PAIN AND THE NEUROSURGEON

A Forty-Year Experience

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FOREWORD

WILDER PENFIELD, M.D., O.M., C.C., F.R.S.,
Honorary Consultant and former Director of the Montreal Neurological Institute

A PAIN, an ache, a discomfort—these are the common complaints of those who seek the doctor's help. Pain issues a warning with kindly intent. She calls to action and, pointing the way, brooks no delay. And thus the ancient cycle is served, from pain to cause, to treatment and cure—*pro re natum* and *secundum artem.*

So pain, in normal fashion, plays this ancient rôle and turns away, while we who are human go back to love and work, to wisdom and folly. But it is not always so. Pain may stay. Transformed into a torturer, it clings and claws to no good purpose.

Intractable pain and its cure is the subject of this monograph. Sir Geoffrey Jefferson expressed it ten years ago in his Foreword to the First Edition: "This book is concerned with pain," he wrote, "not as a warning signal but as an enemy that can be defeated."

When I was young, the art of defeating this enemy was young too. I used to say, "All pain can be relieved, if it is really required, by cutting the proper sensory nerves or nerve tract in the proper place at the proper time." But it is not always as simple as that may sound. I believed, and I still do, that it is wrong to allow a patient to suffer when relief is at hand.

But it is also wrong—indeed it is a major professional sin—to allow a patient to become a drug addict if there is any other solution. This is a dilemma that demands from the doctor knowledge, compassion, wisdom and rapid decision.

Drug addiction, once established, creates its own form of torture. The addict feels an anguish only relieved by each succeeding injection for lessening periods of time. Addiction puts an end to the hope of return to active normal life.

Each case must, of course, be studied on its own merits. A fatal prognosis presents the doctor with a special set of problems. The good physician must face them with compassion, honesty and quiet tact. The end will come at last for every man, and the doctor may know what his patient does not want to be told. Passage to the other world must often be eased. Sometimes the doctor should even hasten it mercifully, though mindful always of the Hippocratic Oath never to "administer a poison."

What should a physician do when he finds he cannot cure? There is no

standard answer. The problem is vastly complicated by the fact that the enemy presents himself with devilish guile behind so many masks: visceral pain, angina pectoris, neuralgias of many types, amputation pains and phantoms, arthritic pains, intolerable headaches and the torment of spreading cancer, to name but a few.

The nervous mechanism involved and the pattern of nerve paths are multiform. And thus the radical steps that will interrupt appropriate nerves and bring relief are also vastly complicated.

And there is always another problem to be solved—a psychological one. Is the patient receiving compensation in some form? Is he really being paid to complain? Does she use her symptoms to attract sympathy and admiration, or to escape the day's work that a wife and mother should give to the service of others?

Here the doctor must hurry across the quicksands of decision between the "functional" and the "organic." It is so easy to make an error here! The human brain has an amazing capacity to inhibit or even to block the incoming streams of sensation, particularly those of pain. There is also another cerebral mechanism that is capable of magnifying the stream and of focussing attention on selected portions of it. Christian Science makes skillful use of these basic principles of neurophysiology, and it is well for medical science to recognize and to make use of them.

Methods of treatment have multiplied during the past forty years. The problems of radical relief of intractable pain are not as simple as some of us thought in the outset. Indeed, to expect that the phantoms and the burning pains, produced by accidental nerve section, could be cured every time by cutting the fibres again calls to mind a nursery rhyme.

"There was a man from our town
And he was wondrous wise.
He jumped into a bramble bush
And scratched out both his eyes.
And when he saw his eyes were out,
With all his might and main
He jumped into another bush
And scratched them in again."

Here, then, is a field in which every clinician has need of the quick answers to be found in this book. It makes a detailed statement of what radical operations can do. Its pronouncements are based on practical experience.

In the nineteen thirties and forties, Otfried Foerster, the great German neurosurgeon, presented his research on the pathways of pain and surgical treatment, and the distinguished French clinician, René Leriche, explored sympathetic neurectomy as a method in the surgery of pain.

But nothing has ever been written that approaches in completeness and critical, practical honesty this book by James White and William Sweet. It answers many, not all, of the needs of today. It is a follow-up study of forty years of treatment for such patients. With this, the authors present their own collateral research and the experience of others in 900 pages of text and 60 pages of bibliography.

I have been the admiring friend of these two neurosurgeons over the years when at work and play, at home and abroad, on ski slopes, in conferences and during a term as visiting professor in the Massachusetts General Hospital. It is altogether fitting that this authoritative monograph should be issued from that venerable Boston hospital. It was there too that general anaesthesia was born and ether was first used to still the pain of operation, where Jason Mixter, the revered neurosurgeon and teacher of White and Sweet, discovered that vertebral disc-protrusion was the cause of chronic sciatica and other forms of intractable spinal pain.

