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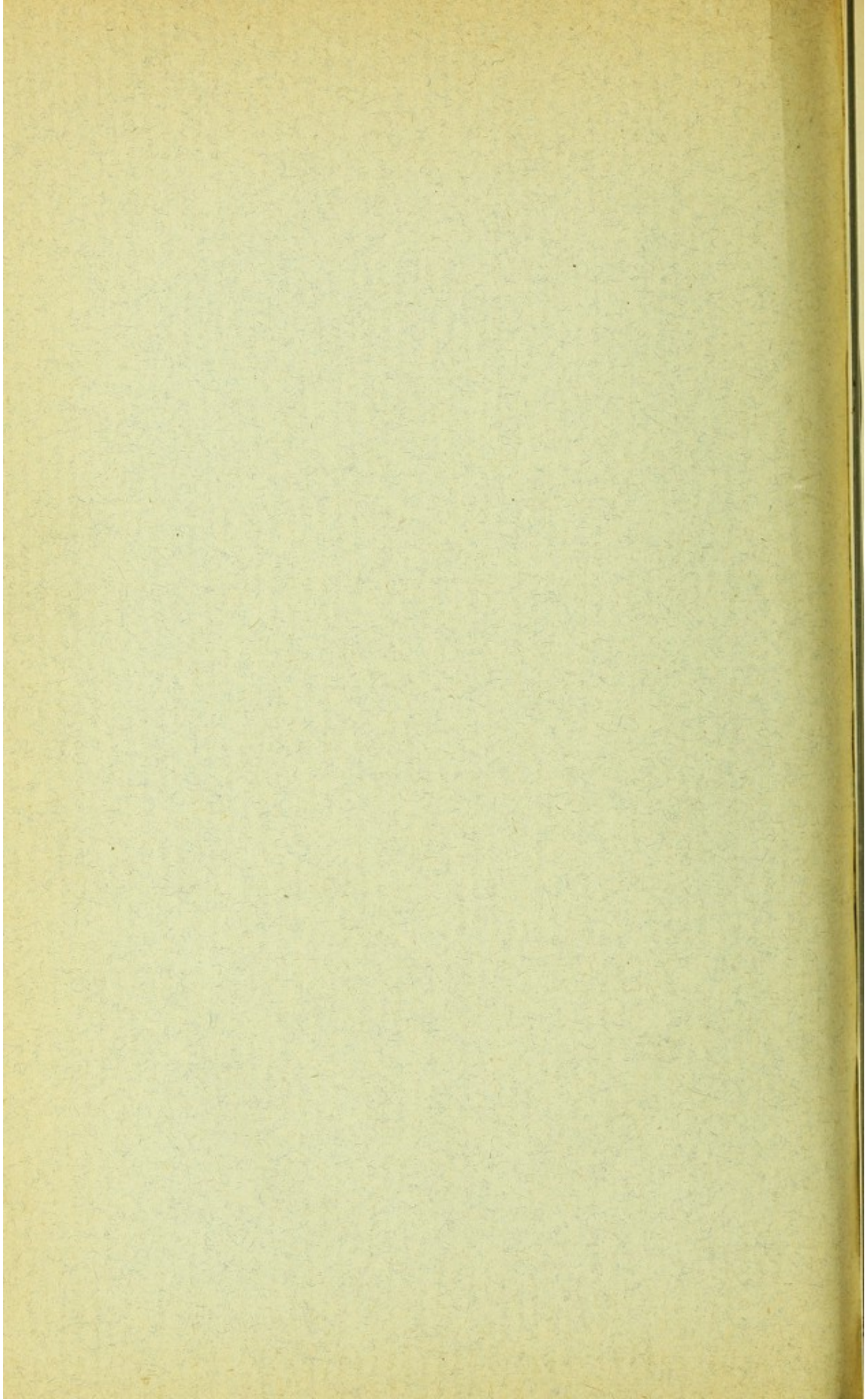
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SIR RICHARD OWEN: HIS LIFE AND WORKS.

By C. W. G. ROHRER, M. A., M. D., PH. D., Baltimore.





SIR RICHARD OWEN: HIS LIFE AND WORKS.*

By C. W. G. ROHRER, M. A., M. D., PH. D., Baltimore.

Doubtless some of you have questioned yourselves concern- [133]
ing the "why and wherefore" for this paper, entitled "Sir
Richard Owen: His Life and Works." I wish to give three
brief reasons for thus imposing upon your time and good
nature.

1. Because of Professor Owen's contributions to medical science.
2. Because of Professor Owen's contributions to the allied sciences. And,
3. For purely sentimental reasons. On Monday, April 4, 1898, when I was a second-year medical student, I attended a Young Men's Christian Association lecture delivered by the late Dr. Daniel C. Gilman, an honored president of this university. In the course of Dr. Gilman's remarks he gave us the following terse bit of advice: "Read biography. Familiarize yourself with the lives of the good and great."

BIRTH AND PARENTAGE.

Richard Owen, the subject of my sketch, was born on Thurnham Street in the town of Lancaster, England, on July 20, 1804. He was the younger son of Richard Owen, formerly of Fulmer Place, Bucks. His grandfather, William Owen, married Elizabeth, daughter of Richard Eskrigge. This Richard Eskrigge was high sheriff of Bucks in 1741, and was the owner of Fulmer Place. In an old family prayer book, dated 1713, with a frontispiece portrait of Queen Anne,

* Paper read before the Johns Hopkins Hospital Historical Club, January 9, 1911.

