A HISTORY OF NEUROSURGERY.
Edited by Samuel H. Greenblatt, T. Forcht Dagi and Mel H. Epstein.
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This excellent book typifies the very high standards set, and met, by the now quite extensive library published by the American Association of Neurological Surgeons. Although some repetition is inevitable in a large volume of this nature, with 36 contributors, skilful editing has produced not only a comprehensive reference book but also an entertaining read.

As the senior editor points out in the introductory chapter, the purposes of the book include ‘...entertainment (fun, in plain language), acquisition of apparently useful knowledge, and improved insight into how we got to be what we are, individually and collectively’. There is a strong sense of continuity in neurosurgery, and this is expressed elegantly and poignantly at the very beginning of the book in that the preface was written by Dr A. Earl Walker, one of the ‘greats’ of modern neurosurgery, very shortly before his death. Dr Walker published a history of neurological surgery himself nearly half a century ago, in 1951, since when the speciality has, as he put it, ‘undergone a metamorphosis and entered new dimensions’. One of the editors of the present volume, Mel Epstein, was Earl Walker’s last resident.
The success or failure of an enterprise as large and complex as this book depends fundamentally upon its structure or framework. Dr Greenblatt proposes two basic premises which lead to the subdivision of the history of neurosurgery into three epochs. The first premise is that the development of neurosurgery depended upon three technological advances: cerebral localization theory, antisepsic/aseptic techniques, and anaesthesia, both general and local. The second premise is that neurosurgery fulfills the definition of a distinct profession. The three epochs are: Premodern, Gestational and Modern. Premodern is before Macewen, 1879, i.e. before the tenets of the first premise were combined into practice. Gestational refers to the period of transition into a distinct profession (1879–1919). Modern is after Cushing, 1919, with the realization of the second premise. It might be argued that there is a fourth epoch: Contemporary Neurosurgery. The three technological advances cited have continued to evolve, but neurosurgical practice has also changed enormously and more rapidly in relatively recent times as a result of the operating microscope and the phenomenal advances that have occurred in imaging.

It is worth noting at this point that although A History of Neurosurgery is an American book, published by the society which Harvey Cushing founded in 1931, the editors have laudably avoided an American bias in general, and particularly towards this great man, who is generally considered the father of modern neurosurgery. His pivotal role is set appropriately in perspective. Thus the early contributions and significance of many others, particularly William Macewen (1848–1924) of Glasgow and Victor Horsley (1857–1916), are also extensively considered. Macewen was the first practitioner of ‘modern’ neurosurgery, exemplified by his removing a left frontal meningioma from a teenager, who was subsequently able to work, in 1879 when Cushing was 10. Victor Horsley was the holder of the first specifically neurosurgical appointment—at the National Hospital, Queen Square, London. A two-volume textbook by Antoine Chipault (the first French neurosurgeon) included sections on skull base surgery, epilepsy surgery, synthetic cranioplasty, surgery for hydrocephalus, spina bifida, spinal fractures and tumours, torticollis, trigeminal neuralgia and intractable pain. It was published in 1894 and 1895 when Cushing was in his mid-twenties. Cushing was certainly not the first modern neurosurgeon, but his unique contribution was not based on primacy.

After the introductory chapters, the book is divided into five further sections. Sections II and III deal with the first two of Greenblatt’s three epochs, spread over nine chapters and culminating in a careful and detailed analysis of Harvey Cushing: his professional development, his personality and style, and how he emerged as a leader. He may have been the twelfth surgeon (not the first; that was Horsley) to operate on the pituitary gland, the sixth transnasally, but that is irrelevant; it was his appreciation of the importance of establishing a scientific base and a professional identity, as well as a meticulous approach overall and a profound technical understanding, which generated his pre-eminent position in ‘modern’ neurosurgery. He met Horsley in London and was unimpressed, finding him living in ‘seemingly great confusion’ and ‘operating like a wild man’. Cushing also took a pioneering interest in X-rays, hand-cranking the machine which he had paid for himself and developing his own films. With a wonderful prescience of a theme which would recur decades later with CT and MRI, he had reservations about ventriculography because he feared that such imaging would encourage the junior staff to ‘gloss over’ the neurological examination in reaching a diagnosis.

