

Trust Funds. 1894.

Scientific Relief Fund.

£3,000 L. & N.W.R. 4 per Cent. Consolidated Guaranteed Stock.
 £7,200 Great Northern Railway 3 per Cent. Debenture Stock.
 £4,340 South Eastern Railway 5 per Cent. Debenture Stock.
 £509 10s. 7d. 2½ per Cent. Annuities.

Dr.
 £ s. d.
 982 5 0

	£	s.	d.
To Balance { Income.....	862	16	5
Less Capital over-invested	571	19	7
Dividends	230	16	10
Interest on Deposit	665	0	7
Donations (Capital).....	14	10	0
Balance, Capital over-invested	20	10	0
Less Income in hand	551	9	7
	546	6	10
	5	2	9
	£982	5	0

By Grants

£982 5 0

Donation Fund.

£5,030 Great Northern Railway Perpetual 4 per Cent. Guaranteed Stock.
 The Trevelyan Bequest. £1,861 6s. 8d. Great Northern Railway 3 per Cent. Debenture Stock.

	£	s.	d.
To Balance	641	19	2
Dividends	249	5	7
Transfer from Jodrell Fund	138	0	7
	£1,029	5	4

By Grants

£ s. d.
 665 0 0
 364 5 4
 £1,029 5 4

Runford Fund.

£2,330 2½ per Cent. Consolidated Stock.

	£	s.	d.
To Balance	223	7	7
" Dividends	62	1	9
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	£285	9	4
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By Balance			
	£	s.	d.
	285	9	4
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	£285	9	4

Bakerian and Copley Medal Fund.

Sir Joseph Copley's Gift. £1,666 13s. 4d. 2½ per Cent. Consolidated Stock.

£403 9s. 8d. New 2½ per Cent. Stock.

	£	s.	d.
To Balance	113	4	6
" Dividends, New 2½ per Cent. Stock	9	15	4
" Dividend—Sir J. Copley's Fund	44	8	2
	<hr/>		
	£167	8	0
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By Gold Medal			
" Bakerian Lecture, Professor Thorpe	4	12	7
" Gift:—Sir G. G. Stokes	4	0	0
" Balance	50	0	0
	108	15	5
	<hr/>		
	£167	8	0
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The Keck Bequest.

£800 Midland Railway 3 per Cent. Debenture Stock.

	£	s.	d.
To Balance	4	3	7
" Dividends	23	5	6
	<hr/>		
	£27	9	1
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By Payment to Foreign Secretary			
	£	s.	d.
	27	9	1
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	£27	9	1
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Wintringham Fund.

£1,200 2½ per Cent. Consolidated Stock.

	£	s.	d.		£	s.	d.
To Balance	38	7	4	By Payment to Foundling Hospital	38	7	4
" Dividends	31	19	10	" Balance	31	19	10
	£70	7	2		£70	7	2

Croonian Lecture Fund.

One-fifth of the clear rent of an Estate at Lambeth Hill, from the College of Physicians, about £52 per annum.

	£	s.	d.		£	s.	d.
To Balance	2	3	2	By Lecture (1894), Ramon y Cajal	50	0	0
" Rent	50	7	6	" Expenses	4	4	6
" Balance	1	13	10		£54	4	6
	£54	4	6				

Davy Medal Fund.

£660 Madras Railway Guaranteed 5 per Cent. Stock.

	£	s.	d.		£	s.	d.
To Balance	79	14	7	By Gold Medals	62	16	0
" Dividends	31	19	2	" Balance	48	17	9
	£111	13	9		£111	13	9

The Gassiot Trust.

£10,000 Italian Irrigation Bonds.
£400 $2\frac{3}{4}$ per Cent. Consolidated Stock.

	£	s.	d.		£	s.	d.
To Balance	190	16	8	By Payments to Kew Committee.....	£73	15	2
" Dividends	495	0	9	" Purchase of Ten Italian Irrigation Bonds	182	6	0
" Ten Bonds drawn.....	234	14	4	" Balance	164	10	7
					£920	11	9

Handley Fund.

£4,798 Lancashire and Yorkshire Railway 4 per Cent. Guaranteed Stock.

	£	s.	d.		£	s.	d.
To Dividends	186	2	4	By Transfer to Catalogue Account	186	2	4

The Jodrell Fund.