[133] and further "adorn'd," as the title-page has it, "with 50 historical cuts," there are the following entries in Richard Eskrigge's handwriting:

Richard Owen, son of William Owen (who was free of the Fishmongers' Company) and of Elizabeth Owen. The said Richard was born in the parish of St. Matthew, Friday Street, December 5, 1754, and baptized the Sunday following. The sponsors were Richard and Elizabeth Eskrigge and Mr. Beresford (Cashier in the Bank of England)."

Then, in Sir Richard Owen's handwriting, a few explanatory remarks are added. He writes:

The above entries are in the handwriting of my great-grandfather, Richard Eskrigge, of Fulmer Place, Fulmer, Bucks, and relate to the birth of his grandson and heir, my father, Richard Owen.

There is also the following entry in the handwriting of Sir Richard Owen's father:

Richard and Catherine Owen were married at Preston, November 8, 1792, by the Rev. H. Shuttleworth.

This latter Richard Owen was Sir Richard Owen's father, and the Catherine Owen mentioned was Sir Richard Owen's mother. Sir Richard Owen's mother was of French extraction. She was of a Huguenot family of the name of Parrin, who came over from Provence at the revocation of the Edict of Nantes. Her full maiden name was Catherine Longworth Parrin.

Sir Richard Owen's mother, besides being a woman of great refinement and intelligence, was an accomplished musician. Her father before her had supported himself by the profession of music, and she inherited his talent. In appearance she was a handsome, Spanish-looking woman, with dark eyes and hair. Owen himself never tired of speaking of his mother's charm of manner, and of all that he owed to her early training and example.

Sir Richard Owen's father was a complete contrast. Tall, stout and ruddy, his general appearance bore a strong resemblance to the face and figure popularly supposed to be-

long to the typical John Bull. Nor was his character unlike [134]—bluff, burly, obstinate, and perhaps not particularly brilliant, he was yet possessed of sound common sense.

CHILDHOOD AND YOUTH.

Sir Richard Owen as a school-boy succeeded admirably with his studies. In 1808, when Owen was but four years of age, his father, a West India merchant, and often absent from home, included the following sentence in a letter to his wife: "I am glad to know James and Richard come on so well with their studies and are so attentive." James was Professor Owen's elder brother.

After the above preparatory instruction given by an old Quaker lady, Richard Owen, at the mature age of six, was sent to the Lancaster Grammar School to join his elder brother James. Whewell, the famous master of Trinity, who was Owen's fellow-townsmen, also received the first rudiments of his education at this school. Another school-fellow who was in the same class as Owen's elder brother was Higgin, late Bishop of Derry.

One of Owen's teachers in the Lancaster Grammar School stigmatized him as "lazy and impudent," and prophesied that he would come to a bad end. This gentleman gave instruction in penmanship. However, in spite of his dismal predictions he managed to teach Owen to write a remarkably clear and neat hand, which hardly varied till within a few years of his death.

"At this period of his life," as Professor Owen's last surviving sister would relate, "Richard was very small and slight and exceedingly mischievous, and he hardly grew at all until he was sixteen."

Owen's family were evidently apprehensive that it would end by his being a "small man." But he soon began to make up for his early want of stature, and when he left the Grammar School he was already a big, awkward lad. At mature manhood Professor Owen's height was six feet in his socks.

At the age of fourteen Richard Owen had given no signs of a taste for the work to which his life was afterwards de-

[134] voted. Part of a manuscript treatise on "Heraldry" still exists, which he wrote about this time, as well as an elaborately painted coat of arms of the Owen and Eskrigge family.

EARLY EDUCATION.

Soon after leaving school Richard Owen was apprenticed to "Leonard Dickson, of Lancaster, Surgeon and Apothecary," as his indenture dated August 11, 1820, shows. According to the terms of this document Owen was to be provided by his mother with "meat, drink, washing and lodging, and also decent and suitable clothes and wearing apparel," and his master was on his part to teach him the "arts, businesses, professions, and mysteries of a surgeon-apothecary and man midwife, with every circumstance relating thereto."

Mr. Dickson died two years after, and Richard Owen was "assigned, transferred, and turned over" by the executors to Joseph Seed for the term of five years, the indenture of this transfer bearing the date of June 19, 1822. The following year Mr. Seed accepted a post as surgeon in the Royal Navy, and Owen was again transferred, by an indenture dated December 13, 1823, to James Stockdale Harrison, "Surgeon and Apothecary."

There is appended to the indenture to Seed a certificate in Joseph Seed's handwriting, which contains the following paragraph:

Mr. Richard Owen's general conduct during the time he was with me has my highest commendation, and at all times I shall be happy to bear testimony to his most deserving merit, as well as to his respectability.

(Signed)

J. SEED,
Surgeon Royal Navy.

Lancaster, January 10, 1827.

The terms of Owen's surgical apprenticeship at Lancaster were never carried out to the full. In October, 1824, he matriculated at Edinburgh University. Some of his lecture cards of admission are still preserved. We gather from them that he attended, besides numerous other lectures, the ana-

tomical lectures of Monro (tertius); but as that worthy gentleman was in the habit of lecturing—so Owen had remarked—from the notes used by his grandfather and his father, both of whom had successively occupied the chair of anatomy before him, these lectures were found to be neither of particular interest nor yet sufficiently up to date. So Owen was constrained to attend the outside course given by Dr. Barclay on practical anatomy, and anatomy and surgery. Though this was an extra which he could ill afford, still he never regretted it, for of all his teachers at Edinburgh it was to Dr. John Barclay that he owed the most. Many times had Owen spoken of the influence that Dr. John Barclay had on his early career, and the sincere affection with which he inspired him. At this time there were but two lecturers on anatomy in Edinburgh—Dr. Monro and Dr. Barclay. Liston entered the arena as number three.

