



# PAIN AND THE NEUROSURGEON

**A Forty-Year Experience**

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## FOREWORD

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**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 multifiform. 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

**T**HIS 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 respect 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.

*Massachusetts General Hospital*

JAMES C. WHITE  
WILLIAM H. SWEET

## CONTENTS

	<i>Page</i>
<i>Foreword</i> - WILDER PENFIELD .....	vii
<i>Preface</i> .....	xi
<i>List of Illustrations</i> .....	xxi
<i>List of Tables</i> .....	xxvii

### Chapter

I. INTRODUCTION .....	3
-----------------------	---

## PART ONE

### TREATMENT OF SPECIFIC PAINFUL CONDITIONS

II. PERIPHERAL NEURALGIAS: TREATMENT OF PAIN FOLLOWING INJURIES TO PERIPHERAL NERVES .....	11
I. Introduction .....	11
II. Pain Associated with Incomplete Regeneration after Nerve Suture .....	16
III. Pain after Laceration and Surgical Injuries of Nerves .....	17
IV. Pain after Fractures and Contusions .....	37
Conclusions .....	48
III. PAIN FOLLOWING AMPUTATION .....	50
I. Introduction .....	50
II. Treatment of Pain in Amputation Stumps .....	54
III. Treatment of Pain in Phantom Limbs .....	66
Conclusions .....	85
IV. OTHER VARIETIES OF PERIPHERAL NEURALGIA .....	87
I. Causalgia .....	87
II. Post-traumatic Arthritis or Sympathetic Dystrophy .....	98
III. Shoulder-Hand Syndrome .....	109
IV. Pain in Degenerative Arthritis of Hip .....	110
V. Pain in Ischemia and Threatened Digital Gangrene .....	113
VI. Peripheral Neuralgias of Uncertain Etiology .....	116
Conclusions .....	121
V. TRIGEMINAL NEURALGIA, TIC DOULOUREUX .....	123
I. Clinical Features .....	123

<i>Chapter</i>	<i>Page</i>
II. Etiology .....	129
III. Medical Treatment .....	169
VI. IDIOPATHIC TRIGEMINAL NEURALGIA—TREATMENT: INJECTION, OPERATION .....	179
I. Injection of or Operation on Peripheral Branches or Divisions .....	179
II. Injection of Gasserian Ganglion or Posterior Rootlets .....	184
III. Electrocoagulation of Gasserian Ganglion .....	193
IV. Intracranial "Decompression" or Compression of Trigeminal Pathways .....	197
V. Trigeminal Posterior Rhizotomy .....	207
VI. Bulbar Trigeminal Neuralgia .....	232
VII. Bilateral Trigeminal Neuralgia .....	251
VII. INTERMEDIUS, VAGOGLOSSOPHARYNGEAL AND UPPER CERVICAL NEURALGIAS .....	257
I. Intermedius (Geniculate) Neuralgia .....	257
II. Idiopathic Vagoglossopharyngeal Neuralgia .....	265
III. Upper Cervical Neuralgia .....	302
VIII. OTHER CEPHALIC NEURALGIAS .....	306
I. Pain Related to Neoplasms of Face, Head and Upper Neck .....	306
II. Trigeminal Neuritis .....	323
III. Post-traumatic Pain in the Face, Head and Neck .....	325
IV. Periodic Migrainous Neuralgia .....	345
V. Migraine .....	372
VI. Postherpetic Pain .....	380
VII. Central Pain .....	386
VIII. Painful Convulsive Tic .....	406
IX. Atypical Facial Neuralgia .....	408
IX. PAIN OF SPINAL ORIGIN .....	435
I. Introduction .....	435
II. Pain in Paraplegia .....	435
III. Pain following Avulsion of Brachial Plexus .....	447
IV. Arachnoiditis and Epidural Radicular Pain .....	448
V. Painful Arachnoiditis Following Spinal Anesthesia .....	458
VI. Limited Radicular Pain Following Fracture-Dislocation or Disc Surgery .....	459
VII. Coccygodynia .....	466
VIII. Tabetic Crises .....	467
IX. Postherpetic Neuralgia (Spinal Level) .....	472
X. Postcordotomy Dysesthesia .....	477
Conclusions .....	478

