

Second Edition

# PNEUMO- ENCEPHALOGRAPHY

E. GRAEME ROBERTSON

M.D. (Melb.) F.R.C.P.

F.R.A.C.P., F.C.R.A. (Hon.)

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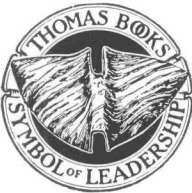
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# PNEUMOENCEPHALOGRAPHY

Believing that he would appreciate a tribute of labour and affection from one of his pupils, the first edition, in 1949, was dedicated to

*Gordon Holmes*

The present work is dedicated as a memorial to this great neurologist and man who died on December 29, 1965, just before his ninetieth birthday.

## Foreword to the First Edition

**I**F it is the province of a foreword to reveal how a book comes to be written, then the circumstances underlying this one may be recounted briefly.

Part of two years of postgraduate training at the Melbourne Hospital as as house-physician and registrar was spent with Sir Sidney Sewell, a physician astute in all branches of medicine, but with a special interest in neurology. In England, after nine months at the Bethlem Royal Hospital, under the guidance of Dr. Murdo Mackenzie, three years were spent at the National Hospital for Nervous Diseases, Queen Square, as house-physician and Resident Medical Officer. Here, in that greatest of all schools of clinical neurology, the writer had the inestimable benefit of being house-officer to Drs. James Collier, S. A. Kinnier Wilson, and W. J. Adie, who have left behind a memorial of themselves in all their pupils. Gordon Holmes (now Sir Gordon) was paternal, as well as the most inspiring and strictest of mentors. The junior physicians, F. M. R. Walshe (now Sir Francis), C. P. Symonds (now Sir Charles), J. Purdon Martin and Macdonald Critchley now occupy with distinction the places vacated by their seniors, while Dr. A. E. Carmichael later transferred his attention to research. Nor can mention be omitted of Dr. J. G. Greenfield, Pathologist to the Hospital and also of world-wide fame, in whose laboratory the writer worked for a time after leaving the house, and of Dr. D. E. Denny-Brown, then Registrar, who introduced him to the field of scientific investigation.

Then followed a period as Assistant Neurologist to Dr. Hinds Howell at St. Bartholomew's Hospital and First Assistant (Neurological) to Dr. Francis Fraser (now Sir Francis) at the London Post-Graduate Teaching School, Hammersmith. In 1934, appointment as Honorary Physician to Outpatients, Melbourne Hospital, determined the writer's return to Melbourne. It was only with the transfer of the hospital to its present magnificent building that the post of Honorary Neurologist was established. In 1944, appointment as Honorary Neurologist to the Children's Hospital, Melbourne, followed. The function of the specialist at that time was to provide consultation for the general physicians and surgeons of the honorary medical staff. To a large extent, the specialist was forced to shift for himself, if, without assistance, he was to develop a satisfactory service. From this circumstance work on pneumoencephalography began in 1935. Herein is presented the result—an experience of pneumoencephalography, obtained by the use of a method which seemed to many to be unduly elaborate at

the time of its inception, in the study of problems presenting in neurological work among adults and children in public hospitals and private practice. Histories have been condensed or eliminated. No systematic description of all intracranial lesions has been provided, but rather of those appearances which are likely to be revealed by pneumoencephalography. No lesion which has not been personally investigated has been included. The experience is presented without detailed reference to the literature. The writers to whom the author is indebted have, he hopes, been mentioned. He apologizes to the many unmentioned who have worked hard and profitably in this field.

Such a work would be impossible without the facilities provided by the Committees of Management of large public hospitals. Colleagues in Melbourne, especially those on the Honorary Medical Staffs of the Royal Melbourne Hospital and the Royal Children's Hospital, and many general practitioners, have contributed materially, for nearly every patient has been referred by them for neurological consultation. The Clinical Research Unit at the Royal Melbourne Hospital has provided patients suffering from general medical disorders of considerable interest. The writer has been fortunate in being associated at both hospitals with Mr. R. S. Hooper, F.R.C.S., who has helped in formulating his ideas regarding the use of encephalography in surgical cases, and who, by operating with the greatest skill and judgment, has provided much information. Dr. Barbara Wood, Radiologist to the Royal Melbourne Hospital, has co-operated in every possible way.

