

Re-engineering Colles: Form, function and fragility fractures

T. C. Lee

Department of Anatomy,
Royal College of Surgeons
in Ireland

Correspondence to: T. C. Lee
Department of Anatomy,
Royal College of Surgeons in Ireland,
St Stephen's Green, Dublin 2,
Ireland
Email: tclee@rcsi.ie

Of the twenty nine anatomy professors in the Royal College of Surgeons in Ireland, *primus inter pares* is Abraham Colles. In his 1811 book *A Treatise on Surgical Anatomy* he revolutionised the subject by teaching it topographically, seeking “to describe the relative position of the parts and to point out the subservience of anatomical knowledge to surgical practice”. Today we have extended this to ‘clinical practice’ and, in the Anatomy Room, students are guided through each region by clinically trained staff, from surface anatomy via three-dimensional dissection to radiological images. This is augmented by online histology and radiology courses and DVDs in which dissection footage, edited by a content analysis engine, is used to preview and review practical classes. In the same book, Colles also wrote that ‘the fixed and immutable laws of mathematics are little applicable to the science of medicine’. Computer-aided learning argues against this. So does research which links fatigue microdamage to bone remodelling and the development of algorithms to predict, and thus prevent, osteoporotic fractures. Mechanical principles are being used to develop scaffolds for tissue engineering and to optimise the mechanical environment of seeded mesenchymal stem cells. While Colles’ teaching approach holds true, in biomechanics, tissue engineering and computing, mathematical laws are now being successfully applied to medical science

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INTRODUCTION

There have been 29 anatomy professors in the Royal College of Surgeons in Ireland (RCSI) since 1785 (Figure 1). The title has changed from ‘Professor of Anatomy and Physiology’ and ‘Professor of Descriptive Anatomy’ to ‘Professor of Anatomy’, in use since 1889.¹ Few would argue that *primus inter pares* is the sixth Professor, Abraham Colles, best remembered for describing a fracture of the distal radius in the *Edinburgh Medical and Surgical Journal* in 1814 (Figure 2).²

Colles was the first graduate of the College to hold the Chair but he was unimpressed by the way he had been taught anatomy in the RCSI. He bemoaned the system by system approach taken by his teachers. It was, he wrote, like attempting to “explain the mechanism of a watch, by taking it to pieces, and giving a separate description of every particular wheel and spring without afterwards attempting to show by what contrivance the one moves the other”.³ So when he was appointed Professor, Colles

Professors Of Anatomy & Physiology	Professors Of Anatomy	Professors Of Descriptive Anatomy
1785 - 1794 JOHN HALAHAN	1889 - 1899 FREDERICK ALCOCK NIXON	1837 - 1853 JOHN HART
1789 - 1799 WILLIAM HARTIGAN	1889 - 1891 FRANCIS THOMAS HEUSTON	1837 - 1847 WILLIAM HARGRAVE
1799 - 1804 JOHN HALAHAN	1909 - 1913 AUCKLAND CAMPBELL GEDDES	1847 - 1851 JOHN McDONNELL
1794 - 1798 WILLIAM LAWLESS	1913 - 1947 EVELYN JOHN EVATT	1851 - 1861 JOHN HATCH POWER
1798 - 1819 RICHARD DEASE	1947 - 1959 ARNOLD KIRKPATRICK HENRY	1853 - 1882 PHILIP BEVAN
1804 - 1827 ABRAHAM COLLES	1959 - 1969 GILBERT MARSHALL IRVINE	1861 - 1876 JOHN MORGAN
1819 - 1826 CHARLES HAWKES TODD	1969 - 1988 BRENDAN PATRICK ROONEY	1876 - 1889 WILLIAM THORNLEY STOKER
1826 - 1827 SAMUEL WILMOT	1988 - 2001 WILLIAM STANLEY MONKHOUSE	1882 - 1883 DANIEL JOHN CUNNINGHAM
1827 - 1837 ROBERT HARRISON	2002 - THOMAS CLIVE LEE	1883 - 1909 ALEXANDER FRASER
1827 - 1867 ARTHUR JACOB		
1867 - 1889 EDWARD DILLON MALPOTHER		

Figure 1: Anatomy professors in the Royal College of Surgeons in Ireland since 1785.

revolutionised the subject by teaching it topographically, region by region, seeking “to describe the relative position of the parts and to point out the subservience of anatomical knowledge to surgical practice”.³ If this is amended to read ‘clinical practice’ then we have a mission statement for the 21st century. Knowledge of where things are is fundamental to clinical examination, diagnostic pathology and imaging and radiological and surgical interventions.

ANATOMY ROOM TEACHING

Colles’ topographical approach has been continued by his successors. *The Dublin Dissector* was written by Robert Harrison (1827), *Manual of Practical Anatomy* by Daniel Cunningham (1889), *Extensile Exposure* by Arnold K Henry (1945) and most recently *Clinical Anatomy*, by Stanley Monkhouse (2001). Nowadays, we describe topographical anatomy and discuss its clinical applications in a lecture and the students then go to the Anatomy Room where, in small groups, they are guided through the region by clinically trained staff, from surface anatomy via three-dimensional dissection to radiological images. By the end of the morning, they have a good understanding of the region and this is enhanced by guided reading and stimulated by the prospect of a ‘Card Signing’ every fortnight. There is no longer a card, and nothing is signed, but in a structured tutorial students are asked to identify features and discuss their clinical relevance.

This emphasis on clinical anatomy is achieved by the use of relevant cases and, most importantly, by the experience of the teachers involved, who have up to 40 years of clinical practice to draw upon (Figure 3). *Primus inter pares* in this group is Harold Browne who has taught anatomy here with wit, enthusiasm and wisdom for 52 years, through the terms of office of 26 Presidents of the College and five Professors of Anatomy. Around him has developed a group of remarkable Surgeon Prosectors who have influenced generations of students and academic staff. They are the secret of our success and have, in a recent student survey, earned satisfaction levels of 93%.⁴



Figure 2: Abraham Colles (1773-1843), sixth Professor of Anatomy and Physiology, 1804-27.



Figure 3: Anatomy teachers in RCSI, 2004. Front row (L-R): Dr R Ali, Mr JS Hanson, Prof EJ Guiney, Mr HJ Browne, Prof MJ Ryan, Mr BE Lane, Dr S Mohsin. Back row (L-R): Ms MA McGarvey, Mr D Kelly, Dr S Kandiah, Prof TC Lee, Dr TB Farrell, Mr K Sayed, Dr FJ O'Brien.

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