



Fifth Edition

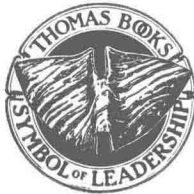
# PRACTICAL NEUROLOGICAL DIAGNOSIS

*With Special Reference to the  
Problems of Neurosurgery*

*By*

R. GLEN SPURLING, M.D.

*Clinical Professor of Surgery (Neurosurgery)  
University of Louisville School of Medicine  
Louisville, Kentucky*



CHARLES C THOMAS • PUBLISHER  
*Springfield • Illinois • U.S.A.*

CHARLES C THOMAS • PUBLISHER  
301-327 EAST LAWRENCE AVENUE, SPRINGFIELD, ILLINOIS

*Published simultaneously in the British Commonwealth of Nations by*  
BLACKWELL SCIENTIFIC PUBLICATIONS, LTD., OXFORD, ENGLAND

*Published simultaneously in Canada by*  
THE RYERSON PRESS, TORONTO

This book is protected by copyright. No part of it  
may be duplicated or reproduced in any manner  
without written permission from the publisher.

*Copyright, 1935, 1940, 1944 by CHARLES C THOMAS*  
*Copyright, 1950 by CHARLES C THOMAS • PUBLISHER*  
*Copyright, 1953 by CHARLES C THOMAS • PUBLISHER*

First Edition, February, 1935  
Second Edition, October, 1940  
Third Edition, September, 1944  
Third Edition, Second Printing, August, 1945  
Fourth Edition, January, 1950  
Fifth Edition, June, 1953

*Library of Congress Catalog Card Number: 53-8696*

*Printed in the United States of America*

DEDICATED TO THE MEMORY OF  
HARVEY CUSHING  
A GREAT SURGEON, TEACHER, AND INVESTIGATOR

## PREFACE TO THE FIFTH EDITION

MANY OF THE book reviews of the Fourth Edition expressed regret that I did not include a discussion of Arteriography and Electroencephalography. Some of the authors of these reviews were teachers of neurology or neurosurgery who were using Practical Neurological Diagnosis as either a text or reference book for their students. I have taken the opportunity in this Fifth Edition to comply with their suggestions.

The general text has been subjected to some editorial revisions, but for the most part the selection and arrangement of materials have remained essentially the same as in previous editions.

I wish to express my appreciation to Dr. Ephraim Roseman, Professor of Neurology, University of Louisville School of Medicine, for preparing the manuscript on Arteriography, and to Dr. Arthur A. Ward, Jr., Associate Professor of Surgery (Neurosurgery), University of Washington School of Medicine, for writing the chapter on Electroencephalography. I accept full responsibility for any errors of omission in both of these chapters for I imposed severe space restrictions in the presentation of these important subjects.

R. GLEN SPURLING

*Louisville, Kentucky*

*May, 1953*

## PREFACE TO THE FOURTH EDITION

THE TEXT of the fourth edition of this book has been submitted to a general editorial revision. The sequence of the subject matter has been somewhat altered. The chapter on the cerebellum has been completely rewritten. A section on the hypothalamus has been added. A glossary of terms commonly used in clinical neurology has also been added. These changes and additions have been accomplished without any essential alteration in the size of the book and without departure from the original objective, "*to present a simple account of the principles of neurological diagnosis . . . for students and practitioners who desire to become more proficient in the recognition of neurological disorders.*"

I am indebted to so many of my friends for helpful suggestions and kindly criticism that to mention all of them by name would be impossible. It gives me pleasure, however, to express particular gratitude to Dr. Arthur Ward, Assistant Professor of Surgery (Neurosurgery) at the University of Washington School of Medicine, whose help has been invaluable.

Miss Elizabeth M. McFetridge made many useful suggestions concerning the arrangement of the text and in other ways contributed to its lucidity. She did most of the hard editorial work on the manuscript and also prepared the index, tasks for which she has my grateful appreciation.

In years gone by it has always been a pleasure to work with Charles C Thomas, the publisher of this book. Now I am indebted not only to him but also to his talented son, Payne, who has shown the same capacity for helpful cooperation as his father.

R. GLEN SPURLING

*Louisville, Kentucky*  
*January, 1950*

## PREFACE TO THE THIRD EDITION

RELATIVELY few changes have been made in the manuscript for the third edition; only the section on Myelography has been revised completely. This course was not occasioned by the exigencies of war or to limitations imposed upon me by the publisher, but rather to the belief that the book in its present form is as useful to students as anything I could write again.

