

Edited for the British Pharmacological Society by

W. D. M. Paton (*Chairman*) H. M. Adam (*Secretary*)
Margaret Day (*Press Editor*)
J. D. Stephenson (*Assistant Press Editor*)

R. B. Barlow	J. Maddox (co-opted)
J. M. Barnes	J. F. Mitchell
J. W. Black	P. A. Nasmyth
W. C. Bowman	M. W. Parkes
P. B. Bradley	Mary Pickford
A. W. Cuthbert	H. P. Rang
C. T. Dollery	H. O. Schild
W. S. Feldberg	D. F. Sharman
D. F. Hawkins	A. P. Silverman
F. Hobbiger	M. A. Simmonds
Margarethe Holzbauer	A. D. Smith (co-opted)
D. B. Hope	F. M. Sullivan
H. W. Kosterlitz	A. Ungar
G. P. Lewis	J. R. Vane

Editorial assistance is provided by the staff of Nature

Papers will be considered for publication on all aspects of drug action, including chemotherapy.

Manuscripts (two copies) should be sent to Dr. H. M. Adam, Department of Pharmacology, University of Edinburgh Medical School, 1 George Square, Edinburgh EH8 9JZ. Authors should consult the suggestions inside the back cover.

Subscriptions. Three volumes of the journal are published annually, each volume containing four numbers. The annual subscription rate is £26.50 in the United Kingdom and the rest of the world; £32.00 U.S.A. and Canada. Subscriptions should be sent to: Subscriptions Department, Macmillan Journals Ltd., Brunel Road, Basingstoke, Hampshire, England. Alternatively, the journal can be ordered through a subscription agent or bookseller.

Advertisements: Applications for advertising space and rates should be sent to: Advertisement Department, *British Journal of Pharmacology*, Macmillan Journals Ltd., 4 Little Essex Street, London, WC2R 3LF, England. Tel: 01-836 6633.

Copyright © 1973 by the *British Journal of Pharmacology*. All rights of reproduction are reserved in respect of all papers, articles, illustrations, etc., published in this journal in all countries of the world.

When you can't stand it... C.F. Palmer can

Flexible

Plain

Adjustable

Large

Mammoth

Detachable

Rigid

Cam

Adjustable

Plain Heavy

Three Claw

Vertical

Adjustment

Magnetic Base

Large Adjustable
Screw

Sonnenblik

Screw

Screw

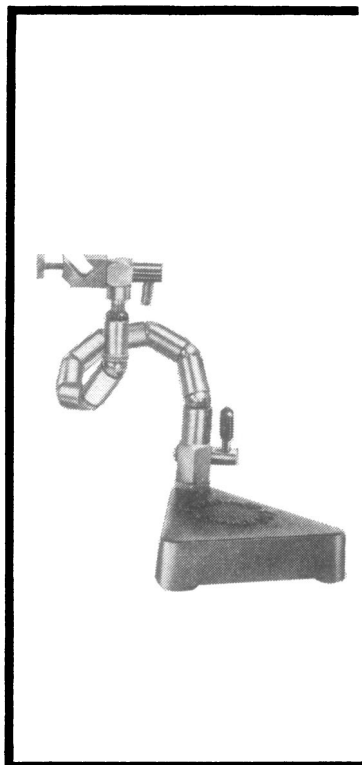
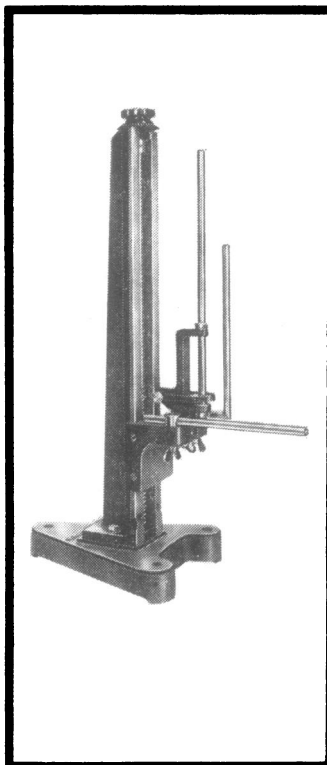
Adjustable

Let us stand up for you. Our complete range of stands and accessories is available from stock and your orders are assured of our most prompt attention.

