Book reviews

John Charnley: The Man and the Hip

William Waugh, 268 pages, Springer-Verlag Berlin, Heidelberg, New York, 1990. ISBN 3-540-19587-4

William Waugh is well known for his work on the gonarthrosis. After retiring from his chair in Nottingham in 1985, he has become a full-time author on a variety of subjects, including *The Whiskies of Scotland,* and the history of orthopedics in the Nottingham area. After having worked both personally and geographically close to John Charnley in Manchester, William Waugh was well qualified to write Charnley's biography.

The book describes the specific orthopedic subjects to which Charnley devoted his life—the triumphs as well as the defeats. Chronologic chapters on his private and professional life provide many examples of Charnley's sometimes bad temper, as well as of his stubbornness and unflinching energy, which were channeled not only into orthopedics, but also into downhill skiing and mountaineering.

Already in primary school Charnley gave expression of his scientific gifts, of which he also used to good advantage at medical school in Manchester and in the Royal Army Corps during World War II, where he obtained considerable experience treating major trauma. Early in his career, Charnley made many essential contributions to the treatment of fractures and to the understanding of the process of repair and healing of bone. In spite of the fact that Charnley, in a paper in 1949, had stressed that "you must face an orthopaedic problem and solve it by using your wits rather than by trying to seek the answer in the remembered pages of a book," not a small number of orthopedic surgeons have gleaned knowledge and practical instruction from his famous textbooks: *Closed Treatment of Common Fractures* (1950), *Compression Arthrodesis* (1953), *Acrylic Cement in Orthopaedic Surgery* (1970), and *Low Friction Arthroplasty of the Hip* (1979).

William Waugh's book is more than just a biography. It describes an important period in the evolution of modern orthopedics, and is also, in some parts, an instruction on how to transform biomechanical knowledge into clinical work. Inspiring and thrilling, indeed, is the story of John Charnley's initial thoughts about an artificial hip joint through the first arthroplasty with a Teflon socket in 1956, the earliest use of acrylic cement (published in *JBJS* in 1960), and the opening of "The Centre for Hip Surgery" in an abandoned sanatorium in Wrightington.

Charnley did not invent the artificial hip joint, but he performed the basic research resulting in "the low friction principle" (the metal-to-metal-bearing hip endoprostheses had already been in clinical use for many years) and the technique of prosthetic fixation with acrylic cement. Charnley did not realize that polytetrafluoroethylene used for the acetabular sockets was not an ideal material until he had performed several hundred arthroplasties. He had to pay for his oversight or stubbornness, however, for he himself revised most of these hips, which had failed because of rapid wear, foreign body reactions, and sterile fistulae. The development of his hip was a laborious undertaking in the workshop, as well as in the clinical environment. Despite continuous efforts to improve the prosthetic design and the manufacturing process (the sockets were made by his faithful protege in the workshop, Mr. Craven, at the rate of one socket every 45 minutes, later made with a homemade machine at the rate of one socket every 4 minutes), Charnley had the time to perform a considerable number of operations and to record many variables for each patient, which became the prerequisites for a later scientific analysis of his clinical results. He was also the first hip-replacement surgeon to discuss the importance of a clean environment in the operating theatre. He was able to prove that lamellar air flow and the use of space-suit gowns resulted in a tenfold reduction of postoperative infections.

During long periods, Charnley simply stayed home and worked quietly, which might explain why several orthopedic surgeons copying him have become equally famous. He was, however, the first person to present many ideas connected with hip surgery. Thus, he rejected the concept of surface replacement as early as 1961; and between 1963 and 1965, he operated on 300 hips using metal-backed press-fit cups, a method he subsequently rejected after comparison with results obtained with his original prosthesis. Much would have been won if later designers of artificial joints had adhered to Charnley's timely appeal: to permit marketing and use of a new prosthetic design only after 5 years of follow-up studies and only by those having received personal instructions for two and a half days! Many attempts have been made to improve the results of hip replacement using new prosthetic materials, new methods of prosthetic fixation, and new surgical

techniques. However, Charnley's long-term results remain the gold standard on which the new designs and techniques have to be tested.

Most orthopedic associations have elected John Charnley as an honorary member, and his medals, prizes, and honorary titles were to become innumerable. In 1977, he received Britain's highest public honor: Knight Bachelor of her Majesty the Queen Mother.

Charnley exposed himself to considerable stress in his search for the perfect hip prosthesis, and his family had to sacrifice a great deal during his long periods of total commitment to producing the ultimate artificial hip joint. In the winter of 1981/82, John Charnley suffered from increasing fatigue and had to reduce his activities—both surgery and experimental work. After several episodes of atrial fibrillation, he died of a myocardial infarction on August 5, 1982.

"Perhaps only once in a lifetime does one come across a man prepared to devote so much time in one direction": stated at John Charnley's funeral by W. P. Thackray (chairman of the board of the company that for many years manufactured the Charnley hip prosthesis). Accordingly, hundreds of thousands of patients have every reason to be satisfied that there own lifetime coincided or followed that of Sir John's.

John Waugh's biography is well written and illustrated and should be obligatory reading for all orthopedic surgeons, giving them a chance to be impressed, as well as inspired, by the indefatigable energy and commitment to the task that were Sir John's marks of nobility.

Urban Rydholm
Department of Orthopedics, Lund University Hospital, S-221 85 Lund, Sweden

Complications in Spinal Surgery

R. A. Balderston and H. S. An. 186 pages. W. B. Saunders Company, Philadelphia 1991. ISBN 0-7216-3522-9

During an epoch of rapid expansion in spinal surgery, the current book seems to be a logical complement to Epp's *Complications in Orthopedic Surgery*. The authors, orthopedic surgeons in Philadelphia and Milwaukee, respectively, have devoted the first chapter to patient expectations, including the natural history of spinal disorders and psychological and social considerations, laying a firm foundation for the technical considerations in the following eight chapters. These eight chapters are systematically divided into three parts: evaluation and preoperative planning, operative technique, and complications. Thus, among the subjects treated are scoliosis, kyphosis and spondylolisthesis, disc disease and degenerative stenosis, tumors, and fractures and dislocations; further, there is a chapter on the surgery of the spine in rheumatoid arthritis and ankylosing spondylitis.

The ambition of the authors to also cover preoperative planning and operative technique means that only one third of the 186 pages are actually devoted to the problem of complications, but this structure makes the book logical and easier to read. However, it also means that the authors have expressed personal preferences as regards some of the topics, e.g., cervical spine injury and lumbar disc disease. A strong point is made against microsurgery and percutaneous operations on lumbar discs; but this may well prove incorrect during the next few years.

The book is composed in a very logical manner, is easy to read, and it has an impressive number of high-quality illustrations—figures, as well as radiographs. The problem of locating the right level and side in disc operations is well, if not purposely, illustrated by the fact that one figure with a lumbar myelogram has been reversed, and in another figure legend, the right-sided changes described are really left-sided.

The results after spinal surgery are not as predictable as they are after treating arthrosis with joint replacement or peripheral nerve entrapments with decompression. Accordingly, in discussing with the patient the prognosis of a spinal operation, the possible adverse effects must also be taken into account. With the rapid development today of spinal surgery techniques, I am convinced that the book will have to be revised in the not to distant future and that even the number of pages dedicated to complications will have to be increased considerably.

In sum, this book fills an important niche among monographs on the spine, and it is recommended that it be read by all those who are concerned with spinal problems: orthopedists and neurosurgeons, as well as others working in related fields.

Björn Strömqvist
Department of Orthopedics, Lund University Hospital, S-221 85 Lund, Sweden