

Seminars in Basic Neurosciences

College Seminars Series

Series Editors

Professor Hugh Freeman, Honorary Professor, University of Salford, and Honorary Consultant Psychiatrist, Salford Health Authority

Dr Ian Pullen, Consultant Psychiatrist, Dingleton Hospital, Melrose, Roxburghshire

Dr George Stein, Consultant Psychiatrist, Farnborough Hospital, and King's College Hospital

Professor Greg Wilkinson, Editor, *British Journal of Psychiatry*, and Professor of Liaison Psychiatry, University of Liverpool

Other books in the series

Seminars in Alcohol and Drug Misuse. Edited by Jonathan Chick & Roch Cantwell

Seminars in Child and Adolescent Psychiatry. Edited by Dora Black & David Cottrell

Seminars in Clinical Psychopharmacology. Edited by David King

Seminars in Liaison Psychiatry. Edited by Elspeth Guthrie & Francis Creed

Seminars in Practical Forensic Psychiatry. Edited by Derek Chiswick & Rosemarie Cope

Seminars in Psychiatric Genetics. By Peter McGuffin, Michael J. Owen, Michael C. O'Donovan, Anita Thapar & Irving Gottesman

Seminars in the Psychiatry of Learning Disabilities. Edited by Oliver Russell

Seminars in Psychology and the Social Sciences. Edited by Digby Tantam & Max Birchwood

Seminars in General Adult Psychiatry. Edited by George Stein & Greg Wilkinson

Forthcoming titles

Seminars in Psychiatry for the Elderly. Edited by Brice Pitt & Mohsen Naguib

Seminars in Psychotherapy. Edited by Sandra Grant & Jane Naismith

Seminars in Basic Neurosciences

Edited by
Gethin Morgan & Stuart Butler

GASKELL

© 1993 The Royal College of Psychiatrists

First published 1993

Reprinted 1998

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

British Library Cataloguing-in-Publication Data

Seminars in Basic Neurosciences.–

(College Seminars Series)

I. Morgan, Gethin II. Butler, Stuart

III. Series

612.8

ISBN 0 902241 61 3

Distributed in North America

by American Psychiatric Press, Inc.

ISBN 0 88048 625 2

Gaskell is an imprint of the Royal College of Psychiatrists,

17 Belgrave Square, London SW1X 8PG.

The Royal College of Psychiatrists is a registered charity, number 228636.

The views presented in this book do not necessarily reflect those of the Royal College of Psychiatrists, and the publishers are not responsible for any error of omission or fact. College Seminars are produced by the Publications Department of the College; they should in no way be construed as providing a syllabus or other material for any College examination.

Phototypeset by Dobbie Typesetting Limited, Tavistock, Devon

Printed in Great Britain by Bell and Bain Ltd, Glasgow

Contents

List of contributors	vi
Foreword. <i>Series Editors</i>	vii
Preface	viii
1 Functional neuroanatomy. <i>Stuart Butler</i>	1
2 Neurophysiology. <i>Steve Logan</i>	42
3 Neurochemistry and neuropharmacology. <i>David Nutt</i>	71
4 Neurological examination and neurological syndromes. <i>Ken Barrett</i>	112
5 Neuropsychology. <i>Stephen Hallett</i>	151
6 Neuropathology. <i>Philip Luthert</i>	186
7 Neuroendocrinology. <i>Stephen Gilbey & Alexander Macrae</i>	221
8 Clinical neurophysiology. <i>Hilary Morgan</i>	246
9 Neuroradiology. <i>John Bradshaw & Timothy Lewis</i>	302
Appendix. Cutaneous innervation and a summary of reflexes	315
Index	319