PREFACE

THIS second monograph on neurosurgical methods of relieving pain has been written to record clinical experience over the forty-year period in which the senior author has been interested in this subject. Statistics are based primarily on patients seen from 1927 through 1961, in order to leave a reasonably long period for follow-up. Only a few later cases are included because of their special importance. In writing our former, more extensive volume published by Charles C Thomas, publisher, in 1955, fundamental as well as clinical aspects of pain perception and technical methods for its relief were included. Knowledge of the anatomical pathways and physiology of pain conduction has increased very little in the past decade. This is equally true of the psychological aspects of the subject and surgical techniques of such standard procedures as sympathectomy, sensory rhizotomy, and cordotomy. In order to reduce the length and cost of this book we have elected to omit much of this material, which can be obtained by reading Parts I and II of the original work. Significant subsequent studies on the course of the pain fibers in the mesencephalon and thalamus and newer surgical procedures such as subarachnoid block with phenol, compression rather than division of the trigeminal rootlets, conservative frontal leucotomy in stages by coagulation with radiofrequency current, and thalamotomy are described in detail. In discussing the long-established operations for relief of pain we have tried only to emphasize the points that we have found valuable in making them safer and more efficient.

In this new volume we intend to concentrate on the clinical results of surgery by interruption of nerve conduction with emphasis on the lasting value of these procedures. Our expanding experience with 1287 patients treated since the clinical material for the previous book was tabulated has been added to the 420 patients described therein and every effort made to obtain reliable information concerning the late results. This continued investigation has taught us a great deal about the ultimate value of the standard neurosurgical procedures in those who survive over long periods, as well as about the recently developed methods of chemical blocking in the subarachnoid space and surgical intervention at the level of the thalamus or frontal lobes.

We have tried not only to follow patients with inoperable malignant lesions to their death, but also those with pain of nonmalignant disease over a period of many years. The latter constitute a much greater problem, because with the passage of time, nature has a way of finding accessory pathways of pain or of frustrating the surgeon's efforts by regeneration. Furthermore, un-

pleasant paresthesias or dysesthesia may appear and result in intensely disagreeable and often intractable complaints. The possibility of recurrence of pain or unpleasant late complications requires careful evaluation before the conscientious neurosurgeon can competently advise the patient suffering from long-persistent incapacitating neuralgia and threatened habituation to drugs on the best course to follow.

In order to carry out the plan described above the book is divided into two parts. The first contains clinical descriptions of the otherwise intractable painful conditions that the neurological surgeon is asked to relieve. In this we record our own experience together with the most impressive results that have been reported by others. Part II contains an evaluation of present-day operations for interruption or mitigation of pain and suffering, together with comments on the most effective methods of carrying them out in order to ensure maximum relief and freedom from complications.

In preparing this second monograph we must acknowledge our indebtedness to a number of associates at the Massachusetts General Hospital who have contributed so much; first of all to our Anesthesia Service and its Chief, Dr. Henry K. Beecher. Testing pathways of pain conduction by diagnostic blocking of sensory nerves, paravertebral sympathetic, and splanchnic trunks, first carried out at our hospital by the senior author and more recently developed to a high degree of efficiency by Dr. Donald Todd and others on Dr. Beecher's service, has been of the greatest help. So has their skill in administering short-action general anesthetics and rapidly awakening the patient to permit stimulation or testing the extent of interruption of sensory fibers in the course of operation.

The collaboration of our Psychiatric Service has been another factor of major importance. Prior to 1955, when our first volume was published, Dr. Stanley Cobb and Dr. Frances Bonner examined most of our difficult cases. This work is currently being carried on by Dr. Frank Ervin and Dr. Thomas Hackett, who have been of invaluable assistance, particularly in the investigation of thalamotomy and a new technique of performing frontal leucotomy in conservative stages by means of inlying electrodes and radiofrequency coagulation.

Dr. Paul Yakovlev, Clinical Professor of Neuropathology, Emeritus, at Harvard Medical School, and Dr. Edward P. Richardson, Jr., Neuropathologist at the Massachusetts General Hospital, have examined the surgical lesions in cases that have eventually come to postmortem examination.

We also wish to acknowledge our indebtedness to our past and present neurosurgical colleagues—our former Chief, the late Dr. W. Jason Mixter, Drs. John Hodgson, Reginald Smithwick, Thomas Ballantine, Hannibal Hamlin, Jost Michelsen, Bertram Selverstone, Vernon Mark, Louis Bakay, Raymond Kjellberg and a number of residents who have generously given us free access to their case records. Our secretaries, Miss Lucy Allen, Mrs.

Deborah Norton and Mrs. Roberta Beer likewise deserve special mention for their devoted work in following this large number of patients, typing, correcting and indexing the text, and Miss Zelda Cushner in preparing the extensive bibliography.

Statistical data on which this book is based are derived from the case records of the Massachusetts General Hospital, the Queen Elizabeth Hospital in Birmingham, England, the New England Center Hospital and New England Deaconess Hospital in Boston, the U. S. Naval Hospitals in Chelsea, Massachusetts, and St. Albans, New York, and the Veterans Administration Hospitals around Boston.

Further acknowledgments are due to numerous medical journals and society transactions that have permitted us to utilize data which we had previously reported in their publications. In this repect we are especially indebted to the Macmillan Company, the Association for Research in Nervous and Mental Disease, and to medical journals mentioned in the text from which we have quoted extensively.

Last but far from least, we wish to express our gratitude to the trustees of a foundation for medical research that wishes to remain anonymous. Without their generous help over the past twenty years it would not have been possible to have collected this material.

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CONTENTS

LIST OF ILLUSTRATIONS