C. F. PALMER

C. F. Palmer (London) Ltd.

Lane End Road, High Wycombe, Bucks



BRITISH JOURNAL OF PHARMACOLOGY

Short Communications

Papers for consideration should be marked "Short Communication", and be submitted in duplicate to the Secretary of the Editorial Board. **THEY MUST BE LESS THAN 1,200 WORDS IN LENGTH**, including a short summary, **AND MAY CONTAIN ONE FIGURE OR ONE TABLE**. To reduce publication delay to a minimum (about 6 weeks), correspondence between author and editor must be avoided. Manuscripts should therefore be prepared with great care and the customary form used in the Journal strictly observed (see instructions on the inside covers of a recent issue of the Journal.) Short Communications will be accepted on the understanding that if authors' proofs are not returned before the Journal goes to press, the Communication will be published with the Press Editor's corrections only.

BRITISH JOURNAL OF PHARMACOLOGY

EDITED FOR
THE BRITISH PHARMACOLOGICAL SOCIETY
BY

W. D. M. Paton (*Chairman*) H. M. Adam (*Secretary*)
Margaret Day (*Press Editor*)
J. D. Stephenson (*Assistant Press Editor*)

R. B. Barlow	J. Maddox (co-opted)
J. M. Barnes	J. F. Mitchell
J. W. Black	P. A. Nasmyth
W. C. Bowman	M. W. Parkes
P. B. Bradley	Mary Pickford
A. W. Cuthbert	H. P. Rang
C. T. Dollery	H. O. Schild
W. S. Feldberg	D. F. Sharman
D. F. Hawkins	A. P. Silverman
F. Hobbiger	M. A. Simmonds
Margarethe Holzbauer	A. D. Smith (co-opted)
D. B. Hope	F. M. Sullivan
H. W. Kosterlitz	A. Ungar
G. P. Lewis	J. R. Vane

Editorial assistance is provided by the staff of Nature

VOLUME 49, 1973

LONDON
MACMILLAN JOURNALS LIMITED
4 LITTLE ESSEX STREET, WC2R 3LF

BRITISH JOURNAL OF PHARMACOLOGY

THE INTERNATIONAL SYSTEM OF UNITS (SI)

The British Journal of Pharmacology uses the **symbols** recommended in the SI (Système Internationale) (see *Symbols, Signs and Abbreviations Recommended for British Scientific Publications* (1969) (London: The Royal Society: price 35p.)). It is the policy of the Editorial Board to adopt SI **units**, although the use of certain non-SI units will for the time being be permitted. Full details of the changes involved will be published in a forthcoming "Instructions to Authors". The following is a list (a) of some of the commoner units with their recommended symbols, (b) of some non-SI units which may still be used, and (c) of units which will no longer be acceptable.

(a) SI units with recommended symbols

Unit	Correct symbol
kilogramme	kg
second, millisecond	s ms
mole, millimole, micromole,	mol mmol μ mol
nanomole, picomole	nmol pmol
metre, centimetre, millimetre,	m cm mm
micrometre	μ m
Hertz	Hz

(b) Some permitted non-SI units

ångström	Å (= 10^{-10} m = 0.1 nm)
gramme	g
minute	min
hour	h
molarity (mol/litre)	M
calorie	cal (4.184 J) (Conversion factor to be given as a footnote at first citation or in Methods)
millimetres of mercury	mmHg (1.333 mbar) (Conversion factor to be given as a footnote at first citation or in Methods)
millibar	mbar
poise	P
curie	Ci
litre	l. (where there is danger of confusion between the numeral '1' and the letter 'l', 'litre' should be written in full, and always at the end of a sentence)
millilitre, microlitre	ml μ l
degree Celsius	°C

(c) Units no longer acceptable

inch, foot, pound, pound per square inch, °F.

Expressions such as cycles per second (c/s) will no longer be accepted. Frequencies should be expressed in the appropriate approved symbols: thus a stimulation frequency should be given in Hz (irregular or occasional events should be given per unit time, e.g. s⁻¹, h⁻¹). When there is more than one solidus in an expression, parentheses should be used to eliminate ambiguity, e.g. (mg/kg)/day).