At the end of April, 1825, Dr. Barclay strongly advised Owen to move to St. Bartholomew's Hospital, London, and study under Abernethy. After some consideration, Owen decided to do so, and obtained his college certificates forthwith, all of which are in existence.

Dr. Barclay (April 25, 1825) speaks of Owen in the following terms in his certificate: "I had much reason to be satisfied with the mode of his attendance, and the manner in which he prosecuted these branches of his medical studies" (anatomy and surgery).

But Dr. Barclay's chief recommendation was a private letter to his friend Abernethy, which he gave to Owen to take to London with him.

Owen was a perfect stranger when he arrived in London. The only connection which he had with his northern friends was Dr. John Barclay's letter of introduction to Dr. Abernethy. This, however, subserved a most useful purpose.

Abernethy had just finished lecturing when Owen arrived at St. Bartholomew's Hospital. He received Owen rather gruffly. Owen presented his letter of introduction from Dr. Barclay. Abernethy read it hurriedly, stuffed it into his pocket and made an appointment with Owen to breakfast with him at eight o'clock the next morning.

[135] When Owen presented himself at Abernethy's residence the next morning he anticipated anything but an agreeable conference with the great physician and surgeon. He found him, to his great surprise, considerably smoothed down and quite pleasant in manner. The result of this meeting was, that Abernethy offered him the post of prosector for his lectures.

To young Owen this was a very desirable position. It possessed several obvious advantages. The prosector was relieved of the necessity of purchasing his own subjects for dissection—no inconsiderable item of expenditure then. This unexpected source of revenue was indeed a saving grace to the young medical student. Owen's father, having suffered severe financial loss, died of a broken heart in 1809, when the boy Richard was but five years old. The mother and six children, two sons and four daughters, were not left penniless, but their means of support were quite meager. For these reasons Richard Owen was early largely thrown upon his own resources.

From such a chief as Abernethy, Owen could not fail to profit. His prosectorship brought with it another decided advantage—the subjects provided for the lectures were in a much sounder and fresher condition, comparatively speaking, than was usually the case in those ever-memorable body-snatching days. To the mind of your humble speaker, this so-called "body-snatching" epoch forms one of the most interesting periods in the whole history of medicine. The wonderful story of John Hunter's persevering efforts to obtain the body of O'Brien, the Irish giant, who died in 1783, should be read by every medical student.

As a rule, Owen fared well at the hands of his professor, Dr. Abernethy; but on one occasion he provoked Abernethy to anger. The lecture was on the human kidney, which Owen had duly prepared. But, unfortunately, in the process of preparation the adrenal gland became detached, owing, most likely, to its not being quite so fresh as it might have been, and, in a great hurry, the prosector carefully fixed it on again—but to the wrong end of the kidney. Abernethy's explanations were somewhat far advanced before he found this

out, and not looking very closely at the specimen he held in [135] his hand, he was elaborately describing its structure, as if it had been a normal kidney. When he discovered the error committed, he did not let the occasion pass without bestowing a few flowers of speech upon his young friend.

PROFESSIONAL CAREER.

On August 18, 1826, Owen obtained his membership of the Royal College of Surgeons. He had then just entered his twenty-third year. His diploma is signed by twelve great men, the three most familiar ones being John Abernethy, Astley Cooper and Everard Home (John Hunter's brother-in-law).

Owen set up as a medical practitioner at 11 Cook's Court, Carey Street, Lincoln's Inn Fields, and gradually secured a small practice among the lawyers. He also diligently visited the poorer classes of the neighborhood.

John Hunter having died in 1793, his rare, valuable and unusually complete collections numbering 3970 specimens were purchased by the government for the sum of \$75,000 and given into the custody of the Royal College of Surgeons. Down to this time (1826) these Hunterian collections had been sadly neglected. For twenty-five years Sir Everard Home was "going to" prepare a descriptive catalogue of the collections which had been transferred by the government from John Hunter's temporary museum in Castle Street to the Royal College of Surgeons.

Owen's peculiar ability as a dissector had not escaped the eagle eye of Abernethy, then president of the Royal College of Surgeons. Abernethy, who was much concerned at the neglect of the collections formed by John Hunter, which had recently been purchased by the government and handed over to the care of the college, insisted on his old pupil, Richard Owen, undertaking their arrangement. As Abernethy said: "The collection was located near his (Owen's) private residence; he could devote his leisure hours to the work; there was no one else equally qualified to do so." Owen undertook the task, and was thus associated with William Clift, at that

[135] time conservator of the college museum, and who subsequently became his father-in-law.

In the year 1828 Owen was appointed lecturer on comparative anatomy at St. Bartholomew's Hospital, an appointment which was the starting point of his career as a lecturer. Early in 1834 Owen was appointed professor of comparative anatomy at St. Bartholomew's.

In April, 1836, Owen was appointed Hunterian professor at the Royal College of Surgeons. To the last days of his life he constantly referred to the gratification which this appointment gave him. As Hunterian professor it was Owen's special duty to deliver twenty-four annual lectures, as illustrative of Hunter's collections.

On the retirement of Sir Charles Bell, of Bell's paralysis fame, from the professorship of anatomy and physiology in the Royal College of Surgeons, in the early part of 1837, Owen was elected to the vacant chair. Owen's full title then [136] became "Hunterian Professor and Professor of Anatomy and Physiology in the Royal College of Surgeons."

Owen now (in 1837) began gradually to relinquish his medical practice in order to devote the whole of his time to scientific research. He had been a practitioner of medicine and surgery for eleven years.

