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**Sir John Struthers MD FRCS Edin LLD Glasg:  
Anatomist, zoologist and pioneer in medical education**

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Sir John Struthers (1823 - 1899), a past president of the Royal College of Surgeons of Edinburgh and Regius Professor of Anatomy at the University of Aberdeen, was an accomplished scientist and medical educator. Much of his career was spent in shaping the medical curriculum of the nineteenth century. He was a strong proponent of a sound basic science education as preparation for a career in medicine, but was also central in developing more formal clinical teaching for medical students. His interest in comparative anatomy and evolution has provided a rich legacy of human and zoological specimens that remain of value in everyday teaching. Much of his work on educational theory and the place of basic sciences in the medical curriculum remains relevant to this day, and is of particular interest given the ongoing debate regarding the place of the basic medical sciences in the undergraduate medical curriculum.

## **INTRODUCTION**

Sir John Struthers, Regius Professor of Anatomy at the University of Aberdeen (1863-1889), and past president of the Royal College of Surgeons of Edinburgh (1895-1897), was an eminent scientist and pioneer in the field of medical education (Figure 1). Born in Dunfermline in 1823, he followed his older brother to Edinburgh to study medicine, graduating MD from the University of Edinburgh in 1845.<sup>1</sup> He gained the FRCS Edin diploma the same year. Following his distinguished undergraduate career, he became a lecturer in the private anatomical schools of Edinburgh and in 1847 was licensed to teach anatomy by the Royal College of Surgeons of Edinburgh.<sup>2</sup> By 1849, Struthers and the other extramural anatomists of Edinburgh had combined to form a new School of Anatomy at Surgeons' Hall. Struthers also worked as a surgeon at the Edinburgh Royal Infirmary.<sup>3</sup> In 1863 he was the first appointee to the Regius Chair of Anatomy in Aberdeen.<sup>4</sup> With this appointment, Struthers gave up medical practice. He was scornful of his colleagues who attempted to juggle a career in anatomy and surgery, believing that "the

lectureship or professorship of anatomy should be worth giving up surgery or medicine for".<sup>5</sup>

On coming to Aberdeen, John Struthers brought a large collection of anatomical specimens which had been bequeathed to him by his retired teaching partner, Dr Peter Handyside. This collection included not only Handyside's own museum, but also at least part of the collection of Dr Robert Knox, made infamous by his unfortunate embroilment in the Burke and Hare controversy.<sup>3,6</sup> When Knox gave up teaching in Edinburgh in 1842, his specimens were bought by Dr Henry Lonsdale, extramural teacher in anatomy at No.1 Surgeons' Square.<sup>3</sup> On Lonsdale's retirement, these specimens passed to Handyside, then subsequently to Struthers. What became of this collection after Struthers brought it to Aberdeen is, unfortunately, not clear. Attempts have been made to identify specimens from Knox's original catalogues, held in the University of Edinburgh, but only one specimen is unique enough to be convincingly identified - that of a cod's cartilaginous head, now resident in the Zoology museum of the University of Aberdeen.<sup>7</sup>



Figure 1: Sir John Struthers. From a painting by Sir George Reid RSA. University of Aberdeen.

## **ABERDEEN UNIVERSITY**

When John Struthers arrived in Aberdeen, he was somewhat dismayed by the state of the accommodation for the Anatomy department and managed to secure funds for what amounted to a complete new department, at a cost of some £4000.<sup>8</sup> Anatomy teaching in Aberdeen is currently still held within the buildings that

Struthers commissioned. The museum, which Struthers considered the most important part of the department, was the initial project. He set about filling this with an array of specimens, "prepared or otherwise provided, mainly by the work of my own hands, and at my own expense".<sup>6</sup> A great number of these specimens were devoted to comparative anatomy as Struthers was a convinced Darwinian.<sup>9</sup> This museum of Comparative Anatomy was said to equal the best in the land.<sup>2</sup> Professor Struthers was a popular but formidable lecturer. He encouraged the development of an inquisitive mind and sharp eye in his students, and would test these skills by calling students to the front of the lecture theatre to be questioned on a subject. Criticism of their performances would come in the form of his renowned "gentle but penetrating sarcasm".<sup>10</sup>