R. GLEN SPURLING

*Washington, D.C.*

*September, 1944*

## PREFACE TO THE SECOND EDITION

IN PREPARING the manuscript for the second edition my objectives have been threefold: *First*, to refrain from the temptation to enlarge the scope of the text and thus increase the size of the book. *Second*, to correct errors that crept into the first edition. *Third*, to include in the text as much new information as is consistent with my primary purpose of presenting to students and practitioners of medicine a *simple* account of the principles of neurological diagnosis.

My thanks are due primarily to reviewers of the first edition who kindly pointed out shortcomings. I have endeavored to profit by their criticism. I am deeply indebted to my former associate, Dr. F. Keith Bradford, for critically reviewing the manuscript and to Dr. Joseph C. Bell for many suggestions that led to a drastic revision of the section on Roentgen Diagnosis.

To Mr. Charles C Thomas, the publisher, I am always indebted for complete coöperation and helpful advice.

R. GLEN SPURLING

*Louisville, Kentucky*  
*October, 1940*

## PREFACE TO THE FIRST EDITION

THIS VOLUME aims to present a simple account of the principles of neurological diagnosis. It is designed for students and practitioners who desire to become more proficient in the recognition of neurological disorders. It is not a glossary of symptoms and signs. Many duplicating diagnostic tests have been omitted. Only those which I have found, over a period of years, to be most useful are described. An attempt has been made to gather together from scattered sources data which explain the anatomical and physiological bases and the clinical interpretation of neurological symptoms and signs. In order to render the diagnostic study complete, chapters dealing with the cerebrospinal fluid and x-ray interpretation are included.

The outline for the neurological examination described is, with minor variations, used in many neurosurgical clinics. It is probably no better than many other synopses, unless, perhaps, it points more directly to a neurosurgical goal. It is, I believe, an entirely adequate guide in all organic disorders of the nervous system.

The field of organic neurology generally has not received the attention which it merits. Surgical lesions of the nervous system still too frequently come to the neurosurgeon in their final stages. If this condition is to be corrected, physicians and students generally must become more "neurologically minded." Toward this end I trust that this book may contribute a small part.

R. GLEN SPURLING

*Louisville, Kentucky*  
*February, 1935*

## ACKNOWLEDGMENTS IN THE FIRST EDITION

THE INFORMATION contained in this book is the product of other minds—those of the past and present. My only claim to originality is in the arrangement and, in some instances, the interpretation of the material. The constant citation of authorities has been dispensed with because it encumbers a text primarily intended for students. A list of references has been appended at the end of Part I to indicate the authorities from whom much of the subject matter has been borrowed. To these authors I express my sincere thanks.

To the president of the University of Louisville, Dr. Raymond A. Kent, and to the dean of the Medical School, Dr. John W. Moore, I am thankful for placing at my disposal the facilities of that institution.

It would be impractical to mention the names of all my friends who have given encouragement and who have contributed valuable suggestions. In particular, I wish to express my debt to Dr. John F. Fulton and Dr. James B. Rogers, who critically reviewed the manuscript on the neurological examination. Drs. Franklin Jelsma, Malcom Thompson, George Wakerlin, and Clarence Bird kindly aided in many ways. Whatever merit of orthographic exactness this book possesses is due to the intelligent labor of my secretary, Miss Nellie Burdette.

The photographs were made by Dr. Clyde McNeill, a chore which he graciously undertook and for which I am appreciative. With few exceptions, the x-ray films were made by Dr. Joseph C. Bell from my own cases.

Miss Helen Woelfel made the drawings which speak for themselves. Some of the drawings were copied from textbooks and published articles and proper acknowledgment appears in the subtitles. To these authors and their publishers I am grateful for permission to reproduce their work.

The publisher, Mr. Charles C Thomas, has shown his devo-

## ACKNOWLEDGEMENTS IN THE FIRST EDITION

tion to the advancement of neurology by many publications. I am deeply appreciative of the advice and cooperation which he has generously extended during the preparation of the manuscript.

R. GLEN SPURLING

## GLOSSARY OF TERMS COMMONLY USED IN NEUROLOGY

NOTE—This list comprises only certain of the clinical terms commonly used in neurology. It is not intended to be inclusive. Anatomical and pathological terms are not included.

