

The Society recognizes that some authors do not have the facilities for producing drawings of a sufficiently high standard to be reproduced directly and it is therefore willing to have such diagrams re-drawn, provided that they are clear.

4. *Tables*

Tables should be numbered (above the table) and set out on separate sheets. Indicate the position of each in the text as for figures:

Table 3 here

5. *References*

References should be collected at the end of the paper numbered in alphabetical order of the authors' names. A reference to a book should give the title, in italics, and then in Roman type the publisher's name and the place and year of publication:

(4) Jeffreys, H. *The earth*, 5th edition, University Press, Cambridge, 1970.

A reference to a paper should give in italics the title of the periodical, the number of the volume and year, and the beginning and end pages of the paper. Titles should be abbreviated as in Mathematical Reviews:

(6) Littlewood, J. E. The 'pits effect' for functions in the unit circle. *J. Analyse Math.* **23** (1970), 237–268.

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press

Mathematical Proceedings of the Cambridge Philosophical Society

MPCPCO 86 (Pt 3) 385–552 (1979) 0305–0041 November 1979

CONTENTS

PAGE

BRITTON, J. L. Integer solutions of systems of quadratic equations 385

AHLSWEDE, R. and DAYKIN, D. E. Integral inequalities for increasing functions . . 391

COHEN, J. M. On Hurwitz extensions by $PSL_2(7)$ 395

BERRICK, A. J. The Smale invariants of an immersed projective space . . . 401

HUMPHREYS, J. F. Rational projective representations of finite groups . . . 413

MORTON, H. R. Closed braids which are not prime knots 421

MILNES, P. Continuity properties of compact right topological groups 427

KIRBY, R. C. and LICKORISH, W. B. R. Prime knots and concordance 437

STEINER, R. A canonical operad pair 443

RANKIN, R. A. Subgroups of the unimodular group defined by a congruence . . 451

SCHOLL, A. J. On the algebra of modular forms on a congruence subgroup . . . 461

HALL, P. On the relative stability of large order statistics 467

WILSON, J. R. Proof of the antithetic-variates theorem for unbounded functions . 477

COWAN, R. Homogeneous line-segment processes 481

EZEILO, J. O. C. A further instability theorem for a certain fifth-order differential equation 491

ATKINSON, C. and BOUILLET, J. E. Some qualitative properties of solutions of a generalised diffusion equation 495

FITZ-GERALD, G. F. and GRIMSHAW, R. H. J. A note on the uniqueness of small-amplitude water waves travelling in a region of varying depth 511

DAVIES, E. B. Classical approximations to Gibbs states 521

PARRY, GARETH P. On the comparison of stability criteria in anisotropic materials 529

PROCEEDINGS 1978–1979 539

ACCOUNTS 1978 545

© The Cambridge Philosophical Society 1979

CAMBRIDGE UNIVERSITY PRESS

THE PITT BUILDING, TRUMPINGTON STREET, CB2 1RP

32 EAST 57TH STREET, NEW YORK, N.Y. 10022

Price £10.40 *net* (*U.S.A. and Canada US* $26.00)

Subscription price £26.00 *per volume* (£52.00 *per annum*) *net post free*

(*US* $63.75 *per volume* (*US* $127.50 *per annum*) *in U.S.A. and Canada*)

Printed in Great Britain at the University Press, Cambridge

https://doi.org/10.1017/S0305004100056206 Published online by Cambridge University Press