It has been a pleasure to work with the radiographers at the Royal Melbourne Hospital, the Royal Children's Hospital and the Heidelberg Military Hospital. Of these, Mr. J. Callow, chief radiographer at the Royal Melbourne Hospital, Mr. B. Thake, Miss Mary Watson, Mr. J. A. Lloyd and Mr. J. Ely must be singled out for mention because of the high quality of their work. The photographs in the previous monographs were taken by Miss Helen Wischusen. Mr. C. Murphy, Clinical Photographer at the Royal Children's Hospital, photographed several of the specimens. Most of the added illustrations, including the skiagrams, were photographed by Mr. R. Inglis, Clinical Photographer at the Royal Melbourne Hospital. As with the radiographers mentioned above, to refer to his superb craftsmanship, and the devotion to an ideal expressed in time-consuming work, seems less than his due. Many of the drawings from the previous monographs, and all the new drawings (with one exception) were by the writer.

I should record thanks for the involuntary help of so many patients—for without them this work would never have been done! Some have benefited from the investigation; it is unfortunate that more have not, but in this pneumoencephalography does not differ from most other investigations.



Thanks must also be recorded to the Walter and Eliza Hall Institute of Research at the Royal Melbourne Hospital for publishing *Encephalography*. I thank Messrs. Patterson, Shugg & Company, Process Engravers, for the earlier blocks made for *Encephalography* and *Further Studies in Encephalography* which have been incorporated in this work. (In that instance, the x-ray films were projected directly on to the plates.) The early stimulus to write these was provided by Dr. C. Wallace Ross. His service did not cease with the stimulus alone, for having an interest in the craft of printing and a great practical knowledge, he gave the earlier books their form and taught the writer some of this art along the way. I gratefully acknowledge my debt to the Trustees of the Walter and Eliza Hall Institute for allowing the use of material from *Encephalography*, and to the publishers and editors of journals for permission to bring into one volume material previously published, namely, A Method of Encephalography, from *Surgery*, Vol. XIX (1946); The Röntgenographic Appearance of the Falx Cerebri, *The American Journal of Röntgenology and Radium Therapy*, Vol. LVI (1946); Some Physical Aspects of Encephalography, *Brain*, Vol. LXX (1947); Developmental Defects of the Cisterna Magna and Dura Mater, *Journal of Neurology, Neurosurgery and Psychiatry*, Vol. XII (1949); Pulsating Exophthalmos due to Defective Development of the Sphenoid Bone, *The American Journal of Röntgenology and Radium Therapy*, Vol. LXII (1949); Craniopagus Parietalis, A.M.A. *Archives of Neurology and Psychiatry*, Vol. LXX (1953).

It has been most pleasant to receive the fullest co-operation from the publisher of this volume, Mr. Charles C Thomas who, from a distance, has written the longest, most helpful and most friendly of letters, smoothing out the difficulties inherent in publishing a book in another country. His suggestions, I believe, have made the book less expensive and more valuable.

Finally, it is difficult to sufficiently thank Miss Margaret Turnbull, secretary to the Department of Neurology and Neurosurgery at the Royal Melbourne Hospital, who has shouldered many burdens and so made more time for relevant work. In addition she has typed and retyped the manuscript with enthusiasm, patience and accuracy.

E. G. R.



## Foreword to the Second Edition

THE first edition has been out of print for some years and the many requests received have prompted the preparation of a second edition. It follows the general plan of the first.

The method, evolved in 1935, was first described in *Encephalography* in 1941. The present edition remains a record of my personal experience of pneumoencephalography over a number of years in the practice of neurology. This explains its manifest faults and whatever virtues it may possess. It is difficult for one person, earning his living in consultant practice, to keep continuous records. I have failed during over-busy periods, and when it was thought that the task was complete after writing the previous monographs and the first edition of *Pneumoencephalography*. This failing makes full statistical analysis impractical. I confess to mathematical incapacity and suspect that without a computing machine, any statistics I compiled would have little value. Special projects have been studied by series of encephalograms done for that specific purpose.