**Adiadokokinesis** Inability to perform rapid alternating movements.

**Ankle clonus** A series of exaggerated ankle-jerks produced by clonic contraction of the gastrocnemius and soleus muscles when the foot is quickly and forcibly pushed up into extreme dorsiflexion.

**Anosmia** Partial or complete loss of the sense of smell.

**Aphasia** Impairment of or loss of the power of expression by speech, writing or signs, or of comprehension of spoken or written language. Motor aphasia is impairment of the execution of speech, sensory aphasia impairment of the reception of speech.

**Apraxia** Loss of ability to perform purposeful motions.

**Astereognosis** Loss of perception of form.

**Asynergy** Lack of the coordination in the contraction of muscles which normally assures that the different components of an act follow in proper sequence, at the proper time, and in the proper degree to assure its accurate performance.

**Ataxia** Failure of muscular coordination or irregularity of muscular action.

**Aura** A peculiar sensation or phenomenon preceding an epileptic fit and heralding its onset.

**Autonomic epilepsy** A rare disease characterized by repeated paroxysmal attacks of sympathetic or parasympathetic discharge consisting of sudden flushing, profuse lacrimation and salivation, and excessive perspiration.

**Babinski's sign** An extensor (dorsiflexion) movement of the

## PRACTICAL NEUROLOGICAL DIAGNOSIS

great toe with spreading or fanning of the other toes when the outer side of the sole of the foot is stroked from the heel forward.

**Bárány's test** A caloric test involving irrigation of the external auditory canal and producing, if the labyrinth is normal, nystagmus, past-pointing, nausea and vomiting and other symptoms and signs.

**Brown-Séquard's syndrome** A group of symptoms and signs due to lateral hemisection of the cord as the result of disease or injury and including ipsilateral paralysis and loss of vibratory and position sense, with contralateral loss of pain and temperature sensation. Light touch acuity may be slightly impaired bilaterally.

**Cerebellar ataxia** Ataxia (q. v.) due to disease of the cerebellum.

**Chaddock's sign** Dorsiflexion of the great toe produced by stroking the lateral malleolus and the dorsum of the fifth metatarsal.

**Choked disc** Edema of the optic papilla (papilledema).

**Cilio-spinal reflex** Momentary dilatation of the pupil caused by pinching the skin of the neck.

**Convulsive discharge** An electrical phenomenon involving all or part of the cells of the cerebral hemispheres and basal ganglia. The cells are excited into rhythmic discharge which persists until the threshold is lowered through exhaustion. If the discharge is general, the convulsion is of the grand mal type; if it is localized to a group of cells, the convulsion is of the jacksonian type.

**Convulsive equivalent** The substitution of an uncinat fit for a major convulsive episode.

**Corneal reflex** Prompt closing of eyelids when the cornea is touched.

**Cracked-pot resonance** *See* Macewen's sign.

**Decerebrate rigidity** Rigid extension of the legs as the result of section of the brain-stem in the region of the red nucleus and above Deiters' nucleus.

## GLOSSARY OF TERMS

**Decomposition of movement** Tendency of a limb to overshoot or fall short of the mark it intends to reach; observed in the syndrome of the neocerebellum.

**Decussation** Crossing in the form of an X.

**Deep sensibility** An ill-defined consciousness of the condition and position of muscles, joints and tendons.

**Diplopia** Double vision.

**Dreamy state** A combined sensation that the surroundings are curiously familiar and at the same time unreal and far away.

**Dysarthria** A type of imperfect utterance in which the words are slurred together.

**Dysmetria** Disturbance of power to control range of movement in muscular action.

**Encephalography** Roentgenologic examination of the head following the replacement by lumbar puncture of all or part of the cerebrospinal fluid by air or some other gas.

**Exteroceptive** Pertaining to the external surface field of distribution of receptor organs.

**Forced grasping** Inability to relax the grip when once an object has been grasped.

**Froin Syndrome** Xanthochromic changes and clotting of cerebrospinal fluid because of high protein content.

**Grand mal** A generalized epileptic convulsion.

**Gordon's sign** Dorsiflexion of the great toe when the calf muscles are firmly grasped and squeezed.

**Hemiplegia** Paralysis of half of the body.

**Hemianopsia** Blindness of half the field of vision in one or both eyes. Bitemporal hemianopsia is blindness on the temporal side of the visual field affecting both eyes. Homonymous hemianopsia is blindness which affects the nasal half of one eye and the temporal half of the other.