£5,182 14s. 10d. $2\frac{3}{4}$ per Cent. Consolidated Stock.

	£	s.	d.		£	s.	d.
To Dividends	138	0	7	By Transfer to Donation Fund	138	0	7

Fee Reduction Fund.

£4,900 Metropolitan $3\frac{1}{2}$ per Cent. Stock.
£9,333 London and North Western Railway 3 per Cent. Perpetual Debenture Stock (Converted from £7,000 4 per cent. Stock).

	£	s.	d.		£	s.	d.
To Balance	143	6	4	By Transfer to Royal Society General Account.....	342	0	0
" Dividends	435	19	7	" Purchase of £200 Metropolitan $3\frac{1}{2}$ per Cent. Stock	231	1	0
				" Balance	6	4	11
					£579	5	11

Darwin Medal Fund.

£2,200 South Eastern Railway 4 per Cent. Debenture Stock.

	£	s.	d.
To Balance	477	9	5
" Dividends	85	6	11
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	£562	16	4
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	£	s.	d.
By Silver Medal	0	17	6
" Gift: Sir J. D. Hooker	100	0	0
" Balance	461	18	10
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	£562	16	4
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Joule Memorial Fund.£1,000 London, Brighton, and South Coast Railway Consolidated Guaranteed 5 per Cent. Stock.
£50 on Deposit on behalf of the Committee.

	£	s.	d.
To Balance	97	1	9
" Interest on Deposit	1	6	7
" Dividends	48	8	10
" Amount withdrawn from Deposit	100	0	0
	<hr/>		
	£246	17	2
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	£	s.	d.
By Purchase of £100 London, Brighton and South Coast Consolidated Guaranteed 5 per Cent. Stock	163	17	10
" Balance	79	19	4
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	£246	17	2
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Brady Library Fund.

£311 19s. on Deposit Account at Bank.

	£	s.	d.
To Amount on Deposit at Bank November 12th, 1893	307	8	6
" Interest thereon	4	10	6
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	£311	19	0
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	£	s.	d.
By Balance on Deposit November 12th, 1894	311	19	0
	<hr/>		
	£311	19	0
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Gunning Fund.

£1,000 4 per Cent. Bond of His Excellency Dr. Gunning.

	£	s.	d.	£	s.	d.
To Balance	60	0	0		120	0
„ Interest	60	0	0		0	0
	£120	0	0		£120	0
					0	0
By Balance						
					£120	0
					0	0

Buchanan Medal Fund.

£258 9s. 2d. Metropolitan 3 per Cent. Stock.

	£	s.	d.	£	s.	d.
To Cash, per Secretary of the Fund, Dr. Bristowe ...	276	12	0		276	12
„ Dividend	1	17	6		1	17
					6	6
	£278	9	6		£278	9
					6	6
By Purchase of £258 9s. 2d. Metropolitan 3 per Cent. Stock ..						
„ Balance						
					276	12
					1	17
					6	6
					£278	9
					6	6

Income and Expenditure Account from 12th November, 1893, to 12th November, 1894.

RECEIPTS.			EXPENDITURE.		
£	s.	d.	£	s.	d.
To Balance at Bank and in hand 12th November, 1893 :—			By Salaries, and Wages.....		
	185	14 10			1,443 10 4
General Purposes	2,200	0 0	" Publications		3,259 2 2
Catalogue Account	500	0 0	" Catalogue of Scientific Papers and Index :—		
Challenger Account	0	5 0	Withdrawn from Deposit	500	0 0
Water Research Account			Paid out of General Funds	254	5 3
		2,885 19 10			754 5 3
Composition and Admission Fees...		70 0 0	Books for the Library		321 9 10
" Annual Contributions		1,414 0 0	" Miscellaneous Expenses, Office, House, Receptions, &c.		1,446 7 9
" Rents.....		696 5 7	Water Research Payments		2 16 6
" Dividends and Interest		2,596 10 7	" Balance at Bank and in hand :—		
" Sale of Publications		678 0 1	General Purposes	350	2 6
" Water Research Grants		250 0 0	Catalogue Account	1,700	0 0
" Receipts on Account of Catalogue...		234 18 10	Challenger Account	500	0 0
" Kew Committee Loan repaid		200 0 0	Water Research Account	247	8 6
" Proceeds of Sale of £722 14s. 1d. India 3 per cent. Stock		724 9 2			2,797 11 0
" Proceeds of Sale of £270 11s. 11d. 2½ per cent. Consolidated Stock...		274 18 9			
		£10,025 2 10			£10,025 2 10