Chapter	Page
X. PAIN FROM MALIGNANT DISEASE IN THE NECK, TORSO AND EXTREMITIES	480
I. Introduction	480
II. Cervical Tumors	484
III. Tumors of the Breast	486
IV. Tumors of the Lung	493
V. Tumors of the Gastrointestinal Tract	498
VI. Tumors of the Urinary Tract	504
VII. Tumors of the Male Genital Tract	506
VIII. Tumors of the Female Genital Tract	509
IX. Tumors of Bone	514
X. Tumors of Skin, Fascia, Muscle, Nerve, Lymphatic and Myeloid Tissue	519
XI. Comment on Overall Results	523
XI. PAIN IN DISEASE OF THE THORACIC VISCERA	525
I. Introduction	525
II. Heart	528
III. Aortic Aneurysm	552
IV. Lung	558
XII. PAIN IN ABDOMINAL VISCERAL DISEASE	560
I. Gastrointestinal Tract	560
II. Liver and Biliary Tracts	566
III. Pancreas	570
IV. Kidney and Ureter	578
V. Bladder and Prostate	582
VI. Uterus	583
VII. Relief of Visceral Pain of Unknown Origin	586
VIII. Potential Dangers of Visceral Desensitization	588
Conclusions	589

## PART TWO

### OPERATIONS FOR RELIEF OF PAIN: TECHNIQUE, COMPLICATIONS AND EFFECTIVENESS OF VARIOUS PROCEDURES

INTRODUCTION	593
XIII. OPERATIONS ON THE CRANIAL NERVES	594
I. Interruption of the Trigeminal Complex	594
II. Operations on Other Sensory Cranial Nerves	622
III. Medullary Tractotomy of Descending Cephalic Pain Pathway	627

<i>Chapter</i>	<i>Page</i>
XIV. INTERRUPTION OF SPECIFIC PAIN PATHWAYS .....	633
I. Interruption of Posterior Spinal Roots .....	633
A. Posterior Rhizotomy .....	633
B. Subarachnoid Block with Phenol .....	660
II. Sympathectomy .....	667
XV. SPINOTHALAMIC TRACTOTOMY: COMPARISON OF RESULTS OF TRACTOTOMY AT DIFFERENT LEVELS OF SPINAL CORD AND BRAIN STEM ...	678
Introduction .....	678
I. Spinothalamic Tractotomy at the Spinal Level .....	680
A. Arrangement of Pain Fibers in Spinothalamic Tract .....	680
B. Effect of Anterolateral Cordotomy on other Sensory Modalities .....	686
C. Thoracic Cordotomy .....	692
D. Cervical Cordotomy .....	694
E. Differential Cordotomy with Sparing of Lumbosacral Fibers .....	701
F. Levels of Sensory Loss after Cordotomy .....	702
G. Duration of Analgesia .....	703
H. Results of Repeated Cordotomies .....	705
I. Upper Cervical Cordotomy with Added Section of Ipsilateral Posterior Roots .....	705
J. Reasons for Disappearance of Analgesia .....	705
K. Conditions in which Anterolateral Cordotomy Is Likely to Fail .....	709
L. Preoperative Tests to Evaluate Effectiveness of Cordotomy .....	711
II. Spinothalamic Tractotomy in the Brain Stem .....	712
A. At the Mesencephalic and Pontine Level .....	712
B. At the Medullary Level .....	716
Conclusions .....	726
XVI. SPINOTHALAMIC TRACTOTOMY: COMPLICATIONS, TECHNIQUE AND REVIEW OF NEW ALTERNATIVE PROCEDURES .....	727
I. Complications of Cordotomy .....	727
II. Comments Regarding Technique .....	750
III. Other Methods of Interrupting the Spinothalamic Tract .....	762
A. Percutaneous Cordotomy .....	762
B. Commissural Myelotomy .....	767
C. Section of Lissauer's Tract .....	770
D. Dorsal Cordotomy .....	772