Contributors

- Dr Ken Barrett, Consultant Neuropsychiatrist/Senior Lecturer, Department of Psychiatry, School of Postgraduate Medicine, Keele University, Stoke on Trent ST4 7QB
- Dr John Bradshaw, Consultant Radiologist, Department of Neuroradiology, Frenchay Hospital, Frenchay, Bristol BS16 1LE
- Dr Stuart Butler, Scientific Director, Burden Neurological Institute, Stoke Lane, Stapleton, Bristol BS16 1QT
- Dr Stephen Gilbey, Consultant Physician, Department of Endocrinology, Hammersmith Hospital, Ducane Road, London W12 0HS
- Dr Stephen Hallett, Consultant Clinical Neuropsychologist, Coventry Consulting Rooms, 11 Dalton Road, Earlsdon, Coventry CV5 6PB
- Dr Timothy Lewis, Consultant Radiologist, Department of Neuroradiology, Frenchay Hospital, Frenchay, Bristol BS16 1LE
- Dr Steve Logan, Senior Lecturer, Department of Physiology, The Medical School, University of Birmingham, Birmingham B15 2TT
- Dr Philip Luthert, Senior Lecturer in Neuropathology and Honorary Consultant Neuropathologist, Department of Neuropathology, Institute of Psychiatry, De Crespigny Park, Denmark Hill, London SE5 8AF
- Dr Alexander Macrae, MRC Training Fellow, Molecular Genetics Unit, Department of Medicine, Addenbrooke's Hospital, Cambridge CB2 2QQ
- Professor Gethin Morgan, Professor of Mental Health, University of Bristol, 41 St Michael's Hill, Bristol BS2 8DZ
- Dr Hilary Morgan, Consultant Clinical Neurophysiologist, Burden Neurological Hospital, Stoke Lane, Stapleton, Bristol BS16 1QT
- Dr David Nutt, Director, Psychopharmacology Unit, School of Medical Sciences, University Walk, Bristol BS8 1TD

Foreword

Series Editors

The publication of *College Seminars*, a series of textbooks covering the breadth of psychiatry, represents a new venture for the Royal College of Psychiatrists. At the same time, it is very much in line with the College's established role in education and in setting professional standards.

College Seminars are intended to help junior doctors during their training years. We hope that trainees will find these books useful, on the ward as well as in preparation for the MRCPsych examination. Separate volumes will cover clinical psychiatry, each of its subspecialties, and also the relevant non-clinical academic disciplines of psychology and sociology.

College Seminars will also make a contribution to the continuing medical education of established clinicians.

Psychiatry is concerned primarily with people, and to a lesser extent with disease processes and pathology. The core of the subject is rich in ideas and schools of thought, and no single approach or solution can embrace the variety of problems a psychiatrist meets. For this reason, we have endeavoured to adopt an eclectic approach to practical management throughout the series.

The College can draw on the collective wisdom of many individuals in clinical and academic psychiatry. More than a hundred people have contributed to this series; this reflects how diverse and complex psychiatry has become.

Frequent new editions of books appearing in the series are envisaged, which should allow *College Seminars* to be responsive to readers' suggestions and needs.

Hugh Freeman
Ian Pullen
George Stein
Greg Wilkinson

Preface

Trainees in psychiatry need to acquire a thorough knowledge of the basic neurosciences. As things are at present, they are liable to experience several problems in trying to do so. They often find it difficult to decide exactly how far they should explore topics which may not have been addressed since they were undergraduates, and perhaps no more than superficially at that time. Furthermore, totally new fields of knowledge may have appeared, ones which are complex and not easy to understand. Access to relevant texts and identification of appropriate key original sources may also be difficult, with the result that trainees fear that they have not covered essential areas in their reading.

In preparing this volume we have tried to address such problems which have long been voiced. Relevant postgraduate examinations do not specify a detailed syllabus and it is necessary to use good judgement in deciding exactly how much detailed knowledge is required. We have dealt with this problem by ensuring that our contributors are experienced as teachers of clinical trainees. We do not claim to have comprehensively defined a basic neurosciences curriculum, nor do we have any formal remit to do so, but we do believe that included in the present volume are the key topics which are likely to be encountered in postgraduate examinations in psychiatry. Bringing them together under a single cover should help by making access to relevant information easier, as will the recommendations for selective further reading. The chapter concerned with examination of the nervous system and neurological syndromes rounds off the total picture. It emphasises the close relationships which psychiatry has with both basic and clinical neurosciences, and reminds trainees that they are expected to be able to carry out a competent and thorough examination of the nervous system.

We hope that the text which is presented here will also allow psychiatrists, trainees or otherwise, to update their knowledge of the neurosciences and help them to feel confident that they are appropriately aware of the important topics in this complex and rapidly developing field.

*Gethin Morgan
Stuart Butler*