On May 2, 1837, at 5 o'clock p. m., Professor Owen delivered his first Hunterian lecture. The subject of this course of lectures was the microscopical structure and nature of the teeth.

On June 19, 1837, Owen was elected Fullerian professor of comparative anatomy and physiology to the Royal Institution. This professorship Owen was obliged to decline.

Owen filled the position of Hunterian professor of anatomy and physiology at the Royal College of Surgeons for a period of twenty years (1836 to 1856). On May 26, 1856, Owen was appointed superintendent of the natural history department of the British Museum, at a salary of 800 pounds (about \$4000) a year. This appointment was originally suggested by Lord Macaulay. The office of superintendent was generally understood to have been created expressly for Owen.

Long after Macaulay had abandoned all other public busi-

ness, he continued to occupy himself in the administration of [136] the British Museum. In February, 1856, he wrote to Lord Lansdowne with the view of securing that old friend's potent influence in favor of an arrangement by which Professor Owen might be placed in a position worthy of his reputation and of his services. The following is an extract from Macaulay's letter to Lord Lansdowne, in which he proposes that Professor Owen should be constituted superintendent of the whole department of natural history, including geology, zoölogy, botany and mineralogy.

Macaulay writes:

I cannot but think that this arrangement would be beneficial in the highest degree to the Museum. I am sure it would be popular. I must add that I am extremely desirous that something should be done for Owen. I hardly know him to speak to. His pursuits are not mine; but his fame is spread over Europe. He is an honour to our country, and it is painful to me to think that a man of his merit should be approaching old age amidst anxieties and distresses. He told me that eight hundred a year (meaning 800 pounds a year) without a house in the Museum, would be opulence to him. He did not, he said, even wish for more. He seems to me to be a case for public patronage. Such patronage is not needed by eminent literary men or artists. A poet, a novelist, an historian, a painter, a sculptor, who stood in his own line as high as Owen stands among men of science, could never be in want except by his own fault. But the greatest natural philosopher may starve while his countrymen are boasting of his discoveries, and while foreign Academies are begging for the honor of being allowed to add his name to their list.

Professor Owen entered upon the duties of his new office, that of superintendent of the natural history department of the British Museum, on June 8, 1856. This position Professor Owen held for twenty-eight years, or until he had almost reached the eightieth year of his age.

The superintendency gave Professor Owen an opportunity to do a little outside work. In 1857 Professor Owen was appointed lecturer on palæontology at the Royal School of Mines. His first lecture was given on February 26, at the Museum of Practical Geology. Amongst the audience, as an entry in the diary shows, were many old friends: Dr. Living-

[136] stone, Frank Buckland, the Duke of Argyll, with his sons, Sir Charles Lyell and Sir Roderick Murchison.

Towards the end of 1857 Owen was offered and accepted an appointment which some years previously, while at the Royal College of Surgeons he was obliged to decline; it was the Fullerian professorship of physiology at the Royal Institution of Great Britain.

PRIVATE LIFE.

Professor Owen was one of the most affable of men. His home-life was ideal. In scientific circles he was universally loved and respected. Even those whose views ran counter to his own always dealt with him with the highest consideration. His earnestness of purpose, his sincerity and frankness, were marked traits of his character.

On July 20, 1835, Professor Owen's thirty-first birthday, the event took place to which he had so long looked forward, namely, his marriage to Miss Caroline Clift. Professor Owen had been engaged to Miss Clift for eight years. It was a very quiet wedding, and is thus described in Miss Clift's diary:

July 20.—Richard Owen and I, my father and Harriet Sheppard, were in the new St. Pancras Church, Euston Square, by half-past eight o'clock. The Rev. Mr. Laing came immediately after we got into the vestry, and, Caroline Clift having been lost on the road, Mrs. Richard Owen returned to breakfast at No. 1. Euston Grove; after which my husband, my mother and I set off to Oxford.

This union was blessed with one child, William Owen, born October 6, 1837. On October 6, Professor Owen writes in his wife's diary:

At a quarter-past nine William Owen was born.

The next day there is the entry:

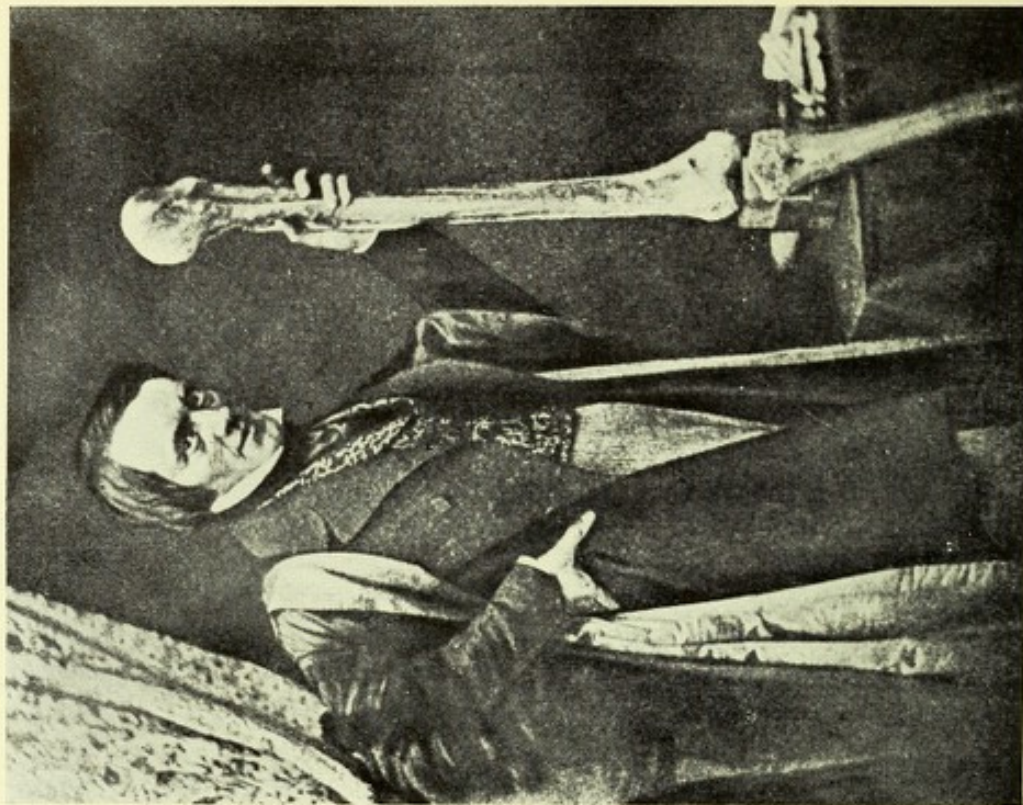
Papa's joy a little damped by excruciating toothache. Mother and child as well as possible.

