# The BIOCHEMICAL JOURNAL

15 May 1977

Volume 164, No. 2

### **EDITORIAL BOARD**

Chairman
J. T. Dingle

Deputy Chairmen
R. D. Marshall
J. A. Lucy
J. J. Holbrook
R. N. Perham

Editorial Secretary
J. D. Killip

Assistant Editorial Secretary E. N. Maltby

P. M. Bayley\*
J. W. Bradbeer
R. C. Bray
H. G. Britton
R. B. Cain
M. Cannon
J. B. Clark

A. J. Cornish-Bowden
D. D. Davies
R. M. Denton

R. R. Dils G. J. Dutton D. C. Ellwood J. L. Gordon

F. M. Dickinson

D. E. Griffiths L. A. Grivell

M. R. Hollaway R. C. Hughes U. E. Loening

W. I. P. Mainwaring R. M. Marchbanks

R. E. Offord C. I. Pogson

D. Robinson E. V. Rowsell

A. P. Ryle
D. Schulster

J. E. Scott R. L. Smith S. P. Spragg\* D. R. Stanworth

M. J. A. Tanner
D. H. Williamson

\*Nominated by the British Biophysical Society

### Overseas Advisory Panel

F. J. Ballard (Australia), B. Chance (U.S.A.), C. de Duve (Belgium and U.S.A.), D. Garfinkel (U.S.A.), F. Gibson (Australia), A. A. Hadjiolov (Bulgaria), O. Hayaishi (Japan), H. G. Hers (Belgium), M. Ya. Karpeisky (U.S.S.R.), T. C. Laurent (Sweden), P. Siekevitz (U.S.A.), W. D. Stein (Israel), G. P. Talwar (India), H. G. Williams-Ashman (U.S.A.)



London: The Biochemical Society

# THE BIOCHEMICAL SOCIETY

## OFFICERS AND COMMITTEE, 1976-77

Chairman of the Committee

T. S. Work\*

Treasurer

D. F. Elliott

General Secretary H. M. Keir

Publications Secretary R. M. C. Dawson

Meetings Secretary
H. F. Bradford

Committee G. B. Ansell

H. S. Bachelard

K. Burton, F.R.S.

N. G. Carr

J. T. Dingle\*†
C. A. Fewson

C. Green

M. G. Harrington

J. N. Hawthorne C. H. S. Hitchcock

J. J. Holbrook

H. K. King

R. J. B. King J. C. Metcalfe

R. R. Porter, F.R.S.

B. E. Ryman

\*Ex Officio Member of Committee. †Representative of Editorial Board of the Biochemical Journal.

**Executive Secretary** 

A. I. P. Henton (7 Warwick Court, London WC1R 5DP)

The Biochemical Society exists to advance the science of biochemistry through meetings and publications. Several meetings a year are held, each at a different place; original papers are presented and special topics are discussed at symposia and colloquia.

Persons interested in biochemistry are eligible for election as Members. Details of further facilities accorded to Members, and forms of application for membership, are available from the Executive Secretary, The Biochemical Society, 7 Warwick Court, London WC1R 5DP [01-242 1076 (4 lines)].

The major publication of the Biochemical Society is the *Biochemical Journal*. Contributors (who need not be Members of the Biochemical Society) may be interested to know that the Journal places emphasis on prompt publication of both full-length papers (on average about 6 months after receipt) and rapid papers (on average 10–12 weeks after receipt).

The Journal makes no manuscript handling charges, no page charges and no charges for plates.

Reprints are available at modest cost at about the same time as publication, and, if an author is a Member of the Biochemical Society, 50 reprints are provided free of charge.

The Biochemical Journal is published and distributed by the Biochemical Society. It is published twice monthly, alternate issues being devoted to Molecular Aspects and to Cellular Aspects of biochemistry. It is planned that in 1977 eight volumes, each volume being made up of three issues, will be published according to the following schedule:

Molecular Aspects			Cellular As	Cellular Aspects			
1977	Vol.	Part	1977	Vol.	Part		
l Jan.	161	1	15 Jan.	162	1		
l Feb.	161	2	15 Feb.	162	2		
1 Mar.	161	3*	15 Mar.	162	3*		
l Apr.	163	1	15 Apr.	164	1		
1 May	163	2	15 May	164	2		
1 June	163	3*	15 June	164	3*		
l July	165	1	15 July	166	1		
1 Aug.	165	2	15 Aug.	166	2		
1 Sept.	165	3*	15 Sept.	166	3*		
1 Oct.	167	1	15 Oct.	168	1		
1 Nov.	167	2	15 Nov.	168	2		
1 Dec.	167	3*	15 Dec.	168	3*		

<sup>\*</sup> Completes volume, and includes Indexes.

