The Journal of Bone and Joint Surgery

EDITORIALS AND ANNOTATIONS

THE DEBT OF ORTHOPAEDIC SURGERY TO JOSEPH LISTER

John Hunter was born in 1728, Joseph Lister one hundred years later in 1827, and whereas the principles of modern surgery rest on the researches of John Hunter throughout the eighteenth century, the technique of modern surgery certainly depends upon the studies of Joseph Lister throughout the nineteenth century.

John Hunter had no microscope, no knowledge of cellular structure, no concept of bacterial micro-organisms and no aid from anaesthesia; but from his learning of bone growth, the healing of fractures and development of deformity he became a pioneer of orthopaedic surgery. His private practice was prodigious and in the words of Robert Owen he was “the founder of philosophic surgery.” Yet it was largely non-operative orthopaedics, and his final lecture in the courses of instruction given from his home in Leicester Square began: “This last part of surgery, namely operations, is a reflection on the healing art. It is a tacit acknowledgment of the insufficiency of surgery. It is like an armed savage who attempts to get that by force which a civilised man would get by stratagem. No surgeon should approach the victim of his operation without a sacred dread and reluctance.”

Joseph Lister had a microscope—his father had been elected Fellow of the Royal Society in acknowledgment of his development of microscopy and the achromatic lens. Thus Lister knew of cellular structure and studied inflammatory reaction in the web of the frog’s foot. He had the aid of anaesthesia recently developed by Thomas Green Morton in Boston and James Young Simpson in Edinburgh. By a remarkable coincidence of birth within the same five years, Louis Pasteur taught him of bacterial infection, publishing on June 29, 1863, his “*Récherches sur la putréfaction*.” At the same time Semmelweis in Vienna was teaching ward cleanliness in the control of puerperal fever.

It seemed that Joseph Lister had all that John Hunter had not got. Yet when Joseph Lister was a medical student at University College Hospital in London, then associate of James Syme in Edinburgh, whose daughter he married, and even after that as Regius Professor of Surgery in Glasgow, it was still true that surgeons approached their victims with “sacred

dread and reluctance.” Unknowingly they still wiped dirty hands on dirty tail coats. The hospitals were charnel houses; they were mortuaries before the patients died; the patients died not just of gangrene but of *hospital* gangrene.

Charles Bell of Edinburgh, remembered better for his first description of facial palsy, wrote: “ Let him bear in mind that this is a hospital disease and that without the circle of the infected walls men are safe; let him therefore hurry them out of this house of death; let him lay them in a schoolroom, a church, on a dunghill or in a stable; let him carry them anywhere but to their graves.”

On August 12, 1865, Lister treated the compound tibial fracture of an eleven-year-old boy with creosote, German creosote, the carbolic acid that was used nearby in Carlisle to purify the drains. And the wound healed.

One success followed another: a crushed leg with wound two inches across healed dry and by scab; a severely crushed forearm and arm with fractured bones sticking through the skin but with healing of wounds and union of fractures; amputations without secondary haemorrhage and certainly not death from pyaemia; his first private patient with a compound dislocation of the ankle whose recovery was complete. His wards in the Glasgow Royal Infirmary became happy places, smelling sweet and clean, with patients going home fit and well, surrounded as they still were by the dunghills and charnel houses of other wards.

The battle began. Joseph Lister made the greatest of all his contributions not just when his scientific mind and the surgical application of it recognised the antiseptic principle in wound treatment, but when he devoted his life to the preaching of the principle despite every opposition. This he did. He did it first in Glasgow as Regius Professor of Surgery; then in his first publications to the *Lancet* in March 1867 which we are honouring today one hundred years later; then on return to the Edinburgh Royal Infirmary two years later again as Regius Professor; on his triumphant return to London in 1877 as Professor of Clinical Surgery to King's College and Surgeon to King's College Hospital; and finally from his home in Park Crescent near Portland Place where his statue now stands, face inclined and kind eyes looking straight through the window where these words are being written, with the simplest of all inscriptions “ Lister, Surgery, Science.”

Lister is not to be remembered for creosote, or for a carbolic steam kettle. He himself quite quickly withdrew from these early adventures in the technique of antiseptic surgery. In addressing an international congress in Berlin in 1890 he said: “ As regards the spray I feel ashamed that I should ever have recommended it for the purpose of destroying the microbes of the air.” Reminding himself that the cause of septic troubles was for long looked on as connected with the admission of air to the wounds he at once recalled John Hunter's observation that it could not be the gases in the air which cause harm: “ for in the cases of emphysema and pneumothorax due to fracture of a rib and puncture of the lung, the tissues and the cavity became distended with air; but neither sepsis nor suppuration supervened.”

Joseph Lister's contribution was a principle: “ Destroy the bacteria before they enter and establish themselves in the tissues.” One hundred years later we must relearn Joseph Lister's teaching. We have strayed so far that the danger of hospital gangrene is with us once more. Repeatedly we are told now in 1967, not in 1867, that the ideal time to operate upon a fractured limb is within the first few hours of admission to hospital lest the wound suffers from “ hospital infection.” We have been lulled into false security by the advance of antibiotics, and encouraged in the lazy and careless entry of bacteria into the wound because we think that we can destroy them thereafter.

Go back to Lister: have less trust in antibiotics: do not breed new bacteria to defeat us once again: let no bacteria “ enter and establish themselves in the tissues.” Antisepsis for every instrument; non-touch for every technique; asepsis for every surgical principle. Let us all be Listers.

Reginald WATSON-JONES.