About a month afterwards Mrs. Owen begins the diary again. The diaries of Mrs. Owen, began about the year 1827, are now kept almost without a break up to 1873, the year of her death, thus covering a period of at least forty-six years.

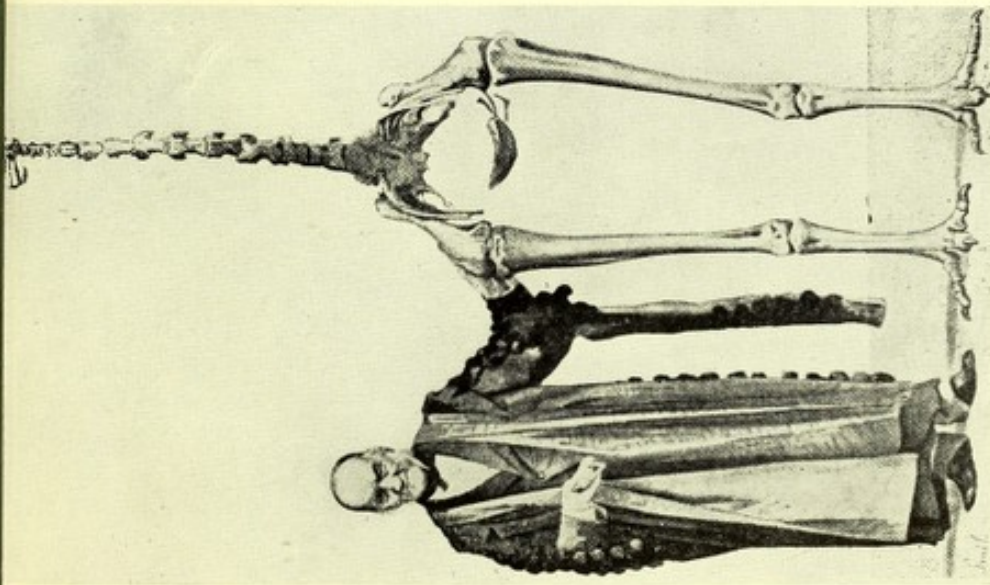




PROFESSOR OWEN AT THE AGE OF 22 YEARS.



PROFESSOR OWEN IN HIS PRIME—AGED 42 YEARS—AS HE LECTURED. HE HOLDS A BONE OF THE DINORNIS MAXIMUS.



PROFESSOR OWEN—AGED 73 YEARS—AND
THE SKELETON OF DINORNIS MAXIMUS.



PROFESSOR OWEN—AGED 85 YEARS—AND HIS GRAND-
DAUGHTER.



Many of the scenes and incidents in Professor Owen's life,^[136] which I have incorporated in this paper, have been taken from Mrs. Owen's interesting diary.

Mrs. Owen died May 7, 1873, and by her death Professor Owen lost one who had been his fitting helpmate for nearly forty years, and who had, in her younger days especially, assisted his work in no small degree by her acute powers of observation and by her artistic skill.

CONTRIBUTIONS TO MEDICAL SCIENCE.

Owen's most important contribution to medical science is his discovery of the *Trichina spiralis*, a small nematoid worm which harbors in striated muscle and causes the disease known as trichinosis. This important microscopic discovery was^[137] made by Owen in the autumn of 1834. At first it seemed merely a curiosity of science. Mr. Wormald, demonstrator of anatomy at St. Bartholomew's Hospital, sent Professor Owen a piece of human muscle accompanied by the following letter:

DEAR OWEN.—I send you some sort of organised beings, as I believe, which occupy the muscles of a subject now under dissection at St. Bartholomew's Hospital, and as I know you are a keen hand for parasitical things from crabs downwards, I send the enclosed for your inspection.

Ever yours sincerely,

THO. WORMALD.

Upon examining this piece of muscle, Owen discovered a new entozoon, the *Trichina spiralis*. Owen's nomenclature has been slightly changed, and in your recent text-books on pathology you will find this parasite spoken of as the *Trichinella spiralis*. Owen's paper, entitled "Description of a Microscopic Entozoon infesting the Muscles of the Human Body," appeared in the *Proceedings of the Zoölogical Society*, Vol. III, 1835.

