CAMPBELL'S OPERATIVE ORTHOPAEDICS

SPEED — KNIGHT

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Campbell's Operative Orthopaedics

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PREFACE TO THIRD EDITION

It is only after thoroughly surveying the orthopaedic and related literature of the postwar years that one becomes truly aware of the innumerable changes that have taken place in our specialty in the past ten years. A great many of these changes have been outgrowths, either direct or indirect, of World War II itself. Some represent true advances in orthopaedic surgery, while others, although representing new or different ideas, may or may not survive. Time and use alone can make this decision.

In this revision, in addition to incorporating much of the new material and deleting many of the outmoded methods and ideas, we have placed greater emphasis upon the fundamentals, particularly in regard to indications and contraindications for operation, and in the choice of the proper operative procedures where more than one method is available. In many places, we have indicated our own preference. Although we have been able to eliminate many of the older operative technics, an even greater number of new ones has been added.

A work of this type cannot be prepared by one or two men alone. The editors have, of necessity, stood on the shoulders of others, including the listed contributors, those who have generously offered suggestions, those who have read sections of the book critically, and those who have generously permitted us to reproduce illustrative material.

A new chapter on surgical physiology, by Dr. James D. Hardy, has been added. The chapter on surgical approaches has been enlarged, considerable of the accompanying illustrative material having been furnished us by Drs. Abbott and associates, Banks and Laufman, and Anson and Maddock. The chapters on fractures, both new and old, have been extensively revised, incorporating advances in medullary fixation and prosthetic replacement arthroplasty. Prosthetic replacement arthroplasty has been considered in other appropriate chapters as well. The chapter on peripheral nerve surgery has been revised thoroughly, incorporating the experiences of the American and British Army Medical Corps; the sections on orthopaedic reconstruction have been largely rewritten. Amputation surgery has been presented with due consideration of civilian problems. The section on intervertebral discs has been revised to include modern diagnostic considerations and present-day operative technics. The chapter on the treatment of skeletal tuberculosis has been extensively rewritten, taking into consideration changing concepts brought about by the use of the antibacterial agents. Dr. Smith-Petersen's section on mold arthroplasty has been replaced by an entirely new section written by his long-time associate, Dr. Otto E. Aufranc. The discussion of skin plastic procedures has been omitted from the current edition, for a section sufficiently detailed to be of real value is beyond the scope of this work. The management of poliomyelitis, static disabilities of the feet, scoliosis, and congenital anomalies have likewise been brought up to date.

We have made little headway in including foreign orthopaedic literature in this edition. However, a perusal of recent works on orthopaedic operations from other countries reveals that they, too, are deficient in this respect. We shall continue our efforts to fairly represent the foreign orthopaedic literature, and hope that we can ultimately accomplish this.

Among those who have sent comments, made criticisms, and have offered corrections are Drs. W. P. Blount, E. D. McBride, J. E. Bateman, and Messrs. H. Osmond-Clarke, K. I. Nissen, and H. Jackson Burrows. To these men, and to the many others who have helped us, we extend our thanks. Again, we wish to thank Mr. C. F. Ingram, our medical artist; Mrs. Allene Jefferson, who has assisted in preparing the indexes; and Miss Emily McCurdy, librarian of the University of Tennessee College of Medicine.