<i>Chapter</i>	<i>Page</i>
XVII. CEREBRAL OPERATIONS FOR RELIEF OF PAIN .....	773
I. Leucotomy (Lobotomy) and Limited Lobectomy .....	773
A. Introduction .....	773
B. Clinical and Surgical Considerations .....	777
C. Psychological Considerations .....	818
II. Postcentral Gyrectomy .....	835
XVIII. STEREOTACTIC SURGERY FOR RELIEF OF PAIN .....	843
I. Introduction .....	843
II. Development of Thalamotomy at the Massachusetts General Hospital .....	844
III. Results of Thalamotomy .....	850
IV. Anatomicoclinical Syndromes Following Thalamotomy .....	856
V. Deaths and Complications .....	867
VI. Technique .....	870
Addendum .....	884
Conclusions .....	886
XIX. CONTROL OF PAIN BY ACTIVATION OF INHIBITORY MECHANISMS .....	888
I. Inhibition by Stimulation of Peripheral Nerves .....	889
II. Inhibition by Stimulation of the Spinal Cord .....	900
III. Inhibition by Stimulation of the Brain .....	901
IV. Summary .....	904
<i>Bibliography</i> .....	905
<i>Author Index</i> .....	967
<i>Subject Index</i> .....	983

## LIST OF ILLUSTRATIONS

<i>Figure</i>	<i>Page</i>
1. Dysesthesia following surgical trauma of superficial radial nerve . . . . .	18
2. Dysesthesia following laceration of neck and shoulder . . . . .	30
3. Painful "end-bulb" neuromata following midhumeral amputation . . . . .	51
4. Photomicrograph of painful and normal nerve trunks . . . . .	52
5. Photomicrograph of neuroma following injection of formalin . . . . .	58
6. Neurotomy in upper portion of sciatic nerve with proximal stump en- cased in tantalum foil . . . . .	61
7. Position and extent of cordotomies for phantom pain . . . . .	74
8. Postcentral gyrectomy for painful phantom after forearm amputation . . . . .	81
9. The secondary sensory area above Sylvian fissure, according to Penfield . . . . .	83
10. Causalgic syndrome: Typical lesion following partial injury of median nerve by rifle bullet . . . . .	88
11. Causalgia: Preoperative photograph . . . . .	97
12. Lesion causing causalgia: Operative exposure of lateral neuroma of median and extensive loss of ulnar nerve . . . . .	98
13. Post-traumatic dystrophy: Degree of calcification disclosed by x-ray of hand, upper arm and shoulder . . . . .	104-105
14. Post-traumatic dystrophy: Characteristic attitude of patient and trophic changes . . . . .	106
15. Surgical exposure of superficial and deep peroneal and tibial nerves 15 cm above ankle . . . . .	114
16. Area of sensory loss following crushing of superficial and deep branches of peroneal and tibial nerves . . . . .	115
17. Electron micrographs of Gasserian ganglion in trigeminal neuralgia . . . . .	150-151
18. Central afferent pathways of trigeminal rootlets . . . . .	166
19. Injection of Gasserian ganglion; incorrect placement of needle . . . . .	190
20. Injection of Gasserian ganglion and rootlets with phenol in glycerin followed by Pantopaque . . . . .	191
21. Sagittal section of brain stem through spinal trigeminal tract and nu- cleus: Myelin stain . . . . .	239
22. Main sensory nucleus and descending tract of trigeminal nerve: Dia- gram . . . . .	240
23. Sensory distribution of fibers passing via nervus intermedius through the geniculate ganglion: Diagram . . . . .	258
24. Chorda tympani and tympanic membrane . . . . .	262
25. Hypotension and bradycardia provoked by intense pain in throat: Charts . . . . .	298
26. Histologic section of medulla after bulbar tractotomy of descending cephalic (trigeminal) tract four months before death . . . . .	317