This minute worm is not limited in its distribution to the muscles of men, but when in the human body not unfrequently causes death. It is well known as producing the epidemic trichinosis, which formerly made its appearance chiefly in Germany, or in such places where diseased pork or

[137] partially cooked ham is consumed. Cobbold, in his masterly treatise on parasites, appends a list of thirty-three epidemics of trichinosis observed in Germany during the first six years immediately following the announcement of Professor Owen's discovery of the *Trichina spiralis*.

The *Trichina spiralis* figures conspicuously in Professor Joseph Leidy's excellent monograph, "Flora and Fauna in Living Animals." Dr. Leidy lays especial stress upon the fact that the inhabitants of the United States are less infected with entozoa than the inhabitants of other countries.

Before leaving this important subject it is intensely interesting to note that the medical student who was making the dissection at St. Bartholomew's was Mr. Paget, who afterwards became the renowned Sir James Paget.

Owen was the last great exponent of the so-called "Vertebrate Theory of the Skull." This theory originated in the fertile brain of the German poet Goethe, in the year 1790; it was greatly elaborated in 1807 by Lorenz Oken, a German anatomist; and further developed and most ably championed by Professor Owen about the middle of the nineteenth century. Professor Owen's views are embodied in his "Report on the Archetype and Homologies of the Vertebrate Skeleton," published in 1846.

The vertebral theory of the skull is based upon the hypothesis that the vertebrate skull consists of four modified or expanded vertebræ—in other words, that the skull is the highly differentiated anterior end of the backbone.

While Owen's classic anatomy was faultless, many of his conclusions were subsequently proven by Huxley to be untenable. These were Huxley's words:

The spinal column and the skull start from the same primitive condition, whence they immediately begin to diverge.

It may be true to say that there is a primitive identity of structure between the spinal or vertebral column and the skull; but it is no more true that the adult skull is a modified vertebral column than it would be to affirm that the vertebral column is a modified skull.

Professor Owen conferred an inestimable boon upon medical science by editing two octavo volumes of John Hunter's manu-

scripts. These two volumes of Hunter's unpublished manu- (137)
scripts, edited by Owen, appeared in 1860, and are entitled
"John Hunter's Essays and MSS." These volumes contain
essays on natural history, psychology and kindred topics.

Professor Owen was one of the pioneers in public health
work and in sanitation. He was chairman of the original
Health of Towns' Commission. Sir Henry Littlejohn, the
man who made the first sanitary survey of the city of London,
mentioned by Dr. Osler in his recent magazine article entitled
"Man's Redemption of Man," served with Professor Owen on
this commission.

Professor Owen was also a member of the Commission of
Sewers and of the Royal Commission on Smithfield Market
and the Meat Supply of London.

CONTRIBUTIONS TO COMPARATIVE ANATOMY AND PHYSIOLOGY.

Owen's contributions to comparative anatomy represent his
most exhaustive work. These are largely embodied in his
three-volume work, "On the Anatomy and Physiology of
Vertebrates," and his one-volume work, "On the Anatomy
and Physiology of Invertebrates." Owen was the leading
anatomist of the age, and the leading vertebrate anatomist of
all time.

An observation which Owen made on the generative organs
in the muridæ or mouse and rat family is of interest. This
was mentioned in his Hunterian lectures for 1840. The sub-
ject of the lectures for this year was "The Comparative Anat-
omy of the Generative Organs and the Development of the
Ovum and Fœtus in the Different Classes of Animals." In
these lectures Professor Owen describes for the first time, as
separate and distinct glands, the "small glands with a gran-
ulated exterior" situated adjacent to the seminal vesicles in
the rat and mouse. Previous investigators had described these
glandular structures as part of the prostate gland.

Owen also rendered great service to comparative anatomy
by pointing out the distinction between homology or struc-
tural resemblance and analogy or functional resemblance.

CONTRIBUTIONS TO ZOÖLOGY.

- [137] Owen's contributions to zoölogical literature are almost as innumerable as the sands of the sea. His first zoölogical paper, written in 1830, was "On the Anatomy of the Ourang-outang." In 1832 Owen published his "Memoir on the Pearly Nautilus," the description of which seemed to have given his mind a bent in a definite direction. This was Owen's first work which attracted the attention of scientific men. In the same year Owen published a paper "On the [138] Mammary Glands of the *Ornithorhynchus paradoxus*," and another "On the Generation of Marsupial Animals." In 1863 Owen published his "Memoir on the Aye-Aye."

CONTRIBUTIONS TO PALÆONTOLOGY.

Owen was the first to identify the mammoth, an extinct hairy elephant, and assign it to its proper place in the zoölogical world. Owen was also the first to properly describe the *Archæopteryx*, an extinct bird possessing reptilian characters and supposed to be the transition link between reptiles and birds. The *Megatherium americanum*, an extinct ground-sloth from South America, was the subject of considerable controversy until the appearance of Owen's memoir.

Owen's most notable contributions to palæontology are contained in his monograph on the "Extinct Wingless Birds of New Zealand." Herein Owen describes with characteristic clearness and thoroughness the apteryx, the dinornis, and the notornis, all extinct birds of New Zealand; and in an appendix he describes the extinct dodo of Mauritius, the gar-fowl of Newfoundland, and the solitaire of Rodriguez.

Professor Owen described six distinct species of the genus dinornis, ascending respectively from the size of the great bustard to that of the dodo, of the emu and of the ostrich, and finally attaining a stature far surpassing three of the once-deemed most gigantic of birds. This latter is the *Dinornis maximus*, or great moa, a large struthious bird "of a heavier and more sluggish species than the ostrich." Its greatest height, as determined by Professor Owen, was probably sixteen feet.