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PREFACE TO FIRST EDITION

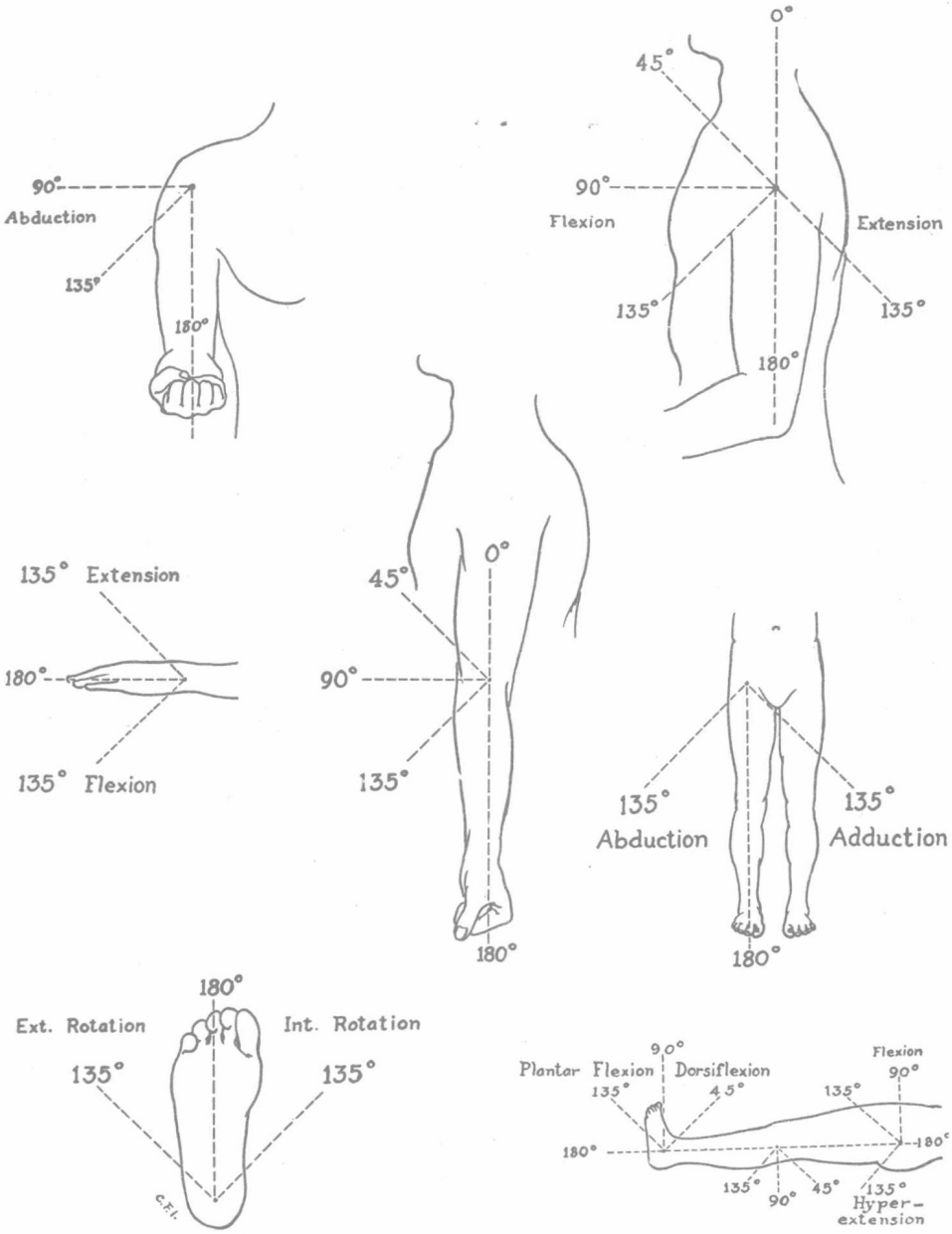
The title of this book, "Operative Orthopedics," is not intended to convey the impression that the chief or most important method of treatment of orthopedic affections is open surgery. Although many orthopedic affections are best treated by operative measures alone, the majority are successfully treated by more conservative means. Further, such measures are often essential adjuncts either before or after operation.

This volume has been written to meet the current need for a comprehensive work on operative orthopedics, not only for the specialist, but also for many industrial and general surgeons who are doing excellent work in some branches of orthopedic surgery, and are making valuable contributions to this field.

The evolution of orthopedic surgery has been exceedingly slow as compared to that of surgery in general. Not until aseptic technic had been materially refined was surgery of the bones and joints feasible. The statement is often made that the World War afforded the experience which made possible the rapid development of orthopedic surgery during the past two decades. The surgery of the war, however, was chiefly the surgery of sepsis; there was little of the refined asepsis which is required in reconstruction surgery. Undoubtedly, the demonstration during the war of the necessity and importance of this field led many able men to specialize in orthopedics, and to them considerable credit is due for its subsequent progress.

No classification of orthopedic affections is entirely satisfactory, consequently, any arrangement of operative procedures is subject to similar criticism. With the exception of the chapters on Arthroplasty and Arthrodesis, operations described in this text are grouped together according to their applicability to a given affection. This involves less repetition as to generalities of etiology, pathology and treatment than would be necessary in a classification according to anatomic location. Operative procedures appropriate to two or more affections are described in the discussion of the one wherein they are most commonly employed.