**Horner's syndrome** Unilateral narrowing of palpebral fissure, enophthalmos, contraction of pupil, absence of sweating over face and neck, and vasodilatation of vessels of head and neck. Also called cervical sympathetic syndrome.

## PRACTICAL NEUROLOGICAL DIAGNOSIS

**Hyperacusis** An abnormally acute sense of hearing; a painful sensitivity to sounds.

**Hypermetria** An excessive range of movement; an exaggerated extension of a part in a certain direction.

**Hypersomnia** Pathological drowsiness or prolonged sleep.

**Jacksonian convulsion** A localized or focal convulsion beginning in a single part of the body. It may spread upward or downward until half of the body is involved. Consciousness is not usually lost.

**Jacksonian march** Clonic movements following tonic movements in a jacksonian convulsion.

**Kinetic tremor** A tremor occurring in a limb during active movement.

**Macewen's sign** Production of a note of "cracked-pot" quality when the skull is percussed with the finger tips.

**Ménière's disease** An inflammatory process in the semicircular canals characterized by vertigo and various aural and ocular disturbances.

**Monoplegia** Paralysis of a single part of the body.

**Nystagmus** An involuntary rapid movement of the eyeball, consisting of a quick phase (jerk) in the direction of voluntary movement of the eyes, followed by a slow phase in which the eyes return to the position of rest.

**Oculogyric crisis** An attack common in postencephalitic parkinsonism consisting of violent movement of the eyes upward or to one side, marked emotional distress, and turning of the head forward, backward or to the side. Propulsion or retropulsion is associated if the patient is standing when the attack comes on.

**Oppenheim's sign** Dorsiflexion of the great toe in response to firm stroking of the inner border of the tibia from above downward.

**Palmar reflex** Forced grasping (q. v.).

**Papilledema** Edema of the optic papilla (choked disc).

**Parkinson's disease** Paralysis agitans, a disease characterized by mask-like facies, characteristic tremor, slowing of volun-

## GLOSSARY OF TERMS

tary movements, a festinating gait, peculiar posture and muscular weakness.

**Past-pointing** Inability to bring the finger to a desired point; instead, the finger falls short of it or passes beyond it.

**Petit mal** A convulsion characterized by momentary loss of consciousness.

**Pharyngeal reflex** Contraction of the pharyngeal muscles, with or without gagging, when the posterior wall of the pharynx or the pharyngeal tonsil is touched.

**Praxis** The performance of an action.

**Proprioceptive** Receiving stimulations within the tissues of the body.

**Queckenstedt's test** A rapid rise in pressure of the cerebrospinal fluid when the veins of the neck are compressed, with a quick return to normal when compression is released.

**Rinne's test** A test to determine whether air conductivity or bone conductivity is the better, carried out by holding a vibrating tuning fork alternately before the ear and over the mastoid process.

**Romberg's sign** Swaying of the body when the feet are held close together in the erect position with the eyes closed.

**Scotoma** A blind or partially blind area in the visual field.

**Stereognosis** The faculty of perceiving the form and nature of objects by the sense of touch.

**Syndrome of the neocerebellum** A type of cerebellar disease characterized by hypotonia, disorders of movement, tremor, and nystagmus.

**Tabetic dissociation** Loss of vibratory and position sense, with preservation of pain, temperature and touch sensibility.

**Tic douloureux** Spasmodic facial neuralgia.

**Todd's paralysis** Transient partial paralysis of the part first involved in a jacksonian march.

**Trunk ataxia** A disturbance of station and gait, with loss of balance and tendency to fall backward, due to incoordination of movements of the trunk with those of the extrem-

## PRACTICAL NEUROLOGICAL DIAGNOSIS

ities. This is not ataxia in the true sense, since the capacity to maintain balance is what is disturbed.

**Uncinate fits** Hallucinations of smell, chiefly unpleasant, likely to be followed by, or to occur in the course of, dreamy state.

**Ventriculography** Roentgenography of the head following replacement of the cerebrospinal fluid by ventricular tap with air or some other gas.

**Weber's test** A test for lateralization of auditory impairment, carried out by holding a vibrating tuning fork on the vertex in the midline.

**Wilson's disease** A disease characterized by tremor, spastic contractures, psychic disturbance, increasing weakness and hypertrophic cirrhosis of the liver, as the result of bilateral degeneration of the corpus striatum. Known also as progressive lenticular degeneration.