MISCELLANEOUS CONTRIBUTIONS.

Professor Owen was the most sought-after man in scientific England. He played a considerable rôle in the discovery of the remains of John Hunter, and in their removal from the vaults beneath St. Martin's Church to Westminster Abbey. These events transpired early in 1859, or nearly sixty-six years after John Hunter's death.

All through Owen's life he was regarded as legitimate prey to the numerous inquirers as to the nature and habits of such fabulous monsters as the cockatrice, the phoenix and the bunyip. Even the question of the existence of a sea-serpent was referred to Owen. In 1848-1849 this "Great Sea-serpent" was alleged to have been seen no less than 187 times. The officers and crew of H. M. S. *Dædalus* also gave a description of this sea-monster. In a letter to the Prince Consort, Professor Owen states his opinion that the "animal" seen from the deck of the *Dædalus* was the head and track of a great seal, or sea-lion. About this time there was another sea-serpent seen, of which the particulars were sent to Owen by the Duke of Northumberland. This Owen demonstrated to be the ribbon-fish from the drawing which was sent. *Punch* soon had a parody on the subject, modeled after the famous Mother Goose rhyme, "Who Killed Cock Robin?" *Punch's* lines began:

"Who killed the sea-serpent?"

"'I,' said Professor Owen."

"Scotched, not killed," was Owen's comment on this.

Owen attempted a classification of animals, based on the nervous system. He also founded the science of "Odontography," or the natural history of teeth.

Even obstetrics was not neglected, because in 1842 Owen wrote a paper entitled "Notes on the Birth of the Giraffe at the Zoölogical Society's Gardens, and description of the fetal membranes, and of some of the natural and morbid appearances observed in the dissection of the young animal."

SUMMARY OF LIFE WORK.

Professor Owen's active working life covered the phenomenal period of sixty-five years. His first two papers were on

[138] pathological subjects, and were read before the Abernethian Society in 1826: one "On Encysted Calculus of the Urinary Bladder," and the other "A Case of Gluteal Aneurism with Ligature of the Internal Iliac." Owen's first surgical paper was published in 1830. Its subject was "An Account of the Parts concerned in the Aneurism for the Cure of which Dr. Stevens tied the Internal Iliac Artery at Santa Cruz in the Year 1812." Owen's last paper was written in 1889, when its venerable author was eighty-five years of age. It was entitled "A Monograph on the British Fossil Cetacea from the Red Crag."

Owen's published works number 642. These embrace books and monographs in every department of natural history—zoölogy, comparative anatomy, geology, botany, palæontology, anatomy, physiology, geography, chemistry and public health. Owen was one of the earliest workers with the microscope, and a founder and charter member of the Royal Microscopical Society.

Owen received inspiration from the great Cuvier, whom he met in 1831. Owen was called "the British Cuvier."

Owen manifested a great love of chess, of music and of gardening. He was an accomplished 'cellist.

The story of Owen's life has been admirably written by his grandson, the Rev. Richard Owen, M. A. It comprises two volumes. The data contained therein have been largely gleaned from about 1200 of his own letters, written chiefly to his wife and sisters, and from more than 15,000 letters which have been preserved from the voluminous correspondence which Professor Owen received during his long life.

DEGREES AND HONORS.

Professor Owen received four honorary degrees, including D. C. L. from Oxford and LL. D. from Cambridge. He was awarded fourteen medals and was a member of eighty-three learned and scientific societies. These include the Royal Society, of which he was elected Fellow in 1834, and the Linneæan Society.

OWEN AND EVOLUTION.

Professor Owen, being of deep religious convictions, was a sworn foe of evolution. Owen's works teem with references

to the "Divine plan" and the "will of the Creator." But [138] the crisis came in 1860, when the British Association for the [139] Advancement of Science met in Oxford, England. That this battle for evolution should take place at this time was a foregone conclusion.

But only one man in the whole world had the courage to openly oppose Professor Owen's views or dissent from his opinions. This was a rising young anatomist twenty-one years Professor Owen's junior. It was none other than that great master-mind of the nineteenth century, namely, Thomas Henry Huxley. Everybody knows who Huxley was. Huxley's name is inseparably blended with the early history of *this* great institution of learning; because it was Huxley's most famous pupil, Dr. H. Newell Martin, who organized the biological department in this university.

Huxley plead eloquently for the cause of evolution. Owen, representing scientific England, and Bishop Wilberforce, representing the church and the populace, as eloquently opposed it. Bishop Wilberforce, in the course of his remarks, turned to Huxley and asked him if it was on his grandfather's side or on his grandmother's side that he was related to an ape.

When Bishop Wilberforce had ended his speech, Huxley arose to his feet, and in his usual calm but earnest demeanor made the following reply, which has become historical:

"I asserted, and I repeat, that a man has no reason to be ashamed of having an ape for his grandfather. If there were an ancestor whom I should feel shame in recalling, it would be a *man*, a man of restless and versatile intellect, who, not content with an equivocal success in his own sphere of activity, plunges into scientific questions with which he has no real acquaintance, only to obscure them by an aimless rhetoric, and distract the attention of his hearers from the real point at issue by eloquent digressions, and skilled appeals to religious prejudice.