BRITISH JOURNAL OF PHARMACOLOGY

THE INTERNATIONAL SYSTEM OF UNITS (SI)

The British Journal of Pharmacology uses the **symbols** recommended in the SI (Système Internationale) (see *Symbols, Signs and Abbreviations Recommended for British Scientific Publications* (1969) (London: The Royal Society: price 35p.)). It is the policy of the Editorial Board to adopt SI units, although the use of certain non-SI units will for the time being be permitted. Full details of the changes involved will be published in a forthcoming "Instructions to Authors". The following is a list (a) of some of the commoner units with their recommended symbols, (b) of some non-SI units which may still be used, and (c) of units which will no longer be acceptable.

(a) SI units with recommended symbols

Unit	Correct symbol
kilogramme	kg
second, millisecond	s ms
mole, millimole, micromole,	mol mmol μ mol
nanomole, picomole	nmol pmol
metre, centimetre, millimetre,	m cm mm
micrometre	μ m
Hertz	Hz

(b) Some permitted non-SI units

ångström	Å (= 10^{-10} m = 0.1 nm)
gramme	g
minute	min
hour	h
molarity (mol/litre)	M
calorie	cal (4.184 J) (Conversion factor to be given as a footnote at first citation or in Methods)
millimetres of mercury	mmHg (1.333 mbar) (Conversion factor to be given as a footnote at first citation or in Methods)
millibar	mbar
poise	P
curie	Ci
litre	l. (where there is danger of confusion between the numeral '1' and the letter 'l', 'litre' should be written in full, and always at the end of a sentence)
millilitre, microlitre	ml μ l
degree Celsius	°C

(c) Units no longer acceptable

inch, foot, pound, pound per square inch, °F.

Expressions such as cycles per second (c/s) will no longer be accepted. Frequencies should be expressed in the appropriate approved symbols: thus a stimulation frequency should be given in Hz (irregular or occasional events should be given per unit time, e.g. s⁻¹, h⁻¹). When there is more than one solidus in an expression, parentheses should be used to eliminate ambiguity, e.g. (mg/kg)/day.

Instructions to Authors

1. **Manuscripts** (2 copies) should be typed in double spacing on one side of paper not larger than foolscap (33×20.5 cm). There should be a separate title page giving the names and addresses of the authors in alphabetical order. A short title containing not more than 40 letters should also be suggested.
2. A **short summary of results and conclusions** (arranged in numbered paragraphs), **tables and legends to figures** should be typed on separate sheets of paper.
3. **References** should be collected at the end of the paper. They should include the authors' names, year of publication, title of article, title of publication (abbreviated in accordance with the fourth edition of the *World List of Scientific Periodicals*), volume number and first and last page numbers. References to books should, in addition, include the names of editors, the edition number, where appropriate, and the town of origin and name of publisher.
4. **Figures** should NOT BE LARGER THAN FOOLSCAP (33×20.5 cm) and may be in the form of original drawings, recorded tracings or high quality photographic prints made from them. Negative prints of kymograph tracings (black on white) should be provided and both ordinates and abscissae should be calibrated.
5. **Lettering** on figures should be inserted in PENCIL. Symbols which are to appear in figures or legends should be chosen from the following:
 \times $+$ \bullet \blacksquare \circ \square \triangle \blacktriangle ∇ \blacktriangledown \odot \ominus \diamond
6. **Photographs and photomicrographs** should be printed on glossy paper and should be larger than the size required for reproduction.
7. **Tables** ideally should not have more than 84 characters to a line (counting spaces between columns as 4 characters) and certainly not more than 130 characters to a line, unless absolutely unavoidable.
8. An **abstract** of about 100 words suitable for inclusion in *International Abstracts of Biological Sciences* should be typed on a separate sheet, giving the author's name and address and the title of the paper.

General remarks. A recent issue of the journal is a good guide to style. Papers are accepted only if accompanied by a statement that they have not and will not be published in whole or in part in any other Journal.

Two page proofs will be supplied, one of which may be retained by the authors. The other should be corrected immediately and returned to the Press Editor. Corrections should be kept to a minimum.

Twenty-five reprints will be supplied to the authors free of charge. Additional reprints can be purchased. A reprint order form, which should be returned promptly, will be sent out with the proofs. No reprints of abstracts are supplied.