Some of the specimens desired by Struthers proved more troublesome than others to acquire, and one attempt at an acquisition ended in court. The skeleton of a large crocodile was kept by the Aberdeen Medico-Chirurgical Society and John Struthers had coveted it for many years. In 1866, he offered to clean and remount the skeleton. It remained at Marischal College for the next 10 years, despite many demands for its return. Eventually it was reluctantly returned, but with characteristic determination he waited until elected President of the Medico-Chirurgical Society in 1885 and then again attempted to remove the crocodile to Marischal. Members of the society were so enraged by this that a court action was raised against him, requesting an interdict to prevent removal of the monster that "has been of much use to the members in their professional studies and inquiries". This was duly granted.<sup>11</sup> However, even in death, he eventually got his way and the skeleton came to the Anatomy department in 1956. Many of Struthers' original specimens can still be seen in the Zoology museum at the University of Aberdeen, and the crocodile has pride of place in the museum foyer.



Figure 2: The skull of a sheep, prepared by Professor Struthers. His signature and description can be seen on the attached label. Courtesy of Dr M. Gorman, Reader in Zoology, School of Biological Sciences, University of Aberdeen©.

## **STRUTHERS AND THE WHALES**

One of John Struthers' great research interests were the whales that occasionally washed up on the shores of the east of Scotland. Such carcasses were often removed to the University of Aberdeen's Marischal College, where the medical class of the day would be assembled around the unfortunate beast and given a lecture on its rudimentary mammalian structures. The Professor's private laboratory at Marischal was well known for its distinctive odour, the result of various decomposing whale parts that had been retained for further inspection.<sup>6</sup> Such examinations allowed Struthers to

publish articles on the anatomy of the great fin whale (*Balaenopteras musculus*), the Greenland right whale (*Balaena mysticetus*), the humpback whale (*Megaptera longimana*) and the beluga (*Delphinapterus leucas*).<sup>12-15</sup> Former Aberdeen medical students may remember the skeleton of a sei whale (*Balaenopteras borealis*), which hung imposingly in the foyer of the Anatomy department until its removal in 1967. This was one of Struthers' many specimens. Now in the Zoology museum, it is said to still drip oil on particularly hot days!<sup>16</sup>



Figure 3: Professor Struthers (right) and his assistant Robert Gibb, examine the carcass of a beluga whale outside Marischal College. George Washington Wilson Collection, University of Aberdeen©.

Figure 3 shows Professor Struthers and his assistant Robert Gibb outside Marischal College. They are inspecting the carcass of a beluga or white whale that had been found on April 26th 1884, alive in salmon fisherman's nets near Wick in northern Scotland. Following its death, the carcass was shipped overnight to Aberdeen for Struthers to dissect. A detailed description of the examination of this whale was published some six years following Struthers retirement.<sup>15</sup>

Professor Struthers was involved in the saga of the Tay Whale, a rather cruel story in which a male humpback whale appeared in the Tay Estuary in December 1883 and was hunted down by local whalers. An entrepreneurial Dundee oil merchant, 'Greasy' Johnnie Wood, bought the carcass despite fierce competition from Professor Struthers, and the public flocked to view the beast, for a modest fee. Professor Struthers was eventually invited to publicly dissect the carcass, in a further money-spinning exercise by the canny Dundonian oilman. The story is immortalised by William McGonagall, the Dundee poet of a unique style, in his verses 'The

Famous Tay Whale'.<sup>17</sup> The skeleton of this whale now hangs in a Dundee museum.<sup>18</sup>

## **THE HUMERAL SUPRACONDYLAR PROCESS**

John Struthers is famous for his detailed comparative anatomical studies, and is generally credited with the first description of the humeral supracondylar process and its eponymously named ligament in 1848.<sup>19</sup> However, Robert Knox mentioned such a structure in an article in the Edinburgh Medical Journal in 1841. The demise of an unfortunate circus jaguar provided Knox with the opportunity to give a lesson on the comparative anatomy of the forelimb and in particular, the supracondylar foramen of the feline humerus. This was followed by the observation of a supracondylar process in a cadaver at his school that corresponded closely with the foramen seen in the jaguar.<sup>20</sup> Struthers acknowledged Knox's observation in his initial publication on the subject. A specimen showing a supracondylar process is also illustrated much earlier in Tiedmann's *Tabulae Arterium* of 1822.<sup>21</sup> Such a rudimentary structure was, of course, of interest to Charles Darwin who corresponded with Struthers regarding the process and its potential pattern of inheritance.<sup>22</sup>

