Great advances have been made in recent years towards a better understanding of the healthy brain and the physical basis of psychiatric disorder. This text brings together contributions from leading international authorities to provide a timely and multidisciplinary overview of this fast-developing area. Its broad coverage ranges from epilepsy and schizophrenia to basal ganglia disorder and brain lesions. In many cases, a clinically oriented chapter is paired with one that describes the basic science that underpins it and considerable attention is given to the impact of the new technologies - structural and functional neuroimaging. In highlighting the basic pathophysiological mechanisms of multifaceted clinical manifestations, this book serves as a valuable review of current neuropsychiatry. It will be welcomed by clinicians, researchers and students alike from neuroscience through to neuropsychology and psychiatry.

‘This is an excellent book focusing on various neuropsychiatry topics where brain and mind come together. Written and edited by internationally recognized experts in the field, it is an outstanding contribution to psychiatry . . . Any clinician or researcher involved and interested in psychopathology–brain relationships should read and refer to it.’

Michael J. Schrift (Rush-Presbyterian-St Luke’s Medical Center) for *Doody’s Notes*

‘Most of the neuroscience that is relevant to psychiatrists, or likely to be in the foreseeable future, is here. The book is particularly strong on cognitive neuropsychology but also has many excellent chapters on behavioural pharmacology, neuroimaging and the neurodevelopmental approach to schizophrenia. . . . This is without doubt the best introduction to neuroscience for psychiatrists.’

Stephen M. Lawrie *British Journal of Psychiatry*
DISORDERS OF BRAIN AND MIND

Edited by

MARIA A. RON
Professor of Neuropsychiatry, Institute of Neurology, London

and

ANTHONY S. DAVID
Professor of Cognitive Neuropsychiatry, King’s College School of Medicine & Dentistry and Institute of Psychiatry, London
Contents

List of contributors page ix

Preface xiii

Introduction D. Frank Benson 1

SECTION I Frontal lobes and neuropsychiatry

1 The neuropsychology of the frontal lobes
   Susan E. McPherson and Jeffrey L. Cummings 11

2 Frontal lobe structural abnormalities in schizophrenia: evidence from neuroimaging
   Brian K. Toone 35

SECTION II Basal ganglia and neuropsychiatry

3 The neuropsychology of basal ganglia disorders: an integrative cognitive and comparative approach
   Trevor W. Robbins,
   Adrian M. Owen and Barbara J. Sahakian 57

4 The behavioural pharmacology of brain dopamine systems: implications for the cognitive pharmacotherapy of schizophrenia
   Eileen Joyce and Sam Hutton 84

SECTION III Memory and its disorders

5 Neuropsychology of memory and amnesia
   Andrew R. Mayes 125

6 Clinical and neuropsychological studies of patients with amnesic disorders
   Michael D. Kopelman 147

SECTION IV Brain disease and mental illness

7 Psychiatric manifestations of demonstrable brain disease
   Maria A. Ron 177

8 Structural brain imaging in the psychoses
   Shôn Lewis 196
SECTION V Epilepsy: biology and behaviour
9 Behaviour in chronic experimental epilepsies  213
  John G.R. Jefferys and Jane Mellonby
10 A neurobiological perspective of the behaviour disorders of epilepsy  Michael R. Trimble  233

SECTION VI Perspectives on neurodevelopment: the case of schizophrenia
11 Early disorders and later schizophrenia: a developmental neuropsychiatric perspective  Eric Taylor  255
12 Neurodevelopmental disturbances in the aetiology of schizophrenia  J. Megginson Hollister and Tyrone D. Cannon  280

SECTION VII Imaging brain and mind: new approaches
13 Magnetic resonance spectroscopy in neuropsychiatry  305
  Michael Maier
14 The hallucination: a disorder of brain and mind  336
  Anthony S. David and Geraldo Busatto

Index  363
Contributors

D. Frank Benson
Professor of Neurology, Augustus S. Rose Department of Neurology, University of California School of Medicine, Centre for Health Sciences, Los Angeles, California 90024, USA

Geraldo Busatto
Lecturer, Department of Psychological Medicine, Institute of Psychiatry, De Crespigny Park, Denmark Hill, London SE5 8AF, UK

Tyrone D. Cannon
Assistant Professor, Department of Psychology, University of Pennsylvania, 3815 Walnut Street, Philadelphia, PA 1904, USA

Jeffrey L. Cummings
Professor of Neurology and Psychiatry, Department of Neurology, Reed Neurological Research Centre, UCLA School of Medicine, 710 Westwood Plaza, Los Angeles, California 90024, USA

Anthony S. David
Professor of Cognitive Neuropsychiatry, Department of Psychological Medicine, Institute of Psychiatry, De Crespigny Park, Denmark Hill, London SE5 8AF, UK

Sam Hutton
Research Fellow, Queen Mary’s University Hospital, Roehampton Lane, London SW15 5PN, UK

John G.R. Jefferys
Professor of Neuroscience, Department of Physiology, University of Birmingham, Birmingham B15 2TT, UK

Eileen Joyce
Senior Lecturer in Psychiatry, Queen Mary’s University Hospital, Roehampton Lane, London SW15 5PN, UK
Contributors