Biochemical Society Transactions. This is now a separate publication (see below). Volume 5 will be published in 1977, in six parts.

Subscription Rates to the Biochemical Journal. For non-members of the Biochemical Society the subscription rates for 1977 are as follows.

Zone A: U.S.A., Canada and Mexico, U.S. \$320.00 (despatch by air freight) or sterling equivalent.

Zone B: Japan, £154.00 (despatch by accelerated surface post).

Zone C: U.K. and all remaining destinations, £140.00 (despatch by surface post).

Subscribers to the Biochemical Journal can subscribe to Biochemical Society Transactions on a

joint subscription, saving £10.00 (U.S. \$25.00). The joint subscription rates are: Zone A, U.S. \$355.00; Zone B, £175.00; Zone C, £158.00. The methods of despatch of both publications are as shown above.

Terms are cash with order or against proforma invoice. Orders and subscriptions should be sent to the Biochemical Society Book Depot, P.O. Box 32, Commerce Way, Colchester CO2 8HP, Essex, or through your normal agent.

Claims regarding issues lost or damaged in transit should be addressed to the Biochemical Society at the address given in the preceding paragraph. Claims cannot be entertained if they are received later than three months after the date of posting, plus such time as would be expected for transit by post.

Back Numbers. Enquiries for volumes 1–19 of the Journal should be addressed to William Dawson & Sons Ltd., Back Issues Department, Cannon House, Park Farm Road, Folkestone, Kent. Quotations for available issues of subsequent volumes and parts of the Journal, and also of Transactions, may be obtained on application to The Biochemical Society Book Depot, P.O. Box 32, Commerce Way, Colchester CO2 8HP, Essex.

Microforms. The following versions are available.

- (a) Microfilm (36mm): Volumes 1-101.
- (b) Microfiche (98-image): Volumes 102-160. Details and prices are available on request from the Biochemical Society's Colchester office.

Advertisements. Applications for advertising space should be sent to the Advertising Department, The Biochemical Society, 7 Warwick Court, London WC1R 5DP [01-242 1076 (4 lines)]. Copy is required eight weeks before publication date. Rate cards are available on request.

CONTENTS

# INDEX OF AUTHORS

	PAGE		PAGE		PAGE
Agrawal, H. C.	323	Ellwood, D. C.	461	O'Brien, P. J.	473
Allan, D.	389	Evans, W. H.	415	Olavesen, A. H.	423
Amils, R.	363	•		<b>D.1</b> 1 C	20.5
Atkinson, T.	461	Fujimoto, K.	323	Padmanaban, G.	295
·		,		Pallavicini, G.	469
Badawy, A. AB.	431	Grant, D. A. W.	465	Pogson, C. I.	357
Baird, J. K.	461	Greenberg, N.	379	Powell, G. M.	423
Balduini, C.	469	Gregoriadis, G.	439	Rahimtula, A. D.	473
Ballard, F. J.	399	,		Ravazzola, M.	447
Barford, P. A.	423	Hall, B.	331	Read, G.	349
Bell, J. I.	289	Hansford, R. G.	305	Rutter, D. A.	461
Berger, R.	339	Hjertén, Ś.	465	Rutter, D. 71.	401
Bhat, K. S.	295	Hopgood, M. F.	399	Sardana, M. K.	295
Booth, R. F. G.	339			Schumm, D. E.	379
Braidman, I. P.	439	Ismail, N. A.	409	Scornik, O. A.	363
Brosnan, J. T.	331			Sener, A.	447
Brovelli, A.	469	Johnson, R. N.	305	Sherwood, R. F.	461
•		,		Sinigaglia, F.	469
Clark, J. B.	339	Koser, M.	447	Smith, G. H.	349
Clark, M. G.	399	<b>,</b>		Solanki, K. U.	477
Conde, R. D.	363	Lajtha, A.	323	St. Louis, P. J.	457
Cook, D. B.	477	Land, J. M.	339	Suhail, M.	469
Crabtree, B.	349	Latner, A. L.	477	Sulakhe, P. V.	457
Curtis, C. G.	423	Liu, D. K.	371		
				Toth, J.	323
Douglas, A. P.	289	Malaisse, W. J.	447	Webb, T. E.	379
,		Malaisse-Lagae, F.	447	Wiblin, C. N.	461
Eastham, E. J.	289	Matrisian, P. E.	371		
El Denshary, EE. S. M.	409	Michell, R. H.	389	Wisher, M. H.	415
Elliott, K. R. F.	357	Montague, W.	409	Zachariah, P. K.	473
,			***	<b>,</b> ,	