The aim of this work has been to present a reasonably full account of personal work on the theory and practice of pneumoencephalography, which may help the beginner, serve as a work of reference in the x-ray department and even interest the erudite in the field as a record of some of the fascinating encephalograms which have accumulated in one practice. Anatomical details have been added, but, it is hoped, kept within the bounds necessary for practical interpretation. Readers with good anatomical knowledge are advised to pass over these sections. An attempt has been made to lead through encephalographic theory, anatomy and clinical records to the task of interpreting films and integrating such static pictures into the life-history of the patient's disorder. To this end only basic tracings have been made, lest more stultify personal interpretation before verbal explanations provided in the legends are consulted. Case numbers have been added only where cross-reference between text and illustration is necessary. The arrangement of the material has been determined by ease of reading; but a desire to make some chapters complete in themselves has led to some splitting of material. It is hoped that the index will help to provide nosological unity. References have been confined to papers which I have found illuminating, for a full study is beyond the bounds of this book. I apologize to many authors of excellent papers unmentioned. The drawings are the work of the writer.

Most of the encephalograms have been done by the writer, but in this edition, some which have been done by my colleague Dr. Peter Ebeling (now Honorary Neurologist, Royal Melbourne Hospital) have been included. Ventriculograms and angiograms have been done by Mr. R. S. Hooper, Neurosurgeon to the Royal Melbourne and Royal Children's Hospitals, Melbourne; Neurosurgeons Mr. J. Bryant Curtis and Mr. Robin Lowe; Professor W. S. Hare (Director of Radiology at the Royal Melbourne Hospital and now Professor of Radiology, Melbourne University), Dr. Harry Hiller (Director of Radiology at the Royal Children's Hospital), and Dr. P. McDonald (Assistant Director).

I have been most fortunate throughout in being so closely associated with Mr. R. S. Hooper, M.S., F.R.C.S., F.R.A.C.S. The excellence of his work is evident in many of the operative procedures mentioned (necessarily briefly) in this book.

It is difficult to sufficiently express my thanks for all the help I have been given so freely. The additional reproductions of radiograms (the number of plates has been more than doubled in this edition) have been made with ideal craftsmanship by the Department of Audio and Visual Aids of the Melbourne University, the Department of Medical Illustration at the Royal Melbourne Hospital, and the Department of Photography and Visual Aids at the Royal Children's Hospital. Mr. R. Inglis, Director of the former department, and Mrs. E. Murphy and Mr. A. V. Daniel of the latter department have been responsible for some excellent photographic work.

Again, I must express my deep gratitude to colleagues on the Honorary Medical Staffs of the Royal Melbourne Hospital and the Royal Children's Hospital, Melbourne, and to general practitioners for entrusting me with the care of their patients, to the committees of management of these magnificent public hospitals and to the late Dr. J. W. Perry, Medical Director of the Royal Children's Hospital, for providing facilities and all possible help, and to the tireless cooperation of the Directors of Radiology (Professor W. S. C. Hare and Dr. H. G. Hiller) of these hospitals. The radiographers at the hospitals have given excellent service, which is a credit both to their personal qualities and to their training. Their names are far too numerous to mention, but amongst them all I must choose to thank Mr. J. Callow, Mr. W. Haning, Mr. J. A. Lloyd and Mr. J. Ely for their long-continued association and helpful collaboration.

As before, it is my pleasant duty to thank Miss Margaret Turnbull, Secretary to the Department of Neurology and Neurosurgery at the Royal Melbourne Hospital for her efficiency, excellent memory, organization and ever-ready help.

Miss A. Plane, Secretary of the Department of Radiology at the Royal Children's Hospital found films during a difficult period of changing filing

systems. Miss Ann McGalliard, Librarian to the Royal Melbourne Hospital also pleasantly gave invaluable help.

The manuscript has been enthusiastically typed by Miss Joan Robertson and Miss Herma Schrader.

E. G. R.

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