Michael D. Kopelman
Reader, United Medical and Dental School, St Thomas’s Hospital, Lambeth Palace Road, London SE1 7EH, UK

Shôn Lewis
Professor, Department of Psychiatry, University of Manchester, Withington Hospital, West Didsbury, Manchester M20 8LR, UK

Michael Maier
Senior Lecturer, Charing Cross and Westminster Medical School, London W6 8RP, UK

Andrew R. Mayes
Professor of Cognitive Neuroscience, Royal Hallamshire Hospital, Sheffield University, Glossop Road, Sheffield S10 2JF, UK

Susan E. McPherson
Assistant Clinical Professor, Department of Psychiatry and Biobehavioural Sciences, UCLA School of Medicine, Los Angeles, California 90024, USA

J. Megginson Hollister
Post-doctoral Fellow, Department of Psychiatry, University of Pennsylvania, 3815 Walnut Street, Philadelphia, PA 1904, USA

Jane Mellanby
Lecturer, Department of Experimental Psychology, University of Oxford, Oxford OX1 3UD, UK

Adrian M. Owen
Senior Research Associate, Department of Psychiatry, University of Cambridge, Addenbrooke’s Hospital, Cambridge CB2 2QQ

Trevor W. Robbins
Professor in Cognitive Neuroscience, Department of Experimental Psychology, University of Cambridge, Downing St, Cambridge CB2 3EB, UK

Maria A. Ron
Professor of Neuropsychiatry, Institute of Neurology, Queen Square, London WC1N 3BG, UK

Barbara J. Sahakian
Lecturer in Clinical Neuropsychology, Department of Psychiatry, University of Cambridge, School of Clinical Medicine, Addenbrooke’s Hospital, Cambridge CB2 2QQ, UK
Contributors

Eric Taylor
Professor of Developmental Neuropsychiatry, Department of Child Psychiatry, Institute of Psychiatry, De Crespigny Park, Denmark Hill, London SE5 8AF, UK

Brian K. Toone
Consultant Neuropsychiatrist, Department of Psychological Medicine, Kings College Hospital, Denmark Hill, London SE5 8AF, UK

Michael R. Trimble
Professor of Behavioural Neurology, Department of Neurology, Institute of Neurology, Queen Square, London WC1N 3BG, UK
Preface

The description and categorisation of mental phenomena has been the traditional métier of psychiatry. Much of this painstaking work was done without reference to the brain, which, by implication, was perceived as largely irrelevant or else too forbidding and inaccessible. In parallel with this brainless psychiatry, the neurosciences largely contrived to bypass the study of mental phenomena in favour of more accessible areas of research. The brain and the mind thus remained apart.

A dramatic change in this desolate situation has taken place in the last two decades. Neurobiologically based models of behaviour have sprung from new theoretical concepts of brain function such as parallel distributed processing, which leave behind the limited traditional localisationist approach. New neuropsychological tools to analyse behavioural components have been designed and finely tuned and meanwhile considerable progress has been made in elucidating the neurochemical underpinnings of normal and abnormal behaviour. Among these developments, neuroimaging occupies a central place. The advent of computerised tomography (CT) in the mid-seventies, followed by magnetic resonance imaging (MRI) a decade later allowed the visualisation and quantification of subtle structural brain abnormalities in the major psychoses bringing in its wake a renewed interest in the neuropathology of mental illness. Magnetic resonance spectroscopy (MRS) has recently opened a window into the living chemistry of the brain and functional imaging using PET and fMRI has given us much information about the neural systems involved in cognitive processes. These latter techniques are only beginning to make the transition from research to the clinical arena.

The idea behind this book was to gather salient examples of this coming together of brain and mind, focusing on some areas where clinically relevant progress has been made. In a rapidly evolving discipline attempts at
comprehensive coverage would have almost certainly led to failure. Our intention was to illustrate these points of convergence and not to produce a comprehensive textbook or exhaustive compilation of activity in the field. Our personal interests have inevitably coloured the choice of topics and we therefore must accept the blame for what some may see as important omissions.

A further reason for producing Disorders of Brain and Mind was to find a suitable way to mark the retirement of Professor Alwyn Lishman and we dedicate this book to him. From his position as Professor of Neuropsychiatry at the Institute of Psychiatry, Alwyn Lishman has provided the leading inspiration to generations of psychiatrists, neurologists and psychologists in the UK and abroad. His contribution to neuropyschiatry goes well beyond the impact of his original research, although many areas from memory, to head injury, to alcoholic brain damage and imaging have benefited from his work. For those who had the fortune to work with him, his unrivalled clinical skill and teaching ability are a lasting example and, for the less fortunate, his book Organic Psychiatry, now in its third edition, is an invaluable source of information and distilled clinical wisdom.

For the two of us the association with Alwyn Lishman has been a very close and fruitful one and our debt to him therefore greater. It would come as no surprise to our readers to know that many of those who have contributed to the book have also been associated with Alwyn Lishman and their willingness to participate in this small tribute has made our task that much easier. Unfortunately this introduction has to end on a sad note by mentioning the recent death of Professor Frank Benson, a close colleague and friend of Alwyn Lishman who wrote the foreword for Disorders of Brain and Mind.

Maria A. Ron
Anthony S. David

London, January 1997