*Figure**Page*

27. Histologic section of medulla after bulbar tractotomy twenty days before death .....	319
28. Afferent and efferent fibers in the greater superficial petrosal nerve ..	361
29. Anatomic relationships of the three superficial petrosal nerves in the middle cranial fossa .....	364
30. Second sensory area of cortex and pain: Diagram .....	391
31. Connections between lower cranial and upper cervical nerves .....	419
32. Pain following injury and adhesions of cauda equina: Characteristic attitude of patient .....	437
33. Metastatic cancer of breast: Photomicrograph showing carcinoma cells invading trunk of brachial plexus .....	481
34. Unilateral frontal leucotomy in melanotic sarcoma of supraclavicular fossa .....	485
35. Advanced carcinoma of breast .....	492
36. Malignant tumor of right superior pulmonary sulcus .....	493
37. Results of combined contralateral high cervical cordotomy plus ipsilateral division of sensory spinal roots C3-5 .....	501
38. Diagram of sensory innervation of the viscera .....	526
39. Experimental cardiac pain in dogs: Kymographic tracings .....	529
40. The cardiosensory pathways .....	531
41. Extent of anesthesia after posterior rhizotomy T1-T4 .....	551
42. Aneurysm of ascending arch of aorta .....	553
43. X-ray of barium in esophagus outlining aneurysms of aorta .....	556
44. Area of cutaneous sensory loss following division of eight upper thoracic posterior roots .....	557
45. Sensory innervation of the tracheobronchial tree, pleura and diaphragm .....	558
46. Sensory innervation of gastrointestinal tract .....	561
47. Abdominal x-ray showing calculi in head of pancreas .....	575
48. Sensory innervation of kidney, ureters and male genital tract .....	579
49. Sensory innervation of female genital tract .....	583
50. Injection of supra- and infraorbital nerves .....	595
51. Injection of maxillary, mandibular and inferior alveolar nerves .....	596
52. Injection of maxillary nerve .....	597
53. Injection of mandibular nerve .....	598
54. Radiography of foramen rotundum .....	600
55. Radiographic localization of needle for maxillary block .....	601
56. Radiographic localization of needle for mandibular block .....	602
57. Course taken by phenol in Pantopaque injected at foramen ovale ...	604-605
58. Härtel's approach for injection of Gasserian ganglion .....	606
59. Injection of Gasserian ganglion and rootlets .....	607
60. Electrocoagulation of Gasserian ganglion and rootlets .....	608
61. Supraorbital, supratrochlear and lacrimal neurectomy .....	610
62. Infraorbital neurectomy .....	610
63. Technique of retrogasserian rhizotomy, subtemporal approach .....	612-613



Figure	Page
64. A. Magnifying glasses worn during neurosurgical operations. B. Delicate alligator forceps and scissors for rhizotomies .....	614
65. Trigeminal rootlets containing ganglion cells: Photomicrographs ....	616
66. Differential trigeminal rhizotomy: Technique of Dooley and Browder .....	617
67. Retrogasserian rhizotomy: Dandy's posterior approach .....	619
68. Retrogasserian rhizotomy: Dandy's posterior approach: Variations in petrosal vein .....	620
69. Rhizotomy of nervus intermedius .....	623
70. Rhizotomy of glossopharyngeus and/or vagus .....	625
71. Microdissections of cranial nerves VII, intermedius and VIII .....	626
72. Location of uncrossed descending and crossed ascending pain pathways in closed medulla .....	629
73. Incision for tractotomy of V, VII, IX, X .....	629
74. Arrangement of V <sub>1</sub> , V <sub>2</sub> , V <sub>3</sub> , nervus intermedius, IX and X axons in descending bulbar tract .....	630
75. Depth and dorsoventral extent of incision: Bulbar cephalic pain tractotomy .....	631
76. The spinal dermatomes according to Foerster .....	634
77. Sensory examination following posterior rhizotomy C2-T2 .....	636
78. Sensory examination following posterior rhizotomy C6-C7 .....	637
79. Sensory examination following posterior rhizotomy: total section C8 plus two lowest fascicles C7 and two upper fascicles T1 .....	638
80. Sensory examination following posterior rhizotomy C8-T2 .....	639
81. Sensory examination following posterior rhizotomy from lowest rootlet of C6 through T3 .....	640
82. Sensory examination following posterior rhizotomy L5 and S1 .....	641
83. Sensory examination following posterior rhizotomy L5 and S1 (Case 953) .....	642
84. Sensory examination following posterior rhizotomy L5 and S1 (Case 954) .....	643
85. Sensory examination following posterior rhizotomy L5 and S1 (Case 955) .....	643
86. Course of sacral and coccygeal nerves through dural <i>cul-de-sac</i> and sacral foramina .....	644
87. Anatomical relationship between the spinal nerves, the segmental levels in the cord, and the vertebrae .....	656
88. Anatomical relationships of fifth lumbar and first sacral nerves to lumbar vertebrae, intervertebral discs and spinal foramina of exit .....	657
89. X-ray of subarachnoid block of lower intercostal nerves with phenol in Pantopaque .....	666
90. Technique of paravertebral injection of thoracic sympathetic ganglia under radiographic control .....	671
91. Thoracic sympathectomy by the Adson technique .....	672
92. Upper thoracic sympathectomy via medial costotransversectomy through laminectomy type of midline exposure .....	672