Section IV encompasses the development of modern neurosurgical techniques and technology. The 14 chapters cover all the major topics within neurosurgery, both cranial and spinal, and include welcome chapters on neuroanaesthesia, pain management and psychosurgery as well as the more mainstream neurosurgical topics. This section is inevitably the most factual, business-like and least interpretative, and although it includes excellent and thoughtful analyses, there are areas in which the ‘colour’ and ‘feel’ of some events, developments and personalities are imparted with less depth than in other sections. For example, in the very long chapter on the history of stereotactic surgery, the extraordinary manner in which Irving Cooper overturned the perceived wisdom of the time (that tremor could not be relieved without producing at least some pyramidal weakness) is rather brushed over, and the powerfully negative reaction of the establishment to his work and to him is not mentioned. The way in which Cooper followed his significant serendipitous discovery (a ventral thalamic/pallidal infarct could specifically abolish tremor without any clinically apparent deficit) with scientific investigation and prolific clinical application, and his development of the cryoprobe (which is mentioned) deserve greater emphasis. None of the drama of these developments and of the professional atmosphere at that time comes across in an otherwise very competent chapter. This contrasts with the earlier sections of the book which do impart a vivid impression of pioneering work, bravado and dramatic developments. The chapter on localization techniques and neuroimaging does not mention the recent development of image fusion and frameless stereotaxy but this technology is mentioned, albeit briefly, in the chapter on stereotactic surgery. A quirk of this otherwise comprehensive book is that something which has had a revolutionary impact upon the speciality, namely the operating microscope, receives barely a mention. The addition to Section IV of a chapter on the impact of technological developments might have addressed this, and would have provided a useful cross-referencing with other chapters. It would have provided an opportunity to give appropriate emphasis to the considerable recent changes in practice resulting from modern imaging. These are described in various parts of the book, but their impact is somehow dissipated.

Section V is entitled ‘Organizational and Philosophical Issues’. This fascinating and readable section comprises four chapters: ‘Schools’ of neurosurgery—their development and
evolution; The evolution of organized neurological surgery in the United States; Development of neurosurgery beyond the North Atlantic countries—Africa, Asia, Australia and New Zealand, Central and South America, and Eastern Europe; and Philosophical currents in the history of neurosurgery. This section not only satisfies parochial interests but also allows a more extensive discussion of certain individuals and places. Many readers will have their own heroes and, apart from a few undisputed leaders, may feel that certain neurosurgeons past and present deserve a greater (or smaller) mention. To some extent this section accommodates this, by increasing the magnification on the metaphorical microscope through which the history of neurosurgery is being examined. As with a real microscope, some depth of focus is then lost but fascinating details are revealed.

The chapters are generally extensively referenced and the final section includes a cumulative index of references cited and a standard bibliography and biography. There is a list of illustrations (the book is superbly illustrated throughout, with nearly 600 illustrations; much more than just the expected numerous portraits) and a standard index. The latter could be improved. A useful list of birth and death dates of historical individuals is included. A helpful and interesting addition to this section might have been provided by a chronological list of key events, e.g. the introduction of cerebral angiography, the operating microscope, lumbar puncture, clinical stereotaxy, CSF shunts, penicillin etc.

In reading this book one is struck by the inventiveness and the breadth of the contribution of many of the pioneers. Macewen, for example, also pioneered endotracheal anaesthesia in 1878. Horsley’s research included frequently anaesthetizing himself. Halsted’s experimental self-administration of cocaine led to an addiction which forced him to move from New York to the John Hopkins Hospital, Baltimore, where he had a significant influence on Cushing. Cushing also experimented with cocaine nerve blocks and probably coined the term ‘regional anaesthesia’. Not only did neurosurgeons contribute greatly to the development of anaesthesia, they also played a major part in the evolution of imaging techniques. Cushing’s precocious use of X-rays has been mentioned above. Dandy experimented with contrast media and, in 1918, introduced ventriculography. The following year he introduced pneumoencephalography, recognizing not only its enormous value but also its lethal potential. Cerebral angiography was introduced soon after (1926) by the Portuguese neurologist Egas Moniz and his neurosurgical colleague, Almeida Lima, 10 years before the former’s better-known introduction of prefrontal leucotomy.

In those days, before galloping litigation and well before clinical governance, it was easier to exhibit the bravado (and arrogance) that facilitates great innovations. Moniz, for example, was happy to inject strontium bromide intravenously into humans to assess its toxicity, and his first cerebral angiogram proved fatal. In 1876, Macewen had wanted to operate on a child with a cerebral abscess. He was prevented from doing so and the child died. An autopsy confirmed his diagnosis of both the nature and the site of the lesion. Macewen was only 28 at the time; there are striking parallels with the young Irving Cooper, nearly 80 years later. In 1952 Cooper deliberately (and successfully) occluded the anterior choroidal artery to treat tremor, against the better judgement of his superiors, when he was 29. It is difficult to see how our present social and professional climate could be inducive to such bold advances. In Babylon, in 2000 BC, the Code of Hammurabi warned: ‘...if a physician treats a patient with a metal knife for a severe wound and has caused the man to die—his hands shall be cut off’. The intensity of the reaction may have softened over four millennia, but what goes around comes around...

There is a modern tendency, facilitated and fuelled by the media, to allow hype and the inappropriate raising of expectations to accompany the re-introduction of old procedures and other ‘advances’. Furthermore, successful neurosurgery is not necessarily dependent upon high technology such as sophisticated imaging; Macewen, for example, published in 1893 his series of successful operations on 21 out of 22 brain abscesses and five out of five extradural abscesses—without any imaging. A major function of works such as A History of Neurosurgery is to militate against such distortions and to correct and enhance our perspective. All those who have contributed to this superb and important book have lived up to this responsibility and should be proud of their achievement.

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