

BING'S LOCAL DIAGNOSIS  
IN NEUROLOGICAL DISEASES

HAYMAKER

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## LOCAL DIAGNOSIS

### IN NEUROLOGICAL DISEASES

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By

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## DEDICATIONS

To Valérie Bing, née Guggenheim  
1857-1951

Robert Bing

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To Evelyn

Webb Haymaker



## FOREWORD

BY ROBERT WARTENBERG

SAN FRANCISCO, CALIF.

The original German "Kompendium der topischen Gehirn- und Rückenmarksdiagnostik" of Robert Bing appeared in 1909 and has been translated into six languages. This is its second rendition into English by Webb Haymaker. The first, published in 1940, soon went out of print. In the present work, Haymaker has retained the kernel of the old Bing, which was a very personal record of Bing's experience. The text as it stood in German has been adroitly freshened through amplification both in text and illustration. The imposing collection of references to the literature which has been introduced widens the value of the book. Here one finds representation of the new and authentication of the old.

This work represents a happy blending of the awe-inspiring, lifelong clinical acumen of Bing with the anatomical erudition of Haymaker. The accent is on the clinic. Bing is primarily a clinician, a neurologist of the Babinski and Oppenheim type. He is a dean of European neurology, like the German Max Nonne, the English Gordon Holmes, and the French Georges Guillain and Jean-Alexandre Barré. Bing likes to quote the words of his old friend, the late Barney Sachs: "All true scientific research in medicine stems from the bedside." Such clinical orientation is all the more needed now, when 'mechanized' neurology strives to gain the upper hand. But rapid advances in neuroanatomy and neurophysiology are constantly bringing new ideas to explore at the bedside. And it is these advances, presented in condensed form in this volume, which help to make the localization of disease not a matter of mechanical memorization but of logical anatomico-physiological thinking.

A book has been achieved which, for study and reference, is unequalled in the literature. The style is clear, the facts accurate, the presentation didactic, the illustrations pertinent. Plain, convincing logic prevails throughout.

There has never been a book with an unfavorable foreword. If this one sounds particularly favorable, it is so not only because the book is indeed good, but also because the foreword is written by a confessedly ardent admirer and long-time friend of the two authors. But the reader may judge for himself.





## PREFACE

By ROBERT BING

BASEL, SWITZERLAND

In retrospect, it seems to me that the first edition of my *Kompendium*, which appeared in 1909, was a rather bold undertaking. The aim in view was to synthesize a great mass of data on localization of brain and spinal cord lesions and to present the material in such a way that it would serve to orient those not familiar with the subject. The first edition appeared at a time when 'dynamic' and 'topographic' viewpoints in neurology were in conflict, with the real issues becoming more and more clouded. In some quarters, opinions on the correct approach to the problems of localization had degenerated into controversies of a theoretical nature.

In view of the futility of the purely theoretical approach, I selected only the material that could be used for the purposes of localization. What the French physiologist, Eugene Gley, said of physiology applies also to neurology: "Theories are very attractive to most persons because they are the philosophy, and often the poetry, of science. Even the most captivating theories are subject to eternal change. Recorded observations, on the other hand, although primarily addressed to the rational part of one's nature, have values which endure."

The fact that there have been numerous editions and translations of the *Kompendium* has justified its pragmatic approach. It is an especial satisfaction that this work has served not only its original aim of helping the ill, but also that it has made available to a large circle of readers the fundamentals of one of the most fascinating provinces of medicine. It is also a source of gratification that this enlarged American edition, provided by Webb Haymaker in the garb of a new title, will give broader direction to the investigation of problems of localization. *Habent sua fata libelli.*

## PREFACE

BY WEBB HAYMAKER

WASHINGTON, D. C.

It is rare for a book in the medical field to have such excellence and vitality as to remain for almost half a century a source of authoritative information. Such is the *Kompendium* of Professor Bing. Just as one must go back to Gowers to be enlightened in the broad field of clinical neurology, so one must have recourse to Bing for the essentials in the localization of lesions. The terseness which characterized that first edition back in 1909 still remains in the fourteenth German edition and, we trust, in the present much amplified version in English.

Dr. Robert Wartenberg whacked and reshaped the text as chapter after chapter of the new manuscript reached his desk, and Dr. Wartenberg's associate, Dr. Francis Schiller, and Major Ludwig Kempe, M.C., of the Walter Reed Army Hospital, Washington, D. C., followed through in an effort to light upon any incongruities which might have remained. A tougher trio of able critics would be difficult to find. My expression of appreciation goes to them and to those who prepared the special chapters. I am equally grateful to Dr. Walther Riese, of Richmond, Virginia, for the weight he brought to bear on some of the more theoretical aspects of localization. Dr. Ludwig Guttmann, of Aylesbury, Bucks, England, and Dr. Paul I. Yakovlev, of Boston also offered criticism and supplementation. Thus the manuscript represents the combined thoughts of a band whose very lives move around the pivot of Neurology. I felt fortunate in having the editorial support of Helen Knight Steward, Jessie Clare Tomlinson, and Genevieve Overmyer of the Armed Forces Institute of Pathology.

For illustrations, I am particularly indebted to Dr. A. G. Bingle, of San Antonio, Lt. Col. George Hayes, M.C., of Walter Reed Army Hospital, Dr. Richard Lindenberg, of Baltimore, Dr. A. Ornsteen, of Philadelphia, Prof. Dr. W. Scholz, of Munich, and Prof. Dr. K. J. Zülch and Doz. Dr. R. Kautzky, of Cologne.

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# CHAPTER 1

## TRACTS, CELL GROUPS AND BLOOD SUPPLY OF THE SPINAL CORD

### I. INTRODUCTION

Two aspects of localization should be considered when one is confronted with clinical evidence of focal damage of the spinal cord. The *first* is the site of the lesion in the transverse plane. Here one has to determine whether the lesion is situated in the central or the peripheral part of the cord, whether it lies dorsally or ventrally, and whether it is on the right or on the left side—also which tracts are affected and to what extent the grey matter is damaged. The *second* is the site of the lesion in the longitudinal plane. The problem is to determine the exact segment or segments involved. In the text which follows, the principles of localization are considered from these two standpoints. The anatomy of the spinal cord is presented primarily from the clinical viewpoint, and is, therefore, simplified.

The spinal cord consists of both white and grey matter, the white composed of fiber tracts and the grey of nerve cells. The position and the course of the fiber tracts will be discussed first, then the distribution and grouping of the nerve cells in the grey matter (Chapter 1), then the functions of the tracts and the nerve cells (Chapter 2). Knowledge of the anatomy and functions of the cord will put us in a position to draw conclusions regarding the localization of lesions (Chapter 3).

### II. TRACTS OF THE SPINAL CORD

Long and short spinal tracts are usually distinguished. Since this distinction is of little clinical value, the terms 'exogenous tracts' and 'endogenous tracts,' indicating their origin, will be used.

Tracts with their cells originating outside the spinal cord are referred to as *exogenous tracts*. These tracts merely traverse the spinal cord. The afferent tracts have their origin in cells of the posterior root ganglia, while the efferent arise in the cerebrum or brain stem. They may be destroyed not only in primary disease of the spinal cord but also by lesions of posterior root ganglia or of certain structures of the cerebrum or brain stem. The destruction occurs in accordance with *Waller's law* (1850) that a nerve fiber can preserve its anatomical and functional integrity only if it is in continuity with its parent cell body.

Tracts arising from nerve cells within the spinal cord are called *endogenous tracts*. Degeneration of these tracts in their entirety can be due only to lesions of the spinal cord, more specifically the spinal grey matter from which their cells stem.