# NOTES FOR CONTRIBUTORS

It is the policy of the *Biochemical Journal* to publish papers in English in all fields of biochemistry, provided that they make a sufficient contribution to biochemical knowledge. Papers may include new results obtained experimentally, descriptions of new experimental methods of biochemical importance, or new interpretations of existing results. Theoretical contributions will be considered equally with papers dealing with experimental work. All work presented should have as its aim the development of biochemical concepts rather than the mere recording of facts. Preliminary or inconclusive experiments should not generally be described.

For detailed instructions on the preparation of papers contributors should refer to Policy of the Journal and Instructions to Authors [Biochem. J. (1976), 153, 1-21] and amendments [Biochem, J. (1977), **161**, 1-2] (obtainable free, on request, from the Executive Secretary, The Biochemical Society, 7 Warwick Court, London WC1R 5DP). The Biochemical Journal uses the recommended SI (Système Internationale) symbols [see Pure Appl. Chem. (1970), 21, 1-44; Quantities, Units and Symbols, 2nd edn. (1975), The Royal Society, London]. For biochemical nomenclature authors should as far as possible follow the Tentative Rules and Proposals of the IUPAC-IUB Commission on Biochemical Nomenclature [see Biochem. J. (1976), 153, 10]. For chemical nomenclature the IUPAC Rules should be followed [see Biochem. J. (1976), 153, 13]. The Biochemical Journal uses as a standard of spelling the Concise Oxford Dictionary of Current English (Clarendon Press, Oxford).

Two types of paper are accepted by the editors.

Full-length papers. Papers submitted for publication should be sent, preferably in duplicate, together with an extra copy of the synopsis, to the Editorial Secretary, The Biochemical Journal, 7 Warwick Court, London WC1R 5DP. Typescripts should bear the name and address of the person to whom the proof of the paper is to be sent.

Papers submitted should be written concisely. Special attention is directed to the sections below concerning the preparation of the typescript. Typescripts that are not concise or do not conform to the conventions of the *Biochemical Journal* will be returned to the authors for revision. If a paper that has been returned to an author for revision is not resubmitted within one month, it will, on resubmission, be deemed to be a new paper and the date of receipt altered accordingly. A revised paper containing a significant amount of new material will also be redated.

Submission of a paper to the Editorial Board implies that it has been approved by all the named

authors, that it reports unpublished work, that it is not under consideration for publication elsewhere, and that if accepted for the *Biochemical Journal* it will not be published elsewhere in the same form, either in English or in any other language, without the consent of the Editorial Board.

Papers should be headed by a concise but informative full title, by the names of the authors (preferably with one forename in full, with initials, for each author) and by the name and address of the establishment where the work was performed. Details of financial support appear in the acknowledgements at the end of the paper.

Before preparing papers authors should consult a current issue of the Journal to make themselves familiar with the general format, such as the use of cross-headings, lay-out of tables and citation of references. Papers should be in double-spaced typing throughout (including the references and legends of tables and figures) on sheets of uniform size with wide margins. The top copy should be submitted. Submission of a duplicate typescript in addition may avoid delay. It cannot be overemphasized that the need for revision of badly prepared typescripts inevitably leads to delays in publication.

Papers on specialized subjects should be presented so that they are intelligible to the ordinary reader of the Journal. Sufficient information must be included to permit repetition of the experimental work.

Rapid Papers. Typescripts should be submitted in duplicate, written in English, and conform strictly to the form of the Journal as far as spelling and abbreviations are concerned. Each rapid paper should be provided with a short synopsis (normally not exceeding 50 words). Such papers should not exceed 2400 words in length inclusive of the title, references etc. Authors may include insertions (preferably not more than two) such as tables, figures or schemes: in these cases authors must assess what proportion of a page these insertions will occupy and reduce the number of text words accordingly at the rate of 700 words per full page of the Journal. Authors are advised that the preparation of tables and especially figures is liable to cause an increase in publication time. In no circumstances whatsoever can a complete rapid paper occupy more than four pages of the Journal. Papers should be complete in themselves: (1) the methods used in experimental work must be adequately described or sufficient reference given to allow repetition of the work; (2) sufficient indication of the results of experimental work must be included to justify the claims made. Rapid papers should be addressed to the Editorial Secretary, The Biochemical Journal, 7 Warwick Court, London WC1R 5DP.