The following Table shows the progress and present state of the Society with respect to the number of Fellows :—

	Patron and Royal.	Foreign.	Com- pounders.	£4 yearly.	£3 yearly.	Total.
Nov. 30, 1893 ..	5	48	153	124	181	511
Since Elected ..		+3		+1	+15	+19
Since Compounded			+1		—1	
Since Deceased ..	—1	—3	—4	—8	—4	—20
Withdrawn or Removed ..				—2		—2
Nov. 30, 1894 ..	4	48	150	115	191	508

Account of Grants from the Donation Fund in 1893-94.

	£	s.	d.
Prof. J. Milne, in further aid of his Seismographic Investigations	100	0	0
Prof. Liveing, to enable Mr. W. J. Sell to continue certain Chemical Researches.....	25	0	0
W. T. Thiselton Dyer, to further aid Mr. Theodore Bent in making Botanical Collections in Southern Arabia ..	50	0	0
Measurement of Plants and Animals Committee (per F. Galton) for conducting Statistical Inquiries into the Measurable Characteristics of Plants and Animals....	50	0	0
Dr. H. Hicks, to enable Mr. J. Lewis Abbott to continue his Exploration of an Ossiferous Fissure near Ightham	10	0	0
Prof. G. H. Darwin, to assist him in his work on Periodic Orbits	30	0	0
Sir A. Geikie, to assist Miss M. M. Ogilvie in her Geological Researches.....	50	0	0
Prof. J. B. Sanderson, to assist Mr. H. M. Vernon in his Physiological Researches	25	0	0
Prof. McKendrick, to further aid Dr. Jack in Researches on Muscular Movements.....	5	0	0
Prof. W. C. Williamson, in aid of his Researches on Fossil Plants	10	0	0
Capt. Abney, for aid in his Researches on Colour.....	40	0	0
Carried forward.....	£395	0	0"
	F 2		

	£	s.	d.
Brought forward	395	0	0
Prof. W. M. Hicks, to aid him in his Experiments on the Higher Recalescence Point of Iron.	20	0	0
Refunded Government Grant Committee (additions to Royal Society's telescope)	250	0	0
	<u>£665</u>	<u>0</u>	<u>0</u>

“Electrical Interference Phenomena somewhat analogous to Newton’s Rings, but exhibited by Waves along Wires.”
By EDWIN H. BARTON, B.Sc., late “1851 Exhibition”
Science Scholar. Communicated by Professor ARTHUR
W. RÜCKER, M.A., F.R.S. Received February 20,—Read
April 19,—Abbreviated* July, 1894.

INTRODUCTION.

The preliminary paper on this subject† gave the results of a single experiment, and approximately accounted for them by a mathematical theory of the reflexion and interference phenomena involved.

Since the publication of that paper the question of disturbances has been investigated, the experimental conditions improved, and various results obtained in confirmation of the original conclusions.

These matters form the subject of the present communication.

The apparatus employed for observing the interference phenomena is diagrammatically represented in fig. 1 and explained in the notes accompanying it.

In Experiment VII the electrometer was placed at HH’ instead of EE’, its usual position. In Experiments VIII and IX two electrometer needles were used, their respective attachments being at FF’ and HH’.

The lengths of SAM and MD, and the special construction of the abnormal part will be specified as required in the course of the paper when reference is made to the figure.

In the former paper‡ it was shown that in the case of a train of electrical waves advancing along the secondary from AA’ towards DD’ fig. 1, we have the following phenomena:—

- (1.) A partial reflexion at BB’, the beginning of the abnormal part;
- (2.) A partial reflexion at CC’, the end of the abnormal part; and
- (3.) Interferences between the two sets of waves proceeding from BB’ and CC’ respectively.

* The references given in the abstract of this paper (‘Proceedings,’ vol. 55, p. 350) are to the full manuscript, preserved in the archives of the Royal Society.

† ‘Proc. Roy. Soc.’ vol. 54, pp. 85—96.

‡ *Loc. cit.*, p. 87.