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Richard Owen's Contribution to Endocrine Surgery

Malcolm H Wheeler*

Department of Endocrine Surgery, University Hospital of Wales, UK

Correspondence should be addressed to Malcolm H Wheeler, m.h.wheeler@btinternet.com

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EDITORIAL

Professor Sir Richard Owen still remains almost unknown and is certainly not adequately recognized for his many scientific achievements, even though he was once described, in 1861, by William Gladstone, a future Prime Minister of the UK, as 'a splendid genius and the world's greatest living naturalist'.

Owen was born in Lancaster, England in 1804 and by the age of 16 was apprenticed to a local surgeon. He then spent 6 months as a medical student in Edinburgh before completing his medical training at St Bartholomew's Hospital in London, where he continued his studies under the eminent surgeon, Dr. John Abernathy. Fascinated by anatomy and dissection Owen later became a Fellow of the Royal College of Surgeons of England.

In 1836 he was appointed to the post Conservator of the Hunterian Museum at the Royal College, which housed the enormous specimen collection of the famous John Hunter, a cornucopia of human and zoological specimens which up to that point had never been catalogued.

Owen described and named a vast number of new creatures, publishing more than 600 scientific manuscripts on a diverse range of subjects. He was an outstanding palaeontologist, his work on fossil reptiles leading him to coin the term 'dinosaur'.

His powers of original thought and deduction were remarkable and well-illustrated in 1839 when he was sent from New Zealand a fragment of bone from which he was able to describe a hitherto unknown ostrich like bird, later to be recognized as a giant Moa.

This outstanding biologist, comparative anatomist and palaeontologist was made a Fellow of the Royal Society in 1834 at the remarkably young age of 30.

His relationship with the famous Charles Darwin was initially both close and fruitful with Owen fulfilling the role of mentor, often advising Darwin on palaeontological issues and matters relating to the development of vertebrates.

Unfortunately the relationship became strained and later disintegrated. Owen, although accepting the concept of evolution, strongly disagreed with Darwin's views on natural selection and the forces which brought it about, believing himself more in the theory of creationist mechanisms.

In many other areas Owen's views were considered to be somewhat negative and he eventually became estranged from much of the scientific community, accused of jealousy, dishonesty, malice and a failure to give credit to the work of others.

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This was a most unfortunate sequence of events for a man who had performed a great public service by acting as the driving force behind the establishment of the London Natural History Museum in 1881, received a knighthood from Queen Victoria, whose children he tutored, and gathered a circle of influential friends which included Charles Dickens, Sir Robert Peel and Alfred Lord Tennyson. But, to the endocrine surgeon Owen's name will be forever linked to a discovery which is truly pivotal to the history of endocrine surgery.

In 1849 an Indian Rhinoceros (*Rhinoceros unicornis*) died at London Zoo, almost certainly as a result of an injury sustained in a confrontation with an elephant housed in the same compound, Owen was asked to carry out an autopsy on the unfortunate two ton rhinoceros, which incredibly he performed over a period of several months at his own home, his wife being moved to comment on the unpleasant smell pervading the house.

In the course of his meticulous dissection, he carefully delineated the structures related to the upper airway, including the thyroid gland. He made a specimen preparation, which measured 30 × 14 × 8 cm, the original of which still exists in the Hunterian Museum at the Royal College. It was noted that the thyroid consisted of two elongate, subtriangular lobes extending from the sides of the larynx to the fourth tracheal ring.

In his detailed description Owen refers to 'a small, compact yellow glandular body attached to the thyroid at the point where the veins emerged. Undoubtedly he was describing for the first time a structure which we now know to be a parathyroid gland.

The account of the dissection was published in 1862 [1] but gave insufficient weight to the identification of the parathyroid glands such that his discovery remained dormant for several decades until it was mentioned in an article in the British Medical Journal in 1905 [2].

Owen had not performed microscopy of the gland and as far as we know never mentioned the presence of these glands in any other dissections or animal studies.

It is therefore perhaps not surprising that the credit for discovering the parathyroid glands is often given to the Swedish Uppsala anatomist Ivar Sandström who made a detailed anatomical and histological description of the gland in human and several other species.

In 1880 he reported his findings and named the glands 'glandulae parathyroideae' but published in a relatively unknown Swedish journal [3]. However, fortunately two of his abstracts were published in German and as a result his work was recognized by the wider scientific community [4].

Although Sandström had no understanding of the physiological importance of these glands he did speculate on their possible pathological and clinical relevance.

Sandström had been unaware of Owen's earlier discovery, but in a remarkable parallel his work also went unnoticed for many years. Despite his earlier speculation Sanström had no understanding of the crucial role which the parathyroid glands played in calcium metabolism.

This consideration lay dormant until Eugene Gley, Professor of Physiology in Paris published in 1891 the first report on a relationship between the parathyroid glands and tetany [5].

In the same year von Recklinghausen had described the condition of 'osteitis fibrosa cystica' characterized by a bone disorder in which cysts and brown tumours resulted in distortion and recurrent fractures, not associated with any significant trauma [6].

Von Recklinghausen did not link the bone disease to any parathyroid disorder and when Askanazy and others [4]

later described patients with similar bone disease and parathyroid enlargement it was thought that the parathyroid condition was secondary to the bone disease.

But in 1915 Schlagenhaufer was the first to propose that the parathyroid gland enlargement might actually be the cause of the bone disease [7].

This immediately raised the possibility that the parathyroid disease might be treated surgically.

The true birth of parathyroid surgery did not occur, however until 1925 when a Viennese street car driver, Albert Jahne, underwent an initially unsuccessful operation performed by Felix Mandl. After a second procedure in which only normal parathyroid glands were excised Jahne subsequently succumbed to renal failure [8].

With little understanding of parathyroid pathophysiology it is perhaps not surprising that the development of this surgery was initially slow but soon the technical difficulties posed by the enormous variability of parathyroid anatomy, including supernumerary and ectopic glands, became apparent.

Perhaps one of the most famous early cases which serves to illustrate these challenges was that of Captain Charles Martell, who underwent 7 operations before his mediastinal parathyroid adenoma was removed by the young Boston surgeon, Oliver Cope in 1932 [9].

Sadly, Martell died 6 weeks later from tetany and laryngospasm. More than half a century later parathyroid surgery has become extremely successful even when ectopic glands are located in the mediastinum.

In Cardiff we reported a success rate for primary exploration of 97.3% in a consecutive series of 520 patients undergoing parathyroid surgery between 1981 and 1997 [10].

Returning to Owen, perhaps his discovery of the parathyroid glands might compensate for some of the opprobrium and censure which beset so much of his professional life.

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