To overcome the too widespread conception of orthopedic surgery as a purely mechanical equation, an effort is made in the first chapter of this book to correlate the mechanical, surgical, and physiologic principles of orthopedic practice, and throughout the book to emphasize the practical application of these physiologic principles. A special chapter has been written on surgical technic, for the purpose of stressing certain details in preparation and after-treatment which vary to some extent from those described in works on general surgery. A thorough knowledge of these phases of treatment is a requisite to success. To avoid constant repetition, chapters have been included on apparatus and on surgical approaches; repeated reference is made to these chapters. The after-treatment is given in detail for practically all operative technics. This is a most essential, yet too often neglected, factor in the success of any surgical treatment.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90°
Plantar Flexion
Dorsiflexion
Flexion
90°
135°
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135°
180°
180°
135°
90°
45°
135°
Hyper-
extension

In giving the position or range of motion of a joint, only one system has been followed: With the exception of the ankle and wrist, the joint is in neutral position when parallel with the long axis of the body in the anteroposterior and lateral planes. As the joint proceeds from the neutral position in any direction, the number of degrees in which such movement is recorded decreases progressively from 180 to 170, 160, and so on, to the anatomic limit of motion in that particular direction. To illustrate, complete extension of the knee is 180 degrees; when the joint is flexed 30 degrees, the position is recorded as the angle formed between the component parts of the joint, i.e., the leg and thigh, or 150 degrees. Flexion to a right angle is 90 degrees, and full flexion 30 degrees. In the wrist, the joint is at 180 degrees, or in the neutral position, when midway between supination and pronation, and flexion and extension. In the ankle joint, motion is recorded as follows: the extreme of dorsiflexion, 75 degrees; right angle, 90 degrees; and the extreme of plantar flexion, 140 degrees.

In some instances, the exact end results have been given, to the best of our knowledge. So many factors are involved in any one condition, that a survey of end results can be of only questionable value unless the minute details of each case are considered. Following arthroplasty of the knee, for example, one must consider the etiology, pathology, position of the ankylosed joint, the structure of the bones comprising the joint, the distribution of the ankylosis, and the age of the patient, in estimating the end result in each case. Further, a true survey should include the results of *all* patients treated over a period of *many* years, and should be made by the surgeon himself, rather than by a group of assistants, or by correspondence.

In our private clinic and the hospitals with which we are associated, a sufficient amount of material on every phase of orthopedic surgery has been accumulated during the past twenty years or more to justify an evaluation of the various procedures. From this personal experience, we also feel that definite conclusions may be drawn in regard to the indications, contraindications, complications, and other considerations entering into orthopedic treatment. In all surgical cases, mature judgment is required for the selection of the most appropriate procedure. With this in mind, the technics which have proved most efficient in the author's experience have been given preference in the text. In addition, after a comprehensive search of the literature, operative measures have been selected which in the judgment of the author are most practicable.

Although no attempt has been made to produce an atlas of orthopedic surgery, an effort has been made to describe those procedures which conform to mechanical and physiologic principles and will meet all individual requirements. In any work of this nature, there are sins of omission; also, many surgeons in the same field may arrive independently at the same conclusions and devise identical procedures. We have endeavored, however, to give credit where credit was due. If there are errors, correction will gladly be made. In some of the chapters we have drawn heavily from authoritative articles on special subjects; the author gratefully acknowledges his indebtedness for this material. He also wishes to thank those authors who have so graciously granted permission for the reproduction of original drawings.

In conclusion, I cannot too deeply express my sincere appreciation and gratitude to my associate, Dr. Hugh Smith, who has untiringly and most efficiently devoted practically all of his time during the past two years to collaboration with me in the compilation and preparation of material, which alone has made this work possible. I also desire to express appreciation to Dr. J. S. Speed for his collaboration on the sections on Spastic Cerebral Paralysis and Peripheral Nerve Injuries; to Dr. Harold Boyd for anatomic dissections verifying all surgical approaches described, and for his assistance in preparing the chapter on this subject; to Dr. Don Slocum for his aid in the preparation of the chapter on Physiology and Pathology; to Mrs. Allene Jefferson for her efficient editorial services, and to Mr. Ivan Summers and Mr. Charles Ingram for their excellent illustrations.

WILLIS C. CAMPBELL

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