BRITISH JOURNAL OF PHARMACOLOGY

September 1973 Volume 49 Number 1

Page

Systematic Pharmacology

- 1 GRAHAM, J. D. P. and LI, D. M. F. Cardiovascular and respiratory effects of cannabis in cat and rat. (SP1, SP3, DM2)
- 11 ABBS, E. T. and PYCOCK, C. J. The effects of bretylium on the subcellular distribution of noradrenaline and on adrenergic nerve function in rat heart. (SP1, AP1, DM1)
- 23 HARANATH, P. S. R. K. and SHYAMALAKUMARI, S. Sleep induced by small doses of tubocurarine injected into cerebral ventricles of dog. (SP2, AP1)
- 29 COSTALL, B. and NAYLOR, R. J. The role of the substantia nigra in the locomotor stimulant action of amphetamine. (SP2)
- 37 HILL, R. G., SIMMONDS, M. A. and STRAUGHAN, D. W. A comparative study of some convulsant substances as γ -aminobutyric acid antagonists in the feline cerebral cortex. (SP2)
- 52 HORTON, R. W. and MELDRUM, B. S. Seizures induced by allylglycine, 3-mercaptopropionic acid and 4-deoxypyridoxine in mice and photosensitive baboons, and different modes of inhibition of cerebral glutamic acid decarboxylase. (SP2, DM1)
- 64 DHAWAN, B. N. and SRIMAL, R. C. Anti-inflammatory and some other pharmacological effects of 3,4-*trans*-2,2-dimethyl-3-phenyl-4-(*p*-(β -pyrrolidinoethoxy)-phenyl)-7-methoxy-chroman (centchroman). (SP3, M)

Autopharmacology

- 74 BLOCK, A. J. and REIT, E. The influence of histamine and other vasoactive substances on contractile responses of cat skeletal muscle to acetylcholine. (AP1, AP2, DM2)
- 86 FERREIRA, S. H., MONCADA, S. and VANE, J. R. Prostaglandins and the mechanism of analgesia produced by aspirin-like drugs. (AP2)
- 98 HORTON, E. W. and POYSER, N. L. Elongation of oestrous cycle in the guinea-pig following subcutaneous or intra-uterine administration of indomethacin. (AP2, SP3)

Drug Mechanisms

- 106 BRIANT, R. H., DOLLERY, C. T., FENYVESI, T. and GEORGE, C. F. Assessment of selective β -adrenoceptor blockade in man. (DM2, CP)

Clinical Pharmacology

- 115 DURNIN, J. V. G. A. and WOMERSLEY, J. The metabolic effects, and the composition of the tissue lost, in weight reduction by obese patients on treatment with fenfluramine. (CP)

Psychopharmacology

- 121 DAVIES, J. A. and REDFERN, P. H. The effects of hallucinogenic drugs on maze exploration in the rat over a 24-hour period. (PP, SP2)

SHORT COMMUNICATIONS

- 128 GARLAND, L. G. Effect of cromoglycate on anaphylactic histamine release from rat peritoneal mast cells. (AP2, DM1)
- 131 BHOOLA, K. D. and EDJTEHADI, M. Biosynthesis of noradrenaline in organ cultured hearts. (PK2)
- 134 CUTHBERT, A. W. and PIC, P. Adrenoceptors and adenylyl cyclase in gills. (DM1, DM2)
- 138 KATZ, B. and MILEDI, R. The effect of α -bungarotoxin on acetylcholine receptors. (DM1)
- 141P PROCEEDINGS OF THE BRITISH PHARMACOLOGICAL SOCIETY, GLASGOW, 12-13 July, 1973. (See pp. iii, and iv, for contents).

Systematic Pharmacology

Cardiovascular system SP1
Central nervous system SP2
Other physiological systems SP3

Pharmacokinetics

Storage, distribution, fate PK1
Synthesis, metabolism PK2
Uptake, release PK3

Clinical Pharmacology, Experimental

Therapy CP
Chemotherapy CT
Miscellaneous M

Autopharmacology

Adrenergic, cholinergic transmission AP1
Histamine, kinins, prostaglandins, etc. AP2
Hormones AP3

Drug Mechanisms

Molecular, cellular, biochemical, biophysical DM1
Receptors, antagonism, potentiation, tolerance DM2

Pharmacometrics PM

Psychopharmacology PP
Toxicology TX