## **STRUTHERS AND MEDICAL EDUCATION**

John Struthers was an accomplished scientist and teacher of anatomy, but many of his publications were related to the field of medical education, in which he should be considered a pioneer.<sup>23-26</sup> He was highly critical of the content and style of medical education of the day, particularly the overload of the curriculum with many lectures that were often irrelevant or repeated.<sup>5</sup> He advocated more vertical integration of basic science and clinical subjects in an attempt to discourage teaching of "the dry details of anatomy". He proposed more structured clinical teaching - "instead of the system of giving what are called 'clinical lectures' to the pupils assembled in the theatre, there should be true clinical instruction at the bedside, and to a limited number so that each pupil can be trained".<sup>5</sup> Many of his ideas regarding education and teaching are as relevant today as they were at the time of his death in 1899.

Professor John Struthers was appointed a member of the fledgling General Medical Council (GMC) in 1883, and until 1886 served for the joint Universities of Aberdeen and Edinburgh.<sup>27</sup> The Medical Act of 1886 caused a huge amount of controversy in Aberdeen, as it was suggested that Aberdeen should share a place on the GMC with St. Andrews, while Edinburgh and Glasgow Universities would have a member each. His indignation at what he clearly saw as a snub is

evident: "to be grouped with Edinburgh University when we were all grouped was unobjectionable, but to stand with a University which has no medical school, and as yet no medical reputation [St. Andrews], was not satisfactory". Referring to his campaign to rectify this snub, he wrote: "I don't think I ever worked with stronger feeling to accomplish anything".<sup>24</sup> The situation was duly rectified, and Struthers continued as the GMC member for Aberdeen from 1886 to 1891. In 1890, as chairman of the new educational committee, he presided over one of the most important changes to medical education of the day, the introduction of the five year medical course with a final year dedicated to clinical work.<sup>23</sup>

## **DISCUSSION**

Professor John Struthers retired from his post in Aberdeen in 1889, and returned to Edinburgh - it is said "he was only lent to Aberdeen for a time".<sup>2</sup> However, he was far from idle in retirement. Notwithstanding the GMC commitments noted above, he was elected President of the Royal College of Surgeons of Edinburgh from 1895 to 1897. A knighthood was bestowed upon him in 1898 and he died aged seventy-six, from metastatic colorectal carcinoma on 24 February 1899.<sup>2</sup>

Although much time has passed since the death of Sir John Struthers, his influence can still be felt both locally and nationally. Today's life science students at the University of Aberdeen are reminded of Struthers' contribution to the subject of zoology by the efforts of the Reader in Zoology, who maintains a website on this subject, and by many of Struthers' zoological specimens which remain on prominent display.<sup>16</sup> Many doctors working in the United Kingdom today will have experienced the 'traditional' medical curriculum, with its strong pre-clinical element, along the format established by Struthers in 1890. The medical curriculum of today, established following the publication of *Tomorrow's Doctors* by the GMC in 1993 and 2003, would in most areas be unrecognisable to Sir John Struthers.<sup>28</sup> He would undoubtedly be greatly dismayed at the drastic reduction in the teaching of basic medical sciences, and the subsequent perceived decline in the anatomical knowledge of medical students and practicing clinicians.<sup>29</sup>

During undergraduate anatomy teaching in Aberdeen, we try to remind today's medical students of the advice Professor Struthers gave to his students of the same University over one hundred years ago: "Unless you are well informed in the foundation sciences and principles, you may practise your profession, but you will never understand disease and its treatment; your practice will be routine,

the unintelligent application of the dogmas and directions of your textbook or teacher".<sup>25</sup>

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