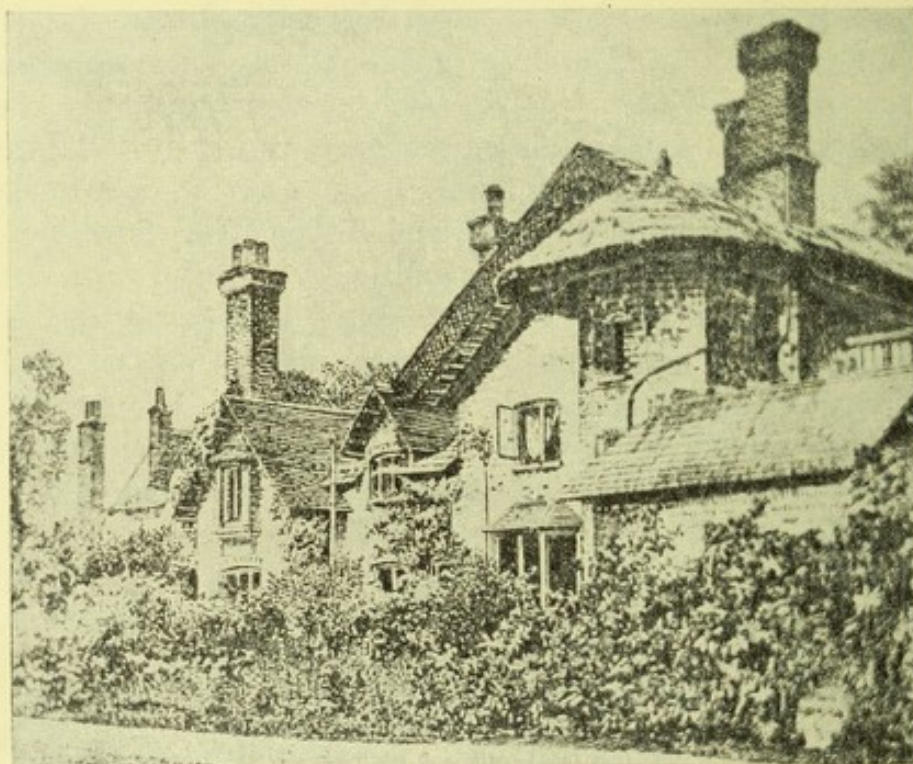
However, later in life Owen's heart softened toward evolution and evolutionists. Shortly after Louis Agassiz's death, which occurred December 14, 1873, Professor W. J. Stillman of this country visited London and interviewed Professor Owen. Professor Owen spoke feelingly of Agassiz's death, and lamented the fact that our great naturalist had held out so obstinately against evolution. Professor Owen's words

[139] were: "If I could have had half-an-hour's conversation with Agassiz, I believe I could have convinced him of the truth of evolution."

After Owen's death in 1892, Huxley wrote a meritorious essay on "Owen's Position in the History of Anatomical Science." It forms the closing chapter in Vol. II, "Life of Owen."

CLOSING YEARS.

On January 5, 1884, Professor Owen was knighted, and henceforth we shall speak of him as Sir Richard Owen.



SHEEN LODGE, RICHMOND PARK.

Sir Richard Owen's last days were spent at Sheen Lodge, the beautiful home in the suburbs of London, presented to him by Her Majesty Queen Victoria, in recognition of his services. Sir Richard Owen enjoyed reasonably good health, notwithstanding his excessive mental application. For twenty years he had suffered with chronic bronchitis. Early in 1890 he had a stroke of paralysis, from which he never entirely recovered. But he rallied from it in marvellous way. From this date on, his hearing became visibly affected.

On August 30, 1892, his old friend, Sir James Paget paid ^[139] him a visit, and tried to converse with him; but Sir Richard, owing to his great prostration, was unable to sustain the effort long. In reply to the repeated inquiries of Dr. Palmer, his physician, Sir Richard invariably answered: "I feel no pain at all, but I have no desire to rise from this bed."

Towards the end of November Sir Richard grew gradually weaker, and began to take less and less nourishment. From the first week of December he never showed the slightest disposition to rally. On December 16 he ceased to recognize those who were standing around him. His death occurred a little before three o'clock on Sunday morning, December 18, 1892.

Sir Richard Owen's death was not due to any definite disease, but to a gradual decadence of all the vital functions. His days had been bounteously prolonged. He was in his eighty-ninth year.

The news of Sir Richard Owen's death, like that of Agassiz and of Darwin, created widespread regret throughout the civilized world. The people of all nations, regardless of race or creed, realized that a great figure, not only of the age but of the century, had passed away. Indeed, the world was made poorer by Sir Richard Owen's death, because it lost an untiring scientific worker and a most genial, kind-hearted man.

101. In the year 1850, the population of the United States was 23,000,000.

In the year 1860, the population was 39,000,000.

In the year 1870, the population was 39,000,000.

In the year 1880, the population was 50,000,000.

In the year 1890, the population was 63,000,000.

In the year 1900, the population was 76,000,000.

In the year 1910, the population was 92,000,000.

In the year 1920, the population was 106,000,000.

In the year 1930, the population was 123,000,000.

In the year 1940, the population was 137,000,000.

In the year 1950, the population was 152,000,000.

In the year 1960, the population was 179,000,000.

In the year 1970, the population was 203,000,000.

In the year 1980, the population was 226,000,000.

In the year 1990, the population was 251,000,000.

In the year 2000, the population was 281,000,000.

In the year 2010, the population was 307,000,000.

In the year 2020, the population was 331,000,000.

In the year 2030, the population is projected to be 354,000,000.

In the year 2040, the population is projected to be 376,000,000.

In the year 2050, the population is projected to be 397,000,000.

In the year 2060, the population is projected to be 417,000,000.

In the year 2070, the population is projected to be 436,000,000.

In the year 2080, the population is projected to be 454,000,000.

In the year 2090, the population is projected to be 471,000,000.

In the year 2100, the population is projected to be 487,000,000.